DECLASSIFIED

MEMORANDUM

January 21, 1998

TO:
____ DIVISION OF APPEALS
____ DIVISION OF AUDITING AND FINANCIAL ANALYSIS
____ DIVISION OF COMMUNICATION
____ DIVISION OF ELECTRIC AND GAS
XX DIVISION OF RESEARCH
____ DIVISION OF WATER AND WASTEWATER
____ DIVISION OF LEGAL SERVICES

FROM: DIVISION OF RECORDS AND REPORTING (SANDERS)

RE: CONFIDENTIALITY OF CERTAIN INFORMATION

DOCUMENT NO: 01124-98

DESCRIPTION: Certain info in audit of electric service quality and reliability.

SOURCE: Gulf Power Company

DOCKET NO: 971668-EI

The above material was received with a request for confidentiality (attached). Please prepare a recommendation for the attorney assigned to the case by completing the section below and forwarding a copy of this memorandum, together with a brief memorandum supporting your recommendation, to the attorney. Copies of your recommendation should also be provided to the Division of Records and Reporting and to the Division of Appeals.

Please read each of the following and check if applicable.

___ The document(s) is (are), in fact, what the utility asserts it (them) to be.

✓ The utility has provided enough details to perform a reasoned analysis of its request.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: Florida Public Service Commission
Review of Electric Service Quality and
Reliability
_____/

Docket No.: Undocketed Audit
Date: January 20, 1998

EXHIBIT "A"

REQUEST FOR CONFIDENTIAL CLASSIFICATION

The information provided herein should be maintained as proprietary confidential business information pursuant to Section 366.093 and Rule 25-22.006, F.A.C.

EXHIBIT "A"

Provided to the Division of Records and Reporting
under separate cover as confidential information

FPSC Audit Document/Record Request
Electric Service Quality Audit
Gulf Power Company
April 14, 1997

6. Identify any goals, objectives, and/or benchmarks relating to distribution maintenance.

ANSWER:

Gulf's goal is to maintain a level of service that customers expect and can afford, while reducing the costs associated with maintenance of the system by identifying and planning specific distribution programs to accomplish this goal. Gulf uses its Public Opinion Research, Distribution Line Clearing Cost Goals, Line Clearing Reliability Goals and its Distribution Trouble Reports Outage Summary as benchmarks.

Regarding Gulf Power's Strengths and Weaknesses

Nearly all respondents agree that Gulf Power is doing a good job maintaining reliable service and providing correct bills, while fewer customers agree that Gulf Power is doing a good job planning wisely for the future and being concerned about the environment which are two areas in which Gulf Power can strive to improve in 1997.

Strengths and Weaknesses of Gulf Power
(% who agree with statements)

	Jan./ Feb. 1996	March/ April 1996	May/ June 1996	July/ August 1996	Sept/ Oct. 1996	Nov./ Dec. 1996	Jan./ Feb. 1997
(Base)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
Attributes	%	%	%	%	%	%	%
Strengths							
Maintaining reliable service	92	92	96	92	91	93	94
Providing correct bills	90	88	87	82	→ 92	90	92
Restoring service quickly when it goes out	89	88	92	89	88	90	86
Energy efficiency advice	86	← 73	80	80	82	81	84
Keeping you informed	84	78	80	79	80	84	82
Friendly/courteous employees	88	83	83	80	84	85	80
Average							
Good citizen of the community	86	82	82	82	79	82	78
Operating efficiently	77	73	74	80	81	74	77
Keeping rates reasonable	64	64	64	68	68	66	69
Handling requests	78	← 69	→ 78	72	78	76	68
Caring about customers as individuals	76	← 64	65	64	70	66	68
Weaknesses							
Providing safety education	74	66	67	73	72	66	66
A well managed company	66	62	63	66	72	61	64
Concern about the environment	62	61	54	→ 68	62	55	60
Planning wisely for future	54	52	50	→ 63	58	54	54
Overall Average Agreement	78	73	74	76	77	75	75

Strengths and Weaknesses of Gulf Power

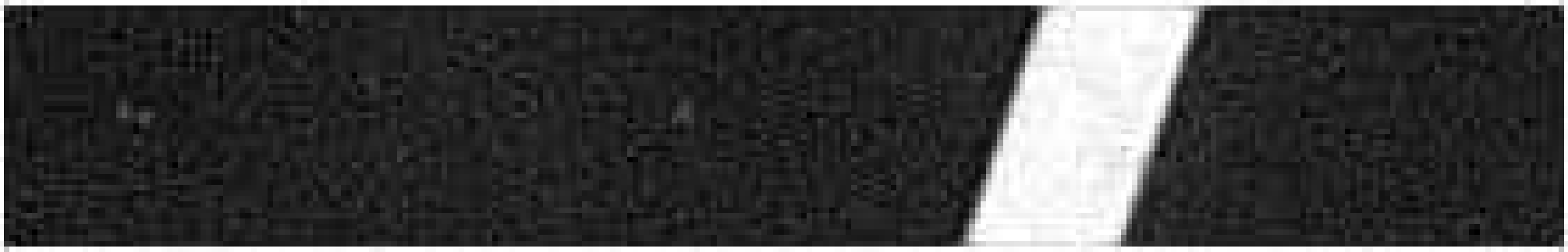
Strengths and Weaknesses of Gulf Power (% Agree)

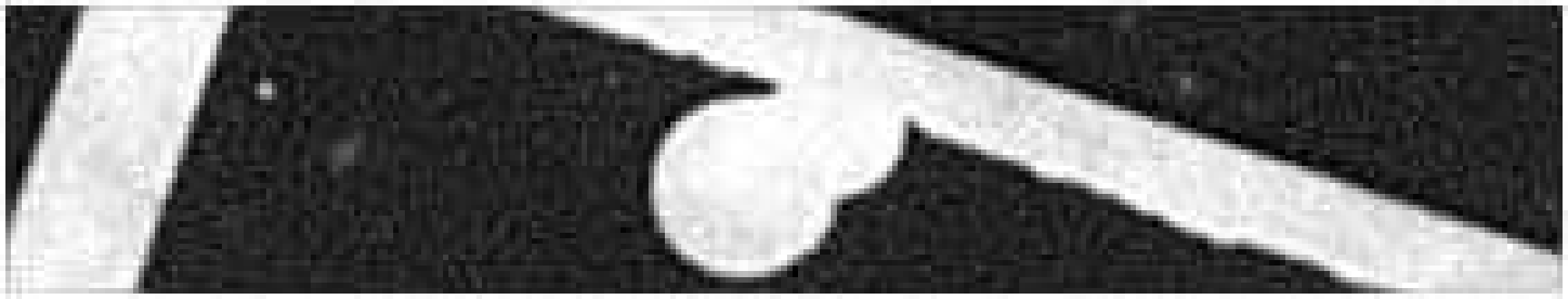
Attributes	(Base)	Jan./ Feb. 1996 (200) %	March/ April 1996 (200) %	May/ June 1996 (200) %	July/ August 1996 (200) %	Sept./ Oct. 1996 (200) %	Nov./ Dec. 1996 (200) %	Jan./ Feb. 1997 (200) %
Strengths								
Maintaining reliable service		92	92	96	92	91	93	94
Providing correct bills		90	88	87	82	→ 92	90	92
Restoring service quickly when it goes out		89	88	92	89	88	90	86
Energy efficiency advice		86	← 73	80	80	82	81	84
Keeping you informed		84	78	80	79	80	84	82
Friendly/courteous employees		88	83	83	80	84	85	80
Average								
Operating efficiently		77	73	74	80	81	74	77
Good citizen of the community		86	82	82	82	79	82	78
Keeping rates reasonable		64	64	64	68	68	66	69
Handling requests		78	← 69	→ 78	72	78	76	68
Caring about customers as individuals		76	← 64	65	64	70	66	68
Weaknesses								
Providing safety education		74	66	67	73	72	66	66
A well managed company		66	62	63	66	72	61	64
Concerned about the environment		62	61	54	→ 68	62	55	60
Planning wisely for future		54	52	50	→ 63	58	54	54

Strengths and Weaknesses of Gulf Power (% Disagree)

Attributes	(Base)	Jan./ Feb. 1996 (200) %	March/ April 1996 (200) %	May/ June 1996 (200) %	July/ August 1996 (200) %	Sept./ Oct. 1996 (200) %	Nov./ Dec. 1996 (200) %	Jan./ Feb. 1997 (200) %
Keeping rates reasonable		22	20	18	18	18	20	19
Restoring service quickly when it goes out		8	4	2	→ 8	10	6	8
Caring about customers as individuals		6	→ 12	9	13	9	8	8
Keeping you informed		6	8	8	8	6	5	6
Operating efficiently		6	6	4	8	6	6	4
Planning wisely for future		6	8	7	6	6	4	4
A well managed company		4	5	2	→ 6	6	4	4
Energy efficiency advice		3	→ 8	6	5	6	3	2
Maintaining reliable service		6	4	1	4	6	3	2
Handling requests		4	7	4	8	5	5	6
Concerned about the environment		9	6	5	5	5	2	3
Good citizen of the community		2	4	2	2	4	2	2
Providing correct bills		4	8	4	→ 10	← 3	4	2
Friendly/courteous employees		2	→ 6	2	→ 6	3	4	4
Providing safety education		4	4	4	3	2	2	4

Q.: Please tell me if you agree, disagree, or have no opinion as to whether GULF POWER is doing a good job o (ATTRIBUTE).





4–

DIVISION	TOTAL OUTAGES	OUTAGES PER 100 MILES	NO. OF CUSTOMERS INTERRUP	PERCENT CUSTOMERS INTER/MONTH	TOTAL INTERRUP TIME (MIN)	AVG INTERRUP TIME (MIN)/ CUST INTERRUP	AVG INTERRUP TIME (MIN)/ CUST SERVED	RELIABILITY INDEX	TREE OUTAGES /100 MI	DIG-IN OUTAGES /100 MI
CURRENT PERIOD (03/96 THRU 02/97)										
EASTERN	1,113	73.80	60,610	6.034	3,677,022	60.667	45.929	99.99164	7.79	5.71
CENTRAL	1,168	83.97	36,138	3.728	1,898,777	52.842	23.568	99.99552	6.84	12.02
WESTERN	4,187	125.92	113,294	5.620	6,743,123	59.519	40.194	99.99236	18.96	7.37
COMPANY TOTAL	6,468	104.32	210,042	5.268	12,318,922	58.650	37.079	99.99294	11.77	6.44
PREVIOUS PERIOD (03/95 THRU 02/96)										
EASTERN	1,344	91.88	64,140	6.457	3,670,097	57.228	44.338	99.99156	14.34	7.14
CENTRAL	957	70.32	49,165	5.213	2,855,431	58.055	36.319	99.99316	7.28	16.49
WESTERN	3,545	108.16	109,859	5.578	7,637,322	69.534	46.479	99.99118	17.40	6.46
COMPANY TOTAL	5,846	95.82	223,164	5.799	14,163,850	63.465	43.482	99.99174	[illegible]	9.00
SIX-YEAR AVERAGE (03/91 THRU 02/97)										
EASTERN	1,388	96.12	63,003	6.833	3,322,904	52.742	41.394	99.99213	9.49	13.29
CENTRAL	1,452	119.80	56,602	6.363	2,669,433	47.161	35.446	99.99326	9.72	21.56
WESTERN	4,659	145.25	165,016	8.046	8,795,578	53.301	55.311	99.98948	21.61	9.81
COMPANY TOTAL	7,499	125.59	284,621	7.537	14,787,915	51.957	46.995	99.99106	16.61	13.19
CURRENT MONTH (02/97)										
EASTERN	49	3.30	713	0.850	61,441	86.173	0.734	99.99817	0.25	0.00
CENTRAL	71	5.10	4,629	5.730	246,841	53.757	3.061	99.99235	0.51	0.47
WESTERN	216	6.50	8,971	5.346	270,877	30.186	1.610	99.99600	0.53	0.21
COMPANY TOTAL	336	5.42	14,313	4.300	580,359	40.548	1.747	99.99566	0.45	0.25

Louis Rouillier

Bin 312

EDS546-04

GULF POWER COMPANY
DISTRIBUTION TROUBLE REPORTS
OVERHEAD AND UNDERGROUND OUTAGE SUMMARY

DATE 03/27/97
TIME 10 01 44

DIVISION	TOTAL OUTAGES	OUTAGES PER 100 MILES	NO. OF CUSTOMERS INTERRUP	PERCENT CUSTOMERS INTER/MONTH	TOTAL INTERRUP TIME (MIN)	AVG INTERRUP TIME (MIN)/ CUST INTERRUP	AVG INTERRUP TIME (MIN)/ CUST SERVED	RELIABILITY INDEX	TREE OUTAGES /100 MI	DIG-IN OUTAGES /100 MI
OVERHEAD OUTAGES — CURRENT PERIOD (03/96 THRU 02/97)										
EASTERN	1,016	77.44	[illegible]	7.293	3,510,404	57.186	51.774	99.99016	7.79	0.00
CENTRAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
WESTERN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
COMPANY TOTAL	6,047	113.38	194,703	6.738	11,548,138	55.424	43.041	99.99152	11.77	0.00
PREVIOUS PERIOD (03/95 THRU 02/96)										
EASTERN	1,246	95.97	60,182	7.602	3,369,074	58.040	43.904	99.99083	14.34	0.00
CENTRAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7.28	[illegible]
WESTERN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
COMPANY TOTAL	5,399	102.82	213,701	7.322	13,043,918	60.[illegible]	52.009	99.99033	14.42	0.00
SIX-YEAR AVERAGE (03/91 THRU 02/97)										
EASTERN	1,273	98.03	60,092	7.742	3,083,292	51.318	47.716	99.99092	9.49	0.00
CENTRAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
WESTERN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
COMPANY TOTAL	6,972	133.34	274,960	9.437	13,702,513	49.835	56.437	99.98927	16.61	0.00
UNDERGROUND OUTAGES — CURRENT PERIOD (03/96 THRU 02/97)										
EASTERN	97	24.87	1,216	0.440	166,566	136.980	14.526	99.99797	0.00	5.71
CENTRAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
WESTERN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
COMPANY TOTAL	421	40.87	5,340	0.644	779,784	144.330	9.772	99.99814	0.00	6.44
PREVIOUS PERIOD (03/95 THRU 02/96)										
EASTERN	101	60.18	3,958	0.956	301,025	81.107	29.308	99.99613	0.00	7.14
CENTRAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	16.49
WESTERN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6.46
COMPANY TOTAL	449	55.56	9,463	1.042	1,139,137	122.491	11.515	99.99709	0.00	9.00
SIX-YEAR AVERAGE (03/91 THRU 02/97)										
EASTERN	116	74.60	2,911	1.062	239,613	82.313	16.276	99.99718	0.00	13.29
CENTRAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	21.56
WESTERN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9.81
COMPANY TOTAL	529	71.29	9,362	1.120	1,085,443	113.337	15.095	99.99712	0.00	13.19

ESQ-1 Item Number 26

CONFIDENTIAL

This document consists of pages 1 - 190. Each page in its entirety is confidential, including all tables, graphs and accompanying text.

26. Provide a blank copy of any customer satisfaction surveys performed by the company in the last 5 years.

Answer:

Blank copies of surveys are provided for 1992 through 1996.

Entire Document is Confidential

1992 Customer Satisfaction Survey

Residential	Residential Customers
Commercial/Industrial	Same survey used for Commercial and Industrial Customers
Active	Residential Customers who had an active contact with the company

THE MARKETING WORKSHOP, INC.
Norcross, GA 30092
92-3049-Res

Residential

(ASK TO SPEAK WITH "HEAD OF HOUSEHOLD" STATUS RESPONDENT.) Hello, I am calling from Compass Marketing Research, a national public opinion research firm. We are conducting a brief survey on some issues of local interest and we would like to ask for some opinions in your household.

1. If utilities were graded like students in school, based upon your experience, what grade from 0 to 100 would you give your (READ FIRST ITEM ON LIST) on the job they do in satisfying customers?

(ROTATE)	Write in Grade
Electric company	_____
Telephone company	_____
Gas company	_____
Cable company	_____

2. How concerned is your electric company about satisfying customers with the service it provides—very concerned, somewhat concerned, somewhat unconcerned or very unconcerned?

Very concerned 1
Somewhat concerned 2
Somewhat unconcerned 3
Very unconcerned 4
(DO NOT READ) Not sure 5

3. Generally speaking, would you say your overall opinion of your electric company is very favorable, somewhat favorable, somewhat unfavorable, or very unfavorable?

Very favorable 1
Somewhat favorable 2
Somewhat unfavorable 3
Very unfavorable 4
(DO NOT READ) Not sure 5

4. If you had the opportunity to choose your supplier of electricity, would you be very likely, somewhat likely, somewhat unlikely, or very unlikely to choose your current electric company?

Very likely 1
Somewhat likely 2
Somewhat unlikely 3
Very unlikely 4
(DO NOT READ) Not sure 5

5. How satisfied are you with the reliability of the electric power supplied by your electric utility —that is keeping the number and duration of service interruptions down—are you very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

6. During the past month, did you call or visit an office of your electric company for any reason?

Called 1
Visited 2
Called and visited 3
Did not call or visit 4
(DO NOT READ) not sure 5

7. (IF "CALLED" OR "VISITED" IN Q.6, ASK Q.7-9; ALL OTHERS SKIP TO Q.10, ASK:) How courteously did the employee you had contact with handle your call or visit —very courteously, somewhat courteously, or not courteously at all?

Very courteously 1
Somewhat courteously 2
Not courteously at all 3
(DO NOT READ) Not sure 4

8. Was the employee you had contact with very knowledgeable, fairly knowledgeable, or not knowledgeable at all?

Very knowledgeable 1
Somewhat knowledgeable 2
Not knowledgeable at all 3
(DO NOT READ) Not sure 4

9. And, how satisfied were you with the way the electric company employee handled your call or visit—very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

10. (ASK EVERYONE:) During the past month has your household experienced any electric outages lasting longer than 5 minutes?

Yes 1
No 2
(DO NOT READ) Not sure 3

11. And, during the past month have your digital clocks and VCR's ever stopped operating for very brief periods and blinked on and off, or not?

Yes 1
No 2
(DO NOT READ) Not sure 3

12. Thinking for a moment about the management of your electric company, would you say that management is—very competent, somewhat competent, somewhat incompetent, or very incompetent?

Very competent 1
Somewhat competent 2
Somewhat incompetent 3
Very incompetent 4
(DO NOT READ) Not sure 5

13. In your opinion, does your electric company make it very easy, fairly easy, fairly difficult, or very difficult to do business with them?

Very easy 1
Fairly easy 2
Fairly difficult 3
Very difficult 4
(DO NOT READ) Not sure 5

14. Do you consider the price you pay for electricity to be low, reasonable, a little higher than it should be, or much higher than it should be?

Low 1
Reasonable 2
A little higher than it should be 3
Much higher than it should be 4
(DO NOT READ) Not sure 5

15. How hard do you think your electric company is working to reduce its costs and keep electric prices down—are they working very hard, fairly hard, not very hard, or not hard at all?

Working very hard 1
Working fairly hard 2
Not working very hard 3
Not working hard at all 4
(DO NOT READ) Not sure 5

16. Now, for the next few questions I'd like you to rate your electric company's performance in certain areas. For example, how would you rate your electric company's performance as it relates to (READ ITEMS FROM LIST)—would you say they do an excellent, pretty good, not so good or poor job at: (READ PHRASE)?

(ROTATE QUESTIONS)	Excellent	Pretty Good	Not so Good	Poor	Not Sure
a. Providing emergency repairs during disruptions of electricity service	1	2	3	4	5
b. Handling individual customer complaints and problems	1	2	3	4	5
c. Being courteous in the service they provide	1	2	3	4	5
d. Responding promptly to questions or requests for information	1	2	3	4	5
e. Accurately reading electric meters	1	2	3	4	5
f. Being careful about their impact on the environment	1	2	3	4	5
g. Showing concern for customers' safety in using electricity	1	2	3	4	5
h. Providing reliable electrical service	1	2	3	4	5
i. Having competent employees	1	2	3	4	5
j. Attracting new business and industry to the area	1	2	3	4	5
k. Being involved in the community	1	2	3	4	5
l. Providing a good value for the money you spend on electricity	1	2	3	4	5
m. Caring about customers and not taking them for granted	1	2	3	4	5

17. And, in thinking about the overall services that your electric company provides—that is, electrical service, customer assistance, and other services—how satisfied are you with the services provided by your electric company—very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

18. Finally, I'd like to ask just a few classification questions... (DO NOT PAUSE)...

a. Which category best describes your age—is it between: (READ LIST)?

18 to 24 1
25 to 34 2
35 to 44 3
45 to 54 4
55 to 64 5
65 or over 6
(DO NOT READ) DK/NA/refused 7

b. And, what was the last grade or level of school you completed? (READ LIST.)

Less than high school 1
High school graduate 2
Some college 3
College graduate 4
Post graduate 5
(DO NOT READ) Not sure 6
(DO NOT READ) DK/NA/refused 7

c. Do you own or rent your home?

Own 1
Rent 2
(DO NOT READ) DK/NA/refused 3

d. And finally, which category best describes your total household income for 1991? (READ LIST)

Under $5,000 1
$5,000 up to $9,999 2
$10,000 up to $14,999 3
$15,000 up to $24,999 4
$25,000 up to $34,999 5
$35,000 up to $49,999 6
$50,000 up to $74,999 7
$75,000 or over 8
(DO NOT READ) Not Sure 9
(DO NOT READ) DK/NA/refused . . . 10

X. Record but do not ask:

Male - 1
Female - 2

Thank you for your time and cooperation. Your opinions DO count!

Before I hang up I would like to verify that I reached you at (READ THE PHONE NUMBER YOU DIALED).

Respondent's Name_____ Date_____

Respondent's Phone ( )_____ Interviewer's Name_____

THE MARKETING WORKSHOP, INC.
Norcross, GA 30092
91-2848-C

LAYOUT

Version 2
5-8-91

Commercial/Industrial

SWITCHBOARD INTRODUCTION

Hello, my name is _____, I'm calling from Compass Marketing Research, a national public opinion research firm. We are conducting a brief survey among commercial and industrial companies in The South and I would like to speak to the person in your company/organization who is most knowledgeable about the types of energy your company uses, such as electricity and natural gas at this location, and has contact with your local utility companies? May I please have his or her name, title and direct telephone number.

Respondent Name_____

Title:_____

Phone #:_____

RESPONDENT INTRODUCTION

Hello, my name is _____, I'm calling from Compass Marketing Research, a national public opinion research firm. We are conducting a brief survey among a random sample of commercial and industrial users of energy in The South and we would like to include your opinions. You have our pledge that this interview is being conducted completely off the record—that your identity and specific attitudes and opinions will be held in strictest confidence. The interview should require about 10 minutes of your time.

(INTERVIEWER, BE SURE TO READ.) Your organization may have more than one location in this state. In this interview, we would like you to keep all these locations in mind when answering the questions.

Before we begin, I would like to confirm that you are the person in your company/organization who is most knowledgeable about your company's energy use and the services you receive from your local electric and gas company.

(IF YOU ARE SPEAKING TO THE APPROPRIATE RESPONDENT, CONTINUE TO Q.1. IF NOT, ASK FOR A REFERRAL AND REPEAT RESPONDENT INTRODUCTION.)

1. If utilities were graded like students in school, based upon your experience, what grade from 0 to 100 would you give you (READ FIRST ITEM ON LIST) on the job they do in satisfying customers?

BEGIN CARD 1

(ROTATE)	Write In Grade	
Electric company	_____	(cols 8-10)
Telephone company	_____	(11-13)
Gas company	_____	(14-16)

2. How concerned is your electric company about satisfying customers with the service it provides—very concerned, somewhat concerned, somewhat unconcerned or very unconcerned?

(17)

Very concerned 1
Somewhat concerned 2
Somewhat unconcerned 3
Very unconcerned 4
(DO NOT READ) Not sure 5

3. If you had the opportunity to choose your supplier of electricity, would you be very likely, somewhat likely, somewhat unlikely, or very unlikely to choose your current electric company?

(18)

Very likely 1
Somewhat likely 2
Somewhat unlikely 3
Very unlikely 4
(DO NOT READ) Not sure 5

4. How would you rate the overall quality of service provided by your electric supplier—excellent, pretty good, not so good, or poor?

(19)

Excellent 1
Pretty good 2
Not so good 3
Poor 4
(DO NOT READ) Not sure 5

5. How satisfied are you with the reliability of the electric power supplied by your electric utility —that is keeping the number and duration of service interruptions down—are you very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

(20)

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

6. And, how would you assess the quality of the power provided by your electric utility—is it satisfactory, or is it subject to surges, dips and fluctuations?

Satisfactory 1
Subject to dips, surges, fluctuations 2
(DO NOT READ) not sure 3

(21)

7. And, thinking for a moment about the price you pay for electricity, would you say the price is low, reasonable, a little higher than it should be, or much higher than it should be?

Low 1
Reasonable 2
A little higher than it should be 3
Much higher than it should be 4
(DO NOT READ) Not sure 5

(22)

7X. As I read the following list of industries, please rate each one's performance as it relates to being careful about their impact on the environment. Would you say (READ ITEMS ON LIST) do [does] an Excellent, Pretty Good, Not So Good, or Poor job as it relates to being careful about their impact on the environment? (ROTATE LIST)

CARD	COL		Excellent	Pretty Good	Not So Good	Poor	(DO NOT READ) DK/NA/RF
1	48	a. Chemical plants in your area	1	2	3	4	5
	49	b. Your electric company	1	2	3	4	5
1	50	c. Oil Refineries in your area	1	2	3	4	5
1	51	d. Steel mills in your area	1	2	3	4	5
1	52	e. Paper mills in your area	1	2	3	4	5
1	53	f. Textile mills in your area	1	2	3	4	5

8. During the past month, did you call or visit an office of your electric company for any reason?

Called 1
Visited 2
Called and visited 3
Did not call or visit 4
(DO NOT READ) not sure 5

(23)

ID

9. Now, for the next few questions I'd like you to rate your electric company's performance in certain areas. For example, how would you rate your electric company's performance as it relates to (READ ITEMS FROM LIST)—would you say they do an excellent, pretty good, not so good or poor job at: (READ PHRASE)?

	(ROTATE QUESTIONS)	Excellent	Pretty Good	Not so Good	Poor	Not Sure
(24)	a. Being a reliable source of information	4	3	2	1	5
(25)	b. Being careful about their impact on the environment	4	3	2	1	5
(26)	c. Conducting themselves in an open and honest manner	4	3	2	1	5
(27)	d. Keeping prices as low as possible	4	3	2	1	5
(28)	e. Providing reliable electric service	4	3	2	1	5
(29)	f. Taking an active role in the community in which it operates	4	3	2	1	5
(30)	g. Restoring power quickly during emergencies	4	3	2	1	5
(31)	h. Being courteous to customers	4	3	2	1	5
(32)	i. Responding promptly to customer questions and problems	4	3	2	1	5
(33)	j. Conducting their operations efficiently	4	3	2	1	5
(34)	k. Caring about customers and not taking them for granted	4	3	2	1	5
(35)	l. Having knowledgeable, well trained employees	4	3	2	1	5
(36)	m. Providing a good value for the money you spend on electricity	4	3	2	1	5
(37)	n. Attracting new business and industry to the area	4	3	2	1	5
(38)	o. Sending accurate bills	4	3	2	1	5

10. All things considered, how satisfied are you with the full package of services that your electric supplier provides your organization—are you very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

(47)

11. And, how satisfied would you say you are with the full package of services that your natural gas supplier provides your organization—are you very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

(48)

CLOSING

And finally, I'd like to ask just a few classification questions...

12. Approximately how many people are employed at this location?

(41 – 44)

_____

13. Does your company own or lease the building at this location?

Own 1
Lease 2
Neither 3
DK/NA/refused 4

(45)

14. And, finally, what is your title? _____ (46)

Thank you for your time and cooperation. Your opinions DO count!

Before I hang up I would like to verify that I reached you at (READ THE PHONE NUMBER YOU DIALED).

Respondent's Name _____ Date _____

Respondent's Phone ( ) (60 – 71) Interviewer's Name ID (57-59)

Seq.# from phone pages CARD 3 (COLS 40-48)

COMPANY CARD1 (COLS 76) OVER CARD 1 COL (54)

DISTRICT CODE (77-78)

MALE/FEMALE (79)

ACTIVE CUSTOMER SURVEY

Revised April 3, 1991

Sequence Number _____ Customer Class _____

Contact Date ___/___/___ CUIQ Code _____

Rep. ID _____

Is this the (read name from sample) household?

No - TERMINATE
Yes - CONTINUE

Hello, my name is _____ with _____. (Research firm). We are conducting a short survey of people who have had a recent contact with _____ Power. Their records indicate that someone in your (home/business) has been in contact with them recently concerning electric service, an electric bill or something else. Are you the person who contacted _____ Power?

1) YES, -- CONTINUE
2) NO, but person is available -- CONTINUE
3) NO, person not available -- ARRANGE FOR CALL-BACK
4) NO, don't recall contact -- TERMINATE

1. Thinking back to your most recent contact with _____ Power, was this made over the telephone or did you visit one of their offices? **(Do not read list.)**

1) TELEPHONE
2) OFFICE VISIT
3) MAIL/OTHER **(Ask Q-2, then skip to Q-5)**
4) CAN'T RECALL -- TERMINATE

2. Again, thinking back to that (call/visit/contact) you recently made, what was the purpose or reason for your (call/visit/contact)? **(Do not read list. Record all that apply).**

1) SERVICE TURNED ON TO A **NEW** HOME/BUILDING
2) SERVICE TURNED ON TO AN **EXISTING** HOME/BUILDING
3) TRANSFER/ACCOUNTING INFORMATION CHANGE
4) SERVICE PROBLEM/INQUIRY
5) TO GET SERVICE TURNED OFF
6) REPORT A POWER OUTAGE
7) STREET/SECURITY/OUTDOOR LIGHTS
8) BILLING PROBLEM/COMPLAINT

9) BILL PAYMENT INQUIRY
10) BUDGET/LEVELIZED BILLING PROBLEM
11) BUDGET/LEVELIZED BILLING INQUIRY
12) APPLIANCE QUESTION/PURCHASE
13) OTHER (EXPLAIN) _____
14) DK/NA/REFUSED

3. How do you feel about the way the **customer service representative** whom you first spoke with handled your inquiry? **(Read list)**

1) VERY SATISFIED
2) SATISFIED
3) DISSATISFIED
4) VERY DISSATISFIED
5) DK/REFUSED **(Do not read, skip to Q-5.)**

4. What specifically made you _____? **(Response to Q-3)**

_____

_____

_____

5. Did _____ Power come to your (home/business) as a result of your inquiry or service request? **(Do not read list.)**

1) YES
2) NO **(SKIP TO Q-8)**
3) DK/REFUSED **(Skip to Q-8)**

6. How do you feel about the service _____ Power provided **at your (home/business)? (Read list)**

1) VERY SATISFIED
2) SATISFIED
3) DISSATISFIED
4) VERY DISSATISFIED
5) DK/REFUSED **(Do not read, skip to Q-8.)**

7. What specifically made you _____? **(Response to Q-6)**

_____

_____

_____

8. Do you feel that your inquiry or service request was resolved to your satisfaction or not? **(Do not read list.)**

1) YES
2) NO
3) NOT YET RESOLVED
4) DK/REFUSED

9. **(Ask Q-9 only if Q-2 = 1 or 2, otherwise, skip to Q-11)** Did _____ Power provide electrical service to you by the date they promised?

1) YES (Skip to Q-11)
2) NO
3) DK/REFUSED

10. If no, what was the reason the promised date was not met?

_____

_____

11. Thinking only about your recent contact with _____Power, how do you feel about _____ Power's performance in handling your inquiry or service request? **(Read list)**

1) VERY SATISFIED
2) SATISFIED
3) DISSATISFIED
4) VERY DISSATISFIED
5) DK/REFUSED **(Do not read)**

12. What can _____ Power and its employees do to improve their customer service efforts?

_____

_____

13. Do you have a specific problem or question you need _____ Power to call you about?

NO... GO TO Q14
YES... SO THAT I CAN GET THE PROPER PERSON TO CONTACT YOU, WOULD YOU TELL ME THE NATURE OF YOUR PROBLEM OR QUESTION?

_____

_____

(Record nature of problem/question and generate "Customers Who Wish To Be Contacted" report)

15

PLEASE GIVE ME YOUR NAME AND THE TIME OF DAY YOU CAN BE REACHED:

CUSTOMER NAME:_____

TIME OF DAY: _____DAY _____EVENING

PHONE NO: _____

Q14

ASK Q14 IF RESPONDENT IS "DISSATISFIED" OR "VERY DISSATISFIED" IN Q3, Q6, OR Q11, AND Q13="NO". **DO NOT ASK FOR MISSISSIPPI POWER.**

14. _____ Power would like to improve the service they provide to you. May we pass along your name and comments to _____ Power?

Yes - Generate "Customers Who Are Dissatisfied" report.

No - Continue

CLOSING

Record sex

Ask for respondent's name

Verify phone number

THANK YOU VERY MUCH FOR YOUR COOPERATION!

1993 Customer Satisfaction Survey

The 1992 Survey was used again in 1993 with the exception of the Key Account Survey.

Residential	Residential Customers
Commercial/Industrial	Same survey used for Commercial and Industrial Customers
Active	Residential Customers who had an active contact with the company
Key Accounts	Key Accounts were given a separate survey. They were not surveyed in the Commercial or Industrial survey.

THE MARKETING WORKSHOP, INC.
Norcross, GA 30092
92-3049-Res

Residential

(ASK TO SPEAK WITH "HEAD OF HOUSEHOLD" STATUS RESPONDENT.) Hello, I am calling from Compass Marketing Research, a national public opinion research firm. We are conducting a brief survey on some issues of local interest and we would like to ask for some opinions in your household.

1. If utilities were graded like students in school, based upon your experience, what grade from 0 to 100 would you give your (READ FIRST ITEM ON LIST) on the job they do in satisfying customers?

(ROTATE)	Write In Grade
Electric company	_____
Telephone company	_____
Gas company	_____
Cable company	_____

2. How concerned is your electric company about satisfying customers with the service it provides—very concerned, somewhat concerned, somewhat unconcerned or very unconcerned?

Very concerned 1
Somewhat concerned 2
Somewhat unconcerned 3
Very unconcerned 4
(DO NOT READ) Not sure 5

3. Generally speaking, would you say your overall opinion of your electric company is very favorable, somewhat favorable, somewhat unfavorable, or very unfavorable?

Very favorable 1
Somewhat favorable 2
Somewhat unfavorable 3
Very unfavorable 4
(DO NOT READ) Not sure 5

4. If you had the opportunity to choose your supplier of electricity, would you be very likely, somewhat likely, somewhat unlikely, or very unlikely to choose your current electric company?

Very likely 1
Somewhat likely 2
Somewhat unlikely 3
Very unlikely 4
(DO NOT READ) Not sure 5

5. How satisfied are you with the reliability of the electric power supplied by your electric utility —that is keeping the number and duration of service interruptions down—are you very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

6. During the past month, did you call or visit an office of your electric company for any reason?

Called 1
Visited 2
Called and visited 3
Did not call or visit 4
(DO NOT READ) not sure 5

7. (IF "CALLED" OR "VISITED" IN Q.6, ASK Q.7-9; ALL OTHERS SKIP TO Q.10, ASK:) How courteously did the employee you had contact with handle your call or visit —very courteously, somewhat courteously, or not courteously at all?

Very courteously 1
Somewhat courteously 2
Not courteously at all 3
(DO NOT READ) Not sure 4

8. Was the employee you had contact with very knowledgeable, fairly knowledgeable, or not knowledgeable at all?

Very knowledgeable 1
Somewhat knowledgeable 2
Not knowledgeable at all 3
(DO NOT READ) Not sure 4

9. And, how satisfied were you with the way the electric company employee handled your call or visit—very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

10. (ASK EVERYONE:) During the past month has your household experienced any electric outages lasting longer than 5 minutes?

Yes 1
No 2
(DO NOT READ) Not sure 3

11. And, during the past month have your digital clocks and VCR's ever stopped operating for very brief periods and blinked on and off, or not?

Yes 1
No 2
(DO NOT READ) Not sure 3

12. Thinking for a moment about the management of your electric company, would you say that management is—very competent, somewhat competent, somewhat incompetent, or very incompetent?

Very competent 1
Somewhat competent 2
Somewhat incompetent 3
Very incompetent 4
(DO NOT READ) Not sure 5

13. In your opinion, does your electric company make it very easy, fairly easy, fairly difficult, or very difficult to do business with them?

Very easy 1
Fairly easy 2
Fairly difficult 3
Very difficult 4
(DO NOT READ) Not sure 5

14. Do you consider the price you pay for electricity to be low, reasonable, a little higher than it should be, or much higher than it should be?

Low 1
Reasonable 2
A little higher than it should be 3
Much higher than it should be 4
(DO NOT READ) Not sure 5

15. How hard do you think your electric company is working to reduce its costs and keep electric prices down—are they working very hard, fairly hard, not very hard, or not hard at all?

Working very hard 1
Working fairly hard 2
Not working very hard 3
Not working hard at all 4
(DO NOT READ) Not sure 5

16. Now, for the next few questions I'd like you to rate your electric company's performance in certain areas. For example, how would you rate your electric company's performance as it relates to (READ ITEMS FROM LIST)—would you say they do an excellent, pretty good, not so good or poor job at: (READ PHRASE)?

(ROTATE QUESTIONS)	Excellent	Pretty Good	Not so Good	Poor	Not Sure
a. Providing emergency repairs during disruptions of electricity service	1	2	3	4	5
b. Handling individual customer complaints and problems	1	2	3	4	5
c. Being courteous in the service they provide	1	2	3	4	5
d. Responding promptly to questions or requests for information	1	2	3	4	5
e. Accurately reading electric meters	1	2	3	4	5
f. Being careful about their impact on the environment	1	2	3	4	5
g. Showing concern for customers' safety in using electricity	1	2	3	4	5
h. Providing reliable electrical service	1	2	3	4	5
i. Having competent employees	1	2	3	4	5
j. Attracting new business and industry to the area	1	2	3	4	5
k. Being involved in the community	1	2	3	4	5
l. Providing a good value for the money you spend on electricity	1	2	3	4	5
m. Caring about customers and not taking them for granted	1	2	3	4	5

17. And, in thinking about the overall services that your electric company provides—that is, electrical service, customer assistance, and other services—how satisfied are you with the services provided by your electric company—very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

18. Finally, I'd like to ask just a few classification questions... (DO NOT PAUSE)...

a. Which category best describes your age—is it between: (READ LIST)?

18 to 24 1
25 to 34 2
35 to 44 3
45 to 54 4
55 to 64 5
65 or over 6
(DO NOT READ) DK/NA/refused 7

b. And, what was the last grade or level of school you completed? (READ LIST.)

Less than high school 1
High school graduate 2
Some college 3
College graduate 4
Post graduate 5
(DO NOT READ) Not sure 6
(DO NOT READ) DK/NA/refused 7

c. Do you own or rent your home?

Own 1
Rent 2
(DO NOT READ) DK/NA/refused 3

d. And finally, which category best describes your total household income for 1991? (READ LIST)

Under $5,000 1
$5,000 up to $9,999 2
$10,000 up to $14,999 3
$15,000 up to $24,999 4
$25,000 up to $34,999 5
$35,000 up to $49,999 6
$50,000 up to $74,999 7
$75,000 or over 8
(DO NOT READ) Not Sure 9
(DO NOT READ) DK/NA/refused . . . 10

X. Record but do not ask:

Male - 1
Female - 2

Thank you for your time and cooperation. Your opinions DO count!

Before I hang up I would like to verify that I reached you at (READ THE PHONE NUMBER YOU DIALED).

Respondent's Name_____ Date_____

Respondent's Phone ( )_____ Interviewer's Name_____

THE MARKETING WORKSHOP, INC.
Norcross, GA 30092
91-2848-C

LAYOUT

Version 2
5-8-91

Commercial/Industrial

SWITCHBOARD INTRODUCTION

Hello, my name is _____, I'm calling from Compass Marketing Research, a national public opinion research firm. We are conducting a brief survey among commercial and industrial companies in The South and I would like to speak to the person in your company/organization who is most knowledgeable about the types of energy your company uses, such as electricity and natural gas at this location, and has contact with your local utility companies? May I please have his or her name, title and direct telephone number.

Respondent Name_____

Title:_____

Phone #:_____

RESPONDENT INTRODUCTION

Hello, my name is _____, I'm calling from Compass Marketing Research, a national public opinion research firm. We are conducting a brief survey among a random sample of commercial and industrial users of energy in The South and we would like to include your opinions. You have our pledge that this interview is being conducted completely off the record—that your identity and specific attitudes and opinions will be held in strictest confidence. The interview should require about 10 minutes of your time.

(INTERVIEWER, BE SURE TO READ.) Your organization may have more than one location in this state. In this interview, we would like you to keep <u>all</u> these locations in mind when answering the questions.

Before we begin, I would like to confirm that you are the person in your company/organization who is most knowledgeable about your company's energy use and the services you receive from your local electric and gas company.

(IF YOU ARE SPEAKING TO THE APPROPRIATE RESPONDENT, CONTINUE TO Q.1. IF NOT, ASK FOR A REFERRAL AND REPEAT RESPONDENT INTRODUCTION.)

1. If utilities were graded like students in school, based upon your experience, what grade from 0 to 100 would you give your (READ FIRST ITEM ON LIST) on the job they do in satisfying customers?

BEGIN CARD 1

(ROTATE)	Write in Grade	
Electric company	_____	(cols 8-10)
Telephone company	_____	(11-13)
Gas company	_____	(14-16)

2. How concerned is your electric company about satisfying customers with the service it provides—very concerned, somewhat concerned, somewhat unconcerned or very unconcerned?

(17)

Very concerned 1
Somewhat concerned 2
Somewhat unconcerned 3
Very unconcerned 4
(DO NOT READ) Not sure 5

3. If you had the opportunity to choose your supplier of electricity, would you be very likely, somewhat likely, somewhat unlikely, or very unlikely to choose your current electric company?

(18)

Very likely 1
Somewhat likely 2
Somewhat unlikely 3
Very unlikely 4
(DO NOT READ) Not sure 5

4. How would you rate the overall quality of service provided by your electric supplier—excellent, pretty good, not so good, or poor?

(19)

Excellent 1
Pretty good 2
Not so good 3
Poor 4
(DO NOT READ) Not sure 5

5. How satisfied are you with the reliability of the electric power supplied by your electric utility —that is keeping the number and duration of service interruptions down—are you very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

(20)

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

6. And, how would you assess the quality of the power provided by your electric utility—is it satisfactory, or is it subject to surges, dips and fluctuations?

Satisfactory 1
Subject to dips, surges, fluctuations 2
(DO NOT READ) not sure 3

(21)

7. And, thinking for a moment about the price you pay for electricity, would you say the price is low, reasonable, a little higher than it should be, or much higher than it should be?

Low 1
Reasonable 2
A little higher than it should be 3
Much higher than it should be 4
(DO NOT READ) Not sure 5

(22)

7X. As I read the following list of industries, please rate each one's performance as it relates to being careful about their impact on the environment. Would you say (READ ITEMS ON LIST) do [does] an Excellent, Pretty Good, Not So Good, or Poor job as it relates to being careful about their impact on the environment? (ROTATE LIST)

CARD	COL		Excellent	Pretty Good	Not So Good	Poor	(DO NOT READ) DK/NA/RF
1	48	a. Chemical plants in your area	1	2	3	4	5
	49	b. Your electric company	1	2	3	4	5
1	50	c. Oil Refineries in your area	1	2	3	4	5
1	51	d. Steel mills in your area	1	2	3	4	5
1	52	e. Paper mills in your area	1	2	3	4	5
1	53	f. Textile mills in your area	1	2	3	4	5

8. During the past month, did you call or visit an office of your electric company for any reason?

Called 1
Visited 2
Called and visited 3
Did not call or visit 4
(DO NOT READ) not sure 5

(23)

9. Now, for the next few questions I'd like you to rate your electric company's performance in certain areas. For example, how would you rate your electric company's performance as it relates to (READ ITEMS FROM LIST)—would you say they do an excellent, pretty good, not so good or poor job at: (READ PHRASE)?

	(ROTATE QUESTIONS)	Excellent	Pretty Good	Not so Good	Poor	Not Sure
(24)	a. Being a reliable source of information	4	3	2	1	5
(25)	b. Being careful about their impact on the environment	4	3	2	1	5
(26)	c. Conducting themselves in an open and honest manner	4	3	2	1	5
(27)	d. Keeping prices as low as possible	4	3	2	1	5
(28)	e. Providing reliable electric service	4	3	2	1	5
(29)	f. Taking an active role in the community in which it operates	4	3	2	1	5
(30)	g. Restoring power quickly during emergencies	4	3	2	1	5
(31)	h. Being courteous to customers	4	3	2	1	5
(32)	i. Responding promptly to customer questions and problems	4	3	2	1	5
(33)	j. Conducting their operations efficiently	4	3	2	1	5
(34)	k. Caring about customers and not taking them for granted	4	3	2	1	5
(35)	l. Having knowledgeable, well trained employees	4	3	2	1	5
(36)	m. Providing a good value for the money you spend on electricity	4	3	2	1	5
(37)	n. Attracting new business and industry to the area	4	3	2	1	5
(38)	o. Sending accurate bills	4	3	2	1	5

10. All things considered, how satisfied are you with the full package of services that your electric supplier provides your organization—are you very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

(47)

11. And, how satisfied would you say you are with the full package of services that your natural gas supplier provides your organization—are you very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied 3
Very dissatisfied 4
(DO NOT READ) Not sure 5

(48)

CLOSING

And finally, I'd like to ask just a few classification questions...

12. Approximately how many people are employed at this location?

(41 – 44)

_____

13. Does your company own or lease the building at this location?

Own 1
Lease 2
Neither 3
DK/NA/refused 4

(45)

14. And, finally, what is your title? _____ (46)

Thank you for your time and cooperation. Your opinions DO count!

Before I hang up I would like to verify that I reached you at (READ THE PHONE NUMBER YOU DIALED).

Respondent's Name _____ _____ Date _____

Respondent's Phone ( ) (60 – 71) Interviewer's Name ID (57-59)

Seq.# from phone pages CARD 3 (COLS 40 – 48)

COMPANY CARD 1 (COLS 76) OVER CARD 1 COL (54)

DIRECT CODE (77-78)

MALE/FEMALE (79)

ACTIVE CUSTOMER SURVEY

Revised April 3, 1991

Sequence Number _____ Customer Class _____

Contact Date ___/___/___ CUIQ Code _____

Rep. ID _____

Is this the (read name from sample) household?

No - TERMINATE
Yes - CONTINUE

Hello, my name is _____ with _____. (Research firm). We are conducting a short survey of people who have had a recent contact with _____ Power. Their records indicate that someone in your (home/business) has been in contact with them recently concerning electric service, an electric bill or something else. Are you the person who contacted _____ Power?

1) YES, -- CONTINUE
2) NO, but person is available -- CONTINUE
3) NO, person not available -- ARRANGE FOR CALL-BACK
4) NO, don't recall contact -- TERMINATE

1. Thinking back to your most recent contact with _____ Power, was this made over the telephone or did you visit one of their offices? **(Do not read list.)**

1) TELEPHONE
2) OFFICE VISIT
3) MAIL/OTHER **(Ask Q-2, then skip to Q-5)**
4) CAN'T RECALL -- TERMINATE

2. Again, thinking back to that (call/visit/contact) you recently made, what was the purpose or reason for your (call/visit/contact)? **(Do not read list. Record all that apply).**

1) SERVICE TURNED ON TO A **NEW** HOME/BUILDING
2) SERVICE TURNED ON TO AN **EXISTING** HOME/BUILDING
3) TRANSFER/ACCOUNTING INFORMATION CHANGE
4) SERVICE PROBLEM/INQUIRY
5) TO GET SERVICE TURNED OFF
6) REPORT A POWER OUTAGE
7) STREET/SECURITY/OUTDOOR LIGHTS
8) BILLING PROBLEM/COMPLAINT

9) BILL PAYMENT INQUIRY
10) BUDGET/LEVELIZED BILLING PROBLEM
11) BUDGET/LEVELIZED BILLING INQUIRY
12) APPLIANCE QUESTION/PURCHASE
13) OTHER (EXPLAIN) _____
14) DK/NA/REFUSED

3. How do you feel about the way the **customer service representative** whom you first spoke with handled your inquiry? **(Read list)**

1) VERY SATISFIED
2) SATISFIED
3) DISSATISFIED
4) VERY DISSATISFIED
5) DK/REFUSED **(Do not read, skip to Q-5.)**

4. What specifically made you _____? **(Response to Q-3)**

_____

_____

_____

5. Did _____ Power come to your (home/business) as a result of your inquiry or service request? **(Do not read list.)**

1) YES
2) NO **(SKIP TO Q-8)**
3) DK/REFUSED **(Skip to Q-8)**

6. How do you feel about the service _____ Power provided **at your (home/business)? (Read list)**

1) VERY SATISFIED
2) SATISFIED
3) DISSATISFIED
4) VERY DISSATISFIED
5) DK/REFUSED **(Do not read, skip to Q-8.)**

7. What specifically made you _____? **(Response to Q-6)**

_____

_____

_____

8. Do you feel that your inquiry or service request was resolved to your satisfaction or not? **(Do not read list.)**

1) YES
2) NO
3) NOT YET RESOLVED
4) DK/REFUSED

9. **(Ask Q-9 only if Q-2 = 1 or 2, otherwise, skip to Q-11)** Did _____ Power provide electrical service to you by the date they promised?

1) YES (Skip to Q-11)
2) NO
3) DK/REFUSED

10. If no, what was the reason the promised date was not met?

_____

_____

11. Thinking only about your recent contact with _____Power, how do you feel about Power's performance in handling your inquiry or service request? **(Read list)**

1) VERY SATISFIED
2) SATISFIED
3) DISSATISFIED
4) VERY DISSATISFIED
5) DK/REFUSED **(Do not read)**

12. What can _____ Power and its employees do to improve their customer service efforts?

_____

_____

13. Do you have a specific problem or question you need _____ Power to call you about?

NO... GO TO Q14
YES... SO THAT I CAN GET THE PROPER PERSON TO CONTACT YOU, WOULD YOU TELL ME THE NATURE OF YOUR PROBLEM OR QUESTION?

_____

_____

(Record nature of problem/question and generate "Customers Who Wish To Be Contacted" report)

PLEASE GIVE ME YOUR NAME AND THE TIME OF DAY YOU CAN BE REACHED:

CUSTOMER NAME:_____

TIME OF DAY: _____DAY _____EVENING

PHONE NO: _____

Q14

ASK Q14 IF RESPONDENT IS "DISSATISFIED" OR "VERY DISSATISFIED" IN Q3, Q6, OR Q11, AND Q13="NO". **DO NOT ASK FOR MISSISSIPPI POWER.**

14. _____ Power would like to improve the service they provide to you. May we pass along your name and comments to _____ Power?

Yes - Generate "Customers Who Are Dissatisfied" report.

No - Continue

CLOSING

Record sex

Ask for respondent's name

Verify phone number

THANK YOU VERY MUCH FOR YOUR COOPERATION!

1993 Key Account Survey - Gulf Power Company

Questionnaire #00003

V.S.
Ye:

Q.1 Hello, my name is ____. I'm calling for Gulf Power Company. May I speak with && please.

Getting proper person

Q.2 Hello, &&. My name is_____, and I'm calling for Gulf Power Company. Did you receive the survey we sent you several days ago? (If "No", read survey PURPOSE statement). Would this be a convenient time for you to answer the survey questions for us, or would you prefer we reschedule you sometime within the next few days?

Convenient now

Q.3 Your organization may have more than one location in the South. In this interview, we would like your answers to be based only on locations in &&'s service territory. First I'd like you to think about ENERGY EFFICIENCY. I'm going to read you a list of statements concerning ENERGY MANAGEMENT and EFFICIENCY options. Using a scale of 1 to 10 where 1 means Poor and 10 means Excellent, please rate && on each of the following. (Enter "1" to continue)

(Continue)

Q.4 Keeping you up-to-date on energy efficiency programs.

6

Q.5 Responding to your requests for energy efficiency information or service.

DK/RF

Q.6 Understanding your energy efficiency needs and providing solutions that meet them.

DK/RF

Overall, how satisfied are you with &&'s Energy Efficiency Program? Please use a scale of 1 to 10, where 1 means Very Dissatisfied and 10 means Very Satisfied.

DK/RF

Q.8 Now thinking about the RELIABILITY of electric power to your business, please rate && on each of the following using a 10 point scale where 1 means Poor and 10 means Excellent.

(Continue)

Q.9 Coordinating planned power outages with your company.

9

Q.10 Keeping unplanned power outages to a minimum.

Excellent

Q.11 Restoring power in a timely manner.

Excellent

Q.12 Being easy to reach to report a power outage.

Excellent

Q.13 Informing you of approximately how long the power is going to be off.

Excellent

Q.14 Keeping the number of power interruptions lasting less than one minute to a minimum.

8

Q.15 Overall, how satisfied are you with the RELIABILITY of electric power from &&? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

Very Satisfied

How much of a problem is it for your business if you have a power outage that lasts 1 minute or less? Is it.....

A major problem

Q.17 If your operation is interrupted by an outage lasting 1 minute or less, what amount of time is required for you to return to normal business operations?

Minutes	0
Hours	0
Days	4

Q.18 Thinking about the QUALITY of electric power, that is, anything that may interfere with your equipment or computers OTHER THAN a power outage, please rate && on each of the following. Please use a 10-point scale, where 1 means Poor and 10 means Excellent. (Enter "1" to continue)

(Continue)

Q.19 Minimizing spikes, surges, or line noise that may adversely affect sensitive electronic equipment.

8

Q.20 Providing technical assistance to help solve your power quality problems.

Excellent

Q.21 Providing information on power conditioning equipment.

DK/RF

Q.22 Overall, how satisfied are you with the QUALITY of electric power? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

Very Satisfied

Now I'm going to read you a list of statements concerning your ELECTRIC BILL, and the PRICE you pay for electricity. Using a scale of 1 to 10, where 1 means Poor and 10 means Excellent, please rate && on each of the following. (Enter "1" to Continue)

(Continue)

Q.24 Providing clear and understandable billing formats.

DK/RF

Q.25 Ensuring that you are on the right electric rate.

DK/RF

Q.26 Providing a good value for the money.

8

Q.27 Providing rates that are competitive compared to other Southeastern electric utilities.

DK/RF

Q.28 Working hard to control costs to keep rates down in the future.

8

Q.29 Overall, how satisfied are you with the PRICE you pay for electricity? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

6

Q.30 Approximately what percent of your total budget is for electric power? (Don't Know = 99)

Enter % 99

Q.31 If another electric supplier offered you a lower price, would your decision to stay with && be based on price alone?

No

Other than PRICE, what OTHER FACTORS would affect your decision to change electric suppliers? (PROBE - DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

Other

Q.33 (Explain "Other" in Q32)

corporate decision

Q.34 If another electric supplier made you an offer to provide electric service to your business, would you give && the opportunity to match the offer?

Yes

Q.35 Do you have an account rep at && who periodically calls or visits you?

Yes

In the last 12 months, have you been contacted by your account rep?

Yes

Q.37 And in the past 12 months, how many times has your account rep contacted you .....

No. of Times (DK = 99) 48

Q.38 Do you consider the number of contacts to be.....

About right

Q.39 For what reasons did your account rep contact you? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

Discuss pricing options
Other

Q (Explain "Other" in Q39).

modifications

Using a scale of 1 to 10 where 1 means Poor and 10 means Excellent, please tell me how you would rate your account rep's performance on each of the following. (Enter "1" to Continue)

(Continue)

Q.42 Having adequate technical knowledge about your business operations.

Excellent

Q.43 Having the ability to follow through and get the job done.

Excellent

Q.44 Possessing good human relations skills.

Excellent

Q.45 Making recommendations that meet your specific energy needs.

Excellent

Q.46 Keeping you informed on all energy matters relating to your business.

Excellent

Q.47 Treating you as a valued business partner.

Excellent

Q.48 Providing you with timely forecasts on future prices that can be used in your planning process.

Excellent

Q.49 Overall, how satisfied are you with the performance of your account rep on servicing your account? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

Very Satisfied

How could your account rep better service your account and meet your needs? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

DK/RF

Q.51 (Explain "Other" in Q50)

Q.52 On a scale of 1 to 10, where 1 means Poor and 10 means Excellent, please tell me how you would rate &&'s performance AS A COMPANY on each of the following. ("1" to Continue)

Q.53 Having the technical knowledge about your business operations.

Q.54 Having the ability to follow through and get the job done.

Q.55 Caring about customers and not taking them for granted.

Q.56 Making recommendations that meet your specific energy needs.

Q.57 Keeping you informed on all energy matters relating to your business.

Q.58 Treating you as a valued business partner.

Q.59 Providing you with timely forecasts on future prices that can be used in your planning process.

Using a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied, overall, how satisfied are you with &&'s performance on servicing your account?

Q.61 How could && better service your account and meet your needs? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

Q.62 (Explain "Other" in Q61)

Q.63 During the past 6 months, have you contacted && regarding a problem or complaint?

Yes

Q.64 And how many times in the past 6 months have you contacted && regarding a problem or complaint?

Number of Contacts 1

Q.65 What was the purpose of the most recent contact?

Power outage/ reliability

Q.66 (Explain "Other" in Q65)

Q.67 Thinking about the most recent contact, how well did && perform on each of the following? Please use a scale of 1 to 10, where 1 means Poor and 10 means Excellent. (Enter "1" to Continue)

(Continue)

Q.68 Being easy to reach.

Excellent

Responding promptly to your inquiry.

8

Q.70 Treating you as a valued customer.

Excellent

Q.71 Having the knowledge to handle your recent contact.

Excellent

Q.72 Being willing to resolve your inquiry.

Excellent

Q.73 Following up later to see if your problem was resolved.

Excellent

Q.74 Communicating clearly and concisely what they would do.

Excellent

Q.75 Has your problem been resolved to your satisfaction?

Yes

Q.76 How long has && been working on your problem? (DK = 99)

Minutes
Hours
Days
Weeks
Months

Q.77 How long did it take && to resolve your problem? (DK = 99)

Minutes	30
Hours	6
Days	0
Weeks	0
Months	0

And was that an acceptable time period to resolve your problem?

Yes

Q.79 Overall, how satisfied were you with the way your problem or complaint was handled? Please use a 10-point scale, where 1 means Very Dissatisfied and 10 means Very Satisfied.

Very Satisfied

Q.80 If your company was considering a new facility, and you were asked by management to recommend a power company, what would you most likely say about your current power company? Would you...

Recommend them highly

Q.81 If your location had the opportunity to choose any power company to provide your electric power, how likely do you think your company would be to switch energy companies? Would you be.... (READ LIST)

Very unlikely to switch

Why do you feel that way? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

Q.83 (Explain "Other" in Q82)

Q.84 What COULD another power company do that might cause your company to switch electric suppliers? (DO NOT READ LIST - PROBE - CHOOSE UP TO 3 ANSWERS)

DK/RF

Q.85 (Explain "Other" in Q84)

Overall, how satisfied are you with the full package of services && provides your company? Are you..(READ LIST)

Very Satisfied

Q.87 And what would that rating be on a 10-POINT SCALE where 1 means Very Dissatisfied and 10 means Very Satisfied?

Very Satisfied

Q.88 (Mr./Mrs.) _____, you have given us some very good information today that could be very useful to && in improving their service to you or in developing customized programs for you. May we provide your individual responses to them?

Yes

Q.89 May I have your NAME, TITLE, and PHONE NUMBER for our records?

Tom Nichols, principal elec eng 904-995-5318

Thank you very much for your time and cooperation. && appreciates you as a customer.

(Enter "1")

Q.91 Thank you anyway and have a good day. (Enter "1")

Q.92 Company Name from Sample File

.....,.Gulf.Power.Company

Q.93 (Respondent Name from Sample File).

Mr..Nichols.....

Q.94 (Enter Comments - DO NOT ASK)

1994 Customer Satisfaction Survey

Residential	Residential Customers
Commercial/Industrial	Same survey used for Commercial and Industrial Customers
Active	Residential Customers who had an active contact with the company
Key Accounts	Commercial and Industrial Key Accounts were given a separate survey. They were not surveyed in the Commercial or Industrial survey.

Questionnaire # _____ (1-5)

Q.1 Hello, my name is _____ and I'm calling for &&. Are you the person in your household who would usually contact them if you had a request or problem regarding your electric service?

(6)

Yes 1
Person not available 2
Different electric supplier .. 3
Refused 4

[IF THE ANSWER IS 2-4, THEN SKIP TO QUESTION 100]

Q.2 We are conducting a brief survey to determine your level of satisfaction with the services provided by &&. Using a 10-point scale, where 1 means Poor and 10 means Excellent, please tell me how you would rate their performance on each of the following. (Enter "1" to Continue)

(7)

(Continue) .. 1

Q.3 Caring about their customers and not taking them for granted.

(8-9)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.4 Providing a good value for the money you spend on electricity.

(10-11)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.5 Keeping you up to date on their energy conservation programs.

(12-13

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.6 Responding quickly to emergencies such as power outages.

(14-15

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.7 Being active in the community.

(16-17)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.8 Being honest in dealing with the public.

(18-19)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.9 Keeping rates fair and reasonable.

(20-21)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.10 Keeping power interruptions which cause lights to flicker, or digital clocks to blink, to a minimum.

(22-23)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.11 Keeping power outages which last several minutes or longer, to a minimum.

(24-25)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.12 Attracting new business to the community.

(26-27)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.13 Showing concern for the environment.

(28-29)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.14 In thinking about the OVERALL SERVICES that && provides--- that is, electrical service, customer assistance, and other services, how satisfied are you with the services? Are you.....

(30)

Very satisfied	1
Somewhat satisfied	2
Somewhat dissatisfied	3
Very dissatisfied	4
(DO NOT READ) Don't know/refused	5

Q.15 In the last month, how many total times have YOU, for any reason, called or visited &&?

(31)

1	1
2	2
3	3
4 or more	4
None	5
DK/RF	6

[IF THE ANSWER IS 5 OR 6, THEN SKIP TO QUESTION 18]

Q.16 And what was the primary reason for your MOST RECENT contact with &&? (DO NOT READ LIST)

(32-33)

Billing	1
Request for Service (new/transfer)	2
Service Disconnect	3
Report Service Problem	4
Update Account Information	5
Request Program Information	6
Outdoor lighting	7
Complaints	8
Other Information	9
Other	10
DK/RF	11

Q.17 And thinking only about your recent contact, how satisfied are you with the way && handled your inquiry? Are you....

(34)

Very satisfied	1
Satisfied	2
Dissatisfied	3
Very dissatisfied	4
(DO NOT READ) Don't know/refused	5

Q.18 How long have you been a customer of &&?

(35)

Less than 6 months	1
6 months to 1 year	2
1 to 5 years	3
More than 5 years	4
DK/RF	5

Q.19 Which of the following age groups best describes your age? Are you... ..(READ LIST)

(36)

18 to 24	1
25 to 34	2
35 to 44	3
45 to 54	4
55 to 64	5
65 or over	6
DK/RF (DO NOT READ)	7

Q.20 What is the last level of education you have completed? (READ LIST)

(37)
Less than high school graduate .. 1
High school graduate 2
Some college 3
College graduate 4
Post-graduate degree 5
DK/RF (DO NOT READ) 6

Q.21 Do you own or rent your home?

(38)
Own 1
Rent ... 2
DK/RF .. 3

Q.22 Which category best describes your total household income for 1993? Was it.....(READ LIST)

(39)
Under $5,000 1
$5,000 to $9,999 2
$10,000 to $14,999 .. 3
$15,000 to $24,999 .. 4
$25,000 to $34,999 .. 5
$35,000 to $49,999 .. 6
$50,000 to $74,999 .. 7
$75,000 or over 8
DK/RF 9

Q.23 Finally, just to be sure we're representing all groups in this survey, please tell me whether you would describe yourself as.... (READ LIST)

(40)
African American 1
White 2
Hispanic 3
Asian 4
Other (Do Not Read) .. 5
DK/RF (Do Not Read) .. 6

Q.24 Thank you very much for your cooperation. && appreciates you as their customer.

(41)
(Continue) .. 1

Q.25 (COMMENTS - DO NOT ASK)

42-541

[IF THE ANSWER TO QUESTION 24 IS 1, THEN SKIP TO QUESTION 100]

Q.26 (Southern Company Utility Name From Sample File)

1994 Commercial CS Survey

Questionnaire # _____ (1-5)

Q.1 Hello, my name is _____. I'm calling for &&. May I speak with the person in your company who is most familiar with how your company uses electricity and natural gas, and who contacts the electric company if there is a problem.

(6)

Getting proper person 1
Person not available 2
Different electric supplier .. 3
Refused 4

[IF THE ANSWER IS 3 OR 4, THEN SKIP TO QUESTION 91]
[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 93]

Q.2 Hello, my name is _____. I'm calling for &&. We're talking with selected customers today to ask their opinions about the service they receive from &&. We would like to include your opinions.

(7)

Continue 1
Not convenient now callback .. 2
Refused 3

[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 100]
[IF THE ANSWER IS 3, THEN SKIP TO QUESTION 91]

Q.3 Your organization may have more than one location in the South. In this interview, we would like your answers to be based only on locations in &&'s service territory. First I'd like you to think about ENERGY EFFICIENCY. I'm going to read you a list of statements concerning ENERGY MANAGEMENT and EFFICIENCY options. Using a scale of 1 to 10 where 1 means Poor and 10 means Excellent, please rate && on each of the following. (Enter "1" to continue)

(8)

(Continue) .. 1

Q.4 Keeping you up-to-date on energy efficiency programs.

(9-10)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.5 Responding to your requests for energy efficiency information or service.

(11-12)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.6 Understanding your energy efficiency needs and providing solutions that meet them.

(13-14)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.7 Overall, how satisfied are you with &&'s Energy Efficiency Program? Please use a scale of 1 to 10, where 1 means Very Dissatisfied and 10 means Very Satisfied.

(15-16)

Very Dissatisfied .. 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Very Satisfied 10
DK/RF 11

Q.8 Now thinking about the RELIABILITY of electric power to your business, please rate && on each of the following using a 10 point scale where 1 means Poor and 10 means Excellent.

(17)

(Continue) .. 1

Q.9 Coordinating planned power outages with your company.

(18-19)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.10 Keeping unplanned power outages to a minimum.

(20-21)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.11 Restoring power in a timely manner.

(22-23)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.12 Being easy to reach to report a power outage.

(24-25)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.13 Informing you of approximately how long the power is going to be off.

(26-27)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.14 Keeping the number of power interruptions lasting less than one minute to a minimum.

(28-29)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.15 Overall, how satisfied are you with the RELIABILITY of electric power from &&? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

(30-31)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.16 How much of a problem is it for your business if you have a power outage that lasts 1 minute or less? Is it.....

(32)

A major problem 1
A minor problem 2
Not a problem at all .. 3
DK/RF 4

Q.17 If your operation is interrupted by an outage lasting 1 minute or less, what amount of time is required for you to return to normal business operations?

Minutes ____ (33-34)
Hours ____ (35-36)
Days ____ (37-38)

Q.18 Thinking about the QUALITY of electric power, that is, anything that may interfere with your equipment or computers OTHER THAN a power outage, please rate && on each of the following. Please use a 10-point scale, where 1 means Poor and 10 means Excellent. (Enter "1" to continue)

(39)

(Continue) .. 1

Q.19 Minimizing spikes, surges, or line noise that may adversely affect sensitive electronic equipment.

(40-41)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.20 Providing technical assistance to help solve your power quality problems.

(42-43)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.21 Providing information on power conditioning equipment.

(44-45)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.22 Overall, how satisfied are you with the QUALITY of electric power? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

(46-47)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.23 Now I'm going to read you a list of statements concerning your ELECTRIC BILL, and the PRICE you pay for electricity. Using a scale of 1 to 10, where 1 means Poor and 10 means Excellent, please rate && on each of the following. (Enter "1" to Continue)

(48)
(Continue) .. 1

Q.24 Providing clear and understandable billing formats.

(49-50)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.25 Ensuring that you are on the right electric rate.

(51-52)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.26 Providing a good value for the money.

(53-54)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.27 Providing rates that are competitive compared to other Southeastern electric utilities.

(55-56)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.28 Working hard to control costs to keep rates down in the future.

(57-58)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.29 Overall, how satisfied are you with the PRICE you pay for electricity? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

(59-60)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.30 Approximately what percent of your total budget is for electric power? (Don't Know = 99)

Enter % ____ (61-62)

Q.31 If another electric supplier offered you a lower price, would your decision to stay with && be based on price alone?

(63)

Yes	1
No	2
DK/RF	3

Q.32 Other than PRICE, what OTHER FACTORS would affect your decision to change electric suppliers? (PROBE - DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(64-69)

Better Services/ Responsiveness	1
No Power Outages/ Better Reliability	2
Better Energy Conser vation Programs	3
Better Quality of Power/Clean Power	4
Guaranteed Uninterru pted Service	5
Civic/community contributions	6
	7
	8
Nothing else, just price	9
Other	10
DK/RF	11

[IF THE ANSWER IS 10, THEN SKIP TO QUESTION 33]
[IF THE ANSWER IS 1-9 OR 11, THEN SKIP TO QUESTION 34]

Q.33 (Explain "Other" in Q32)

_____

_____

Q.34 If another electric supplier made you an offer to provide electric service to your business, would you give && the opportunity to match the offer?

(120)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1-3, THEN SKIP TO QUESTION 52]

Q.35 Do you have an account rep at && who periodically calls or visits you?

(121)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 52]

Q.36 In the last 12 months, have you been contacted by your account rep without your requesting the contact?

(122)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 41]

Q.37 And in the past 12 months, how many times has your account rep contacted you .....

By Phone? (DK = 99) ____ (123-124)
In Person? (DK = 99) ____ (125-126)

Q.38 Do you consider the number of contacts to be.....

(127)
About right .. 1
Too many 2
Too few 3

Q.39 For what reasons did your account rep contact you? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(128-133)
Recommend specific process equipment 1
Help you understand your bill 2
Help you solve an energy problem 3
Respond to a complaint 4
Discuss pricing options 5
Make recommendation on energy efficiency .. 6
Make sales presentation 7
General (social) call/visit 8
..... 9
..... 10
..... 11
Other 12
DK/RF 13

[IF THE ANSWER IS 12, THEN SKIP TO QUESTION 40]
[IF THE ANSWER IS 1-11 OR 13, THEN SKIP TO QUESTION 41]

Q.40 (Explain "Other" in Q39).

136-183

_____

_____

Q.41 Using a scale of 1 to 10 where 1 means Poor and 10 means Excellent, please tell me how you would rate your account rep's performance on each of the following. (Enter "1" to Continue)

(184)
(Continue) .. 1

Q.42 Having adequate technical knowledge about your business operations.

(185-186)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.43 Having the ability to follow through and get the job done.

(187-188)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.44 Possessing good human relations skills.

(189-190)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.45 Making recommendations that meet your specific energy needs.

(191-192)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.46 Keeping you informed on all energy matters relating to your business.

(193-194)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.47 Treating you as a valued business partner.

(195-196)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.48 Providing you with timely forecasts on future prices that can be used in your planning process.

(197-198

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 1
DK/RF 1

Q.49 Overall, how satisfied are you with the performance of your account rep on servicing your account? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

(199-200

Very Dissatisfied .. 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Very Satisfied 10
DK/RF 11

Q.50 How could your account rep better service your account and meet your needs? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(201-206)

More available/ easier to reach	1
Better understand my operations	2
Better understand my energy needs	3
Better communication	4
More responsive/ prompt	5
More meaningful visits	6
Improve technical ability	7
Provide energy conservation tips	8
More frequent visits	9
More flexible/less rigid rules	10
Offer more energy alternatives	11
Not refer me to other people	12
More notice for visits	13
	14
	15
Other	16
DK/RF	17

[IF THE ANSWER IS 16, THEN SKIP TO QUESTION 51]
[IF THE ANSWER IS 1-15 OR 17, THEN SKIP TO QUESTION 63]

Q.51 (Explain "Other" in Q50)

207-256

_____

_____

[IF THE ANSWER TO QUESTION 50 IS 16, THEN SKIP TO QUESTION 63]

Q.52 On a scale of 1 to 10, where 1 means Poor and 10 means Excellent, please tell me how you would rate &&'s performance AS A COMPANY on each of the following. ("1" to Continue)

(257)

(Continue) .. 1

Q.53 Having the technical knowledge about your business operations.

(258-259)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.54 Having the ability to follow through and get the job done.

(260-261)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.55 Caring about customers and not taking them for granted.

(262-263)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.56 Making recommendations that meet your specific energy needs.

(264-265)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.57 Keeping you informed on all energy matters relating to your business.

(266-267)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.58 Treating you as a valued business partner.

(268-269)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.59 Providing you with timely forecasts on future prices that can be used in your planning process.

(270-271)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.60 Using a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied, overall, how satisfied are you with &&'s performance on servicing your account?

(272-273)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.61 How could && better service your account and meet your needs? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(274-279)

More available/ easier to reach	1
Better understand my operations	2
Better understand my energy needs	3
Better communication	4
More responsive/ prompt	5
More meaningful visits	6
Improve technical ability	7
Provide energy conservation tips	8
More frequent visits	9
More flexible/less rigid rules	10
Offer more energy alternatives	11
Not refer me to other people	12
More notice for visits	13
	14
	15
Other	16
DK/RF	17

[IF THE ANSWER IS 16, THEN SKIP TO QUESTION 62]
[IF THE ANSWER IS 1-15 OR 17, THEN SKIP TO QUESTION 63]

Q.62 (Explain "Other" in Q61)

328-329

_____

_____

Q.63 During the past 6 months, have you contacted && regarding a problem or complaint?

(330)

Yes	1
No	2
DK/RF	3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 80]

Q.64 And how many times in the past 6 months have you contacted && regarding a problem or complaint?

Number of Contacts ____ (331-332)

Q.65 What was the purpose of the most recent contact?

(333-334)

Power outage/ reliability 1
Power quality spikes/drops/noise .. 2
Billing error 3
Rates 4
Contract disputes 5
Flexibility with rules 6
Hard to reach 7
Responsiveness to problem 8
Late on deadline 9
Tree trimming 10
..... 11
..... 12
..... 13
Other 14
DK/RF 15

[IF THE ANSWER IS 1-13 OR 15, THEN SKIP TO QUESTION 67]

Q.66 (Explain "Other" in Q65)

335 - 334

Q.67 Thinking about the most recent contact, how well did && perform on each of the following? Please use a scale of 1 to 10, where 1 means Poor and 10 means Excellent. (Enter "1" to Continue)

(385)

(Continue) .. 1

Q.68 Being easy to reach.

(386-387)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

ponding promptly to your inquiry.

(388-389)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

ating you as a valued customer.

(390-391)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

ing the knowledge to handle your recent contact.

(392-393)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.72 Being willing to resolve your inquiry.

(394-395)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.73 Communicating clearly and concisely what they would do.

(398-399)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.74 Following up later to see if your problem was resolved.

(396-397)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.75 Has your problem been resolved to your satisfaction?

(400)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 77]

Q.76 How long has && been working on your problem? (DK = 99)

Minutes ____ (401-402)
Hours ____ (403-404)
Days ____ (405-406)
Weeks ____ (407-408)
Months ____ (409-410)

[IF THE ANSWER TO QUESTION 75 IS 2 OR 3, THEN SKIP TO QUESTION 79]

Q.77 How long did it take && to resolve your problem? (DK = 99)

Minutes ____ (411-412)
Hours ____ (413-414)
Days ____ (415-416)
Weeks ____ (417-418)
Months ____ (419-420)

Q.78 And was that an acceptable time period to resolve your problem?

(421)
Yes 1
No 2
DK/RF .. 3

Q.79 Overall, how satisfied were you with the way your problem or complaint was handled? Please use a 10-point scale, where 1 means Very Dissatisfied and 10 means Very Satisfied.

(422-423)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.80 If you were asked by management to reccomend a power company, what would you most likely say about &&? Would you..... (READ LIST)

(424)

Recommend them highly	1
Recommend them	2
Recommend them with some reservations	3
Not recommend them at all	4
DK/RF	5

Q.81 If your location had the opportunity to choose any power company to provide your electric power, how likely do you think your company would be to switch energy companies? Would you be....(READ LIST)

(425)

Very likely to switch	1
Somewhat likely to switch	2
Somewhat unlikely to switch	3
Very unlikely to switch	4
DK/RF	5

[IF THE ANSWER IS 3-5, THEN SKIP TO QUESTION 84]

Q.82 Why do you feel that way? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(426-431)

Better Rates/Costs/ Price	1
Better Services/ Responsiveness	2
Reduce Power Outages /Reliability	3
Surges/spikes/line noise/power quality	4
Like to compare/shop around	5
Lack of conservation programs/incentives	6
Unresolved problems/ complaints	7
	8
	9
Other	10
DK/RF	11

[IF THE ANSWER IS 10, THEN SKIP TO QUESTION 83]
[IF THE ANSWER IS 1-9 OR 11, THEN SKIP TO QUESTION 84]

Q.83 (Explain "Other" in Q82)

432-448

_____

_____

Q.84 What could another power company do that might cause your company to switch electric suppliers? (DO NOT READ LIST - PROBE - CHOOSE UP TO 3 ANSWERS)

(482-487)

Better services/ Responsiveness	1
No power outages/ better reliability	2
Better energy conservation programs	3
Better quality of power/clean power	4
Guaranteed uninterrupted service	5
Construction of service facilities	6
	7
Lower/better price	8
Other	9
DK/RF	10

[IF THE ANSWER IS 9, THEN SKIP TO QUESTION 85]
[IF THE ANSWER IS 1-8 OR 10, THEN SKIP TO QUESTION 86]

78

Q.85 (Explain "Other" in Q84)

48-537

Q.86 Overall, how satisfied are you with the full package of services && provides your company? Are you..(READ LIST)

(538)
Very Satisfied 1
Satisfied 2
Dissatisfied 3
Very Dissatisfied .. 4
DK/RF 5

[IF THE ANSWER IS 1-5, THEN SKIP TO QUESTION 88]

Q.87 And what would that rating be on a 10-POINT SCALE where 1 means Very Dissatisfied and 10 means Very Satisfied?

(539-540)
Very Dissatisfied .. 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Very Satisfied 10
DK/RF 11

Q.88 We normally review the results of surveys on a SUMMARY basis, however, your individual responses may help && customize programs for your company. May we have your permission to review your answers individually?

(541)
Yes 1
No 2
DK/RF .. 3

Q.89 May I have your NAME, TITLE, and PHONE NUMBER for our records?

502-614

Q.90 Thank you very much for your time and cooperation. && appreciates you as a customer.

(617)
(Enter "1") .. 1

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 93]

Q.91 Thank you anyway and have a good day. (Enter "1")

(618)
(Continue) .. 1

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 93]

Q.92 Company Name from Sample File

527-9400

Q.93 (Enter Comments -DO NOT ASK)

502-614

Q.1 Hello, my name is ____ and I'm calling for &&. We are conducting a brief follow-up survey of people who have recently visited or called & & to determine their level of satisfaction with the contact. Are you the person who contacted &&?

(6)

Yes	1
Person not available	2
Different electric company	3
Don't recall contact (DROP BOX)	4
Paid bill (DRIVE THRU)	5
Paid bill (OFFICE VISIT)	6
Refused	7

[IF THE ANSWER IS 2-4 OR 7, THEN SKIP TO QUESTION 105]
[IF THE ANSWER IS 5, THEN SKIP TO QUESTION 18]
[IF THE ANSWER IS 6, THEN SKIP TO QUESTION 5]

Q.2 Thinking about your most recent contact with && was it by.....

(7)

Telephone	1
Office visit	2
Drive-Thru	3
Drop-Box	4
Other	5

[IF THE ANSWER IS 4, THEN SKIP TO QUESTION 99]
[IF THE ANSWER IS 5, THEN SKIP TO QUESTION 7]
[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 5]
[IF THE ANSWER IS 3, THEN SKIP TO QUESTION 18]

Q.3 When you called, did you speak with someone immediately, or were you put on hold?

(8)

Spoke with someone immediately	1
Put on hold	2
Got recording	3
DK/RF	4

[IF THE ANSWER IS 1 OR 3 OR 4, THEN SKIP TO QUESTION 7]

Q.4 Were you on hold longer than you thought was reasonable?

(9)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1-3, THEN SKIP TO QUESTION 7]

Q.5 When you visited, did you speak with someone immediately or did you have to wait?

(10)
Spoke with someone immediately .. 1
Had to wait 2
DK/RF 3

[IF THE ANSWER IS 1 OR 3, THEN SKIP TO QUESTION 7]

Q.6 Did you have to wait longer than you thought was reasonable?

(11)
Yes 1
No 2
DK/RF .. 3

Q.7 And what was the PRIMARY reason for your MOST RECENT contact with &&? (DO NOT READ LIST)

(12-13)
Billing inquiry 1
Report service problem 2
Request service(New/ transfer/disconnect) .. 3
Request information 4
Pay bill ONLY 5
Energy audit 6
Change account information 7
Complaint 8
Other 9
DK/RF 10

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 9]
[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 11]
[IF THE ANSWER IS 3, THEN SKIP TO QUESTION 13]
[IF THE ANSWER IS 4, THEN SKIP TO QUESTION 15]
[IF THE ANSWER IS 5, THEN SKIP TO QUESTION 18]
[IF THE ANSWER IS 6-8, THEN SKIP TO QUESTION 17]
[IF THE ANSWER IS 10, THEN SKIP TO QUESTION 105]

Q.8 (Describe "Other" in previous question)

14-63

[IF THE ANSWER TO QUESTION 7 IS 9, THEN SKIP TO QUESTION 17]

Q.9 What was the specific reason for your BILLING INQUIRY?

(64)

High bill	1
Request payment extension	2
Check account balance	3
Check bill due date	4
Didn't get bill	5
Budget/levelized billing	6
Other	7
DK/RF	8

[IF THE ANSWER IS 1-6 OR 8, THEN SKIP TO QUESTION 17]

Q.10 (Describe "Other" in previous question)

65-114

[IF THE ANSWER TO QUESTION 9 IS 7, THEN SKIP TO QUESTION 17]

Q.11 What type of SERVICE PROBLEM did you experience?

(115)

Power outage	1
Pole or lines down	2
Lights flickering	3
Oudoor light out/ blinking	4
Other	5
DK/Rf	6

[IF THE ANSWER IS 1-4 OR 6, THEN SKIP TO QUESTION 17]

Q.12 (Describe "Other" in previous question)

116-165

[IF THE ANSWER TO QUESTION 11 IS 5, THEN SKIP TO QUESTION 17]

Q.13 Was your request for service to.....(READ LIST)

(166)

Establish service as new customer	1
Transfer service	2
Reconnect service	3
Disconnect serevice	4
Have outdoor light installed	5
Other	6
DK/RF	7

[IF THE ANSWER IS 1-5 OR 7, THEN SKIP TO QUESTION 17]

Q.14 (Describe "Other" in previous question)

167-216

[IF THE ANSWER TO QUESTION 13 IS 6, THEN SKIP TO QUESTION 17]

Q.15 What was the PRIMARY type of INFORMATION you requested?

(217-218)

Budget/levelized billing program	1
Energy conservation/ energy audit	2
Heat pump program/ sale	3
Appliance sales/ service	4
Outdoor lighting program/sale	5
Senior citizen discount	6
Financial Assistance Program	7
Guaranteed Service Program	8
Other	9
DK/RF	10

[IF THE ANSWER IS 1-8 OR 10, THEN SKIP TO QUESTION 17]

Q.16 (Describe "Other" in previous question)

219-268

Q.17 Approximately how many times did you have to contact && to get your problem or request taken care of?

(269)
Once 1
Twice 2
Three or more times .. 3
DK/RF 4

Q.18 Compared to what you expected, how would you rate && on handling your most recent contact? would you say they did . . . (READ LIST)

(270)
Much better 1
Better 2
Just as you expected .. 3
Worse 4
Much worse 5
DK/RF 6

[IF THE ANSWER TO QUESTION 3 IS 3, THEN SKIP TO QUESTION 94]
[IF THE ANSWER TO QUESTION 7 IS 2, THEN SKIP TO QUESTION 31]
[IF THE ANSWER TO QUESTION 7 IS 3, THEN SKIP TO QUESTION 50]
[IF THE ANSWER TO QUESTION 7 IS 4, THEN SKIP TO QUESTION 72]
[IF THE ANSWER TO QUESTION 7 IS 5, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 7 IS 6, THEN SKIP TO QUESTION 83]
[IF THE ANSWER TO QUESTION 7 IS 7, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 7 IS 8, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 7 IS 9, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 2 IS 3, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 1 IS 5, THEN SKIP TO QUESTION 80]

Q.19 Did the && representative seem to have the KNOWLEDGE to handle your billing inquiry?

(271)
Yes 1
No 2
DK/RF .. 3

Q.20 Did the rep appear to have the necessary AUTHORITY to resolve your BILLING INQUIRY?

(272)
Yes 1
No 2
DK/RF .. 3

Q.21 Did the rep seem INTERESTED in solving your BILLING INQUIRY?

(273)
Yes 1
No 2
DK/RF .. 3

Q.22 Did the rep appear to be FLEXIBLE in helping to solve your BILLING INQUIRY?

(274)
Yes 1
No 2
DK/RF .. 3

Q.23 Was the rep COURTEOUS?

(275)
Yes 1
No 2
DK/RF .. 3

Q.24 Did the rep mention anything about Alabama Power's billing programs?

(276)
Yes 1
No 2
DK/RF .. 3

Q.25 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your BILLING INQUIRY? Would you say they did .... (READ LIST)

(277)
Much better 1
Better 2
Just as you expected .. 3
Worse 4
Much worse 5
DK/RF 6

Q.26 As a result of your BILLING INQUIRY, did you meet with someone from & & at your home or business?

(278)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 94]

Q.27 Did the rep you met with ..... Have the KNOWLEDGE to handle your problem or request?

(279)
Yes 1
No 2
DK/RF .. 3

Q.28 Did they seem INTERESTED in solving your problem or request?

(280)
Yes 1
No 2
DK/RF .. 3

Q.29 Were they COURTEOUS?

(281)
Yes 1
No 2
DK/RF .. 3

Q.30 Compared to what you expected, how would you rate the service provided at your home or business? Was it ... (READ LIST)

(282)

Much better	1
Better	2
Just as you expected	3
Worse	4
Much worse	5
DK/RF	6

[IF THE ANSWER IS 1-6, THEN SKIP TO QUESTION 94]

Q.31 When you contacted && to report your SERVICE PROBLEM, was anyone able to tell you when your service problem would be taken care of?

(283)

Yes	1
No	2
DK/RF	3

Q.32 Did the rep seem INTERESTED in solving your SERVICE PROBLEM?

(284)

Yes	1
No	2
DK/RF	3

Q.33 Was the rep COURTEOUS?

(285)

Yes	1
No	2
DK/RF	3

Q.34 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your SERVICE PROBLEM? Would you say they did ... (READ LIST)

(286)

Much better	1
Better	2
Just as you expected	3
Worse	4
Much worse	5
DK/RF	6

Q.35 As a result of your SERVICE PROBLEM, did you meet with a && representative at your home or business?

(287)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 39]

Q.36 Did the rep you met with..... Have the KNOWLEDGE to handle your problem or request?

(288)
Yes 1
No 2
DK/RF .. 3

Q.37 Did they seem INTERESTED in solving your problem?

(289)
Yes 1
No 2
DK/RF .. 3

Q.38 Were they COURTEOUS?

(290)
Yes 1
No 2
DK/RF .. 3

Q.39 As a result of your SERVICE PROBLEM, did you see a work crew in your area?

(291)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 40]
[IF THE ANSWER TO QUESTION 35 IS 1, THEN SKIP TO QUESTION 48]
[IF THE ANSWER TO QUESTION 35 IS 2 OR 3, THEN SKIP TO QUESTION 49]

Q.40 Did anyone from the work crew tell you they would be working in your area?

(292)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 43]

Q.41 Did they tell you WHAT they would be doing?

(293)
Yes 1
No 2
DK/RF .. 3

Q.42 Were you treated courteously?

(294)
Yes 1
No 2
DK/RF .. 3

Q.43 Did the work crew show respect for your property?

(295)
Yes 1
No 2
They weren't on my property .. 3
DK/RF 4

[IF THE ANSWER IS 3 OR 4, THEN SKIP TO QUESTION 46]

Q.44 Was your personal property damaged in any way?

(296)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 46]

Q.45 Has the damage to your property been repaired to your satisfaction?

(297)
Repaired to my satisfaction .. 1
Repaired but not satisfied ... 2
Not repaired 3

Q.46 Did the work crew leave the area neat and clean?

(298)
Yes 1
No 2
DK/RF .. 3

Q.47 Was the job done by the work crew completed.....(READ LIST)

(299)
Quicker than you expected .. 1
About when you expected 2
Slower than you expected ... 3
DK/RF 4

Q.48 Compared to what you expected, how would you rate the service provided at your home or business, would you say it was ... (READ LIST)

(300)
Much better 1
Better 2
Just as you expected 3
Worse 4
Much worse 5
No service provided at home (DON'T READ) .. 6
DK/RF 7

Q.49 Was your service problem resolved.....(READ LIST)

(301)
Quicker than you expected .. 1
About when you expected 2
Slower than you expected ... 3
DK/RF 4

[IF THE ANSWER IS 1-4, THEN SKIP TO QUESTION 94]

Q.50 Did the && representative seem to have the KNOWLEDGE to handle your SERVICE REQUEST?

(302)
Yes 1
No 2
DK/RF .. 3

Q.51 Did the rep appear to have the necessary AUTHORITY to resolve your SERVICE REQUEST?

(303)
Yes 1
No 2
DK/RF .. 3

Q.52 Did the rep seem INTERESTED in solving your SERVICE REQUEST?

(304)
Yes 1
No 2
DK/RF .. 3

Q.53 Was the rep COURTEOUS?

(305)
Yes 1
No 2
DK/RF .. 3

Q.54 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your SERVICE REQUEST? Would you say they did . . . (READ LIST)

(306)
Much better 1
Better 2
Just as you expected .. 3
Worse 4
Much worse 5
DK/RF 6

Q.55 When you made your SERVICE REQUEST, were you told clearly when your request would be handled?

(307)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 57]

Q.56 Was your SERVICE REQUEST handled by the date && promised?

(308)
Yes 1
No 2
No date was promised .. 3
DK/RF 4

Q.57 As a result of your SERVICE REQUEST, did you meet with a && representative at your home or business?

(309)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 61]

Q.58 Did the representative you met with..... have the KNOWLEDGE to handle your request?

(310)
Yes 1
No 2
DK/RF .. 3

Q.59 Did they seem INTERESTED in solving your SERVICE REQUEST?

(311)
Yes 1
No 2
DK/RF .. 3

Q.60 Were they COURTEOUS?

(312)
Yes 1
No 2
DK/RF .. 3

Q.61 As a result of your SERVICE REQUEST, did you see a work crew in your area?

(313)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 62]
[IF THE ANSWER TO QUESTION 57 IS 1, THEN SKIP TO QUESTION 70]
[IF THE ANSWER TO QUESTION 57 IS 2 OR 3, THEN SKIP TO QUESTION 71]

Q.62 Did anyone from the work crew tell you they would be working in your area?

(314)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 65]

Q.63 Did they tell you WHAT they would be doing?

(315)
Yes 1
No 2
DK/RF .. 3

Q.64 Were you treated courteously?

(316)
Yes 1
No 2
DK/RF .. 3

Q.65 Did the work crew show respect for your property?

(317)

Yes 1
No 2
They weren't on my property .. 3
DK/RF 4

[IF THE ANSWER IS 3 OR 4, THEN SKIP TO QUESTION 68]

Q.66 Was your personal property damaged in any way?

(318)

Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 68]

Q.67 Has the damage to your property been repaired to your satisfaction?

(319)

Repaired to my satisfaction .. 1
Repaired but not satisfied ... 2
Not repaired 3

Q.68 Did the work crew leave the area neat and clean?

(320)

Yes 1
No 2
DK/RF .. 3

Q.69 Was the job done by the work crew completed.....(READ LIST)

(321)

Quicker than you expected .. 1
About when you expected 2
Slower than you expected ... 3
DK/RF 4

Q.70 Compared to what you expected, how would you rate the service provided at your home or business? Would you say it was . . . (READ LIST)

(322)

Much Better	1
Better	2
Just as you expected	3
Worse	4
Much Worse	5
No service provided at home	6
DK/RF	7

Q.71 Was your SERVICE REQUEST handled.....(READ LIST)

(323)

Quicker than you expected	1
About when you expected	2
Slower than you expected	3
DK/RF	4

[IF THE ANSWER IS 1-4, THEN SKIP TO QUESTION 94]

Q.72 Was your REQUEST FOR INFORMATION handled promptly?

(324)

Yes	1
No	2
DK/RF	3

Q.73 Did you get the INFORMATION you wanted?

(325)

Yes	1
No	2
DK/RF	3

Q.74 Did the && representative seem INTERESTED in providing you with the INFORMATION you requested?

(326)

Yes	1
No	2
DK/RF	3

Q.75 Did the && rep seem KNOWLEDGEABLE about the INFORMATION you requested?

(327)
Yes 1
No 2
DK/RF .. 3

Q.76 Was the && rep COURTEOUS?

(328)
Yes 1
No 2
DK/RF .. 3

Q.77 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your request for INFORMATION. Would you say they did ... (READ LIST)

(329)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

Q.78 Did you receive any literature as a result of your request for INFORMATION?

(330)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 94]

Q.79 Was the literature ...

(331)
Very helpful 1
Somewhat helpful 2
Not very helpful 3
Not helpful at all 4
Haven't read it yet (do not read) .. 5
DK/RF 6

[IF THE ANSWER IS 1-6, THEN SKIP TO QUESTION 94]

Q.80 Did the && representative seem INTERESTED in assisting you?

(332)
Yes 1
No 2
DK/RF .. 3

Q.81 Was the rep COURTEOUS?

(333)
Yes 1
No 2
DK/RF .. 3

Q.82 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your CONTACT? Would you say they did ... (READ LIST)

(334)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

[IF THE ANSWER IS 1-6, THEN SKIP TO QUESTION 94]

Q.83 Did the && repesentative who scheduled your ENERGY AUDIT ... Seem INTERESTED in helping you?

(335)
Yes 1
No 2
DK/RF .. 3

Q.84 Were they courteous?

(336)
Yes ..., 1
No 2
DK/RF .. 3

Q.85 When you made your ENERGY AUDIT REQUEST, were you told clearly when your audit would be done?

(337)
Yes 1
No 2
DK/RF .. 3

Q.86 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who SCHEDULED your energy audit? Would you say they did . . . (READ LIST)

(338)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

Q.87 Has your energy audit already been done?

(339)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 94]

Q.88 Was your energy audit done by the date && promised?

(340)
Yes 1
No 2
No date promised .. 3
DK/RF 4

Q.89 Did the representative WHO PERFORMED your energy audit appear to have the KNOWLEDGE necessary to conduct the audit?

(341)
Yes 1
No 2
DK/RF .. 3

Q.90 Did they seem INTERESTED in performing your audit?

(342)
Yes 1
No 2
DK/RF .. 3

Q.91 Were they COURTEOUS?

(343)
Yes 1
No 2
DK/RF .. 3

Q.92 Compared to what you expected, how would you rate the THOROUGHNESS of your energy audit? Would you say it was . . . (READ LIST)

(344)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

Q.93 Compared to what you expected, how would you rate the rep's ABILITY to make energy saving recommendations? Would you say they did . . . (READ LIST)

(345)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

Q.94 And thinking only about your recent contact with Alabama Power, how satisfied are you with the way it was handled? Are you ...

(346)
Very Satisfied 1
Satisfied 2
Dissatisfied 3
Very Dissatisfied .. 4
DK/RF 5

[IF THE ANSWER TO QUESTION 87 IS 2 OR 3, THEN SKIP TO QUESTION 99]
[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 96]
[IF THE ANSWER IS 2-5, THEN SKIP TO QUESTION 95]

Q.95 What could && have done to make you VERY SATISFIED?

347-74

[IF THE ANSWER TO QUESTION 1 IS 5, THEN SKIP TO QUESTION 99]
[IF THE ANSWER TO QUESTION 7 IS 5, THEN SKIP TO QUESTION 99]

Q.96 And finally, has everything been taken care of to your satisfaction?

(747)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 99]

Q.97 Is someone working with you to solve your request or problem, or do you need someone from && to call you?

(748)
Need someone to call me .. 1
Being handled 2
DK/RF 3

[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 99]

Q.98 Please give me the name of the person to be contacted, their phone number, and the time of day they can be reached.

747-798

Q.99 Thank you very much for your cooperation. && appreciates you as a customer.

(799
(Continue) .. 1

Q.100 (COMMENTS - DO NOT ASK)

800-1279

[IF THE ANSWER TO QUESTION 99 IS 1, THEN SKIP TO QUESTION 105]

Q.101 (Southern Company Utility Name From Sample File)

_____

1994 KEY ACCOUNT QUESTIONNAIRE

About The Survey:

Gulf Power is committed to providing you with superior electric service. We need your help in telling us how well we are meeting that commitment.

Your responses to the following survey will help determine how well Gulf Power is currently meeting your electric needs as well as identify ways to improve service. To ensure confidentiality, Gulf Power has arranged for Southern Company Services Research to administer the survey. Please complete all appropriate sections. Answer only those questions that apply to you and your experience with Gulf Power. Most questions offer a list of appropriate answers. Read all the choices and circle the number or check the appropriate box next to your answer. Please choose only one answer per question. After completing the survey, please return it to Southern Company Services Research in the postage-paid envelope which has been provided for your convenience. However, if you prefer, you may respond to this survey by fax at 1-800-254-2691.

Thank you for your participation in this survey. Gulf Power values you as a customer and appreciates your comments.

1. Overall, how satisfied are you with Gulf Power?

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	11

2. Below is a list of statements that describe several aspects of performance that customers expect from their power company. For each statement, please indicate how satisfied you are with Gulf Power's performance.

	Very Dissatisfied									Very Satisfied	Don't Know
Provides clean, consistent power with few spikes, dips or fluctuations	1	2	3	4	5	6	7	8	9	10	11
Approaches situations creatively with our best interests in mind	1	2	3	4	5	6	7	8	9	10	11
Offers fair, reasonable rates	1	2	3	4	5	6	7	8	9	10	11
Takes responsibility when there's a problem, and works with us to solve it	1	2	3	4	5	6	7	8	9	10	11
Works with us to save money on electrical costs	1	2	3	4	5	6	7	8	9	10	11
Provides bill statements that clearly spell out energy usage, rate, and how bills are calculated	1	2	3	4	5	6	7	8	9	10	11
Finds the best available rate for us	1	2	3	4	5	6	7	8	9	10	11
Coordinates planned outages with our business operations	1	2	3	4	5	6	7	8	9	10	11
Responds quickly to outages	1	2	3	4	5	6	7	8	9	10	11

Provides technical assistance to help solve power quality problems	1	2	3	4	5	6	7	8	9	10	11
Follows up on questions or problems I may have	1	2	3	4	5	6	7	8	9	10	11
Alerts us to energy issues that may affect our business	1	2	3	4	5	6	7	8	9	10	11
Offers different rate options to best fit our needs	1	2	3	4	5	6	7	8	9	10	11
Provides information on how we can use energy more efficiently	1	2	3	4	5	6	7	8	9	10	11
Plans ahead, helps us avoid potential problems	1	2	3	4	5	6	7	8	9	10	11
Is a partner to help us get our job done, is part of the team	1	2	3	4	5	6	7	8	9	10	11
Informs us of new technologies that help keep us competitive	1	2	3	4	5	6	7	8	9	10	11

3. Do you have a Primary Contact from Gulf Power who calls or visits you?

Yes ☐ No ☐ Not Sure ☐

(If you answered "No" or "Not Sure" to Question 3, please skip to Question 6)

4. How would you rate your Primary Contact's performance on the following items?

	Very Dissatisfied									Very Satisfied	Don't Know
Is knowledgeable	1	2	3	4	5	6	7	8	9	10	11
Stays in touch with me on a regular basis	1	2	3	4	5	6	7	8	9	10	11
Is interested in us, treats us like a valued business customer	1	2	3	4	5	6	7	8	9	10	11
Is trustworthy	1	2	3	4	5	6	7	8	9	10	11
Knows and understands my business	1	2	3	4	5	6	7	8	9	10	11
Is the one person to call for any situation, someone I know and who knows me	1	2	3	4	5	6	7	8	9	10	11
Is easy to get in touch with	1	2	3	4	5	6	7	8	9	10	11

5. Overall, how satisfied are you with the performance of your Primary Contact?

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	11

6. In the future, organizations such as yours may be able to choose their power company in a competitive marketplace. Below are several statements about electricity suppliers. Please indicate how strongly you agree or disagree with each statement.

	Strongly Disagree									Strongly Agree	Don't Know
If we had the opportunity, my company would switch electric suppliers	1	2	3	4	5	6	7	8	9	10	11
In a competitive marketplace, I would recommend Gulf Power to other companies	1	2	3	4	5	6	7	8	9	10	11
Compared to other electricity suppliers, Gulf Power provides excellent value	1	2	3	4	5	6	7	8	9	10	11

7. How likely would you be to switch from Gulf Power to another electric utility for a:

	Very Unlikely									Very Likely	Don't Know
2% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11
5% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11
10% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11

8. Overall, how satisfied are you with the full package of services Gulf Power provides to your company?

Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐ Don't Know ☐

9. Thank you very much for completing this survey. You have provided feedback which can help Gulf Power better meet your electric needs. May we have your permission to pass along your individual responses to your Primary contact at Gulf Power?

Yes ☐ No ☐

10. Are there any additional comments or suggestions you would like to make regarding Gulf Power, its service, employees, or products?

Southern Company Services Research
64A Perimeter Center East
Bin 235
Atlanta, GA 30346
1-800-284-2691 (Fax)

1995 Customer Satisfaction Survey

The 1994 survey was used again in 1995.

Residential	Residential Customers
Commercial/Industrial	Same survey used for Commercial and Industrial Customers
Active	Residential Customers who had an active contact with the company
Key Accounts	Key Accounts were given a separate survey. They were not surveyed in the Commercial or Industrial survey.

Residential/General Customer Satisfaction Survey - 1994

Questionnaire # _____ (1-5)

Q.1 Hello, my name is _____ and I'm calling for &&. Are you the person in your household who would usually contact them if you had a request or problem regarding your electric service?

(6)

Yes 1
Person not available 2
Different electric supplier .. 3
Refused 4

[IF THE ANSWER IS 2-4, THEN SKIP TO QUESTION 100]

Q.2 We are conducting a brief survey to determine your level of satisfaction with the services provided by &&. Using a 10-point scale, where 1 means Poor and 10 means Excellent, please tell me how you would rate their performance on each of the following. (Enter "1" to Continue)

(7)

(Continue) .. 1

Q.3 Caring about their customers and not taking them for granted.

(8-9)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.4 Providing a good value for the money you spend on electricity.

(10-11)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.5 Keeping you up to date on their energy conservation programs.

(12-13

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.6 Responding quickly to emergencies such as power outages.

(14-15

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.7 Being active in the community.

(16-17)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.8 Being honest in dealing with the public.

(18-19)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.9 Keeping rates fair and reasonable.

(20-21)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.10 Keeping power interruptions which cause lights to flicker, or digital clocks to blink, to a minimum.

(22-23)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.11 Keeping power outages which last several minutes or longer, to a minimum.

(24-25)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.12 Attracting new business to the community.

(26-27)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.13 Showing concern for the environment.

(28-29)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.14 In thinking about the OVERALL SERVICES that && provides--- that is, electrical service, customer assistance, and other services, how satisfied are you with the services? Are you.....

(30)

Very satisfied	1
Somewhat satisfied	2
Somewhat dissatisfied	3
Very dissatisfied	4
(DO NOT READ) Don't know/refused	5

Q.15 In the last month, how many total times have YOU, for any reason, called or visited &&?

(31)

1	1
2	2
3	3
4 or more	4
None	5
DK/RF	6

[IF THE ANSWER IS 5 OR 6, THEN SKIP TO QUESTION 18]

Q.16 And what was the primary reason for your MOST RECENT contact with &&? (DO NOT READ LIST)

(32-33)

Billing	1
Request for Service (new/transfer)	2
Service Disconnect	3
Report Service Problem	4
Update Account Information	5
Request Program Information	6
Outdoor lighting	7
Complaints	8
Other Information	9
Other	10
DK/RF	11

Q.17 And thinking only about your recent contact, how satisfied are you with the way && handled your inquiry? Are you....

(34)

Very satisfied	1
Satisfied	2
Dissatisfied	3
Very dissatisfied	4
(DO NOT READ) Don't know/refused	5

Q.18 How long have you been a customer of &&?

(35)

Less than 6 months	1
6 months to 1 year	2
1 to 5 years	3
More than 5 years	4
DK/RF	5

Q.19 Which of the following age groups best describes your age? Are you... ..(READ BIST)

(36)

18 to 24	1
25 to 34	2
35 to 44	3
45 to 54	4
55 to 64	5
65 or over	6
DK/RF (DO NOT READ)	7

Q.20 What is the last level of education you have completed? (READ LIST)

(37)
Less than high school graduate .. 1
High school graduate 2
Some college 3
College graduate 4
Post-graduate degree 5
DK/RF (DO NOT READ) 6

Q.21 Do you own or rent your home?

(38)
Own 1
Rent ... 2
DK/RF .. 3

Q.22 Which category best describes your total household income for 1993? Was it.....(READ LIST)

(39)
Under $5,000 1
$5,000 to $9,999 2
$10,000 to $14,999 .. 3
$15,000 to $24,999 .. 4
$25,000 to $34,999 .. 5
$35,000 to $49,999 .. 6
$50,000 to $74,999 .. 7
$75,000 or over 8
DK/RF 9

Q.23 Finally, just to be sure we're representing all groups in this survey, please tell me whether you would describe yourself as.... (READ LIST)

(40)
African American 1
White 2
Hispanic 3
Asian 4
Other (Do Not Read) .. 5
DK/RF (Do Not Read) .. 6

Q.24 Thank you very much for your cooperation. && appreciates you as their customer.

(41)
(Continue) .. 1

Q.25 (COMMENTS - DO NOT ASK)

42-541

[IF THE ANSWER TO QUESTION 24 IS 1, THEN SKIP TO QUESTION 100]

Q.26 (Southern Company Utility Name From Sample File)

Questionnaire # _____ (1-5)

Q.1 Hello, my name is _____. I'm calling for &&. May I speak with the person in your company who is most familiar with how your company uses electricity and natural gas, and who contacts the electric company if there is a problem.

(6)

Getting proper person 1
Person not available 2
Different electric supplier .. 3
Refused 4

[IF THE ANSWER IS 3 OR 4, THEN SKIP TO QUESTION 91]
[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 93]

Q.2 Hello, my name is _____. I'm calling for &&. We're talking with selected customers today to ask their opinions about the service they receive from &&. We would like to include your opinions.

(7)

Continue 1
Not convenient now callback .. 2
Refused 3

[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 100]
[IF THE ANSWER IS 3, THEN SKIP TO QUESTION 91]

Q.3 Your organization may have more than one location in the South. In this interview, we would like your answers to be based only on locations in &&'s service territory. First I'd like you to think about ENERGY EFFICIENCY. I'm going to read you a list of statements concerning ENERGY MANAGEMENT and EFFICIENCY options. Using a scale of 1 to 10 where 1 means Poor and 10 means Excellent, please rate && on each of the following. (Enter "1" to continue)

(8)

(Continue) .. 1

Q.4 Keeping you up-to-date on energy efficiency programs.

(9-10)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.5 Responding to your requests for energy efficiency information or service.

(11-12)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.6 Understanding your energy efficiency needs and providing solutions that meet them.

(13-14)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.7 Overall, how satisfied are you with &&'s Energy Efficiency Program? Please use a scale of 1 to 10, where 1 means Very Dissatisfied and 10 means Very Satisfied.

(15-16)

Very Dissatisfied .. 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Very Satisfied 10
DK/RF 11

Q.8 Now thinking about the RELIABILITY of electric power to your business, please rate && on each of the following using a 10 point scale where 1 means Poor and 10 means Excellent.

(17)

(Continue) .. 1

Q.9 Coordinating planned power outages with your company.

(18-19)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.10 Keeping unplanned power outages to a minimum.

(20-21)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.11 Restoring power in a timely manner.

(22-23)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.12 Being easy to reach to report a power outage.

(24-25)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.13 Informing you of approximately how long the power is going to be off.

(26-27)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.14 Keeping the number of power interruptions lasting less than one minute to a minimum.

(28-29)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.15 Overall, how satisfied are you with the RELIABILITY of electric power from &&? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

(30-31)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.16 How much of a problem is it for your business if you have a power outage that lasts 1 minute or less? Is it.....

(32)

A major problem 1
A minor problem 2
Not a problem at all .. 3
DK/RF 4

Q.17 If your operation is interrupted by an outage lasting 1 minute or less, what amount of time is required for you to return to normal business operations?

Minutes ____ (33-34)
Hours ____ (35-36)
Days ____ (37-38)

Q.18 Thinking about the QUALITY of electric power, that is, anything that may interfere with your equipment or computers OTHER THAN a power outage, please rate && on each of the following. Please use a 10-point scale, where 1 means Poor and 10 means Excellent. (Enter "1" to continue)

(39)

(Continue) .. 1

Q.19 Minimizing spikes, surges, or line noise that may adversely affect sensitive electronic equipment.

(40-41)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.20 Providing technical assistance to help solve your power quality problems.

(42-43)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.21 Providing information on power conditioning equipment.

(44-45)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.22 Overall, how satisfied are you with the QUALITY of electric power? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

(46-47)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.23 Now I'm going to read you a list of statements concerning your ELECTRIC BILL, and the PRICE you pay for electricity. Using a scale of 1 to 10, where 1 means Poor and 10 means Excellent, please rate && on each of the following. (Enter "1" to Continue)

(48)
(Continue) .. 1

Q.24 Providing clear and understandable billing formats.

(49-50)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.25 Ensuring that you are on the right electric rate.

(51-52)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.26 Providing a good value for the money.

(53-54)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.27 Providing rates that are competitive compared to other Southeastern electric utilities.

(55-56)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.28 Working hard to control costs to keep rates down in the future.

(57-58)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.29 Overall, how satisfied are you with the PRICE you pay for electricity? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

(59-60)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.30 Approximately what percent of your total budget is for electric power? (Don't Know = 99)

Enter % ____ (61-62)

Q.31 If another electric supplier offered you a lower price, would your decision to stay with && be based on price alone?

(63)

Yes	1
No	2
DK/RF	3

Q.32 Other than PRICE, what OTHER FACTORS would affect your decision to change electric suppliers? (PROBE - DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(64-69)

Better Services/ Responsiveness	1
No Power Outages/ Better Reliability	2
Better Energy Conser vation Programs	3
Better Quality of Power/Clean Power	4
Guaranteed Uninterru pted Service	5
Civic/community contributions	6
	7
	8
Nothing else, just price	9
Other	10
DK/RF	11

[IF THE ANSWER IS 10, THEN SKIP TO QUESTION 33]
[IF THE ANSWER IS 1-9 OR 11, THEN SKIP TO QUESTION 34]

Q.33 (Explain "Other" in Q32)

_____

_____

Q.34 If another electric supplier made you an offer to provide electric service to your business, would you give && the opportunity to match the offer?

(120)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1-3, THEN SKIP TO QUESTION 52]

Q.35 Do you have an account rep at && who periodically calls or visits you?

(121)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 52]

Q.36 In the last 12 months, have you been contacted by your account rep without your requesting the contact?

(122)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 41]

Q.37 And in the past 12 months, how many times has your account rep contacted you .....

By Phone? (DK = 99) ____ (123-124)
In Person? (DK = 99) ____ (125-126)

Q.38 Do you consider the number of contacts to be.....

(127)
About right .. 1
Too many 2
Too few 3

Q.39 For what reasons did your account rep contact you? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(128-133)
Recommend specific process equipment 1
Help you understand your bill 2
Help you solve an energy problem 3
Respond to a complaint 4
Discuss pricing options 5
Make recommendation on energy efficiency .. 6
Make sales presentation 7
General (social) call/visit 8
..... 9
..... 10
..... 11
Other 12
DK/RF 13

[IF THE ANSWER IS 12, THEN SKIP TO QUESTION 40]
[IF THE ANSWER IS 1-11 OR 13, THEN SKIP TO QUESTION 41]

Q.40 (Explain "Other" in Q39).

136-183

_____

_____

Q.41 Using a scale of 1 to 10 where 1 means Poor and 10 means Excellent, please tell me how you would rate your account rep's performance on each of the following. (Enter "1" to Continue)

(184)
(Continue) .. 1

Q.42 Having adequate technical knowledge about your business operations.

(185-186)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.43 Having the ability to follow through and get the job done.

(187-188)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.44 Possessing good human relations skills.

(189-190)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.45 Making recommendations that meet your specific energy needs.

(191-192)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.46 Keeping you informed on all energy matters relating to your business.

(193-194)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.47 Treating you as a valued business partner.

(195-196)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.48 Providing you with timely forecasts on future prices that can be used in your planning process.

(197-198)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.49 Overall, how satisfied are you with the performance of your account rep on servicing your account? Please use a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied.

(199-200)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.50 How could your account rep better service your account and meet your needs? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(201-206)

More available/ easier to reach	1
Better understand my operations	2
Better understand my energy needs	3
Better communication	4
More responsive/ prompt	5
More meaningful visits	6
Improve technical ability	7
Provide energy conservation tips	8
More frequent visits	9
More flexible/less rigid rules	10
Offer more energy alternatives	11
Not refer me to other people	12
More notice for visits	13
	14
	15
Other	16
DK/RF	17

[IF THE ANSWER IS 16, THEN SKIP TO QUESTION 51]
[IF THE ANSWER IS 1-15 OR 17, THEN SKIP TO QUESTION 63]

Q.51 (Explain "Other" in Q50)

207-256

_____

_____

[IF THE ANSWER TO QUESTION 50 IS 16, THEN SKIP TO QUESTION 63]

Q.52 On a scale of 1 to 10, where 1 means Poor and 10 means Excellent, please tell me how you would rate &&'s performance AS A COMPANY on each of the following. ("1" to Continue)

(257)

(Continue) .. 1

Q.53 Having the technical knowledge about your business operations.

(258-259)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.54 Having the ability to follow through and get the job done.

(260-261)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.55 Caring about customers and not taking them for granted.

(262-263)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.56 Making recommendations that meet your specific energy needs.

(264-265)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.57 Keeping you informed on all energy matters relating to your business.

(266-267)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.58 Treating you as a valued business partner.

(268-269)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.59 Providing you with timely forecasts on future prices that can be used in your planning process.

(270-271)

Poor	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Excellent	10
DK/RF	11

Q.60 Using a 10-point scale where 1 means Very Dissatisfied and 10 means Very Satisfied, overall, how satisfied are you with &&'s performance on servicing your account?

(272-273)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.61 How could && better service your account and meet your needs? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(274-279)

More available/ easier to reach	1
Better understand my operations	2
Better understand my energy needs	3
Better communication	4
More responsive/ prompt	5
More meaningful visits	6
Improve technical ability	7
Provide energy conservation tips	8
More frequent visits	9
More flexible/less rigid rules	10
Offer more energy alternatives	11
Not refer me to other people	12
More notice for visits	13
	14
	15
Other	16
DK/RF	17

[IF THE ANSWER IS 16, THEN SKIP TO QUESTION 62]
[IF THE ANSWER IS 1-15 OR 17, THEN SKIP TO QUESTION 63]

Q.62 (Explain "Other" in Q61)

890-329

_____

_____

Q.63 During the past 6 months, have you contacted && regarding a problem or complaint?

(330)

Yes	1
No	2
DK/RF	3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 80]

Q.64 And how many times in the past 6 months have you contacted && regarding a problem or complaint?

Number of Contacts ____ (331-332)

Q.65 What was the purpose of the most recent contact?

(333-334)

Power outage/ reliability 1
Power quality spikes/drops/noise .. 2
Billing error 3
Rates 4
Contract disputes 5
Flexibility with rules 6
Hard to reach 7
Responsiveness to problem 8
Late on deadline 9
Tree trimming 10
..... 11
..... 12
..... 13
Other 14
DK/RF 15

[IF THE ANSWER IS 1-13 OR 15, THEN SKIP TO QUESTION 67]

Q.66 (Explain "Other" in Q65)

335 - 354

Q.67 Thinking about the most recent contact, how well did && perform on each of the following? Please use a scale of 1 to 10, where 1 means Poor and 10 means Excellent. (Enter "1" to Continue)

(385)

(Continue) .. 1

Q.68 Being easy to reach.

(386-387)

Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

ponding promptly to your inquiry.

(388-389)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

ating you as a valued customer.

(390-391)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

ing the knowledge to handle your recent contact.

(392-393)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.72 Being willing to resolve your inquiry.

(394-395)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.73 Communicating clearly and concisely what they would do.

(398-399)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.74 Following up later to see if your problem was resolved.

(396-397)
Poor 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Excellent . 10
DK/RF 11

Q.75 Has your problem been resolved to your satisfaction?

(400)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 77]

Q.76 How long has && been working on your problem? (DK = 99)

Minutes ____ (401-402)
Hours ____ (403-404)
Days ____ (405-406)
Weeks ____ (407-408)
Months ____ (409-410)

[IF THE ANSWER TO QUESTION 75 IS 2 OR 3, THEN SKIP TO QUESTION 79]

Q.77 How long did it take && to resolve your problem? (DK = 99)

Minutes ____ (411-412)
Hours ____ (413-414)
Days ____ (415-416)
Weeks ____ (417-418)
Months ____ (419-420)

Q.78 And was that an acceptable time period to resolve your problem?

(421)
Yes 1
No 2
DK/RF .. 3

Q.79 Overall, how satisfied were you with the way your problem or complaint was handled? Please use a 10-point scale, where 1 means Very Dissatisfied and 10 means Very Satisfied.

(422-423)

Very Dissatisfied	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
Very Satisfied	10
DK/RF	11

Q.80 If you were asked by management to reccomend a power company, what would you most likely say about &&? Would you..... (READ LIST)

(424)

Recommend them highly	1
Recommend them	2
Recommend them with some reservations	3
Not recommend them at all	4
DK/RF	5

Q.81 If your location had the opportunity to choose any power company to provide your electric power, how likely do you think your company would be to switch energy companies? Would you be....(READ LIST)

(425)

Very likely to switch	1
Somewhat likely to switch	2
Somewhat unlikely to switch	3
Very unlikely to switch	4
DK/RF	5

[IF THE ANSWER IS 3-5, THEN SKIP TO QUESTION 84]

Q.82 Why do you feel that way? (DO NOT READ LIST - CHOOSE UP TO 3 ANSWERS)

(426-431)

Better Rates/Costs/ Price	1
Better Services/ Responsiveness	2
Reduce Power Outages /Reliability	3
Surges/spikes/line noise/power quality	4
Like to compare/shop around	5
Lack of conservation programs/incentives	6
Unresolved problems/ complaints	7
	8
	9
Other	10
DK/RF	11

[IF THE ANSWER IS 10, THEN SKIP TO QUESTION 83]
[IF THE ANSWER IS 1-9 OR 11, THEN SKIP TO QUESTION 84]

Q.83 (Explain "Other" in Q82)

432 - 481

Q.84 What could another power company do that might cause your company to switch electric suppliers? (DO NOT READ LIST - PROBE - CHOOSE UP TO 3 ANSWERS)

(482-487)

Better services/ Responsiveness	1
No power outages/ better reliability	2
Better energy conser vation programs	3
Better quality of power/clean power	4
Guaranteed uninterru pted service	5
Construction of service facilities	6
	7
Lower/better price	8
Other	9
DK/RF	10

[IF THE ANSWER IS 9, THEN SKIP TO QUESTION 85]
[IF THE ANSWER IS 1-8 OR 10, THEN SKIP TO QUESTION 86]

Q.85 (Explain "Other" in Q84)

488-537

Q.86 Overall, how satisfied are you with the full package of services && provides your company? Are you..(READ LIST)

(538)
Very Satisfied 1
Satisfied 2
Dissatisfied 3
Very Dissatisfied .. 4
DK/RF 5

[IF THE ANSWER IS 1-5, THEN SKIP TO QUESTION 88]

Q.87 And what would that rating be on a 10-POINT SCALE where 1 means Very Dissatisfied and 10 means Very Satisfied?

(539-540)
Very Dissatisfied .. 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
Very Satisfied 10
DK/RF 11

Q.88 We normally review the results of surveys on a SUMMARY basis, however, your individual responses may help && customize programs for your company. May we have your permission to review your answers individually?

(541)
Yes 1
No 2
DK/RF .. 3

Q.89 May I have your NAME, TITLE, and PHONE NUMBER for our records?

502-616

Q.90 Thank you very much for your time and cooperation. && appreciates you as a customer.

(617)
(Enter "1") .. 1

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 93]

Q.91 Thank you anyway and have a good day. (Enter "1")

(618)
(Continue) .. 1

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 93]

Q.92 Company Name from Sample File

927-940

Q.93 (Enter Comments -DO NOT ASK)

571-617

Q.1 Hello, my name is ____ and I'm calling for &&. We are conducting a brief follow-up survey of people who have recently visited or called & & to determine their level of satisfaction with the contact. Are you the person who contacted &&?

(6)

Yes	1
Person not available	2
Different electric company	3
Don't recall contact (DROP BOX)	4
Paid bill (DRIVE THRU)	5
Paid bill (OFFICE VISIT)	6
Refused	7

[IF THE ANSWER IS 2-4 OR 7, THEN SKIP TO QUESTION 105]
[IF THE ANSWER IS 5, THEN SKIP TO QUESTION 18]
[IF THE ANSWER IS 6, THEN SKIP TO QUESTION 5]

Q.2 Thinking about your most recent contact with && was it by.....

(7)

Telephone	1
Office visit	2
Drive-Thru	3
Drop-Box	4
Other	5

[IF THE ANSWER IS 4, THEN SKIP TO QUESTION 99]
[IF THE ANSWER IS 5, THEN SKIP TO QUESTION 7]
[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 5]
[IF THE ANSWER IS 3, THEN SKIP TO QUESTION 18]

Q.3 When you called, did you speak with someone immediately, or were you put on hold?

(8)

Spoke with someone immediately	1
Put on hold	2
Got recording	3
DK/RF	4

[IF THE ANSWER IS 1 OR 3 OR 4, THEN SKIP TO QUESTION 7]

Q.4 Were you on hold longer than you thought was reasonable?

(9)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1-3, THEN SKIP TO QUESTION 7]

Q.5 When you visited, did you speak with someone immediately or did you have to wait?

(10)
Spoke with someone immediately .. 1
Had to wait 2
DK/RF 3

[IF THE ANSWER IS 1 OR 3, THEN SKIP TO QUESTION 7]

Q.6 Did you have to wait longer than you thought was reasonable?

(11)
Yes 1
No 2
DK/RF .. 3

Q.7 And what was the PRIMARY reason for your MOST RECENT contact with &&? (DO NOT READ LIST)

(12-13)
Billing inquiry 1
Report service problem 2
Request service(New/ transfer/disconnect) .. 3
Request information 4
Pay bill ONLY 5
Energy audit 6
Change account information 7
Complaint 8
Other 9
DK/RF 10

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 9]
[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 11]
[IF THE ANSWER IS 3, THEN SKIP TO QUESTION 13]
[IF THE ANSWER IS 4, THEN SKIP TO QUESTION 15]
[IF THE ANSWER IS 5, THEN SKIP TO QUESTION 18]
[IF THE ANSWER IS 6-8, THEN SKIP TO QUESTION 17]
[IF THE ANSWER IS 10, THEN SKIP TO QUESTION 105]

Q.8 (Describe "Other" in previous question)

14-63

[IF THE ANSWER TO QUESTION 7 IS 9, THEN SKIP TO QUESTION 17]

Q.9 What was the specific reason for your BILLING INQUIRY?

(64)

High bill	1
Request payment extension	2
Check account balance	3
Check bill due date	4
Didn't get bill	5
Budget/levelized billing	6
Other	7
DK/RF	8

[IF THE ANSWER IS 1-6 OR 8, THEN SKIP TO QUESTION 17]

Q.10 (Describe "Other" in previous question)

65-114

[IF THE ANSWER TO QUESTION 9 IS 7, THEN SKIP TO QUESTION 17]

Q.11 What type of SERVICE PROBLEM did you experience?

(115)

Power outage	1
Pole or lines down	2
Lights flickering	3
Oudoor light out/ blinking	4
Other	5
DK/Rf	6

[IF THE ANSWER IS 1-4 OR 6, THEN SKIP TO QUESTION 17]

Q.12 (Describe "Other" in previous question)

116-165

[IF THE ANSWER TO QUESTION 11 IS 5, THEN SKIP TO QUESTION 17]

Q.13 Was your request for service to.....(READ LIST)

(166)

Establish service as new customer	1
Transfer service	2
Reconnect service	3
Disconnect serevice	4
Have outdoor light installed	5
Other	6
DK/RF	7

[IF THE ANSWER IS 1-5 OR 7, THEN SKIP TO QUESTION 17]

Q.14 (Describe "Other" in previous question)

167-216

[IF THE ANSWER TO QUESTION 13 IS 6, THEN SKIP TO QUESTION 17]

Q.15 What was the PRIMARY type of INFORMATION you requested?

(217-218)

Budget/levelized billing program	1
Energy conservation/ energy audit	2
Heat pump program/ sale	3
Appliance sales/ service	4
Outdoor lighting program/sale	5
Senior citizen discount	6
Financial Assistance Program	7
Guaranteed Service Program	8
Other	9
DK/RF	10

[IF THE ANSWER IS 1-8 OR 10, THEN SKIP TO QUESTION 17]

14)

Q.16 (Describe "Other" in previous question)

219-268

Q.17 Approximately how many times did you have to contact && to get your problem or request taken care of?

(269)
Once 1
Twice 2
Three or more times .. 3
DK/RF 4

Q.18 Compared to what you expected, how would you rate && on handling your most recent contact? would you say they did . . . (READ LIST)

(270)
Much better 1
Better 2
Just as you expected .. 3
Worse 4
Much worse 5
DK/RF 6

[IF THE ANSWER TO QUESTION 3 IS 3, THEN SKIP TO QUESTION 94]
[IF THE ANSWER TO QUESTION 7 IS 2, THEN SKIP TO QUESTION 31]
[IF THE ANSWER TO QUESTION 7 IS 3, THEN SKIP TO QUESTION 50]
[IF THE ANSWER TO QUESTION 7 IS 4, THEN SKIP TO QUESTION 72]
[IF THE ANSWER TO QUESTION 7 IS 5, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 7 IS 6, THEN SKIP TO QUESTION 83]
[IF THE ANSWER TO QUESTION 7 IS 7, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 7 IS 8, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 7 IS 9, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 2 IS 3, THEN SKIP TO QUESTION 80]
[IF THE ANSWER TO QUESTION 1 IS 5, THEN SKIP TO QUESTION 80]

Q.19 Did the && representative seem to have the KNOWLEDGE to handle your billing inquiry?

(271)
Yes 1
No 2
DK/RF .. 3

Q.20 Did the rep appear to have the necessary AUTHORITY to resolve your BILLING INQUIRY?

(272)
Yes 1
No 2
DK/RF .. 3

Q.21 Did the rep seem INTERESTED in solving your BILLING INQUIRY?

(273)
Yes 1
No 2
DK/RF .. 3

Q.22 Did the rep appear to be FLEXIBLE in helping to solve your BILLING INQUIRY?

(274)
Yes 1
No 2
DK/RF .. 3

Q.23 Was the rep COURTEOUS?

(275)
Yes 1
No 2
DK/RF .. 3

Q.24 Did the rep mention anything about Alabama Power's billing programs?

(276)
Yes 1
No 2
DK/RF .. 3

Q.25 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your BILLING INQUIRY? Would you say they did .... (READ LIST)

(277)
Much better 1
Better 2
Just as you expected .. 3
Worse 4
Much worse 5
DK/RF 6

Q.26 As a result of your BILLING INQUIRY, did you meet with someone from & & at your home or business?

(278)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 94]

Q.27 Did the rep you met with ..... Have the KNOWLEDGE to handle your problem or request?

(279)
Yes 1
No 2
DK/RF .. 3

Q.28 Did they seem INTERESTED in solving your problem or request?

(280)
Yes 1
No 2
DK/RF .. 3

Q.29 Were they COURTEOUS?

(281)
Yes 1
No 2
DK/RF .. 3

Q.30 Compared to what you expected, how would you rate the service provided at your home or business? Was it ... (READ LIST)

(282)

Much better	1
Better	2
Just as you expected	3
Worse	4
Much worse	5
DK/RF	6

[IF THE ANSWER IS 1-6, THEN SKIP TO QUESTION 94]

Q.31 When you contacted && to report your SERVICE PROBLEM, was anyone able to tell you when your service problem would be taken care of?

(283)

Yes	1
No	2
DK/RF	3

Q.32 Did the rep seem INTERESTED in solving your SERVICE PROBLEM?

(284)

Yes	1
No	2
DK/RF	3

Q.33 Was the rep COURTEOUS?

(285)

Yes	1
No	2
DK/RF	3

Q.34 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your SERVICE PROBLEM? Would you say they did ... (READ LIST)

(286)

Much better	1
Better	2
Just as you expected	3
Worse	4
Much worse	5
DK/RF	6

Q.35 As a result of your SERVICE PROBLEM, did you meet with a && representative at your home or business?

(287)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 39]

Q.36 Did the rep you met with..... Have the KNOWLEDGE to handle your problem or request?

(288)
Yes 1
No 2
DK/RF .. 3

Q.37 Did they seem INTERESTED in solving your problem?

(289)
Yes 1
No 2
DK/RF .. 3

Q.38 Were they COURTEOUS?

(290)
Yes 1
No 2
DK/RF .. 3

Q.39 As a result of your SERVICE PROBLEM, did you see a work crew in your area?

(291)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 40]
[IF THE ANSWER TO QUESTION 35 IS 1, THEN SKIP TO QUESTION 48]
[IF THE ANSWER TO QUESTION 35 IS 2 OR 3, THEN SKIP TO QUESTION 49]

Q.40 Did anyone from the work crew tell you they would be working in your area?

(292)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 43]

Q.41 Did they tell you WHAT they would be doing?

(293)
Yes 1
No 2
DK/RF .. 3

Q.42 Were you treated courteously?

(294)
Yes 1
No 2
DK/RF .. 3

Q.43 Did the work crew show respect for your property?

(295)
Yes 1
No 2
They weren't on my property .. 3
DK/RF 4

[IF THE ANSWER IS 3 OR 4, THEN SKIP TO QUESTION 46]

Q.44 Was your personal property damaged in any way?

(296)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 46]

Q.45 Has the damage to your property been repaired to your satisfaction?

(297)
Repaired to my satisfaction .. 1
Repaired but not satisfied ... 2
Not repaired 3

Q.46 Did the work crew leave the area neat and clean?

(298)
Yes 1
No 2
DK/RF .. 3

Q.47 Was the job done by the work crew completed.....(READ LIST)

(299)
Quicker than you expected .. 1
About when you expected 2
Slower than you expected ... 3
DK/RF 4

Q.48 Compared to what you expected, how would you rate the service provided at your home or business, would you say it was ... (READ LIST)

(300)
Much better 1
Better 2
Just as you expected 3
Worse 4
Much worse 5
No service provided at home (DON'T READ) .. 6
DK/RF 7

Q.49 Was your service problem resolved.....(READ LIST)

(301)
Quicker than you expected .. 1
About when you expected 2
Slower than you expected ... 3
DK/RF 4

[IF THE ANSWER IS 1-4, THEN SKIP TO QUESTION 94]

Q.50 Did the && representative seem to have the KNOWLEDGE to handle your SERVICE REQUEST?

(302)
Yes 1
No 2
DK/RF .. 3

Q.51 Did the rep appear to have the necessary AUTHORITY to resolve your SERVICE REQUEST?

(303)
Yes 1
No 2
DK/RF .. 3

Q.52 Did the rep seem INTERESTED in solving your SERVICE REQUEST?

(304)
Yes 1
No 2
DK/RF .. 3

Q.53 Was the rep COURTEOUS?

(305)
Yes 1
No 2
DK/RF .. 3

Q.54 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your SERVICE REQUEST? Would you say they did . . . (READ LIST)

(306)
Much better 1
Better 2
Just as you expected .. 3
Worse 4
Much worse 5
DK/RF 6

Q.55 When you made your SERVICE REQUEST, were you told clearly when your request would be handled?

(307)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 57]

Q.56 Was your SERVICE REQUEST handled by the date && promised?

(308)
Yes 1
No 2
No date was promised .. 3
DK/RF 4

Q.57 As a result of your SERVICE REQUEST, did you meet with a && representative at your home or business?

(309)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 61]

Q.58 Did the representative you met with..... have the KNOWLEDGE to handle your request?

(310)
Yes 1
No 2
DK/RF .. 3

Q.59 Did they seem INTERESTED in solving your SERVICE REQUEST?

(311)
Yes 1
No 2
DK/RF .. 3

Q.60 Were they COURTEOUS?

(312)
Yes 1
No 2
DK/RF .. 3

Q.61 As a result of your SERVICE REQUEST, did you see a work crew in your area?

(313)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 62]
[IF THE ANSWER TO QUESTION 57 IS 1, THEN SKIP TO QUESTION 70]
[IF THE ANSWER TO QUESTION 57 IS 2 OR 3, THEN SKIP TO QUESTION 71]

Q.62 Did anyone from the work crew tell you they would be working in your area?

(314)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 65]

Q.63 Did they tell you WHAT they would be doing?

(315)
Yes 1
No 2
DK/RF .. 3

Q.64 Were you treated courteously?

(316)
Yes 1
No 2
DK/RF .. 3

Q.65 Did the work crew show respect for your property?

(317)
Yes 1
No 2
They weren't on my property .. 3
DK/RF 4

[IF THE ANSWER IS 3 OR 4, THEN SKIP TO QUESTION 68]

Q.66 Was your personal property damaged in any way?

(318)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 68]

Q.67 Has the damage to your property been repaired to your satisfaction?

(319)
Repaired to my satisfaction .. 1
Repaired but not satisfied ... 2
Not repaired 3

Q.68 Did the work crew leave the area neat and clean?

(320)
Yes 1
No 2
DK/RF .. 3

Q.69 Was the job done by the work crew completed.....(READ LIST)

(321)
Quicker than you expected .. 1
About when you expected 2
Slower than you expected ... 3
DK/RF 4

Q.70 Compared to what you expected, how would you rate the service provided at your home or business? Would you say it was . . . (READ LIST)

(322)

Much Better	1
Better	2
Just as you expected	3
Worse	4
Much Worse	5
No service provided at home	6
DK/RF	7

Q.71 Was your SERVICE REQUEST handled.....(READ LIST)

(323)

Quicker than you expected	1
About when you expected	2
Slower than you expected	3
DK/RF	4

[IF THE ANSWER IS 1-4, THEN SKIP TO QUESTION 94]

Q.72 Was your REQUEST FOR INFORMATION handled promptly?

(324)

Yes	1
No	2
DK/RF	3

Q.73 Did you get the INFORMATION you wanted?

(325)

Yes	1
No	2
DK/RF	3

Q.74 Did the && representative seem INTERESTED in providing you with the INFORMATION you requested?

(326)

Yes	1
No	2
DK/RF	3

Q.75 Did the && rep seem KNOWLEDGEABLE about the INFORMATION you requested?

(327)
Yes 1
No 2
DK/RF .. 3

Q.76 Was the && rep COURTEOUS?

(328)
Yes 1
No 2
DK/RF .. 3

Q.77 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your request for INFORMATION. Would you say they did ... (READ LIST)

(329)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

Q.78 Did you receive any literature as a result of your request for INFORMATION?

(330)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 94]

Q.79 Was the literature ...

(331)
Very helpful 1
Somewhat helpful 2
Not very helpful 3
Not helpful at all 4
Haven't read it yet (do not read) .. 5
DK/RF 6

[IF THE ANSWER IS 1-6, THEN SKIP TO QUESTION 94]

Q.80 Did the && representative seem INTERESTED in assisting you?

(332)
Yes 1
No 2
DK/RF .. 3

Q.81 Was the rep COURTEOUS?

(333)
Yes 1
No 2
DK/RF .. 3

Q.82 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who handled your CONTACT? Would you say they did ... (READ LIST)

(334)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

[IF THE ANSWER IS 1-6, THEN SKIP TO QUESTION 94]

Q.83 Did the && repesentative who scheduled your ENERGY AUDIT ... Seem INTERESTED in helping you?

(335)
Yes 1
No 2
DK/RF .. 3

Q.84 Were they courteous?

(336)
Yes 1
No 2
DK/RF .. 3

Q.85 When you made your ENERGY AUDIT REQUEST, were you told clearly when your audit would be done?

(337)
Yes 1
No 2
DK/RF .. 3

Q.86 Compared to what you expected, how would you rate the OVERALL PERFORMANCE of the CUSTOMER SERVICE REPRESENTATIVE who SCHEDULED your energy audit? Would you say they did . . . (READ LIST)

(338)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

Q.87 Has your energy audit already been done?

(339)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 2 OR 3, THEN SKIP TO QUESTION 94]

Q.88 Was your energy audit done by the date as promised?

(340)
Yes 1
No 2
No date promised .. 3
DK/RF 4

Q.89 Did the representative WHO PERFORMED your energy audit appear to have the KNOWLEDGE necessary to conduct the audit?

(341)
Yes 1
No 2
DK/RF .. 3

Q.90 Did they seem INTERESTED in performing your audit?

(342)
Yes 1
No 2
DK/RF .. 3

Q.91 Were they COURTEOUS?

(343)
Yes 1
No 2
DK/RF .. 3

Q.92 Compared to what you expected, how would you rate the THOROUGHNESS of your energy audit? Would you say it was . . . (READ LIST)

(344)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

Q.93 Compared to what you expected, how would you rate the rep's ABILITY to make energy saving recommendations? Would you say they did . . . (READ LIST)

(345)
Much Better 1
Better 2
Just as you expected .. 3
Worse 4
Much Worse 5
DK/RF 6

Q.94 And thinking only about your recent contact with Alabama Power, how satisfied are you with the way it was handled? Are you ...

(346)
Very Satisfied 1
Satisfied 2
Dissatisfied 3
Very Dissatisfied .. 4
DK/RF 5

[IF THE ANSWER TO QUESTION 87 IS 2 OR 3, THEN SKIP TO QUESTION 99]
[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 96]
[IF THE ANSWER IS 2-5, THEN SKIP TO QUESTION 95]

Q.95 What could && have done to make you VERY SATISFIED?

367-74

[IF THE ANSWER TO QUESTION 1 IS 5, THEN SKIP TO QUESTION 99]
[IF THE ANSWER TO QUESTION 7 IS 5, THEN SKIP TO QUESTION 99]

Q.96 And finally, has everything been taken care of to your satisfaction?

(747)
Yes 1
No 2
DK/RF .. 3

[IF THE ANSWER IS 1, THEN SKIP TO QUESTION 99]

Q.97 Is someone working with you to solve your request or problem, or do you need someone from && to call you?

(748)
Need someone to call me .. 1
Being handled 2
DK/RF 3

[IF THE ANSWER IS 2, THEN SKIP TO QUESTION 99]

Q.98 Please give me the name of the person to be contacted, their phone number, and the time of day they can be reached.

749-798

Q.99 Thank you very much for your cooperation. && appreciates you as a customer.

(799)
(Continue) .. 1

Q.100 (COMMENTS - DO NOT ASK)

800 - 1277

[IF THE ANSWER TO QUESTION 99 IS 1, THEN SKIP TO QUESTION 105]

Q.101 (Southern Company Utility Name From Sample File)

_____

1995 KEY ACCOUNT QUESTIONNAIRE

About The Survey:

Gulf Power is committed to providing your company with superior electric service. We need your help in telling us how well we are meeting that commitment.

Your responses to the following survey will help determine how well Gulf Power is currently meeting your electric needs as well as identify ways to improve service. To ensure confidentiality, Gulf Power has arranged for TQS Research, Inc. to administer the survey. Please complete all appropriate sections. Answer only those questions that apply to you and your experience with Gulf Power. Most questions offer a list of appropriate answers. Read all the choices and circle the number or check the appropriate box next to your answer. Please choose only one answer per question. After completing the survey, please return it to TQS Research, Inc. in the postage-paid envelope which has been provided for your convenience. However, if you prefer, you may respond to this survey by phone at 1-800-643-1990 or by fax at 1-800-781-7112.

Thank you for your participation in this survey. Gulf Power values you as a customer and appreciates your comments.

1. **Overall, how satisfied are you with Gulf Power?**

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	11

2. **Below is a list of statements that describe several aspects of performance that customers expect from their power company. For each statement, please indicate how satisfied you are with Gulf Power's performance.**

	Very Dissatisfied									Very Satisfied	Do Kn
Provides clean, consistent power with few spikes, dips or fluctuations	1	2	3	4	5	6	7	8	9	10	1
Approaches situations creatively with our best interests in mind	1	2	3	4	5	6	7	8	9	10	1
Offers fair, reasonable rates	1	2	3	4	5	6	7	8	9	10	1
Takes responsibility when there's a problem, and works with us to solve it	1	2	3	4	5	6	7	8	9	10	1
Works with us to save money on electrical costs	1	2	3	4	5	6	7	8	9	10	1
Provides bill statements that clearly spell out energy usage, rate, and how bills are calculated	1	2	3	4	5	6	7	8	9	10	1
Finds the best available rate for us	1	2	3	4	5	6	7	8	9	10	1
Will do repairs at the best time for us, even if it involves overtime	1	2	3	4	5	6	7	8	9	10	1
Responds quickly to outages	1	2	3	4	5	6	7	8	9	10	1
Provides technical assistance to help solve power quality problems	1	2	3	4	5	6	7	8	9	10	
Follows up on questions or problems I may have	1	2	3	4	5	6	7	8	9	10	
Alerts us to energy issues that may affect our business	1	2	3	4	5	6	7	8	9	10	
Offers different rate options to best fit our needs	1	2	3	4	5	6	7	8	9	10	

Provides information on how we can use energy mor efficiently	1	2	3	4	5	6	7	8	9	10
Plans ahead, helps us avoid potential problems	1	2	3	4	5	6	7	8	9	10
Is a partner to help us get our job done, is part of the team	1	2	3	4	5	6	7	8	9	10
Informs us of new technologies that help keep us competitive	1	2	3	4	5	6	7	8	9	10
Problems and requests are responded to, don't fall through the cracks	1	2	3	4	5	6	7	8	9	10

3. **Do you have a Primary Contact from Gulf Power who calls or visits you?**

Yes ☐ No ☐ Not Sure ☐

If yes, what is your Primary Contact's name? _____

(If you answered "No" or "Not Sure" to Question 3, please skip to Question 6)

4. **How would you rate your Primary Contact's performance on the following items?**

	Very Dissatisfied									Very Satisfied	Do Kn
Is knowledgeable	1	2	3	4	5	6	7	8	9	10	1
Stays in touch with me on a regular basis	1	2	3	4	5	6	7	8	9	10	1
Is interested in us, treats us like a valued business customer	1	2	3	4	5	6	7	8	9	10	1
Is trustworthy	1	2	3	4	5	6	7	8	9	10	1
Knows and understands my business	1	2	3	4	5	6	7	8	9	10	1
Is the one person to call for any situation, someone I know and who knows me	1	2	3	4	5	6	7	8	9	10	1
Is easy to get in touch with	1	2	3	4	5	6	7	8	9	10	1

5. **Overall, how satisfied are you with the performance of your Primary Contact?**

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	11

6. **In the future, organizations such as yours may be able to choose their power company in a competitive marketplace. Below are several statements about electricity suppliers. Please indicate how strongly you agree or disagree with each statement.**

	Strongly Disagree									Strongly Agree	Do Kn
In a competitive marketplace, I would recommend Gulf Power to other companies	1	2	3	4	5	6	7	8	9	10	1
The products and services that Gulf Power provides are worth what we pay for them	1	2	3	4	5	6	7	8	9	10	1

7. How likely would you be to switch from Gulf Power to another electric utility:

	Very Unlikely									Very Likely	Don't Know
If your electric bill did not change	1	2	3	4	5	6	7	8	9	10	11
For a 2% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11
For a 5% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11
For a 10% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11

8. Overall, how satisfied are you with the full package of services Gulf Power provides to your company?

Very dissatisfied ☐ Dissatisfied ☐ Satisfied ☐ Very satisfied ☐ Don't Know ☐

9. Thank you very much for completing this survey. You have provided feedback which can help Gulf Power better meet your electric needs. May we have your permission to pass along your individual responses to your Primary Contact at Gulf Power?

Yes ☐ No ☐

10. Are there any additional comments or suggestions you would like to make regarding Gulf Power, its service, employees, or products?

_____

_____

_____

_____

TQS Research, Inc.
2660 Holcomb Bridge Road, Suite 208
Alpharetta, GA 30202
1-800-643-1990 (phone)
1-800-781-7112 (fax)

1996 Customer Satisfaction Survey

The 1995 Survey was used again in 1996.

Residential	Residential Customers
Business	Same survey used for Commercial and Industrial Customers
Active	Residential Customers who had an active contact with the company
Key Accounts	Key Accounts were given a separate survey. They were not surveyed in the Commercial or Industrial survey.

RESIDENTIAL CUSTOMER SURVEY

Hello, my name is _____ , and I'm calling for _____. We're conducting a brief survey among _____customers to determine their level of satisfaction with _____ and identify areas where they can improve their service. Is this a convenient time to talk?

Yes..... Continue
No..... Schedule Callback

1. May I please speak to Mr. or Mrs. [insert lastname from sample]?

YES..... Continue

No..... Schedule callback

Refused..... Terminate

If no name available from sample, ask May I speak with the person who normally contacts _____when there is a problem or question?

(Reread intro if different person)

2. Overall, how satisfied are you with _____'s performance as an electric company? Please use a scale of 1 to 10, where 1 means **Very Dissatisfied** and 10 means **Very Satisfied.**

Very Dissatisfied									Very Satisfied	DK/RF
1	2	3	4	5	6	7	8	9	10	11

3. I'm going to read you a list describing what some people have said they want from their electric company. Think specifically about all of your experiences with _____. Please rate how good a job _____ does on each of the following items. Use any number from 1 to 10, where 1 means Poor and 10 means Excellent.

(ROTATE LIST)

RESPONSIVE	Poor									Excellent	DK/RF
Work crews that do the job right	1	2	3	4	5	6	7	8	9	10	11
Responds quickly at any time to problems or service requests	1	2	3	4	5	6	7	8	9	10	11
Dependable, do what they say they will do	1	2	3	4	5	6	7	8	9	10	11
Cares about helping customers	1	2	3	4	5	6	7	8	9	10	11
Plans ahead when doing work and coordinates with other parties like the phone company and cable company	1	2	3	4	5	6	7	8	9	10	11
Easy to get service turned on	1	2	3	4	5	6	7	8	9	10	11

BILLING	Poor									Excellent	DK/RF
Fair, reasonable rates	1	2	3	4	5	6	7	8	9	10	11
Accurate bills	1	2	3	4	5	6	7	8	9	10	11
Bills clearly spell out usage, rate, and how the bill was calculated	1	2	3	4	5	6	7	8	9	10	11
Helps you understand and anticipate what your bill should be	1	2	3	4	5	6	7	8	9	10	11

PROFESSIONAL EMPLOYEES	Poor									Excellent	DK/RF
Can always talk to a person who can help you	1	2	3	4	5	6	7	8	9	10	11
Knowledgeable employees	1	2	3	4	5	6	7	8	9	10	11
Interested in you, treats you like more than just an account number	1	2	3	4	5	6	7	8	9	10	11
Solves problems without any hassles	1	2	3	4	5	6	7	8	9	10	11
Courteous and pleasant employees	1	2	3	4	5	6	7	8	9	10	11
Provides information on how you can use energy more efficiently and save money	1	2	3	4	5	6	7	8	9	10	11
Trustworthy employees	1	2	3	4	5	6	7	8	9	10	11

WELL-RUN COMPANY	Poor									Excellent	DK/RF
Plenty of stable, uninterrupted power	1	2	3	4	5	6	7	8	9	10	11
Well prepared to handle emergencies	1	2	3	4	5	6	7	8	9	10	11
A reputable, well-run company	1	2	3	4	5	6	7	8	9	10	11
Cares about the community	1	2	3	4	5	6	7	8	9	10	11
Shows concern for the environment	1	2	3	4	5	6	7	8	9	10	11
Plans for future energy needs	1	2	3	4	5	6	7	8	9	10	11

4. How many times in the past month would you say you have contacted _____ either by telephone or by visiting their office?

0 times	1	(Skip to Question 11)
1 time	2	
2 times	3	
3 times	4	
4 times	5	
5 times or more	6	
DK/RF	7	

5. What was the reason for **your most recent contact** with Georgia Power?
(DO NOT READ LIST)

PAY BILL	1
BILLING INQUIRY OR PAYMENT ARRANGEMENT	2
SERVICE PROBLEM (outages, fix outdoor lights, etc.)	3
SERVICE REQUEST (turn on/off electricity for move, change name on account, etc..)	4
INFORMATION REQUEST (energy audit, energy efficiency, etc.)	5
COMPLAINT OTHER THAN BILLING (damage to property, etc.)	6
APPLIANCE SALES OR SERVICE	7
SALES OF OTHER ITEMS (i.e. heat pumps, etc.)	8
ENERGY AUDIT	9
OTHER _____ (Please specify)	10

6. **How satisfied are you with the way ____________ handled your most recent contact? Please use a scale of 1 to 10, where 1 means Very Dissatisfied and 10 means Very Satisfied.**

Very Dissatisfied 1	2	3	4	5	6	7	8	9	Very Satisfied 10	DK/RF 11

7. **Has everything been taken care of to your satisfaction?**

Yes 1
No 2
DK/RF 3

(If the answer is 1, skip to Q11)

8. **Is someone working with you to solve your request or problem, or do you need someone from _________ to call you?**

Need someone to call me 1
Being handled 2
DK/RF 3

(If the answer is 2, skip to Q11)

9. **Please give me the name of the person to be contacted, their phone number, and the time of day they can be reached.**

____

____

10 (Reason Customer Needs to be Called - Comments)

____

____

____

____

____

11. **Overall**, how satisfied **are** you with ________________? Are you.......

Very satisfied.......... 1
Satisfied.................. 2
Dissatisfied............. 3
Very dissatisfied..... 4
DK/RF.................... 5

12. How can ____________ improve its service to you?

____

____

____

____

13. Record Sex (Do Not Ask)

MALE 1

FEMALE 2

DK.. 3

THANK YOU!

BUSINESS CUSTOMER SURVEY

Hello, my name is ______, and I'm calling for ____________. May I speak with the person in your company who is most knowledgeable about your company's use of electricity, and who would contact ______________ if there is a problem or question.

(After correct respondent is on phone)

Hello, my name is ______, and I'm calling for __________. We're conducting a brief survey among companies like yours to determine their satisfaction with ______________ and identify areas whe[r] they can improve their service. Is this a convenient time to talk?

Yes............ Continue
No .... Schedule callback

1. **Overall, how satisfied are you with _________'s performance as an electric company? Please use a scale of 1 to 10, where 1 means Very Dissatisfied and 10 means Very Satisfied.**

Very Dissatisfied									Very Satisfied	DK/RF
1	2	3	4	5	6	7	8	9	10	11

2. I'm going to read you a list describing what some companies have said they want from their electric company. Think specifically about <u>all</u> of your experiences with__________. Please rate how good a job __________ does on each of the following items. Use any number from 1 to 10, where 1 means Poor anc 10 means Excellent.

(ROTATE LIST)

Professional Employees.	Poor									Excellent	DK/RF
Work crews show up when you need them and get the job done	1	2	3	4	5	6	7	8	9	10	11
Interested in you, treats you like you're their most important customer	1	2	3	4	5	6	7	8	9	10	11
Courteous, pleasant employees	1	2	3	4	5	6	7	8	9	10	11
Knowledgeable employees	1	2	3	4	5	6	7	8	9	10	11
Employees really work to make sure you're happy	1	2	3	4	5	6	7	8	9	10	11
Easy to get through to someone who can help you	1	2	3	4	5	6	7	8	9	10	11
Trustworthy employees	1	2	3	4	5	6	7	8	9	10	11

Responsive	Poor									Excellent	DK/RF
Responds quickly to problems and service requests without hassles	1	2	3	4	5	6	7	8	9	10	11
A dependable partner, always there to explain things and help out	1	2	3	4	5	6	7	8	9	10	11
Easy to get service turned on	1	2	3	4	5	6	7	8	9	10	11

Billing/Financial	Poor									Excellent	DK/RF
Fair, reasonable rates	1	2	3	4	5	6	7	8	9	10	11
Accurate, clear bills that help you understand your usage	1	2	3	4	5	6	7	8	9	10	11
Shows you ways to save money on electrical costs	1	2	3	4	5	6	7	8	9	10	11
Works with you to resolve billing disputes and payment problems	1	2	3	4	5	6	7	8	9	10	11

Well-Run Company	Poor									Excellent	DK/RF
Well prepared to handle emergencies	1	2	3	4	5	6	7	8	9	10	11
Keeps you well supplied with clean, uninterrupted power	1	2	3	4	5	6	7	8	9	10	11
Plans ahead, helps you avoid potential problems	1	2	3	4	5	6	7	8	9	10	11
A reputable, well-run company	1	2	3	4	5	6	7	8	9	10	11
Cares about the community	1	2	3	4	5	6	7	8	9	10	11
Shows concern for the environment	1	2	3	4	5	6	7	8	9	10	11

Keeps Us Competitive/Informed	Poor									Excellent	DK/RF
Alerts you to emerging issues and technologies that may impact your business	1	2	3	4	5	6	7	8	9	10	11
Informs you of and lets you participate in any special programs they offer	1	2	3	4	5	6	7	8	9	10	11
Approaches situations creatively and with your best interest in mind	1	2	3	4	5	6	7	8	9	10	11
Provides complete, unbiased information on how to use energy more efficiently	1	2	3	4	5	6	7	8	9	10	11
Enables you to analyze and see trends in your power usage	1	2	3	4	5	6	7	8	9	10	11

3. In the future, companies like yours may be able to choose their power company in a competitive marketplace. Below are several statements about electricity suppliers. Please indicate how strongly you disagree or agree with each statement by using a scale of 1 to 10, where 1 means **Strongly Disagree** and 10 means **Strongly Agree**.

	Strongly Disagree									Strongly Agree	
If you had the opportunity, your company would switch electric suppliers	1	2	3	4	5	6	7	8	9	10	11
In a competitive marketplace, you would strongly recommend _____ to other companies	1	2	3	4	5	6	7	8	9	10	11
Compared to other electricity suppliers, _____ _____provides excellent value	1	2	3	4	5	6	7	8	9	10	11
Your company would switch from _____for a 10% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11

4. Other than receiving and paying your bills, have you had any contacts with a _____ representative in the last twelve months?

- ☐ Yes
- ☐ No (Skip to Q11)

5. What was the reason for your MOST RECENT contact with_____? (Choose all that apply...DO NOT READ)

- ☐ Power Outage
- ☐ Power Fluctuation (flicker, surge, spike, etc.)
- ☐ Billing Question or Conflict
- ☐ Rates (rate structures, how to save money etc.)
- ☐ Technical Support (technical information, recommendations, etc.)
- ☐ Change in Service (add, move, etc.)
- ☐ Maintenance (repairing lights, etc.)
- ☐ Contract Disputes
- ☐ Product Sales (outdoor lights, Enerlink, etc.)
- ☐ Other_____

6. How satisfied are you with the way _____ handled your most recent contact? Please use a scale of 1 to 10, where 1 means Very Dissatisfied and 10 means Very Satisfied.

Very Dissatisfied									Very Satisfied	DK/RF
1	2	3	4	5	6	7	8	9	10	11

7. Has everything been taken care of to your satisfaction?

Yes..... 1
No..... 2
DK/RF..... 3

(If the answer is 1, skip to Q11)

8. Is someone working with you to solve your request or problem, or do you need someone from _____ Power to call you?

Need someone to call me..... 1
Being handled..... 2
DK/RF..... 3

(If the answer is 2, skip to Q11)

9. Please give me the name of the per on to be contacted, their phone number, and the time of day they can be reached.

_____

_____

10 (Reason Customer Needs to be Called)

_____

_____

_____

_____

_____

11. Overall, how satisfied are you with_____? Are you.....

Very satisfied..... 1
Satisfied..... 2
Dissatisfied..... 3
Very dissatisfied..... 4
DK/Rf..... 5

12. How can_____ improve its service to you?

_____

_____

_____

_____

13. (Comments - DO NOT ASK)

_____

_____

_____

_____

_____

_____

_____

14. What type of business is your company in?

Type of business:_____

15. What is your job title?

Manager 1
Owner 2
Plant Engineer 3
Maintenance Engineer 4
Facilities Engineer 5
Energy Manager 6
Other _____

16. May we pass along your comments to_____?

☐ Yes
☐ No

May I have your name and phone number?

Name_____

Phone No._____

THANK YOU!!

Redesigned Active Questionnaire for 1995
(10/19/94)

Hello, my name is ___ and I'm calling for ____ Power Company. We are conducting a brief follow-up survey of people who have recently visited or called ___ Power to determine their level of satisfaction with the contact. Are you the person who contacted ___ Power on _____ (day of week and date)?

Yes.....Continue
No.....May I speak to that person?
Person not available.....Schedule callback

Q1. Overall, how satisfied are you with the way ____ Power Company handled your most recent contact? Please rate ____ Power on a scale of "1" to "10", where "1" means "Very Dissatisfied" and "10" means "Very Satisfied."

Very Dissatisfied									Very Satisfied	DK/ RF
1	2	3	4	5	6	7	8	9	10	11

Q2. Thinking about your most recent contact with ____ Power, was that by ....

Phone 1
Office Visit 2
Other 3

If Q2 = 2, skip to Q5
If Q2 = 3, skip to Q7

Q3. When you CALLED, were you able to speak with someone immediately, were you put on hold, or did you get a recording?

Spoke w/ someone immediately	1	Skip to Q7
Put on hold	2	Continue
Got a recording	3	Skip to Q7
Dk/Rf	4	Skip to Q7

Q4. ***Were you ON HOLD longer than you thought was reasonable?***

Yes 1
No 2
Dk/Rf 3
[Skip to Q7]

Q5. ***When you VISITED ____ Power, were you able to speak with someone immediately or did you have to wait?***

Spoke w/ someone immediately	1 Skip to Q7
Had to wait	2 Continue
Dk/Rf	3 Skip to Q7

Q6. ***Did you have to WAIT LONGER than you thought was reasonable?***

Yes	1
No	2
Dk/Rf	3

Generic Contact Questions for all Active Customers

Thinking only about your contact with ____ Power on _____(date), please rate how good a job ___ Power did on each of the following items. You may use any number from 1 to 10, where "1" means Poor and "10" means "Excellent."

(Rotate)

Q7. Responds quickly at any time to problems or service requests

Q8. Dependable, do what they say they will do

Q9. Cares about helping customers

Q10. Can always talk to a person who can help you

Q11. Phone system menu covers what you need (ask if Q3 = 3)

Q12. Trustworthy employees

Q13. Knowledgeable employees

Q14. Courteous and pleasant employees

Q15. Interested in you, treats you like more than just an account number

Q16. ***What was the PRIMARY reason you contacted ____ Power?***

PAY BILL*	1	Q69
BILLING INQUIRY OR PAYMENT ARRANGEMENT	2	Q17
SERVICE PROBLEM (outages, fix outdoor lights, etc.)	3	Q31
SERVICE REQUEST (turn on/off electricity for move, change name on account, etc..)	4	Q37
INFORMATION REQUEST (energy audit, energy efficiency, etc.)	5	Q69
COMPLAINT OTHER THAN BILLING (damage to property, etc.)	6	Q69
APPLIANCE SALES OR SERVICE	7	Q69
SALES OF OTHER ITEMS (i.e. heat pumps, etc.)	8	Q69
ENERGY AUDIT	9	Q44
OTHER _____ (Please specify)	10	Q69

*** Issue - what to do with these guys**

Q17. ***What was the specific reason for your BILLING INQUIRY?***

High Bill	1
Payment Extension	2
Budget/Levelized Pgm	3
Other	4

General Billing Questions

Please rate how good a job ___ Power does on each of the following items. You may use any number from 1 to 10, where "1" means Poor and "10" means "Excellent."

Q18. Fair, reasonable rates

Q19. Bills clearly spell out usage, rate, and how the bill was calculated

Q20. Accurate bills, you know that you're never over charged for the electricity you used

Q21. Alerts you and helps you diagnose unusual increases or decreases in your bill

Q22. Tells you whether your bill is based on estimated or actual usage

(If Q17 = 3,4, Skip to Q50)

(Ask only for HIGH BILL INQUIRIES Q17 = 1))

Q23. Offers different payment options to fit your household budget

Q24. Works with you if you're having a problem paying your bill

Q25. They are always able to resolve any billing conflicts that you have

Q26. Let's you know when and why rates are going to increase (Skip to Q50)

(Ask only for BILL PAYMENT EXTENSIONS Q17 = 2)

Q27. Works with you if you're having a problem paying your bill

Q28. Let's you know exactly what the grace period is for paying your bill

Q29. Billing cycle that fits your bill paying schedule

Q30. Offers different payment options to fit your household budget (Skip to Q50)

Q31. ***What type of SERVICE PROBLEM did you experience?***

Power Outage	1
Outdoor light problem	2
Other	3

Thinking of your recent SERVICE PROBLEM, please rate how good a job ___ Power did on each of the following items. You may use any number from 1 to 10, where "1" means Poor and "10" means "Excellent."

Q32. Solves problems without any hassles

Q33. Well prepared to handle emergencies

Q34. Service rep explains exactly what is happening and what they are planning to do

(If Q31 = 2.3, Skip to Q50)

(Power outages only - Q31 = 1))

Q35. Gives you plenty of warning when there is going to be a PLANNED outage

Q36. Can give you an explanation of why the power went off (Skip to Q50)

Q37. Was your REQUEST FOR SERVICE to .....

Establish service as a new customer	1
Transfer existing service	2
Have outdoor light installed	3
Other	4

Thinking of your recent REQUEST FOR SERVICE, please rate how good a job ___ Power did on each of the following items. You may use any number from "1" to "10", where "1" means Poor and "10" means "Excellent."

Q38. Keeps you informed of when they expect the work to be done

Q39. Will do repairs or installations at the best time for you

Q40. Does repairs or installations by the date promised (If Q37 = 3,4, Skip to Q50)

(Ask for NEW OR TRANSFER SERVICE - Q37 = 1,2)

Q41. Turns the power on when they're supposed to

Q42. Just takes one phone call to get electric service turned on

Q43. Don't need to provide a large long-term deposit to get service turned on

(Skip to Q50)

Energy Audit Questions

Q44. Has your energy audit already been done?

Yes 1 Continue
No 2 Skip to Q69
Dk/Rf 3

Q45. Was your energy audit done by the date promised?

Yes 1
No 2 Continue
No date promised 3
Dk/Rf 4

Thinking about your recent ENERGY AUDIT request, please rate how good a job ___ Power did on each of the following items. You may use any number from 1 to 10, where "1" means Poor and "10" means "Excellent."

Q46. Presents the full picture, pluses and minuses, when making energy efficiency recommendations.

Q47. Shows you how to lower your electric bill

Q48. Conducting a thorough and complete audit

Q49. Making practical energy recommendations for your home (Skip to Q51 lead-in)

Home Contact Questions

Q50. As a result of your recent contact with ____ Power Company, did you meet with a ____ representative at your home?

Yes 1 Continue
No 2 Skip to Q56
DK/RF 3

Please rate how good a job the ___ Power Company representative did on each of the following items. You may use any number from 1 to 10, where "1" means Poor and "10" means "Excellent."

Q51. Being Trustworthy

Q52. Being Knowledgeable

Q53. Being Courteous and Pleasant

Q54. Interested in you, treats you like more than just an account number

Q55. Having a neat appearance (If Q16 = 9, Skip to Q69, else, Continue)

(Ask only for Service Problems or Service Requests)

Work Crew Contact Questions

Q56. As a result of your recent contact with ____ Power Company, did you see a work crew in your area or was a work crew on your property?

Saw crew in the area	1	Continue
Crew on my property	2	
Neither	3	Skip to Q69
DK/RF	4	

Q57. Did anyone from the work crew contact you to tell you what they would be doing?

Yes	1	Continue
No	2	Skip to Q63
DK/RF	3	

Please rate how good a job the person from the work crew did on each of the following items. You may use any number from 1 to 10, where "1" means Poor and "10" means "Excellent."

Q58. Being Trustworthy

Q59. Being Knowledgeable

Q60. Being Courteous and Pleasant

Q61. Interested in you, treats you like more than just an account number

Q62. Keeps you informed of when they expect the work to be done

Now, please rate the work crew on the following items. You may use any number from "1" to "10", where "1" means Poor and "10" means "Excellent."

Q63. Work crews take the time to do it right: it never seems like they're in a hurry

Q64. Work crews don't make a mess, clean up after themselves

Q65. Has everything been taken care of to your satisfaction?

Yes	1	Skip to Q69
No	2	Continue
DK/RF	3	

Q66. Is someone working with you to solve your request or problem, or do you need someone from _____ Power to call you?

Need someone to call me.....1
Being handled.....2
DK/RF.....3

(If the answer is 2, skip to Q69)

Q67. Please give me the name of the person to be contacted, their phone number, and the time of day they can be reached.

Q68. (Reason Customer Needs to be Called - Comments)

Q69. How could Georgia Power have handled your recent contact better?

Q70. Record Sex (Do Not Ask)

MALE.....1
FEMALE.....2
DK.....3

THANK YOU!

1996 KEY ACCOUNT QUESTIONNAIRE

About The Survey:

Gulf Power is committed to providing your company with superior electric service. We need your help in telling us how well we are meeting that commitment.

Your responses to the following survey will help determine how well Gulf Power is currently meeting your electric needs as well as identify ways to improve service. To ensure confidentiality, Gulf Power has arranged for TQS Research, Inc. to administer the survey. Please complete all appropriate sections. Answer only those questions that apply to you and your experience with Gulf Power. Most questions offer a list of appropriate answers. Read all the choices and circle the number or check the appropriate box next to your answer. Please choose only one answer per question. After completing the survey, please return it to TQS Research, Inc. in the postage-paid envelope which has been provided for your convenience. However, if you prefer, you may respond to this survey by phone at 1-800-643-1990 or by fax at 1-800-781-7112.

Thank you for your participation in this survey. Gulf Power values you as a customer and appreciates your comments.

---

1. **Overall, how satisfied are you with Gulf Power?**

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	11

2. **Below is a list of statements that describe several aspects of performance that customers expect from their power company. For each statement, please indicate how satisfied you are with Gulf Power's performance.**

	Very Dissatisfied									Very Satisfied	Don't Know
Provides clean, consistent power with few spikes, dips or fluctuations	1	2	3	4	5	6	7	8	9	10	11
Approaches situations creatively with our best interests in mind	1	2	3	4	5	6	7	8	9	10	11
Offers fair, reasonable rates	1	2	3	4	5	6	7	8	9	10	11
Takes responsibility when there's a problem, and works with us to solve it	1	2	3	4	5	6	7	8	9	10	11
Works with us to save money on electrical costs	1	2	3	4	5	6	7	8	9	10	11
Provides bill statements that clearly spell out energy usage, rate, and how bills are calculated	1	2	3	4	5	6	7	8	9	10	11
Finds the best available rate for us	1	2	3	4	5	6	7	8	9	10	11
Will do repairs at the best time for us, even if it involves overtime	1	2	3	4	5	6	7	8	9	10	11
Responds quickly to outages	1	2	3	4	5	6	7	8	9	10	11
Provides technical assistance to help solve power quality problems	1	2	3	4	5	6	7	8	9	10	11
Follows up on questions or problems I may have	1	2	3	4	5	6	7	8	9	10	11
Alerts us to energy issues that may affect our business	1	2	3	4	5	6	7	8	9	10	11
Offers different rate options to best fit our needs	1	2	3	4	5	6	7	8	9	10	11
Provides information on how we can use energy more efficiently	1	2	3	4	5	6	7	8	9	10	11
Plans ahead, helps us avoid potential problems	1	2	3	4	5	6	7	8	9	10	11
Is a partner to help us get our job done, is part of the team	1	2	3	4	5	6	7	8	9	10	11
Informs us of new technologies that help keep us competitive	1	2	3	4	5	6	7	8	9	10	11
Problems and requests are responded to, don't fall through the cracks	1	2	3	4	5	6	7	8	9	10	11

3. Do you have an Primary Contact from Gulf Power who calls or visits you?
Yes ☐ No ☐ Not Sure ☐

If yes, what is your Primary Contact's name? _____

(If you answered "No" or "Not Sure" to Question 3, please skip to Question 6)

4. How would you rate your Primary Contact's performance on the following items?

	Very Dissatisfied									Very Satisfied	Don't Know
Is knowledgeable	1	2	3	4	5	6	7	8	9	10	11
Stays in touch with me on a regular basis	1	2	3	4	5	6	7	8	9	10	11
Is interested in us, treats us like a valued business customer	1	2	3	4	5	6	7	8	9	10	11
Is trustworthy	1	2	3	4	5	6	7	8	9	10	11
Knows and understands my business	1	2	3	4	5	6	7	8	9	10	11
Is the one person to call for any situation, someone I know and who knows me	1	2	3	4	5	6	7	8	9	10	11
Is easy to get in touch with	1	2	3	4	5	6	7	8	9	10	11

5. Overall, how satisfied are you with the performance of your Primary Contact?

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	11

6. In the future, organizations such as yours may be able to choose their power company in a competitive marketplace. Below are several statements about electricity suppliers. Please indicate how strongly you agree or disagree with each statement.

	Strongly Disagree									Strongly Agree	Don't Know
In a competitive marketplace, I would recommend Gulf Power to other companies	1	2	3	4	5	6	7	8	9	10	11
The products and services that Gulf Power provides are worth what we pay for them	1	2	3	4	5	6	7	8	9	10	11

7. How likely would you be to switch from Gulf Power to another electric utility:

	Very Unlikely									Very Likely	Don't Know
If your electric bill did not change	1	2	3	4	5	6	7	8	9	10	11
For a 2% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11
For a 5% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11
For a 10% reduction in your electric bill	1	2	3	4	5	6	7	8	9	10	11

8. Overall, how satisfied are you with the full package of services Gulf Power provides to your company?

Very Dissatisfied ☐ Dissatisfied ☐ Satisfied ☐ Very Satisfied ☐ Don't Know ☐

9. Thank you very much for completing this survey. You have provided feedback which can help Gulf Power better meet your electric needs. May we have your permission to pass along your individual responses to your Primary Contact at Gulf Power?

Yes ☐ No ☐

10. Are there any additional comments or suggestions you would like to make regarding Gulf Power, its service, employees, or products?

_____

_____

_____

_____

TQS Research, Inc
2660 Holcomb Bridge Road, Suite 208
Alpharetta, GA 30202
1-800-643-1998 (phone)
1-770-751-7112 (fax)

27. Provide the annual results of any customer satisfaction surveys performed from 1992 - 1997 year to date.

Answer:

Listed below are the annual results of the customer satisfaction surveys performed from 1992 - 1997 year to date.

	1992	1993	1994	1995	1996	1997
Residential	54.10	76.10	71.98	75.92	73.50	None
Commercial	51.95	48.56	56.44	57.45	N/A	None
Industrial	51.91	47.71	62.22	52.68	N/A	None
Business	N/A	N/A	N/A	N/A	52.65	None
Active	69.71	70.45	65.05	67.19	61.58	None
Key Accts.	N/A	72.22	65.67	82.90	78.69	None
Comm. Key	N/A	77.27	N/A	N/A	N/A	None
Composite	56.9	66.70	63.50	71.60	68.09	None

28. Provide a copy of policies, instructions, or procedures used by those administering the customer satisfaction surveys requested above.

Answer:

Customer satisfaction survey processes are continually being refined. On-going changes are made to ensure that timely, meaningful and actionable information is being captured. This type of continuous process improvement does not lend itself to a written set of policies and procedures. The following flow chart, however, provides a summary of the current process.

Identify the customer classes to include.
(Residential/Commercial/Industrial/Transactions)

Determine the level at which data collection should take place.
(Company level was deemed appropriate.)

Develop a set of performance based questions for each customer class.
(Questionnaires based on Voice-Of-The-Customer research.)

Determine the level of accuracy and confidence desired.
(95% Confidence with +/- 5% Accuracy.)

Establish desired frequency for data collection and reporting.
(Monthly.)

Define sample from which to pull monthly samples.
(Res/Com/Ind come from Customer Accounting Files.)
(Transaction customers come from CUIQ coded customer files.)

Set criteria for eliminating customer annoyance from over sampling.
(Recirculating files were created to prevent selecting customers who had been selected within the past 12 months. Industrial samples were reviewed by Gulf Power personnel to ensure Key Account customers were not interviewed during the course of the year. Key Account customers were interviewed once during the Autumn of the year.)

Ensure quality data collection.
(Periodically, randomly monitor customer interviews conducted by vendor.)

Define the most timely and cost effective method of data collection.
(Telephone interviewing.)

Allow all customers equal opportunity to be included in any monthly sample.
(Random sampling used for Residential Class. Stratified sampling used for Com/Ind to ensure balanced selection of customers <50kW and those over 50kW)
Allow all customers in the sample equal opportunity to be included.
(Missing phone #s were looked up by the vendor.)

Ensure accuracy of reporting.
(Duplicate data bases were maintained; one by the vendor the other by SCSKey' performance numbers were doubled checked from both data bases to guarantee consistent, accurate reporting.)

CONFIDENTIAL

ESO-2 Item Number 1
1997 Power Delivery Downsizing Study

This document consists of pages 1 - 181. Each page in its entirety is confidential, including all tables, graphs and accompanying text.

Pages 1-181 are Confidential

Florida Public Service Commission
Audit Document/Record Request
Request # ESQ-2 9/12/97

Question #1:

Provide a copy of GPC's most current 1997 Power Delivery Downsizing study.

Answer:

See Power Delivery Work Processes - Exempt Staffing Study 1996

Pages 1-18! are Confidential

POWER DELIVERY WORK PROCESSES - EXEMPT STAFFING STUDY 1996

Louis Rouillier

Gulf Power

/

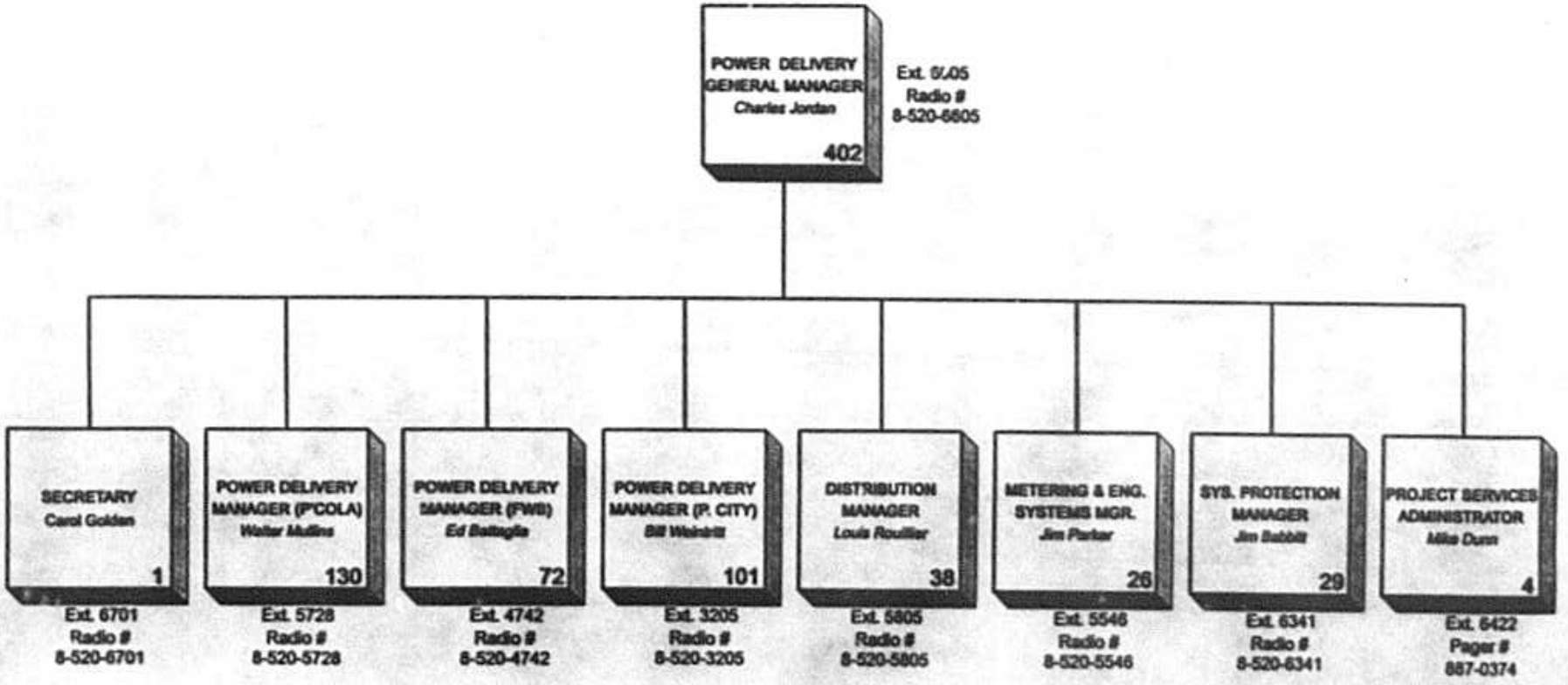
POWER DELIVERY ORGANIZATION

NOVEMBER 14, 1996

Gulf Power

If you have any questions regarding these organizational charts, please call Carol Golden at ext. 6701.

POWER DELIVERY

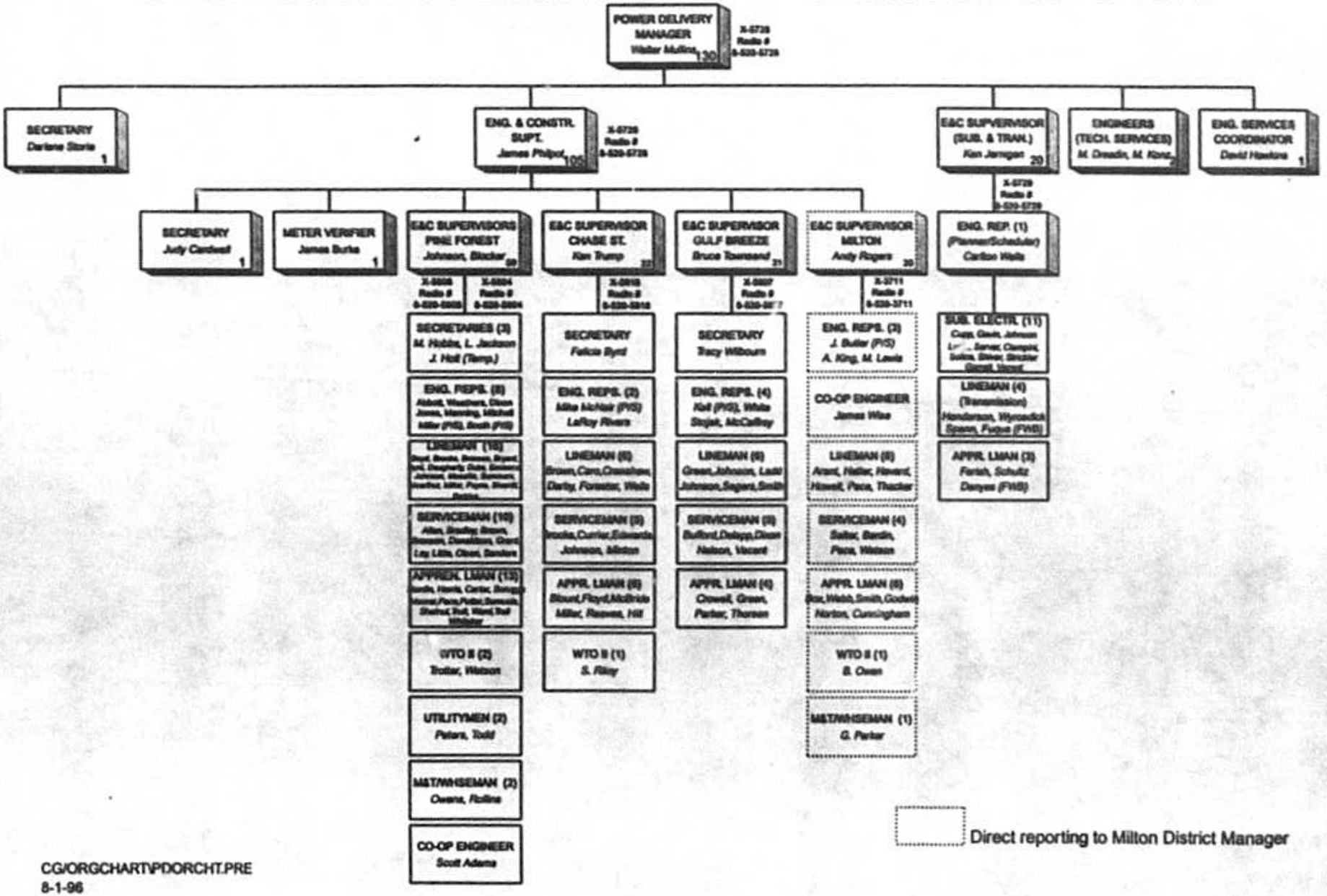


CG/ORGCHART/PDORCHT.PRE
8-1-96

Note: Charts include 2 temporary and 6 Co-op Engineer positions

4

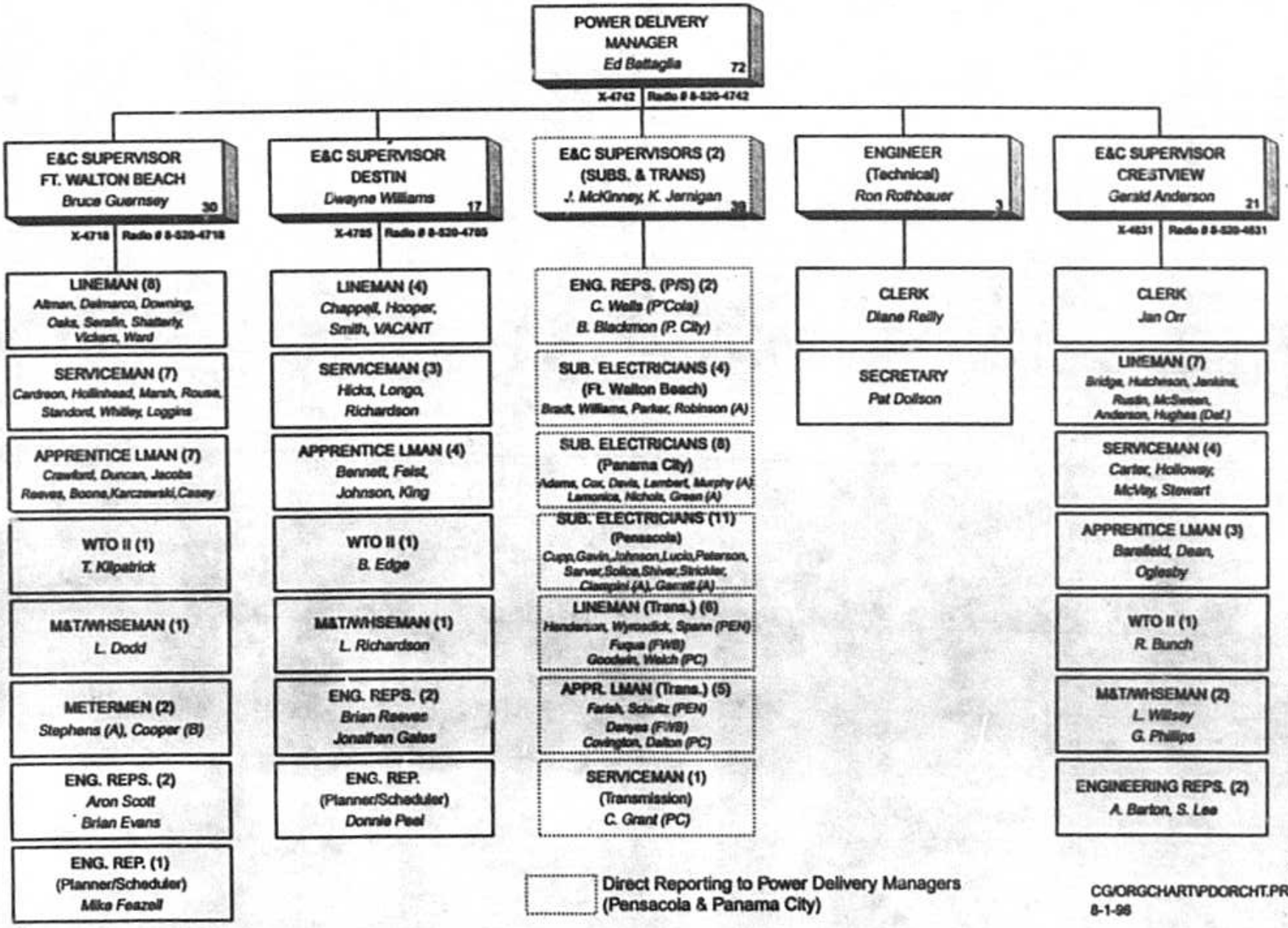
POWER DELIVERY - PENSACOLA



CG/ORGCHART/PDORCHT.PRE
8-1-96

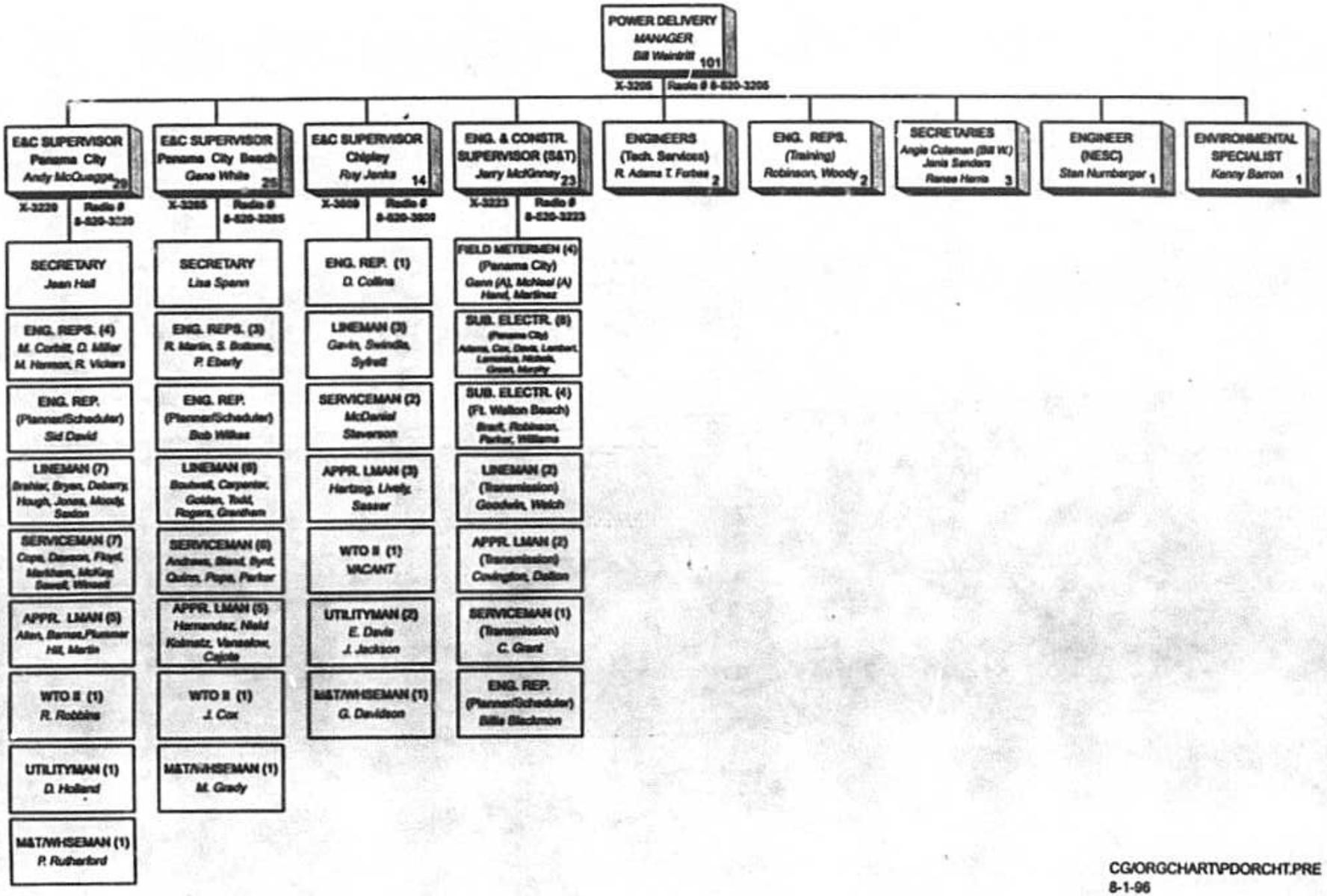
5

POWER DELIVERY - FT. WALTON



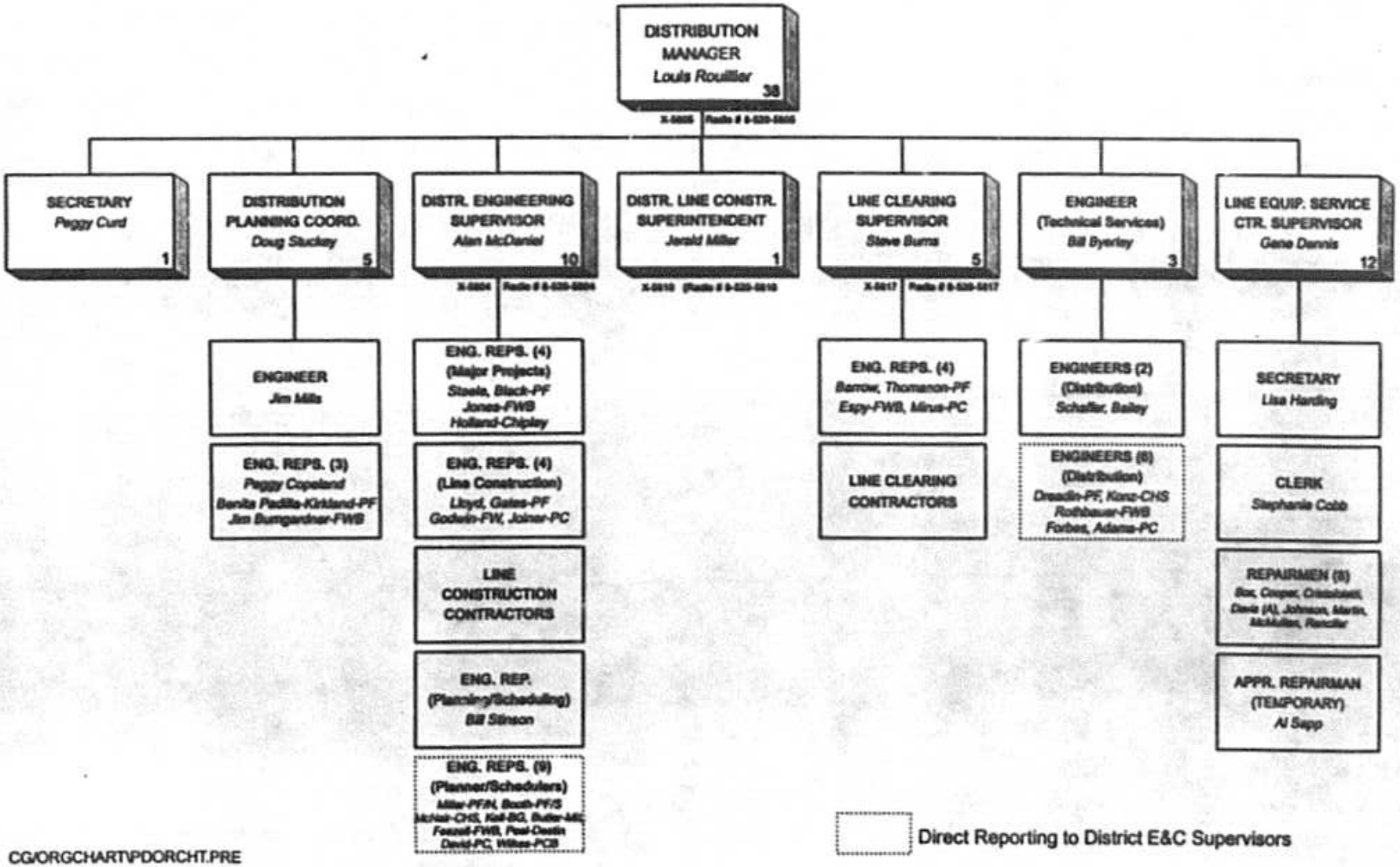
CG/ORGCHART/PDORCHT.PRE
8-1-96

POWER DELIVERY - PANAMA CITY



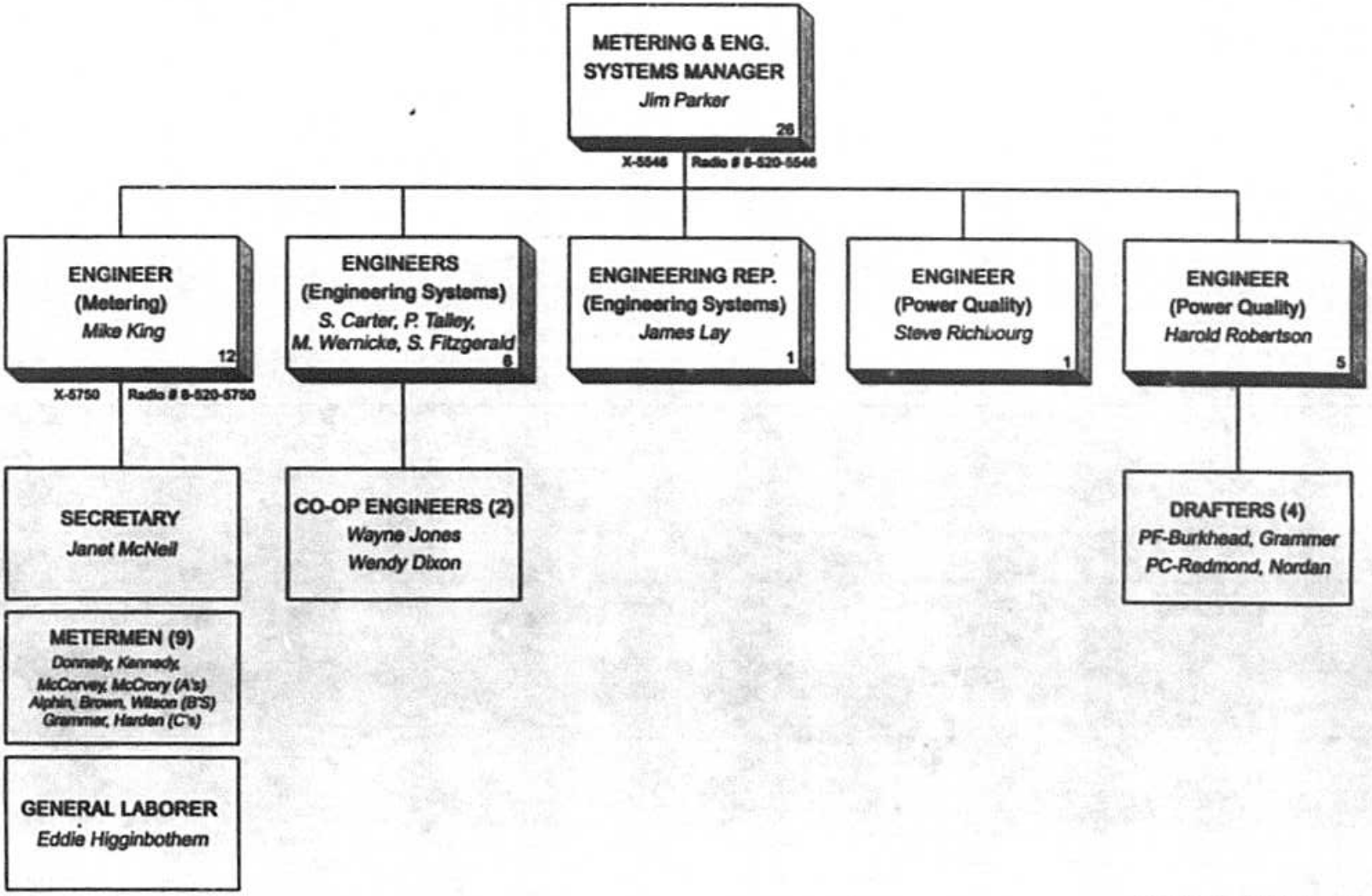
CG/ORGCHART/PDORCHT.PRE
8-1-96

DISTRIBUTION



CG/ORGCHART/PDORCHT.PRE
8-1-96

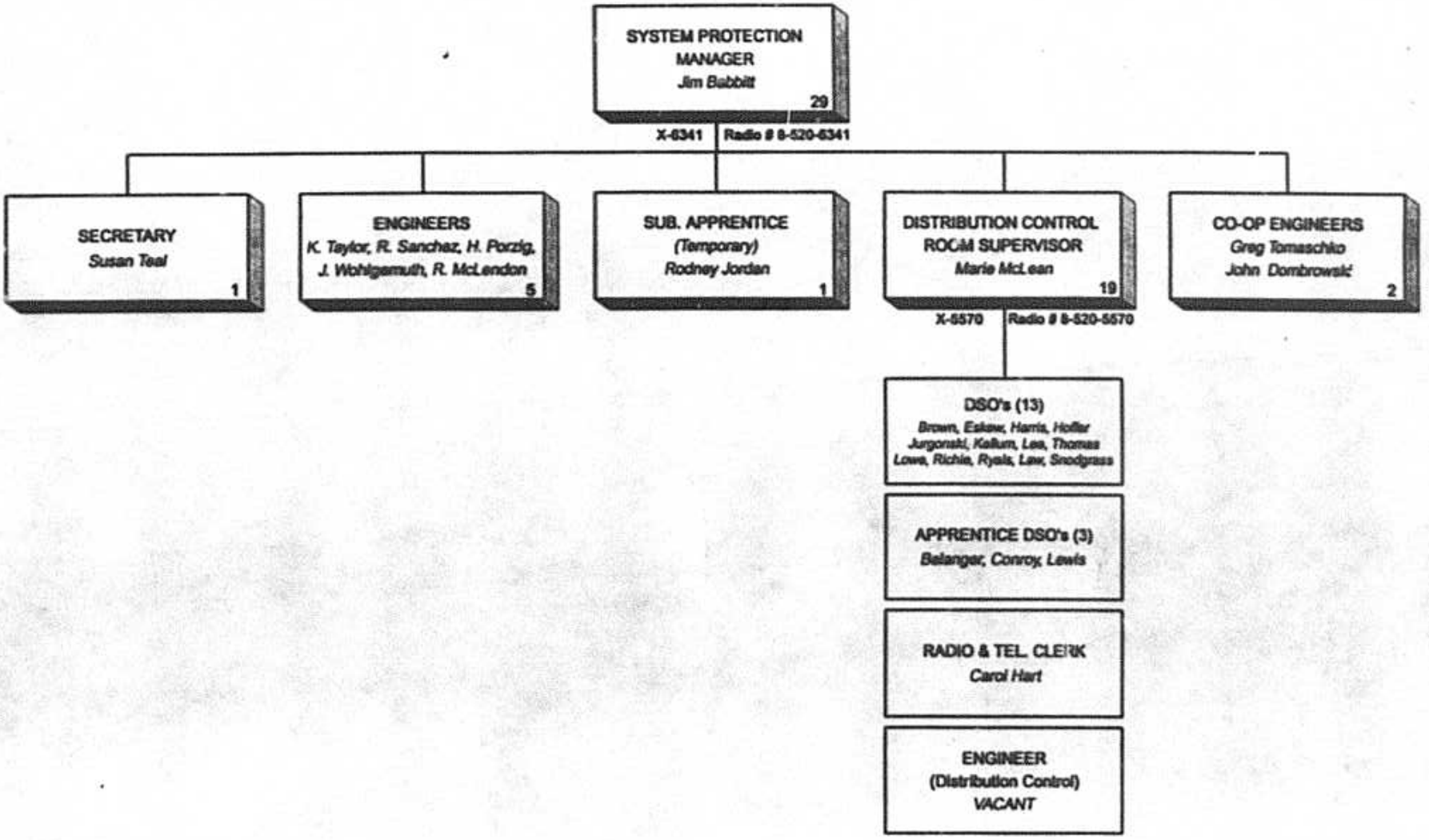
METERING AND ENGINEERING SYSTEMS



CG/ORGCHART/PDORCHT.PRE
8-1-96

6

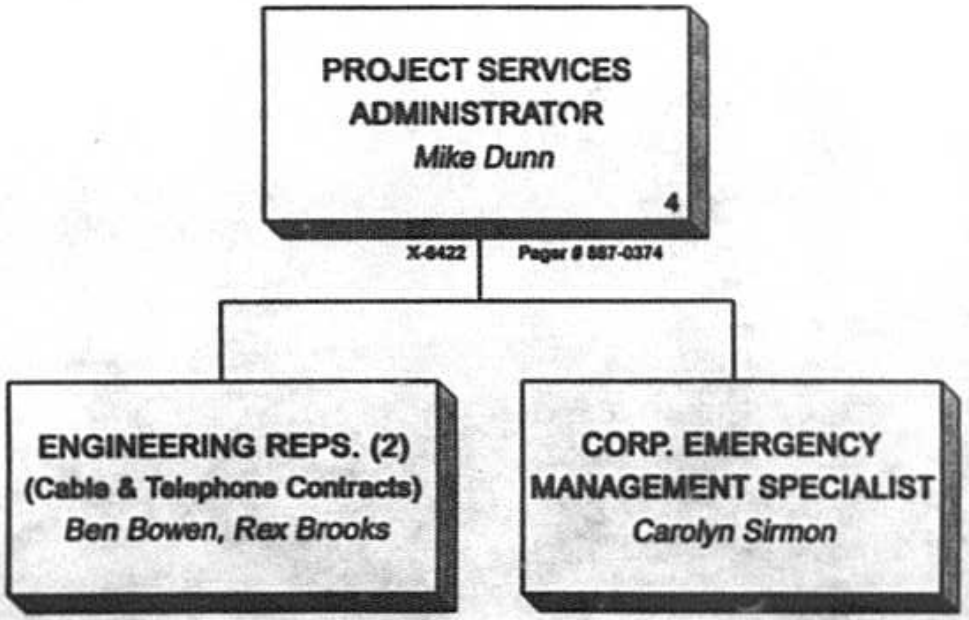
SYSTEM PROTECTION



CG/ORGCHART/PDORCHT.PRE
8-1-96

61

PROJECT SERVICES



CG\ORGCHART\PDORCHT.PRE
8-1-96

POWER DELIVERY
EXEMPT & NON-EXEMPT COMPLEMENT POSITIONS

	EMPLOYEE NAME	CURRENT POSITION	POS LEVEL
	PENSACOLA / MILTON		
1	ABBOTT, B.	ER - PF 1	4
2	BLOCKER, W.	E&C SUPV - PF 1	7
3	BOOTH, K.	ER (P&S) - PF 2	5
4	BUTLER, J.	ER (P&S) - MIL	3
5	DIXON, E.	ER - PF	2
6	DREADEN, M.	ENG (TS) - PF	5
7	HAWKINS, D.	E SVCS COOR - PF	5
8	JOHNSON, P.	E&C SUPV - PF 2	7
9	JONES, D.	ER - PF	3
10	KELL, R.	ER (P&S) - GB	3
11	KING, D.	ENG (ER) - MIL	4
12	KONZ, M.	ENG (TS) - CS	6
13	LEWIS, M.	ER - MIL	4
14	MANNING, W.	ER - PF 2	3
15	MCCAFFRY, C.	ER - GB	4
16	McNAIR, M.	ER (P&S) - CS	3
17	MILLER, S.	ER - PF 2	4
18	MITCHELL, J.	ER - PF 2	5
19	MULLINS, W.	PDM - PF	8
20	PHILPOT, J.	E&C SUPT - PF	7
21	RIVERS, L.	ER - CS	5
22	ROGERS, A.	E&C SUPV - MIL	6
23	STOJAK, M.	ENG (ER) - CS	4
24	TOWNSEND, B.	E&C SUPV - GB	6
25	TRUMP, K.	E&C SUPV - CS	7
26	WEATHERS, D.	ER - PF	4
27	WHITE, P.	ER - GB	3
28	BURK, J.	M. VESSIER - PF	14 est
29	BYRD, E.	SSC - CS	8
30	CARDWELL, J.	SSC - PF	10
31	ROBBS, M.	SSC - PF	8
32	JACKSON, L.	SSC - PF	8
33	STORIE, D.	LSC - PF	10
34	WILBOURN, T.	SSC - GB	6
	FT. WALTON / CRESTVIEW		
1	ANDERSON, G.	E&C SUPV -CV	8
2	BARTON, A.	ER - CV	4
3	BATTAGLIA, E.	PDM - FW	8
4	EVANS, B.	ER - FW	2
5	FARZELL, M.	ER (P&S) - FW	4
6	GATES, J.	ER - DES	3
7	GUERNSEY, B.	E&C SUPV - FW	6
8	LEE, S.	ER - CV	3
9	PEEL, D.	ER (P&S) - DES	3
10	REEVES, W.	ER - DES	3
11	ROTHBAUER, R.	ENG (TS) - FW	6
12	SCOTT, A.	ER - FW	3
13	WILLIAMS, D.	E&C SUPV - DES	6
14	DOUGHTY, P.	SSC - FW	12
15	REILLY, D.	CLERK - FW	2
	PANAMA CITY / CHIPLEY		
1	ADAMS, R.	ENG (TS) - PC	6
2	BOTTOMS, S.	ER - PCB	5
3	COLLINS, D.	ER - CHY	5
4	CORBITT, M.	ER - PC	4
5	DAVID, S.	ER (P&S) - PC	3
6	EBERLY, P.	ER - PCB	4
7	FORBES, T.	ENG (TS) - PC	5
8	HARMON, M.	ER - PC	4
9	JENKS, W.	E&C SUPV - CHY	6
10	MARTIN, R.	ER - PCB	4
11	MCQUAGGE, A.	E&C SUPV - PC	7
12	MILLER, D.	ER - PC	2
13	VICKERS, R.	ER - (C. SPOT.) - PC	2
14	WEINTRITT, B.	PDM - PC	8
15	WHITE, G.	E&C SUPV - PC	6
16	WILKES, R.	ER (P&S) - PCB	3
17	COLEMAN, A.	SSC - PC	8
18	HALL, J.	SSC - PC	8
19	HARRIS, S.	SSC - PC	10
20	SANDERS, J.	SSC - PC	8
21	SPANN, L.	SSC - PCB	6

	EMPLOYEE NAME	CURRENT POSITION	POS LEVEL
	DISTRIBUTION		
1	BAILEY, B.	ENG (DIST) - CO	6
2	BARROW, W.	ER (LC) - PF	4
3	BLACK, C.	ER (MP) - PF	4
4	BUMGARDNER, J.	ER (DP) - FW	4
5	BURNS, S.	LC SUPV - CO	6
6	BYERLEY, B.	ENG (TS) - CO	6
7	COPELAND, P.	ER (DP) - CO	4
8	DENNIS, G.	LESC SUPV - CS	5
9	ESPY, J.	ER (LC) - FW	4
10	GATES, B.	ER (DLC) - PF	3
11	GODWIN, T.	ER (DLC) - FW	3
12	HOLLAND, G.	ER (MP) - PC	4
13	JOINER, J.	ER (DLC) - PC	3
14	JONES, R.	ER (MP) - FW	4
15	LLOYD, K.	ER (DLC) - PF	3
16	MCDANIEL, A.	E. SUPV - CO	7
17	MILLER, J.	DLC SUPT - CO	7
18	MILLS, J.	ENG (DP) - CO	6
19	MIRUS, E.	ER (LC) - PC	3
20	PADILLA-KIRKLAND, B.	ER (DP) - CO	4
21	ROUILLIER, L.	D. MGR. - CO	8
22	SCHAFFER, P.	ENG (DIST) - CO	6
23	STEELE, A.	ER (MP) - PF	3
24	STINSON, B.	ER (P&S) - CO	5
25	STUCKEY, D.	DP COOR. - CO	6
26	THOMASON, E.	ER (LC) - PF	4
27	COBB, [illegible]	CLERK - LESC	2
28	CURD, P.	SSC - PF	10
29	HARDING, [illegible]	SSC - LESC	8
	ENGINEERING SYSTEMS		
1	CARTER, S.	ENG (ENG SYS) - PB	6
2	FITZGERALD, S.	ENG (ENG SYS) - PB	3
3	LAY, J.	ER (ENG SYS) - PB	3
4	PARKER, J.	M & ES MGR. - PB	8
5	RICHBOURG, S.	ENG (PQ) - PB	6
6	ROBERTSON, H.	ENG (PQ) - FW	6
7	SCHULTE, L.	ENG (MS) - PF	5
8	TALLEY, P.	ENG (ENG SYS) - PB	5
9	WERNICKE, M.	ENG (ENG SYS) - PB	6
10	BURCHFIELD, G.	DRAFTER - PF	14
11	GRAHAM, T.	DRAFTER - PF	8
12	HIGGINBOTHAM, B.	G. LABORER - PF	0
13	HOPE, J.	SSC - PF	8
14	MORGAN, M.	DRAFTER - PC	12
15	REDMOND, K.	DRAFTER - PC	14
	SYSTEM PROTECTION		
1	BABBITT, J.	SYS PROT SUPV -CO	7
2	KING, M.	ENG (D. CONT.) - PB	4
3	MCLEAN, M.	DIST S. CONT. SUPV -PB	6
4	MCLENDON, R.	ENG (SP) - CO	6
5	PORZIO, H.	ENG (SP) - PC	6
6	SANCHE[illegible], R.	ENG (SP) - CO	3
7	TAYLOR, K.	ENG (SP) - CO	3
8	WOHLGEMUTH, J.	ENG (SP) - CO	6
9	TRAIL, S.	SSC -CO	8
	PROJECT SERVICES		
1	BOWEN, B.	ER (CATV) - CO	4
2	BROOKS, R.	ER (CATV) - CO	5
3	DUNN, M.	PS ADM. - CO	7
4	SIRMON, C.	SPEC (CEMC) - CO	2
	SUBSTATION / TRANSMISSION		
1	BLACKMON, B.	ER (P&S - S&T) - FW	3
2	JERNIGAN, K.	E&C SUPV (S&T) - PF	6
3	MCKINNEY, J.	E&C SUPV (S&T) - PC	6
4	WELLS, C.	ER (P&S - S&T) - PF	3
	TRAINING & COMPLIANCE		
1	BARRON, K.	ENV SPECIALIST - PC	5
2	ROBINSON, E.	ER (TRAIN) - PC	3
3	WOODY, L.	ER (TRAIN) - PF	3
4	NURNBERGER, S.	ENG (NESC) - CO	6
	POWER DELIVERY ADMINISTRATION		
1	GOLDEN, C.	SSC - CO	10

ENG REP III	ENG REP II	ENGR REP I	SR ENG REP	ENG III	ENG II	ENG I	SR ENG
			DISTRICTS				
DAVID JONES EDDIE DIXON BRAIN EVANS DENISE MILLER ROY VICKERS	JIMMIE BUTLER RONNIE KELL WAYNE MANNING MIKE McNAIR CARLTON WELLS PAUL WHITE SCOTT LEE DONNIE PEEL MARK REEVES ARON SCOTT SID DAVID MARY HARMON LARRY WOODY	BEN ABBOTT MIKE LEWIS CHERYL McCAFFRY STEVE MILLER DAVID WEATHERS ALLEN BARTON MIKE FEAZELL MAC CORBITT PETE EBERLY ROBERT MARTIN	KEN BOOTH JOHN MITCHELL LEROY RIVERS BILLIE BLACKMON STEVE BOTTOMS DONNELL COLLINS ERNEST ROBINSON ROBERT WILKES		DAVID KING MARK KONZ MIKE STOJAK	MARK DREADIN TOMMY FORBES	RON ROTHBAUR RONNIE ADAMS
			CORPORATE				
CAROLYN SIRMON	BUDDY GATES TOMMY GODWIN KENNY LLOYD EARL MIRUS BENITA PADILLA JAMES LAY JERRY JOINER	WAYNE BARROW CHRIS BLACK JIM BUMGARDNER PEGGY COPELAND JAMES ESPY GEORGE HOLLAND ROGER JONES BEN BOWEN EDDIE THOMASON	BILL STINSON REX BROOKS ALAN STEELE	SYBELLE FITZGERALD	MIKE KING	LYNN SCHULTE PAUL TALLEY RICK SANCHEZ KENNY TAYLOR	BOB BAILEY BILL BYERLEY JIM MILLS STAN NURNBERGER PAUL SCHAFFER STEVE CARTER STEVE RICHBOURG HAROLD ROBERTSON MIKE WERNICKE ROBERT McLENDON HERMAN PORZIG JIMMY WOHLGEMUTH

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: Power Quality Engineer

POSITION FUNCTION:

A Evaluate customer's electrical system to determine power quality needs

B Install power quality monitors on customer's premises

C Evaluate power quality data from recording equipment

D Make recommendations to customers on solutions to power quality problems

E Provide technical power quality support to engineering, marketing, and line/service personnel

F Provide seminars on power quality support to customers, architects, and engineers

G Evaluate, improve and maintain company power quality programs

H Establish company standards and procedures related to power quality issues

I Evaluate new power quality monitoring equipment

J Train engineering personnel on the operation of power quality recording equipment

WORK VOLUME:

The total work volume for this position is 89 hrs./week. The majority of the work volume for this position (66 hr.) is in the installation of power quality monitors on customer premises, the evaluation of the data retrieved from these recorders, and providing Power Quality recommendations to the customer. There is also some additional work not reported as being done by PQ engineers amounting to 9.5 FTE's. This work is assumed to be done by Engineering Reps throughout the Company.

RECOMMENDATION:

Staff this position with two engineers at a Senior level.
Provide 9.5 FTE positions as follows:

- **4 Pensacola area**
- **2 Ft. Walton area**
- **1 Crestview Defuniak area**
- **2 Panama City and Panama City Beach area**
- **0.5 Chipley area**

cg/PWRQUENG.DOC

POWER DELIVERY

EXEMPT & NON-EXEMPT COMPLEMENT POSITIONS

	EMPLOYEE NAME	CURRENT POSITION	POS LEVEL
	PENSACOLA / MILTON		
1	ABBOTT, B	ER - PF 1	4
2	BLOCKER, W	E&C SUPV - PF 1	7
3	BOOTH, K	ER (P&S) - PF 2	5
4	BUTLER, J	ER (P&S) - MIL	3
5	DIXON, E	ER - PF	2
6	DREADIN, M	ENG (TS) - PF	5
7	HAWKINS, D	E SVCS COOR - PF	5
8	JOHNSON, P	E&C SUPV - PF 2	7
9	JONES, D	ER - PF	3
10	KELL, R	ER (P&S) - GB	3
11	KING, D	ENG (ER) - MIL	4
12	KONZ, M	ENG (TS) - CS	4
13	LEWIS, M	ER - MIL	4
14	MANNING, W	ER - PF 2	3
15	MCCAFFRY, C.	ER - GB	4
16	McNAIR, M	ER (P&S) - CS	3
17	MILLER, S	ER - PF 2	4
18	MITCHELL, J	ER - PF 2	5
19	MULLINS, W	FDM - PF	8
20	PHILPOT, J	E&C SUPT - PF	7
21	RIVERS, L	ER - CS	5
22	ROGERS, A	E&C SUPV - MIL	6
23	STOJAK, M	ENG (ER) - CS	4
24	TOWNSEND, B	E&C SUPV - GB	6
25	TRUMP, K	E&C SUPV - CS	7
26	WEATHERS, D	ER - PF	4
27	WHITE, P	ER - GB	3
28	BURK, L	M. VERIFIER - PF	14
29	BYRD, F	SEC - CS	8
30	CARDWELL, J	SEC - PF	[illegible]
31	HOBBS, M	SEC - PF	9
32	JACKSON, L	SEC - PF	8
33	STORIE, D	SEC - PF	10
34	WILBOURN, T	SEC - GB	6
	FT. WALTON / CRESTVIEW		
1	ANDERSON, G	E&C SUPV -CV	6
2	BARTON, A	ER - CV	4
3	BATTAGLIA, E	FDM - FW	8
4	EVANS, B	ER - FW	2
5	FARZELL, M	ER (P&S) - FW	4
6	GATES, J	ER - DES	3
7	GUERNSEY, B	E&C SUPV - FW	6
8	LEE, S	ER - CV	3
9	PEEL, D	ER (P&S) - DES	3
10	REEVES, W	ER - DES	3
11	ROTHBAUER, R	ENG (TS) - FW	6
12	SCOTT, A	ER - FW	3
13	WILLIAMS, D	E&C SUPV - DES	6
14	DOLLSON, F	SEC - FW	10
15	REILLY, D	CLERK - FW	7
	PANAMA CITY / CHIPLEY		
1	ADAMS, R	ENG (TS) - PC	6
2	BOTTOMS, S	ER - PCB	5
3	COLLINS, D	ER - CHY	5
4	CORBITT, M	ER - PC	4
5	DAVID, S	ER (P&S) - PC	3
6	EBERLY, P	ER - PCB	4
7	FORBES, T	ENG (TS) - PC	5
8	HARMON, M	ER - PC	4
9	JENKS, W	E&C SUPV - CHY	6
10	MARTIN, R	ER - PCB	4
11	MCQUAGGE, A	E&C SUPV - PC	7
12	MILLER, D	ER - PC	2
13	VICKERS, B	ER - (C. SPOT.) - PC	2
14	WEINTRITT, B	FDM - PC	8
15	WHITE, G	E&C SUPV - PC	6
16	WILKES, R	ER (P&S) - PCB	3
17	COLEMAN, A	SEC - PC	8
18	HALL, J	SEC - PC	8
19	HARRIS, B	SEC - PC	10
20	SANDERS, J	SEC - PC	8
21	SPANN, L	SEC - PCB	6

	EMPLOYEE NAME	CURRENT POSITION	POS LEVEL
	DISTRIBUTION		
1	BAILEY, B	ENG (DIST) - CO	6
2	BARROW, W	ER (LC) - PF	4
3	BLACK, C	ER (MP) - PF	4
4	BUMGARDNER, J	ER (DP) - FW	4
5	BURNS, S	LC SUPV - CO	6
6	BYERLEY, B	ENG (TS) - CO	6
7	COPELAND, P	ER (DP) - CO	4
8	DENNIS, G	LESC SUPV - CS	5
9	ESPY, J	ER (LC) - FW	4
10	GATES, B	ER (DLC) - PF	3
11	GODWIN, T	ER (DLC) - FW	3
12	HOLLAND, G	ER (MP) - PC	4
13	JOINER, J	ER (DLC) - PC	3
14	JONES, R	ER (MP) - FW	4
15	LLOYD, K	ER (DLC) - PF	3
16	MCDANIEL, A	E. SUPV - CO	7
17	MILLER, J	DLC SUPT - CO	7
18	MILLS, J	ENG (DP) - CO	6
19	MIRUS, E	ER (LC) - PC	3
20	PADILLA-KIRKLAND, B	ER (DP) - CO	4
21	ROUILLIER, L	D. MGR. - CO	8
22	SCHAFFER, P.	ENG (DIST) - CO	6
23	STEELE, A	ER (MP) - PF	5
24	STINSON, B	ER (P&S) - CO	5
25	STUCKEY, D	DP COOR - CO	6
26	THOMASON, E	ER (LC) - PF	4
27	COBB, S	CLERK - LESC	7
28	CURD, P	SEC - PF	10
29	HARDING, L	SEC - LESC	8
	ENGINEERING SYSTEMS		
1	CARTER, S	ENG (ENG SYS) - PB	6
2	FITZGERALD, S	ENG (ENG SYS) - PB	3
3	LAY, J	ER (ENG SYS) - PB	3
4	PARKER, J	M & ES MGR - PB	8
5	RICHBOURG, S	ENG (PQ) - PB	6
6	ROBERTSON, H	ENG (PQ) - FW	6
7	SCHULTE, L	ENG (MS) - PF	5
8	TALLEY, P	ENG (ENG SYS) - PB	5
9	WERNICKE, M	ENG (ENG SYS) - PB	6
10	BURKHEAD, G	DRAFTER - PF	14
11	GRAMS, C	DRAFTER - PF	8
12	HIGGINBOTHAM, E	D. LABORER - PF	9
13	MINER, J	SEC - PF	8
14	NORDAN, M	DRAFTER - PC	12
15	REDMOND, E	DRAFTER - PC	14
	SYSTEM PROTECTION		
1	BABBITT, J	SYS. PROT. SUPV -CO	7
2	KING, M	ENG (D. CONT.) - PB	4
3	MCLEAN, M	DIST S. CONT. SUPV -PB	6
4	MCLENDON, R	ENG (SP) - CO	6
5	PORZIO, H	ENG (SP) - PC	6
6	SANCHEZ, R	ENG (SP) - CO	5
7	TAYLOR, K	ENG (SP) - CO	5
8	WOHLG MUTH, J	ENG (SP) - CO	6
9	TEAL, E	SEC -CO	8
	PROJECT SERVICES		
1	BOWEN, B	ER (CATV) - CO	4
2	BROOKS, R	ER (CATV) - CO	5
3	DUNN, M	PS ADM. - CO	7
4	SIRMON, C	SPEC (CEMC) - CO	2
	SUBSTATION / TRANSMISSION		
1	BLACKMON, B	ER (P&S - S&T) - FW	3
2	JERNIGAN, K	E&C SUPV (S&T) - PF	6
3	MCKINNEY, J	E&C SUPV (S&T) - PC	6
4	WELLS, C	ER (P&S - S&T) - PF	3
	TRAINING & COMPLIANCE		
1	BARRON, K	ENV. SPECIALIST - PC	5
2	ROBINSON, E	ER (TRAIN) - PC	5
3	WOODY, L	ER (TRAIN) - PF	3
4	NURNBERGER, S	ENG (NESC) - CO	6
	POWER DELIVERY ADMINISTRATION		
1	GOLDEN, C	SEC - CO	10

1996

POWER DELIVERY

Exempt Job Progression Families

STEPS	JOB CODE	JOB TITLE	GRADE LEVEL
4	000174	Engineer, Senior	6
3	000175	Engineer I	5
2	000176	Engineer II	4
1	000177	Engineer III	3
4	004933	Engineering Representative, Senior	5
3	004934	Engineering Representative I	4
2	004936	Engineering Representative II	3
1	004937	Engineering Representative III	2

January 1, 1996

ENG REP III	ENG REP II	ENGR REP I	SR ENG REP	ENG III	ENG II	ENG I	SR ENG
			DISTRICTS				
DAVID JONES EDDIE DIXON BRAIN EVANS DENISE MILLER ROY VICKERS	JIMMIE BUTLER RONNIE KELL WAYNE MANNING MIKE McNAIR CARLTON WELLS PAUL WHITE SCOTT LEE DONNIE PEEL MARK REEVES ARON SCOTT SID DAVID MARY HARMON LARRY WOODY	BEN ABBOTT MIKE LEWIS CHERYL McCAFFRY STEVE MILLER DAVID WEATHERS ALLEN BARTON MIKE FEAZELL MAC CORBITT PETE EBERLY ROBERT MARTIN	KEN BOOTH JOHN MITCHELL LEROY RIVERS BILLIE BLACKMON STEVE BOTTOMS DONNELL COLLINS ERNEST ROBINSON ROBERT WILKES		DAVID KING MARK KONZ MIKE STOJAK	MARK DREADIN TOMMY FORBES	RON ROTHBAUR RONNIE ADAMS
			CORPORATE				
CAROLYN SIRMON	BUDDY GATES TOMMY GODWIN KENNY LLOYD EARL MIRUS BENITA PADILLA JAMES LAY JERRY JOINER	WAYNE BARROW CHRIS BLACK JIM BUMGARDNER PEGGY COPELAND JAMES ESPY GEORGE HOLLAND ROGER JONES BEN BOWEN EDDIE THOMASON	BILL STINSON REX BROOKS ALAN STEELE	SYBELLE FITZGERALD	MIKE KING	LYNN SCHULTE PAUL TALLEY RICK SANCHEZ KENNY TAYLOR	BOB BAILEY BILL BYERLEY JIM MILLS STAN NURNBERGER PAUL SCHAFFER STEVE CARTER STEVE RICHBOURG HAROLD ROBERTSON MIKE WERNICKE ROBERT McLENDON HERMAN PORZIG JIMMY WOHLGEMUTH

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: Power Quality Engineer

POSITION FUNCTION:

A Evaluate customer's electrical system to determine power quality needs

B Install power quality monitors on customer's premises

C Evaluate power quality data from recording equipment

D Make recommendations to customers on solutions to power quality problems

E Provide technical power quality support to engineering, marketing, and line/service personnel

F Provide seminars on power quality support to customers, architects, and engineers

G Evaluate, improve and maintain company power quality programs

H Establish company standards and procedures related to power quality issues

I Evaluate new power quality monitoring equipment

J Train engineering personnel on the operation of power quality recording equipment

WORK VOLUME:

The total work volume for this position is 89 hrs./week. The majority of the work volume for this position (66 hr.) is in the installation of power quality monitors on customer premises, the evaluation of the data retrieved from these recorders, and providing Power Quality recommendations to the customer. There is also some additional work not reported as being done by PQ engineers amounting to 9.5 FTE's. This work is assumed to be done by Engineering Reps throughout the Company.

RECOMMENDATION:

Staff this position with two engineers at a Senior level.
Provide 9.5 FTE positions as follows:

- **4 Pensacola area**
- **2 Ft. Walton area**
- **1 Crestview Defuniak area**
- **2 Panama City and Panama City Beach area**
- **0.5 Chipley area**

	STAFFING STUDY FOR ENGINEERS AND ENGINEERING REPRESENTATIVES												
		ITEM	POSITION RESPONSIBILITES	LEVEL OF LEADER	SKILL TECH	REQUIRED HUM. REL.	TOTAL # REQ'D	LEVEL SR	1	2	3	
	ENG SYSTEMS POWER QUALITY											
	2 incumbents	A	Evaluate customer's electrical system to determine power quality needs	4	5	5	8 hrs/wk	x				4 per wk @ 1 hr each + 4 hrs driving
		B	Install power quality monitors on customer's premises	4	5	5	24 hrs/wk		x			8 per wk @ 2 hrs on site + 2 hrs driving
		C	Evaluate power quality data from recording equipment	3	5	3	18 hrs/wk	x				6 per week @ 3 hrs each
		D	Make recommendations to customers on solutions to power quality problems	3	5	5	24 hrs/wk	x				6 per week @ 4 hrs each
		E	Provide technical power quality support to engineering, marketing, and line/sevice personnel	4	5	4	4 hrs/wk	x				
		F	Provide seminars on power quality support to customers, architects, and engineers	5	5	5	1 hr/wk	x				
		G	Evaluate, improve and maintain company power quality programs	4	5	5	2 hrs/wk	x				
		H	Establish company standards and procedures related to power quality issues	5	5	4	3 hrs/wk	x				includes 2 two day system meetings per yr
		I	Evaluate new power quality monitoring equipment	5	5	4	1 hr/wk	x				
		J	Train engineering personnel on the operation of power quality recording equipment	5	5	5	4 hrs/wk	x				
						Subtotal	89 hrs/wk					
		T1	Loadcheck transformers	2	3	3			x			Items T1 thru T5 should be included in field rep
												normal work. If separated it will take the
		T2	Voltage checks	2	4	3				x		following level to staff:
												0.5 Chipley
		T3	TVI investigations	2	4	4					x	2 Panama City and PC Beach
												1 Crestview/DeFuniak
		T4	Pool shocking complaints	2	3	4			x			2 Ft Walton/Niceville/Destin
												4 Pensacola/Gulf Breeze/ Milton
		T5	Ground resistance checks	2	3	2				x		Total 9.5

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: SYSTEM PROTECTION ENGINEER

DRAFT

==========

POSITION FUNCTION:

1) Coordinate and direct all aspects of new protection and control installations.
2) Maintenance relay testing and reliability testing of protection and control systems.
3) Proactive protection analysis and coordination.
4) Maintenance of test equipment, fault recorders, other instrumentation and transducers.
5) Assist key account customers with problems and perform special projects relating to those customers and other areas.
6) Southern committees, standardization initiatives, and seeking new methods/technology.
7) Maintenance of data bases for System Protection.
8) Assist field engineers with technical problems.
9) Mobile substation support.

WORK VOLUME:

		RECOMMENDATIONS (DAYS)			
WORK VOLUME	GULF EST. DAYS 1996	GULF	COASTAL	APCO	GULF CHANGE (DAYS)
1) Protection/control construction	479	362	--	--	(117)
2) Relay testing and reliability testing	222	--	200	--	(222)
3) Protection analysis and coordination	182	117	--	117	(65)
4) Test equipment, etc., maintenance	259	259 (1)	--	--	--
5) Key account customers, special projects	92	100	--	--	8
6) Southern committees, standardization, new methods/technology	84	100	--	--	16
7) Database maintenance	28	100	--	--	72
8) Assist field engineers with technical problems	28	28	--	--	--
9) Mobile substation support	41	10	--	--	(31)
TOTALS	1,415	1,076	200	117	(339)

RECOMMENDATION:

1) Support plants' new protection and control installations and major key account customers with experienced Engineers.
2) Engineers should rely on Technician's Capabilities for routine work on new construction.
3) Gulf's staff requirements would be:
   * Three experienced, technical, up-to-date Engineers
   * One technical assistant, also technically current
   * One Engineer-in-training
4) Move engineers through System Protection regularly.
5) Use Co-op Student if Gulf plans to hire Engineers in next few years.
6) Shift maintenance and reliability testing to Coastal Test Team.
7) Establish process so that APCO Maintains Protection database and calculate relay settings.

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996
SYSTEM PROTECTION FUNCTION

.0 Study Purpose

"...to determine Power Delivery's highly competitive business needs in regards to number of positions and skills required for these positions. This study is intended to analyze our engineering and engineering representative work requirements and work force to structure ourselves to be "America's Best." CEJ, 10/9/96.

2.0 Prior Study Work

Previously, job functions were identified in the System Protection area developed through several discussions with the System Protection engineers and through position descriptions. The individual job functions were then assessed on the basis of leadership, technical, and human relations skills required for each particular function. These assessments were also done using input from the System Protection engineers.

Figure 2.0 lists these job functions and the skills levels required. Also shown on this listing are the estimated 1996 man-hours in each job function.

Figure 2.0

ITEM	POSITION RESPONSIBILITIES	LEVEL OF SKILL REQUIRED			1996 DAYS
		LEADER	TECH	HUM. REL.	
A	Coordinate & direct installation of new protective equipment & controls related to generation, transmission lines, substations, distributions lines, and key account customer facilities. This includes reviewing budget items, participating in pre-design work, recommending materials, verifying schemes, calculating relays, supervising construction, and performing administrative duties related to the project.	5	5	5	479
B	Maintain & test relays & associated protective devices.	2	4	3	176
C	Ensure protection schemes are intact & failed components are repaired.	4	4	4	46
D	Analyze power system operations and disturbances to correct or improve system reliability and integrity-interpret fault recorder data and trouble shoot equipment.	2	4	3	72
E	Maintain test equipment, fault records, and other equipment.	2	3	2	105
F	Investigate coordination problems, protection scheme problems, or other issues that may arise.	4	4	4	94
G	Assist key account customers with problems & improvements on the interconnection & lend small scale assistance for internal problems while ensuring good customer relations.	4	5	4	46
H	Work on Southern committee such as SCORE, CAPE & Substation Standardization Committee as well as Power Delivery, Transmission and other company committees.	4	3	3	41
I	Seek and implement new methods to improve reliability and reduce costs.	4	3	4	43
J	Maintain power system monitoring transducers.	1	3	2	154
K	Build, maintain & utilize database for computer aided protection engineering system (CAPE).	2	4	2	16
L	Maintain database for relay test sheets, STOMP and distribution control feeder information database.	3	3	2	28
M	Assist field engineers w/customer complaints and claims involving feeder operations.	3	3	3	28
N	Special projects-work with utility industry specialist and vendors to solve problems and design protection schemes which involve non-industry standard. technology.	5	5	4	46
O	Coordinate the installation of mobile subs.	4	4	3	41
	OVERALL	4	5	3	1,415

3.0 Current Study Investigation

This phase of the study encompasses using the results of the assessments to determine the necessary skills, developing a list of concerns and issues (with System Protection engineers' input), reviewing historical and future construction work requirements, brainstorming efforts to determine new ways of doing things, affects of changing industry requirements, and the study components listed in Section 4.0. Also, the annual man-hours used in the various job functions during 1996 were estimated to develop a better understanding of our current focus. Finally, recommendations will be developed to determine manning requirements and alternatives.

4.0 Study Components

4.1 Study Components and Associated Questions

For use during System Protection brainstorming, the following questions were developed for the various components:

- **Quantity/Complexity**

  Quantity
  - How frequently will this occur in the next 4 years?
  - How frequently has this occurred in the past?

  Complexity
  - How complex is this activity?
  - What experience and skill level is required?

- **Service Level**
  - What is the current service level?
  - What alternative service levels can be practical?

- **Staffing levels - number required**

- **Exempt vs. non-exempt**
  - At what level should this activity be done?

- **Outsourcing possibilities**
  - Can this activity be outsourced?
  - If so, what project management controls would be necessary?

- **Temporaries/Co-op role**
  - What involvement would these individuals have in this activity?

- **Do or Not do**

- **Strategic relevance**
  - What is the relevance of this activity in a competitive environment?

- **System consolidation with emphasis on coastal region**
  - Can this be done more efficiently with a mobile work team?

4.2 System Protection Issues

The following list of issues was developed by the System Protection team through brainstorming activities in considering these study components.

- Increased utilization of equipment.
- *Will we see more unplanned projects?*
- Decreased maintenance leads to increased failures.
- *Equipment aging possibly can lead to increased failures?*
- If increased failures, more important for System Protection reliability and security.
- *External companies' use of our system will increase loadings, especially in Scholz area.*
- NWF will increased growth will require unforeseen construction.
- *Maintain reliability of key customers, how? What level of reliability will be required?*
- What level of involvement by System Protection is REALLY required for mobile sub installation? Who should be responsible?
- *Work is "out there" - Someone will have to do it.*
- Should System Protection engineering be testing/repairing transducers. Telecommunications, outsourcing, etc.
- *Not looking at big picture on System Protection Coordination basis.*
- Oasis Transmission Reporting.
- *Project Management is an issue of outsourcing.*
- "Oasis" will increase testing days per year.
- *Work orders will be required.*
- Replacing high maintenance equipment.
- *Using new technology to reduce high maintenance equipment ex. Sweitzers (or equivalent) strategically placed.*
- Install Sweitzers (or equivalent) in " 4 year" maintenance (critical buses) substations to decrease relay maintenance testing time. (Should have good payoff.)
- *Addressing known problem areas. (e.g. Sweitzers can provide*
- *instantaneous reclosing.)*
- Basler has replacement overcurrent relays that do not require
- rewiring of relay cases.
- *Prints maintenance*
- Don't sell department short.
- *When we go to substation and finds things that are not documented, that is a problem.*
- Push paperwork (Substation procedures, test sheets, etc.) to electronic media.
- *Better communication (coordination) back and forth between System*
- *Protection and customers.*
- In-plant fossil/hydro support in future - how responsive will other support be?
- *Bulk transmission support in unbundled arrangement.*
- Stay up with technology.
- *CAPE (Computer Aided Protection Engineering)*
- Compare construction future vs. recent past.
- *Engineer call out will still be needed.*
- Engineers need to have time to study new processes (i.e. learning curves).
- *Getting wiring work done (i.e. 2 wireman versus contracting panel wiring..)*
- What is the appropriate level of maintenance of relay testing in an unbundled/competitive environment.
- *Someone needs to ensure that the equipment we order is what we get (e.g. Miramar capacitor breaker.)*

As seen from the above list, System Protection is concerned about factors that can change the face of how we consider protection and control. Summarizing the issues into categories on the following page.

ISSUE CATEGORIES

- Increased maintenance cycles, increased equipment utilization, and external use of our system could require even more attention to protective relay reliability and security.
- Load growth will continue.
- Use of right skill level and/or outsourcing.
- Company unbundling effects - what effect will this have on System Protection?
- Attention to key accounts.
- System Protection work is "out" there to be done.
- Use of new technology, better internal communications and process improvement to be more efficient.
- Attention to "big picture" coordination is needed.
- Construction work is forecasted to be less, but needs to be better coordinated.

4.3 Past and Future Construction Support

(Figure 2 - Position Responsibility, Item A.)

Figure 4.0 shows the number of construction projects by various categories in the first three years of the construction budget. Only these years are illustrated since these are the budget years where the projects are more firm (rather than the outer years). From this chart it is apparent that System Protection support of construction projects has been constant in the past and is expected to remain so in the near future.

Quantity
System Protection estimates 479 days for 1996 for new construction projects. (No process of man-hour tracking exists at the present, although more detail has been captured through time sheets since mid-year, 1996). With no change in methods of accomplishing the various tasks necessary, similar man-hour requirements will be necessary for the near future. However, there are other areas that should be addressed. It is expected that improved planning using project planning meetings, project planning methods, work order system, and better communications among all parties should reduce the man-hour requirement. The major effort at substation standardization will also reduce design and preparation time.

Complexity
The commissioning of new equipment varies in complexity from very complex schemes such as certain line terminals consisting of ring bus configuration, carrier relaying, and breaker failure protection to feeder breakers. However, if the proper attention is not given to the relay settings, control wiring, checkout, print corrections, and substation procedures at this time; this can set a trap in this future for risks of: dropping load inadvertently, damaging equipment, or safety of personnel.

Service Level
As mentioned above, there are certain risks involved with reducing the service level of these activities. Rather, effort should be given on the various process improvements mentioned earlier to reduce time, not service level.

Staffing Level
Subjectively, although the construction support level remains the same, the man-hour requirements could conceivably be reduced by 117 days to 362 days if proper attention is given to the process.

Exempt vs. Non-exempt
This should remain as a mix of senior engineers and engineers, although technicians can certainly provide assistance in the less technical activities, such as ct & pt testing, relay testing, circuit checkout, etc.

Outsourcing Possibilities
This is not an area which should at this time be considered for outsourcing consideration. There are definitely contractors which will bid to do this type work, but project management may require the same or more effort by the Company.

Temporaries/Co-op Role
Co-op students do provide assistance in this responsibility area, but more than that, the co-op students learn a tremendous amount from their experience with System Protection and especially in this area.

4.3 Past and Future Construction Support (Continued)

Do or Not Do
Continue to do this.

Strategic Relevance
This is part of doing business. New transmission and distribution protection and control equipment must be commissioned properly.

System Consolidation
This can easily be done, especially with the substation standardization effort. Coastal team(s) can be put together to support construction in Gulf, MPC, and APCO.

FIGURE 4.0

CONSTRUCTION PROJECTS
BY CATEGORIES

IN FIRST THREE YEARS OF BUDGET

CATEGORY	Oct. '93	Oct. '94	Oct. '95	Oct. '96
1. Substation Capacity Increase	2	3	5	6
2. New Distribution Substation	1	-	1	1
3. Transmission Breakers	2	2	1	2
4. Circuit Switcher/Motor Operated Switches	4	2	4	0
5. Transmission Line Additions/ Reconductors	5	1	4	4
6. Auto Transformer Replacement	-	-	-	-
7 115KV Substation Capacitor	2	3	3	3
12KV Breakers	1	2	-	-
9. 12KV Feeder Bays	2	5	3	2
10. Crist 115KV Circuit breaker replacement project	-	1	2	2

4.4 Remaining Position Responsibilities

The following discussion will address Position Responsibilities, Items B through O relating to the Study Components.

Position Responsibility: B - Relay Testing
C - Scheme Testing

Quantity

There are approximately 85 substations in Gulf's service territory. Of significance, though are the number of line terminals, differential relay sets, breaker failure relay schemes, feeder breaker relays, and many others. There are approximately 2700 relay test sheets with varying degrees of complexity. There are also approximately 300 feeder breaker test sheets in System Protection's responsibility.

Complexity

Varies considerably from very complex to quite simple.

Service Level

The service level that has been agreed upon in Southern is below:

- Generating Plant Relay Testing Frequency - every 4 years
- All others - every 10 years

We agree with this service level except with the following caveats:

- Begin proper reliability testing. This means testing protection and control schemes, ct and ct cables, and the other requirements set forth in the Southern relay preventive maintenance procedure. We have experienced during 1996 operations and failures which might not have occurred if this had been done.
- Pay particular attention to the key account customers' substations.
- Address high risk substations such as generating plant substations, major bulk power substations.

What does this mean? To get to this standard requires 100 test days per year (2 person team) with very experienced personnel. In 1996, System Protection days in this area are estimated to be 222 days, but are not well focused as identified above. It is expected that external use of our transmission lines will add to the man-hour requirements due to the added notifications and possible inability to take equipment out when needed to accomplish the reliability testing.

Staffing Levels

The requirement is 200 days per year. This should be accomplished by a coastal testing team staffed by Gulf, MPC, and APCO System Protection employees.

Exempt vs. Non-exempt

Experience and close attention to details are what counts. This should be a team(s) consisting of both.

Outsourcing Possibilities

Outsourcing is possible, although the contractor capability to test transmission relays and the reliability testing is very sparse. A combination of Southern test teams and outsourcing may be an alternative.

4.4 Remaining Position Responsibilities (Continued)

Temporaries/Co-op Role
Co-op students can participate in this activity.

Do or Not Do
This must be continued, but with the added reliability testing preventive maintenance.

Strategic Relevance
This will become even more important with the external use of the transmission lines.

System Consolidation (coastal)
The recommendation is to work with the other coastal companies to establish the parameters of coastal test team(s) which would perform on a continuous basis, the preventive maintenance testing of the coastal protection and control in the substations.

A Gulf relay engineer (or technician) could either be permanently assigned or rotate in and out of the team.

Position Responsibility: *(Protection Analysis and Coordination)*
D - Analysis of operations and disturbances and
F - Investigations of coordination problems, etc.
K - Protection Data Base

Quantity
System Protection estimates 182 days in this area in 1996. Much of this is reactive and, although necessary, some of this time should be shifted to proactively reviewing transmission relay coordination from an overall perspective rather than piecemeal as problems appear.

This activity, on a proactive basis, is estimated to be 1 man-year, but may be contracted to some extent to APCO.

Complexity
Complexity of problems vary, but overall coordination on a proactive basis requires technical abilities.

Service Level
For the reactive analysis, this frequently must be done quickly after the disturbance. The details vary depending upon the magnitude of the disturbance. However, system-wide coordination reviews should be accomplished through careful, rigorous studies. This type study should be done through Gulf's transmission system and not on a problem-by-problem basis.

Staffing Level
233 days

Exempt vs. Non-exempt
Should be System Protection engineer.

Outsourcing Possibilities
Contract with APCO the CAPE data base maintenance and coordination. This is estimated to be 117 days of the staffing level above.

Temporaries/Co-op Role
Very little, other than assistance when needed.

Do or Not Do
This is critical to prepare for transmission constraints.

Strategic Relevance
Becomes more important as transmission access becomes a reality.

System Consolidation
Yes, see reference to outsourcing to APCO.

Position Responsibility:	E - Maintenance of Test Equipment, Fault Recorders, and Other Equipment D - Maintenance of Transducers

Quantity
System Protection utilizes many different types of test equipment to install and maintain the various protection and control facilities on the power system. Among them are five fully equipped vans with test sets for the various types of relays and portable computers to address microcomputer-based relays and fault recorders. The approximately half dozen fault recorders strategically placed throughout the transmission system require maintenance attention as well as the many transducers that are in place to monitor the analog quantities of the generation, transmission and distribution system.

The days required that were estimated for 1996 are 259 for these activities.

Complexity
Although some of this equipment is electromechanical, much of the test equipment and monitoring equipment is microcomputer-based.

Service Level
To maintain fully-equipped test vans and to provide adequate system monitoring, these test and monitoring equipment must be kept in serviceable condition.

Staffing Level
259 days.

Exempt vs. Non-Exempt
Currently, these activities are done by engineers, senior engineers, and co-op students. However, properly trained technical personnel could accomplish this.

Outsourcing Possibilities
This could be outsourced if the proper vendors could be found, the response time was appropriate, and the proper controls in place.

Temporaries/Co-op Role
Co-op students are doing some of this work, especially the transducer maintenance. Training is required for each co-op student before they can be productive in the activity.

Do or Not Do
Must do.

Strategic Relevance
Supports protection and control activities.

System Consolidation
Could be done, but probably no interest at this time.

Position Responsibility:	G - Assist Key Account Customers N - Special Projects

Quantity
Although 92 days are estimated for 1996 in these activities, as retail access becomes more of a reality, this is expected to increase.

Complexity
This can vary considerably, depending on customer requirements.

Service Level
This usually required rapid response and can be quite technically-oriented.

Staffing Level
Should increase to 100 days,

Exempt vs. Non-Exempt
Should be a System Protection engineer (senior).

Outsourcing Possibilities
Not appropriate.

Temporaries/Co-op Role
Very little.

Do or Not Do
Must be done and be highly responsive.

Strategic Relevance
Important for our competitive environment.

System Consolidation
Not appropriate at this time.

Position Responsibility:	H - Southern Committees and Other Standardization Initiatives I - Seek New Methods/Technology

Quantity
There is very concerted effort across Southern to standardize the substation design and maintenance. Protection and control is very involved in this effort. In 1996, 84 days are estimated in this effort by System Protection, with several protection and control schemes accepted by the system for standardization which were developed at Gulf. This effort will continue and may increase somewhat.

Complexity
Committee representatives must be knowledgeable in the various initiatives undertaken by the committees to assist the group in determining the best solutions for Southern.

Service Level
No change from the present involvement. We should be very active in the committees.

Staffing Level
100 days.

Exempt vs. Non-Exempt
System Protection engineer (senior).

Outsourcing Possibilities
Not appropriate.

Temporaries/Co-op Role
None.

Do or Not Do
Must continue.

Strategic Relevance
Important for Southern to be competitive.

System Consolidation
This is already in progress.

Position Responsibility:	L - Maintain Various Databases for System Protection

Quantity
Currently, the relay test sheet data is in at least five different locations ranging from hard copy sheets to several different computer data bases. In progress currently is an effort to centralize to the CAPE system. This is major effort and is expected to extend well into 1997. Some of this may be transferred to APCO through a purchase order.

Complexity
Database creation must be very accurate, because of the many idiosyncrasies of the computer system which must be understood plus the substation and relay knowledge which is required.

Service Level
Must be kept current. Centralizing the databases into CAPE should reduce the work requirement after the initial effort is completed.

Staffing Level
Increase to 100 days - may shift to APCO.

Exempt vs. Non-Exempt
This is a shared responsibility between a System Protection engineer and a co-op student.

Outsourcing Possibilities
Only to APCO or CAPE software vendor.

Temporaries/Co-op Role
Co-op student is assisting at this time.

Do or Not Do
Must do. Major effort now should reduce requirements in the future. In addition, the access to relay databases will be available to others through STOMP.

Strategic Relevance
Centralizing and standardization or relay databases in Southern.

System Consolidation
Yes, possible with APCO.

Position Responsibility:	M - Assist Field Engineers With Technical Problems

Quantity
System Protection estimates 28 days for this activity in 1996. This is expected to remain at this level with the increase in technology assistance.

Complexity
Usually, these requests involve trying to understand more fully, transients on the distribution feeders.

Service Level
System Protection should remain responsive to these requests.

Staffing Level
Should remain at 28 days supported by System Protection engineer.

Exempt vs. Non-Exempt
Exempt.

Outsourcing Possibilities
Not appropriate.

Temporaries/Co-op Role
Can assist, not the sole responsible party.

Do or Not Do
Continue.

Strategic Relevance
Necessary to correct problems or reliability or Power Quality.

System Consolidation
Not appropriate, but may utilize technology advances tried in other Southern locations.

Position Respons'bility: O - Mobile Substation Support

The support of this activity should be decreased and responsibility placed more upon substation electricians.

This should be reduced from the estimated 41 days in 1996 to 10 days.

cg/SYSPROT.DOC

APPENDIX

CONSTRUCTION PROJECTS
BY CATEGORIES

October, 1993

CATEGORY	1994	1995	1996	1997	1998	TOTAL
1. Substation Capacity Increase		1	1	1	3	6
2. New Distribution Substation	1			1	1	2
3. Transmission Breakers		1	1			3
4. Circuit Switcher/Motor Operated Switches		3	1	1	3	8
5. Transmission Line Additions/ Reconductors		4	1			5
6. Auto Transformer Replacement			-	-	2	2
7. 115KV Substation Capacitor			2	1		3
8. 12KV Breakers		1				1
9. 12KV Feeder Bays		2		3	3	8
10. Crist 115KV Circuit breaker replacement project				1		1

CONSTRUCTION PROJECTS
BY CATEGORIES

October, 1994

CATEGORY	1995	1996	1997	1998	1999	TOTAL
1. Substation Capacity Increase		3		2	1	6
2. New Distribution Substation				1		1
3. Transmission Breakers	1		1			2
4. Circuit Switcher/Motor Operated Switches	1		1	1		3
5. Transmission Line Additions/ Reconductors		1				1
6. Auto Transformer Replacement						0
7. 115KV Substation Capacitor	1	2				3
8. 12KV Breakers		1	1	1	1	4
9. 12KV Feeder Bays	3		2			5
10. Crist 115KV Circuit breaker replacement project			1			1

CONSTRUCTION PROJECTS
BY CATEGORIES

October, 1995

CATEGORY	1996	1997	1998	1999	2000	2001	TOTAL
1. Substation Capacitor Increase		2	3		1	1	7
2. New Distribution Substation			1				1
3. Transmission Breakers		1				1	2
4. Circuit Switcher/Motor Operated Switches	1	1	2	1	1	1	7
5. Transmission Line Additions/ Reconductors	1	2	1			3	7
6. Auto Transformer Replacement					1		1
7. 115KV Substation Capacitor	2	1			1		4
8. 12KV Breakers						2	2
9. 12KV Feeder Bays	1	1	1		1		4
10. Crist 115KV Circuit breaker replacement project	1		1				2

CONSTRUCTION PROJECTS
BY CATEGORIES

October, 1996

CATEGORY	1997	1998	1999	2000	2001	2002	2003	TOTAL
1. Substation Capacity Increase	2	3	1		1	1		8
2. New Distribution Substation		1						1
3. Transmission Breakers	1	1						2
4. Circuit Switcher/Motor Operated Switches								
5. Transmission Line Additions/ Reconductors	1	3			1	4	1	10
6. Auto Transformer Replacement				2				2
7. 115KV Substation Capacitor	3			1	1			5
8. 12KV Breakers					2	1	1	4
9. 12KV Feeder Bays		1	1					2
10. Crist 115KV Circuit breaker replacement project	1	1						2

October, 1993		YEARS					
PE#	DESCRIPTION	1993	1994	1995	1996	1997	1998
2611	Air Products Capacity Inc	X					
2830	Transmission BKR Replacements			X			
2859	Crist 115KV Switch houses	X					
2861	Glendale Rd-Bonifay 46KV SW			X			
8711	Brentwood Circuit Switcher Replacement			X			
7827	Crestview-Glendale Rd Tap 115KV Line					X	
7829	Lansing Smith Auto TX Replacement						X
7842	Munson Rd 115/46KV Motor Operators						X
7846	Smith Substation Motor Mechanisms						X
7847	Shoal River TX Addition						X
7848	Redwood-Wewa Upgrade				X		
7849	Highland City-Callaway Upgrade					X	
3573	Ft. Walton Sub OCB Replacement				X		
3587	Ft. Walton Circuit Switcher			X			

October, 1993 (Continued) PE#	DESCRIPTION	YEARS 1993	1994	1995	1996	1997	1998
3590	Pace Feeder Bay	X					
3591	Arizona Chemical Tx	X					
3592	Live Oak Capacitor Add	X					
3603	Pace Sub-New OCB FDR IMP	X					
3622	Monsanto Circuit Switcher	X					
3646	Goulding Sub Circuit Switcher			X			
3647	Unlocated Sub Tx Addition			X			
3648	Marianna/Atha TX Swap	X					
8439	Molino Capacity Inc						X
8440	Cordova Sub Bank #2 Addition						X
8447	Jay Road 115KV Cap Bank				X		
8453	Innerarity Sub Bank #2					X	
8455	Pensacola City Sub OCB Replacements					X	
8468	Dist Sub Bus-Tie Bkr Replacements					X	X
8477	Live Oak Bank Addition				X		

October, 1993 (Continued) PE#	DESCRIPTION	YEARS 1993	1994	1995	1996	1997	1998
8478	Miramar 30 MVAR Capacitor				X		
8479	S. Crestview Bank Addition						X
8480	Milton New Substation						X
8481	Marianna Sub Capacitor add					X	
3735	Vernon Sub-12KV to 25KV Conversion	X					
3745	Bayou Marcus Feeder Add	X					
3746	East Bay-Hurlburt Line				X		
3747	Crystal Beach Sub & Fdr		X				
8706	Northside Substation Feeder #4						X
8711	Circuit Switcher Improvement				X	X	X
8714	115KV Sub Capacitor Bkr Repl					X	
8715	Crist 115KV Circuit Breaker Repl					X	
8716	Pine Forest FDR Bay					X	

October, 1993 (Continued) PE#	DESCRIPTION	YEARS 1993	1994	1995	1996	1997	1998
8717	Chipley 3rd FDR			X			
8718	Honeysuckle 4th FDR			X			
8719	Gulf Breeze Substation Feeder #5 & Submarine Cable						X

October, 1994		YEARS					
PE#	DESCRIPTION	1994	1995	1996	1997	1998	1999
2809	Lansing Smith Auto Transformer Replacement						X
2815	Munson Road Motor Operators					X	
2819	Smith Sub Motor Mechanisms					X	
2821	Redwood-Wewa Upgrade				X		
2822	Highland City-Callaway Line Upgrade				X		
2825	Glendale Rd. 30 MVAR Capacitor Addition				X		
2830	Transmission Breaker Replacements						
2830	Transmission Breaker Replacements	X	X				
2861	Glendale-Bonifay 46KV Line	X					
2862	Brentwood Sub Circuit Switcher Repl			X			
2863	Rat Pond 115 KV Tap				X		
2867	Glendale Road 115/12KV Transformer Addition					X	
3407	Molino Sub Capacity Inc					X	
3408	Cordova Sub Bank #2 Add						X

October, 1994 (Continued) PE#	DESCRIPTION	YEARS 1994	1995	1996	1997	1998	1999
3409	Jay Road Capacitor Bank		X				
3410	Innerarity Sub Bank #2					X	
3411	Pensacola City Sub OCB Replacement				X		
3413	Dist Sub Bus-Tie Breaker Replacement						X
3415	Live Oak 115/12.47 Bank Add					X	
3416	Miramar 30 MVAR Capacitor Addition			X			
3419	Marianna Sub Bank Addition		X				
3421	Pine Forest 30 MVAR Capacitor Addition		X				
3573	Ft. Walton Sub OCT Replacement	X		X			
3587	Ft. Walton Circuit Switcher Replacement		X				
3646	Goulding 115/12KV Sub Switcher Replacement				X		
3647	Unlocated 115/12KV Sub Tx Addition			X			
3701	Northside Sub Fdr #4 (JT)					X	

October, 1994 (Continued) PE#	DESCRIPTION	YEARS 1994	1995	1996	1997	1998	1999
3702	Circuit Switcher Improve					X	
3704	115 KV Capacitor Breaker Replacements				X		
3705	Crist Circuit Breaker Rep				X		
3706	Pine Forest Sub Feeder Bay Addition				X		
3707	Chipley Sub Third Feeder		X				
3708	Honeysuckle Fourth FDR		X				
3709	Gulf Breeze Feeder #5				X		
3710	Milton New Sub					X	
3711	Shoal River Substation-New Bank and Feeder			X			
3712	Airport Substation Conversion						X
3746	East Bay-Hurlburt Line			X			
3747	Crystal Beach Feeder Bay	X					

October, 1995		YEARS						
PE#	DESCRIPTION	1995	1996	1997	1998	1999	2000	2001
2809	Lansing Smith Auto Transformer Replacement						X	
2815	Munson Road Motor Operators				X			
2820	Shoal River 230KV Transformer Addition						X	
2821	Redwood-Wewa Upgrade			X				
2822	Highland City-Callaway Line Upgrade				X			
2825	Glendale Rd 30 MVAR Capacitor Addition			X				
2830	Transmission Breaker Replacements - 1995	X						
2863	Rat Pond 115KV Tap			X				
2864	Holmes Creek-Marianna 115KV Reconductor							X
2865	Crist-Pace 115KV Line Reconductor							X
2867	Laguna 115KV Capacitor Bkr Re							X
3407	Molino Sub Capacity Inc				X			
3409	Jay Road Capacitor Bank	X						
3410	Innerarity Sub Bank #2					X		

October, 1995 **(Continued)** PE#	DESCRIPTION	YEARS 1995	1996	1997	1998	1999	2000	2001
3411	Pensacola City Sub OCB Replacement							X
3413	Dist Sub Bus-Tie Breaker Replacement							X
3415	Live Oak 115/12.47 Bank AD changed 33 MVA to 28 MVA				X			
3416	Miramar 30 MVAR Capacitor		X					
3419	Marianna 39 MVAR Capacitor	X						
3421	Pine Forest 30 MVAR Capacitor Addition	X						
3423	Navarre Substation 30 M Capacitor Addition						X	
3424	Glendale Road TX Addition				X			
3573	Ft. Walton Sub OCT Replacement		X					
3587	Ft. Walton 115KV Circuit Switcher Replacement	X						
3647	Unlocated 115/12KV Sub Tx Addition			X				
3661	Highland City 115KV CAPA Bank		X					

11/11/96
jab/schedule

October, 1995 **(Continued)** PE#	DESCRIPTION	YEARS 1995	1996	1997	1998	1999	2000	2001
3662	Ft. Walton 115KV Capacitor Breaker Replacement			X				
3701	Northside Sub Fdr #4						X	
3702	Circuit Switcher Improv		X	X	X	X	X	X
3705	Crist Circuit Breaker RE		X		X			
3706	Pine Forest Sub Feeder Bay Addition				X			
3707	Chipley Sub Third Feeder	X						
3708	Honeysuckle Fourth Fdr	X						
3709	Gulf Breeze Feeder #5			X				
3710	Milton New Sub				X			
3711	Shoal River Substation New Bank and Feeder			X				
3712	Airport Substation Conversion							X
3746	East Bay-Hurlburt Line		X					
3749	Wewa-Tyndall 115KV Lin							X

October, 1996		YEARS							
PE#	DESCRIPTION	1996	1997	1998	1999	2000	2001	2002	2003
2601	Exxon Sub Tx Add	X							
2807	Crestview-Glendale Reconductor								X
2809	Lansing Smith Auto Transformer Replacement					X			
2820	Shoal River 230KV Transformer Addition					X			
2821	Redwood-Wewa Upgrade			X					
2822	Highland City-Callaway Line Upgrade			X					
2825	Glendale Rd 30MVAR Capacitor Addition		X						
2831	Smith Capacitor Bank Addition		X						
2832	Wright Capacitor Bank Addition		X						
2863	Rat Pond 115KV Tap		X						
2864	Holmes Creek-Marianna 115KV Reconductor							X	
2865	Crist-Pace 115KV Line Reconductor						X		
2866	Scholz-Marianna 115KV Reconductor							X	
2867	Laguna 115KV Capacitor Breaker Replacement			X					

October, 1996 (Continued) PE#	DESCRIPTION	YEARS 1996	1997	1998	1999	2000	2001	2002	2003
3407	Molino Sub Capacity Inc			X					
3408	Cordova Sub Bank #2 Add							X	
3410	Innerarity Sub Bank #2				X				
3411	Pensacola City Sub OCB Replacement						X		
3413	Dist Sub Bus-Tie Breaker Replacement						X	X	X
3415	Live Oak 115/12.47 Bank Addition			X					
3416	Miramar 30 MVAR Capacitor Bank	X							
3422	Pace 115KV Substation 30 MVAR Cap Add						X		
3423	Navarre Substation 30 MVAR Cap Add					X			
3424	Glendale Road Tx Add			X					
3425	Century 46/12KV Capacity Increase		X						
3573	Ft. Walton OCB Repl	X							
3661	Highland City Capacitor Bank Addition	X							
3662	Ft. Walton 115KV Cap BKR Repl		X						
3705	Crist Circuit BKR Repl	X	X	X					

October, 1996 (Continued) PE#	DESCRIPTION	YEARS 1996	1997	1998	1999	2000	2001	2002	2003
3706	Pine Forest Sub Feeder Bay Addition			X					
3709	Gulf Breeze Feeder #5				X				
3710	Milton New Sub			X					
3711	Shoal River Substation - New Bank and Feeder		X						
3712	Airport Substation Conversion						X		
3713	Bonifay/Chipley Upgrades			X					
3746	East Bay-Hurlburt Line	X							
3748	Laguna -Phillips Inlet 115KV Line #2							X	
3749	Wewa-Tyndall 115KV Line							X	

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: Engineering Systems Engineer

POSITION FUNCTION:

1. Systems Administration
2. Major Project managment
3. Systems implementation and Support
4. Training and assisting GPCo personeel with systems
5. Network administrtation and hardware support

WORK VOLUME:

The total work volume for this postion is 206 hrs/week. The majority of this is concentrated in Major Project Administration and Systems Implmentation (140 hrs.). The work in this area is driven by projects and implemented systems. There are projects in early stages of development such as MET, TLM conversion, FAMS conversion, OCR, and Systems Integration that very few hours are being allocated. As they progress, and time is made available by the completion of other ongoing projects, more time will be spent on these developing projects. There are other projects, such Distribution Automation, Lightning Flash Density and Detection, and Engineering Toolbox, that have not made it to the development stage and requires some time to investigate the feasibility and merits of beginning the project.

RECOMMENDATION:

Staff this position with 4 engineers at the Senior level
Include 1 Coop or Engineer 3

STAFFING STUDY INTERVIEW WITH STEVE CARTER AND SYBELLE FITZGERALD

Date of Interview: 10-24-96

Trouble Call Management System

- They are basically doing installation and testing of the software, as well as maintenance of the database
- They are doing coordination and training with the control room personnel.
- SQL and ORACLE knowledge are important for working on this system
- Also, knowledge of the UNIX operating system
- There is a lot of coordination required with Alabama Power
- They are installing and maintaining hardware: eight SUN SPARC 20 workstations, large control room monitors (NEC projection display units), plus a separate network for TCMS through the Pace Boulevard office's Ethernet LAN.
- They have to coordinate with the customer accounting SCS support team in Atlanta for the GOLS interface, and with the mapping system support personnel here and in Atlanta
- It's not yet a production system, but will be soon. (It is scheduled to be accepted in December). It will be a dual-server system, with one for backup.
- On average, this takes 3/4 of two people right now, and will probably continue to do so through mid-1997.
- After the middle of 1997, it will probably require 1/2 of two people. There will still be a lot to do: build an interface to CSS, add the dual server to the system, continue the map clean-up (circuit tracing).

Computer-Aided Protection Engineering (CAPE)

- This system is used by System Protection
- It is a repository of short circuit models and relay data for calculations (reclosing relays, sync-check relays, etc. are not in the library, so they can't be stored in CAPE right now)
- Steve was in charge of this program when he was in System Protection, and no one else knows much about it, so he helps to maintain the system for them and provides training for users
- He will continue to have a significant role (about 10% of his time) for at least a year
- He will probably have a permanent smaller role (say 5% of his time)

Automated Resource Management System (ARMS)

- This system provides for radio assignment and tracking of orders
- Steve and Sybelle are working with a Southern Company team, Arthur Andersen, and the vendor, Alliance, to define the configuration for implementation, the interfaces, the RF network, hardware, window designs, etc.
- This system is at the stage where it requires a lot of sales/political work to coordinate the development
- They will also have to spend time presenting the system to Gulf's district personnel
- They will have to develop & prepare data such as work areas, work groups, sorting methods, etc.
- They will have to enter a lot of data into the database for startup
- Over the next two years, they estimate it will take at least 50% of the time of two people to implement this system on Gulf's service trucks and C&D trucks
- Later, they will need to implement it on line trucks, supervisor's trucks, and engineering personnel's vehicles
- Also, they plan to add the capability to display maps
- There are also plans to add interfaces to the timekeeping system and to TCMS

Momentary Outage Reduction Team System (MORT)

- Sybelle is working with Automation Consultants and Lee Hagler on this project
- Automation Consultants is doing most of the technical work inside the system components.
- They are almost ready to test the new generation of MORT boxes. She has been developing a list of test households.
- Sybelle will be responsible for operating/maintaining the PC that receives and processes the calls from the boxes.
- Until now, this work has been taking less than 10% of her time. In the future, it will be more like 50% of her time if we proceed to implement this either at Gulf or throughout The Southern Company. (It takes a lot of time to find the proper locations for the boxes.

Miscellaneous

- Steve has implemented an automatic transfer and paralleling scheme for the Corporate Office, using a PLC controller
- Sybelle is putting in a similar system at the Pace Boulevard office (no paralleling, just automatic transfer)
- These systems do not take a lot of time, especially after they are installed, but they do take a high degree of technical knowledge. There is a fair amount of learning to do at the beginning.
- Steve receives occasional calls from building maintenance for help on the Corporate Office electrical system
- He also helps System Protection occasionally with modems, with relay work he did in the past, etc.

ESINT1.doc

STAFFING STUDY INTERVIEW WITH JIM PARKER

The focus of this interview was on future changes in Mike Wernicke's job when JETS starts to wind down.

Job Estimating and Tracking System (JETS)

- JETS is presently a full-time job and will continue to be for the next two or three months, probably.
- The main area of concentration right now is the interfaces to other systems such as Gulf's Standard Plant Accounting System (SPAS), Gulf's material system (COPICS), and the new Customer Service System (CSS). The SPAS and COPICS interfaces are being worked on now, and should go into service in December of this year. CSS should be ready next February.
- Testing of each interface will take a significant amount of time
- Until the SPAS interface is in production, Mike will need to support manual closing of JETS work orders in SPAS. This will require a significant amount of time working with plant accounting, at least during the startup period.
- Other JETS work going on now is general assistance to all the new users, as well as clean-up of data problems encountered as we begin using the system.
- After the interfaces are all in production and we are over the startup hump, the work on this system should subside. Mike doesn't have a good estimate for the amount of this effort, but it is probably going to take a while to get down below one day a week.

Mobile Engineering Tool (pen computing for field engineers)

- This project has been dormant since the completion of the pilot in the fall of 1995.
- Mike's overall evaluation of the pilot is that it was "balanced" on the point of success. Two of the four users were willing to give up their machines at the end of the pilot (the two who had the IBM 730T hardware) and two users wanted to keep their machines (the two who had the Fujitsu Stylistic 500 hardware).
- Since then, MapFrame Corporation has developed a new generation of the software for Southern California Edison (SCE) that incorporates many of the suggestions made by our personnel to MapFrame and to the SCE personnel who visited Gulf. This new software would probably tip the balance in the direction of much greater usefulness and net increases in productivity for all users.
- Mike is working with Paul Wilson of MapFrame to get a demo version of the new software for Gulf. This project could take off once he has time to work on it again.

Future possibilities mentioned by Jim Parker during the interview include the following:

- pen computing projects (The Mobile Engineering Tool and other possibilities as well...)
- further work on the Customer Service System
- development of CD-ROM maps (in conjunction with the Automated Resource Management System (ARMS))
- engineering systems integration (represent Gulf on the Southern team that will be looking at this project)
- distribution automation
- development of Alabama Power's "Power Map" product for Gulf
- adaptation of the load-study system "DINIS" for Gulf
- implementation of the Southern Electric Geographic Information System (SEGIS) at Gulf

STAFFING STUDY INTERVIEW WITH PAUL TALLEY

Energy Management System (EMS-2000)

- He supports distribution & transmission control rooms and will install generating plant networks and stations starting in 1997
- keeps hardware up & running (Ernie Dixon and Jessica Collins do database, displays, etc.)
- He works with computers, networks, routers (replace and reconfigure, hard drives, etc.)
- He and Steve Carter are about the only people in company who know UNIX and that's why they do our work stations
- EMS is still in development and things change every day. He spends 2-3 days a week keeping the system running now. When it is a production system and operating stable, he expects it to take only 1 day per week. (Harris says that will be next April, but they've been saying that for 3 years now.)
- It will need 24-hour coverage from now on.

Trouble Call Management System (TCMS)

- He is doing the same things with TCMS: UNIX system administration and Network administration (Steve Carter & Sybelle Fitzgerald are doing drawing cleanup.)
- He spends maybe 1/2 day per week on this, average (it's a lot smaller system, all in one building, with only one server; whereas EMS has four locations across NW Fla.). The workload will probably stay the same over the next 2-3 years.

Weather Radar (this is the live video system for the control rooms, not the info system on the corporate office computer networks)

- This system has one station for the distribution control room and one for transmission control
- He supports the UNIX workstations and application software.
- The amount of time required is variable; he spent 1/2 day this week, but typically it takes only a couple of hours a week.

Southern EMS Teams

- This involves meetings, testing, and coordination
- He expects it to take about one day per week over the next 2-3 years (this is only an average, since one meeting can take a week.)
- This workload could increase if Gulf begins a distribution automation project next year, since EMS would be its front end.

Project Coordination and Design for Engineering Systems

- An example of this is the "crew callout" project that has just begun with Automation Consultants. This system will automatically call a specified number of employees of specified grades in a specified number of offices. It will be on a computer in the control room.
- Another example is the Distribution System Operator Training program. This is now being set up on a computer also.
- Plus he has several other small projects like this, as well as TCMS meetings, etc.

Prepare the Budget for Engineering Systems

- Capital and O&M budgets
- Gulf equipment budgets
- PE's and GWO's
- This does not include the SCS-IRO budget; James Lay does that
- He spends at least a week a year on this, sometimes more; for example, time figuring out if there is enough money left to buy another piece of equipment.

Computer Support for the control rooms

- Develop databases, other PC general support (example: an Approach database of all switches in Gulf Power for the control rooms.)
- This takes more time than anything else he does: say 2-1/2 days per week.
- (Note: we are up to 6-1/2 days per week already; he says some of this doesn't get done. Probably 3 days a week he fights fires; the other 2 days he works on projects.)

Maintain & Support UNIX / SUN / IBM RS6000

- This work is included in the previous items.
- This is mainly a skill-level issue; he wanted to emphasize that this work content is definitely engineering-level work.
- He learned most of this on the job: self-taught

Computer Support for Meter Shops

- He handles all meter-reading laptops, all meter-reading programming (basically everything David Jones was doing before he moved out of the meter shop) (Having David there first was a big help; David cleaned it up an made it manageable)
- This is about 1 day/week of work, but he has been sloughing it off lately

Special Projects

- A web home page for Power Delivery
- A web home page for the Distribution Control Center (procedures, employee names, etc.)
- Other miscellaneous projects
- On these projects, like others, he gets help from the co-op student

The work described above is engineer-level work. Anything that is technician-level, he gets the telecommunications department to do, after he diagnoses the problem.

We are getting ready to put in new routers with new software, etc. It will be a major effort to learn the new system and implement it.

Paul thinks that this work is too specialized to outsource, in general, to any one company. For example, the only people who would take on EMS would be its vendor, Harris; and only the vendor, CES, would take on TCMS.

All the bidders in the recent SCS-IRO outsourcing inquiry expected as a given that ***all*** computer hardware, cards, software, configurations, etc. would be standard across the entire Southern Company. There is no way we could do that.

He could possibly give up router maintenance to Scott Moore, but he and Scott are the only two in this area who know routers. With both of them working on routers, they serve as back-ups and redundant support for each other.

STAFFING STUDY INTERVIEW WITH WENDY DIXON

Date: 10-28-96

Wendy said she basically does whatever people ask her to do. Examples of recent work include:

- Developing Web home pages for the Control Center and Power Delivery (She learned how to do this at school, and then learned more from a manual on HTML that Paul Talley provided)
- Developed a switch list database for the control room operators and maintains it
- Check maps for TCMS in the TCMS on-line database
- AutoSketch drawings for engineering systems such as EMS-2000
- Wrote a program to reset modems in laptops at the Ft. Walton Beach and Panama City meter shops.
- Lots of "little things":
    1. measure the control room and prepare a drawing of it
    2. "go-for" tasks such as buying computer connectors, books, etc.
    3. help out in the control room in bad weather
- Shadow the engineers and learn from them

Wendy said that Wayne Jones did a lot of things over the summer on his quarter here, which she is not aware of.

ESINT4.doc

STAFFING ... JDY FOR ENGINEERS AND ENGINEERING REPRESENTATIVES

	ITEM	POSITION RESPONSIBILITES	LEVEL OF SKILL REQUIRED			TOTAL #	LEVEL			
			LEADER	TECH	HUM. REL	REQ'D	SR	1	2	3
ENG SYSTEMS										
ENG SYSTEMS										
1 incumbent 1 co-op position (2 incumbents)	A	Administer Energy Management System EMS(2000)	5	5	5	24 hrs/wk	x			
	B	Administer Trouble Call Management System (TCMS)	5	5	4	4 hrs/wk	x			
	C	Administer weather radar	4	4	4	2 hrs/wk		x		
	D	Provide network administration and design for EMS 2000 and TCMS	5	5	4	8 hrs/wk	x			
	E	Participate on SAuthora System Project Team, Test TEAM & Technical Staff for EMS 2000	5	5	5	4 hrs/wk	x			
	F	Provide project coordination & design for engineering systems	5	4	4	20 hrs/wk	x			
	G	Prepare budget for engineering systems	4	3	4	1 hr /wk				x
	H	Provide computer support for the distribution control room & the transmission control room	3	4	4	40 hrs/wk			x	
	I	Maintain and support workstation hardware/ software for UNIX/SUN/IBM RS6000	5	5	3	(incl. above)	x			
	J	Provide computer support for the meter shops - meter reading and programming computers	4	5	4	8 hrs/wk		x		
2 incumbents	A	Implement & support Trouble Call Management System (TCMS)	5	5	5	60 hrs/wk	x			
	B	Implement & support Computer Aided Protection Engineering System (CAPE)	4	5	4	4 hrs/wk	x			
	C	Project management of Automated Resource Management System (ARMS) - formerly automated dispatch	5	5	5	40 hrs/wk	x			
	D	Project management of the Momentary Outage Reduction Team feeder performance monitoring system (MORT-BOX)	5	4	4	4 hrs/wk		x		
	E	Maintain miscellaneous systems such as the Corporate Office and Pace Blvd standby generators	2	3	3	1 hr /wk			x	
1 incumbent	A	Support all aspects of JETS - design, development, testing, and training	5	5	5	10 hrs/wk	x			
	B	Design, develop, test, implement, and support the mobile pen computer work order system (MET) for distribution engineering	5	5	4	10 hrs/wk	x			
	C	Train & assist GPCo personnel in using MET	4	3	5	2 hrs/wk			x	
	D	Coordinate the development of interfaces between the new CSS and various Power Delivery computer systems - JETS, Trouble Call Management System (TCMS), and mapping systems such as SEGIS and FAMS	4	5	4	2 hrs/wk	x			
	E	Support and assist users with other computer systems such as Gulf's present distribution work management system (GAMMA), transformer load management system (TLM), recloser tracking system, and the new automated dispatch system	3	5	4	2 hrs/wk	x			
	F	Develop & monitor budgets for JETS & TLM	4	3	3	< 1 hr /wk				x
					Total	246 hrs/wk				

Note: Several of these systems require 24-hour x 7-day availability for call-out.

85

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: Technical Services Engineer

POSITION FUNCTIONS:

1) Provide technical engineering advice and training, to district engineering & marketing personnel.
2) Coordinate technical aspects of special projects, such as hospitals, industrial and large commercial load additions, submarine cable crossings, and key account customers.
3) Analyze system planning and protection studies, for applicability to district conditions and for inclusion in the budgeting process.
4) Interface with company personnel to establish distribution programs, and to coordinate their application into district operations.
5) Support the power delivery team by handling emergency work assignments and other special projects.

What Gpc

WORK VOLUME:

VOLUME ISSUE	PENSACOLA (Days)	FORT WALTON (Days)	PANAMA CITY (Days)
1. Technical Engineering Advice and Training:	48	24	24
2. Technical Coordination:			
a) Major Projects,	20	12	12
b) Commercial/Industrial and Key Accounts,	70	30	36
c) Power Quality;	24	12	18
Total =	114	54	66
3. System Planning & Protection Analyses:			
a) Area Distribution Study Data Gathering,	43	18	19
b) Study Incorporation into Budgeting Process,	20	11	12
c) Preparing Workorders from Approved Budget,	40	24	24
d) Study Application to Distribution Operations;	24	12	12
Total =	127	65	67
4. Distribution Programs Application:			
a) Osmose Pole Inspection Coordination,	30	15	15
b) System Inspection/Maintenance Coordination,	40	20	24
c) Other Distribution Programs Coordination;	21	11	13
Total =	91	46	52
5. Power Delivery Support:			
a) Special Area Assignments and Projects,	40	25	25
b) Storm Assignments;	20	10	10
Total =	60	35	35
Total Requirements:	440	224	244

RECOMMENDATION:

1) The Technical Services Engineer's work responsibilities are based upon the listed position functions;
2) Actual time spent on each function should correspond to work volume shown above;
3) Technical Services Engineer manpower requirements are:
   a) 2 assigned to the Pensacola Area,
   b) 1 assigned to the Fort Walton Area,
   c) 1 assigned to the Panama City Area;
4) Proper interface, with flexibility among Major Project Engineering Representatives, Field Engineering Representatives, and Power Quality Engineers, is critical to allow Technical Services Engineers to perform the most important functions.

POSITION FUNCTION DETAIL

1) Provide technical engineering advice and training, to district engineering & marketing personnel.
   a) Motor start analysis,
   b) Fault current analysis,
   c) Voltage drop and flicker analysis,
   d) Transformer loading analysis, and
   e) Other engineering training modules;

2) Coordinate technical aspects of special projects, such as hospitals, industrial and large commercial load additions, submarine cable crossings, and key account customers.

   a) Key account power distribution analysis and design, including load side power distribution,
   b) Large commercial power distribution design, such as malls,
   c) Large industrial power distribution design, such as the military and chemicals,
   d) Hospital power distribution design, such as transfer schemes,
   e) Special projects, such as submarine cable crossings,
   f) Power quality issues associated with source side power distribution,
   g) Other technical analysis and design projects, such as with power plants.

3) Analyze system planning and protection studies, for applicability to district conditions and for inclusion in the budgeting process.

   a) Area Distribution Study Data Gathering, pursuant to Distribution Bulletin No. 37, Procedures Section III. Phase I, Division Load Data and Collection, Items A through E; and Procedures Section IV. Phase II, Distribution Load Data Assessment and Evaluation, Item B, Division Input.
   b) Area Distribution Study Incorporation into Budgeting Process, pursuant to Distribution Bulletin No. 37, Procedures Section V. Phase III, Division OD(Operating Department)-35 Compilation; and Section VII. Phase V, Division Joint Budget Meetings.
   c) Budget inclusion into Distribution Operations, should be based upon area distribution study recommendations that are continually scrutinized. Overhead and underground distribution system orders, as well as general workorders shall be developed and coordinated to meet the requirements of each study recommendation.
   d) Area distribution load & protection studies shall be utilized for the every day power system analysis, to determine impromptu load flows and fault current conditions required to incorporate new load and system changes.

4) Interface with company personnel to establish distribution programs, and to coordinate their application into district operations.

   a) Osmose Pole Inspection Coordination, includes meetings that determine the inspection scope, provide mapping records, as well as coordination, review, and field critique of inspection, billing, reinforcement, and replacement process.
   b) System Inspection and Maintenance Coordination, shall be pursuant to Distribution Bulletin No. 10, which includes organizational programs, monthly/quarterly monitoring reports, and annual summary reports associated with overhead and underground power distribution systems.
   c) Other Distribution Programs Coordination, including programs such as padmount transformer and switchgear painting; Distribution circuit recloser maintenance; and the 800 Mhz digital radio system. Such additional coordination could require interaction with the following departments:
      i. Budgeting Department
      ii. Distribution Control Center,
      iii. Corporate Risk Services
      iv. Distribution,
      v. Engineering Systems
      vi. Environmental,
      vii. Information Services
      viii. Plant Accounting,
      ix. Project Services
      x. Substation and Transmission,
      xi. Support Services
      xii. System Protection,
      xiii. Telecommunications.

Support the power delivery team by handling emergency work assignments and other special projects.
a) Special Area assignment and projects, such as major underground subdivisions, reconductors, conversions, etc.
b) Storm Assignments, such as local, company, system, and off-system restoration efforts.

INTERACTION AMONG DEPARTMENTS

Technical Services (TS) interaction with system planning:

- TS will analyze both load and protection studies with the goal of completing all feeders every 3 years.
- Provide information to system planning on high growth feeders as to amount and location of new load. I.E. prepare load growth studies.
  Analyze recommendations made by system planning concerning major expenditures on our system.
- Prepare estimates and budget requests (OD-35's) for these items and submit them to the budget committee for their review.
- If approved , prepare the workorder and ensure the job is completed.
- With regards to field checking feeders, system planning suggests that a joint effort with TS be utilized.

Technical Services interaction with field reps.:

- When called upon by field reps. TS should perform various calculations and functions. These can include; but are not limited to, motor start calculations, fault current calculations, voltage drop, cable pulling calculations, fast transfer switching schemes, etc. In short, TS should handle the more technical aspects of some work-orders when needed.
- TS should be available to handle EA's on a temporary basis when workload of field reps. is high enough to warrant that action.
- The work responsibilities of the TS engineers, field reps, major projects, and planner/schedulers should be tied together for 2 reasons. The first is for professional development and the second is for flexibility in handling the work load.

Technical Services should interface with Power Quality as follows:

- Field reps should handle minor items- should at least check voltage and talk to customer, maybe use beast of burden.
- If problem is on source side of meter, it should fall upon technical services. If on load side, power quality should handle.

Technical Services should interact with system protection as follows:

TS should contact sys. prot. when more elaborate protection schemes are needed or when info. on breakers / relays is needed. TS should handle the bulk of system protection coordination issues as encountered by field reps. This should be done according to the standards set forth by system protection. This would include fusing, OCR coordination, etc..

Technical Services should interact with major projects as follows:

- When major projects originate from field reps, they should have some say if they want to do a special project to get the experience. Projects should not automatically be handed off because they fall into a certain category. However, if the field rep. is "loaded down" and a special project arises, they should contact their supervisor who will, in turn, contact the supervisor of special projects . At that point the supervisor of special projects will contact the TS coordinator and they will decide which group will get to handle the project. Certain types of projects do not need discussion between TS and major projects, such as DOT projects, county projects , UG conversions, and etc. Flexibility needs to be maintained in order to allow for varying workloads and other reasons.

Technical Services should interact with the Distribution Dept. as follows:

- Prepare OD-35's for plant budget.
- Review and help prioritize budget requests with PDM's and Distribution.
- Coordinate ground line pole inspection program for your district.
- Coordinate pole reinforcement program for district.
- Coordinate pole replacement program for district.
- Coordinate underground cable injection / replacement program for district.
- Coordinate OCR maintenance program for district.
  Coordinate a priority program (worst feeder reports) for doing DB-10 inspections.
- Coordinate group relamping programs.
- Coordinate transformer vault replacement programs.

ALTERNATE SOLUTIONS

1) Have major construction engineering representatives handle large projects previously assigned to Technical Service Engineers.

2) Have Planner Schedulers handle projects such as Osmose, pole replacement program, padmount painting, cable injection, etc.

3) Have engineering representatives handle some of the large area projects presently done by Technical Service Engineers.

4) Contract out special technical projects/assignments to an outside consultant.

5) Have Power Delivery managers handle technical related question and projects.

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: TECHNICAL SERVICES COORDINATOR

==========

POSITION FUNCTION:

1. Distribution work order system - JETS (Job Estimating and Tracking System) - Administrator.

2. Coordinate the development and implementation of Distribution Business Plan Projects and the Plant and O&M budgets by communication with the Power Delivery Managers and Technical Services Engineers. Review the distribution needs of the field, develop a planned solution, budget for recommended projects and negotiate for contracts where out-sourcing is the best option. Administer contracts and coordinate with the Technical Services Engineers to schedule and monitor the work in specific districts.

3. Coordinate distribution design and construction specifications and material standards additions and revisions. Coordinate the implementation of new specifications or materials when needed and plan and schedule a review of existing specifications and materials. Maintain distribution engineering publications. Coordinate distribution engineering design to residential and commercial line construction programs and policies.

WORK VOLUME:

1. Distribution Work Order System (JETS) - 40% of time (95 days) spent on this function.

2. Coordinate the development and implementation of distribution business plan projects and the plant and O&M budgets - 44% of time (105 days) spent on this function.

3. Coordinate distribution design and construction specifications and material standards and revisions - 16% of time (39 days) spent on this function.

RECOMMENDATION:

Maintain one position company wide to report to the Manager of Distribution to perform the functions listed above.

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996
TECHNICAL SERVICES COORDINATOR

1. **Distribution Work Order System - JETS (Job Estimating and Tracking System) - Administrator.**

   - Provide assistance to field personnel on the use of JETS (billing on jobs, create templates, etc.).
   - Work with Southern Company Services--Atlanta to maintain system and request updates.
   - Hold user meetings to get feedback and recommended changes to make system more effective and easier to use.
   - Attend quarterly JETS User Design Team meetings to review and approve changes to the system.
   - Revise the Work Order Processing Instruction book (outlining instructions on use of system and updating material and labor cost in JETS as needed).

2. **Coordinate the development and implementation of Distribution Business Plan Projects and the Plant and O&M budgets by communicating with the Power Delivery Managers and Technical Services Engineers. Review the distributions needs of the field, develop a planned solution, budget for recommended projects and negotiate for contracts where out sourcing in the best option. Administer contracts and coordinate with the Technical Services Engineers to schedule and monitor the work in specific districts.**

   - Ground Line Pole Inspection Program - (contract required - OSMOSE)
   - Pole Replacement Program
   - Deteriorated Conductor Program
   - Pole Relocation's and Clearance Corrections
   - Padmount Transformer Painting - (contract required - Utility Services & Maintenance)
   - Group Relamping Street Lights - (contract required - Asplundh)
   - Underground Cable Injection/replacement - (contract required - UTILX)
   - Network Operations & Maintenance
   - Transformer Vault Replacement
   - Removal of Unused Transformers
   - OCR Maintenance Program
   - Locate and Mark Underground Cables and Claims - (contract required for Ft. Walton - NOCUTS & Pensacola - Byers Engineering)
   - Worst feeder reports
   - DB-10 pole line maintenance inspections
   - Sunshine State One Call of Florida
   - Collect, review, and approve OD-35's from districts. Submit to Customer Operations Support for inclusion into Plant Budget.
   - Prepare O&M Budget for distribution projects. Submit to Customer Operations Support for inclusion into O&M Budget.

3. **Coordinate Distribution Design and Construction Specifications and Material Standards additions and revisions. Coordinate the implementation of new specifications or materials when needed and plan and schedule a review of existing specifications and materials. Maintain the following:**

   - Overhead Distribution Specifications
   - Underground Distribution Specifications
   - Distribution Bulletins
   - Distribution Engineering Handbook
   - Distribution Update Publications
   - Coordinate distribution engineering design to residential and commercial line construction programs and policies.

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996
TECHNICAL SERVICES COORDINATOR

1. **Distribution Work Order System - JETS (Job Estimated and Tracking System) - Administrator.**

   40% of time spent on this function

   Alternatives:
   - Have Distribution Manager do it.
   - Have another engineer outside Distribution Department do it (Engineering Systems Area, etc.).
   - Contract it out to Southern Company Services.
   - Contract it our to a local engineering firm.

2. **Coordinate the development and implementation of Distribution Business Plan Projects and the Plant and O&M budgets by communicating with the Power Delivery Managers and Technical Services Engineers. Review the distribution needs of the field, develop a planned solution, budget for recommended projects and negotiate for contracts where out-sourcing is the best option. Administer contracts and coordinate with the Technical Services Engineers and monitor the work in specific districts.**

   44% of time spent on this function

   Alternatives:
   - Have Distribution Manager do it.
   - Have each Power Delivery Manager do it for their own district.
   - Have the Technical Services Engineer do it for their own district.
   - Contract it out to another operating company (Georgia, Alabama, Mississippi or Savannah)

3. **Coordinate distribution design and construction specifications and material standards additions and revisions. Coordinate the implementation of new specifications or materials when needed and plan and schedule a review of existing specifications and materials. Maintain distribution engineering publications. Coordinate distribution engineering design to residential and commercial line construction programs and policies.**

   16% of time spent on this function

   Alternatives:
   - Have Distribution Manager do it.
   - Contract it out to another operating company (Georgia, Alabama, Mississippi or Savannah)
   - Contract it out the Southern Company Services.
   - Contract it out to a consulting engineering firm.

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: Engineering Reps. (Major Projects)

==========

POSITION FUNCTION:

1. Act as the primary contacts with the FDOT. Provide distribution engineering for pole relocations. Negotiate to minimize Gulf's cost while satisfying regulatory requirements.

2. Coordinate the engineering and implementation of overhead to underground conversions.

3. Act as Gulf's representative at local Utility Coordinating Committees, encourage cooperation with all utilities in the right-of-way.

4. Support District engineering staffs when workload overflow occurs. Provide distribution engineering on projects such as municipal and county road relocations, telephone and CATV requests, large URD projects and complex commercial or industrial jobs.

5. Provide cost estimates for plant budget items and engineering for PE work order preparation.

6. Provide backup for URD coordinators as needed.

WORK VOLUME:

1. DOT jobs = 131 days/yr.
2. OH/URD conversions = 24 days/yr.
3. Utility Coordination = 19 days/yr.
4. District support = 17 days/yr.
5. Budget items = 30 days/yr.
6. URD coordinator = 19 days/yr.

Source: Major Projects Engineering Representatives estimates.

RECOMMENDATION:

Staffing should remain at 4 unless management decides to outsource distribution engineering for FDOT and large URD projects. 2 employees then still would be needed to coordinate FDOT and to complete the remaining internal duties.

Precise quantification of the future work requirement for this group is difficult due to the uncertainty of the volume of district overflow and OH/UG jobs. No one contacted disagreed with the current staff of 4. However comments did indicate the need for better mutual understanding of the roles of district staffs and major projects. This work group should be more aggressive in pursuing the district overflow across " boundaries ".

cg/majproj.doc

Major Projects Engineering Representatives

1. Florida Department of Transportation Work

55% of time spent on this function.

Alternatives:

Have each Power Delivery District do their own.
Have the Technical Services Engineer do them for each district.
Contract it out to a consulting engineering firm.

2. Coordinate the engineering and implementation of Gulf's policy on Overhead to Underground conversion requests. These requests come from Marketing, District Engineering, and municipalities

10% of time spent on this function.

Alternatives:

Have each Power Delivery District do their own.
Have the Technical Services Engineer do them for each district.
Contract it out to another operating company (Georgia, Alabama, Mississippi or Savannah).
Contract it out to a consulting engineering firm.

3. Act as Gulf's representatives at the local Utility Coordinating Committee meetings.

8 % of time spent on this function.

Alternatives:

Have the Distribution Supervisor do it.
Have each Power Delivery District do their own.
Have the Technical Services Engineer attend for each district.
Contract it out to a consulting engineering firm.

4. Be flexible to provide District support when a workload overflow occurs on such projects as: City and County relocation of facilities, telephone and CATV work requests, underground requests for residential, commercial, or industrial engineering and design. Provide training assistance.

7% of time spent on this function.

Alternatives:

Have each Power Delivery District do their own.
Have the Technical Services Engineer do this for each district.
Contract it out to a consulting engineering firm.

5. Provide assistance with preparing budget items estimated costs and work order preparation.

12% of time spent on this function.

Alternatives:

Have each Power Delivery District do their own.
Have the Technical Services Engineer do them for their district.
Contract it out to another operating company (Georgia, Alabama, Mississippi or Savannah).
Contract it out to a consulting engineering firm.

6. Provide back-up to Underground coordinator engineering representatives when required.

8 % of time spent on this function.

Alternatives:

Have the Distribution Supervisor do it.
Request assistance from each Power Delivery District as needed.
Request assistance from the Technical Services Engineer from the district as needed.

1. Florida Department of Transportation Work.

- Work with FDOT to maintain system, negotiate, and respond to requests.
- Provide assistance to field personnel on preparing FDOT permits.
- Attend monthly Utility Coordinating Committee meetings and quarterly FDOT meetings to review status and discuss problems.
- Design and engineer relocation of facilities to accommodate road widening projects.

2. Coordinate the engineering and implementation of Gulf's policy on Overhead to Underground conversion requests. These requests come from Marketing, District Engineering, and municipalities.

- Set up meetings with affected parties
- Discuss specifics about potential conversion project -- Define parameters
- Discuss options on pricing -- Ball Park method and Deposit for specific price method
- Field Notes
- Prepare Estimates
- Apply Distribution Bulletin 44.0 to obtain Estimated Cost
- Coordinate with Marketing and District on presenting Price to Customer

3. Act as Gulf's representatives at the local Utility Coordinating Committee meetings. Encourage cooperation with all utilities in the right-of-way.

- Attend monthly Utility Coordinating Committee meetings to review statues and discuss problems.
- Foster positive relationships betewwn utilities to avoid conflicts and delay claims.

4. Be flexible to provide District support when a workload overflow occurs on such projects as: City and County relocation of facilities, telephone and CATV work requests, underground requests for residential, commercial, or industrial engineering and design.

- Work with district E & C Supervisors to maintain system, negotiate, and respond to requests.
- Provide assistance to field personnel on preparing work orders and estimates on underground subdivisions, along with large commercial, industrial, and military requests..

5. Provide assistance with preparing budget items estimated costs and work order preparation.

- Prepare estimates for assigned OD-35 budget items
- Prepare work orders for assigned projects that result from the approved budget for the current year. Often times these are different from the ones that were estimated.

6. Provide back-up to Underground coordinator engineering representatives when required.

- Coordinate and schedule contractor underground crews doing distribution work in various areas when the coordinator is out due to vacation, illness, etc.

	Panama City and Chipley District		
Active as of January 1996			
WPI No.	Number	Location	Let Date
3110312	46060-6548	SR 77 - Bailey Bridge	9/26/94
3110317	46060-6551	SR 77 n/o Hwy 231	
	46020-6556	US 90(15th St) & CR 2327	10/16/95
3110315	46020-6597	Hwy. 30 A from Beck Ave to SR75	
3110304	46040-6549	SR 77 / 23rd St.	
3119155	60020-6522	US98 - Peach Creek to Bay County Line	9/21/-11/07/94
3110283	46060-3532	SR 77 and Cove Blvd.	12/6/94
		US98-331East toEast of Peach Creek	5/8/95
3119123	60020-3521	SR77 @ 4th Street - Graceville	9/25/95
3114698	53060-6516	SR77 - From SR273 to Jackson County Line	4/9/96
3119702	61080-6532	SR79 - Washington County line to St. Johns Road	4/9/96
3114209	52030-6519		
3110334		SR 389 - From Hwy. 98 to Hwy. 231	7/20/96
3110327	46040-3555	Hwy. 231 North	7/20/96
3110329	46010-3544	US98 Alternate - Front Beach Road	7/20/96
3110252	46010-1537	Thomas Drive - US 98 Intersection	6/27/96

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

FORT WALTON - CRESTVIEW - DeFUNIAK SPRINGS

Active as of January 1996

WPI No.	Number	Location	Date	
3117424	57040-3578	SR20 @ Rocky Bayou	8/2/94	1
3117450	57010-3526	US90- Holt to Milligan	8/12/94	2
3119109	60010-6515	US 90 @ SR83N(9th St)	11/2/94	3
3127298	57000-3875	Martin Luther King, Jr. Blvd-SR30 to SR 189	5/1/95	4
3117434	57040-6582	SR85 Bridge -Niceville (Government Avenue)	7/5/95	5
3117463	57110-6534	SR 393 - Mary Ester Cutoff @ Lovejoy Rd	11/10/95	6
3117452	57080-3507	SR 4 - Santa Rosa County Line to SR 189 in Baker	7/12/96	7
0000000	57040-0000	SR 85 - Traffic Signal I-10 @ SR 85(CVW)	7/30/96	8
0000000	57040-0000	SR 85 - Traffic Signal P.J. Adams @ SR 85(CVW)	7/30/96	9
3117476	57050-3524	SR 85 @ Duggan Avenue/Alpin Road	8/13/96	10
3117462	57040-6589	SR 20 @ Bailey Drive Intersection	8/26/96	11
3117460	57010-1527	SR10(US90) -End 4-lane east to Walton County Line	9/27/96	12
3117461	57040-6590	SR 85 Eglin Parkway - US 98 to North Shalimar	10/14/96	13
3117457	57060-6515	SR 85 - End 4 Lane N. or CR 188 to End of 3 Lane	10/21/96	14

17

Potential	Reimbursement		Active as of January 1996					
WPI No.	Number	Location	Date	DSO No.	Total Cost	Re-Imbursable Amount	Assigned	Stage/Let Date
3111971	48004-3520	SR 727(Fairfield) @ SR 298 (Lillian Hwy.)	5/11/94					
3121062	48040-6629	Bayou Grande Bridge	5/11/94				KB	90% 05/29/98
3111062	48080-6532	Gulf Beach Hwy @ Navy Blvd.	5/20/94				KB/CB	? 07/30/97
3111068	48050-6538	Bayou Chico Bridge - Lighting and Signalization	6/3/94				KB	90% 09/24/97
3111063	48020-6562	US90(Mobile Hwy) @ W St.	6/15/94				KB/CB	
3111043	48012-6513	SR296(Bayou Blvd.) Firestone to Cervantes St.	6/6/94				KB	30%/60%/90% 05/28/98
3111044	48040-3508	US29 - Pace Blvd. to Brent Ln.	6/6/94				KB/CB	60%/ Info. Only/90% 01/24/98
3121062	48540-6528	Perdido Bridge @CR 292 - Gulf Beach Hwy.	6/6/94				KB	60%/90% 03/27/98
3111041	48003-6519	SR289(9th Ave)from Cervantes to Creighton Rd.	11/30/94				KB	90%
3110069	58040-6509	SR87 @ I-10	12/2/94				KB/AHS	30%/60%/90% 06/11/97
3111066	48003-1521	SR289(9th Ave) [illegible] Ln to SR290(Olive Rd)	4/11/95				KB/AHS	30%/60%/90% 04/30/97
3032127	48099-3511	Saufley Rd. - Muldoon to Mobile Hwy.	4/14[illegible]/10/95,8/24/95				AHS	30% 05/29/98
3142056	48270-3432	I-110 @ Cervantes - Lights	4/24/95				AHS	30%/60%/90%
3111067	48003-3524	9th Ave-Clements St. to SR750(Airport Rd)	5/10/95				AHS	30% 06/22/98
3110068	58005-3508	SR 281 @ CR 281-A Intersection	6/5/ & 7/21/95				AHS	60% 08/11/97
3110067	5801-6509	SR10(US90) from CR89(Ward Basin to 87)	6/16/95				AHS	30% 09/12/97
3111066	48050-6530	Sorrento - Bayou Chico to Bay	8/7/95				CB	30%/60%/90%/100% 05/29/98
3111077	48080-3533	SR298(Lillian Hwy.) @SR295(New Warington Rd)	7/21/95				AHS	30%/60%/90% 06/15/98
3111076	48030-6503	Scenic Hwy. (Hwy. 90) @ Nine Mile Road	8/28/95				CB	30%/60%/90% 04/24/98
3111093	48110-1507	SR298(Lillian Hwy) @ 65th Ave.	10/11/95				CB	30%/100% 04/10/97
3111061	48020-1507	Pp. Eleven Mile Creek Bridge	10/11/95				CB	30%
3127082	58000-3510	Blackwater Heritage State Trail	10/11/95				CB	30%/60% 08/11/97
3111099	48030-6517	SR290(Olive Rd) - Old Palfox Rd. to Whitmore	10/25/95				CB	90%
3111098	48205-3504	SR173(Blue Angel Parkway) @ Saufley Field Rd.	10/25/95				CB	60% 12/11/98
3110049	58040-3505	SR 87-US 98 to I-10	11/10/95				CB	30%/60%/100% 12/03/97
3112001	48060-3535	SR30(Garden St)/Paving Pace Blvd. to A St.	5/1/98				CB	60%/100% 04/30/97
3118027	58001-6514	SR89 - From US90 to SR87	7/10/98				CB	100%
3118045	58060-6519	SR 87 - End 4 Lane to Clear Creek Bridge	7/10/98				CB	30%
3142500	48270-6433	I-110 @SR 296	7/12/98				CB	30%/60%
3111068	48013-6517	SR 742(Burgess) - Hilburn Dr. to SR 291 (Davis Hwy.)	7/12/98				CB	90%
3111092	48013-6518	Creighton Rd(SR742) - 9th Ave. to Scenic Hwy(US90)	7/21/98				CB	90%
3111070	48030-6510	Olive Rd(SR290) - US29 to Scenic Hwy.(SR 10A)	7/21/98				CB	30%
3111094	48020-3504	SR10(US90) Cervantes St - Bayou Texar Bridge Ap.	8/20/98				CB	30%
3111974	48040-6568	US29 @ CR184 & Beck Lake Rd	10/21/98				CB	30%
3111083	48050-6548	SR292(Gulf Beach Hwy) - AL State Line to Bridge(ICWW)	10/21/98				CB	90%
3112008	48004-6523	SR727(Fairfield) -From Imperial Drive Intersection	10/21/98				CB	30%
3111970	48080-6524	SR95(US29) - CR4 to Al State Line	10/21/98				CB	30%
3112009	48080-6525	SR95(US29) @ SR 4	10/21/98				CB	90%
			10/21/98				CB	90%
							CB	90%

39

72

Engineering Summary
1994 Results for 4/1 - 12/31
Totals

Engineer	EA's	NWR	Dollars	DSO's	EO's	Planners	Avg Cost per DSO	Co. Pct. of Dollars	Dist. Pct. of Dollars
Major Projects									
Pens / Milton	111	2	$2,566,494	90	3	9	$28,517	11.47%	22.96%
PC / C	107	47	$574,524	55	3	40	$10,446	2.57%	13.57%
F/C/N/D	33	0	$2,337,574	55	0	18	$42,501	10.44%	33.54%
Subtotal	*251*	*49*	*$5,478,592*	*200*	*6*	*67*	*$27,393*	*24.47%*	
Tech. Services									
Pens / Milton	337	1	$1,009,380	251	72	3	$4,021	4.51%	9.03%
PC / C	206	79	$418,921	97	20	52	$4,319	1.87%	9.89%
F/C/N/D	51	2	$186,927	29	9	13	$6,446	0.84%	2.68%
Subtotal	*594*	*82*	*$1,615,228*	*377*	*101*	*68*	*$4,284*	*7.22%*	
Other									
Pens / Milton	370	45	$1,858,835	307	4	9	$6,054	8.30%	16.63%
PC / C	48	22	$594,244	124	1	8	$4,792	2.65%	14.03%
F/C/N/D	772	27	$784,475	49	0	1	$16,010	3.50%	11.25%
Subtotal	*1190*	*94*	*$3,237,354*	*480*	*5*	*18*	*$6,744*	*14.46%*	

	ISSD	% OF TOTAL ISSUED	COMP	NWR	> 30 DAYS	TENC	% OF TOTAL TENC	DSO	% OF TOTAL DSO	EO	PLAN	EA PL.. MONTH	DSO PER MONTH
PCOLA NORTH	1858	12.7%	1598	771	305	2,062,356	8.3%	634	10.4%	74	27	155	53
PCOLA CENTRAL	1927	13.2%	1845	1069	116	1,731,672	6.9%	538	8.8%	15	38	161	45
PCOLA SOUTH	1294	8.9%	1103	525	132	1,188,619	4.8%	393	6.4%	31	26	108	33
GULF BREEZE	676	4.6%	710	181	2	1,772,988	7.1%	423	6.9%	2	54	57	35
MILTON	911	6.3%	906	255	8	1,913,987	7.7%	610	10.0%	22	42	76	51
PCOLA SP PROJ	78	0.5%	120	30	7	2,050,097	8.2%	97	1.6%	3	0	7	8
PCOLA TECH SVCS	194	1.3%	194	2	0	2,082,820	8.4%	181	3.0%	28	34	16	15
PCOLA OTHERS	164	1.1%	165	5	0	1,424,049	5.7%	142	2.3%	0	0	14	13
PCOLA SUBTOTAL	*7100*	*48.7%*	*6641*	*2838*	*570*	*14,226,788*	*57.0%*	*3018*	*49.4%*	*175*	*221*	*594*	*253*
DEFUNIAK	176	1.2%	176	0	6	339,552	1.4%	157	2.6%	26	13	15	13
FWB1	1235	8.5%	1076	519	233	1,018,842	4.1%	258	4.2%	8	55	103	21
FWB2	313	2.1%	307	37	35	641,440	2.6%	130	2.1%	1	20	26	11
CRESTVIEW	741	5.1%	754	273	1	751,880	3.0%	405	6.6%	34	60	62	34
DESTIN	428	2.9%	458	33	66	2,284,357	9.2%	254	4.2%	57	87	36	21
FWB SP PROJ	16	0.1%	30	10	0	458,071	1.8%	22	0.4%	3	14	1	2
FWB TECH SVCS	39	0.3%	43	0	8	631,794	2.5%	16	0.3%	30	12	3	1
FWB OTHERS	156	1.1%	154	39	30	70,274	0.3%	50	0.8%	29	2	13	4
FWB SUBTOTAL	*3104*	*21.3%*	*2998*	*911*	*379*	*6,196,210*	*24.8%*	*1292*	*21.1%*	*188*	*263*	*259*	*107*
PC BEACH	898	6.2%	898	506	0	1,153,164	4.6%	316	5.2%	49	49	75	26
EAST PC	1047	7.2%	1051	605	0	884,541	3.5%	399	6.5%	45	36	87	33
WEST PC	987	6.8%	994	619	0	550,274	2.2%	334	5.5%	36	135	82	28
CHIPLEY	700	4.8%	692	312	6	419,460	1.7%	265	4.3%	24	51	58	22
PC SP PROJ	393	2.7%	410	81	1	459,967	1.8%	163	2.7%	137	87	33	14
PC TECH SVCS	298	2.0%	297	15	1	546,173	2.2%	244	4.0%	43	33	25	21
PC OTHERS	47	0.3%	47	28	0	503,790	2.0%	81	1.3%	0	7	4	7
PC SUBTOTAL	*4370*	*30.0%*	*4389*	*2166*	*8*	*4,517,369*	*18.1%*	*1802*	*29.5%*	*334*	*398*	*364*	*151*
PCOLA SUB TOTAL	7100	48.7%	6641	2838	570	14,226,788	57.0%	3018	49.4%	175	221	594	253
FWB SUBTOTAL	3104	21.3%	2998	911	379	6,196,210	24.8%	1292	21.1%	188	263	259	107
PC SUBTOTAL	4370	30.0%	4389	2166	8	4,517,369	18.1%	1802	29.5%	334	398	364	151
TOTALS	*14574*	*100.0%*	*14028*	*5915*	*957*	*24,940,367*	*100.0%*	*6112*	*100.0%*	*697*	*882*	*1217*	*511*

11.9% OVERALL

74

PANAMA CITY AREA (1995)

	ISSD	COMP	NWR	>30 DAYS	TENC	DSO	EO	PLAN	EA/MONTH	DSO/MONTH	$/DSO
PC BEACH											
Davis											
Martin	513	513	262	0	610067	204	29	22	43	17	2991
Corbitt	385	385	244	0	543097	112	20	27	32	9	4849
Subtotal	*898*	*898*	*506*	*0*	*1153164*	*316*	*49*	*49*	*75*	*26*	
EAST PC											
McGregge	43	43	0	0	79031	28	19	8	4	2	2823
Harmon	596	598	358	0	625454	205	20	21	50	17	3051
Miller, D.	408	410	247	0	180056	166	6	7	34	14	1085
Subtotal	*1047*	*1051*	*605*	*0*	*884541*	*399*	*45*	*36*	*87*	*33*	
WEST PC											
White											
Bottoms	540	542	332	0	526440	189	19	50	45	16	2785
Eberly	447	452	287	0	323834	145	17	85	37	12	2233
Subtotal	*987*	*994*	*619*	*0*	*850274*	*334*	*36*	*135*	*82*	*28*	
CHIPLEY											
Collins	700	692	312	6	419460	265	24	51	58	22	1583
Subtotal	*700*	*692*	*312*	*6*	*419460*	*265*	*24*	*51*	*58*	*22*	
SPEC PROJECTS											
David	34	35	16	0	20920	7	3	21	3	1	2989
King	359	375	65	1	439047	156	134	66	30	13	2814
Subtotal	*393*	*410*	*81*	*1*	*459967*	*163*	*137*	*87*	*33*	*14*	
TECH SVCS											
Forbes	202	201	3	1	231599	162	43	22	17	14	1430
Konz	96	96	12	0	314574	82	0	11	8	7	3836
Subtotal	*298*	*297*	*15*	*1*	*546173*	*244*	*43*	*33*	*25*	*21*	
OTHERS											
Misc	47	47	28	0	23765	17	0	7	4	1	1398
Sanders	0	0	0	0	392222	32	0	0	0	3	12257
Andrews	0	0	0	0	87803	32	0	0	0	3	2744
Subtotal	*47*	*47*	*28*	*0*	*503790*	*81*	*0*	*7*	*4*	*7*	

FT. WALTON AREA (1995)

	ISSD	COMP	NWR	>30 DAYS	TENC	DSO	EO	PLAN	EA/MONTH	DSO/MONTH	$/DSO
DEFUNIAK											
Dobson	176	176	0	6	339552	157	26	13	15	13	2163
Subtotal	*176*	*176*	*0*	*6*	*339552*	*157*	*26*	*13*	*15*	*13*	
FWB 1											
Adams	36	37	0	1	301056	53	0	0	3	4	5680
Evans	517	346	72	224	700928	191	8	55	43	16	3670
Scott	682	693	447	8	16858	14	0	0	57	1	1204
Subtotal	*1235*	*1076*	*519*	*233*	*1018842*	*258*	*8*	*55*	*103*	*21*	
FWB 2											
Guernsey	0	0	0	0	0	16	0	0	0	1	0
Feazell	313	307	37	35	641440	114	1	20	26	10	5627
Subtotal	*313*	*307*	*37*	*35*	*641440*	*130*	*1*	*20*	*26*	*11*	
CRESTVIEW											
Anderson	0	2	0	0	36333	11	0	0	0	1	3303
Lee	383	383	145	0	330828	195	24	49	32	16	1697
Barton	358	369	128	1	384719	199	10	11	30	17	1933
Subtotal	*741*	*754*	*273*	*1*	*751880*	*405*	*34*	*60*	*62*	*34*	
DESTIN											
Williams	15	28	9	0	238490	31	0	0	1	3	7693
Carroll	190	214	24	18	842283	87	22	32	16	7	9681
Reeves	223	216	0	48	1203584	136	35	55	19	11	8850
Subtotal	*428*	*458*	*33*	*66*	*2284357*	*254*	*57*	*87*	*36*	*21*	
SP PROJECTS											
Jones	16	30	10	0	458071	22	3	14	1	2	20821
Subtotal	*16*	*30*	*10*	*0*	*458071*	*22*	*3*	*14*	*1*	*2*	
TECH SVCS											
Rothbaur	39	41	0	2	199558	14	30	6	3	1	14254
Bailey	0	2	0	6	432236	2	0	6	0	0	216118
Subtotal	*39*	*43*	*0*	*8*	*631794*	*16*	*30*	*12*	*3*	*1*	
OTHERS											
Johnson	86	82	34	9	45549	26	7	1	7	2	1752
Misc'	70	72	5	21	24725	24	22	1	6	2	1030
Subtotal	*156*	*154*	*39*	*30*	*70274*	*50*	*29*	*2*	*13*	*4*	

PENSACOLA AREA 1995

	ISSD	COMP	NWR	>30 DAYS	TENC	DSO	EO	PLAN	EA/MONTH	DSO/MONTH	$/DSO
NORTH											
Blocker	0	0	0	0	0	0	0	0	0	0	
Abbott	646	493	148	182	715234	295	6	0	54	25	2425
Drane	972	956	570	25	1024664	274	66	27	81	23	3740
Lowe	238	149	53	98	322458	65	2	0	20	5	4961
Subtotal	1856	1598	771	305	2062356	634	74	27	155	53	
CENTRAL											
Johnson	0	0	0	0	0	0	0	0	0	0	
Manning	680	655	446	31	331889	186	5	8	57	16	1784
Miller	607	605	336	16	604895	172	4	1	51	14	3517
Mitchell	640	585	287	69	794888	180	6	29	53	15	4416
Subtotal	1927	1845	1069	116	1731672	538	15	38	161	45	
SOUTH											
Trump	82	81	19	1	200605	60	10	3	7	5	3343
Black (til 6/1) *	254	207	69		454880	118	2	1	21	10	3855
Stojack (from 7/1) **	418	366	207	31	289300	84	6	22	35	7	3444
Rivers	540	449	230	100	244034	131	13	0	45	11	1863
Subtotal	1294	1103	525	132	1188819	393	31	26	108	33	
GULF BREEZE											
Townsend	4	4	0	0	58301	4	0	6	0	0	14575
McCaffry	296	307	81	1	1055720	195	1	10	25	16	5414
Stojak (til 7/1) **	247	275	62		553249	151	1	31	21	13	3664
White	129	124	38	1	105718	73	0	7	11	6	1448
Subtotal	676	710	181	2	1772988	423	2	54	57	35	
MILTON											
Rogers	5	5	0	0	40410	5	0	1	0	0	8082
Butler	6	6	0	0	17507	7	0	0	1	1	2501
King, D	424	422	100	3	733826	324	13	20	35	27	2264
Lewis	476	473	155	5	1122444	274	9	21	40	23	4097
Subtotal	911	906	255	8	1913987	610	22	42	76	51	
SP PROJECTS											
Black (from6/1) *	45	86	30	7	287169	47	3	0	4	4	6110
Booth	9	9	0	0	104048	9	0	0	1	1	11561
Steele	24	25	0	0	1658882	41	0	0	2	3	40461
Subtotal	78	120	30	7	2050097	97	3	0	7	8	
TECH SVCS											
Dreadin	84	84	0	0	1583221	88	13	1	7	7	17991
Pinkerton	110	110	2	0	499599	93	15	33	9	8	5372
Subtotal	194	194	2	0	2082820	181	28	34	16	15	
OTHERS											
Akin	52	52	0	0	1158532	30	0	0	4	3	38618
Cardwell	91	91	0	0	35180	93	0	0	8	8	378
Misc	21	22	5	0	230337	19	0	0	2	2	12123
Subtotal	164	165	5	0	1424049	142	0	0	14	13	

77

SUMMARY Jan - June 1996

	ISSD	% OF TOTAL ISSUED	COMP	NWR	> 30 DAYS	TENC	% OF TOTAL TENC	DSO	% OF TOTAL DSO	EO	PLAN	EA PER MONTH	DSO PER MONTH
PCOLA NORTH	680	9.5%	605	267	273	454,858	3.1%	298	9.3%	6	10	113	50
PCOLA CENTRAL	564	7.9%	607	306	66	582,863	4.0%	209	6.5%	4	34	94	35
PCOLA SOUTH	604	8.5%	601	283	142	2,749,008	19.0%	239	7.5%	5	19	101	40
GULF BREEZE	557	7.8%	544	204	22	882,511	6.1%	298	9.3%	0	25	93	50
MILTON	554	7.8%	513	101	39	730,100	5.0%	393	12.3%	2	38	92	66
PCOLA TECH SVCS	97	1.4%	98	0	0	453,975	3.1%	79	2.5%	0	2	16	13
PCOLA OTHERS	521	7.3%	625	552	624	8,893	0.1%	3	0.1%	0	0	87	1
PCOLA SUBTOTAL	*3577*	*50.2%*	*3591*	*1693*	*1166*	*5,862,208*	*40.5%*	*1519*	*47.5%*	*17*	*126*	*596*	*253*
DEFUNIAK	88	1.2%	88	0	6	113,703	0.8%	90	2.8%	1	1	15	15
FWB	406	5.7%	331	39	332	615,172	4.2%	141	4.4%	2	58	68	24
CRESTVIEW	340	4.8%	338	48	3	674,821	4.7%	257	8.0%	24	24	57	43
DESTIN	277	3.9%	238	28	114	1,829,112	12.6%	240	7.5%	40	89	46	40
FWB TECH SVCS	24	0.3%	23	9	2	139,010	1.0%	9	0.3%	4	7	4	2
FWB OTHERS	230	3.2%	189	59	253	903	0.0%	18	0.6%	0	1	38	3
FWB SUBTOTAL	*1365*	*19.2%*	*1207*	*183*	*710*	*3,372,721*	*23.3%*	*755*	*23.6%*	*71*	*180*	*228*	*126*
PC BEACH	661	9.3%	655	323	8	849,382	5.9%	282	8.8%	15	61	110	47
PANAMA CITY	452	6.3%	459	178	1	868,616	6.1%	283	8.9%	23	52	75	47
CHIPLEY	354	5.0%	353	110	9	249,648	1.7%	171	5.4%	14	41	59	29
PC TECH SVCS	81	1.1%	82	3	0	412,627	2.8%	86	2.7%	5	16	14	14
PC OTHERS	593	8.3%	602	555	4	62,603	0.4%	46	1.4%	1	3	99	8
PC SUBTOTAL	*2141*	*30.1%*	*2151*	*1169*	*22*	*2,462,876*	*17.0%*	*868*	*27.2%*	*58*	*173*	*357*	*145*
SPECIAL PROJECTS	38	0.5%	39	3	9	2,788,381	19.2%	54	1.7%	2	71	6	9
SP PR SUBTOTAL	*38*	*0.5%*	*39*	*3*	*9*	*2,788,381*	*19.2%*	*54*	*1.7%*	*2*	*71*	*6*	*9*
PCOLA SUBTOTAL	3577	50.2%	3591	1693	1166	5,862,208	40.5%	1519	47.5%	17	126	596	253
FWB SUBTOTAL	1365	19.2%	1207	183	710	3,372,721	23.3%	755	23.6%	71	180	228	126
PC SUBTOTAL	2141	30.1%	2151	1169	22	2,462,876	17.0%	868	27.2%	58	173	357	145
SP PR SUBTOTAL	38	0.5%	39	3	9	2,788,381	19.2%	54	1.7%	2	71	6	9
TOTALS	*7121*	*100.0%*	*6988*	*3048*	*1907*	*14,486,186*	*100.0%*	*3196*	*100.0%*	*148*	*550*	*1187*	*533*

BC

sp10/17/96

ENGPRD96.WK4

SPECIAL PROJECTS - CORPORATE Jan - June 1996

	ISSD	COMP	NWR	>30 DAYS	TENC	DSO	EO	PLAN	EA/MONTH	DSO/MONTH	$/DSO
Bailey	1	1	0	6	426	1	0	0	0	0	426
Black	18	21	3	0	1064378	24	0	1	3	2	44349
Holland	0	0	0	0	0	0	0	0	0	0	0
James	9	8	0	2	152509	7	2	6	2	1	21787
Pinkerton	4	3	0	1	319063	5	0	62	1	0	63813
Steele	6	6	0	0	1252005	17	0	2	1	1	73647
Subtotal	*38*	*39*	*3*	*9*	*2788381*	*54*	*2*	*71*	*7*	*4*	

sp10/17/96

ENGPRD96.WK4

FIVE YEAR HISTORY FOR LINE CREW
PRODUCTIVITY - EFFICIENCY - EFFECTIVENESS
FOR 12 MONTH PERIOD ENDING ON INDICATED DATE

DATE	ON - SITE HOURS	AVAILABLE HOURS	PERCENT PRODUCTIVITY		PERCENT EFFICIENCY	PERCENT EFFECTIVENESS	YTD Sept
SEPT 96	15312.51	19812.51	77.29%	77.27	100.07%	77.33%	77.33
SEPT 95	14254.91	19166.04	74.38%	73.88	106.31%	79.07%	739
SEPT 94	13652.44	18309.95	74.56%	74.79	109.22%	81.43%	73.8
SEPT 93	12575.95	17293.55	72.72%	73.3	109.89%	79.91%	75.7
SEPT 92	11128.89	16021.61	69.46%	69.96	107.92%	74.96%	67.3

Sept L

Dec

% Productivity = Onsite hours / Available hours

% Efficiency = Estimated hours / Actual hours

% Effectiveness = (Overall Efficiency)(Productivity)

overall efficiency includes DSOs, special activites, and miscellaneous activities

Productivity

	L	S	L/S
S-96	77.27	66.11	73.25
95	74.37	64.34	70.89
94	74.56	60.95	69.79
93	72.72	57.23	66.27
92	69.46	55.05	63.14

Effectiveness

	L	S	L/S
S-96	77.33	91.91	85.6
S-95	79.07	80.57	80.9
S-94 (74.1)	81.43	89.43 (77.3)	84.90
S-93 (73.74)	79.91	76.07 (71.4)	78.71
S-92 (71.2)	74.96	57.05 (61.7)	67.25

28

	Line Crew		Service Crew		Line/Service		
	P	E	P	E	P	E	
1990	71.08	62.30 *(56.07)*	56.98	50.23	65.49	57.51 *(52.3)*	
1991	68.71	71.10 *(64.00)*	55.70	52.75	63.31	63.40 *(57.7)*	
1992	69.96	74.00 *(66.60)*	55.25	60.63	63.50	68.18 *(62.0)*	
1993	73.30	83.14 *(74.83)*	58.22	81.63	67.14	83.03 *(75.5)*	
1994	74.79	81.10 *(72.99)*	62.44	89.92	70.68	84.45 *(76.9)*	Benchmark Change
1995	73.88	73.88	63.78	80.55	70.27	78.77 *(78.8)*	
1996 Y-T-D Sept	77.27	77.33	66.11	91.9[1]	73.28	85.61 ~~*(82.1)*~~ (85.61)	~~June 1996~~

? Impact of (2) 1995 Hurricanes - Yes

? Benchmark Date of Application - November, 1993

? Crew Complement Change - 1993 and 1994

? Planner Scheduler Utilization Start April, 1994 to March, 1996

COMPARISON OF WORK ORDER LABOR COSTS
1992 VS. 1994

'92 manhour cost to '94 manhour cost.
- 31.02
- 33.30
- 33.73

WESTERN DIVISION:

	W.O. NUMBER	1992 COST	1994 COST	VARIANCE(%) (94-92/92)x0.9197
1	86700	334	296	-10
2	86701	99	122	21
3	86702	287	155	-42
4	86703	4,132	2,640	-33
5	86704	228	257	12
6	86705	123	131	6
7	86706	8,262	8,695	5
8	86707	102	82	-18
9	86708	493	663	32
10	86709	329	341	3
11	86710	493	647	29
12	86711	574	648	12
13	86712	29	35	19
14	86713	180	152	-14
15	86714	144	155	7
16	86715	67	127	82
17	86716	56	57	2
18	86719	1,173	1,054	-9
19	82035	29,627	24,884	-15
20	86721	111	128	14
21	86722	188	210	11
22	86723	44	55	23
23	86724	1,453	1,700	16
24	86726	97	142	43
25	86728	115	101	-11
26	86729	370	391	5
27	86730	193	197	2
28	86732	68	87	26
29	86733	188	194	3
30	86734	535	570	6
31	86736	294	351	18
32	86737	107	145	33
33	86738	114	129	12
34	86739	162	271	62
35	86740	361	515	32
36	86741	634	611	-3
37	86742	6,434	6,199	-3
38	86743	2,395	2,184	-8
39	86744	154	158	2
40	86745	236	280	17
41	86746	93	112	19
42	86747	298	272	-8
43	86748	225	212	-5
44	86749	259	416	56
45	86750	207	218	5
46	81993	34,321	25,686	-23
47	86752	2,027	2,352	15
48	86753	68	77	12
49	86754	241	285	17
50	86755	565	723	22
SUBTOTAL:		99,329	86,114	-12
TOTAL COMPANY:		177,566	159,609	-9

Report Date: 08/31/94 -- 02:30 PM

Report Name: C:\DATA\123\WOCOMP.WK4

COMPARISON OF WORK ORDER LABOR COSTS
1992 VS. 1994

CENTRAL DIVISION:

	W.O. NUMBER	1992 COST	1994 COST	VARIANCE(%) (94-92/92)x0.9197
1	52775	599	612	2
2	52774	115	143	22
3	52773	3,551	3,595	1
4	52772	2,201	2,348	6
5	52771	2,632	2,678	2
6	52770	2,283	1,980	-12
7	52769	234	163	-28
8	52768	513	550	7
9	52767	141	122	-12
10	52766	195	193	-1
11	52765	2,816	3,052	8
12	52764	29	14	-48
13	52763	876	973	10
14	52762	1,627	1,652	1
15	52761	1,802	1,765	-2
16	52760	451	566	23
17	52759	537	567	5
18	52758	297	373	24
19	52756	343	423	21
20	52754	901	1,062	16
21	52755	368	459	23
22	52753	592	682	14
23	52752	149	160	7
24	52751	400	437	9
25	52151	13,509	12,500	-7
		———	———	
SUBTOTAL:		37,161	37,069	-0

Report Date: 08/31/94 -- 02:37 PM

Report Name: C:\DATA\123\WOCOMP.WK4

COMPARISON OF WORK ORDER LABOR COSTS
1992 VS. 1994

EASTERN DIVISION:

	W.O. NUMBER	1992 COST	1994 COST	VARIANCE(%) (94-92/92)x0.9197
1	32332	166	189	13
2	32194	709	819	14
3	32309	59	62	5
4	32349	29	35	19
5	32346	158	162	2
6	32343	350	306	-12
7	32342	749	702	-6
8	32330	455	532	16
9	32321	66	74	11
10	32297	554	600	8
11	32374	33,436	28,718	-13
12	32282	69	77	11
13	32281	882	790	-10
14	32211	296	325	9
15	32202	242	247	2
16	32197	600	572	-4
17	32191	287	302	5
18	32185	427	467	9
19	32178	591	653	10
20	32165	331	350	5
21	32163	74	110	45
22	32158	100	120	18
23	32156	330	294	-10
24	32147	99	101	2
25	32146	19	19	0
SUBTOTAL:		41,078	36,626	-10

Report Date: 08/31/94 -- 02:30 PM

Report Name: C:\DATA\123\WOCOMP.WK4

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: Distribution Planner - Scheduler

POSITION FUNCTION:

1. Receive, plan, schedule, monitor, and inspect the work of the line and service crews - includes inspecting the job site, coordinating with other utilities and agencies, and securing tools, equipment, materials, and manpower.
2. Review engineering work orders to ensure "workability" - provide input on optimum design and construction.
3. Coordinate with other planner - schedulers to maximize crew productivity company wide.
4. Meet and effectively communicate with external customers.

(Items currently in job description, but recommended to be excluded)

1. Substitute for the Engineering and Construction Supervisor.
2. Coach and train engineering representatives to increase their knowledge of construction and engineering practices.

WORK VOLUME:

There are nine planner - scheduler positions currently in the organization. It is necessary to plan and schedule 447 distribution work orders per month. This work totals 67.1% of the total estimated net cost of all work orders. Requests generated by special projects and technical service personnel as well as blanket orders are excluded (see page 18 for details).

RECOMMENDATION:

1. Redefine the job requirements as outlined above.
2. Eliminate the planner - scheduler positions in Destin and Gulf Breeze. This work should be performed by the E&C Supervisor with help from the underground coordinators and engineering representatives.
3. Evaluate the need for a planner - scheduler only when the line and service crew compliment exceeds 16 employees.
4. The remaining planner - scheduler postions should be staffed at a level 4 or 5 engineering representative level.
5. Reevaluate the credibility of the productivity reports as a measure of crew effectiveness along with the planner - scheduler's impact in increasing overall performance.

DOCUMENTATION

PLANNER - SCHEDULER STAFFING STUDY

HISTORY (from TQM - Planning/Scheduling Final Report Recommendation - February 7, 1994)

Based on a study recommended by a TQM team on August 27, 1992, a pilot program which established a planner - scheduler was initiated in the Ft. Walton Beach office from April 15, 1993, to December 31, 1993. The cost effectiveness of the project was to be measured by the impact of crew on site availability as measured in the monthly productivity reports.

For each work order issued by the engineering department, the planner - scheduler would be responsible for coordinating all the preparations for the work order, including ordering material, arranging for utility locates, scheduling service interruptions, scheduling tree trim and pole setting, etc. When the orders were ready to be worked, the planner - scheduler assigned them to crews, grouping orders geographically to minimize travel time and to complete within the time constraints. The planner - scheduler was responsible for seven line crews and seven underground contract crews.

Following the pilot program, personnel from the Ft. Walton Beach area were interviewed for opinions as to the success of the program. Comments included:

Advantages

- time was been saved because the crews had the proper materials and everything was in order when they arrived on site
- line supervisors had more time to spend in the field with crews and in checking work orders for compliance with specifications and codes -- resulting in an increase in crew motivation
- complaints from the crew concerning delays and wasted time was lower
- scheduling problems between the underground contract supervisor and the other line supervisors were reduced
- small DSOs were assigned to service crews resulting in increased efficiency
- assigning work geographically improved travel time
- a one person focal point was smoother than several people coordinating the same job
- supervisors, engineers, timekeepers, and warehousemen could concentrate on their own jobs rather than planning and scheduling issues
- as a focal point, the planner - scheduler served as a communication link for feedback between the crews and engineers
- supervisory personnel agreed that having a planner - scheduler was worth giving up another employee

Disadvantages

- contributing factors clouded whether significant improvements had been made in increasing on site availability - ex: there was a change in the average crew size in Ft. Walton Beach
- the improved techniques of the planner - scheduler could be done by the supervisor instead of having a separate person for this work
- since the lineman development program was geared for developing independence and responsibility in the field, what was the benefit of allowing supervisors more time to spend with the crews in the field

Additional comments from the TQM team included:

Advantages:

- there was agreement on the positive comments from the supervisory personnel
- engineers needed training in calling for proper materials; planner - schedulers could help in this area
- visits to the field meant meeting the needs of the crew in regards to training, resource provisions, and team motivation
- the planner - scheduler should utilize the supervisor to verify field conditions

- the supervisor and planner - scheduler should work closely together and substitute for each other as needed
- there should be a standardized planning - scheduling technique; assignment of a planner - scheduler should be based on workload and number of workers involved.

Disadvantages:

- emphasis should be placed on planning and scheduling techniques - someone needs to be assigned the responsibility, not necessarily add another classification
- the line supervisor's role should be redefined to one of coach, motivator, and resource provider

Jerry Robuck, Gulf's consultant on the project, believed that one of the best measures of line department management was the percent productive hours, or percent on-time. Given a basic level of tools, equipment, and methods, the on-site productivity for any given lineman would be relatively constant and independent of motivation by the supervisor. The planner - scheduler should be able to increase this on - site time.

There was a steady increase in percent hours productive from January 1992 through June 1992 from 73% to 78% followed by random swings for a number of months. These swings stabilized, and in the first quarter of 1993, the percent hours productive appeared to have reached a reached a plateau at the same level as June 1992 of 78%. In May 1993, the values began to rise to a high of 81%.

The pilot program seemed to have coincided with the increase of 3% in the percent hours productive. Crews supported by the planner - scheduler averaged 1900 available man-hours per month. A 3% increase resulted in 57 additional man-hours or 114 paid man-hours for a two man crew. At a man-hour hour cost of $33.00/hour, this was equivalent to $45,000 per year.

Personnel changes, crew sizes, and equipment changes during this same period could have affected the results previously mentioned. Crew compliment changes in the service department allowed for additions to the line department which in turn had the manpower to work large projects. These PE jobs required less travel and could have affected the increased production. The increase in production could have also been attributed to increased productivity of the engineers, warehousemen, and supervisors. Planning and scheduling contract underground crews could have resulted in improvements.

Even though there was no clear numerical data to prove or disprove the effectiveness of the planner - scheduler, it was definitely a part of the progress shown in the Ft. Walton Beach area.

The recommendations and conclusions of the TQM team were:

- the planner - scheduler concept was cost effective, made common sense, and should be part of the team concept - the assignment of duties should be dependent on work load, territorial size, and manpower requirements.
- continue the Ft. Walton Beach project and establish similar positions in Pensacola and Panama City based on criteria established by the consultant - normally one planner - scheduler per line supervisor and 20 line service employees.
- do not establish planner - schedulers in smaller operating offices where it can be presumed that the close interaction among lineman, engineers, and supervisors will take the place of the planner - scheduler; the planner - scheduler techniques should still be utilized in these smaller locations

98

INTERVIEWS

Interviews were conducted with the planner - schedulers, engineering and construction supervisors, planner - scheduler support personnel, inventory management personnel, the original consultant, Jerry Robuck, and representatives from two other utilities which use a planner.

Planner - Schedulers

- concerning the revised bullet statement list (see page 15) - they still do more presently than what the revised list says; if they don't perform the tasks, someone else will have to - if engineers and supervisors always did their responsibilities, the list would be correct - whatever presently comes up, they handle
- job involves working with personalities
- everyday they do tasks the supervisor should do (customer complaints, equipment failure) - they are called upon by crews and engineers rather than the supervisor to handle problems; however, they consider this part of their job and are happy to be called upon - it is perceived to be part of their job - E&Cs have delegated some of the same responsibility they have to the planner - schedulers, but the planner - schedulers do not have the authority to coach, and the crews don't see the planner - schedulers with the same authority as an E&C; find themselves filling in for the supervisor at least 25% of the time - taking the supervisor's place should not be part of the planner - scheduler's job on a regular basis - E&Cs time is spent with union problems, bickering, coaching and discipline
- since the individual must be multi-functional to be a planner - scheduler and is called upon in lieu of the supervisor, the position should be a senior level representative position 5 - the levels should be consistent among all the planner - schedulers; revisiting the skills the planner - schedulers need to do the job should justify the level 5
- productivity reports are meaningless; planner - schedulers don't feel in competition with each other, but when the company looks at the productivity reports, competition is created
- considerable amount of time is spent working with the engineers
- is it good to free up an E&C who can only coach the skills of an engineer or a crew and not both?
- the position is seen as a training ground to gain opportunities and more experience - still important to keep engineering skills current (example of JETS)
- engineers need to interact with crews and should be responsible for what happens within their area
- all training being developed is in line construction - there is no engineering training - engineering support is needed to increase the skills of incumbents and the quality of their work - engineering quality is not what it should be
- planner - scheduler very often checks engineer's work - assuming responsibilities of "old area engineering supervisor and line crew supervisor" (E&Cs don't all have the engineering background)
- planner - scheduler is checking most every job in the field before sending any crews to the site
- ability of the crews is no problem - sometimes they take the empowerment to extremes
- customer response capabilities have increased with the concept of the planner - scheduler
- they serve as a liaison between crews, E&Cs, and engineers
- every area is different with crews all having different work methods - everyone brings different skills to the job
- average work week is 50 hours plus any storm trouble

These summarized bullet statements were mailed to each planner - scheduler for review.

INTERVIEWS (cont)

Engineering and Construction Supervisors

- E&Cs don't like the productivity reports - they are probably skewed due to hurricanes and not being able to perform maintenance on the system - can't schedule maintenance as fill work - also, crews are pulling poles, working on hi -line and in the repair shop; they concentrate more on team work than the productivity reports - many don't even send the face sheet out with the crews; depend on what they hear from customers and the volume of complaints
- when the E&Cs are away, the planner - schedulers are forced to fill in; believe that this is a swap off because with downsizing, it is not practical to upgrade a lineman - there are cost savings also with not upgrading a lineman
- as far as planner - schedulers checking jobs and training engineers, the E&Cs think the reps may feel more comfortable seeking advise from an engineering peer rather than going to their supervisor who is very willing to help
- agree that more of E&C time is spent in meetings and dealing with personnel problems
- agree that planner - scheduler should field check the majority of the jobs prior to sending crews to the site; some areas don't field check if a pole is not going to be installed
- concerning engineering expertise - inexperienced; they don't really draw large jobs - many of the crews could just go to the site and install what was necessary
- E&Cs don't think that there is a real problem with the crews changing the jobs in the field - ok to change as long as more materials are not required - if it will improve efficiency, it is ok
- E&Cs check many jobs after completion - that is not a responsibility of the planner - scheduler
- People go to where they think they can get the answer they want - that's why the planner - scheduler gets more of questions; peer to peer advise
- E&Cs don't see competition among planner - schedulers (and they shouldn't)
- if line work is not up to standards, it is the E&C's job to take corrective action
- planner - scheduler should be able to deal with crew personalities because it is part of being a leader
- if the planner - scheduler has a problem with a crew, it is his responsibility to notify the E&C - coaching and counseling is the responsibility of the E&C
- many E&Cs and planner - schedulers still work a fifty plus hour week
- crew might be using the private feature on the radio to call for additional materials to the site
- supervisory responsibilities are part of the planner - scheduler position; they should be able to fill in at any time
- E&Cs think the planner - schedulers may be assuming more than they should - they don't know when to say "no" - the more they do, the more it will become expected - they should only be planning and scheduling - shouldn't let crews play games with them; in other words, planner - schedulers are doing what it takes to get the job done even though it may be beyond their normal job duties
- agree that the planner - scheduler position should be a level 5 - a top notch person who wants to excel; believe they have more responsibilities than the current senior representative position; they need more skills than anyone in the study; believe that they are being compensated in the same manner the old line supervisors were compensated - basically doing what they use to do
- covered people take more of the E&Cs time - professional people should take less of your time
- agree that there is designated classroom time for line development, but none for engineers
- generally have 2-3 days work on truck; planner - schedulers should have a week planned, but things change (sickness, drug test, weather, etc)
- could reduce manpower (planner - scheduler or E&C) if the paper work, community involvement, meetings, etc were reduced; also would be reducing customer service, increasing overtime, and reducing engineering services; without a planner - scheduler, the entire focus shifts to "crisis management" - just hooking up customers, not planning; believe a planner - scheduler is needed in each location *except Chipley*; without a planner - scheduler, E&C could anticipate 10 - 12 hour days;

consider them a valuable asset - to schedule for the next day takes being available when the crews come in - probably necessary to regroup each day

- E&Cs deal with the people, customers, union, long term planning, etc.
- E&C should have time to spend with crews
- expect the planner - scheduler to plan work based on incumbents knowledge of work methods along with the job estimate
- line crew experience in a planner - scheduler is good because gain respect from the crews
- in smaller areas (Chipley and Crestview) the engineers help plan and schedule; every job is not field checked prior to construction
- crews should probably check with the engineer if a job needs to be changed, because the engineer is the one who has previously talked with the customer; crews changing jobs does not appear to be a problem by the E&Cs
- planner - schedulers should meet with engineers to determine priority work for the week

These summarized bullet statements were mailed to each Engineering and Construction Supervisor for review.

INTERVIEWS (cont)

Planner - Scheduler Support

- position level should be a level 4 with aspirations to a level 5
- perceived that everyone goes to the planner - scheduler rather than the E&C
- engineers are not trained well enough
- varies among areas as to who actually assigns work to the crews (see page 18)
- no other Southern Company operating company uses the planner - scheduler concept or has plans to do so
- no one else within the Southern Company does as much as we do on productivity reporting concerning crew effectiveness
- planner - schedulers possess knowledge which enable them to perform other tasks not normally associated with planning and scheduling functions (switching, claims, preparing work orders, etc)
- our "gamma" estimates are tied to established benchmarks

INTERVIEWS (cont)

Inventory Management

- believe that the planner - schedulers don't really know what their job entails other than to keep the customer happy
- there is an office environment with computer technology that can enhance their job, but they don't know how to use it
- they have assumed supervisory responsibilities but don't really know how to plan and schedule
- their tool is COPICS, but they don't know how to properly utilize it - they don't know how to allocate or track materials
- there is a need to know and understand basic line construction concepts
- crews are allowed to change jobs once they get to the job site
- MRP - Material Requirement Planning should be an integral part of their training - courses are available
- organizational skills and time management are a necessity in performing their duties because every day will be different
- politics will always come into play - designate some crews as rovers to handle the unexpected jobs

warehousemen were called to check on how many unscheduled deliveries are made to the crews once they are on the site - information is summarized on the next page

WAREHOUSE LOCATION	UNSCHEDULED DELIVERIES
General	1 - 2 / month; if requested to make an unscheduled run, they go ahead and make it a normal run 1 / week - someone comes to them for materials
Pine Forest	3 / day
Crestview	none
Panama City	1 - 2 / day
Destin	1 / day
Milton	none
Chipley	1 / week
Panama City Beach	2 / day
Gulf Breeze	1 / day
Fort Walton Beach	1 / day
Chase Street	2 - 3 / day

INTERVIEWS (cont)

Consultant, Jerry Robuck

- his concept of the planner - scheduler is a person who remains in the office and processes paper work as far as verification of materials and the content of the job
- the individual does not routinely make visits to the job site
- provides information to the crews such as location, directions, start and stop time of the projects
- should be able to plan and schedule 20 - 25 line personnel
- line supervisor is responsible for supervising crews and visiting job sites for quality, quantity, and safety issues
- the supervisor is not tied down with paper work
- the supervisor does have the function of staffing
- should routinely plan five days in advance - 100% M - 80% T - 60% W - 60% H - 30% F - then update and reschedule as necessary
- planner - schedulers should be able to compare to standard benchmarks
- ideally, the planner - schedulers should know the nature of the work and the benchmarks and be able to tie the two together

INTERVIEWS (cont)

Tampa Electric, Bob Taylor (813-228-4987)

- their planner - analyst does not go in the field
- engineering support checks work before it goes to the planner - analyst
- the line supervisor is the one who goes in the field; planner - analyst relies on their information
- line and engineering functions are separated
- the planner - analyst processes paper work, schedules material and equipment, check availability of materials, arranges for cable locates, and dispatches trouble

INTERVIEWS (cont)

Louisville Gas and Electric, Fred Krebs (502-429-7818) - Manager of Service Center

- their planner rarely visits the job site
- the planner does not check the work order
- design technicians have already visited the site and prepared a work order and estimated time required to complete the work
- the planner reviews the materials and the scope of the work; utilize time standards and benchmarks
- the construction supervisor and planner work as a team
- the planner also reviews the equipment needs and availability
- the planner is responsible for 6 - 7 crews which may be 2 - 3 man crews

SUMMARY REMARKS

- planner - schedulers often substitute for the E&Cs
- planner - schedulers don't feel they are compensated fairly when they do supervisory functions
- there is no perceived credibility in the effectiveness reports
- inexperience in the engineering personnel is a problem
- other utilities contacted and the consultant have different perspectives than Gulf Power on what the role of the planner should be within the organization
- there should be clarification on who is responsible for field checking work orders upon completion
- there are approximately 12 unscheduled deliveries made to the field daily

POSITION RESPONSBILITIES

A	Receive work orders and update
B	Review and check work orders for workability
C	Pre - inspect work location and determine needs - setting poles, trimming, obtaining tags, scheduling equipment, obtaining necessary manpower (including contractors), and checking availability of materials
D	Prioritize and schedule the work
E	Meet and effectively communicate with external customers - addressing complaints, obtaining property access, etc
F	Coordinate training and vacation schedules and adjust crew compliment accordingly
G	Route service crew orders and pole pull tickets and monitor the work
H	Coordinate with other planner - schedulers to maximize crew productivity company wide
I	Coordinate requests with the meter shop
J	Inspect work orders during construction and upon completion
K	Provide input on optimum design and construction

	Line Crew		Service Crew		Line/Service	
	P	E	P	E	P	E
1990	✓71.08	✓62.30 *(56.7)*	✓56.98	✓50.23	✓65.49	✓57.51 *(52.3)*
1991	✓68.71	✓71.10 *(64.7)*	✓55.70	✓52.75	✓63.31	✓63.40 *(57.7)*
1992	✓69.96	✓74.00 *(67.3)*	✓55.25	✓60.63	✓63.50	✓68.18 *(62.0)*
1993	✓73.30	✓83.14 *(75.7)*	✓58.22	✓81.63	✓67.14	✓83.03 *(75.5)*
1994	✓74.79	✓81.10 *(73.8)*	✓62.44	✓89.92	✓70.68	✓84.45 *(76.9)*
1995	✓73.88	✓73.88	✓63.78	✓80.55	✓70.27	✓78.77 *(78.8)*
1996 Y-T-D Sept	✓77.27	✓77.33	✓66.11	✓91.91	✓73.28	✓85.61

Benchmark Change

(—) Adjusted for Benchmark change in 1994

NATURE SAVER™ FAX MEMO 61616

To Charles Jordan	From L. Rouillier
Co./Dept.	Co.
Phone #	Phone #
Fax #	Fax #

	Line Crew		Service Crew		Line/Service	
1990	71.08	56.7 62.30 (56.07)	56.98	50.23	65.49	57.51 (52.3)
1991	68.71	71.10 (64.00)	55.70	52.75	63.31	63.40 (57.7)
1992	69.96	74.00 (66.60)	55.25	60.63	63.50	68.18 (62.0)
1993	73.30	75.7 83.14 (74.83)	58.22	81.63	67.14	83.03 (75.5)
1994	74.79	73.8 81.10 (72.99)	62.44	89.92	70.68	84.45 (76.9)
1995	73.88	73.88	63.78	80.55	70.27	78.77 (78.8)
1996 Y-T-D Sept	77.27	77.33	66.11	91.91	73.28	85.61

Benchmark Change

- ? Impact of (2) 1995 Hurricanes - Yes
- ? Benchmark Date of Application - November, 1993
- ? Crew Complement Change - 1993 and 1994
- ? Planner Scheduler Utilization Start April, 1994 to March, 1996

9

484-5655

7 MONTH AVERAGE FOR LINE CREW
PRODUCTIVITY - EFFICIENCY - EFFECTIVENESS

	3/96	4/96	5/96	6/96	7/96	8/96	9/96
McQuagge - David							
Productivity	67.06	67.20	70.93	70.35	70.33	71.43	74.20
Efficiency	119.39	119.45	105.37	109.89	108.88	105.85	107.72
Effectiveness	80.06	80.27	81.98	77.31	76.58	75.61	79.93
White - Wilkes							
Productivity	73.64	73.71	65.70	73.90	73.77	76.39	79.07
Efficiency	115.87	101.50	97.77	80.59	77.29	82.07	78.18
Effectiveness	85.33	74.82	64.23	59.56	57.02	62.69	61.82
Williams - Peel							
Productivity	77.60	77.32	77.16	77.23	77.08	76.57	77.24
Efficiency	108.31	103.83	96.67	95.22	94.02	97.91	90.65
Effectiveness	84.05	80.28	74.74	73.54	72.47	74.97	70.02
Guernsey - Feazell							
Productivity	79.21	79.64	80.16	80.26	79.78	79.22	81.63
Efficiency	90.31	85.15	83.60	82.09	80.82	81.80	83.67
Effectiveness	71.53	67.81	67.01	65.89	64.48	64.80	68.47
Townsend - Kell							
Productivity	71.48	71.02	71.92	72.67	73.12	73.48	76.79
Efficiency	138.71	116.81	117.22	110.74	105.61	98.23	101.33
Effectiveness	99.12	82.98	84.30	80.47	77.22	72.18	77.81
Rogers - Butler							
Productivity	74.38	74.85	75.41	75.53	75.56	75.71	76.05
Efficiency	123.05	114.13	113.96	113.38	114.23	116.78	117.40
Effectiveness	91.50	85.43	85.94	85.62	86.31	88.41	91.63
Trump - McNair							
Productivity	81.32	81.79	82.17	82.44	82.61	82.34	83.93
Efficiency	109.90	111.79	111.74	109.52	108.59	108.40	108.27
Effectiveness	89.37	91.43	91.82	90.29	89.71	89.26	90.87
Blocker - Miller							
Productivity	70.10	70.09	69.94	69.89	69.86	70.07	72.28
Efficiency	128.51	114.59	114.59	110.34	106.75	103.36	107.84
Effectiveness	90.09	80.32	80.14	77.12	74.58	72.42	77.95
Johnson - Booth							
Productivity	73.42	73.28	73.67	73.89	74.10	74.04	77.60
Efficiency	124.55	116.83	117.64	119.17	120.62	122.85	114.52
Effectiveness	91.44	85.61	86.67	88.05	89.38	90.96	88.87
Jenks							
Productivity	70.29	69.83	70.04	70.22	70.16	70.17	71.90
Efficiency	101.53	90.93	91.43	93.62	95.03	93.90	95.28
Effectiveness	71.37	63.50	64.04	65.74	66.67	65.89	68.51
Anderson							
Productivity	69.55	69.26	69.47	69.42	68.09	68.51	71.07
Efficiency	110.47	109.50	109.61	114.90	104.25	103.01	103.73
Effectiveness	76.83	75.84	76.15	79.76	70.98	70.57	73.72
Average Jenks and Anderson							
Productivity	69.92	69.55	69.76	69.82	69.13	69.20	71.40
Efficiency							
Effectiveness							
Average Total Company							
Productivity	74.25	74.27	74.54	74.68	74.68	74.70	77.27
Efficiency	110.31	104.79	103.94	102.79	102.79	101.32	100.07
Effectiveness	81.91	77.84	77.48	76.77	76.77	75.67	77.33

SUMM. SHEET

AREA	E&C	P/S	P/S LEVEL	FIELD REPS	REPS LEVEL	95 DSOs PER MONTH	% OF TENC	96 DSOs PER MONTH	% OF TENC	CREW COMP L / SVC	ASSIGNS WORK	CALLS FOR SPOTS
PF North	Blocker	Miller	4	Abbott Weathers Jones	4 4 3	53	8.3	51	6.6	17 / 5	PS	Clerk
PF South	Johnson	Booth	5	Manning Dixon Mitchell	3 2 5	45	6.9	36	4.2	16 / 5	PS	Clerk
Chase St	Trump	McNair	3	Rivers Stojak	5 4	33	4.8	40	13.5	13 / 5	PS	Clerk
Gulf Breeze	Townsend	Kell	3	McCaffry White	4 3	35	7.1	42	5.3	9 / 4	E&C / PS	P&E and PS&T
Milton	Rogers	Butler	3	King Lewis	4 4	51	7.7	61	4.3	13 / 4	PS	Clerk
FWB	Guernsey	Feazell	4	Scott Evans	3 2	32	6.7	19	3.2	15 / 7	PS	Clerk
Destin	Williams	Peel	3	Gates Reeves	3 3	21	9.2	33	10.4	9 / 3	E&C / PS	PS
Crestview	Anderson			Barton Lee	4 3	47	4.4	49	4.2	11 / 4		
PC	McQuagge	David	3	Corbitt Miller Harmon	4 2 4	61	5.7	44	5.9	14 / 7	E&C / PS	Clerk
PC Beach	White	Wilkes	5	Martin Bottoms Eberly	4 5 4	28	4.6	43	4.8	12 / 6	E&C / PS	Clerk
Chipley	Jenks			Collins	5	22	1.7	29	1.6	9 / 2		
TOTALS:						428	57.1	447	64			

Notes: The remaining dollars not shown in TENC are included in special projects, technical service work orders, and blanket orders. Assume the engineers responsible for these orders will be involved in the planning and scheduling aspects of the project.

RECOMMENDATION

Eliminate the planner - scheduler position in Destin and Gulf Breeze based on comparison information with the two offices which do not have a planner - scheduler, original recommendations of the TQM team, and comments from the interviews conducted. Assume there will be sufficient engineering skills within these offices to absorb these reductions.

	DSO/month	% TENC	# of eng	crew comp	who assigns work	Sept 1996 on site hours	Sept 1996 available hours	Sept 1996 % prod
Crestview	49	4.2	2	15	E&C	1,082.10	1,522.55	71.07%
Chipley	29	1.5	1	11	E&C	770.98	1,072.27	71.90%
Destin	33	10.4	2	12	E&C / PS	855.81	1,108.02	77.24%
Gulf Breeze	42	5.3	2	13	E&C / PS	1,076.75	1,402.24	76.79%
Total Co.						15312.51	19815.33	77.28%
Avg w/o Crestview & Chipley						13459.43	17220.51	78.16%
Avg for Crestview & Chipley						1853.08	2594.82	71.41%

Expect a productivity reduction to the Crestview and Chipley average
78.16 - 71.41 = 6.75%

Based on the Sept 1996 data, a 6.75% reduction corresponds to:

Destin: $\frac{855.81(.9325) \text{ on site}}{1108.02 \text{ available}} = \frac{798.04}{1108.02} = 72.02\%$ productive

Gulf Breeze: $\frac{1076.75(.9325) \text{ on site}}{1402.24 \text{ available}} = \frac{1004.07}{1402.24} = 71.60\%$ productive

Looking at lost manhours per month and associated dollars:

Destin: 855.81 - 798.04 = 57.77

(57.77)(2) ($40.43)(12) = $56,055 / year

Gulf Breeze: 1076.75 - 1004.07 = 72.68

(72.68)(2)($40.43)(12) = $70,523 / year

Assume the E&Cs, engineers, and URD coordinators will be able to minimize this reduction in productivity.

Lost manhour dollars are almost offset by salaries

Grade value for a level 4 is $47,016
Grade value for a level 5 is $54,072

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: FIELD ENGINEERING REPRESENTATIVES

POSITION FUNCTION:

1) This positions main function is receiving and completing the daily assignments generated from customer calls. Assignments involve preparing distribution service orders for new business and maintenance type customer requests ranging from outdoor lights, new homes or businesses, new subdivisions to TV/RADIO interference, blinking lights and other power quality type problems.
2) Complete emergency work assignments and other special projects.

WORK VOLUME:

- This review did not attempt to define work units and time standards in order to build a data base that would then define the staffing levels needed. This is beyond the time limits of this review. It would also be questionable, in this reviewer's opinion, as to the validity and value. Instead, the staffing recommendations are based strictly on analysis of the available data using information from both GAMMA and the Line & Service Allocation Study.
- Attached is the detailed review and data.
- Marketing projections indicate work load patterns to remain the same for the foreseeable future.

RECOMMENDATIONS:

This position is key to power delivery's ability to deliver service to our customers on a routine basis and should be staffed predominately to handle a general or wide variety of requests. This position also serves as part of a natural screening process for customer requests. Depending upon the complexity of the request that could be either in its technical aspect or engineering work hours, the assignment may be handed off to either a Technical Services Engineer or Major Projects Engineering Representative.

This position in conjunction with the Major projects Engineering Representatives, Technical Service Engineers and the Planner /Schedulers comprise the team that handles 99% of the customer requests that come in. 1% is in the highly specialized area that may require the assistance from other areas.

The work responsibilities of the District Field Engineering Representative, Planner/Schedulers, Major Projects and Technical Service Engineers are and should be tied together. This is important for two main reasons, the first is for professional development, it gives the opportunity for cross training which is needed in an atmosphere of reduced opportunities for advancement. The second is flexibility for handling the work load, even though the responsibilities for each position are clearly defined, there is a need for the flow of work between these areas to adjust for work load changes, this allows for staffing stability.

Analysis of data does not indicate the need for any major staffing changes. The tables below indicate that some reallocation of resources is needed, but the need for these adjustments have been recognized by local management. Deficiencies are constantly being corrected by using co-op's, technical services, major project representatives, planner/schedulers, power delivery managers and others. There may be some merit to the creation of a "technical aide" type of position to provide assistance to not just this group but as well as others. Obviously this evaluation is not an exact science, local supervision and management can determine what's best for their area, A "lets try it and see what we can do" attitude versus automatically filling vacancies is important, along with working together as a team and not letting who we report to or what area we work in, get in the way of doing what's right to get the job done.

RECOMMENDATIONS CONTINUED:

Each area needs to evaluate for themselves available data to determine if some work loads can be balanced by adjusting field engineering area boundaries. It may be necessary to extend boundaries into another E & C area to accomplish this.

Staffing recommendations are shown below using GAMMA DATA and using LINE & SERVICE ALLOCATION DATA.

	GAMMA DATA APPROACH			
OFFICE	CURRENT STAFFING	AVERAGE BENCHMARK	RECOMMENDED STAFFING	CHANGE & REMARKS
MILTON	2		2.5	+.5
PENSACOLA	10		11.3	+1.3
CRESTVIEW	2		1.7	-.3
FORT WALTON	4		5.6	+1.6
PANAMA CITY	6		4.4	-1.6
CHIPLEY	1		.7	-.3

	LINE & SERVICE ALLOCATION FACTOR APPROACH			
OFFICE	CURRENT STAFFING	ALLOCATION FACTOR	RECOMMENDED STAFFING	CHANGE & REMARKS
MILTON	2	0.125	3.1	+1.1
PENSACOLA	10	0.380	9.5	-.5
CRESTVIEW	2	0.072	1.8	-.2
FORT WALTON	4	0.187	4.7	+.7
PANAMA CITY	6	0.176	4.4	-1.6
CHIPLEY	1	0.060	1.5	+.5

IN ADDITION TO THE ABOVE, SOME OTHER SUGGESTIONS/IDEAS THAT WERE RECEIVED DURING THIS REVIEW PROCESS ARE:

County or City road projects in addition to D.O.T. projects should be handled by major project representatives. Also, lighting projects that require specialized lighting such as metal halide.

Some work load relief could possibly be provided to the Chipley area by contracting out cable spotting.

The technical aide type of position as mentioned earlier could provide needed assistance to areas and positions at a lower cost. Maintenance patrol in the past was done by engineering representatives, we are now using one man crews which is more costly in terms of taking a blanket approach to work done including correcting code violations that should be paid for by others. This position could do some of this, at less cost and be more selective on how our limited budget dollars are spent.

All tree trim requests should be handled by the Tree trim Coordinators.

The full impact of CSS on this area is not clear at this time but could be significant in generating added work. The effect of JETS still remains to be seen, the consensus is that it will speed up work processes.

The quality of support for our computer and communication systems is increasingly critical, improving response time for solving problems needs to be given a higher priority.

Power Quality, "blinking light", TV/RADIO interference problems need to be handed off to technical services and power quality folks more often when they have no quick fix by the engineering representative.

POWER DELIVERY - NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW OF

DISTRICT FIELD ENGINEERING REPRESENTATIVES

BACKGROUND: The reason for this study is to determine Power Delivery's highly competitive business needs in regards to number of positions and skills required for these positions. This study will analyze district field engineering representative work load, work requirements and work-force organization to structure ourselves to be America's Best.

ISSUES/PARAMETERS TO CONSIDER:

- Work Quantity/Complexity.
- Sources for work data, weighting factors.
- System Consolidation.
- Service Level.
- Staffing Levels.
- Exempt/Non-Exempt.
- Outsourcing.
- Co-op students.
- Do-Don't do items.
- Strategic relevance.
- Rep. input/peer input.
- Other?

STAKE-HOLDERS: External customers, Internal customers (Power Delivery, Customer Service, Marketing), Gulf Power's Strategic Plan.

TIME SCHEDULE: Report due Nov. 12. Next meeting will be to discuss report's conclusions & recommendations on Nov. 18. Implementation date to be determined.

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

SURVEY QUESTIONS:

- What is the relevant data to use in evaluating your work load? Such as Gamma items, number of customers, sq. miles of area covered, DSO $ generated by PE for each individual, etc.?
- Do weighting factors seem like a good idea to level playing field?
- Over the last 2 years what staffing changes have happened that would affect these numbers?
- Impact from JETS, CSS, Call-Center, Centralized Control Room, etc.?
- What work do you do that others don't or what work are you not doing that you should? What work tasks should we eliminate?
- How well are field work efforts coordinated with other functions such as tree trim, urd coordinators, major project reps., technical services, etc..

FIELD MEETINGS AND INPUT RECEIVED:

Oct. 7, 2 PM meeting with Crestview E&C Team.

⇒ Its not practical to specialize on "types" of work (because of staffing levels) versus a general work knowledge is needed. You need to be able to handle everything from an O.L. request to urd subdivision to a new Wendys.

⇒ DSO dollars generated does not give an accurate picture of staffing needs because of the higher cost of some materials. For example, an area that does lots of underground distribution work will reflect very high DSO dollars versus an area that does mostly overhead construction.

⇒ MHRS - overhead versus underground, underground generates a lot ofDSO mhrs.

⇒ Engineering time to prepare an underground DSO is greater than an overhead order.

⇒ Differences in work order designs may slant the DSO dollars and estimated mhrs.

⇒ Work load needs to be looked at by Plant Expenditure number. You can generate as much maintenance type work as you want but is all of it necessary. Each area should have a set amount of engineering man-hours devoted to maintenance that is optimal for taking care of their power system and meets company goals for CMI improvements.

⇒ Weighting factors similar to those used in the Line/Service resource allocation study is needed to get all areas on the same playing field.

⇒ What is the best way to handle the DeFuniak engineering work? The local manager is currently responsible for part time engineering duties.

⇒ Additional maintenance man-hours are needed in the DeFuniak area to further improve system reliability.

⇒ Some work measures to take into consideration are: premise additions, number of customers, miles of line UG and OH, square miles of area covered, impact of JETS, impact of CSS, community involvement, training, travel time for training, filling in for supervision.

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

FIELD MEETINGS AND INPUT RECEIVED:

Oct. 8, 10 AM meeting with Chipley E&C Team.

- ⇒ All assignments do not take a work order, yet may be very time consuming. Travel time is a big factor - we cover three counties.
- ⇒ We keep track of feeder balance at substations to avoid outages, UG DSO preparation is more time consuming then OH.
- ⇒ We get support from the Panama City area as needed for large time consuming projects and Major Projects Rep..
- ⇒ Donnell does planner/scheduler work, He calls in locates for pole setting, clerical does not have field knowledge needed.
- ⇒ Impact of JETS, learning curve has slowed us down, Clerical support is from administration.
- ⇒ Sunshine one call tickets are reviewed by Donnell, he does the spotting.
- ⇒ He provides tree trim support by providing maps, Road permits for jobs are drawn up by Donnell.
- ⇒ Fill in for supervision, He did do some road jobs - if just a few poles, now he is turning over all of them to the Major Projects Rep..
- ⇒ Inter-working between Area Eng. rep. & Major proj. rep. & Tech. ser. Eng..
- ⇒ We had co-op help in 94, part of 95, Joel in 95 and part of 96.
- ⇒ Line/ service depends on Donnell to assist with field questions, trouble shooting, etc..
- ⇒ System control calls him when problems happen, he is on the T&D switching lists.

Oct. 8, 1 PM meeting with Panama City East E&C Team.

- ⇒ A concern is that we do not report all assignments.
- ⇒ Experience level of Reps is a factor to consider in relation to productivity.
- ⇒ PLD orders are very high priority, time consuming and lots of them. We handle claims from beginning to end.
- ⇒ Field checks for O.L., tree trim, we don't always generate assignments for these. Field checking for drafting.
- ⇒ Lighting audit was done by reps after the meter readers.
- ⇒ Meeting with SB&T on work involving pole setting, ends up being reworked when they don't do what was agreed to at the start. Also, they are going to contract out all engineering not sure if this will increase tim. v/problems.
- ⇒ Crew support when questions arise. Reps have to fill in for cable spotting, do fault locating. Fill in for E&C's and Planner/Scheduler.
- ⇒ Added work created by customer service with customer calls. New structure, system and/or experience level of cust. ser. reps. is creating more rep work that should of been handled by the cust. ser. rep. or passed onto another party.
- ⇒ Phone system has added a burden. Out of the ordinary special projects such as "shoe box fixture" request by a customer can be very time consuming.
- ⇒ Added concerns are how will recommendations be implemented - opening all positions at once, by area, everyone wanting to be on the best E&C Team, what about folks that don't get selected?

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

FIELD MEETINGS AND INPUT RECEIVED:

Oct. 8, 3 PM meeting with Panama City West E&C Team.

⇒ How do you proceed with this review - look at each area or E&C team or other? Working smarter doesn't mean more paper work. You can create as many assignments as you want.

⇒ O.L. audit, field checks, recalculating extra facilities. We handle claims. Power quality problems, trouble shooting customer problems are very time consuming.

⇒ Tree trim assignments. Assignments were generated in the past for every customer call. Travel time due to traffic. We provide technical support for Chipley. Outdoor light audit is continuous due to diligence of cus ser..

⇒ Impact of call system, tickets/calls that radio operators use to handle are now being handled by reps..

⇒ Field checking of urd service requests for trenching is very time consuming. Issue to consider is 90 elbow at the house - should GPC provide this, if we did may reduce problems. Coordination of this work, who should be mainly responsible. DOT permits have to done by reps..

Oct. 9, 9 AM meeting with Fort Walton Beach E&C Team.

⇒ We need to clearly define what is expected of the Eng. Reps. and other functions such as Major project reps. , Technical services, Urd coordinators, etc..

⇒ Time in meeting with customers on power quality problems, crews. Added phone calls from customer service.

⇒ Don't know how you would use Gamma reports due to accuracy of it resulting from inconsistent input in each area.

⇒ It would be more valid to look at data similar to the Line/service allocation study.

⇒ We use the blanket work order process for most of our orders, others are still generating individual work orders.

⇒ Customer service is not asking the right questions of customers or not listening to them based on the calls/tickets that we get.

⇒ Espy handles all tree trim requests, customer ends up with the right answer to start with.

⇒ Ensure fairness of the selection process no matter where you are located or current position level.

⇒ We need to keep options open for reps to allow them to develop and be able to advance.

⇒ Customer service could really load us down with assignments with CSS interface to JETS.

⇒ We are having to meet more often with P&E crews , checking on and resolving urd customer problems.

⇒ Rothbauer handles a full field area reducing our work load. Training time.

⇒ We do a lot more that is not shown on any reports in resolving customer problems, storm patrolling, and all the daily communications/ team work with other depts., etc.....

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

Oct. 9, 3 PM meeting with Destin E&C Team.

⇒ Urd will always be more expensive. Primary feet and transformer KVA may be more relevant. Urd subdivsion work is even more complicated.

⇒ New construction versus maintenance work for each area. You can have maintenance work generated as a result of a new business job.

⇒ Need weighting factors.

⇒ Over all JETS is a lot quicker.

⇒ We do lots of urd planners. This area demands more of these. City is trying to go all underground.

⇒ We do lots of lighting jobs.

⇒ Urd coordination seems to have gray areas on who handles what. They are crossing each others paths by having the responsibilities for primary and secondary split between folks.

Oct. 10, 9AM meeting with Pineforest E&C Team.

⇒ DSO $, number of assignments, etc., anyone of these items does not reflect the whole work picture.

⇒ Lots of time spent on Power Quality, interference, shocking pools.

⇒ Lots of phone calls, communications with marketing, customer service, electricians, builders, etc., are not accounted for in the data that's available.

⇒ You need to know load growth projections for the future by area.

⇒ Training time spent by experienced reps in bringing new folks up to speed.

⇒ JETS - kind of early to tell, but overall we feel that it will be positive effect in helping us to be more productive.

⇒ Keep the possible effect of CSS in mind when looking at the work load.

⇒ Call - Center and Centralized Control room appears not to have any major effect on work load.

⇒ We handle all tree trim tickets. We do initial leg work on claims.

⇒ Calls from control room directly to reps. versus crews for low wires and other customer problems. Does it happen in all areas as frequently as it appears here?

⇒ Major project reps do not do county road projects.

⇒ Metal-halide lighting for parking lots, we will be doing more commercial lighting applications, what will be our role?

⇒ Concern - some exempt positions are being reviewed by the manger directly responsible for that area, will it be done fairy?

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

Oct. 10, 1:30 PM meeting with Chase St. E&C Team.

⇒ Look at # of assignments, DSO $, etc., as a gauge. The number of customers by rep. would be good to look at.

⇒ We feel comfortable about using weighting factors on available data to have a fair comparison.

⇒ Multiple planning estimates for customers are time consuming and not reflected on assignments or anywhere in the work picture.

⇒ Power quality, blinking light problems are very time consuming. The technical services engineer should be picking up more of this because they have the time and expertise.

⇒ Customer satisfaction is very important, you need to have the time to spend with customers. They look for this as part of providing quality service in treating them in a manner that shows concern for their problem versus just rushing from one assignment to the next.

⇒ The last two years would be a good reflection of our work load. We did have a co-op for 6 months.

⇒ JETS - more difficult, have to run gamma also to feed productivity reports.

⇒ JETS - too early to tell, we feel it may slow us down. But it does give more information, and easier to give multiple estimates.

⇒ Don't let technology drive us where we become its slave versus it being a tool that does support us and helps us be more productive.

⇒ We look at all tree trim requests before they go to the coordinator. Cable spotting and urd locating is done by others.

⇒ Maintenance patrol in the past done by reps, now using one man crew. In the past we took care of only what really needed to be done, now every pole has something done on it resulting in more costs, also we end up correcting code violations that others should be paying for. No urd patrol is done.

Oct. 11, 9AM meeting with Gulf Breeze E&C Team.

⇒ Assignments and work orders show only a part of the work, it doesn't show all of the calls we get. Assignments are not done all the time. Lots of calls come straight into our office since our phone numbers are published in the book here. Our customers have direct access.

⇒ Still have cams come to us with 10-15 lights for disconnecting involving homeowner associations, businesses to check - customer service says they do not have the time to do this.

⇒ We have reduced participation in programs such as safety city, program will not be as effective as before. In our area we took the reduced paper work approach which means GAMMA will not show all of our work.

⇒ JETS - no real feel for this yet, should lead to easier job tracking, assignments and correcting errors. CSS - needs better training to screen calls and get customers to the right party at the start.

⇒ We are still dealing with storm related damage, ends up being a rush. McCaffrey does special projects, Paul and co-op take care of routine stuff.

⇒ Southern Communications cellular quality is still lacking, have to use personal cellular phones. Tree trim tickets go directly to reps, and are received by phone direct from customer.

⇒ Power quality problems, blinking lights end up being a big consumer of time. Cable spotting, fault locating is done by others.

⇒ Claims - we gather just the facts and turn over to Hawkins. Average 60 miles a day, traffic volume not a big problem versus distance that has to be covered. All poles are telephone company, coordination has improved, not sure about future with SB&T contracting out engineering. We have to pacify customers when its Bell's problem and fax information to be sure information is communicated.

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

⇒ Who will feed information to CSS when a subdivision goes in? We suggest marketing. Auto-Cad - how much of this do we want to get into?

⇒ We need quick response when our radios or computers do not work - which we are not getting now, this is needed more as we grow more dependent on this technology.

⇒ We check on u.d projects to see if path is clear for trenchers and do follow up calls needed to coordinate the work.

⇒ Flat estimates have been a real help in getting the job done.

⇒ Everyone needs some field experience to understand this side of the business - such as engineers that later may provide support.

⇒ Skills development and opportunities to do this is very important. We can't leave our positions as other can to participate on committees or developmental opportunities.

Oct. 11, 1PM meeting with Milton E&C Team.

⇒ You can look at the GAMMA data for district offices but keep in mind we have more walk-in customers, community projects, inter-action with other depts., for example customer service helping with applications. Smaller offices inter-act with crews more. Any office that has walk-in customers has more work than is indicated on reports, solving customer problems even when it may not directly relate to "normal" engineering representative duties.

⇒ Not any one piece of information will show the whole picture, only generated E.A.'s when DSO required, we did not have clerical help needed. Rush orders handled by ourselves, district secretary provided help. We now have a clerk that is shared with customer service who reports to district manager.

⇒ We had a co-op every other quarter. JETS - may be too early to tell but looks like it will be better. CSS - not sure of impact or how we will inter-face. Wee look at tree trim requests, take care of Century - travel time factor.

⇒ Assist crews at times with work, inspecting customer installed urd. Pushing more on customer - trenching, pulling wire, we have to run more planners for estimates to get cost differences, requires more customer coordination/contact.

⇒ Cable spotting and urd fault locating is done by others.

⇒ We don't have a lot of folks to delegate work to, no one to screen calls - calls come in direct because customers do not want to deal with the auto-call system, clerical help mainly does time reporting, we do most of the clerical work.

⇒ Walk-in's - 2 or 3 a day, you have to stop everything to address their needs. A small community seems to expect or want more of a personal touch that takes more time. The new radio system has helped a great deal by reducing the time it takes in getting a hold of folks such as the tree trim coordinator, etc..

⇒ Joint use work concern - may be more of a problem when they go to a contractor for their engineering. CATV is good to work with. The joint use process system is not kept up to date, even with bell and catv via electronic notification they are not keeping it current. Very time consuming, with all the systems its still a problem, we need to have a person "bird dog" it, possible role for N.T. type?

⇒ Another big time consumer is when bell sets a pole, we have no leverage to get the job done, requires lots of communications, and we get the wrath of the customer even though its bell's problem. DOT permits are done by reps., getting TLN's from drafting is time consuming - slow turn over?

⇒ In 1994 started blk order process for new work, 95-96 back to regular process, we liked the system but with limited staffing had problem with reconciling orders. We are starting more commercial lighting applications such as for shoe-box fixtures which are very time consuming.

Voltage recorders on customer meters, blinking light problems, spend a good amount of time trouble shooting customer problems. Our area is more rural which requires more easements and going to the court house for information. Team work with planner/scheduler is excellent, we work well together in coordinating work for the customer.

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

DATA: ENGINEERING REPRESENTATIVE - EXISTING ALLOCATION

DISTRICT	E&C SUPERVISOR	ENG. REPRESENTATIVE	LEVEL	POS.
PENSACOLA				
PINEFOREST	JOHNSON	MANNING	3	
		DIXON	2	
		MITCHELL	5	
	BLOCKER	ABBOTT	4	
		WEATHERS	4	
		JONES	3	
CHASE ST.	TRUMP	RIVERS	5	
		STOJAK	4	
GULF BREEZE	TOWNSEND	MCCAFFREY	4	
		WHITE	3	
MILTON	ROGERS	KING	4	
		LEWIS	4	
FORT WALTON BEACH				
FORT WALTON	GUERNSEY	SCOTT	3	
		EVANS	2	
DESTIN	WILLIAMS	GATES	3	
		REEVES	3	
CRESTVIEW	ANDERSON	BARTON	4	
		LEE	3	
PANAMA CITY				
PANAMA CITY	MCQUAGGE	CORBITT	4	
		MILLER	2	
		HARMON	4	
PANAMA CITY BCH	WHITE	MARTIN	4	
		BOTTOMS	5	
		EBERLY		4
CHIPLEY	JENKS	COLLINS	5	

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

POWER DELIVERY -EXEMPT FIELD ENGINEERING REPRESENTATIVE STAFFING

	E&C SUPERVISOR	REP III	REP II	REP I	REP SENIOR	SUB-TOTAL FOR AREA	TOTAL
PINEFOREST	JOHNSON	DIXON	MANNING		MITCHELL		
SUB-TOTAL		1	1		1	3	
PINEFOREST	BLOCKER		JONES	ABBOTT			
				WEATHERS			
SUB-TOTAL			1	2		3	
CHASE ST.	TELSHIP			STOJAK	RIVERS		
SUB-TOTAL				1	1	2	
GULF BREEZE	TOWNSEND		WHITE	MCCAFFREY			
SUB-TOTAL			1	1		2	
MILTON	ROGERS			KING			
				LEWIS			
SUB-TOTAL				2		2	
PENS-TOTAL		1	3	6	2	12	13
FORT WALTON	GUERNSEY	EVANS	SCOTT				
SUB-TOTAL		1	1			2	
DESTIN	WILLIAMS		GAYES				
			REEVES				
SUB-TOTAL			2			2	
CRESTVIEW	ANDERSON		LEE	BARTON			
SUB-TOTAL			1	1		2	
FWB TOTAL		1	4	1		6	6
P C EAST	MCQUAGGE	MILLER		CORBITT			
				HARMON			
SUB-TOTAL		1		2		3	
P C WEST	WHITE			MARTIN	BOTTOMS		
				KNOLY			
SUB-TOTAL				2	1	3	
CHIPLEY	JENKS				COLLINS		
SUB-TOTAL					1	1	
P C TOTAL		1		4	2	7	7
COMPANY TOTAL		3	7	11	4	25	25

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

MY APPROACH TO THIS REVIEW, BASED ON FIELD INPUT AND AVAILABLE DATA WILL BE AS FOLLOWS:

Based on the input received from all areas that there is not single piece of data that reflects the whole work picture or where you can simply look at Gamma data such as number of assignments, number of work orders, etc., I decided to use two separate data bases. One is the data available from GAMMA and the second is data available from the Line and Service Allocation Study.

I will put together two tables derived from each of those data bases. The data for each table will be broken out into the smallest possible components, the smallest would be by engineering representative. First review of reports indicate that data by individual is not readily available from the Line and Service Allocation Study.

Once these tables are set up they will be analyzed to determine staffing levels indicated by area. If both tables indicate approximately the same conclusions then confidence and trust in the data will be high. The continued use of both sets of data or one for convenience or a hybrid of both will be used in the summary report of recommendations and conclusions for the review.

In addition to the data that is available, there is the need to apply weighting factors much the same way as was done on the Line and Service Allocation Study. The weighting factors are necessary to compensate for the fact that the input received from the engineering representatives shows that each area is some what different in processes used, staffing, structure, etc.. The weighting factors will be used to get everyone on the same level playing field in respect to staffing needs. Initially the weighting factors from the Line and Service Allocation Study will be used or if needed a new set will be derived with input from the field.

The staffing results yielded by the data bases and weighting factors will then be tempered with a bandwidth of plus or minus 5% that will again compensate for the fact that this is not an exact science.

In addition, work assignments that do not fall within the normal parameters such as assisting with joint use pole counts, contact case investigations, subject matter experts for training, safety city, United Way Loaned Executive, etc., etc. need to be reflected in the study if the staffing levels shown by the study are close to existing staffing either low or high. This will help to ensure that the best possible review recommendations are derived.

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

MARKETING CUSTOMER GROWTH AND CUSTOMER PROJECTIONS

	MARKETING RESIDENTIAL GROWTH DATA & FORECAST											
	WESTERN			CENTRAL			EASTERN			TOTAL		
YEAR	ADDED	%	CUST/ REP	ADDED	%	CUST/ REP	ADDED	%	CUST/ REP	ADDED	%	CUST/ REP
1992	3412	52	301	1301	30	230	843	18	120	4434	100	165
1993	3916	50	243	1863	32	310	1063	18	151	5840	100	234
1994	3822	47	256	1981	33	330	1163	20	166	5974	100	239
1995	3308	44	193	1978	36	356	929	18	133	5215	100	209
*1996	3133	55	166	1749	31	291	868	15	123	5752	100	229
**1997	3950	50	230	2001	33	334	1341	17	177	7206	100	288
**1998	3870	54	298	1823	33	304	1199	18	171	6896	100	264
**1999	3283	54	274	1674	33	279	1099	15	157	6804	100	262
**2000	3233	54	269	1646	33	274	1081	18	154	5952	100	230
**2001	3130	54	261	1596	33	266	1049	18	150	5775	100	231

	MARKETING COMMERCIAL GROWTH DATA & FORECAST											
	WESTERN			CENTRAL			EASTERN			TOTAL		
YEAR	ADDED	%	CUST/ REP	ADDED	%	CUST/ REP	ADDED	%	CUST/ REP	ADDED	%	CUST/ REP
1992	144	51	12	79	28	13	58	21	8	281	100	11
1993	148	56	12	73	27	12	45	17	6	266	100	11
1994	100	38	8	136	44	21	63	23	9	289	100	12
1995	122	44	10	118	41	19	42	15	6	279	100	11
*1996	133	43	11	130	43	23	48	14	6	313	100	13
**1997	136	43	11	130	43	23	46	14	7	338	100	13
**1998	139	43	12	141	43	24	47	14	7	327	100	13
**1999	142	43	12	144	43	24	48	14	7	334	100	13
**2000	144	42	12	147	43	25	49	14	7	340	100	14
**2001	146	42	12	149	43	25	50	15	7	345	100	14

NOTES: Data shown is actual except for * indicates estimated value based on actual 1996 YTD September data and ** indicates forecasted marketing data.

CUST/REP represents number of customers added per engineering representative using the 1996 staffing levels of 12 in Western, 6 in Central, 7 in Eastern for all years shown. This was done even though some areas may of had added help through co-op's, technical services or major project folks. By using the same 1996 staffing levels for all areas shown, the data gives a relative feel for past and forecasted work load. But at this time, the validity of this data is questionable as an indicator of what is or is not a manageable work load.

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

1995 GAMMA DATA COMPARISON BY E&C AND ENGINEERING REPRESENTATIVE

E&C ENG	1995 DSO SUMMARY											
	ODSO N. B.			UDSO N. B.			DSO MAINT.			TOTAL		
	COUNT	MHRS	COST	COUNT	MHRS	COST	COUNT	MHRS	COST	COUNT	MHRS	COST
JOHNSON	267	4980	[illegible]	60	4309	[illegible]	205	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MANNING	82	1219	121379	3	108	13962	106	1963	179520	191	3186	334661
DIXON	48	734	98311	30	1970	340667	87	1264	107976	152	3968	546529
MITCHELL	130	3027	282497	27	2434	369157	42	634	58857	189	6095	810511
BLOCKER	269	[illegible]	[illegible]	69	[illegible]	[illegible]	180	[illegible]	[illegible]	415	14194	[illegible]
ABBOTT	201	2912	278506	23	679	94133	48	1376	139735	272	4967	412454
JONES	126	1509	200303	40	2721	644016	113	1826	202270	279	7146	1047689
WEATHERS	42	466	39181	4	1588	246738	19	117	13304	67	2081	318223
[illegible]	204	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
RIVERS	78	729	169934	17	312	62472	36	670	87726	131	1711	323132
STOJAK	[illegible]	1266	185333	40	2133	490533	58	3408	230094	133	7824	931360
TOWNSEND	110	1706	[illegible]	50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MCCAFFREY	61	1201	165353	78	4953	801033	31	559	46131	171	6713	1023526
WHITE	53	[illegible]	[illegible]	12	[illegible]	14076	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PENSACOLA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
KING	150	4286	563620	21	793	87837	73	1299	112418	244	6381	763899
LEWIS	165	3343	390017	30	4977	552063	72	1371	103139	287	9091	1000119
MILTON	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
WESTERN	1390	24905	3707911	328	26609	3410523	669	14533	1373136	2394	69496	7723182
GUERNSEY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SCOTT	83	963	139944	23	1409	272219	83	2072	271406	126	4146	683817
EVANS	64	1151	134420	20	537	80253	91	2510	210974	175	4199	425647
WILLIAMS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GATES	15	247	37779	59	3083	451356	18	1774	159723	91	5024	844768
REEVES	17	604	83801	113	6726	1161370	[illegible]	147	12560	144	7477	1258851
F. WALTON	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ANDERSON	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BARTON	136	2440	328944	27	271	41294	59	846	72956	113	3562	444194
LEE	182	2978	487325	27	863	121192	156	2114	[illegible]	365	5955	622733
CRESTVIEW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CENTRAL	466	8295	1130313	279	13011	2330505	279	10962	819480	1134	32268	4278305
MCQUAGGE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CORBITT	164	3487	354267	87	2676	293303	121	3659	196480	342	6823	863152
MILLER	139	1168	137390	7	116	9820	40	303	37393	176	1606	184712
HARMON	168	2345	329964	27	1788	252754	84	1773	163209	316	5886	654827
WHITE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MARTIN	87	1069	154453	26	1966	344387	99	1396	124439	313	4481	614868
BOTTOMS	45	1306	133341	19	2239	333454	53	1136	60361	117	4897	546396
EBERLY	*	*	*	*	*	*	*	*	*	*	*	*
P. C.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
JONES	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
COLLINS	281	3948	430033	34	944	119707	118	1946	177783	433	4938	727763
CHIPLEY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
EASTERN	809	18343	1288798	160	9685	1451973	515	9402	787943	1484	39470	3619813

NOTES: When you look at this chart, please keep in mind that its structure, as it pertains to Engineering Representatives assigned to Engineering and Construction Supervisors, has been set up the same as the 1996 personnel assignments.

The following was done in order to sort out the work completed in each area for 1995:

- In Western, Miller was shown under Dixon, Drain was shown under Jones and Lowe was shown under Weathers.
- In Central, Carrell was shown under Gates, Dobson was shown under Lee, Feazell was shown under Scott, and Johnson was shown under Evans.
- In FWB they used the blanket order process for jobs less than $15,000, the work done under this process is not shown in the above data.
- In Eastern, Bottoms and Eberly was shown under Corbitt, Corbitt was shown under Bottoms.

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

1996, SEPT. YTD GAMMA DATA COMPARISON BY E&C AND ENGINEERING REPRESENTATIVE

E&C ENG	1996 DSD SUMMARY FOR SEPT. YTD											
	OSSO N.B. MIERS			USSO N.B. MIERS			DSD MAINT. MIERS			TOTAL MIERS		
	COUNT COST			COUNT COST			COUNT COST			COUNT COST		
JOHNSON	173	2250	[illegible]	56	3000	[illegible]	135	[illegible]	[illegible]	366	7079	1037963
MANNING	75	891	134696	7	101	22165	62	599	40552	144	1592	197483
DIXON	30	394	49671	36	1491	206486	33	336	34700	89	2216	290836
MITCHELL	70	1304	190332	25	2210	222797	30	657	60483	125	4171	573614
BLOCKER	309	4360	[illegible]	61	[illegible]	407720	89	[illegible]	[illegible]	439	[illegible]	1206675
ABBOTT	170	2551	341429	30	1577	136359	33	874	183701	222	5006	661419
JONES	92	1126	197807	29	1215	206104	48	607	76029	169	3368	479940
WEATHERS	47	433	42381	12	170	38375	9	79	7347	68	673	95063
TRUMP	254	2283	289280	63	3607	[illegible]	83	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
RIVERS	75	733	88375	17	1166	146695	14	147	13693	106	2036	247966
STOJAK	189	1560	392611	46	991	385660	69	1476	115768	259	3527	820014
TOWNSEND	199	1668	297342	95	3920	[illegible]	48	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MCCAFFREY	47	739	132463	50	3018	568139	16	147	103903	113	4404	784539
WHITE	153	929	164879	37	401	71765	37	349	30910	226	1939	268375
PENSACOLA	507	10751	[illegible]	279	12155	[illegible]	348	4110	[illegible]	1020	[illegible]	[illegible]
ROGERS	305	4077	590485	65	933	170420	146	3400	339400	572	8456	[illegible]
KING	196	2068	379469	13	351	118879	82	1567	139167	303	5003	637236
LEWIS	139	1613	216582	20	361	27961	101	1468	134176	270	3441	405099
MILTON	307	4277	[illegible]	33	[illegible]	[illegible]	153	[illegible]	[illegible]	493	[illegible]	[illegible]
WESTERN	1284	15308	2240009	233	13023	2400047	525	9153	863451	2061	37474	5483427
GOVERNOR	155	2280	[illegible]	73	3077	[illegible]	77	[illegible]	[illegible]	254	[illegible]	[illegible]
SCOTT	61	1088	141351	34	1075	177464	48	917	107512	143	2994	426346
EVANS	44	1147	122540	38	2066	224737	29	1115	139860	111	4288	487142
WILLIAMS	90	1608	290666	113	11950	[illegible]	31	[illegible]	[illegible]	271	[illegible]	[illegible]
GATES	36	849	149189	43	2263	309493	14	344	37549	93	4456	487521
REEVES	35	1019	130139	66	8293	1309194	17	384	31507	138	9696	1558099
F. WALTON	150	4800	720004	304	14063	[illegible]	349	3800	[illegible]	800	22313	[illegible]
ANDERSON	320	5070	685000	99	1989	637902	139	1723	196880	458	4219	942069
BARTON	77	852	180813	33	409	143901	21	517	40889	131	1650	341133
LEE	133	2009	333043	43	1139	214882	98	1116	114341	277	4835	661946
CRESTVIEW	233	3300	[illegible]	84	2500	357701	139	1637	380940	436	6075	938074
CENTRAL	489	[illegible]	1800000	341	18011	2767048	333	4213	471049	899	36011	4182549
MCQUAGGE	287	4093	[illegible]	89	5057	737408	93	1300	[illegible]	460	11408	[illegible]
CORBITT	80	1474	176867	23	2409	371780	34	743	41483	97	4483	684309
MILLER	117	1176	148257	19	763	186137	19	407	37534	156	2499	389176
HARMON	90	1309	137421	33	2820	279885	40	950	88161	153	4309	505063
WHITE	255	3205	[illegible]	71	4100	467002	107	2506	337200	396	8706	1125434
MARTIN	86	406	79850	13	523	95483	49	1000	238540	138	1896	413433
BOTTOMS	87	1150	135461	27	1973	223910	39	862	74540	143	4030	463877
EBERLY	75	946	136136	19	673	136176	19	240	14507	113	1851	286951
P.C.	475	6800	[illegible]	138	8426	1318800	290	3500	454710	843	20094	[illegible]
JEANS	166	3442	217667	11	71	4611	84	900	53438	261	3615	275926
COLLINS	166	3442	217667	11	71	4611	84	900	53438	261	3615	275936
CHIPLEY	166	3442	217667	11	71	4611	84	900	53438	261	3615	275936
EASTERN	641	9068	1139973	137	8497	1319820	384	4209	868166	1062	21703	3327959

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

1995 & 1996 SEPT. YTD GAMMA DATA AVERAGES COMPARISON BY OFFICE

OFFICE	OHSO N. B. COUNT	MHRS	COST	UHSO N. B. COUNT	MHRS	COST	DSO MAINT. COUNT	MHRS	COST	TOTAL COUNT	MHRS	COST
95 MILTON	435	7429	958432	31	5082	429950	145	3361	314607	621	15971	1613089
96 MILTON	337	4577	596051	53	913	176031	183	3628	273343	573	8526	[illegible]
MILTON	386	6103	777132	41	2297	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
95 PENS.	968	13628	1829489	264	19017	2779433	524	11871	1058499	1762	44526	5918173
96 PENS.	867	10731	1352948	279	13181	3395436	342	4118	390186	1488	28950	4436813
PENSACOLA	915	12180	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
95 CREST.	318	5433	734269	84	1134	162466	306	2960	168171	578	9517	1066958
96 CREST.	233	3453	463336	64	1509	217763	130	1633	142900	426	6475	942607
CRESTVIEW	275	4428	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
95 FWB	148	2968	397944	235	11877	2168919	175	8903	401313	560	23648	3111376
96 FWB	196	4021	591175	205	14433	3391647	169	2560	216591	568	21313	2398813
FORT WALTON	172	3496	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
95 PANAMA	328	6313	902745	136	8741	1333916	397	7400	609127	1061	14012	2894868
96 PANAMA	475	6646	833205	128	8426	1313809	209	5203	514732	801	20574	2882023
PANAMA CITY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
95 CHIPLEY	281	2868	426083	34	944	119907	118	1946	177755	433	4958	723768
96 CHIPLEY	166	2462	317487	11	71	4813	84	990	53420	261	3511	375836
CHIPLEY	224	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NOTES: Remember 1996 data only shows to Sept.

1995 & 1996 SEPT. YTD GAMMA AVERAGES PER REPRESENTATIVE

OFFICE	OHSO N. B. COUNT	MHRS	COST	UHSO N. B. COUNT	MHRS	COST	DSO MAINT. COUNT	MHRS	COST	TOTAL COUNT	MHRS	COST
MILTON	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	143	2052	260526	26	1149	204150	83	1434	[illegible]	201	6134	714734
PENSACOLA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	91	1219	169131	38	1556	335483	43	908	82434	63	3474	517234
CRESTVIEW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	138	2219	49607	30	683	130063	84	1149	42761	221	4048	502499
FORT WALTON	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	43	874	123615	53	2314	549583	39	1333	129902	133	5539	813006
PANAMA CITY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	64	1247	124708	22	1421	212253	50	1602	93668	155	2732	452648
CHIPLEY	224	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	224	1288	372870	18	508	63504	101	1473	115597	42	4338	550801
TOTAL	2479	35937	4326114	755	42565	6790360	1366	27273	8652396	3529	105771	14127342
PER REP	99	1436	172609	30	1703	271532	52	1091	346104	139	4230	661978

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

	ENGINEERING PRODUCTIVITY REPORT DATA							
E & C ENG	1995 COUNT	COST	AVG/REP	JAN-SEPT. 1996 COUNT	COST	AVG/REP	95/96 AVG.	95/96 AVG. PER REP.
JOHNSON	538	1731672	577224	319	971572	323857	1351622	450541
MANNING	186	331889		128	190213			
DIXON	172	604895		64	247606			
MITCHELL	180	794888		127	533753			
BLOCKER	634	2062356	687452	487	1551019	517006	1806688	602229
ABBOTT	295	715234		239	1020928			
JONES	274	1024664		123	353309			
WEATHERS	65	322458		95	176782			
TRUMP	393	1188819	594410	364	3149010	1049670	2168915	822040
RIVERS	131	244034		114	245158			
STOJAK	262	944785		250	2903852			
TOWNSEND	423	1772988	886494	363	1114516	557258	1443749	721875
MCCAFFREY	195	1055720		150	845910			
WHITE	73	658967		213	268606			
PENSACOLA	1988	6755835	675583	1583	6786111	678611	6770973	677097
ROGERS	610	1913987	956994	549	1009376	504688	1461682	730841
KING	336	791543		290	615093			
LEWIS	274	1122444		259	394283			
MILTON	610	1913987	956994	549	1009376	504688	1461682	730841
WESTERN	2598	8669822	722485	2132	7795487	649624	8232655	686055
GUERNSEY	345	1404735	702368	243	1022437	511219	1213586	606793
SCOTT	128	658258		136	425776			
EVANS	217	746477		107	596661			
WILLIAMS	223	2046167	1023084	248	2176094	1088047	2111131	1055565
GATES	87	842583		98	672593			
REEVES	136	1203584		150	1503501			
F. WALTON	568	3450902	862726	491	3198531	799633	3324717	831179
ANDERSON	551	1095433	547717	430	940371	470186	1017902	508951
BARTON	199	384719		127	255561			
LEE	352	676380		303	684810			
CRESTVIEW	551	1095433	547717	430	940371	470186	1017902	508951
CENTRAL	1119	4546335	757723	921	4138902	689817	4342619	723770
MCQUAGGE	705	1655784	551928	396	1378289	459430	1517037	505679
CORBITT	334	850274		94	618500			
MILLER	166	180056		156	299150			
HARMON	205	625454		146	460639			
WRITE	316	1153164	384388	384	1115303	371768	1134234	756156
MARTIN	204	610067		115	407722			
BOTTOMS	112	543097		158	420563			
EBERLY	-	-		111	287018			
F. C.	1021	2808948	468158	780	2493592	415599	2651270	441879
JENKS	265	419460	419460	258	375100	375100	397280	397280
COLLINS	265	419460		258	375100			
CHIPLEY	265	419460		258	375100		397280	
EASTERN	1286	3228408	461201	1038	2868692	409813	3048550	435507

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

	GAMMA DATA APPROACH			
OFFICE	CURRENT STAFFING	LOW BENCHMARK	RECOMMENDED STAFFING	CHANGE & REMARKS
MILTON	2		3.7	+1.7
PENSACOLA	10		17.0	+7.0
CRESTVIEW	2		2.6	+.6
FORT WALTON	4		8.4	+4.4
PANAMA CITY	6		6.7	+.7
CHIPLEY	1	397,280	1	BENCHMARK

	GAMMA DATA APPROACH			
OFFICE	CURRENT STAFFING	HIGH BENCHMARK	RECOMMENDED STAFFING	CHANGE & REMARKS
MILTON	2		1.8	-.2
PENSACOLA	10		8.2	-1.8
CRESTVIEW	2		1.2	-.8
FORT WALTON	4	831,197	4	BENCHMARK
PANAMA CITY	6		3.2	-2.8
CHIPLEY	1		.5	-.5

	GAMMA DATA APPROACH			
OFFICE	CURRENT STAFFING	AVERAGE BENCHMARK	RECOMMENDED STAFFING	CHANGE & REMARKS
MILTON	2		2.5	+.5
PENSACOLA	10		11.3	+1.3
CRESTVIEW	2		1.7	-.3
FORT WALTON	4		5.6	+1.6
PANAMA CITY	6		4.4	-1.6
CHIPLEY	1		.7	-.3

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

DISTRIBUTION STATISTICS FROM THE LINE & SERVICE RESOURCE ALLOCATION STUDY:

LOCATION	MILES OF LINE	NUMBER OF CUSTOMERS	SQUARE MILES OF AREA	PEAK KW LOAD	MILES ADDED 5 YR AVERAGE	CUSTOMERS ADDED THRU 1996	PEAK KW LOAD ADDED THRU 1996	ALLOCATION FACTOR
MILTON	834	24,341	119	121,476	10.3	1,063	5,343	0.125
PENSACOLA	1,988	119,116	301	640,546	19.3	3,814	13,133	0.380
GULF BREEZE	417	18,943	43	93,684	13.3	1,443	5,009	
WESTERN TOTAL	3,239	[illegible]	[illegible]	[illegible]	42.7	[illegible]	[illegible]	
CRESTVIEW	516	14,063	113	75,143	8.9	1,335	3,044	0.072
FORT WALTON	632	47,541	49	236,378	10.9	1,335	4,808	0.187
DESTIN	207	15,646	24	87,223	7.9	1,793	4,063	
CENTRAL TOTAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
P. C. BEACH	289	27,346	48	137,809	8.3	1,737	3,414	
PANAMA CITY	644	45,434	98	228,473	8.5	1,811	3,486	0.176
CHIPLEY	388	9,207	358	37,474	1.5	474	988	0.060
EASTERN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
TOTAL	6,035	321,646	1,122	1,679,704	90.7	17,834	43,474	

	LINE & SERVICE ALLOCATION FACTOR APPROACH			
OFFICE	CURRENT STAFFING	ALLOCATION FACTOR	RECOMMENDED STAFFING	CHANGE & REMARKS
MILTON	2	0.125	3.1	+1.1 ASST. FROM PENS.
PENSACOLA	10	0.380	9.5	-.5 SHIFT HELP TO MILTON
CRESTVIEW	2	0.072	1.8	-.2 COVER DEFUNIAK
FORT WALTON	4	0.187	4.7	+.7 ADDED HELP TO DESTIN
PANAMA CITY	6	0.176	4.4	-1.6 SHIFT HELP TO CHIPLEY
CHIPLEY	1	0.060	1.5	+.5 ASST. FROM P.C., CONT. URD LOCATING
TOTAL	25	1.000	25	

POWER DELIVERY NOVEMBER 12, 1996

EXEMPT STAFFING REVIEW

DISTRICT FIELD ENGINEERING REPRESENTATIVES

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: Distribution Planning Team
- 1- Team Coordinator
- 1- Engineer
- 3- Engineering Representatives

==========

POSITION FUNCTION:

1. Provide Load and Protection Studies for Gulf Power Company's Distribution System.
2. Provide technical evaluation and study on a wide variety of Major /Special Projects that occur on the distribution system from time to time outside of routine load and protection studies.
3. Provide technical evaluations, recommendations, trainning, and other support for AutoCAD/CADPAD coordination,HP900 maintenance and other logistical and resource planning Miscellaneous Projects request.

WORK VOLUME:

	Man-days
1. Load/Protection Studies:	
A. Mapping Coordination	290
B. Load Studies	462
C. Protection Studies	154
	906
2. Major/Special Projects:	
A. Major	30
B. Special	95
	125
3. Miscellaneous Projects:	260
Total	1291

@ 231mandays/position = 5.6 positions

RECOMMENDATION:

1. Design the Distribution Planning Team Complement as follows:
   - A. Coordinator - Senior Engineer
   - B. Engineer - Engineer II (Maximum)
   - C. Engineering Representative - Engineering Representative I (Maximum)
2. Periodically rotate District Technical Services Engineers through the Distribution Planning Team.

Alternative Solutions:

1. Perform all studies and associated duties through District Technical Services.
2. Perform all load/protection studies through Southern Company Services and associated duties through District Technical Services and/or Transmission Planning.

DISTRIBUTION PLANNING

Activity Analysis
(Annual)

Load/Protection Studies:

Mapping	-	290 Man-days
Load Study	-	462 Man-days
Protection Study	-	154 Man-days
		906 Man-days

Major/Special Projects:

Major	-	30 Man-days
Special	-	95 Man-days
		125 Man-days

Miscelaneous Projects:

260 Man-days

Total 1291 Mandays *

* Based on 231 days per year, this equates to 5.6 man-years. This number does not nclude meeting time, sicktime or storm duty.

LOAD/PROTECTION STUDIES

1. Mapping (Data Base Maintenance)

Goal To update 75% of the total 232 feeders on an 18 month cycle. The average feeder update[(1)] requires 2.5 man-days.*

232 x .75 = 174 feeders
174 x 2.5 = 435 man-days / 18 month period
= 290 man-days / year

2. Load Study

Goal To establish an average 3 year study cycle for the system. This requires approximately 77 feeders per year as the target study scope.

The average study time equates to 1.0 man-days per feeder per study year.* Each study year includes base cases, change cases, any contingency cases and recommendation writeups. Each study is composed of at least 6 total study years for each feeder.[(2)]

(77 feeders) x (1.0 man-days/fdr/yr) = 77 man-days/yr
(77 man-days/yr) x (6 yrs) = 462 man-days

3. Protection Study

Goal To follow up and integrate with each load study a corresponding protection study. The study requires 2 man-days per feeder.*

(77 feeders) x (2 man-days/fdr) = 154 man-days

** Statistical average based on actual data.*
[(1)] Refer to Area Distribution Study Guideline Phase II
[(2)] Refer to Area Distribution Study Guideline Phase III thru Phase VI

NOTE: Estimates do not include Technical Services Engineering time for field checks and forecast data assimilation. Secretarial time is not included.

MAJOR / SPECIAL PROJECTS *

1. Blountstown Regulators
2. Phillips Inlet Cable Crossing
3. Pace/Eagles Nest S/D - Cable Size
4. Pinnacle Port - URD Project
5. Crestview Hospital - Conductor/Protection
6. Ft. Walton - Island Load Review
7. Hurlburt - New Subdivisions Impact
8. Key Accounts
9. Champion - Contingency Service
10. Auto Shred
11. Greenwood - Oak Avenue Feeder Voltage
12. Reichold - Load Addition Impact
13. Destin - Holiday Isle Underground Conversion
14. Tyndall Distribution Study
15. Crystal Beach Study
16. Panama City - Industrial Load Additions Impact (Bay County, North Bay, Highland City and Water Treatment Plant)
17. Century - Alger Sullivan Sawmill
18. Destin 9562 - Industrial Parkway Load Addition
19. Main Street - Underground Conversion
20. Ocean City - New Subdivision Load Impact
21. Destin - Walmart Addition
22. Gulf Breeze - Beach Cable Contingencies
23. New Federal Building - Pensacola
24. Hurlburt Air Force - Voltage project
25. Pace - Jernigan Rd. Reroute
26. Ellyson Field - Reactors
27. AEC Fault Calculations
28. Stone Container - Load Flow / Motor Start

29. Exxon - Various
30. Walmart Protection - Panama City / Panama City Beach / Crystal Beach
31. DeVilliers / City Sub Protection Study
32. IPCO - Motor Starts
33. Communications - Optical Ground Wire Fault Analysis
34. AES Fault Calculations
35. Plant Smith - Generator Excitation Transformer Evaluation
36. Westinghouse - Loop Heating Project

TOTAL = 125 Man-days

**These projects were performed in 1995.*

ROUTINE PROJECTS *

AutoCAD/CADPAD Coordination
HP 900 Maintenance
Economic Evaluations
Transmission Support
Conductor Analysis
Field Checks
PSC Checks
District Distribution Support
Resource Planning
Budget Update and Review
Software Development
Fault Calculations
Training
Power Quality Projects
Recloser / Breaker Projects
DTR Report
Efficiency Report
Harmonic Studies
PMS Coordination
Safety City

Total - 260 Man-days

* Based on 1995 Actual Data -- 1996 Data Available YTD

Note: These are tasks performed each year

AREA DISTRIBUTION STUDY

GUIDELINE

OBJECTIVES

- To provide the most economical and practical expansion plans for the distribution system
- To compile planning studies for all area distribution
- To establish an average 3 year update cycle for all area distribution studies

PHASE I - INITIAL DISTRICT MEETING (ANNUALLY)

- Review current area study schedule
- Prioritize specific area studies
- Discuss existing study area problems
- Discuss data requirements
- Establish study schedules

PHASE II - DATABASE UPDATE

- Revised AutoCAD feeder maps received from Districts
- Field checks
- Download of CADPAD[1] database to FAMS[2]
- Update of all electrical data via FAMS
- Upload of revised database to CADPAD system
- Load flow test runs for data validation

[1]Computer Aided Distribution Planning and Design Software

[2]Florida Automated Mapping System Software

PHASE III - BASE CASE
(Existing Conditions)

- Determine base loads and growth rates
- Establish base case load flows
- Review and document results
- Review and compare results from previous study
- Review Construction Budget for existing area recommendations
- Meet With District Engineering to discuss results
- Field checks (if necessary)
- Base case adjustments (if necessary)

PHASE IV - FORECAST CASES

- Apply growth data to establish annual future cases (5 to 7 years)
- Make appropriate recommendations to resolve problems
- Coordinate significant projects with District Engineering
- Incorporate engineering economics when viable alternatives exist
- Initiate Protection Study
- Compare results with existing Construction Budget items

PHASE V - STUDY DRAFT

- Compile recommendations and appropriate data into a draft study
- Transmit draft to appropriate personnel for comments and recommendations
- Meet with District (if necessary)

PHASE VI - FINAL REPORT

- Make appropriate changes as per draft responses
- Complete Protection Study
- Establish project cost estimates
- Generate OD-35 budget documents
- Forward any revised recommendations to existing budget items
- Bind report and transmit to appropriate personnel

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: Line Clearance Engineering Representatives

By: Walter Mullins

POSITION FUNCTION:

1. Manage daily field activities of the company's line clearing program and serve as a liaison between the company and contractor personnel.
2. Develop and maintain a positive relationship with local municipalities, customers, civic clubs and arborists.
3. Prioritize work schedules for contractors and coordinate efforts of line crews as needed.
4. Monitor the contractor's work on the cost per mile feeders for quality and compliance.
5. Review the needs of the Transmission & Distribution System and use all budget dollars wisely. There is a budget reduction in this program of $900,000 in 1997 from the 1996 actual.

WORK VOLUME:

The addition of the Transmission Line Program in 1996 to this group's responsibility has loaded the existing personnel down. Jerry Mitchem worked the last six months of his tenure accessing the condition of the transmission system that has let us get through 1996 with the present personnel. The Eastern area has about 50% more corridor miles of transmission lines than Fort Walton or Pensacola. The addition of transmission line responsibility has made the eastern area unmanageable with one person over the long haul.

The unit cost per mile on distribution feeder work is a very positive program but requires very close coordination to ensure that the proper work is completed. This program puts the responsibility of crew production on the contractor were it belongs. In reviewing the activities of the group, I came to realize that this group is probably the most organized group in the company.

RECOMMENDATION:

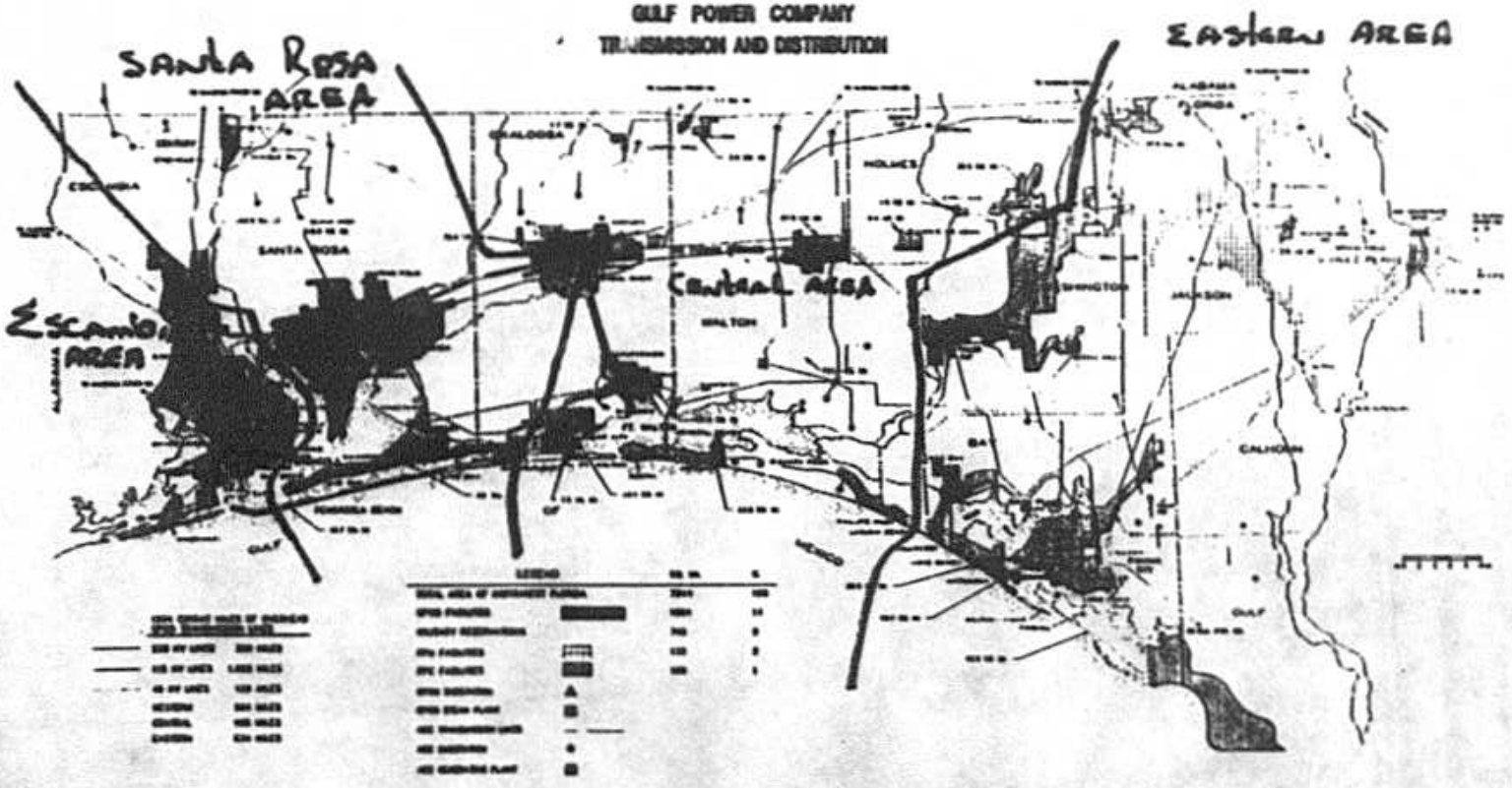
The present organization make up: Supervisor - Steve Burns	Distribution Lift Crews	Engineering Tech	Contract Pre-Inspector	Transmission Crews
Western - Escambia Area Wayne Barrow	6	0	1	As needed
Santa Rosa Area Eddie Thomason	6	0	1	As needed
Central - James Espy	5	0	1	As needed
Eastern - Earl Mirus	5	0	1	As needed

A SOLUTION FOR THE FUTURE MIGHT BE:

Supervisor - Steve Burns	Distribution Lift Crews	Engineering Tech	Contract Pre-Inspector	Transmission Crews
Western - Escambia Area Wayne Barrow	6	1	0	As needed
Santa Rosa Area Eddie Thomason	6	1	0	As needed
Central - James Espy	5	1	0	As needed
Eastern - South - Mirus	5	0	0	As needed
North - New	-	1	-	

The Meter Reader TQM Team recommended replacing contract pre-inspectors with Engineering Techs, which could be filled by qualified C&D, Collectors and Readers. The cost to Gulf Power Company would be $6,510 per year per pre-inspector that was replaced but the cost to the line clearance program would be $15,551 more per year per pre-inspector that was replaced.

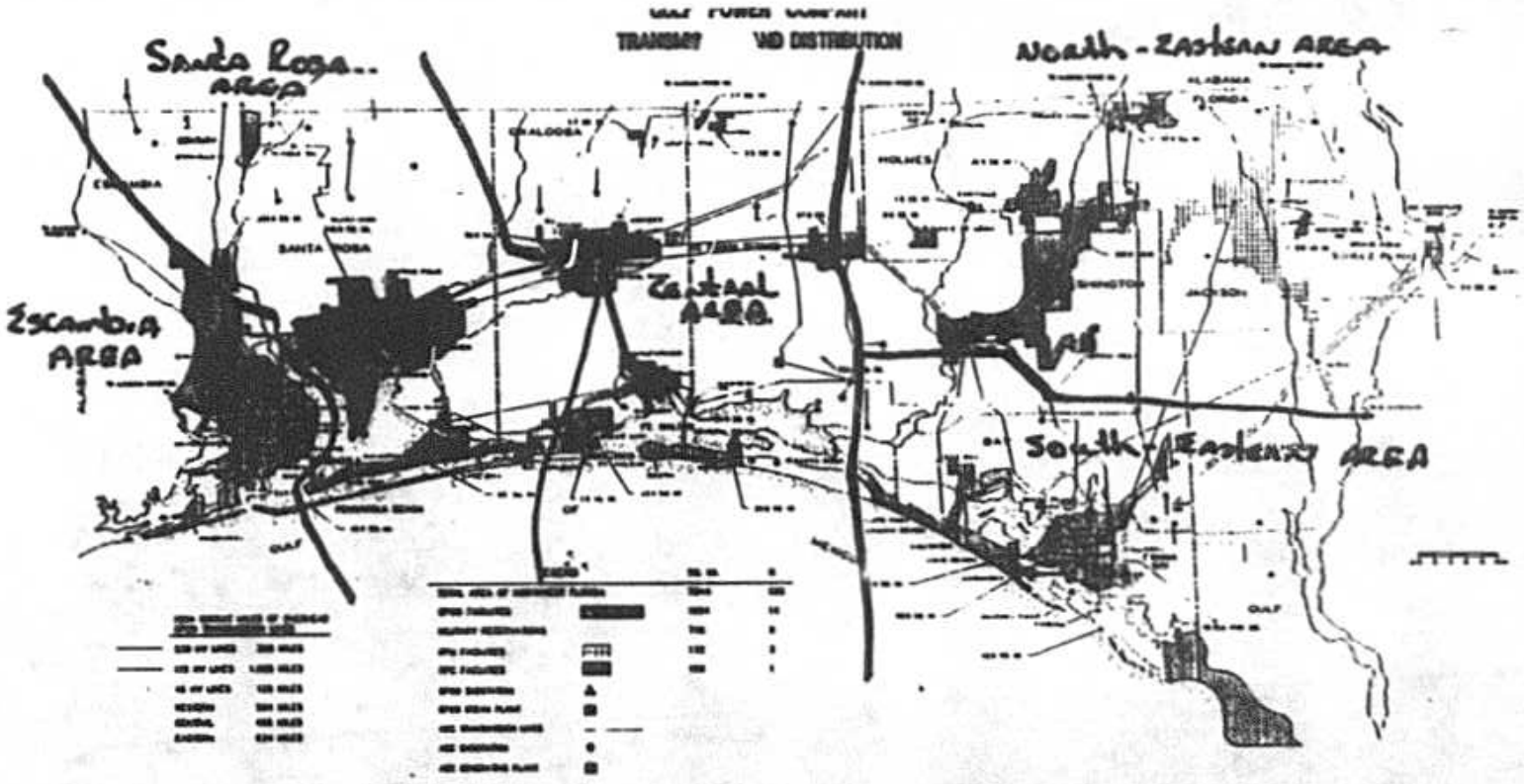
How do you vote?



EXISTING AREA ASSIGNMENTS

11-8-96

W. MULLINS



PROPOSED AREA ASSIGNMENTS

11-8-96
W. MULLINS

1/4

SAVINGS ASSOCIATED WITH HIRING CONTRACT METER READERS AND PLACING METER READERS IN OTHER JOBS UTILIZING A PAY FREEZE

TOPPED OUT METER READER
MONTHLY SALARY **$2,729**
FULLY LOADED ANNUAL COST **$47,583**

	MONTHLY SALARY	FULLY LOADED ANNUAL COST	CONTRACT METER READER MAXIMUM	ANNUAL COST DIFFERENCE
UTILITYMAN	$1,466	$25,561	$23,192	$2,369
PHONE SECTION	$1,629	$28,403	$23,192	$5,211
STOCK HANDLER	$2,213	$38,586	$23,192	$15,394
APPRENTICE	$2,281	$39,772	$23,192	$16,580
ENGINEERING TECH	$2,222	$38,743	$23,192	$15,551
MARKETING TECH	$2,222	$38,743	$23,192	$15,551

NOTE:
FULLY LOADED COST INCLUDE SALARY PLUS 45.3% OVERHEADS

145

PRE-INSPECTOR TREE TRIM POSITION

	CURRENT COST PER HOUR
CONTRACT PRE-INSPECTOR	$18.15 (Includes contractor's vehicle cost)
FULL TIME METER READER	$22.96 (Fully loaded with 45.3% OH)
	$41.11 per Hour

	PROPOSED COST
FULL TIME PRE-INSPECTOR	$26.83 (Includes full time cost from above plus mileage for aproximately 100 miles per da
CONTRACT METER READER	$11.15 (Current top contract rate)
	$37.98 per Hour

SAVINGS PER HOUR	$3.13	
	80	Hours per pay period
SAVINGS PER PAY PERIOD	$250.40	
	26	Pay periods per year
SAVINGS PER YEAR	$6,510.40	
	7	Current number of positions
TOTAL POSSIBLE SAVINGS	**$45,572.80**	

144

Panama City/Chipley District line Clearance Facts

Miles of overhead distribution line:

Chipley District:		Panama City District:	
Chipley	338	Panama City	640
Bonifay	85	Panama City Beach	263
Sunny Hills	80		
Graceville	8		
Total	511		903

Miles of transmission line: about 650

Geographical area: 100 mi. to the north east, Smith - Thomasville/ Scholtz - Bainbridge lines, ACI Distribution line.
80 miles to the north, Cambellton.
From the most distant points in the districts, 130 mi.

The Panama City/Chipley districts program consists of tree trimming, tree removal, herbicide application (foliar, basal, cut stump, and bare ground), bush hog, tree growth regulation, re-engineering of lines, reviewing landscape plans for major developments, replacement trees, and stump grinding.

Job duties:

a. Plan and schedule feeders and transmission lines for work.
b. Maintain work records and maps
c. monitor work quality and productivity
d. Interface with Power Deliviery, contractor, local municipalities, and customers to assure maximum productivity and successful outcome of line clearance work.
e. Coordinate the Panama City line clearance process.

Other activities:

a. Review, prepare,and modify DSO's involving tree trimming to minimize long term maintenance cost and mitigate the impact on the urban forest.
b. Sponsor and coordinate the adopt a tree program.
c. Coordinate forest management activities on Company land including Smith Plant and Caryville.
d. Review plans, coordinate, and educate related to new business, municipalities, and major developers to assure landscaping is compatible with existing and proposed utilities.

Sample

GULF POWER
LINE CLEARANCE - DISTRIBUTION
FEEDER REPORT

FEEDER # 9999

Burns Rd	33.60	Beach Haven Sub	Pensacola	Joe Smith
Feeder Name	Miles	Substation Name	District	Line Clearance Rep

Previous Maintenance 01/24/90 (Date) | $84,650 (T/Cost) | $2,519 ($/Mile)

Key Account	Account Representative	Special Instructions
Burns Auto Manf	Earl Espy - 6634	Open 6:00am - 8:00pm - 432-5569
Thomason Medical	James Lewis - 2256	Do not wk on lines 12/01/96 - 12/07/96 testing new equipment during this time.

Crew Type	Estimated re	Hrly	Hrs	Cost	Actual Crew	Hrly	Hrs	Cost	Additional Comments
Preinspector	1	$18.15	125	$2,269	1	$18.15	112	$2,033	
Man A/L	5	$37.71	1,240	$46,760	5	$37.71	1,322	$49,853	
3 Man A/L				$0				$0	
2 Man Manual	1	$30.95	328	$10,152	2	$30.95	525	$16,249	
3 Man Manual				$0				$0	
Tractor/Mower	1	$45.60	40	$1,824	0	$45.60	0	$0	
				$0				$0	
				$0				$0	
Total Hours	8		1,733	$61,005	8		1,959	$68,134	
Per Mile Cost	ESTIMATED			$1,816	ACTUAL			$2,028	

Open Date _____ Closed Date _____

Wayne Barrow _____ Jim Rhodes _____

Jim Rhodes Wayne Barrow

COMMENTS: _____

Submitted by W. Barrow -

Preinspector Position Turnover

During 1993, the preinspector position turned over two hundred percent. Both crew productivity and customer relations suffered as a result. For the bulk of the year the crews were returning to streets where skips had occurred due to inadequate follow-up by the preinspector. My work load of handling customer calls and complaints increased significantly. It appears the contractor lacks qualified people for this position and does a poor job of selecting and training them. The extreme in productivity loss was made clear when for two weeks one of the Panama City crew foreman had to do his own preinspection. His productivity dropped by fifty percent. The prior two weeks he delivered twelve loads of chips to the mill. During the two week period of doing his own preinspection he delivered six loads of chips to the mill.

Recommendation:

- I recommend that Gulf Power company hire two year college forestry graduates for the preinspector position.

Advantages:

- The education in forestry, biology, and English will result in more positive, professional contacts with homeowners. Asplundh does not have people of this caliber on their payroll on our system and cannot put people with this educational background to work for us at a competitive rate.
- It will be Gulf Power Company contacting the landowner, not the "tree butcher" company. A major advantage.
- We can do it for nearly the same cost as the contract rate.

Disadvantages:

- None.

ASPLUNDH

INVOICE

10/11/96 406788

708 BLAIR MILL ROAD • WILLOW GROVE, PA 19090-1784 • PHONE (215) 784-4200

FOR SERVICES PERFORMED BY: ASPLUNDH TREE EXPERT CO.
TREE TRIMMING DIVISION

TO
GULF POWER COMPANY
ATTN: MR JAMES ESPY
PO BOX 2887
FT WALTON BEACH, FL 32549

MAKE CHECK PAYABLE TO

PLEASE REMIT TO
P.O. BOX 75090
CHARLOTTE, NC 28275

JB9 NS4 DG9 BA6 10 11
1405978 31 96-40-23 283 NB

IMPORTANT: TO INSURE PROPER CREDIT TO YOUR ACCOUNT, RETURN REMITTANCE COPY OF INVOICE WITH YOUR PAYMENT.

THANK YOU.

TRIMMING AND REMOVING TREES

REMAN	CREW NO.	CUSTOMER NO.	PURCHASE ORDER NO.	REQUISITION NO.	TERMS
. HAIRELSON	058396	FLGP	001932-03 B-96-410198		NET 10 D

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	EXTENSION	TOTAL
E-INSPEC-C TL HAIRELSON	40.00	HRS	14.400	576.00	
IAL LABOR	40.00				576.0
CKUP-EQ 7	40.00	HRS	3.750	150.00	
IAL EQUIPMENT	40.00				150.0
GER				10.00	
IAL EXPENSES					10.0

Fort Walton

Take home $9.00

max - $10.00

736

$18.40/Ha

150

UP NUMBER 9682-7902
IC2
52
82

Y PROBLEMS? CALL 800-248-TREE TOLL FREE
HAIR EXT. 4495
EN PAYMENT IS MADE PLEASE FORWARD REMITTANCE COPY

PAY THIS AMOUNT > $ 736.00

[illegible]

INVOICE

10/11/96 406751

708 BLAIR MILL ROAD • WILLOW GROVE, PA 19090-1784 • PHONE (215) 784-4200

FOR SERVICES PERFORMED BY: ASPLUNDH TREE EXPERT CO.
TREE TRIMMING DIVISION

MAKE CHECK PAYABLE TO

PLEASE REMIT TO: P.O. BOX 75090
CHARLOTTE, NC 28275

TO: GULF POWER COMPANY
ATTN: MR JAMES ESPY
PO BOX 2887
FT WALTON BEACH, FL 32549

JB9 MS4 DG9 BA6 10 11
1405981 31 96-40-23 243 NB

IMPORTANT: TO INSURE PROPER CREDIT TO YOUR ACCOUNT, RETURN REMITTANCE COPY OF INVOICE WITH YOUR PAYMENT.

THANK YOU.

TRIMMING AND REMOVING TREES

FMAN	CREW NO.	CUSTOMER NO.	PURCHASE ORDER NO.	REQUISITION NO.	TERMS
SHAW	058306	FLGP 001932-03	B-96-810194		NET 10 D

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	EXTENSION	TOTAL
EMAN C. MD SHAW	40.00	HRS	14.400	576.00	
IMMZR B LJ ROBERTS	40.00	HRS	12.000	480.00	
IAL LABOR	80.00				1056.0
III LIFT SZ12	40.00	HRS	10.460	418.40	
IPPER 14" SEC7	40.00	HRS	4.100	164.00	
WER SAW E-12 OR 3-13	40.00	HRS	.310	12.40	
IAL EQUIPMENT	120.00				594.8

P MBER 9682

F PROBLEMS? CALL 800-248-TREE TOLL FREE
BALKIR EXT. 4495
EN PAYMENT IS MADE PLEASE FORWARD REMITTANCE COPY

PAY THIS AMOUNT > $ 1,650.8(

151

DUTIES OF THE PREINSPECTOR

A. Inspect each job.

1. Maintenance pre-inspector

a. Keeps a TLN map of each active area.
b. Makes notes for maintenace foreman.

2. Plant pre-inspector

a. Checks prints for specific engineering req.
b. Makes notes for plant foreman where needed.

B. Contact the customer for appropriate line clearance.

1. Maintenance pre-inspector

a. Speaks in person with customer when possible.
b. Leaves notification cards when customer is not home.
c. Calls customer at home.

2. Plant pre-inspector

a. Speaks with customer when neccessary.

C. Negotiate for removals where desirable.

D. Coordinate and schedule the work.

1. Maintenance pre-inspector

a. Directs foreman to sensitive work that may require his supervision.
b. Helps to lay out the work in a logical manner so crew does not back track.

2. Plant pre-inspector

a.
b.

E. Assign the appropriate manpower.

1. Maintenance pre-inspector

2. Plant pre-inspector

PENSACOLA DISTRICT FEEDER INFORMATION
1996

Pensacola Area			1996	1996	1996	1994	1994	1995
Substation	Feeder	Feeder Name	OH/ft	UG/ft	T/ft	T/ft	ft/cust.	ft/cust.
Bayou Chico	6508	NAVY BLVD / CORRY RD	95,306	2,161	97,467	99,265	1,755	1,756
Bayou Chico	6522	BARRANCAS AVE	102,297	12,922	115,219	114,885	2,018	2,025
Bayou Chico	6532	WRIGHT ST / ALT POST OFF	125,304	1,151	126,455	133,734	2,568	2,555
Bayou Chico	6542	REICHOLD / PACE OFFICE	12,136	1,284	13,420	13,604	44	44
Bayou Chico	6572	ALT BAPT / UNIV HOSP	121,286	2,909	124,195	123,838	2,131	2,129
Bayou Chico	6582	GREEN ST. / JACKSON ST	109,901	1,039	110,940	111,415	2,118	2,118
Bayou Chico	6592	CORRY FLD / NAVY BLVD	30,179	4,573	34,752	34,612	474	478
Bayou Marcus	5562	PATRICIA / CERNEY RD.	136,542	23,800	160,342	156,708	2,255	2,261
Bayou Marcus	5572	MULDOON / SEWAGE	68,171	7,109	75,280	74,370	1,199	1,195
Bayou Marcus	5582	SAUFLEY FIELD RD.	129,607	1,494	131,101	80,547	891	897
Bayou Marcus	7702	TONAWANDA/MOBILE Hwy	73,630	5,848	79,478	65,397	987	1,154
Bayou Marcus	7712	FAIRFIELD DR / 58TH AVE	59,910	4,036	63,946	63,941	1,019	1,021
Bayou Marcus	7722	JACKSON / 77TH AVE	82,349	3,402	85,751	85,545	1,193	1,196
Bayou Marcus	7732	SPARE	0	0	0	0	0	0
Bayou Marcus	7742	PEN HAVEN	70,751	6,229	76,980	76,631	1,191	1,188
Bayou Marcus	7752	LILLIAN HWY / 65TH AVE	146,338	18,000	164,338	162,804	2,962	2,961
Beach Haven	6022	LILLIAN HWY	183,117	71,568	254,685	250,480	1,775	1,792
Beach Haven	6032	PATTON DR / ALT CORRY	53,110	18,572	71,682	70,357	1,141	1,144
Beach Haven	6042	WINTHROP AVE	117,170	4,011	121,181	114,193	2,275	2,279
Beach Haven	6052	GULF BEACH HWY	87,357	15,683	103,040	138,481	2,072	2,069
Beach Haven	6062	SPARE	108,729	178	108,907	9,723	0	0
Beach Haven	6072	SPARE	345	0	345	4,574	0	0
Beach Haven	6082	DOGTRACK / GULF BEACH	197,243	38,021	235,264	301,133	2,505	2,558
Beach Haven	6092	CORRY HOSPITAL	113,410	40,665	154,075	153,586	2,049	2,055
Beulah	5502	FRANK REEDER / 9 MILE RD	147,115	1,886	149,001	143,701	751	761
Beulah	5512	SOUTH MOBILE HWY	254,625	8,820	263,445	257,381	1,122	1,138
Beulah	5522	PERDIDO LANDFILL	28,083	83	28,166	27,276	4	5

Pensacola Area			1995	1996	1996	1994	1994	1995
Substation	Feeder	Feeder Name	OH/ft	UG/ft	T/ft	T/ft	#/cust.	#/cust.
Brentwood	6662	MOBILE HWY / PINE FOREST	221,594	14,127	235,721	273,595	1,907	1,930
Brentwood	6672	SPARE	303	0	303	303	0	0
Brentwood	6678	MICHIGAN / CLIFTON	103,461	21,909	125,370	117,728	2,361	2,363
Brentwood	6682	MOBILE HWY / CHARBURG	74,350	11,115	85,465	98,691	1,241	1,072
Brentwood	6692	W ST / MASS. AVE	83,284	10,928	94,212	94,506	1,721	1,716
Brentwood	6706	PALAFOX / MICHIGAN	84,756	271	85,027	86,364	1,444	1,441
Brentwood	6716	PALAFOX / AIRPORT	97,333	4,512	101,845	100,645	1,187	1,187
Brentwood	6742	MICHIGAN AVE.	75,089	27,144	102,233	93,772	1,595	1,598
Brentwood	6774	P'COLA BLVD / CAR CITY	128,435	8,074	136,509	134,655	1,043	1,049
Cantonment	5852	OLD PALAFOX / BARR PK	549,250	10,081	559,331	546,899	2,261	2,310
Cantonment	6912	W KINGSFIELD RD / 297A	185,832	12,321	198,153	185,658	789	820
Cantonment	6922	MUSCOGEE RD	277,435	0	277,435	264,374	1,611	1,663
Cantonment	6932	CHEMSTRAND / FIBERWEB	156,682	44,071	200,753	204,377	1,387	1,406
Cantonment	6942	E KINGSFIELD / PALAFOX	203,931	69,085	273,016	247,507	1,724	1,795
Cordova	5972	LANGLEY / SCENIC HWY	59,960	24,055	84,015	83,442	993	994
Cordova	5982	WIMBLEDON RD / SCENIC	81,952	61,115	143,067	141,625	2,236	2,243
Cordova	5992	SPANISH TR / SCENIC HWY	61,384	64,104	125,488	122,655	1,699	1,703
Devilliers	492	13TH/GONZALEZ ST.	31,442	59	31,501	31,315	663	667
Devilliers	6338	CITY NETWORK 3 FEEDER	52	4,301	4,353	4,353		
Devilliers	6348	CITY NETWORK 1 FEEDER	0	4,215	4,215	4,215		
Devilliers	6352	CITY NETWORK 2 FEEDER	0	5,544	5,544	5,544		
Devilliers	7402	ALT SEWAGE PLANT	8,407	384	8,791	8,792	1	1
Devilliers	7404	BAYLEN ST / LA RUE ST	47,754	6,910	54,664	47,310	889	887
Devilliers	7406	13TH & GONZALEZ	92,389	3,491	95,880	119,698	2,623	1,603
Devilliers	7408	DEVILLIERS ST.	18,803	969	19,772	19,772	256	257
Devilliers	7410	TARRAGONA ST / PCS	11,190	296	11,486	11,487	27	27
Devilliers	7414	ALCANIZ ST / PCS	11,153	1,906	13,059	12,290	102	188
Devilliers	7416	CERVANTES / CORP OFF.	59,303	6,964	66,267	66,466	1,085	1,080

Pensacola Area			1996	1996	1996	1994	1994	1995
Substation	Feeder	Feeder Name	OH/ft	UG/ft	T/ft	T/ft	ft/cust.	ft/cust.
Eastgate	6482	OLIVE RD / JOHNSON AVE	73,752	57,371	131,123	128,367	2,040	2,081
Eastgate	7352	KIPLING RD / OLIVE RD	78,688	34,893	113,581	112,738	2,338	2,334
Eastgate	7602	UNIV. MALL / DAVIS	40,588	15,322	55,910	54,739	692	692
Eastgate	7612	NINTH AVE / TIPPIN AVE	74,513	14,870	89,383	91,380	1,869	1,884
Eastgate	7622	FOREST GLENN	61,483	14,094	75,577	74,685	1,356	1,353
Eastgate	7632	OLIVE RD / ALT W FL HOSP	93,342	42,578	135,920	116,726	1,640	1,662
Eastgate	7642	CREIGHTON/HILLTOP RD	64,718	18,380	83,098	85,344	1,539	1,550
Eastgate	7652	ALT SACRED HEART	26,866	13,882	40,748	39,512	570	572
Ellyson	5352	ELLYSON PARK	34,286	9,496	43,782	41,374	78	84
Ellyson	5362	WESTINGHOUSE #1	16,613	426	17,039	17,040	1	1
Ellyson	5372	WESTINGHOUSE #2	16,451	417	16,868	16,868	1	1
Fairfield	7762	MAR. MALL/FAIRFIELD	75,390	3,743	79,133	78,634	1,630	1,629
Fairfield	7772	TOWN & CNTY/PACE BLVD	45,728	5,153	50,881	50,549	829	827
Fairfield	7782	BORDER ST / MOBILE HWY	81,737	5,812	87,549	85,558	1,555	1,547
Goulding	714	JORDAN W. OF 16TH (4Kv)	30,688	0	30,688	30,689	514	519
Goulding	734	16TH S. OF JORDAN (4Kv)	16,278	0	16,278	16,278	221	221
Goulding	748	JORDAN W. OF 16TH (4Kv)	29,527	0	29,527	29,392	499	498
Goulding	6602	HATTON / 7TH AVE	48,020	780	48,800	48,609	954	949
Goulding	6612	EAST HILL / JORDAN ST	30,433	863	31,296	30,838	231	232
Goulding	6622	GONZALEZ	44,381	1,219	45,600	45,600	797	795
Goulding	6632	JORDAN / BAPTIST HOSP.	53,822	2,161	55,983	56,213	808	803
Goulding	6642	UNIVERSITY HOSPITAL	62,996	1,130	64,126	63,684	851	861
Goulding	6652	BAARS ST / NINTH AVE	143,404	3,661	147,065	148,064	2,491	2,490
Goulding	7662	11TH AVE / BAYOU BLVD	104,089	27,843	131,932	130,201	1,830	1,834
Goulding	7682	HYDE PARK / BAYOU	78,899	42,275	121,174	96,528	1,137	2,159
Goulding	7692	FAIRFIELD / DAVIS HWY	76,643	2,592	79,235	77,642	1,111	1,106
Honeysuckle	7872	9TH AVE / SACRED HEART	39,510	6,106	45,616	29,887	343	346
Honeysuckle	7882	PCC / BAYOU BLVD	64,367	29,649	94,016	54,744	523	531
Honeysuckle	7892	BRENT LN / DAVIS HWY	6,782	3,857	10,639	81,091	1,152	1,154
Honeysuckle	7942	Royce / 9th Ave	21,111	8,955	30,066			

Pensacola Area			1996	1996	1996	1994	1994	1995
Substation	Feeder	Feeder Name	OH/ft	UG/ft	T/ft	T/ft	#/cust.	#/cust.
Innerarity	7332	PERLIDO BAY/CNTY CLUB	51,463	54,057	105,520	104,230	1,457	1,475
Innerarity	7342	GULF BEACH/BOWER	248,951	109,915	358,866	340,610	2,243	2,282
Innerarity	7362	PERDIDO KEY WEST	64,292	25,224	89,516	86,252	1,701	1,707
Molino	6800	MOLINO EAST	454,817	0	454,817	430,363	1,068	1,099
Molino	6992	MOLINO WEST	291,796	4,862	296,658	283,803	733	755
Oakfield	7922	AREA / PALAFOX	85,109	56,320	141,429	126,574	1,596	1,624
Oakfield	7932	UNIV. MALL / BURGESS	68,194	24,672	92,866	85,041	1,405	1,410
Pine Forest	6792	9 MILE RD WEST	284,283	61,066	345,349	315,990	2,497	2,518
Pine Forest	7302	PINE FOREST RD. SOUTH	192,024	47,195	239,219	234,790	1,680	1,699
Romana	5902	W MAIN ST / GOVT CX	49,563	13,829	63,392	63,676	1,020	1,021
Romana	5912	E MAIN ST / SEWAGE	30,779	103	30,882	41,971	457	442
Scenic Hills	7572	E 9 MILE RD / CNTY CLUB	134,426	59,099	193,525	190,542	2,040	2,062
Scenic Hills	7582	JOHNSON AVE / PALAFOX	196,503	906	197,409	198,111	2,308	2,328
Scenic Hills	7592	CRIST / CHEMSTRAND	164,606	49,738	214,344	213,250	2,398	2,445
Scenic Hills	7802	UWF / AZALEA TRACE	38,223	20,940	59,163	59,516	786	789
Scenic Hills	7822	W. FL HOSPITAL	45,726	9,683	55,409	53,410	558	563
Scenic Hills	7832	OLIVE RD / HOPE DR	159,867	26,126	185,993	184,634	2,722	2,731
Scenic Hills	7842	9 MILE RD / PALAFOX	133,753	15,705	149,458	145,755	1,403	1,402
Scenic Hills	7852	SPARE	0	0	0	0	0	0
		Total Feet of O/H lines =	9,709,015	1,660,363	11,369,378	11,087,711	125,086	125,846
		Total Miles of Line =	1,839	314	2,153	2,100	125,086	125,846

David R. Hawkins
Engineering Services Coordinator

- Meet and effectively communicate with all external customers; such as builders, developers, electricians and inspectors.

  - coordinate all customer/builder rush jobs
  - maintain membership on Board of Directors for IAEI and ECANF
  - Coordinate all electrician/inspector requests

- Mediate and resolve all customer claims against Pensacola District.

  - # Formal Claims - January thru June, 1996
    Paid: 128

  - # Pass-thru claims handled: 102

  - # Claims denied: 353

  - # Total claims received: 582

- Coordinate "Joint Use" with BellSouth and Cox Cable.

- Evaluate and mediate conflicts between Gulf's Engineering Representatives and external customers.

- Prepare written communications link for Gulf's trade allies.

- Coordinate Company's House Power Panel Program.

- Manage the After-hours Emergency Reconnect Program.

- Evaluate customer-owned meter socket problems and coordinate with customer, Meter Shop, Customer Service and customer's electrician to ensure repair.

- Handle all corporate office referrals
  - Average # 80/month

- Handle all customer service referrals
  - Average # 130/month

- Handle specific problems/projects from Power Delivery Manager, Pensacola District Manager, Risk Manager, and Distribution Manager, i.e. FPSC complaints, service problems, etc.

GULF POWER COMPANY - POWER DELIVERY
WORK PROCESSES - EXEMPT STAFFING STUDY - 1996

POSITION: Major Project Coordinators URD and Major Overhead

By: Walter Mullins

==========

POSITION FUNCTION:

1. Coordinate the work of contractor personnel, company crews with developers, builders, customers and other utility contractors to achieve very satisfied customers.
2. Assign resources to meet daily needs of all the parties involved with each project.
3. Ensure contractor's work complies with all aspects of the contract and that the billing is correct and processed.
4. Inspect developer installed duct systems.

WORK VOLUME:

The Destin, Fort Walton and Pensacola's West side are in a residential construction explosion. In the Pensacola area over 4,000 lots are in some stage of development. Pensacola area developers all want their service first because the market could be over saturated and they want their homes on the market now. The Destin area will be in a building boom for the next ten years or more (until they run out of land).

RECOMMENDATION:

Several methods could be used to analysis how this section should be staffed. I have chosen the number of contract crews in each area.

Existing Personnel and crews by area:

Supervisor - Alan McDaniel

	Back Hoe Crew	Service Crew	Directional Bore	Ground Rod	Gulf Construction	One Call
Pensacola-Gates Lloyd	4	5	1	1	0	1
Fort Walton - Godwin	5	2	-	1	0	1
Panama City - Joiner	2	-	-	1	2	1

Bill Stinson has been working with Godwin in Fort Walton this past month in an effort to let him see daylight. Some improvements are needed in the Fort Walton area. I recommend that an Engineering tech be added in the Fort Walton area to work with Tommy Godwin on a permanent basis. Additional engineering techs can be added in the future to inspect developer installed duct as the needs develop.

P & E ELECTRIC WEEKLY CREW REPORT

WEEK ENDING 10/27/96

	1507 - Pensacola			1508 - Ft. Walton			1505 - Panama City			TOTAL		
	# CREWS	MAN HRS	CHARGE	# CREWS	MAN HRS	CHARGE	# CREWS	MAN HRS	CHARGE	# CREWS	MAN HRS	CHARGE
BACKHOE	4	364	9,594.38	5	435	11,717.36	2	195	4,535.94	11	995	25,847.68
SERVICE	5	469	11,592.02	2	144	3,951.96	0	0	0.00	7	613	15,543.98
DIRECT BORE	1	133	3,807.71	1	43	1,153.16	0	0	0.00	2	177	4,960 87
OVERHEAD	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
POLE	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
GROUND ROD	1	40	1,463.00	1	40	1,368.00	1	11	334.40	3	91	3,165.40
SUBTOTAL	11	1007	26,457.11	9	662	18,190.48	3	207	4,870.34	23	1877	49,517.93
SUBSTATION	1	80	1,842.20	0	0	0.00	0	0	0.00	1	80	1,842.20
TRANSMISSION	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
OTHER	1	15	455.43	0	0	0.00	0	0	0.00	1	15	455.43
TOTAL	13	1103	28,754.74	9	662	18,190.48	3	207	4,870.34	25	1972	51,815.56

36 services 15 17

Total Services = 78

651

GULF POWER COMPANY
SEPTEMBER 1996 YTD
NEW BUSINESS EXPENSE PER PREMISE BY LOCATION

LOC NO	LOCATION	OFFICE NO.	PREMISE ADDITIONS	% UG	2552 EXPENSE	COST PER PREMISE	% RES
16	CHIPLEY	3102-03-04	155	3.9%	$411,855	$2,657	69.7%
15	PANAMA CITY	3105	1,300	6.7%	$1,463,493	$1,126	74.1%
22	CRESTVIEW	3202	360	10.3%	$494,759	$1,374	85.0%
23	DEFUNIAK	3203	53	0.0%	$156,443	$2,952	62.3%
24	FORT WALTON	3204	619	40.4%	$1,460,955	$995	80.8%
27	DESTIN	3204	849	65.4%			76.4%
25	NICEVILLE	3205	122	59.8%	$178,740	$1,465	77.0%
33	CENTURY/MILTON	3302-03	724	19.8%	$475,702	$657	87.8%
55	PENSACOLA	3304	2,613	42.1%	$2,843,525	$1,088	88.1%
	TOTALS		6,795	20.8%	$7,485,471	$1,102	81.5%

11/05/96

160

FYIWDM.WK4

CENTRAL DISTRICT, BILLS TIMMY

INVOICE

OCUTS
3261 Atlantic Avenue
Suite 120
Raleigh, NC 27604
Phone: (919) 713-2392
Fax: (919) 713-2386

Submit Payment To:
NC Utility Services
Treasury - CMR (MC2111)
P.O. Box 50
Wake Forest, NC 27587
Phone: (919) 713-2375

nvoice No.:961011-2094

PO: 896410009 ACCT:021-584-00950

ustomer GULF POWER
ddress P.O. BOX 2887
FT. WALTON BEACH, FL 32549-2887
.ttn TOMMY GODWIN @ 8058
enter GP286/

	From	To
Date	09/15/96	09/21/96

Total tickets 25

Total from billing detail $ 113.00)

Description	Item	Code	Utl	Quantity	Cost	Total
NORMAL LOCATE		NORMAL	1	2.00	10.00	20.00
NORMAL LOCATE		NORMAL	2	4.00	9.00	36.00
SITE VISIT / SHORT NOTICE		SSVNLS	1	3.00	3.00	9.00
SITE VISIT / SHORT NOTICE		SSVNLS	2	16.00	3.00	48.00

Total Amount Due 113.00

*** Please include the invoice number with your payment. ***

161

Billing Report
For GP286 / - 09/15/96 thru 09/21/96
Invoice No.:961011-2094
PO: 896410009 ACCT:0

Ticket Location	Located	Loc	Work Done	Item	Qty	Unit Price	Invoice Amount
0525671	01 09/16/96	0367	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON BEACH/JET DR/JEFFERSON PL 132 JET DR == LOCATE FRONT R/O/W Mch=Y							
0529829	01 09/16/95	0367	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON BEACH/KANUHA DR/BEUGE BLVD 572 KANUHA DR--LOCATE BOTH SIDE AND REAR							
0530261	01 09/16/96	0367	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON BEACH/BASS AVE/COMET ST 11 BASS AVE - NW CORNER OF PROP Mch=Y Depth:							
0529563	01 09/16/96	0367	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON BEACH/TERRY AVE/INDEPENDENCE RD TERRY AVE & INDEPENDENCE RD - 80							
0530173	01 09/17/96	0353	NL%2		1.00 $	9.00 $	9.00
NAVARRE/PALO ALTO ST/US98 2125 PALO ALTO ST-----ENTIRE FRONT BOTH SIDES OF R/W							
0532410	01 09/17/96	0353	NL%2		1.00 $	9.00 $	9.00
WRIGHT/JONQUIL AVE/HOMEWOOD WAY FROM THE NE CORNER OF WOODBINE CIR AND							
0534614	01 09/17/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON/NATURES TRL/BEAL PARKWAY 225 NATURES TRAIL**LOCATE THE FRONT OF THE							
0533680	01 09/18/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON/FIM BLVD/BEAL PKWY EXT **1700 FIM RD**LOCATE THE W SIDE OF THE							
0533594	01 09/18/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON BEACH/LARK ST/FOREST HEIGHTS RD **AT THE INTERSEC OF LARK ST AND							
0538425	01 09/18/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON BEACH/BRADFORD RD/HAWKINS RD 108 BRADFORD RD*****LOCATE 200 FT EACH							
39955	01 09/18/96	0353	NL%2		1.00 $	9.00 $	9.00
NAVARRE/JESSICA WAY/US98 1984 JESSICA WAY **LOCATE THE ENTIRE PROPERTY Mch=Y							
0537238	01 09/19/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
WYNNEHAVEN BEACH/PALMETTO AVE/CYPRESS ST AND WILDWOOD ST PALMETTO AVE ==							
0538998	01 09/19/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON/SW MIRACLE STRIP PKWY/WRIGHT PKWY 363 SW MIRACLE STRIP PKWY**LOCATE							
0542113	01 09/19/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
FT WALTON/SW MIRACLE STRIP PKWY/WRIGHT PKWY 363 SW MIRACLE STRIP PKWY**LOCATE							
0545810	01 09/19/96	0353	NL%2		1.00 $	9.00 $	9.00
FT WALTON BEACH/WILLOW BEND BLVD/WILLOW GROVE LN INTERS OF WILLOW BEND BLVD							
0544233	01 09/20/96	0351	NL%1		1.00 $	10.00 $	10.00
NAVARRE/PALO ALTO ST/US98 2129 PALO ALTO ST-- LOCATE ENTIRE PROPERTY Mch=Y							
0544275	01 09/20/96	0351	NL%1		1.00 $	10.00 $	10.00
NAVARRE/PALO ALTO ST/US98 2125 PALO ALTO ST-- LOCATE ENTIRE PROPERTY Mch=Y							
0544854	01 09/20/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
NAVARRE/US98/LOWE RD LOCATE STARTING 3 MILE EAST IN FRONT OF ZOO ON US98							
0544862	01 09/20/96	0351	#SVNLS%1		1.00 $	3.00 $	3.00
NAVARRE/US98/CORAL ST LOCATE STARTING 4 MILE EAST IN FRONT OF ZOO ON US98							
0544887	01 09/20/96	0351	#SVNLS%1		1.00 $	3.00 $	3.00
NAVARRE/US98/JEANNIE ST LOCATE STARTING 9 MILE EAST IN FRONT OF ZOO ON US98							
0544893	01 09/20/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
NAVARRE// LOCATE STARTING 10 MILE EAST IN FRONT OF ZOO ON US98 (WHICH IS							
0544975	01 09/20/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
NAVARRE/US98/BISCAYNE BLVD LOCATE STARTING 8 MILE EAST IN FRONT OF ZOO ON US98							
0544987	01 09/20/96	0351	#SVNLS%1		1.00 $	3.00 $	3.00
NAVARRE/US98/JEANNIE ST LOCATE STARTING 9 MILE EAST IN FRONT OF ZOO ON US98							
0545001	01 09/20/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
NAVARRE/US98/ LOCATE STARTING 10 MILE EAST IN FRONT OF ZOO ON US98 (WHICH IS							
45325	01 09/20/96	0353	#SVNLS%2		1.00 $	3.00 $	3.00
MARY ESTHER/US98/EAST RD US98 AKA SR30, AND HURLBERT FIELD ENTRANCE -LOCATE							

162

Pensacola AREA STATUS

DSO #	Location	Holding	In Progress	Complete
	REVISED 10 28 96			
x	Gulf Beach/Blue Angel	x		
089309	8260 Mobile Hwy.	x		
089176	Cottages at Marcus Lake	x		
089123	5575 Larimer Ave.	x		
089077	Holiday Inn Express		x	10 17 96
089068	Holiday Inn Express		x	
008052	South Harbour Condos'	10 10 96	10 16 96	10 21 96
088918	Springfield		x	
089231	Harvester Federal Credit Union	1		
089200	Sound Forest	x		
089213	Sound Forest		x	
089242	Shadow Lake	x		
08138	Jefferson Park / Spanish Trail.	10 23 96		
088548	6560 Bay Blvd	10 14 96		
08131	1726 Booth Lake rd.	10 23 96		
089266	College Blvd.		x	
08135	Springdale Forest	10 23 96		
089282	14407 Perdido Key Dr.	x		
089295	8039 Gulf Blvd.	x		
089514	5103 Hwy. 90 W - Tom Thumb	x		
08096	Lamar Advertising 5466 Hwy 98 East.	10 24 96		
089278	*# 20 Calle Hermosa*	10 10 96		
008068	*6436 Scenic Highway*	10 10 96		
089287	*811 S. "R" st.*	10 24 96		
089138	2190 Inda Ave.	x	10 23 96	
089142	Grand Pt. - Phase II			x
089147	Grand Pt - Phase II - St Lt			x
089236	Light House Pt.	x		
089274	General Aviation - Pensacola Airport		x	
089205	Tiger Lake Town Hse	x		
088870	Carribean Isle	x	x	10 09 96
089203	Lost Key - St Lt		x	
089306	207 Laura Lane	x		10 17 96
08151	2121 Reservation Dr.	10 28 96		10 23 96

08148	First American Town & Country	10 28 96		
08146	7240 Scenic Shores Dr.	10 28 96		
08140	Ellison Place	10 28 96		
089520	Baypoint Plantion	x		
089327	Airport & College Pky	x		10 14 96
89325	Baypine Villas	x		
08051	cordova mall	x		
089214	Sound Forest URD access line.	x		
089336	16773 Perdido Key Dr.	x		10 04 96
08067	9900Palafox St.	x		10 15 96
089311	6001 Enteprise dr.	x	10 17 96	10 18 96
089106	3069 Red Fern Rd.	10 14 96	10 15 96	10 15 96
089300	CONCHO DR.	10 17 96		
08111	22 Arapaho Dr.	10 17 96		10 22 96
08108	7431 La Quinta	10 17 96		
08113	9800 Harlington	10 17 96		
008104	Sunset Lane	10 17 96		
08119	Majestic Oaks	10 17 96		
08112	Smith Ave. #24 & #25	10 17 96		
08107	Autum Trace Cir. OL's	10 17 96		
089094	5101 Northpoint Blvd.	10 17 96		10 23 96
08100	7724 Deborah Dr.	10 22 96		
089324	Springdale Forest Sub.	10 22 96		
089031	Seaglades North	10 22 96		
08118	1127 Boodsworth Lane	10 22 96		
089310	Hwy. 95-A GIL Ind.	10 22 96		
08084	Falling Leaves Court	10 22 96		
08065	Falling Leaves Court OL's	10 22 96		
08116	304 Ariola OH/UG	10 22 96		10 22 96
08110	911 Ariola OH/UG	0 22 96		10 22 96

THIRD QUARTER 1996 BOARD REPORT
Pensacola District Marketing

RESIDENTIAL

1997 Parade of Homes - the central site will be **Cambridge Mills off Johnson Avenue**. The developer for this site is Brantley-Knepper.

Bauer Estates - a gas development by Escambia Construction is located at **Seratine off Bauer Road**. This 65 lot single-family development is scheduled to begin in November 1996. It has not been decided on whether it will be overhead or underground. Estimated additional load - 312 KW & approximate annual revenue -$41,535.

Bay Pine Villas - located on **Highway 98 West** is being developed by Escambia Construction. Because of the non-availability of gas, this project will be all-electric. This single-family, overhead project will have 90 lots and started in September with completion scheduled for March 1997. Estimated additional load - 369 KW & approximate annual revenue -$49,320.

Baypoint Plantation - located **off Robinson Point Road** is a single-family project with 63 lots. It is still in the early planning stages.

Belle Mer Condos - a multi-family, 62 unit, all electric project developed by Bill Harbert Ventures, continues construction on **Navarre Beach**., Estimated annual revenue--- $93,000 and approximate added load 790 KW.

Caribbean Isle Subdivision - All Electric, developed by Levin's Navarre Developers, located on **Navarre Beach**. A single-family, underground project with 49 lots. Construction started last quarter and should be complete by January 1999. Estimated additional load---568 KW & approximate annual revenue---$64,000.

Champion's Green 4 - developed by John Carr, continues construction in the 62 lot development in **Tiger Point**. Estimated annual revenue---$68,828 and estimated load---528 KW.

Chandelle - 1st Addition, Phase 3 - located on **Gulf Beach Highway** and developed by Classic Homes. This single-family, underground project with 13 lots will be Good Cents and Gas. Construction started in September with completion scheduled for December 1996. Estimated additional load - 27 KW & approximate annual revenue -$14,000.

Chevalier, Phase III - developed by Avia/Winthrop Group is located on **Gulf Beach Highway**. This single-family, underground project with 94 lots will be a gas development. Construction started in August 1996 with completion scheduled for January 1997. Estimated additional load - 517 KW & approximate annual revenue -$66,470.

Collins Mill Creek Apartments---in **Milton**, being developed by Wesley Jones. Work has started on this 85 unit, underground. The revised completion date for the apartments is November. This will be an all electric, good cents, upscale project. Estimated additional load---825 KW and estimated annual revenue---$83,895.

Cook's Crossing - 74 lots, being developed on **Blue Angel at Dogtrack Road** by Northwood Construction (Kelly/Barchett) is a single-family, underground project. This Good Cents, all electric development, is now under construction (Phase I). The duct system is installed and completion is scheduled for fall 1996. The developer has Good Cents signs and brochures. Estimated added load---754 KW and approximate annual revenue is $81,252.

Coral Village - located on **Blue Angel Parkway** and developed by Henry Company. This gas, single-family, underground subdivision will have 132 lots. Construction should start in December 1996. Estimated additional load - 633 KW & approximate annual revenue - $84,348.

Coste Verde Subdivision - located one mile east of **Navarre Beach bridge off Highway 98** is still being developed by Greg Fountain of Sound Developers, Inc. This project will have 19 underground lots. Estimated annual revenue---$25,000 and approximate additional load---220 KW.

Cottages at Marcus Lake - A single-family, underground, gas development with 136 lots is located on **Massachusetts Avenue** and being developed by RGB Developers. Construction started in August, with roads to grade. The duct crossings are in and the primary and secondary duct are starting to go in. Estimated additional load--652 KW & approximate annual revenue-$36,904.

Cotton Bay Estates - being developed by John Larker. Located in **Navarre** off Highway 98, construction has not started on the 32 lot, underground service subdivision. Estimated annual revenue---$40,000 and estimated additional load---350 KW.

Country Breeze Estates East - (formerly East Bay Shores) in **Navarre** was developed by Bernie Rolls. This 82 lot, single-family, overhead, all-electric development is under construction with completion scheduled for December 1997. Estimated additional load---861 KW and estimated annual revenue---$95,000.

Country Club Circle - located on **Bayshore Drive**, this single-family gas & all-electric, underground development will have 14 lots. Being developed by Ralph Cerretta, construction began in July. Additional estimated load---128 KW and estimated annual revenue---$9,807.

Crane Cove - located on **Highway 98 in Gulf Breeze**, this project is being developed by R.G.B. Development, Inc. This single-family, underground development will have 51 lots but construction has been delayed. Additional estimated load---464 KW and estimated annual revenue---$54,000.

Creekside Apartments - Phase II being developed by Jerry Jegge is one, two and three bedroom apartments. This is in the early planning stage.

Crown Pointe - (Phase I of III) - located on **Lillian Highway**, developed by Reliant Developers. This single-family, underground, gas development with 42 lots has started and the roads are in. Estimated added load---201 KW and estimated annual revenue---$26,838.

Crystal Lake Apartments - is located on **Highway 98 West** and is being developed by J. C. Merrill Developers. This 224 unit, underground, multi-family complex is scheduled to start in December 1996. Final plat has not been received.

Eden Condos - Phase III - located on **Perdido Key**. This all-electric, multi-family, underground project will have 45 units. Construction began in July 1996. Additional estimated load---522 KW and estimated annual revenue---$54,450.

Emerald Isles - on **Pensacola Beach**, designed by Gulf Front Development. Inc. has started on the second story. This 128 unit, underground, multi-family project is still scheduled for completion by 1998. Estimated additional load---1306 KW and approximate annual revenue---$141,000.

Falling Leaves - located on **Highway 98** near Harvester's Village is being developed by Adams Homes. This single-family, underground project with 11 lots will be an all-electric, Good Cents subdivision. The development with 3,000 square foot executive homes will be starting in November 1996. Estimated additional load--134 KW & approximate annual revenue---$15,411.

Forest Creek, Phase III - (Cantonment) Twelve homes have been completed in this 91 lot, single-family project, developed by Raymond Noel. This project's estimated completion date is April 1997. Estimated addition load---1050 KW and estimated annual revenue---$86,450.

Governor's Cottages - This 20 unit, single-family development, located off **University Parkway**, was developed as an all gas project by Mitchell Homes. Completion is scheduled for 1997. Estimated added load---82 KW and approximate annual revenue - $11,000.

Grand Caribbean - (Phase I of II) 67 unit, Good Cents, underground condo, located at **Sandy Key** was developed by Shoults, Gwin & Associates. Construction started in March 1996 with completion changed to November 1996. Estimated additional load---683 KW and estimated annual revenue---$73,566.

Grand Caribbean - (Phase II of II) 67 unit, Good Cents, underground condo, located at **Sandy Key** was developed by Shoults, Gwin & Associates. Construction started in August 1996 with completion scheduled for February 1997. Estimated additional load---683 KW and estimated annual revenue---$73,566.

Greystone - 62 lots, located off **Ten Mile Road** has started construction (Adams Homes). Estimated annual revenue---$52,000 and approximate added load---300 KW.

Harbour Island, Phase C - located on **Gulf Beach Highway**. This single-family, gas, underground project being developed by Garrett Walton & Dick Baker will have 111 lots. Construction began in September with road being brought to grade. There are a total of 780 lots in this project. Additional estimated load - 532 KW and estimated annual revenue---$70,929.

Harbour Lakes - on **Gulf Beach Highway**, developed by Wingate Group Trust. This all-electric, single-family, underground development will have 24 lots. Construction will begin in December. Additional estimated load---278 KW and estimated annual revenue -$31,272.

Heritage Woods - located on **Mobile Highway** and being developed by Byron Cook, this single-family, underground, gas project will have 64 lots. Construction will begin in October 1996. Additional estimated load - 247 KW and estimated annual revenue - $45,440.

Heron's Walk - located on **Johnson Beach**. La Cruz Developers (Harrington) started this single-family, underground, 45 lot project in May, the roads have been completed and construction has started on the homes. Estimated additional load---459 KW and approximate annual revenue---$54,450.

Hidden Bay Village (Phase I) This subdivision located off **Highway 399 in Navarre** across from Hidden Creek Country Club was developed by Majestic Enterprises, Inc. The 95, multi-family, individually metered, underground service, townhouse project started construction in January. Estimated completion is still October 1997. Estimated revenue---$104,000 and approximate 970 KW added load.

Lighthouse Point - (Phase I - 49 lots) on **Highway 98, west of Holley-By-The Sea** is a 286 lot gas subdivision being built in 4 phases by Mitchell Homes. These single-family underground homes have started construction and estimated completion is 1999. Estimated additional load--1373 KW & approximate annual revenue---$182,754.

Lost Key Plantation - (Phase A) a high-end development with golf course continues development by Dan Savage on **Old River Road**. This single-family, underground development with 65 lots began construction in July with completion scheduled for March 1997, and the roads are to grade. Estimated additional load---396 KW and approximate annual revenue---$84,700. Phase B, scheduled to begin construction in January 1997, is a multi-family, underground project with 300 units. Estimated added load---2910 KW and approximate annual revenue---$329,400. There is a possibility that these projects could be a geothermal community but this is still unknown as well as if this will be a Good Cents project.

Magnolia Lake - developed by Henry Company, has started two houses. The 72 lot, single-family, underground project's completion date has been changed to January 1997. Approximate added load---508 KW and estimated annual revenue---$67,500.

Majestic Oaks - located off **Ten Mile Road**, has started four houses in the 28 lot development. Estimated annual revenue---$23,000 and approximate added load---241 KW.

Martha's Cove - this addition in **Navarre** by Adams Homes has planned 34-single family, all electric, Good Cents units. The construction started in February and should be completed by January 1997. Estimated additional load---395 KW and approximate annual revenue---$44,000.

Mirabelle Apartments - this all gas project, developed by JBL Construction with 176 multi-family units is 5% complete. Estimated annual revenue---$81,000 and approximate added load---634 KW.

Mirabelle 4 - located in **Pensacola**, is an all gas, single-family, underground project with 54 lots being developed by JBL. Construction began last quarter. The estimated completion date is still December 1998. Estimated additional load---259 KW and approximate additional revenue---$35,000.

Navarre Beach Regency Condos - scheduled for completion in February 1997 is complete and on line. This single-family, 106 unit, all electric project has an estimated annual revenue---$128,000 and approximate added load 1150 KW.

Navy Housing - (located at N.A.S. Pensacola, developed by the U.S. Navy) This existing, multi-family, overhead project has 236 units. They are continuing to convert the existing townhomes, from gas to total electric, including geo-thermal heat pumps. Construction, started during the first quarter, is still scheduled for completion in February 1998. Additional load---354 KW and approximate annual revenue---$33,000. This project won second place in EEI's National Award Program.

Oakwood Apartments - on **Chisholm Road** is a 64 multi family underground project is still being developed by Larry Fowler. A new construction schedule has not been received. Estimated additional load---653 KW & approximate annual revenue---$70,000.

Perdido Bay Country Club (Unit 3) - (Good Cents and gas) Gas lines are being installed. Being developed by A& M Enterprises, the project is located on **Sorrento Road**. The developer/builder has committed to all electric on the spec houses. This single-family, underground project will have 55 units and started construction in September. The duct is being installed. Estimated additional load--447 KW & approximate annual revenue - $52,275.

Perdido Bay County Club (Unit 7) - (all electric and gas) Gas lines will be installed. Developed by individual owners, D.R. Horton and Randall Construction, this project is located on **Sorrento Road**. This single-family, overhead project will have 55 units. Construction started in July. Estimated additional load--264 KW & approximate annual revenue---$35,035.

Perdido Estates - being developed by Classic Homebuilders for D. R. Horton and located on **Gulf Beach Highway**. This single-family, underground, gas development has 80 lots. Construction started in September 1996. Additional estimated load - 537 KW and estimated annual revenue---$71,568.

Preserve - located at **Crown Pointe on Lillian Highway**, is still being developed by West Florida Developers. This single-family, underground development will have 72 lots with 50% gas/50% electric. Construction is still scheduled for the fall. Approximate additional load---615 KW and estimated annual revenue---$72,468.

Seaglades North - located on **Gulf Beach Highway**, and developed by J. C. Merrill Development (Collier Merrill). This project started construction in May. The 100% gas, single-family, underground project will have 210 lots. As mentioned last quarter, the developer will install the duct at direct buried cost, due to quote already given; however, no payment has been received . 75% of the duct has been installed by the developer. Estimated added load---1008 KW and estimated annual revenue -$115,080.

Shadow Lakes - (Phase I - 64 lots) located on **Highway 399 near Tom King Bayou**. There will be a total of 289 single-family, underground homes. Phase I is expected to begin construction in January 1997 and completion of all phases due to be complete by 1999. This gas subdivision is being developed by Mitchell Homes. Estimated additional load--1387 KW & approximate annual revenue---$184,671.

Sound Forest - single-family, underground project located in **Gulf Breeze** off Soundside Drive. With 48 lots being developed by Godwin Development Co., Inc., construction began the first quarter '96 with an estimated completion date of January 1998. Estimated additional load---542 KW, estimated revenue $82,000.

Springdale Forest (Phase I of III - 220 lots total) - located on **Bellview Road**. Another Henry Homes gas development, the project will be single-family underground with 54 lots in Phase I. Construction began in July with an estimated completion date of December. Estimated additional load--259 KW & approximate annual revenue---$34,506.

Springfield - (Phase I of III) being developed by Mitchell Homes on **Blue Angel Parkway** is a single-family, underground, 100% gas project with 119 lots in Phase I. There will be a total of 328 lots. Phase I began construction in July and estimated completion is December. Duct will be put in at direct buried cost because the customer has already paid for the underground costs. Estimated added load for Phase I---487 KW and estimated annual revenue---$65,212.

Summerdale Subdivision - located on **Highway 90, just east of Pace** is a 78 lot project being developed by Reve' Development. No construction has started. All lots have been sold to Reliant Contractors and Thomas Home Corporation. This project is still in the planning stage. No estimates on load or revenue.

Sunset Oaks - A Mitchell Homes development with 28 lots, located off **Ten Mile Road**, is 90% complete. Estimated annual revenue--- $24,000 and approximate added load---175 KW.

Tarklin Ridge Estates - **on Sorrento Road** and developed by Escambia Construction. Construction began on this 80 lot, single-family, gas, underground project in September 1996. Additional estimated load---384 KW and estimated annual revenue - $51,120.

Terrace Crest - is still being developed by Foret Builders Inc. (13 lots located in **Gulf Breeze** on Shoreline Drive, west of Sunset). Construction has not started. The estimated completion date is estimated to be 1999. Estimated annual revenue---$13,000 and approximate additional load---105 KW.

The Reserve - **off Sundowner Drive across from Smuggler's Cove**. This 167-lot all-electric subdivision will be built in one phase by Henry & Company. The single-family, underground development will start in December 1996 with completion scheduled for 1998. Estimated additional load--1820 KW & approximate annual revenue - $202,070.

Thornwood Subdivision - An all-gas, Mitchell Homes development located on **Arand Road, off Copper Road**. Construction continues on the 29 underground service lots, with completion still scheduled for 1997. Estimated annual revenue-$19,000 and approximate additional load-137 KW.

Tiger Lake Condos - The 103 unit, all electric, Good Cents, multi-family, underground project is being developed by Builders Showcase in **Gulf Breeze**. Construction began In August with an estimated completion date of December 1997. Estimated additional load---1123 KW and approximate annual revenue---$125,000.

Timber Creek Phase 4 - located **adjacent to Timber Creek Subdivision**, in North Pace. This project was developed by Gulf Timberlands for Celebrity Homes. Development construction on this 42 lot development is complete and construction on the homes has started. Estimated additional load---424 KW and estimated annual revenue---$63,000.

Villa Danielle - 108 multi-family, and 86 single-family, all electric project being planned by Fernando Carvajal. It is located off Highway 399 in **Navarre**. Approximate added load--- 2100 KW and estimated annual revenue---$234,000.

West Roberts Estates - located south off West Roberts Road next to Forest Creek Subdivision in **Cantonment**. Developed by Harry Harris, the 36 lots project started development construction in May and they are working on the roads. Estimated added load---368 KW and approximate annual revenue---$34,200.

COMMERCIAL

Arbor Healthcare - This 80 bed nursing home was completed in September. The Good Cents building encompasses 45,000 square feet with an anticipated annual revenue of $72,000.

Baker's House of Steaks - located in **Milton**. Construction is 50% complete. Estimated connected load is 64 KW and annual revenue is $8100.

Billy Bob's Beach Bar BQ - located in **Gulf Breeze**. Construction has started. Estimated annual revenue---$10,000 and approximate added load---97 KW.

Burger King - located in **Gulf Breeze** (Old Popeye's being remodeled) will have approximately 80 KW connected load with approximately $21,000 annual revenue.

Commerce Park - located on **9 Mile Road and Interstate 10** will have a Best Western Hotel with 64 units. Negotiations are still in the process and construction has not started. There is the possibility of two restaurants and some commercial businesses locating there.

Dean Witter Brokerage Firm - the **Gulf Coast Mercantile Building** at 17 E. Main Street is being renovated for Dean Witter's use and should be complete in May 1997. This two story, 22,000 square foot warehouse in now vacant. Waiting on the final plans.

Hampton Inn - located on **Airport Boulevard** is waiting on the final plans from the architect. This motel will have approximately 126 units.

Highway 29 North Shopping Center - Now under construction, this project is on schedule and should be complete by first quarter 1997. The project includes Winn Dixie, Big B Drugs and retail lease units. Approximate added load---770 KW and estimated annual revenue---$105,000.

Lost Key Plantation - located on **Perdido Key** is in the early stages. They have started clearing some areas. Electrical loads and annual revenue on the clubhouse are not available because they have not completed the final plans.

Mariott Courtyard (Burgess Road)- plans are still in the preliminary stages, still getting permits, etc. There will be approximately 90 units. Approximate added load---925 KW and estimated annual revenue---$57,000.

Mariott - (corner of Chase and Salamanca) - plans are still in the preliminary stages, according to the architects. Estimated to have 80 suites.

Navarre High School Phase I - provided classrooms for 9th grade students, was completed in July. The all-electric building encompasses 25,000 square feet with an anticipated annual revenue of $68,000.

Orville Beckford Ford/Mercury Dealership - this is in the bidding process. Construction should begin in January 1997. This location will have an annual revenue of approximately $35,000 with a demand of 250 KW.

Palm Gardens Nursing Homes - This 34 bed addition was completed in July. The Good Cents building which encompasses 29,000 square feet incorporates water source heatpumps. The anticipated annual revenue is $60,000.

Porky's Pizza - located at **500 N. Highway 29**. This all-electric establishment has not started construction. Approximate added load---61 KW and estimated annual revenue---$8,000.

Super 8 Motel (New Warrington Road) - They are installing a Heat Pump instead of electric heat and air. 41 units. Estimated annual revenue---$20,000 and approximate connected load---256 KW.

Wal-Mart Superstore located in **Gulf Breeze** will begin construction in October 1996. Completion date is scheduled for May/June 1997. There is approximately 149,000 square feet with an estimated 5-6 million kwh per year. Estimated annual revenue is approximately $225,000.

Distribution Line Construction
Work Orders worked by Underground Crews
Jerry L. Joiner

No.	Work order No.	Customer/Location	Total Cost
1.	029206	Summerwood Subdivision	110,418
2.	029226	Brittany Woods Estate	103,666
3.	029229	Brittany Woods Street Light	10,359
4.	029244	Northshore Phase VII	84,321
5.	029211	2405 Jenks Avenue	9,117
6.	029257	10607 Parkhill	739
7.	039950	McGee Road	1,297
8.	029260	2501 Country Club	1,629
9.	029259	McKenzie Park	511
10.	029232	103 Hamilton Avenue	1,411
11.	029264	2211 East 6th Court	685
12.	035700	West 14th Street	3,292
13.	029262	South Glades Trail	38,014
14.	029265	Highway 22 and Katherine	5,534
15.	035589	City Complex	13,368
16.	029181	City Marina	90,846
17.	029289	Mowat Highlands, VII	32,693
18.	029276	SouthTrust Bank	7,549
19.	029234	Walmart Super Center	25,935
20.	029179	Albertson's - Highway 22	11,951
21.	029328	Lynn Haven Recreation Complex	31,819
22.	029273	1613 East 12th Street	1,284
23.	029284	June Avenue North of 15th Street	25,881
24.	039965	Chipley - 308 4th Street	233

hcl

(*Underground work orders, cont'd*.....**Page 2**)

No.	Work order No.	Customer/Location	Total Cost
25.	029257	8220 Grand Bay Boulevard	62
26.	029257	212 Village Way	152
27.	029281	17496 Panama City Beach Parkway	4,184
28.	035443	Shores Condominiums	Hurricane Opal
29.	029268	Walton County Road C30 - A Lift Station	4,861
30.	029269	2505 Willow Lane	443
31.	039955	Holiday INN Express	13,043
32.	029287	17825 Front Beach Road	1,033
33.	029283	9807 Front Beach Road - Coconut Creek	2,502
34.	029286	Out Back Steak House	13,298
35.	035443	Front Beach Road and DeLuna	Hurricane Opal
36.	039967	SunnyHills - 921 Country Club Boulevard	417
37.	060357	Graceville - Department of Transportation	4,224
38.	029294	Bear Point Road	10,132
39.	029271	The Palms - 17880 Front Beach Road	19,959
40.	029280	Sleep Inn Motel - Highway 98	15,192
41.	029296	2304 Foxworth Drive	1,989
42.	029302	7222 South Lagoon Drive	556
43.	029298	4600 Collegiate Drive	1,045
44.	029297	7300 Beach Drive	722
45.	029234	Wal-Mart Super Center	25,935
46.	029303	3605 Thomas Drive	1,238
47.	029306	2677 Ferol Lane	12,414
48.	029292	Oak Lane Subdivision	44,435
49.	029311	2503 - 2507 County Club Drive	2,668
50.	029312	465 West 23rd Street	10,405

541

(*Underground work orders, cont'd*.....**Page 3**)

No.	Work order No.	Customer/Location	Total Cost
51.	029307	318 South Bonita Avenue	2,212
52.	029310	Summerwood - Sign	1,412
53.	029276	SouthTrust - Harrison and 7th Street	9,423
54.	029375	2603 Country Club Drive	693
55.	029315	8762 Thomas Drive	1,465
56.	029261	11213 Front Beach Road - Burger King	7,503
57.	029321	23001 Front Beach Road	1,285
58.	036066	204 Tyndall Parkway	3,915
59.	029322	2003 Beck Avenue	1,284
60.	029331	4620 North Lakewood Drive	1,229
61.	036109	Nadine Road	3,149
62.	029337	4113 Pipeline Road	2,497
63.	029323	6501 - 6511 Harbour Place	3,329
64.	029338	3418 Minnesota Avenue	2,943
65.	029304	6000 Gulf Drive	3,659
66.	029325	825 Ohio Avenue	3,848
67.	CJO #018-800-13417	Hidden Pines and Treasure Palm	
68.	029314	6805 Gulf Drive	648
69.	029339	17793 Front Beach Road	993
70.	029340	8727 Thomas Drive	3,781
71.	029342	Gulf Coast Community Hospital	13,027
72.	039968	Lucas Lake	459
73.	039971	Paradise Lakes	45,821
74.	029335	Harbour Blvd.	5,289
75.	029347	12210 Back Beach Road	

(*Underground work orders, cont'd.....*Page 4)

No.	Work order No.	Customer/Location	Total Cost
76.	039346	3113 C C Drive	1,388
77.	029353	Greenfield Village	123,210
78.	039975	Sunny Hills	3,165
79.	029348	225 Glades	947
80.	029359	2505 Jenks Avenue	4,096
81.	029344	Trane Building	29,916
82.	029370	Trane Parking Lot Lighting	15,722
83.	029373	Arizona Chemical	30,270
84.	029358	June Avenue and 17th Street	12,572
85.	029352	Cynthia Court	1,207
86.	029351	Gwendolyn Court	1,207
87.	029371	Shirley Drive and Highway 22	54,440
88.	029374	Shirley and Highway 22 - Street Lights	4,987
89.	029345	6912 Sunset Avenue	816
90.	029355	22500 Front Beach Road	2,034
91.	029380	Windwood Subdivision - 8th Street and Delaware Avenue	49,057
92.	029383	Next to 3011 CC Drive	1,084
93.	029376	3333 Minnesota Avenue	1,366
94.	029361	24000 Front Beach Road	13,692
95.	029379	4534 East Business Highway 98	1,208
96.	029367	Merritt Brown School	2,531
97.	029295	790 Skyland Avenue	687
98.	029335	Harbour Boulevard	5,289
99.	029368	5411 Gulf Boulevard	1,094
100.	029375	Chick-Fil-A - Thomas Drive and Highway 98	9,423
101.	029319	Surfside Townhouses	4,390

LL1

(*Underground work orders, cont'd*.....**Page 5**)

No.	Work order No.	Customer/Location	Total Cost
102.	029369	3201B West 13th Street	1,564
103.	029389	2863 Tupelo Drive	859
104.	029393	State Road 390 and Baldwin	2,662
105.	029390	8335 James Street	2,059
106.	029392	Harvard and Bay Meadows Drive	36,808
107.	029395	8741 North Lagoon Drive	646
108.	029276	Ann Miller Road, Lot 3 and 4	7,549
109.	029394	432 Anita Avenue	1,275
110.	029399	601 Harvard Boulevard	645
111.	029343	Fernwood Development	4,451
112.		Martin Luther King Boulevard and 17th Street	
113.	029391	22901 Panama City Beach Parkway	3,695
114.	029407	152 Marlin Circle	1,047
115.	029409	2915 Marron	1,965
116.	062027	2200 Nelson Street	1,559
117.	029190	Carrillon Beach	4320
118.	029377	Block Buster Video	8,774
119.	029402	530 Florida Avenue	3,642
120.	029400	17950 Panama City Beach Parkway	5,231
121.	029334	20723 Front Beach Road	14,559
122.		22500 Front Beach Road	
123.	008041	19th Street and Wilson Avenue	
124.	029411	Marriott Boulevard	67,913
125.	029410	5205 Gulf Drive	737
126.	029387	2407 St. Andrews Boulevard	4,939

8CJ

(*Underground work orders, cont'd*.....**Page 6**)

No.	Work order No.	Customer/Location	Total Cost
127.	009122	Paradise By-The-Sea - Lot 11, Block B	1,031
128.	008031	117 North Walton Orange Street	2,597
129.	CJO #018-800-13428	135 and 137 Legend Lakes Drive	
130.	008139	7016 South Lagoon Drive	2,182
131.	029408	2027 Thomas Drive	3,120
132.	029311	2503 and 2507 CC Drive	2,668
133.	00415	Calvary Baptist Church - 277 and C-278	
134.	08165	State Road 173 North of Bonifay	

Distribution Line Construction
Work Orders worked by Overhead Crews
Jerry L. Joiner

No.	Work order No.	Customer/Location	Total Cost
1	035328	Holley Street Commercial Park	31,587
2.	032812	Gulf Power Co., 5th St. between Pennsylvania Ave. and Wisconsin Ave.	17,339
3.	035794	Winter Storm	
4.	034725	BPS, 1621 Transmitter Road	15,874
5.	035850	Brittany Woods Estate	15,143
6.	035907	Maintenance - Bob Little Road	8.620
7.	035596	Osmose - Northside Drive and Norwood Place	2,595
8.	035965	Maintenance - 5021 12 Street	1,822
9.	035985	Gulf Power Company 1996 Budget - Russ Lake Drive	12,272
10.	036028	Gulf Power Company 1996 Budget - Minneola Street	10,337
11.	036045	Gulf Power Company 1996 Budget - Winona Avenue	4,332
12.	036063	Gulf Power Company 1996 Budget - Letohatchee Avenue	3,432
13.	036068	Gulf Power Company 1996 Budget - Chipewa Street	4,832
14.	036079	Gulf Power Company 1996 Budget - Eleanor Street	5,732
15.	073856	Santa Rosa County - Live Oak Substation 5932 Extension	68,891
16.	036116	Gulf Power Company 1996 Budget - South Gay Avenue	9,392
17.	036117	Gulf Power Company 1996 Maintenance - S. Gay Ave. going N. on Boatrace	13,731
18.	034930	Gulf Power Company 1996 Budget Item No. 105 - Everitt Ave. Betw. 11th	29,044
19.	060440	Chipley - Pate Jerry	51,034
20.	036160	Gulf Power Company 1996 Budget - 7th Street	6,883
21.	036135	Gulf Power Company 1996 Budget - East Avenue and 8th Street	-18,764
22.	036137	Gulf Power Company 1996 Budget - County Road 389	6,399
23.	035860	Southern Machine Tool Die - 743-B Airport Road	9,322

081

24.	036161	Albertson's - Highway 22 and Camellia Avenue	3,894
25.	036260	Super Walmart - 7th Street and Camellia Avenue	7,548
26.	036487		
27.	029229	Brittany Woods Estates - 7th Street and Bob Little Road	10,359
28.	036133	Gulf Power Company 1996 Budget - East 11th Street	7,273
29.	036200	Gulf Power Company - Bonita Avenue behind Bay Medical Center	2,016
30.	036324	Gulf Power Company 1996 Maintenance - 1826 Frankford Avenue	3,010
31.	036326	Gulf Power Company 1996 Maintenance - West 19th Street	18,108
32.	036364	Gulf Power Company 1996 Budget - West 19th Street	2,308
33.	036370	Gulf Power Company 1996 Maintenance - 5045 Business Highway 98	1,486
34.	036373	Gulf Power Company 1996 Budget - West 19th Street	10,040
35.	036395	Gulf Power Company 1996 Budget - Lisenby Avenue and 11th Street	17,146
36.	035688	Arizona Chemical - Cherry Street	4,078
37.	035699	Arizona Chemical - Cherry Street and Business Highway 98	17,296
38.	036396	Gulf Power Company 1996 Budget -	18,078
39.	062023	Florida Department of Transportation - Highway 77 and 23rd Street	17,832
40.	062032	1996 Gulf Power Company Patrol - 1602 Drake Avenue	1,555
41.	036216	Gus Wise Electric, Inc. - 3105 East Cherry Street	910
42.	062053	Bay County - East Avenue and Baldwin Road	25,236

Florida Public Service Commission
Audit Document/Record Request
Request # ESQ-2 9/12/97

Question #2:

Provide a copy of the TQM Momentary Outage Study results and recommendations, and Gulf's executive management approval/disapproval response.

Answer:

The project statement for this team was to reduce transmission outages which affect Gulf Power Company customers. The plan of action of the study presented by the team on August 27, 1992, is shown on the attached survey sheet. The plan of action and recommendations were approved by Gulf's executives.

GULF POWER COMPANY

MOMENTARY OUTAGE REDUCTION TEAM (MORT)

Jim Parker - Team Leader
David Arguelles
Bob Barham
Robert Forester
Mike McNair
Bill Pope
Steve Richbourg
Walter Mullins

AA A B C D E F G H I J K L M N O

August 10, 1993

SOLUTION(S) SCHEDULE: Improve System Design to Reduce Outages

Column / Row	PLAN OF ACTION	SEPT. '92	OCT. '92	NOV. '92	DEC. '92	JAN. '93	FEB. '93	MAR. '93	APR. '93	MAY '93	JUNE '93	JULY '93	AUG. '93	SEPT. '93	FUTURE
1	Instantaneous Trip Removed										COMPLETED				
2	Reclose Time 30 Cycles								COMPLETED						
3	Study Transtext						COMPLETED								
4	Counters on OCR'S				COMPLETED										
5	Bob's Device									(Delay due to Manufacturing)					
6	Establish System (Monitored Changes)											COMPLETED			

SCHEDULED ACTUAL

ca/mort1

2

Florida Public Service Commission
Audit Document/Record Request
Request # ESQ-2 9/12/97

Question #3:

Provide a copy of the TQM Sustained Outage Reduction study results and recommendations, and Gulf Power Company's executive management approval/disapproval response.

Answer:

The project statement for this team was to reduce distribution sustained outages to Gulf Power Company's customers. The plan of action of the study presented by the team on August 27, 1992 is shown on the attached summary sheet. The plan of action and recommendations were approved by Gulf's executives.

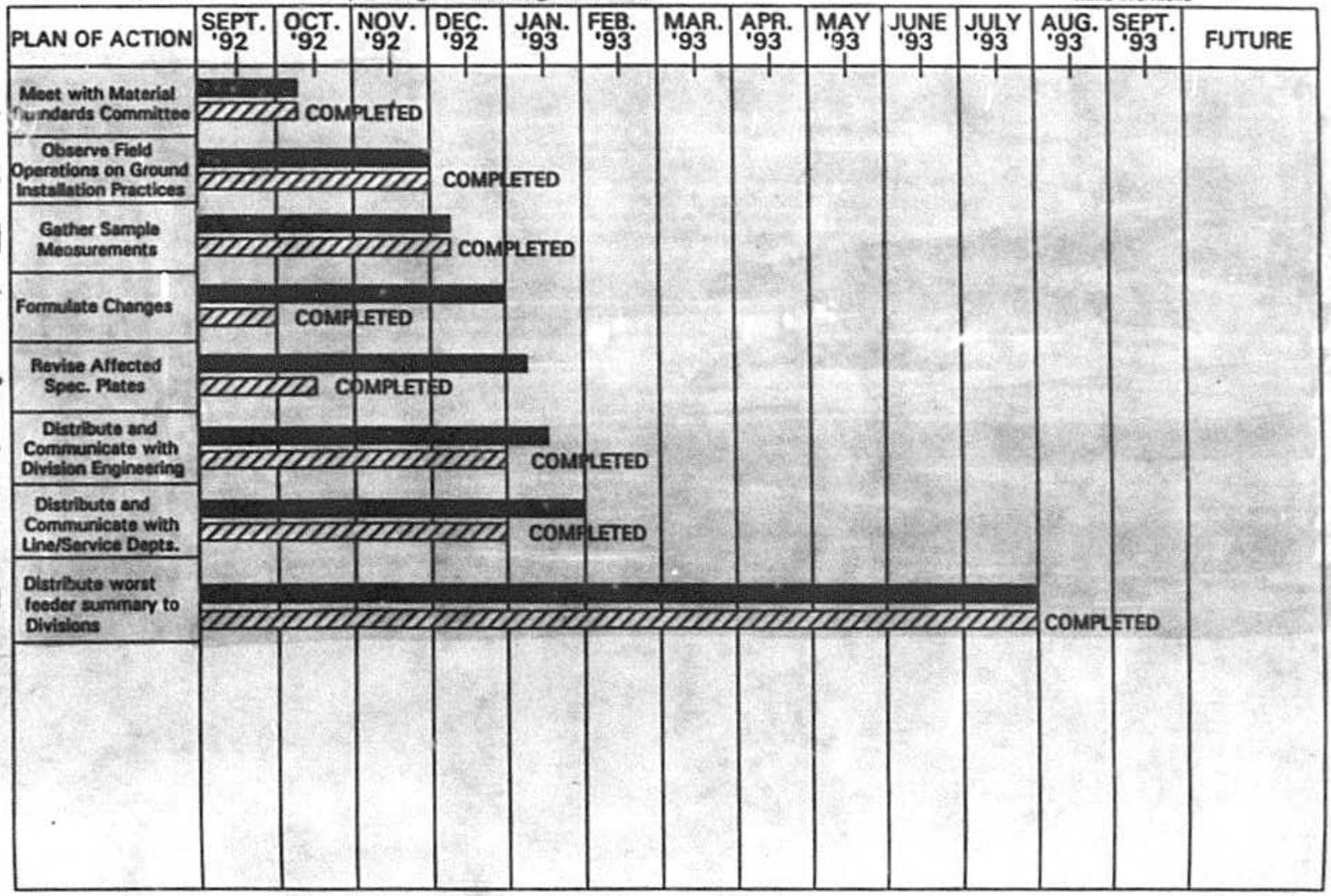
GULF POWER COMPANY

SUSTAINED OUTAGE REDUCTION TEAM (SORT)

August 10, 1993

Alan McDaniel - Team Leader
Bobby Hobbs - Asst. Leader
Tom Kilgore - Quality Advisor
Rex Brooks
Clinton Cooper
Richard Hough
Scott Lee
Mike Wernicke

1 SOLUTION(S) SCHEDULE: Improving Grounding Practices



SCHEDULED ACTUAL

co/sort1

Florida Public Service Commission
Audit Document/Record Request
Request # ESQ-2 9/12/97

Question #4:

Provide a copy of the TQM Transmission Outage Reduction study results and recommendations, and Gulf Power Company's executive management approval/disapproval response.

Answer:

The project statement for this team was to reduce transmission outages which affect Gulf Power Company customers. The plan of action of the study presented by the team on August 27, 1992 is shown on the attached summary sheet. The plan of action and recommendations were approved by Gulf's executives.

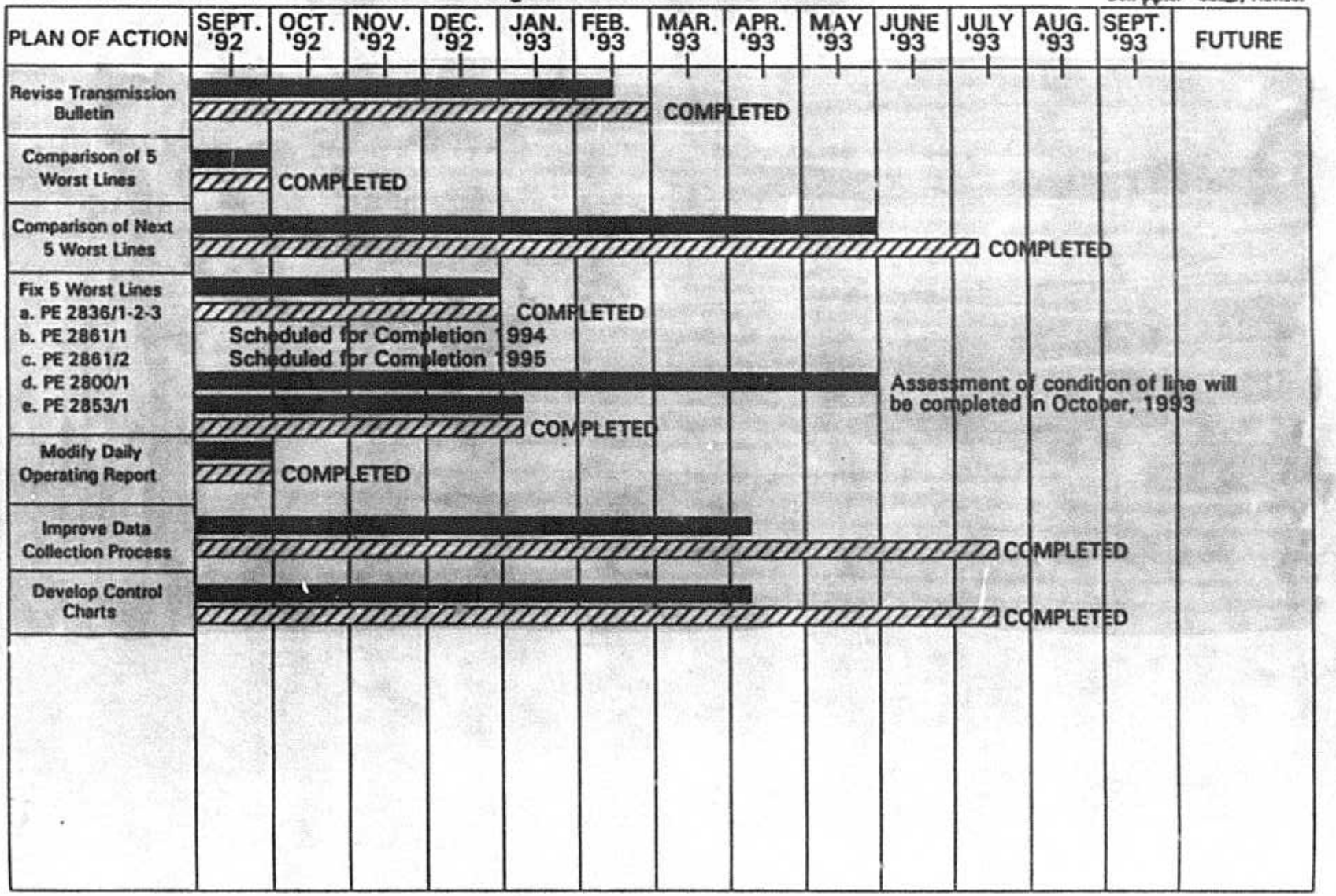
GULF POWER COMPANY

TRANSMISSION OUTAGE REDUCTION TEAM (TORT)

Ken Sims - Team Leader
Bobby Davis
Bobby Jones
Jerry Mitcham
Frank Sarver
Ernie Thames
Robert Wilkes
Don Fisher - Quality Advisor

August 10, 1993

SOLUTION(S) SCHEDULE: Transmission Outages Which Affect GPC Customers



SCHEDULED ACTUAL

Florida Public Service Commission
Audit Document/Record Request
Request # ESQ-2 9/12/97

Question #28:

Provide a copy of the cost/benefit study for centralizing the Distribution Control Center.

Answer:

See Attached.

A

Annual Cost WORKSHEET

B

1	Total Hardware Investment		$1,400,000
2	Building Investment		350,000
3	Total Hardware/Building Invest.		1,750,000
		x	17.93%
4	Annual Fixed Charge		$315,000
5	Equipment Fixed Cost		$315,000
6	Operational Expense (Non-Labor)		20,000
7	Maintenance Expense		
8	Software & Hardware (Non-Labor)		67,000
9	Building Maintenance		20,000
10	Total Annual Cost		$422,000
11	**ANNUAL SAVINGS**		
12	Straight Time Hours (Line/Service)		
13	217 x 2080		451,360
14	Average O.T. (last 5 years)		
15	8 -10%		45,136
16	Cost of O.T.		
17	1.5 x ~ $25 x 45,136		$1,692,600
18	IF		
19	Automation & enabling techniques		
20	reduce OT by 20% (9,027 hours)		
21	THEN		
22	Add annually to savings		$338,520
23	Distribution Center Personnel Savings		
24	= 10 x 2080 (ST) x $25 + 10% (10x2080x$25)(1.5)(OT)		
25	= 520,000 + 78,000 =		$598,000
26	Reduction of Forms/Paperwork Reproduction		$100,000
27	**TOTAL ANNUAL SAVINGS**		$1,036,520
28	**TOTAL ANNUAL COST**		$422,000
29	**TOTAL ANNUAL REDUCTION**		$614,520

DISTRIBUTION CONTROL CENTER

COMMITTEE REPORT

NOVEMBER, 1993

DRAFT 3

Distribution Control Center Committee

Mission

To evaluate the feasibility of a centralized Distribution Control Center and recommend a plan of action.

Committee Members

Bill Blackmon	Gerald Miller	Jack Davis
James Philpot	Marie McLean	Jim Parker
Ernest Robinson		

Present Situation

Distribution Control Centers are presently handled independently by each division. There is a distribution control center in Pensacola, Ft. Walton, and Panama City. In order to evaluate the feasibility of a central operation, several operating companies were evaluated, several outside utilities were interviewed, and some control centers were visited.

Companies Evaluated by Interview

Alabama Power (Birmingham)
Alabama Power (Mobile)
Duke Power (North Carolina)
Entergy (Arkansas)
Entergy (Louisiana)
Entergy (Mississippi)
Georgia Power (Atlanta)
Mississippi (Gulfport)
Santee Cooper (South Carolina)
Florida Power Corporation
Florida Power and Light
Tampa Electric

Control Centers Visited

Alabama Power -- Montgomery
Alabama Power -- Mobile Division
Florida Power -- Suncoast Division
Tampa Electric

General Findings

Tampa Electric has a one building that has a distribution control center and transmission/generation control center. Emergency operations and engineering support are also housed in that building. The center had a outage analysis system and digital radio system but no electronic maps. They are planning to have mobile data terminals in 75 trucks by June 1994. Tampa operates another center in Winter Haven that closes in the evening.

Florida Power and Light operates four centers. They had an outage analysis system, digital radio system, and mobile data terminals in their trouble trucks. The electronic map system was only detailed enough to show large sections of town without street identification.

Alabama Power operates three centers located in Mobile, Montgomery, and Birmingham. The Mobile Division handles 165,000 calls during the day. In the evening the center handles the outlying districts bring their total number of customers handled to 200,000. This division covers about 4440 square miles.

Georgia Power has eight divisions. Within the division, each district takes care of their own operations. East Metro and West Metro Division have combined two districts into one "super district" that handles about 100,000 customers during the day and 900,000 customers at night.

In summary, most companies operated a distribution control center that would handle 100,000 to 900,000. For larger companies, this means that they operated several control centers, depending on their total number of customers, districts, or divisions. Most companies had an outage analysis system and a company-wide radio system.

Centralized Distribution Control Center
Ideal Design

Hours of Operation

24 hours a day

Switching

Switching orders would be issued by the control center and performed by qualified switchmen at each local line-service center.

Calls handled

The center would handle only operational calls and switching calls. Customer calls would be handled by Customer Service.

Equipment

PMS/EMS 2000 Workstations
800 megahertz Company wide radio system
Outage Analysis system
TLN mapping and location system

Other Systems

Customer Service link to Outage Analysis
Large screen display for electronic maps
LAN common database for mapping system
MORT device interface
SCADA status interface
Mobile Data Terminals
IVR telephone system

Backup capability

Primary backup would be in System Control. Secondary backup would be the EMS 2000 workstations available in each division for engineering applications and backup capability.

Staffing

The staffing necessary for a 24 hour, 7 day operation would be:

13 Operators
2 Apprentices
1 Secretary
1 Supervisor

Position Description

The Distribution System Operator position should be changed to a professional level.

Physical Characteristics and Location

The facility should be storm resistant. The actual location would be dependent upon the suitability of available buildings, communication system requirements, and technical support availability.

Reporting Location

The reporting location should be within available management.

Advantages and Disadvantages of Centralized Distribution Operations Center

Advantages

Economics (equipment, personnel, training)
Better use of personnel
Efficient training
Equipment standardization
Shared knowledge
Broad view of company problems, operations, and needs
Removes barriers

Disadvantages

Loss of personal touch
- Customer to Company
- Operator to Crew

Lack of Local Knowledge
Problems converting from Central Operations to Local during Emergency
Displacement of Employees

Cost- Benefits

Most costs associated with centralized or decentralized operation are the same. This is primarily because the radio system, EMS 2000, and LAN are being implemented regardless.

The primary benefit is in staffing. A centralized operation can be staffed with 9 fewer positions.

By cooperating with Alabama and Mississippi in developing similar support systems related to the EMS2000 system, a system backup facility would be feasible.

Distribution Control Center Development Plan

This committee believes that a Centralized Distribution Control Center can be accomplished and operated effectively. The control center operation is only one component in operating the distribution system and resolving trouble on the system. It is essential that company-wide radio, company-wide control, company-wide mapping, and outage analysis be fully operational before this could occur. As these systems go on-line, training for centralized operation can begin. Plans for centralizing should be coordinated with EMS 2000 development. The following tasks need to be implemented:

Task	Priority	Installation	Operational
Central Company-wide Radio System	Must	Jan 1994	Dec 1995
EMS 2000 Control System	Must	Apr 1995	Jun 1996
Develop Outage Analysis system	Must	Jun 1994	Jun 1996
Remote Power Monitor System	Need	Jan 1994	Dec 1995
Develop user friendly mapping and location system	Must	Jun 1994	Jun 1996
Develop large screen display for maps	Need	Jun 1994	Jun 1996
Maintain a standing committee to monitor the technical progress, policy consistency, cross-training and ensure task completion.	Must	Jan 1994	Jun 1996

STAFFING REQUIREMENTS (PROPOSED) CENTRALIZED

POSITION	WEEKDAYS	WEEKEND	TOTAL REQUIRED
DSO	3 - DAY 2 - EVENING 1 - NIGHT	2 - DAY 2 - EVENING .1 - NIGHT	6 - WEEKDAY 5 - WEEKEND
APP	1 - DAY 1 - EVENING	0 - DAY 0 - EVENING	2 - WEEKDAY 0 - WEEKEND
CK	1 - DAY 0 - EVENING 0 - NIGHT	0 - DAY 0 - EVENING 0 - NIGHT	1 - WEEKDAY 0 - WEEKEND
TOTAL	5 - DAY 3 - EVENING 1 - NIGHT	2 - DAY 2 - EVENING 1 - NIGHT	9 - WEEKDAY 5 - WEEKEND

DOCC2.CHT

DISTRIBUTION CONTROL CENTER

SURVEYS

COMPANY NAME: Alabama Power Company/Mobile
COMPANY CONTACT: James Mobley/MarkCustred/David Sullivan (Interviewed)
TELEPHONE #: 8-285-2441/2002

QUESTIONS:

1 Do you have centralized distribution operations?
1 year to 9 months
2 Number of Customers?
165,000 (Day 200,000, Nite 198,000)
3 Number of Units Dispatched to?
4 Radio Consoles
4 Number of Operators (Total)?
Operators Supervisor > 9
5 Number of Operators on shift?
Over Lapping Shifts
1 Outside Man
2 Operator Supervisors
2 Clerks
Relief - One Man
6 Are the Operators Union?
Non-Union (Used to be)
7 How many people on each shift?
2 Clerks
9 Operators
1 Engineer
1 Supervisor
8 Service Area (Square Miles)?
2515 Square Miles [4440 Square Miles]
9 Hours of Operation?
24 Hours
10 Number of Shifts?
9 (Overlap)
2 Operator Supervisors and Clerk 4PM-12PM
8 HR, 10 HR, 12 HR
11 What Type Radio System?
Same as Ours
12 Do you have Computerized Mapping?
Not Yet/Working On
13 Do you have Outage Analysis?
Does Dist. Outage Evaluation System
14 Do you have Remote Data Terminals?
Not all yet
Have Line RTU (Few Line SW. Superv.)

NOTES:
8 Counties
Part of Customer Service Center
CSC sends TT to Clerk
Handle New Services

SURVEY1

COMPANY NAME: Georgia Power Company/Atlanta
COMPANY CONTACT: Danny Edwards (Dispatcher)(Control Room Operator)
TELEPHONE #: 1-404-433-7749 (8-557-3749)

QUESTIONS:

1 Do you have centralized distribution operations?
Yes. Handle 8 Districts, 18 Counties
2 Number of Customers?
900,000
3 Number of Units Dispatched to?
15 Trouble Man (Eve Shift After 4PM to 8 AM)
4 Number of Operators (Total)?
5 Dispatchers Today (2 at Center, 4 on Eve (4-12)
2 Nites, 4 Holidays, 4 Weekends
5 Number of Operators on shift?

6 Are the Operators Union?
Yes, trying to get them out now.
7 How many people on each shift?

8 Service Area (Square Miles)?

9 Hours of Operation?
24 Hours
10 Number of Shifts?
8 hour shift
11 What Type Radio System?
800 MHZ Motorola
12 Do you have Computerized Mapping?
Not Yet
13 Do you have Outage Analysis?
No, they have Dist. Outage Comm.
14 Do you have Remote Data Terminals?
Yes

NOTES:

8AM-4PM 12 Dispatchers/12 Oper Headquarters
If they are out (VAC, Sick) trans. 6 into dispatch center.
Super Districts (100,000 customers, 37 subs, 87 breakers).
Customer Service Rep. Takes Calls - TT printed at the Office.
Larry Woeufl (TRUB) 8-532-3010
Clabe Chapman, Trouble Supv, 8-532-3012

SURVEY2

COMPANY NAME: Georgia Power Company/Atlanta
COMPANY CONTACT: Danny Edwards (Dispatcher)(Control Room Operator)
TELEPHONE #: 1-404-433-7749 (8-557-3749)

QUESTIONS:

1 Do you have centralized distribution operations?

2 Number of Customers?

3 Number of Units Dispatched to?

4 Number of Operators (Total)?

5 Number of Operators on shift?

6 Are the Operators Union?

7 How many people on each shift?

8 Service Area (Square Miles)?

9 Hours of Operation?

10 Number of Shifts?

11 What Type Radio System?

12 Do you have Computerized Mapping?

13 Do you have Outage Analysis?

14 Do you have Remote Data Terminals?

NOTES: Operator talking about how centralized works.
Lose personal touch, everyone isn't 100% dedicated.
They have trouble tracking system - sometimes not kept
up to date due to work load at centralized office.
During normal working hours: 86 Breakers/37 Subs/100,000 cust.

SURVEY3

COMPANY NAME: Duke
COMPANY CONTACT: Michael Royster
TELEPHONE #: 1-704-594-0015

QUESTIONS:

1 Do you have centralized distribution operations?
After hours 3:30 PM -/52 locations
2 Number of Customers?
1.7 million
3 Number of Units Dispatched to?
2 crews per location (100)
4 Number of Operators (Total)?
Dispatcher analyses problems, call out problems
5 Number of Operators on shift?
As many as 15 Dispatchers on 2PM-10PM
6 Are the Operators Union?
No
7 How many people on each shift?
Customer Service Answers Trouble
8 Service Area (Square Miles)?
22,000
9 Hours of Operation?
24 hours
10 Number of Shifts?
4 Shifts (Don't rotate based on ...)
11 What Type Radio System?'
800 MHZ
12 Do you have Computerized Mapping?
Yes (Geographic Services)
13 Do you have Outage Analysis?
Mainframe Analysis Program used by Dispatcher
14 Do you have Remote Data Terminals?
Don't have Dist. SCADA

NOTES:

Mainframe Computer Software - they have
Crews have terminal in truck
Software matches orders to trucks
Dist. Line Techs/Substation Operatoars
One Stop - Customer Service is Centralized

SURVEY4

COMPANY NAME: Entergy
COMPANY CONTACT: Robert Mooney/Ward Hesselbiad
TELEPHONE #: 1-501-370-8982/1-501-541-4701

QUESTIONS:

1 Do you have centralized distribution operations?
3 APL Offices (Used to be 5)
2 Number of Customers?
Didn't Know
3 Number of Units Dispatched to?

4 Number of Operators (Total)?

5 Number of Operators on shift?
4 to 5
6 Are the Operators Union?

7 How many people on each shift?

8 Service Area (Square Miles)?
5,000 miles of trans. lines
9 Hours of Operation?
24 hours
10 Number of Shifts?
3 at 8 hours each
11 What Type Radio System?
800 MHZ (Fully operational in one year)
12 Do you have Computerized Mapping?
No
13 Do you have Outage Analysis?
Yes
14 Do you have Remote Data Terminals?
Yes

NOTES:

SURVEY5

COMPANY NAME: Entergy
COMPANY CONTACT: Bill McGee
TELEPHONE #: 601-984-3871

QUESTIONS:

1 Do you have centralized distribution operations?
Yes
2 Number of Customers?
3 Number of Units Dispatched to?
4 Number of Operators (Total)?
5 Number of Operators on shift?
6 Are the Operators Union?
7 How many people on each shift?
8 Service Area (Square Miles)?
9 Hours of Operation?
10 Number of Shifts?
11 What Type Radio System?
12 Do you have Computerized Mapping?
13 Do you have Outage Analysis?
14 Do you have Remote Data Terminals?

NOTES:
One for MS
One for Louisiana
One for Arkansas

SURVEY6

COMPANY NAME: Mississippi Power Company/Gulfport
COMPANY CONTACT: Buster Griffith
TELEPHONE #: 8-762-1003

QUESTIONS:

1 Do you have centralized distribution operations?
After Hours
2 Number of Customers?
Coastal District
70,000 + 15,000 (5 Districts)
3 Number of Units Dispatched to?
33 Total
5 Elect Serv in Biloxi
27 to 28 + 5 Sub Elec
4 Number of Operators (Total)?
After Hours One Operator
5 Number of Operators on shift?
One
6 Are the Operators Union?
Were, not now. Are Exempt Employees
7 How many people on each shift?
One & 2 or 3 clerks
8 Service Area (Square Miles)?
Dist. Opr. Center (Biloxi, Gulfport, Coastal Div. and Pascagoula
9 Hours of Operation?
24 hours
10 Number of Shifts?
12 hour shifts (4 man rotation) Will have 5 Man (New Person)
11 What Type Radio System?
800 MHZ (Had it 1.5 years)
12 Do you have Computerized Mapping?
No
13 Do you have Outage Analysis?
No
14 Do you have Remote Data Terminals?
Yes
After hours dispatching

NOTES:

SURVEY7

COMPANY NAME: Tampa Electric
COMPANY CONTACT: Mr. Lynn Brown
TELEPHONE #: 813-228-1932

QUESTIONS:

1 Do you have centralized distribution operations?
Yes (6 Operation Centers) (Also Winter Haven day time only)
2 Number of Customers?
481,909
3 Number of Units Dispatched to?
75
4 Number of Operators (Total)?

5 Number of Operators on shift?
5 Monday-Friday
2 Weekend
1 Midnight to 8 AM
6 Are the Operators Union?

7 How many people on each shift?
6
8 Service Area (Square Miles)?
8982 Miles of Line Dist.
9 Hours of Operation?
24 hours
10 Number of Shifts?
3
11 What Type Radio System?
800 MHZ Trunk Analog
12 Do you have Computerized Mapping?
No
13 Do you have Outage Analysis?
Yes - CSR to DSO Office
14 Do you have Remote Data Terminals?
Not yet, by June 1994

NOTES:

SURVEY8

COMPANY NAME: Santee Cooper
COMPANY CONTACT: Vicki Martin
TELEPHONE #: 803-761-8000 x3061

QUESTIONS:

1 Do you have centralized distribution operations?
Yes (1 Dist, 1 System/Trans)
2 Number of Customers?
94,000 retail
3 Number of Units Dispatched to?

4 Number of Operators (Total)?

5 Number of Operators on shift?
2 Dispatchers & Foreman (Day and Evening)
1 Dispatcher at night
6 Are the Operators Union?
Non-Union (Completely) State owned, publicly owned
7 How many people on each shift?

8 Service Area (Square Miles)?

9 Hours of Operation?
24 hours
10 Number of Shifts?
3
11 What Type Radio System?
800 MHZ
12 Do you have Computerized Mapping?
Yes - Intergraph
13 Do you have Outage Analysis?
Not yet
14 Do you have Remote Data Terminals?
No
15 Call Center = 3 operators, Trouble Call Answering puts in Dispatch Center

NOTES:

Myrtle Beach, SC (425 Miles from Atlanta)
Mike Ammons x3042 over Dispatch and SCADA
Socket # ties to TX / Not Accurate
System bogs down on VAX will move to RISC 6000

SURVEY9

COMPANY NAME: Florida Power Corporation
COMPANY CONTACT: Marion Cooper
TELEPHONE #: 813-384-7827

QUESTIONS:

1 Do you have centralized distribution operations?
No (6 Centers, 7 Divisions)
2 Number of Customers?
1,204,522
3 Number of Units Dispatched to?

4 Number of Operators (Total)?

5 Number of Operators on shift?
2 Operators
1 Supervisor
6 Are the Operators Union?
Yes
7 How many people on each shift?
3
8 Service Area (Square Miles)?
21,963 Dist. Miles
9 Hours of Operation?
24 hours - 3 centers into 3 central after 5PM
10 Number of Shifts?
3
11 What Type Radio System?
VHF
12 Do you have Computerized Mapping?
No
13 Do you have Outage Analysis?
Trouble Ticket interactive with CSR
14 Do you have Remote Data Terminals?
No

NOTES:

SURVEY10

COMPANY NAME: Alabama Power Company/Birmingham
COMPANY CONTACT: Bob Waters
TELEPHONE #: 8-250-4285

QUESTIONS:

1 Do you have centralized distribution operations?
After Hours Only
2 Number of Customers?
Birmingham Division
3 Number of Units Dispatched to?

4 Number of Operators (Total)?

5 Number of Operators on shift?

6 Are the Operators Union?

7 How many people on each shift?

8 Service Area (Square Miles)?

9 Hours of Operation?

10 Number of Shifts?

11 What Type Radio System?

12 Do you have Computerized Mapping?

13 Do you have Outage Analysis?

14 Do you have Remote Data Terminals?

NOTES:
During normal working hours Districts handle their own switching.

SURVEY11

CONFIDENTIAL

FSQ-3 Item Number 1 (attachment 5)
1996 System Benchmark Survey: Gulf Power

This document consists of pages 1 - 50. Each page in its entirety is confidential, including all tables, graphs and accompanying text.

The entirety of this document is Confidential

Florida Public Service Commission
Audit Document/Record Request
GULF POWER COMPANY
Request Number ESQ-3
October 14, 1997
Attachment 5
Page 1 of 50

Delivering Quality and Value

1996 System Benchmark Study: Gulf Power

February 18, 1997

SOUTHERN COMPANY
Energy to Serve Your World™

Background

Lessons from deregulation:

- **Companies succeed by providing superior customer value (good quality at acceptable price)**

- **Successful companies make better use of people, processes, and technology to deliver value to customers.**

  - They understand the link between company activities .
  - They focus on areas that are most important to customers.
  - They align key business activities with customer wants and needs.

Benchmark studies: Research objectives

- **Benchmark Other electric utilities to support corporate goal setting**
  - The Southern Company Management Council established the following big intermediate goal: "Best quartile in customer satisfaction"
  - Provide basis for employee financial incentives
- **Identify drivers of loyalty to support management planning**
  - Factors that need improvement most
  - Factors that are most highly correlated with loyalty
  - Factors that represent competitive advantages/disadvantages
- **Track performance over time to determine whether previous improvement efforts have worked**

Questionnaire design

- **Addresses issues that customers say are important (based on Voice of the Customer study).**

- **Covers four topics**
  - Overall satisfaction
  - Price
  - Product/service quality
  - Retention

- **Most questions are based on a 0 to 10 scale**
  - 0 is the lowest possible rating
  - 10 is the highest possible rating

Data collection

- **Survey administered "blind"**
  - Survey sponsor is not identified to respondents
  - Allows fair comparison of System and peer utilities
- **Data collected during fall of 1996**
- **Respondents included both residential and business customers**
- **Business customers screened to identify key decision maker on energy-related matters.**
- **Two categories of business customers**
  - Moderate size (generally between 100 and 999 kW)
  - Large (generally over 999 kW)

Benchmark Utilities

Core Utilities

- Florida Power Corporation
- Florida Power and Light
- Duke
- South Carolina Electric & Gas
- Entergy
- Oglethorpe Power
- MEAG
- TVA

Second Tier

- UtiliCorp
- CINergy
- Louisville Gas & Electric
- Baltimore Gas & Electric
- Virginia Electric Power

Swing Companies

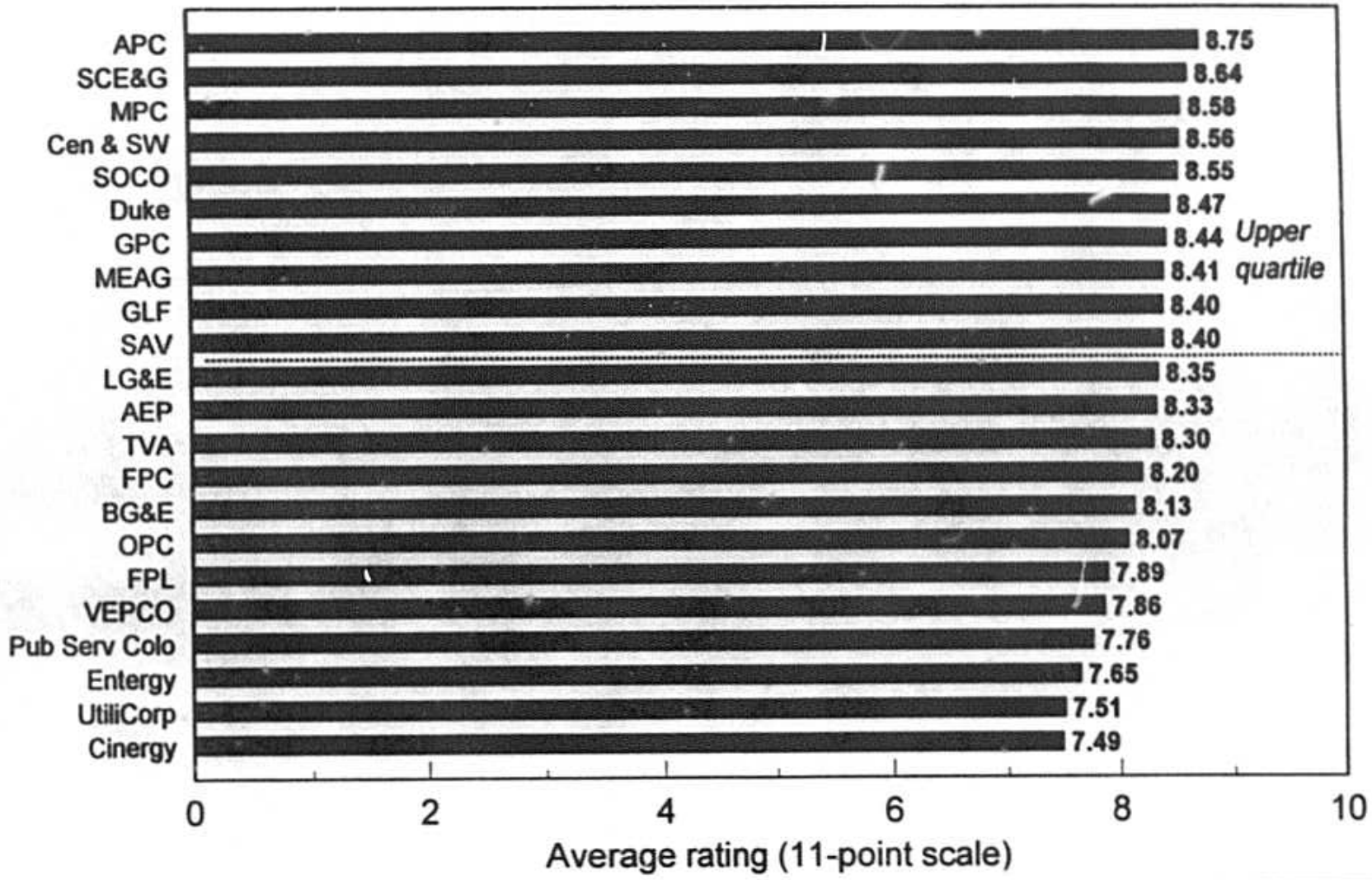
- Central & South West
- American Electric Power (AEP)
- Public Service of Colorado

Overview of benchmark methodology

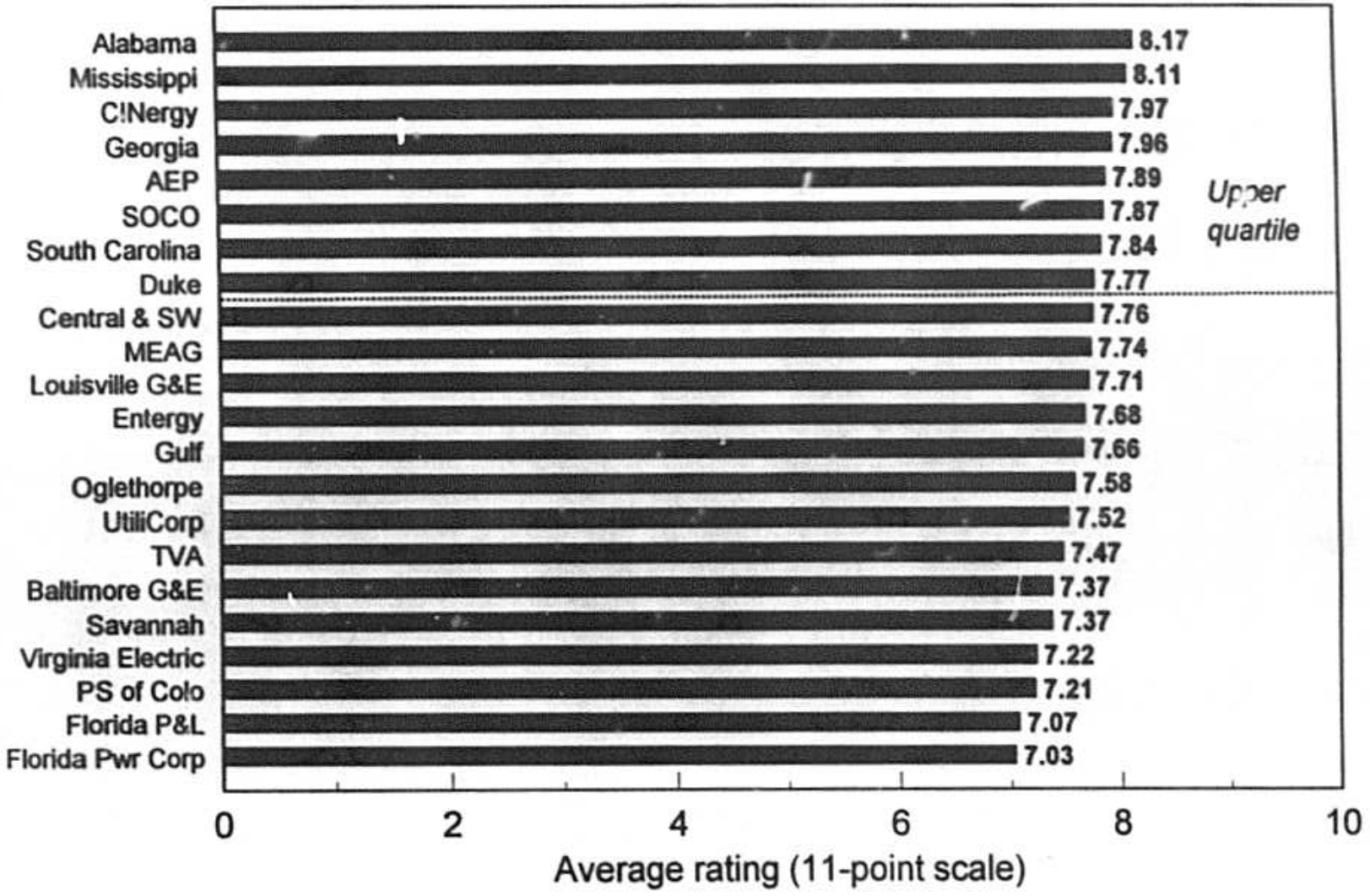
Customer class	Utility	Sample size	Procedure	Date
Residential	APC GPC GLF MPC SAV other utilities	193 146 202 233 166 1323	Blind survey Mail panel	Sep - Oct 1996
Moderate-sized commercial (100 - 999 mW)	APC GPC GLF MPC SAV other utilities	90 92 67 53 31 847	Blind survey Telephone interview	Oct - Nov 1996
Large energy users (generally over 1 mW)	APC GPC GLF MPC SAV other utilties	104 96 37 32 29 878	Blind survey Telephone interview	Oct - Nov 1996

Where are we today?

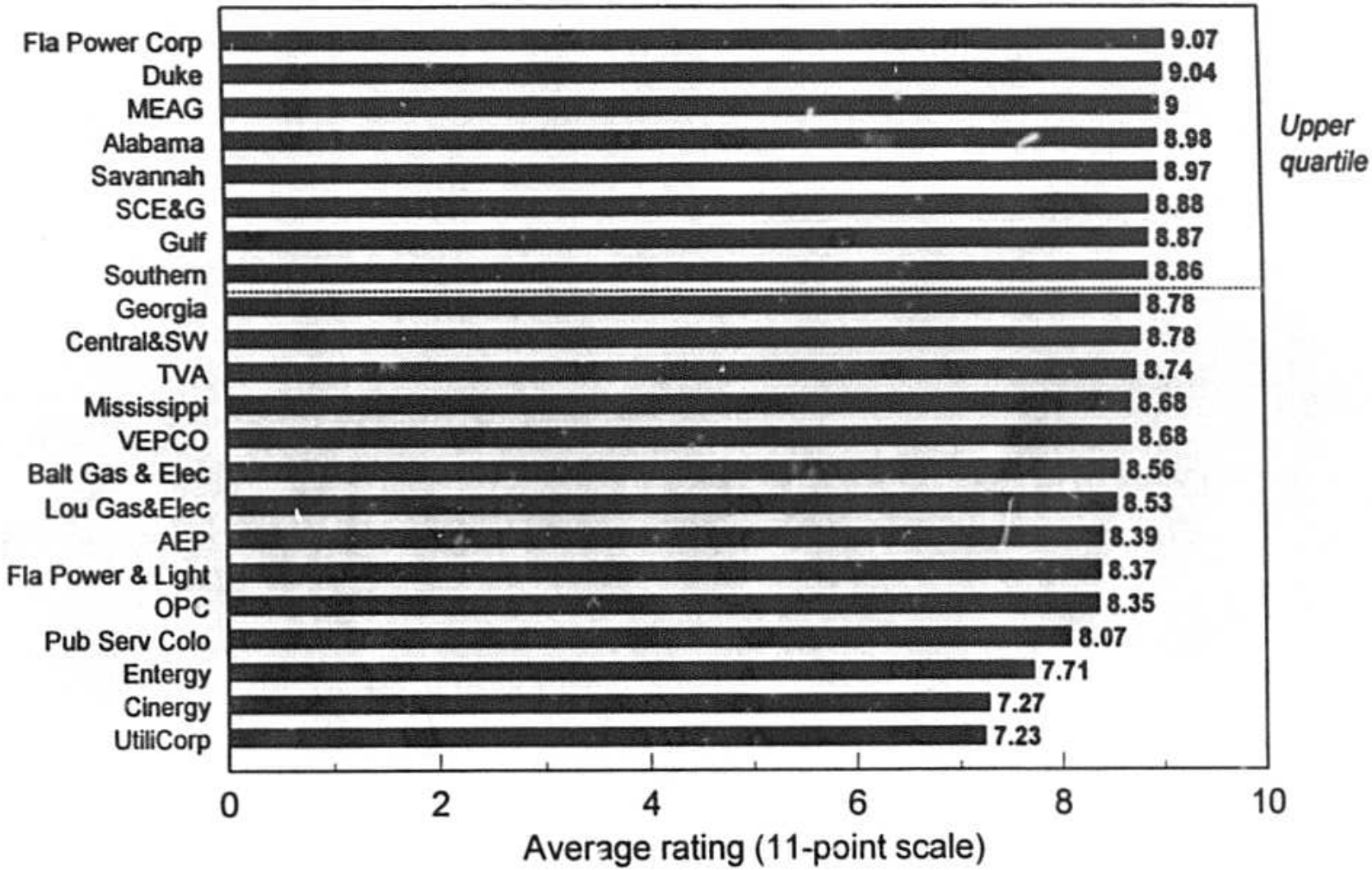
Overall satisfaction: 1996 benchmark study



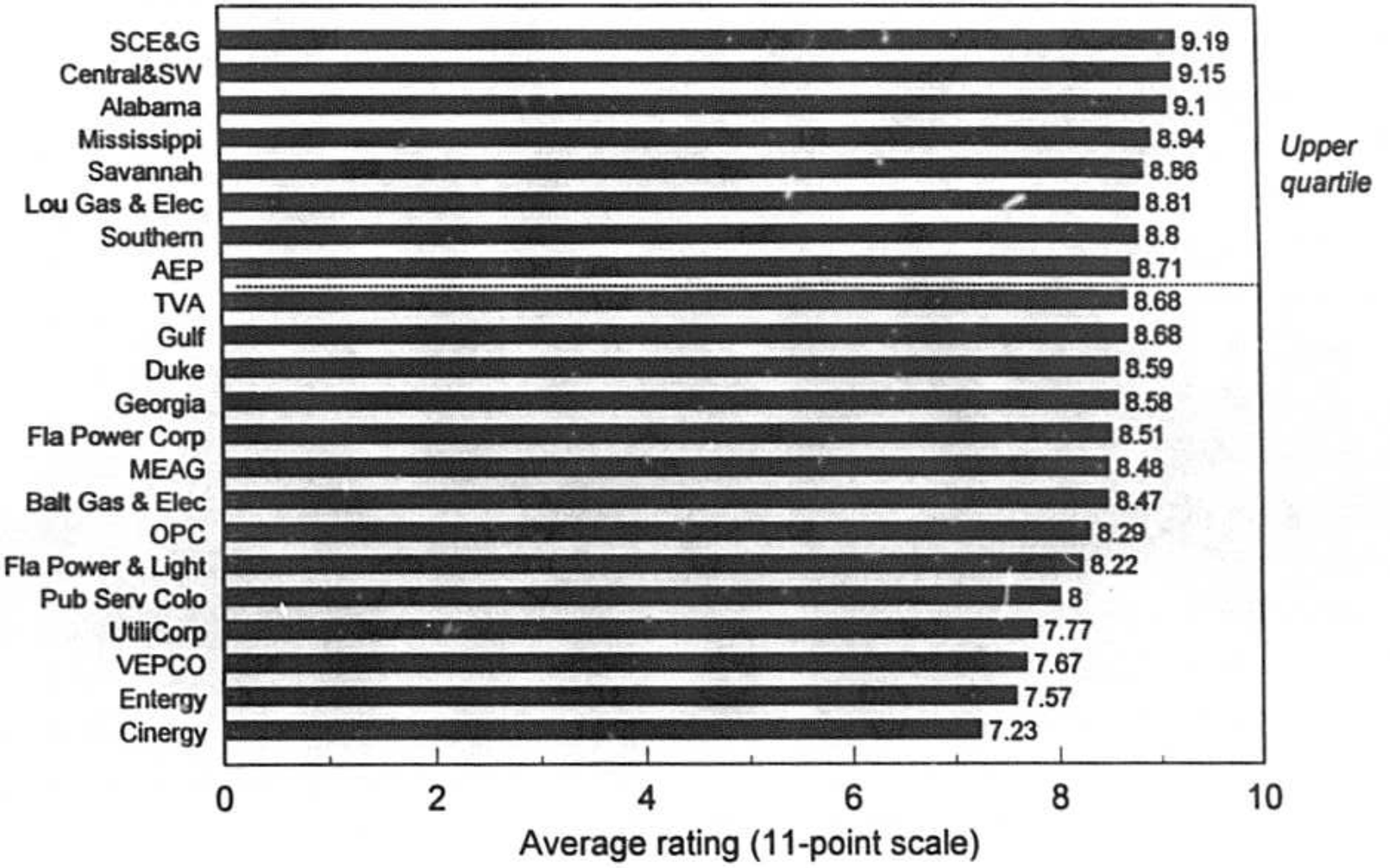
Overall satisfaction: Residential customers



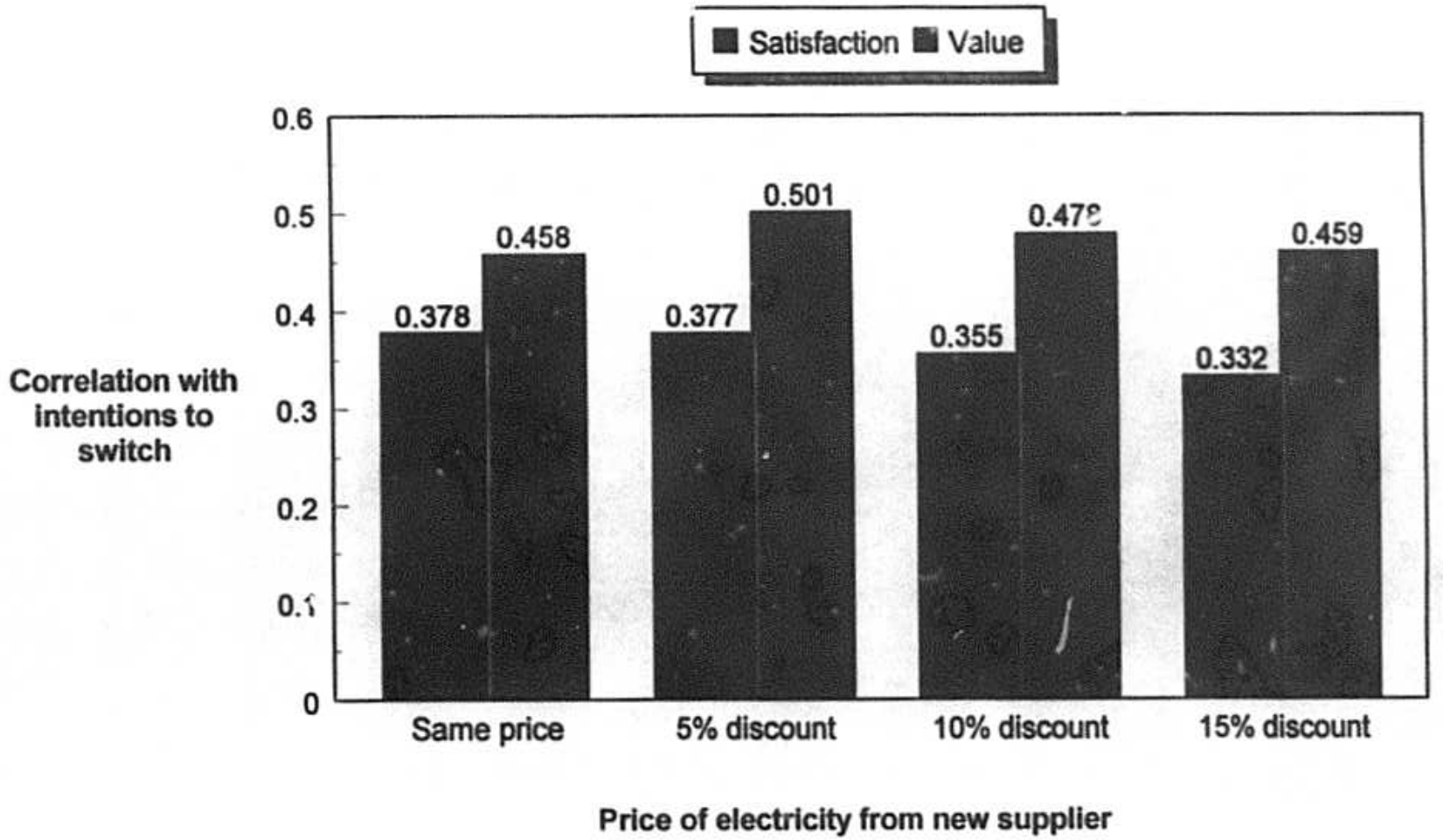
Overall satisfaction: General business



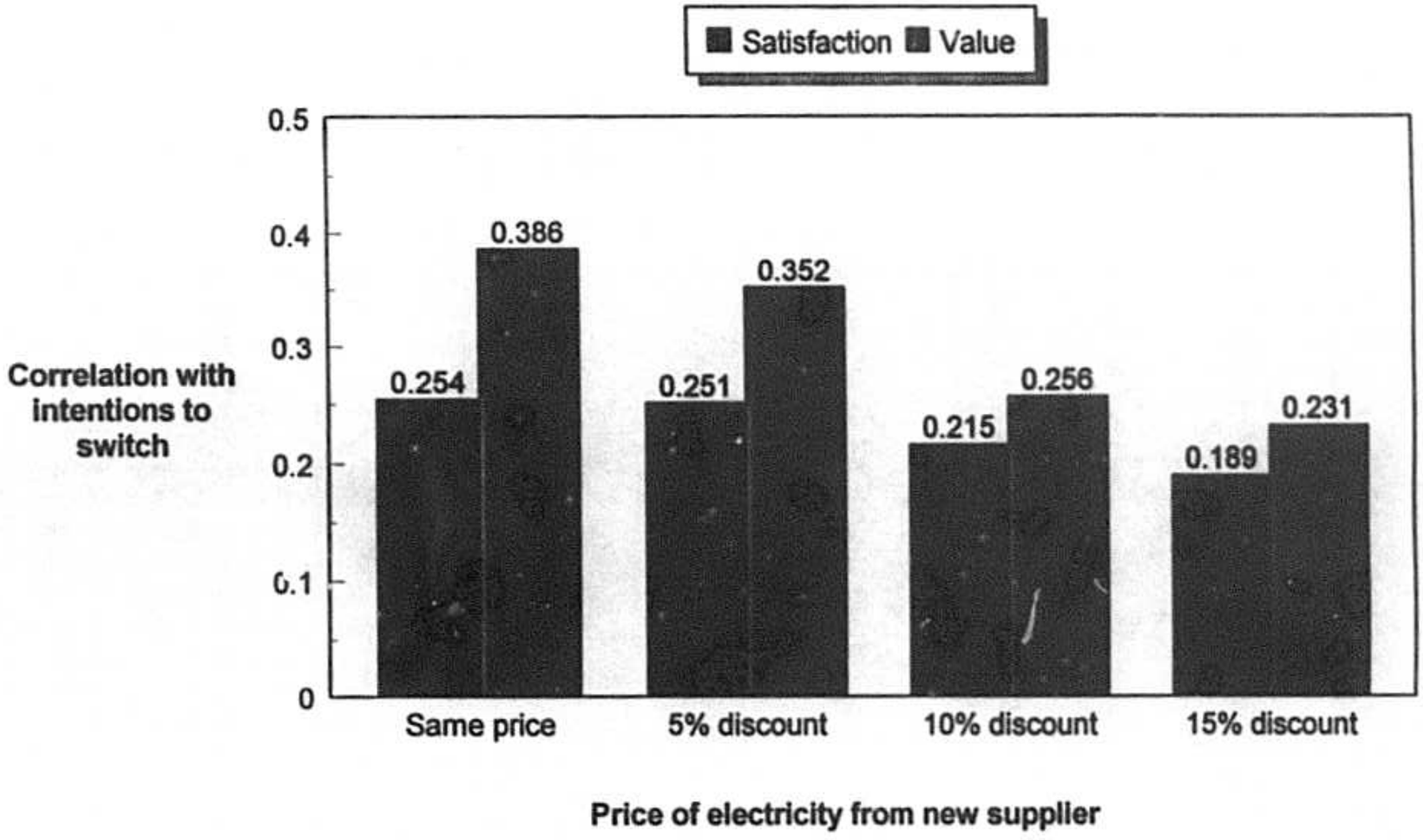
Overall satisfaction: Large energy users



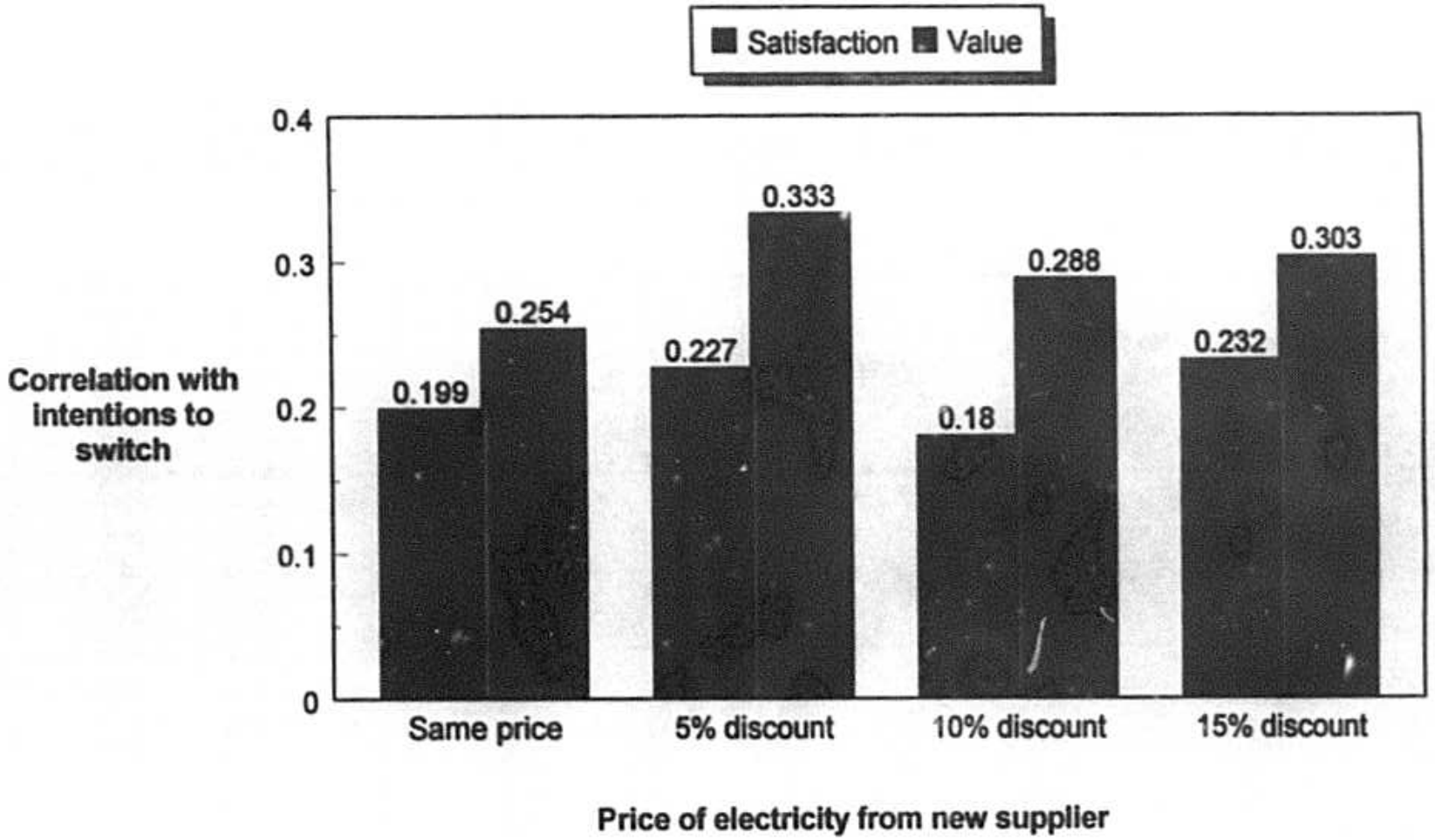
Residential customers: Which measure predicts customer retention more effectively - overall satisfaction or value?



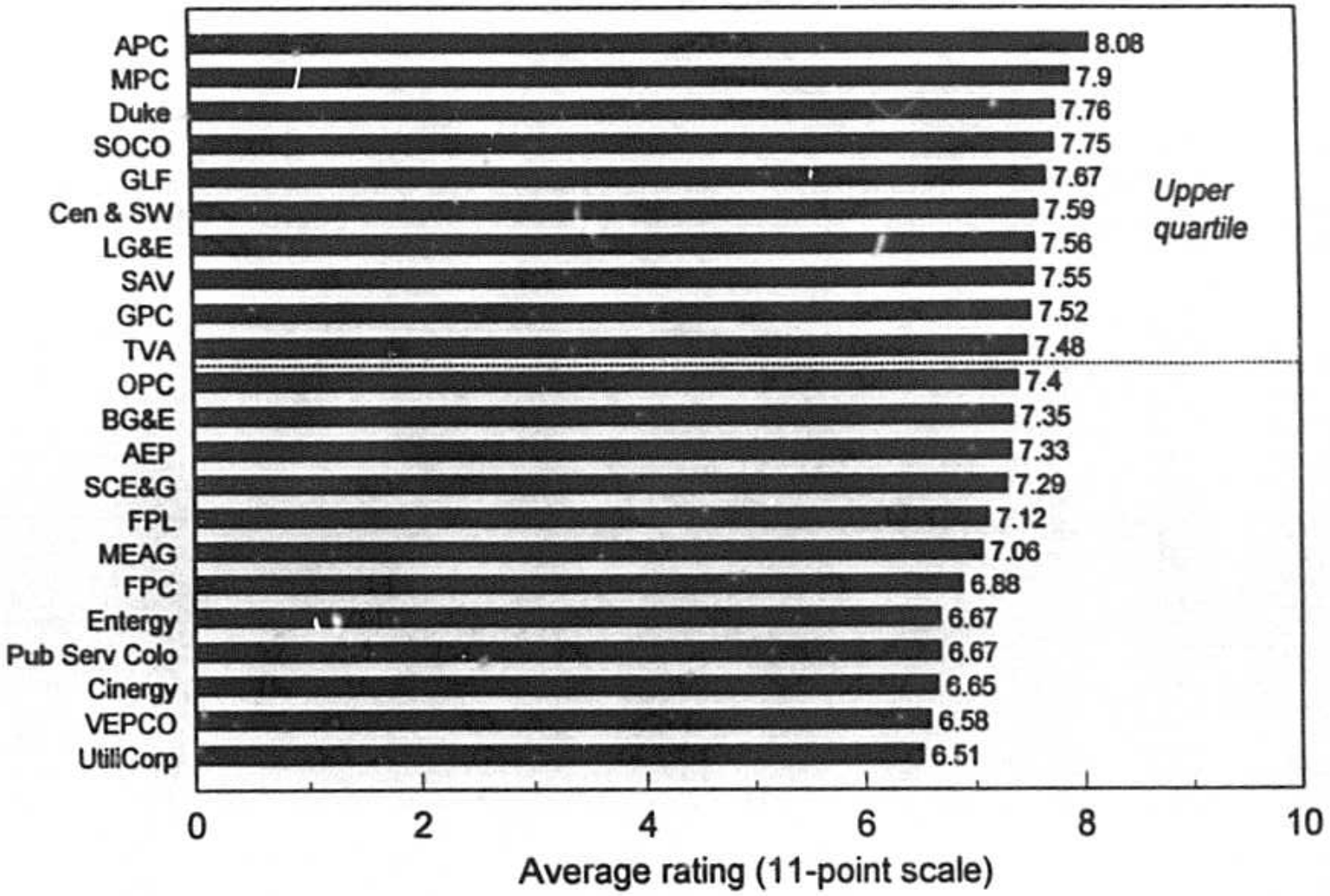
eneral business customers: Which measure predicts customer etention more effectively - overall satisfaction or value?



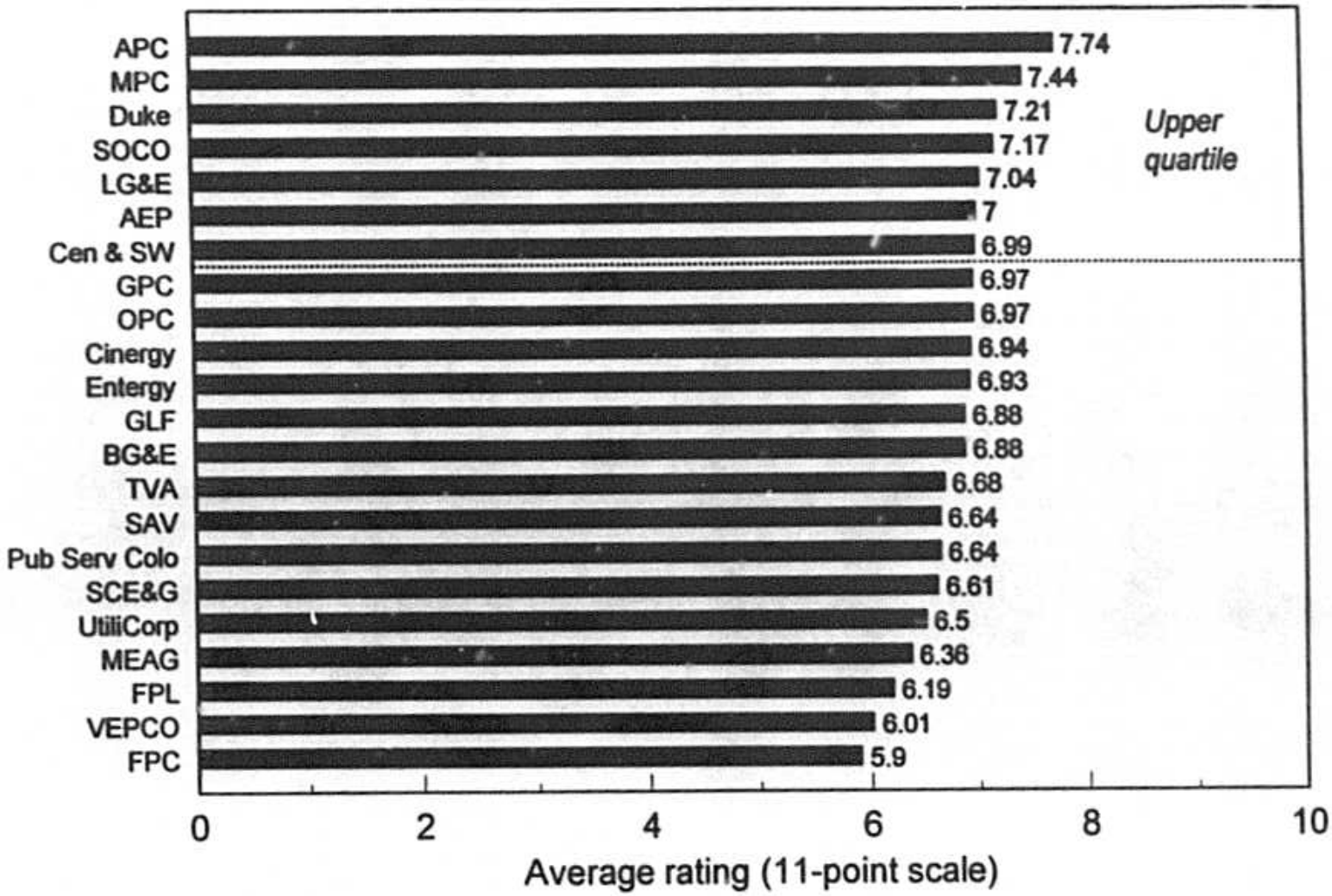
arge business customers: Which measure predicts customer etention more effectively - overall satisfaction or value?



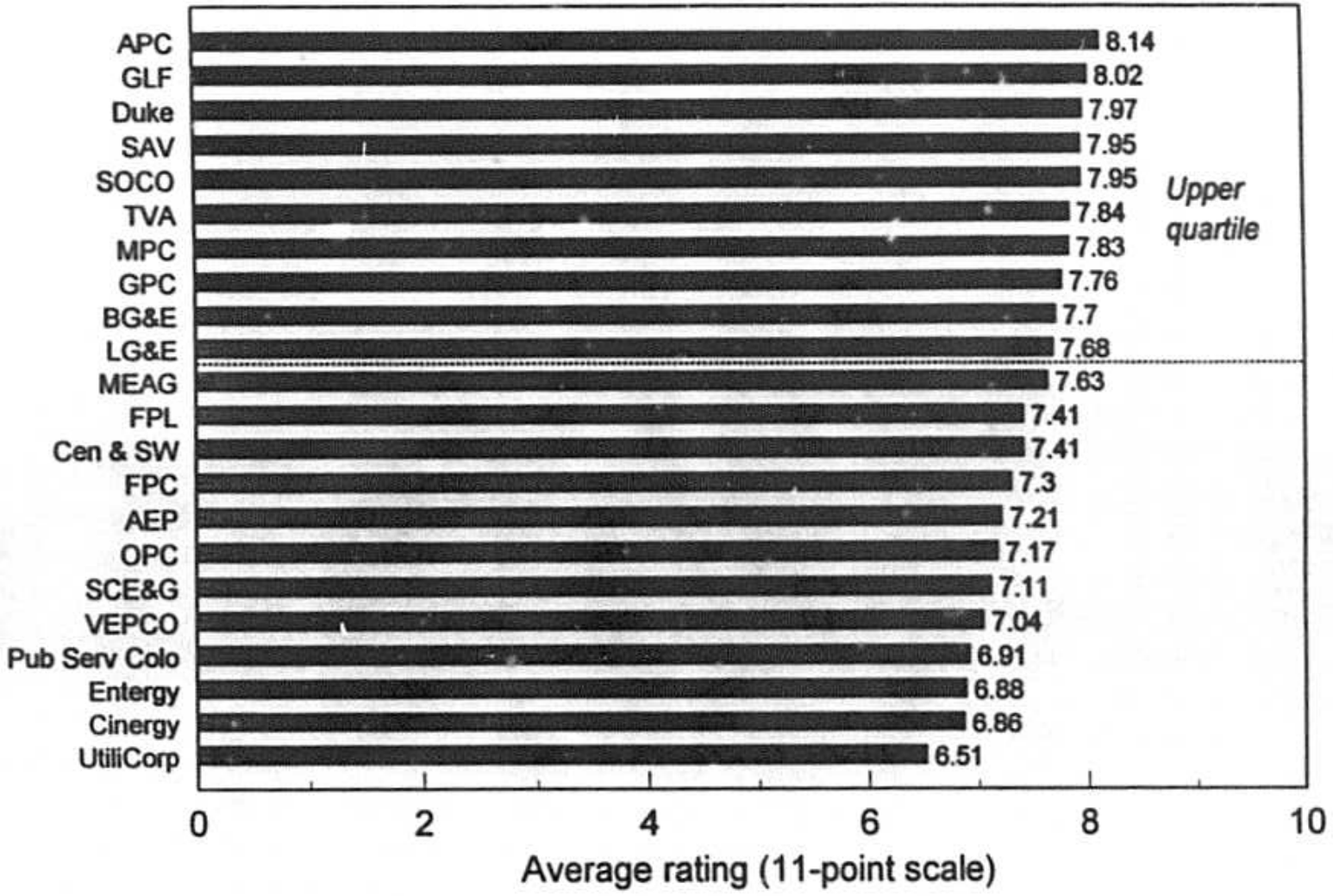
Overall perceived value: 1996 benchmark study



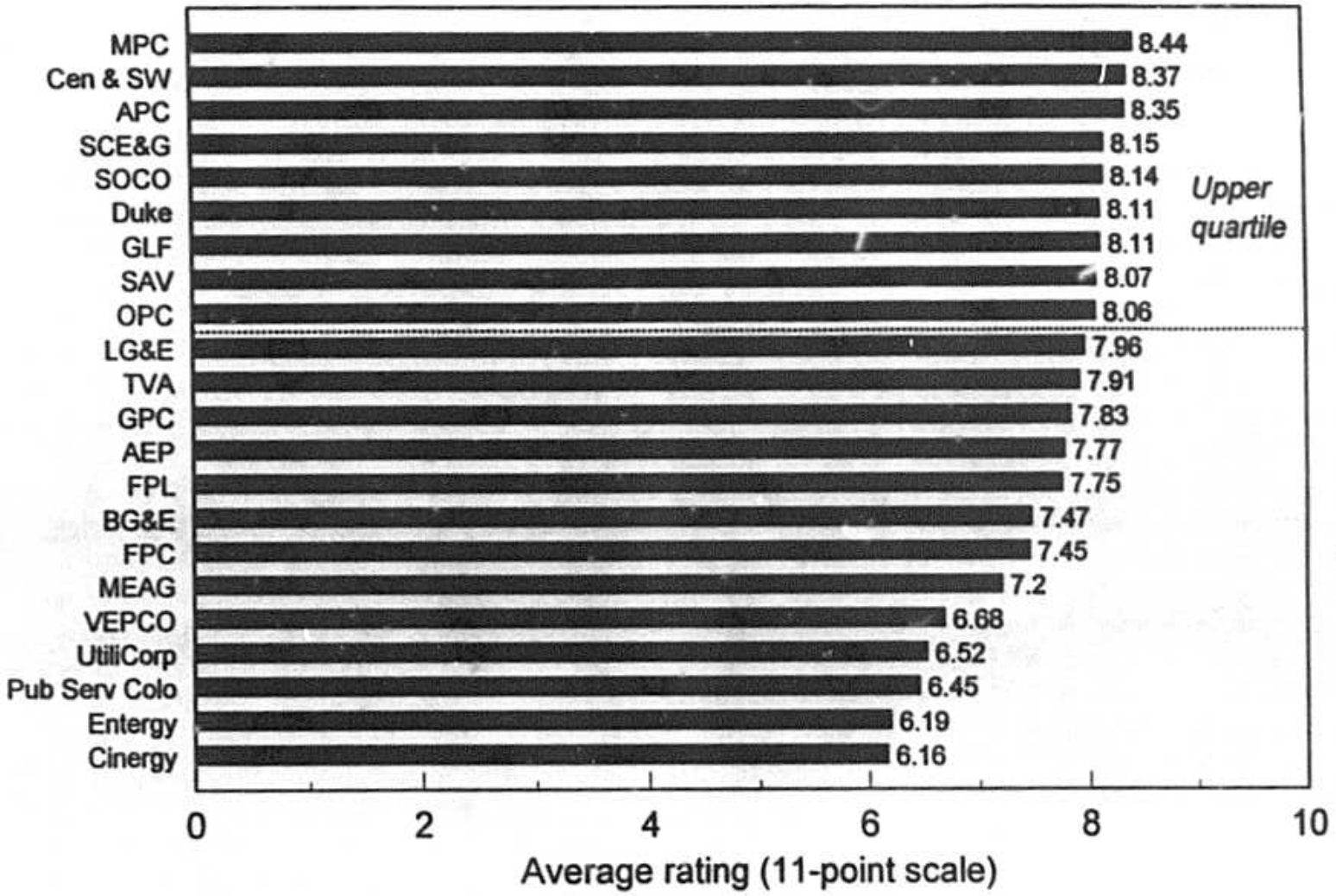
Perceived value: Residential customers



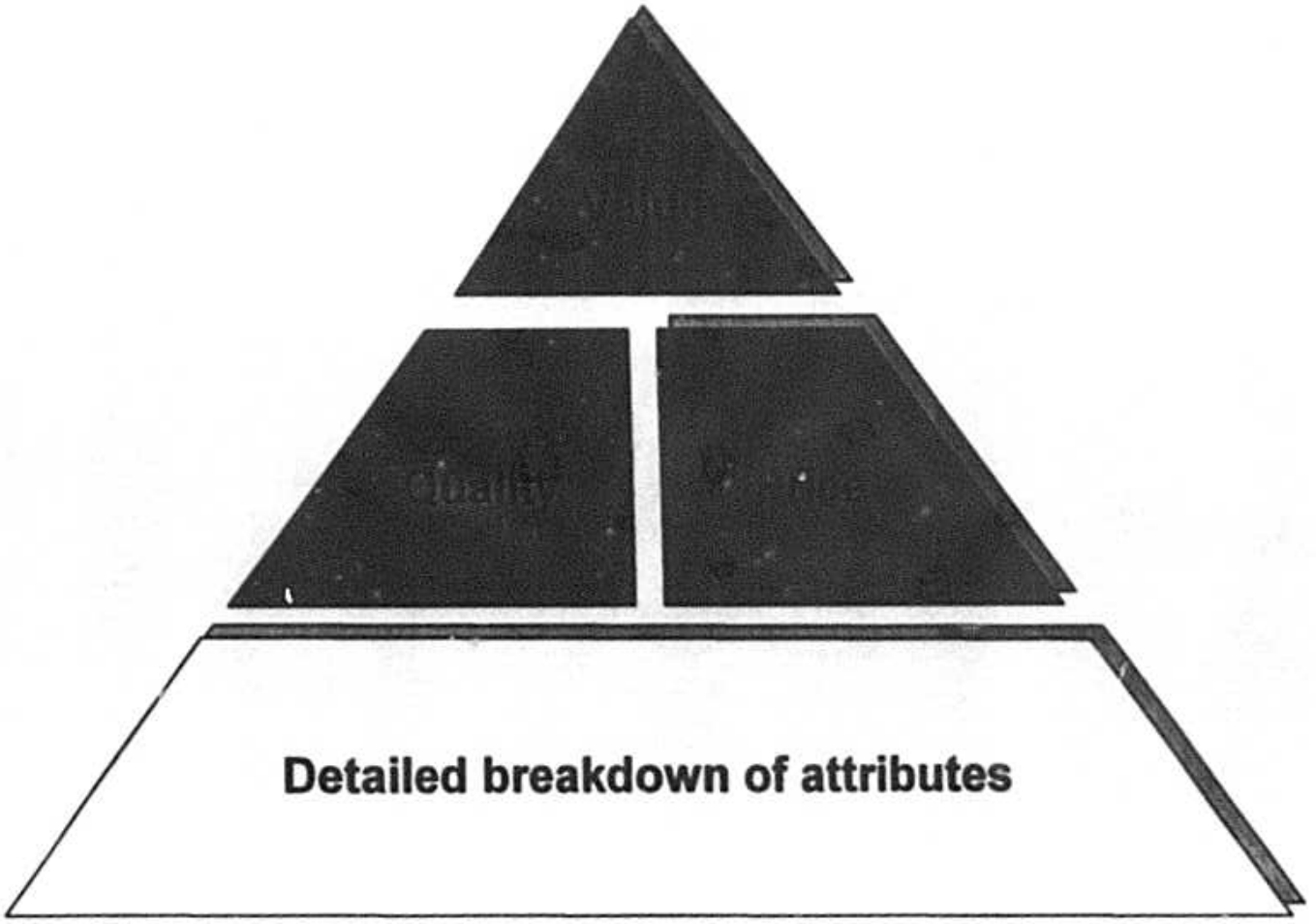
Perceived value: General business customers



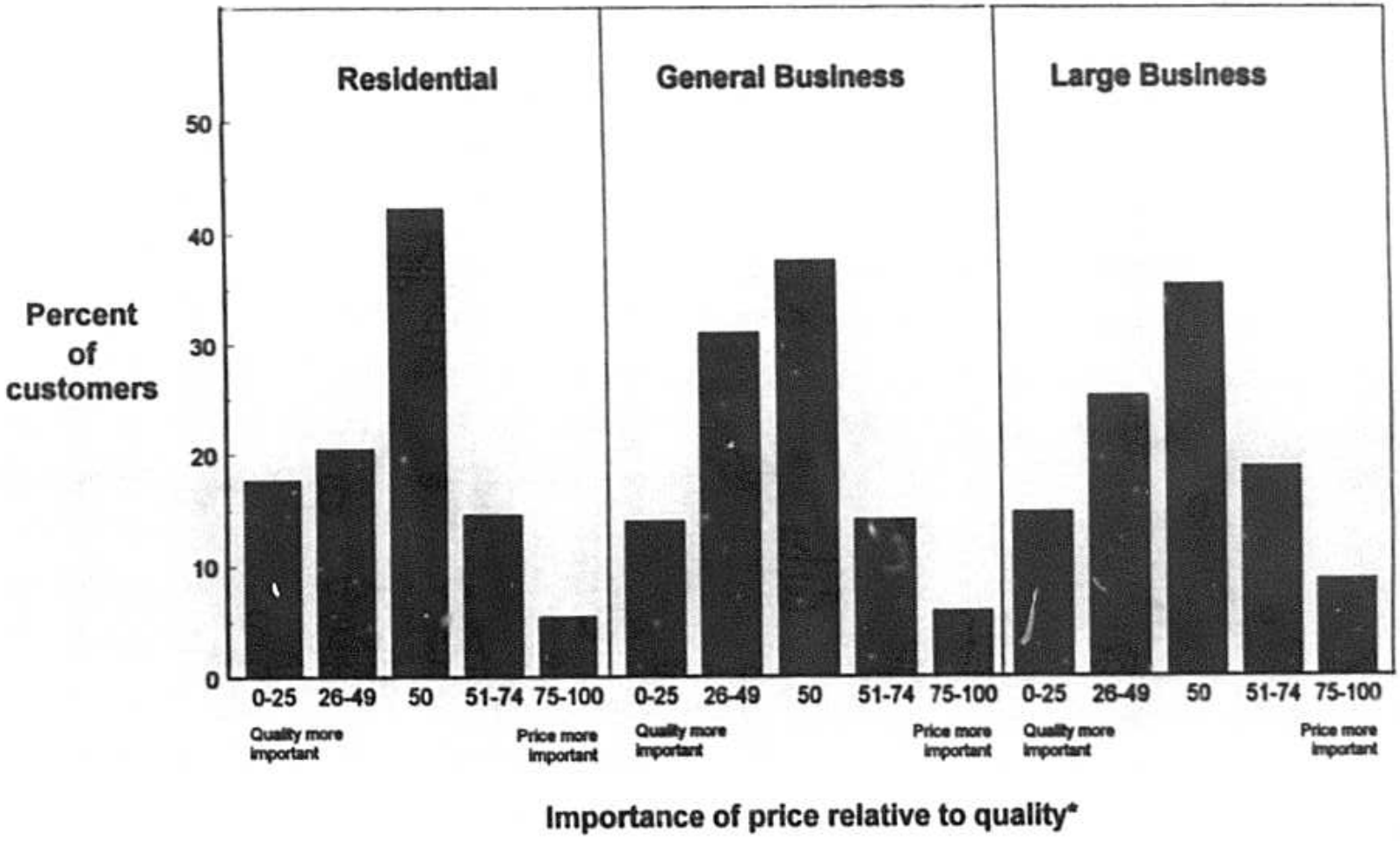
Perceived value: Large business customers



Value perceptions are based on quality and price

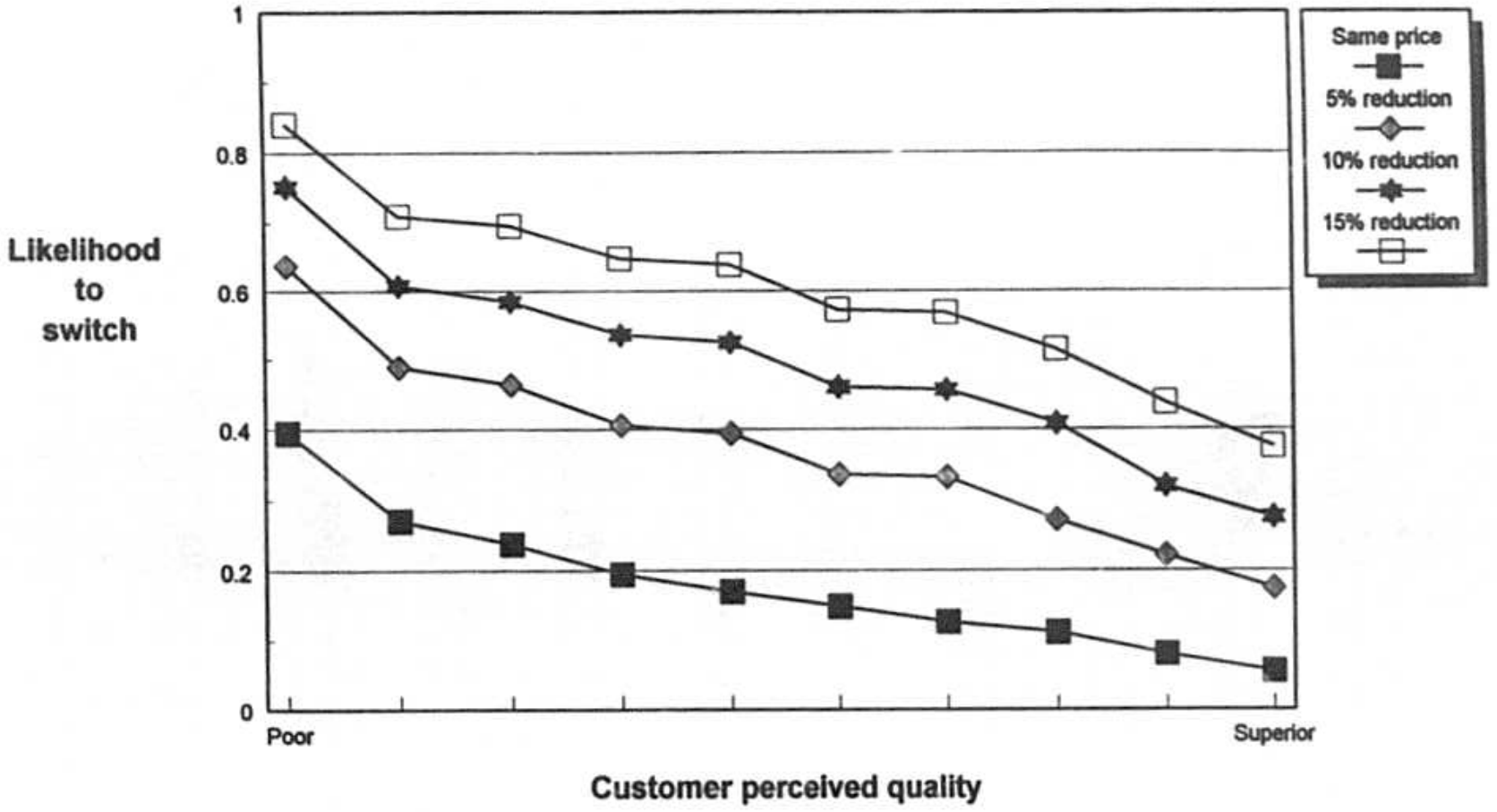


Which is more important - price or quality?

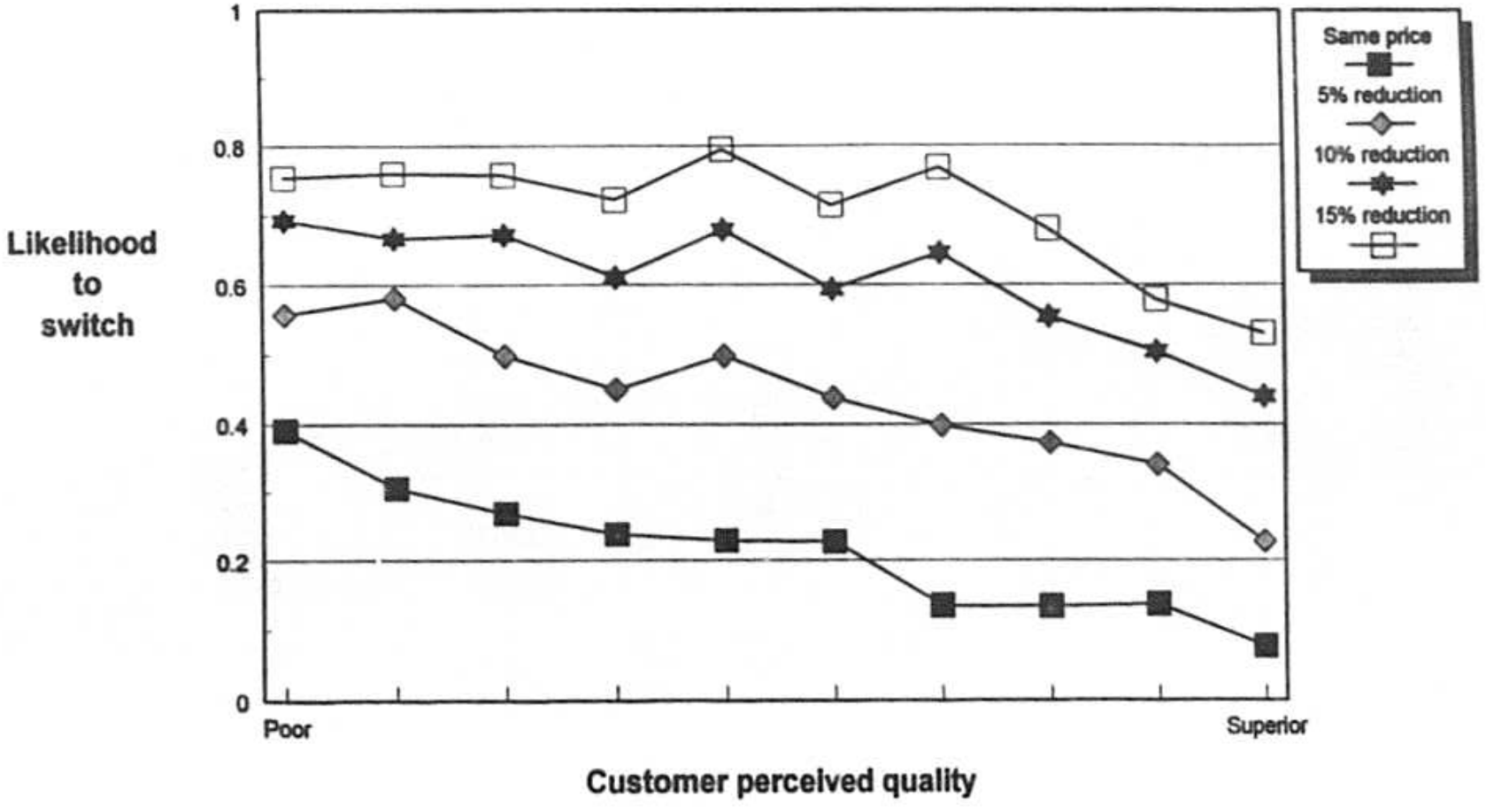


* Customers were asked what role price and quality would play in their choice of an electricity supplier. To indicate the relative importance of price and quality, they allocated 100 points to each (i.e., the total had to add up to 100). The graph shows the number of points (out of 100) assigned to price.

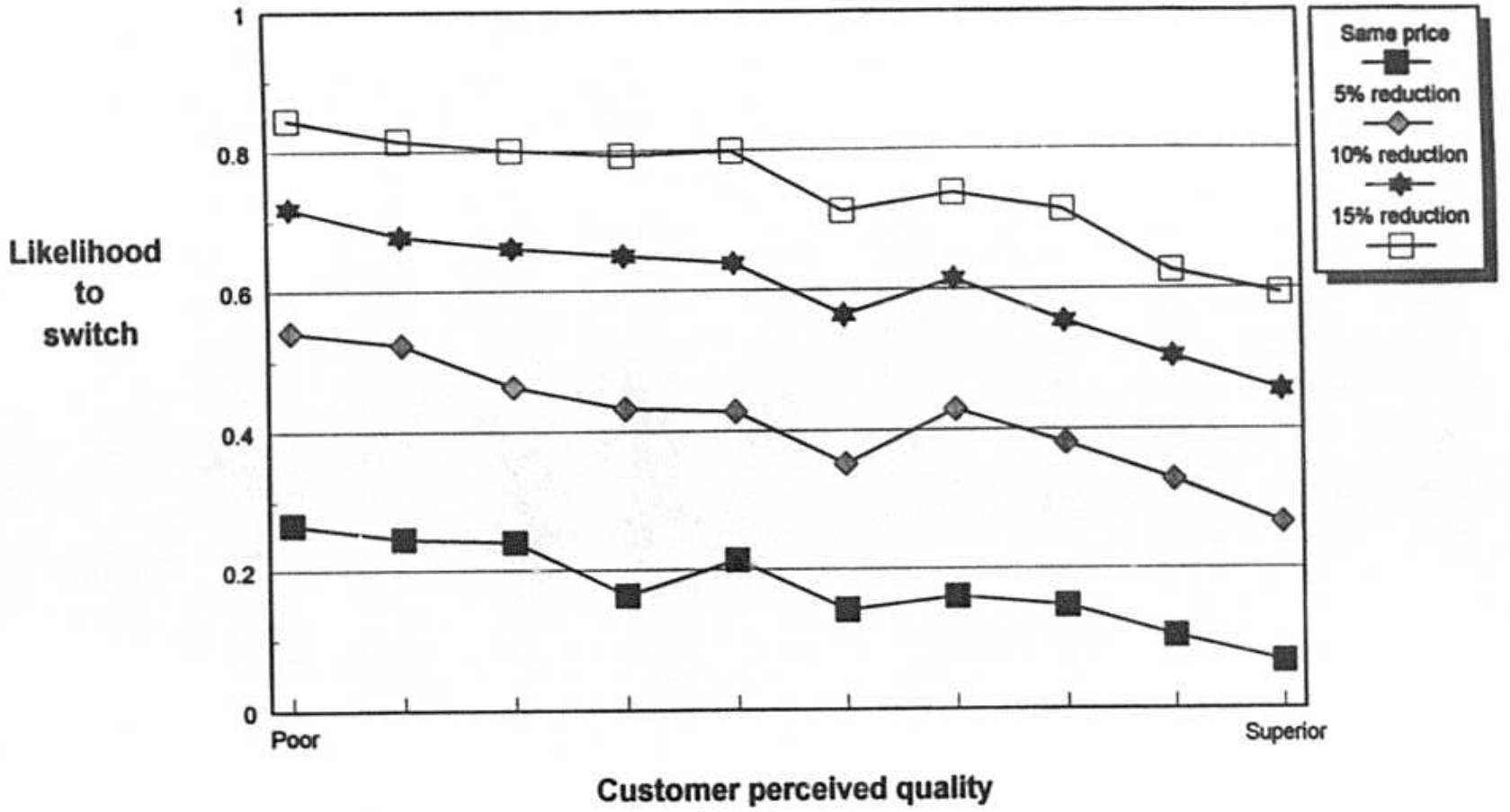
Impact of price and quality on customer retention: Residential customers



Impact of price and quality on customer retention: General business customers



Impact of price and quality on customer retention: Large business customers

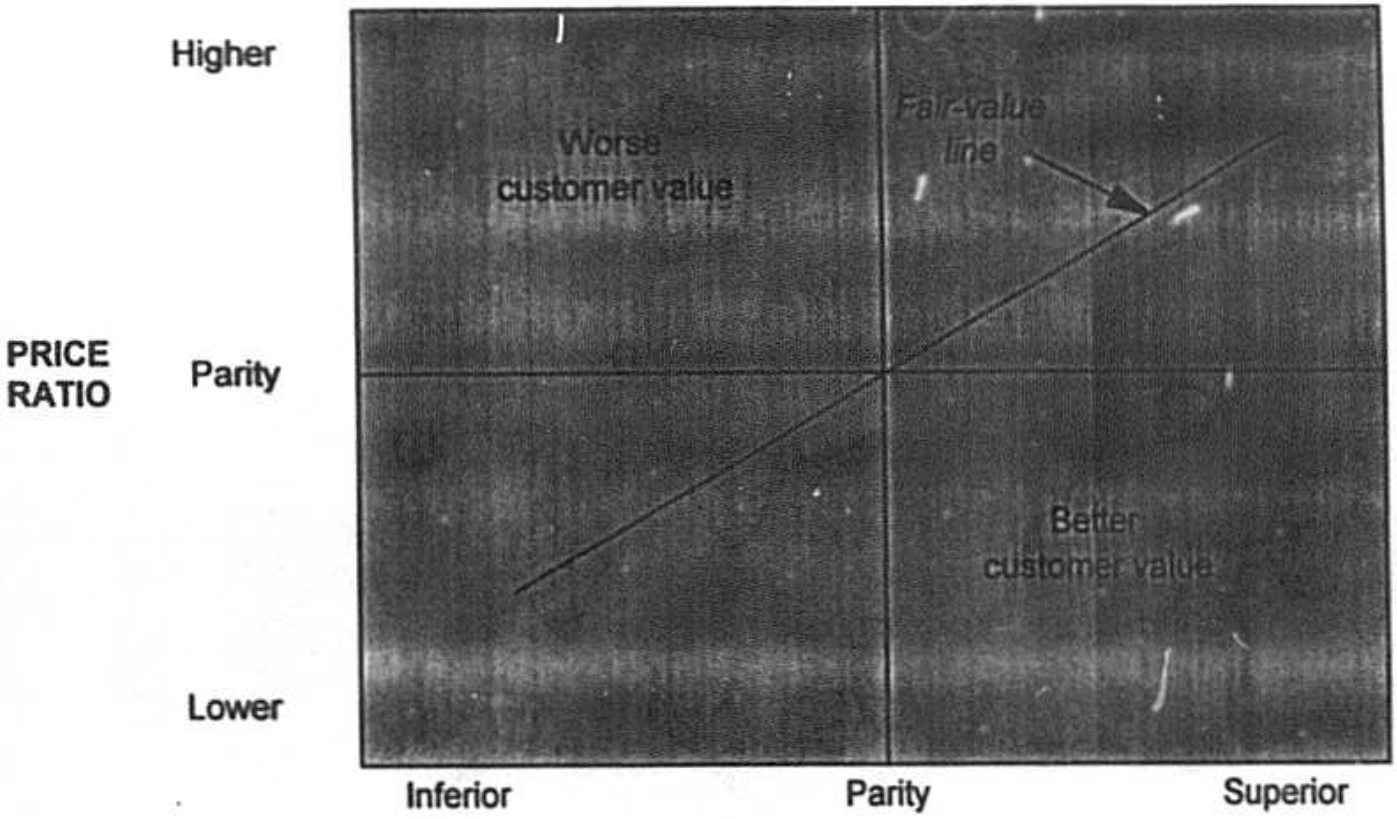


How does the value of our offering compare to the value of offerings available from other electric utilities?

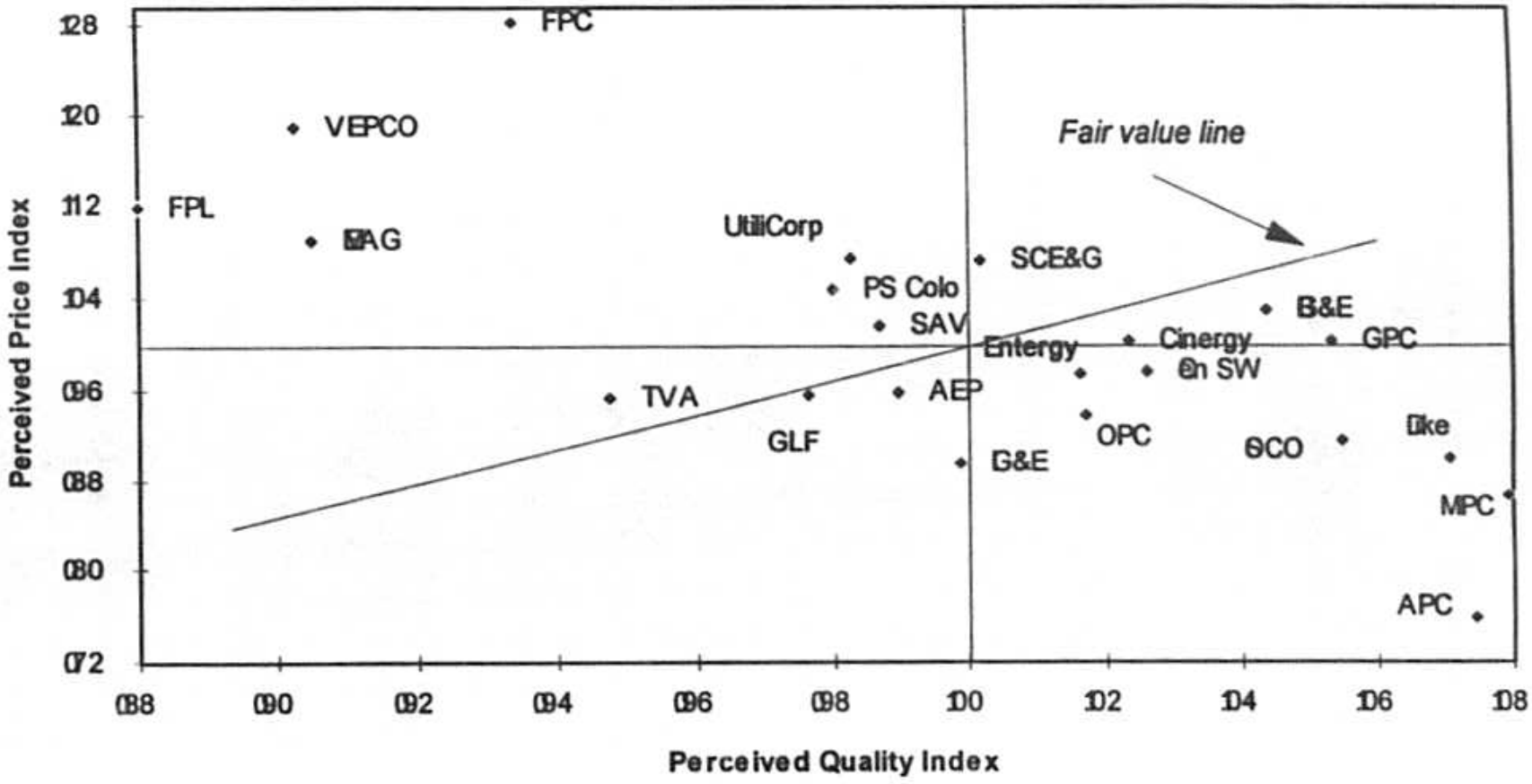
The next pages show customer value maps for utility customers. The way to interpret a value map is described below:

- **Positions on the map are based on customer perceptions about overall price and quality scores for the various competitors.**
- **The fair-value line represents points at which a given provider should neither gain nor lose market share based on the importance of price and quality to the choice decision. At any point along this line, a company is perceived as an average value, based on the perceived price and quality generally available in the market.**
- **The farther a company's position is to the right (superior quality) and to the bottom (lower price) of the map, the better overall value position it is in to compete.**
- **Several points are evident from the second value map:**
  - Customer perceptions about price vary more than perceptions about quality. In each class, the best price index is about 50% better than the worst price index; whereas the best quality index is only about 20% better than the worst quality index.
  - A few utilities are offering a significantly worse value than other utilities. Southern Company is offering a good value, but a number of utilities are offering a comparable value.
  - Together, these points reinforce the need for Southern Company take positive steps to differentiate itself from other utilities.

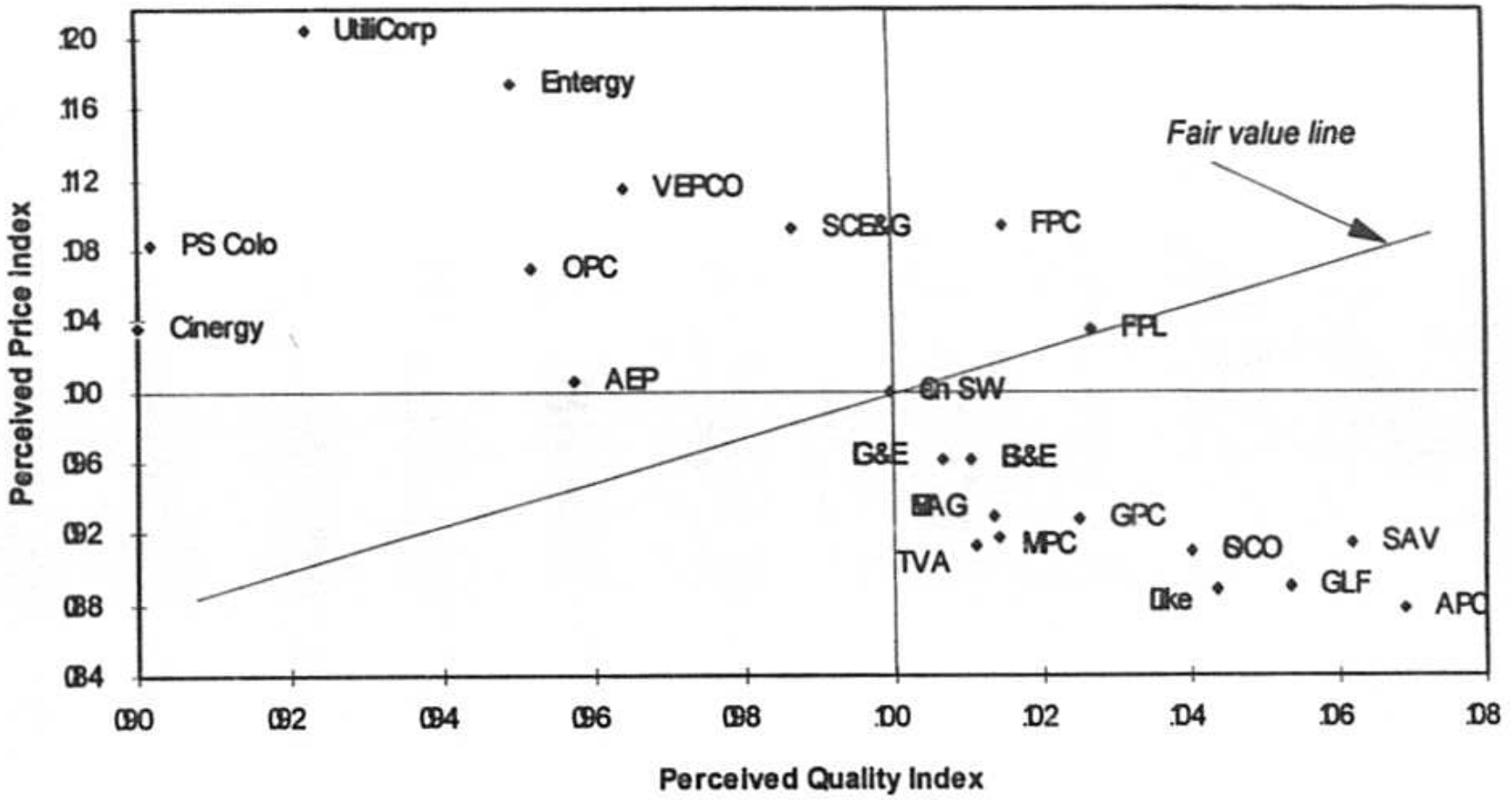
Customer value map



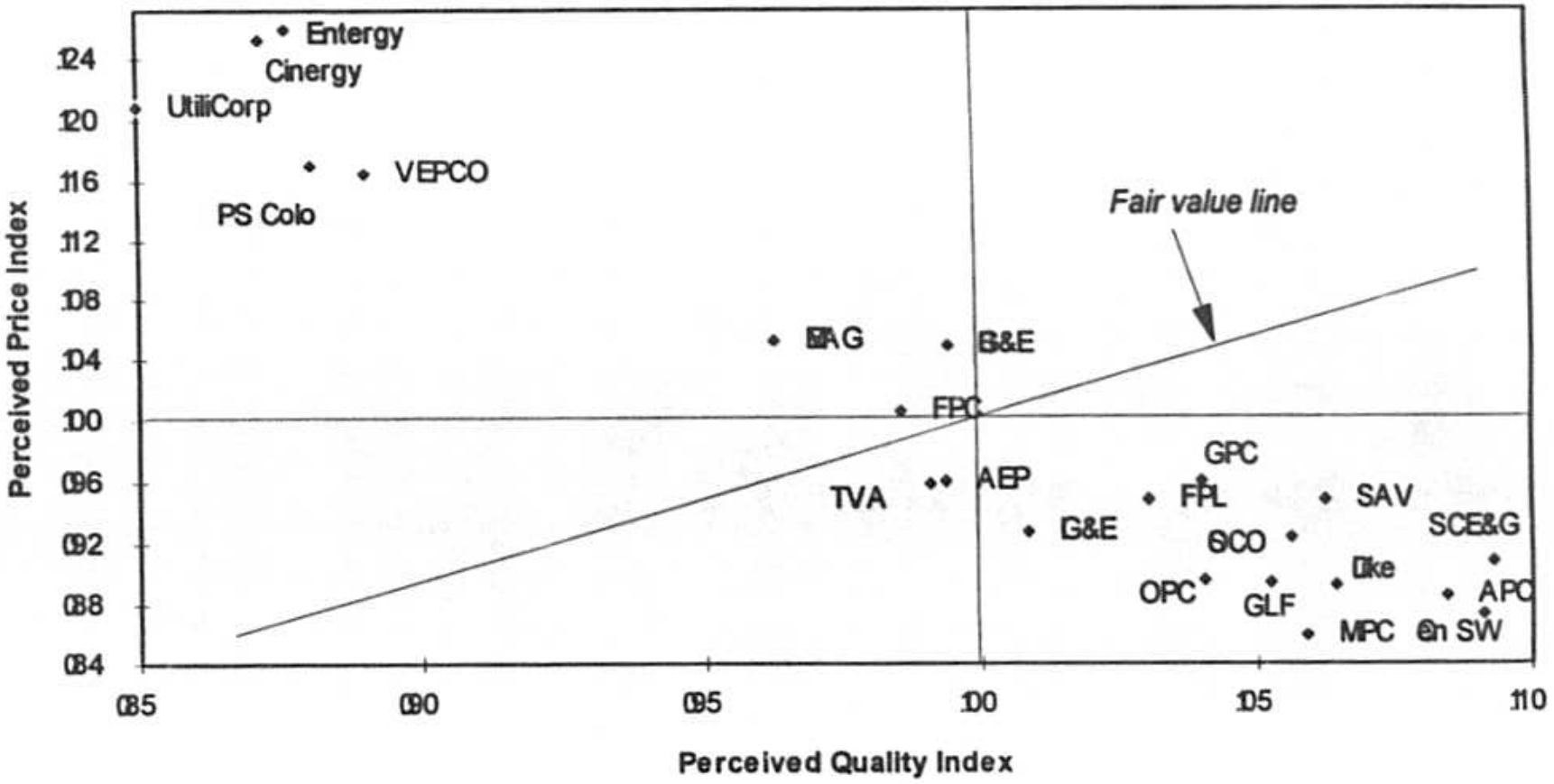
Value map: Residential customers



Value map: General business customers

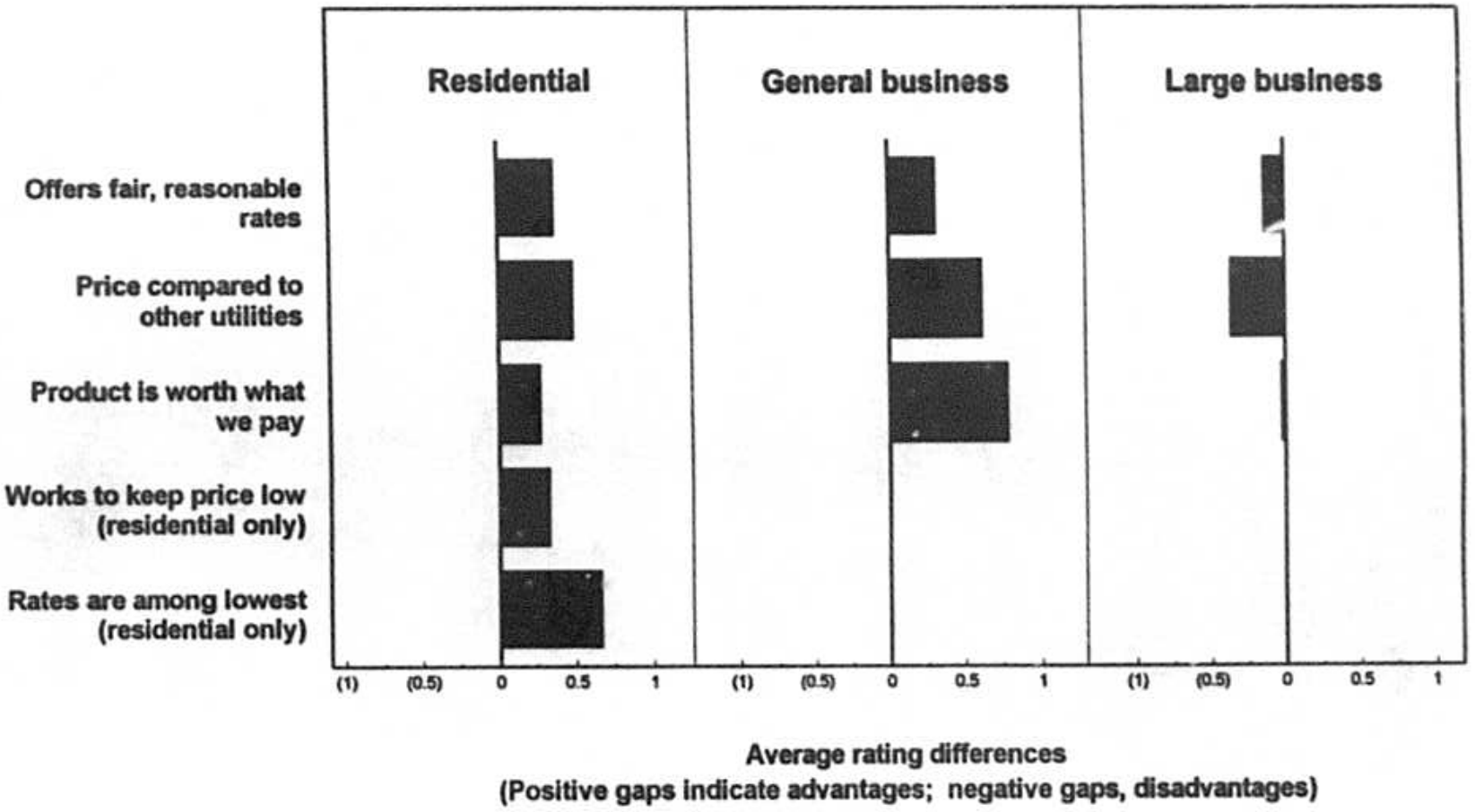


Value map: Large energy users



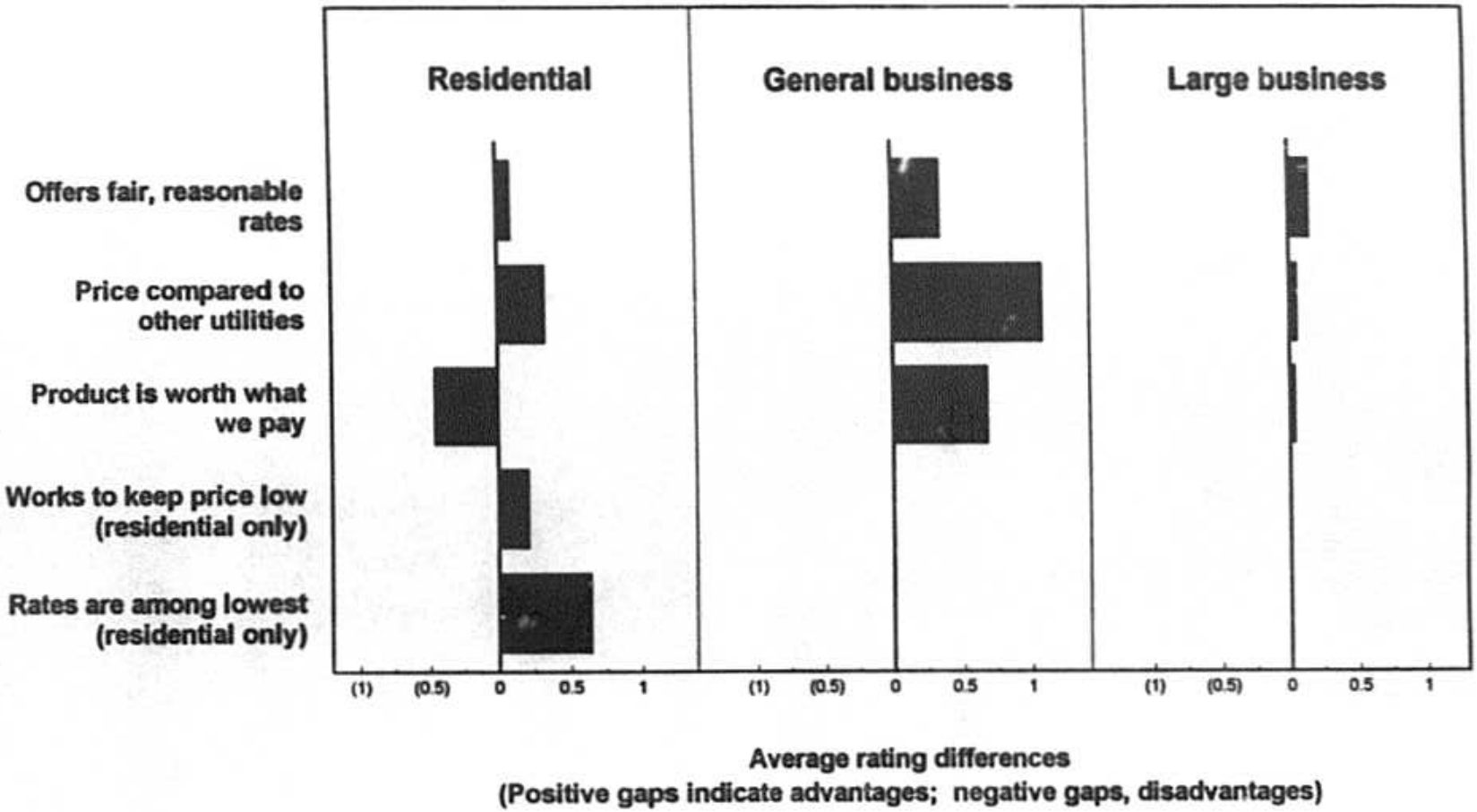
How did we get here?

*Price profile: Southern Company vs. upper quartile utilities**



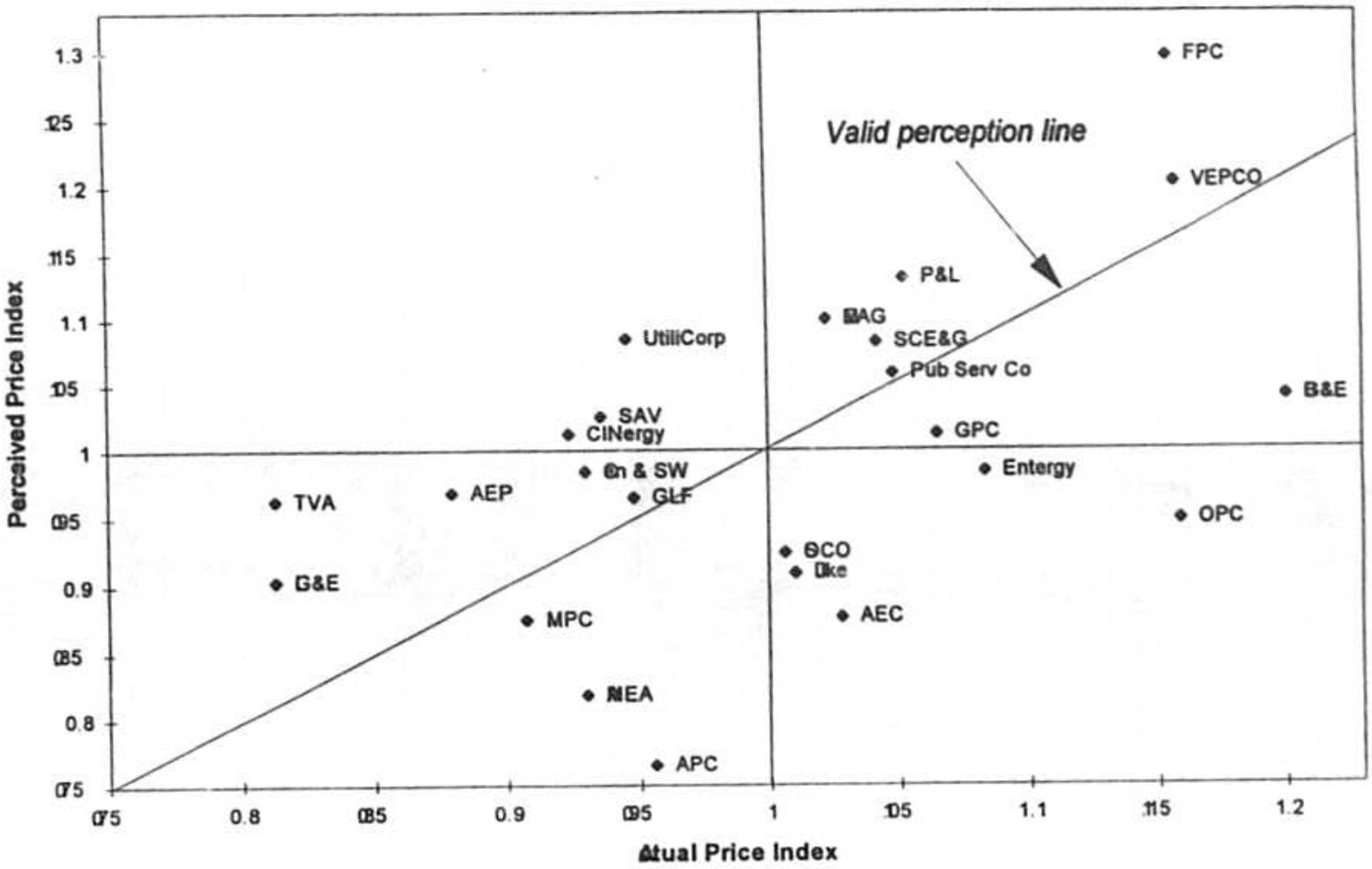
* The upper quartile refers to other utilities with the highest overall satisfaction rating. For residential customers, this included Cinergy, AEP, SCE&G, and Duke; for general business customers, FPC, Duke, MEAG, and SCE&G; and for large energy users, SCE&G, Central & SW, LG&E, and AEP.

Price profile: Gulf Power vs. upper quartile utilities*

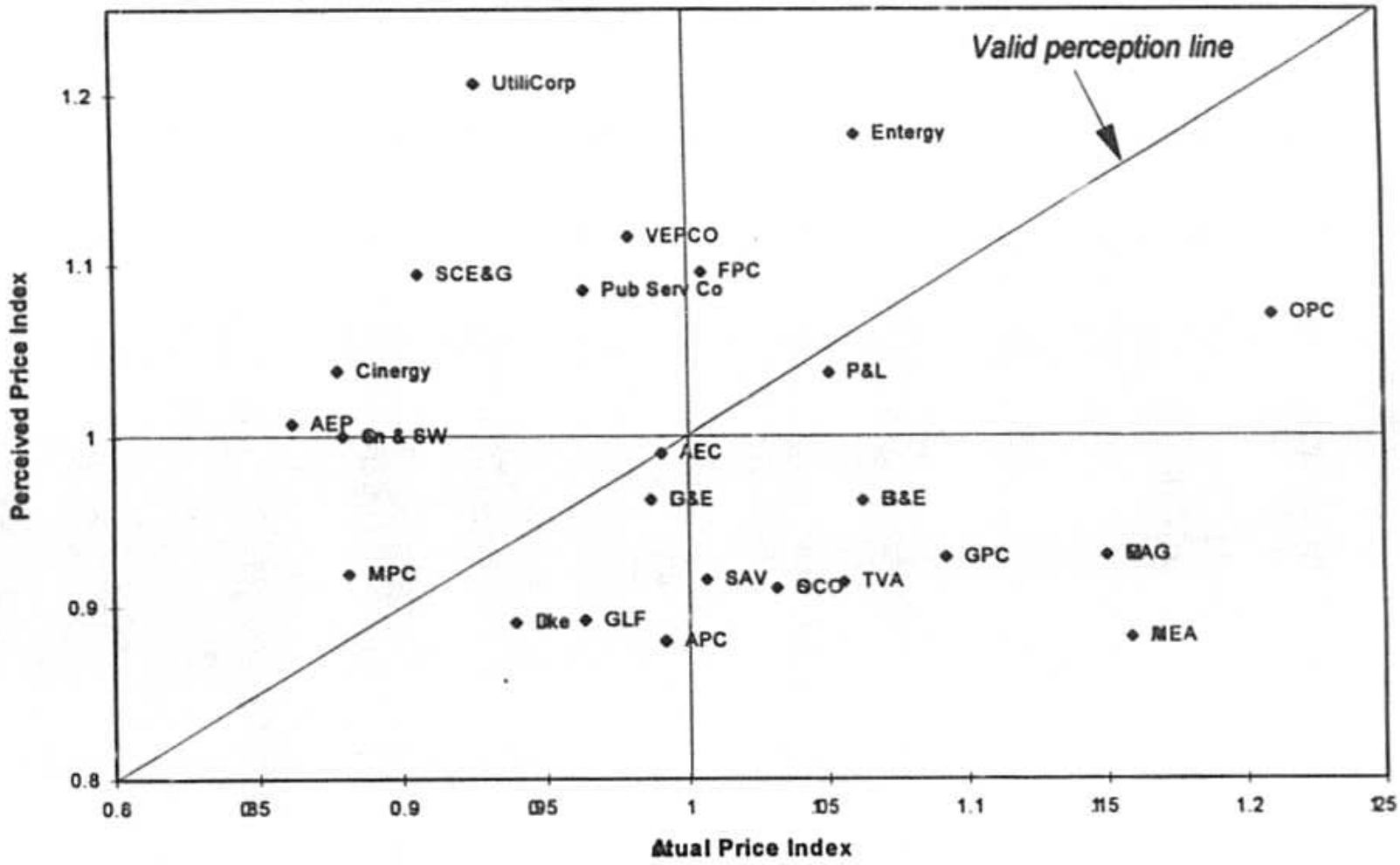


* The upper quartile refers to other utilities with the highest overall satisfaction rating. For residential customers, this included Cinergy, AEP, SCE&G, and Duke; for general business customers, FPC, Duke, MEAG, and SCE&G; and for large energy users, SCE&G, Central & SW, LG&E, and AEP.

Residential customers: How does perceived price compare to actual price?



Business customers: How does perceived price compare to actual price?

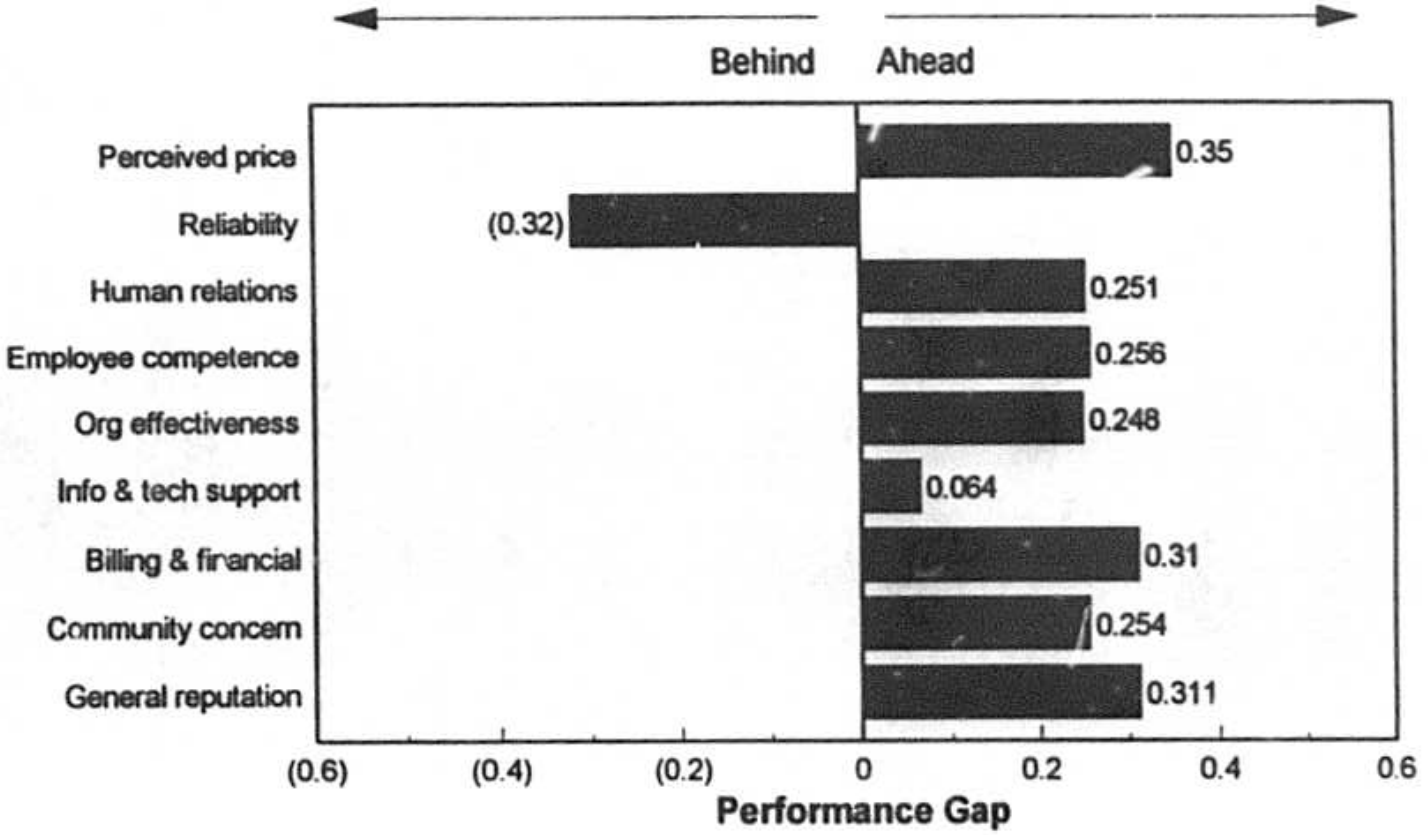


Compared to other utilities, where are we strong and where do we have room to improve?

The next few pages compare Gulf Power with companies that fell in the upper quartile on overall satisfaction).

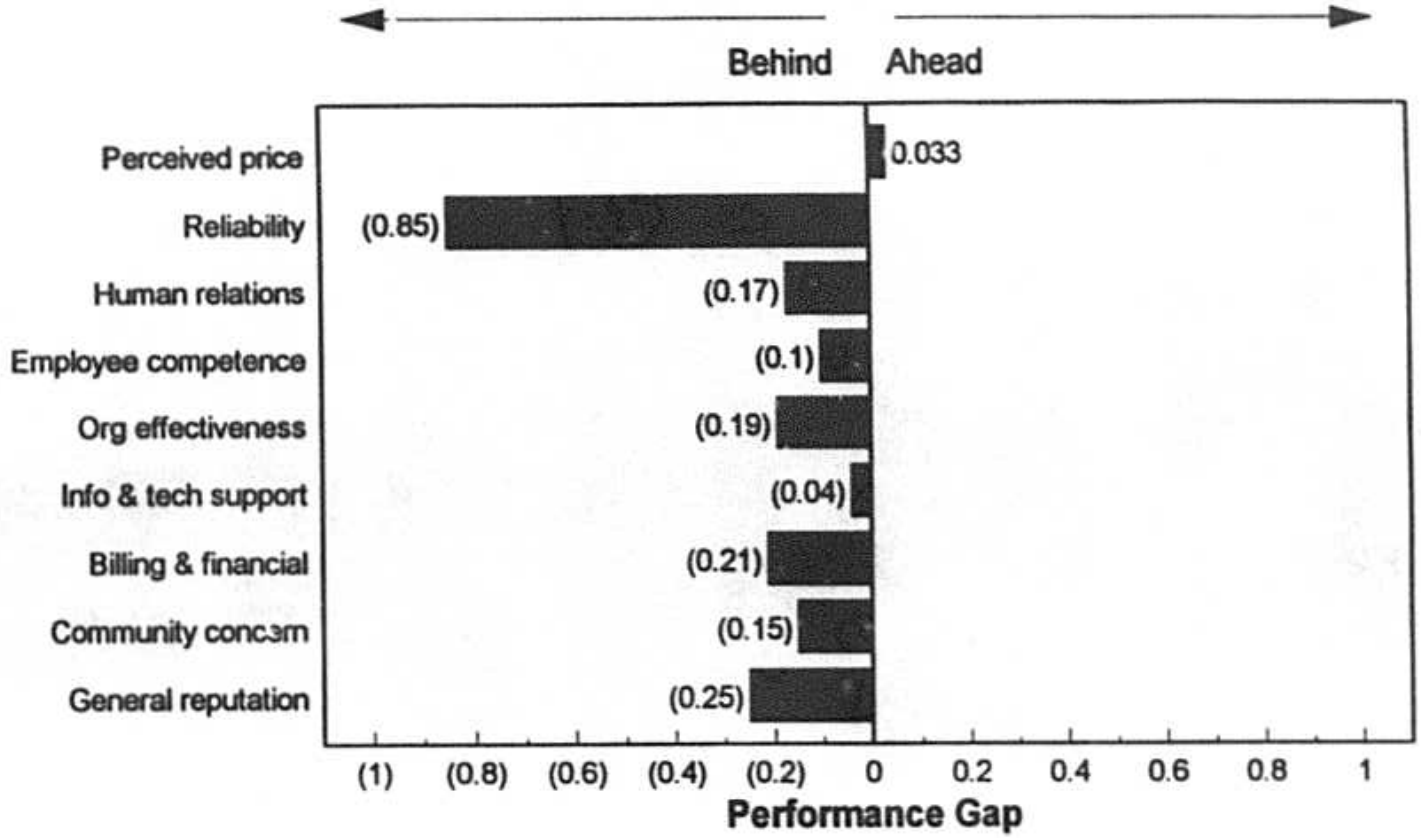
- **Residential customers**
  - On most measures (perceived price, human relations, etc.), differences are not statistically significant.
  - The biggest disadvantage is in the area of reliability. The other utilities also have a small advantage in the areas of billing and general reputation.
- **General business customers**
  - Gulf Power has a significant advantage in pricing, organizational effectiveness, community support and general reputation; and a mild advantage in reliabilitiy..
  - Other measures are roughly equal.
- **Large business customers**
  - Gulf Power has a small advantage on measures associated with billing.
  - The other utilities get slightly better ratings on measures of account rep performance.

*Head-to-head comparison of SoCo versus upper quartile utilities: Residential customers**



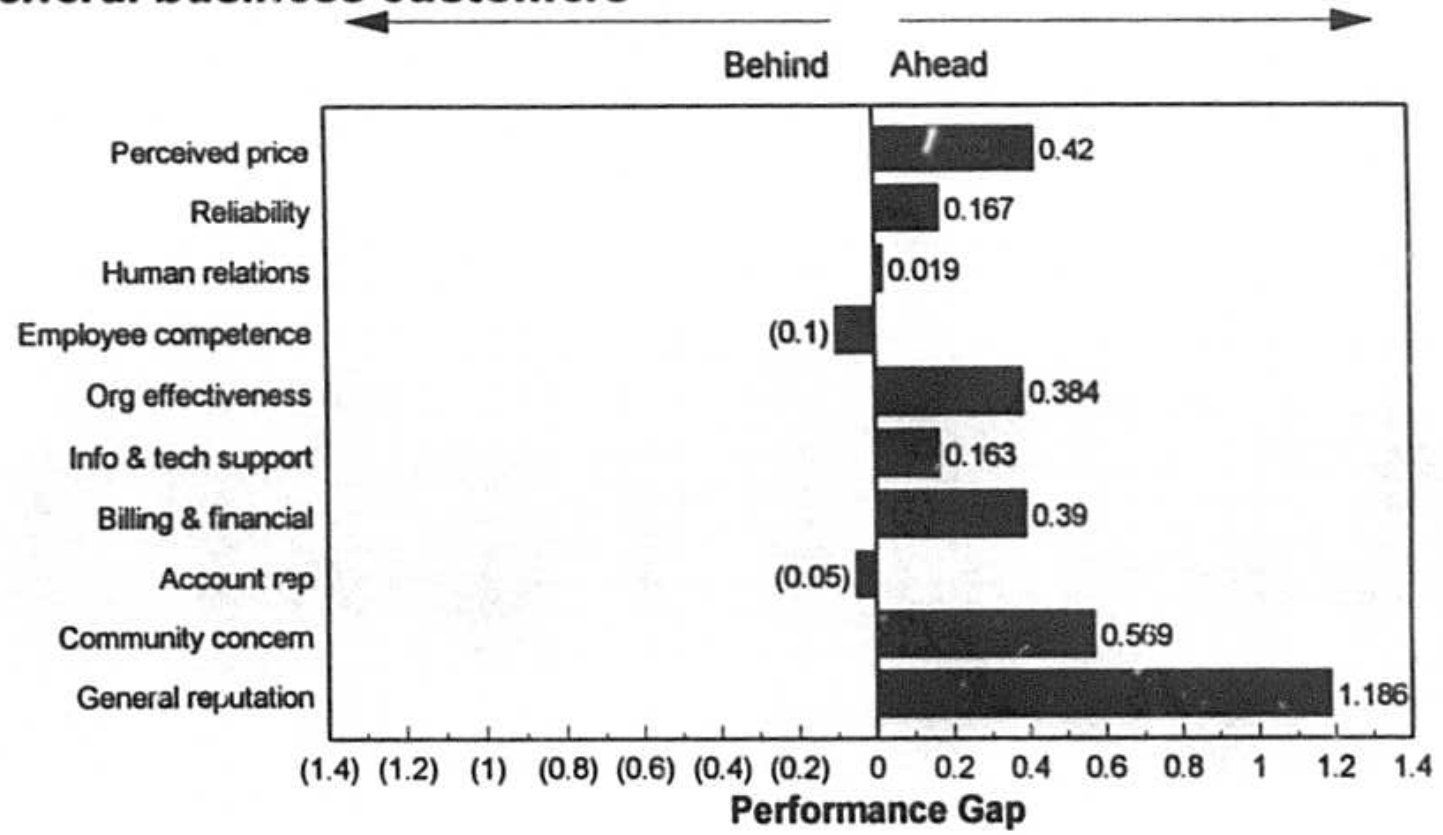
* The upper quartile refers to competitor utilities with the highest overall satisfaction rating. For residential customers, this included Cinergy, AEP, SCE&G, and Duke.

*Head-to-head comparison of Gulf Power versus upper quartile utilities: Residential customers**



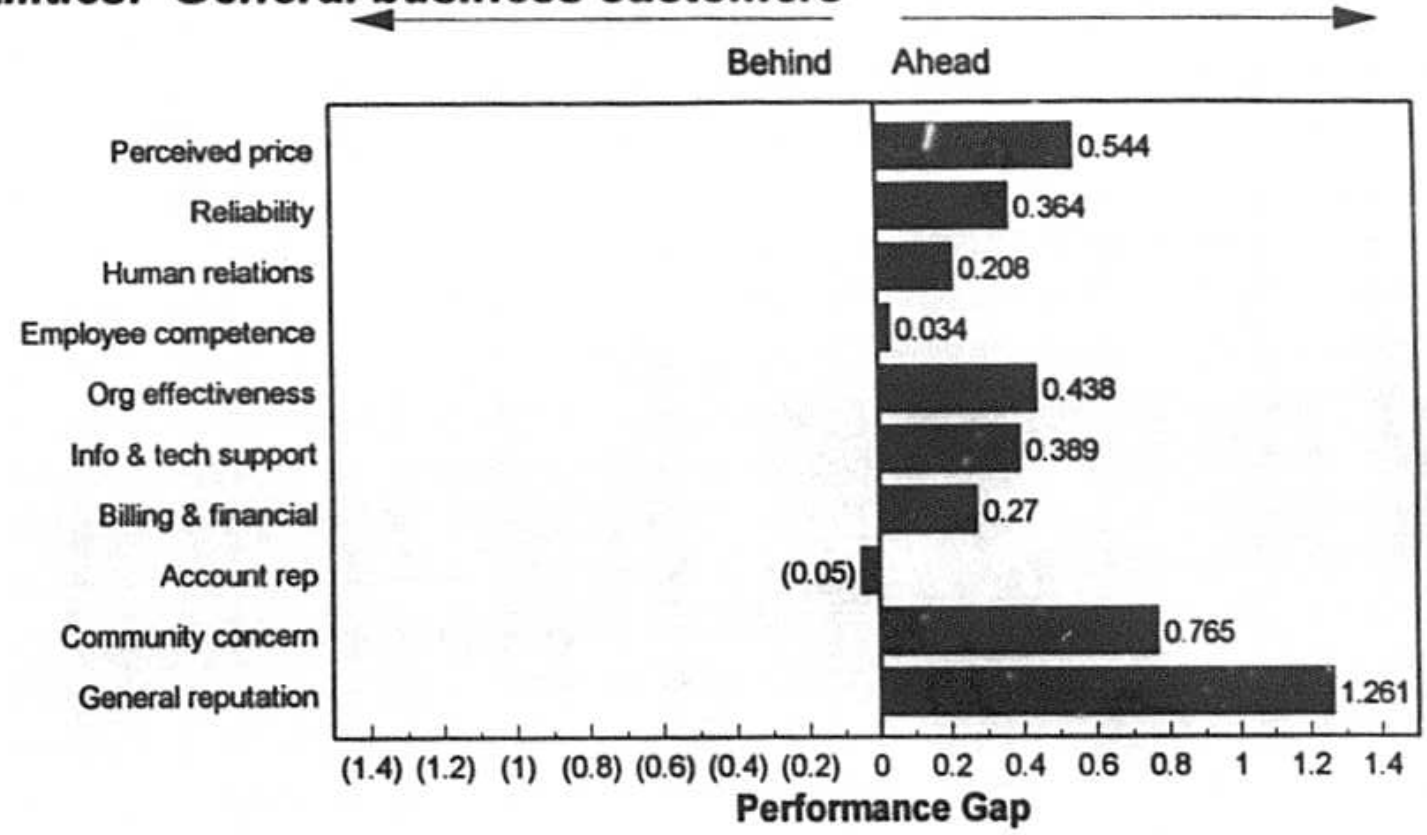
* The upper quartile refers to competitor utilities with the highest overall satisfaction rating. For residential customers, this included Cinergy, AEP, SCE&G, and Duke.

*Head-to-head comparison of SoCo versus upper quartile utilities: General business customers**



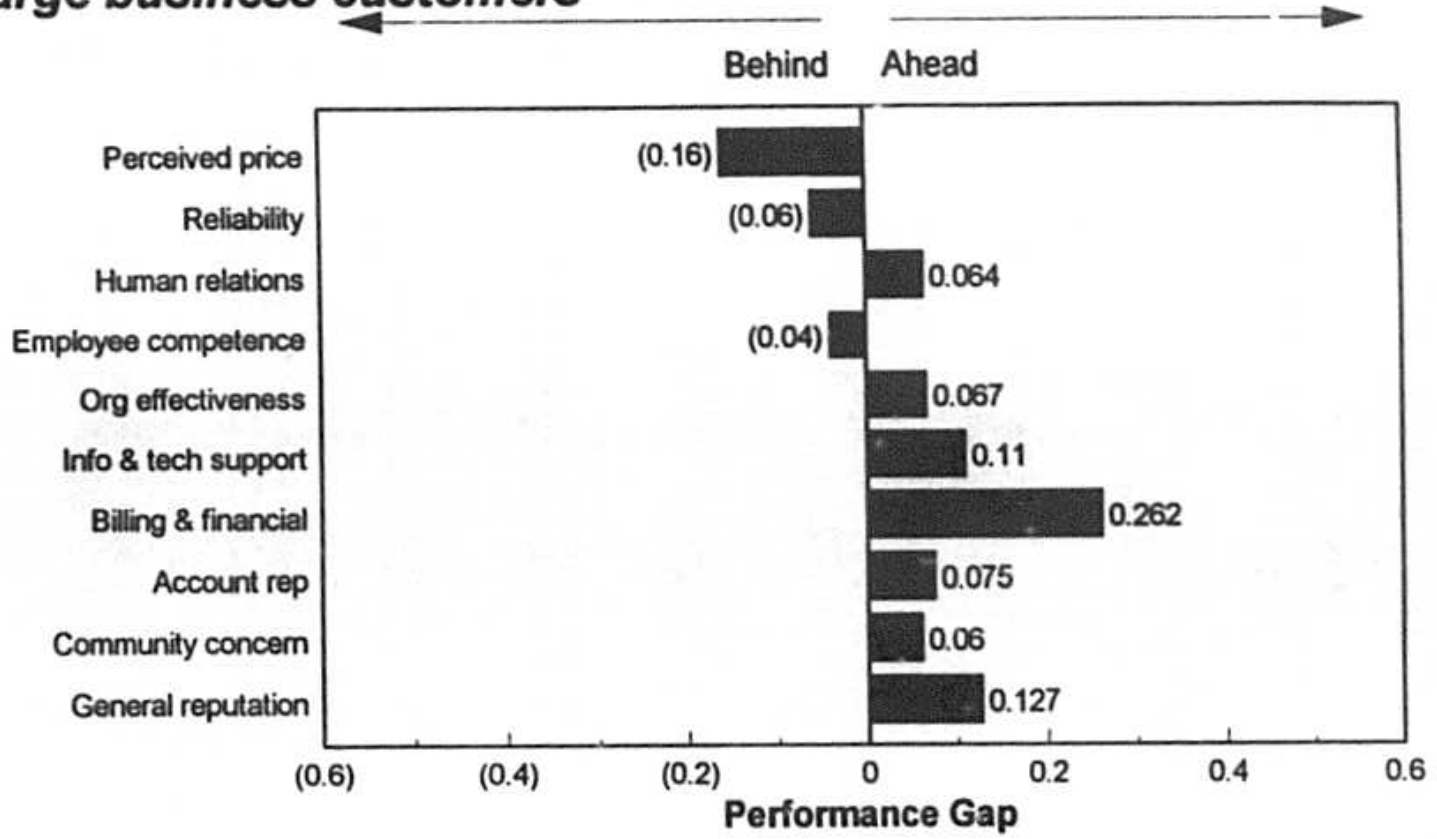
* The upper quartile refers to competitor utilities with the highest overall satisfaction rating. For general business customers, this included FPC, Duke, MEAG, AND SCE&G.

*Head-to-head comparison of Gulf Power versus upper quartile utilities: General business customers**



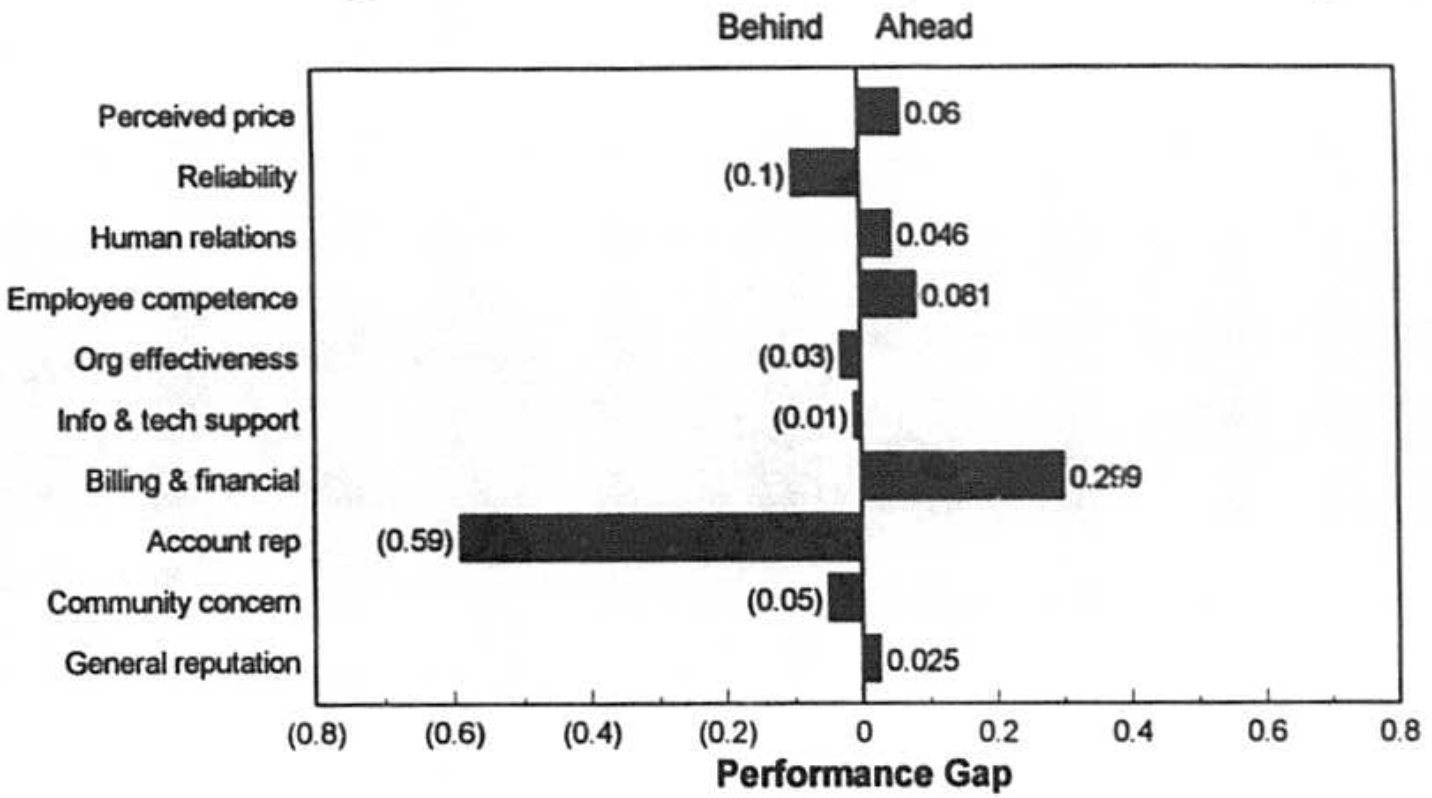
* The upper quartile refers to competitor utilities with the highest overall satisfaction rating. For general business customers, this included FPC, Duke, MEAG, AND SCE&G.

*Head-to-head comparison of SoCo versus upper quartile utilities: Large business customers**



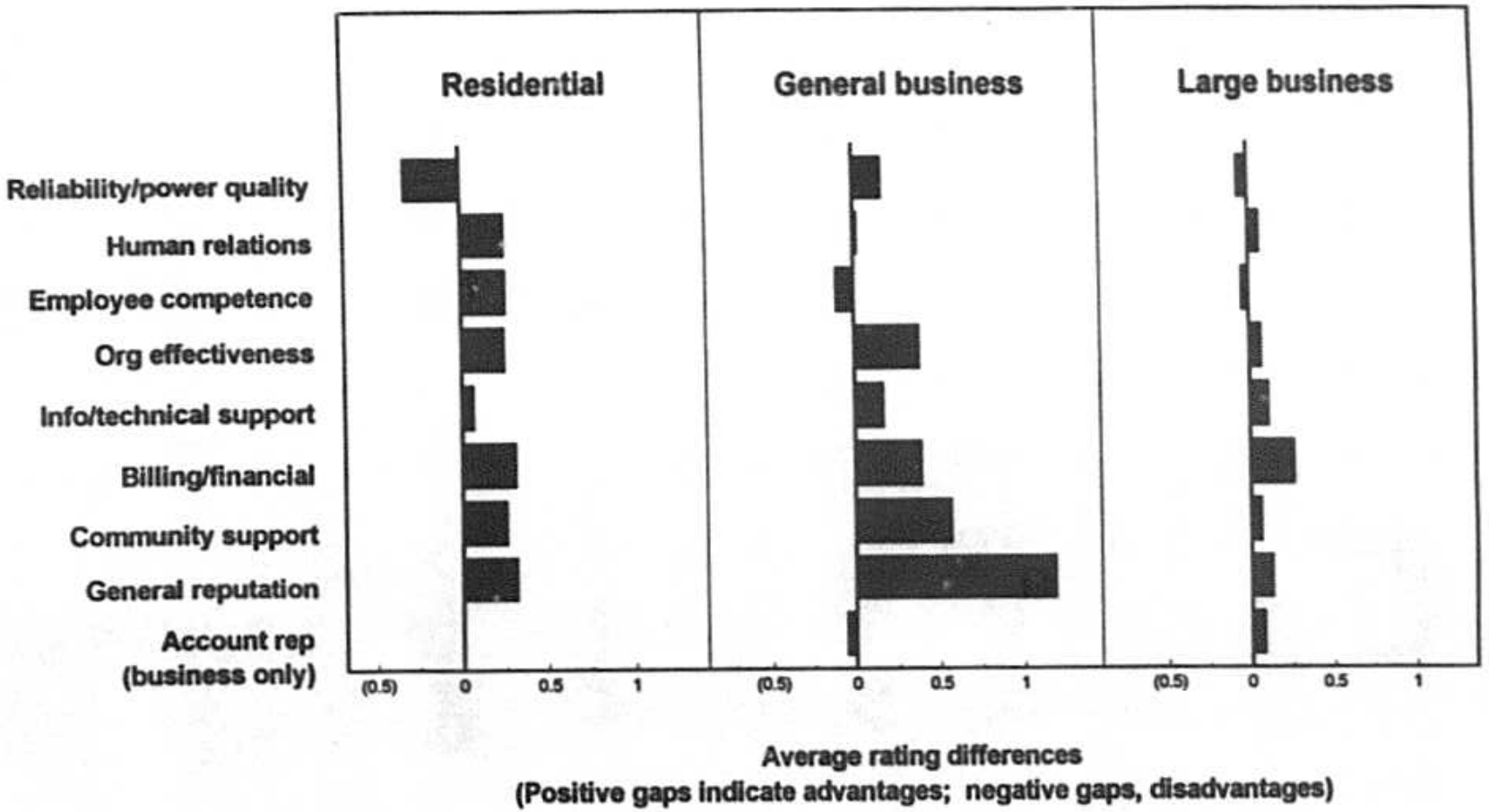
* The upper quartile refers to competitor utilities with the highest overall satisfaction rating. For large business customers, this included SCE&G, Central & SW, LG&E, and AEP.

*Head-to-head comparison of Gulf Power versus upper quartile utilities: Large business customers**



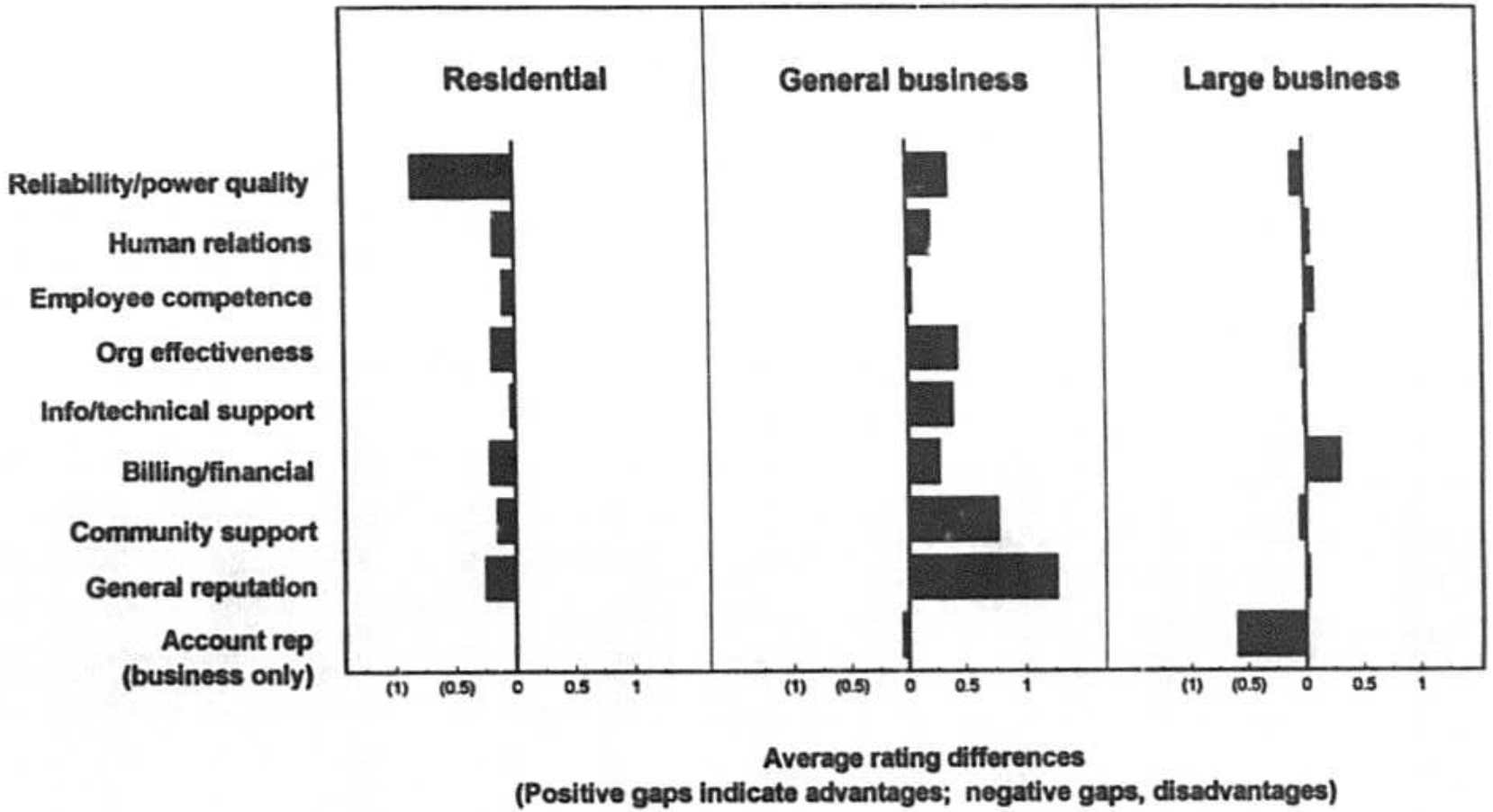
* The upper quartile refers to competitor utilities with the highest overall satisfaction rating. For large business customers, this included SCE&G, Central & SW, LG&E, and AEP.

*Quality profile: Southern Company vs. upper quartile utilities**



* The upper quartile refers to competitor utilities with the highest overall satisfaction rating. For residential customers, this included Cinergy, AEP, SCE&G, and Duke; for general business customers, FPC, Duke, MEAG, and SCE&G; and for large energy users, SCE&G, Central & SW, LG&E, and AEP.

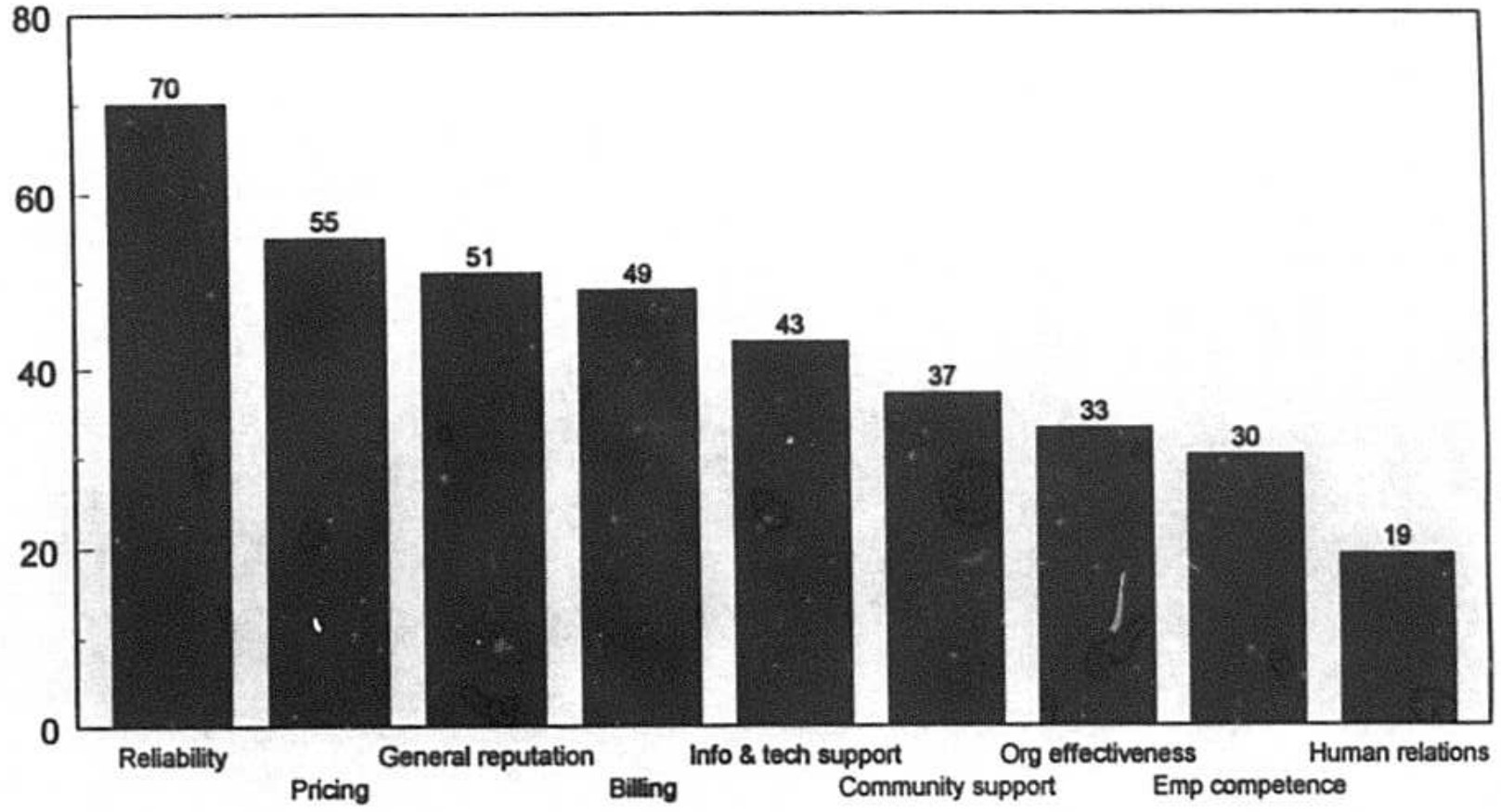
Quality profile: Gulf Power vs. upper quartile utilities*



* The upper quartile refers to competitor utilities with the highest overall satisfaction rating. For residential customers, this included Cinergy, AEP, SCE&G, and Duke; for general business customers, FPC, Duke, MEAG, and SCE&G; and for large energy users, SCE&G, Central & SW, LG&E, and AEP.

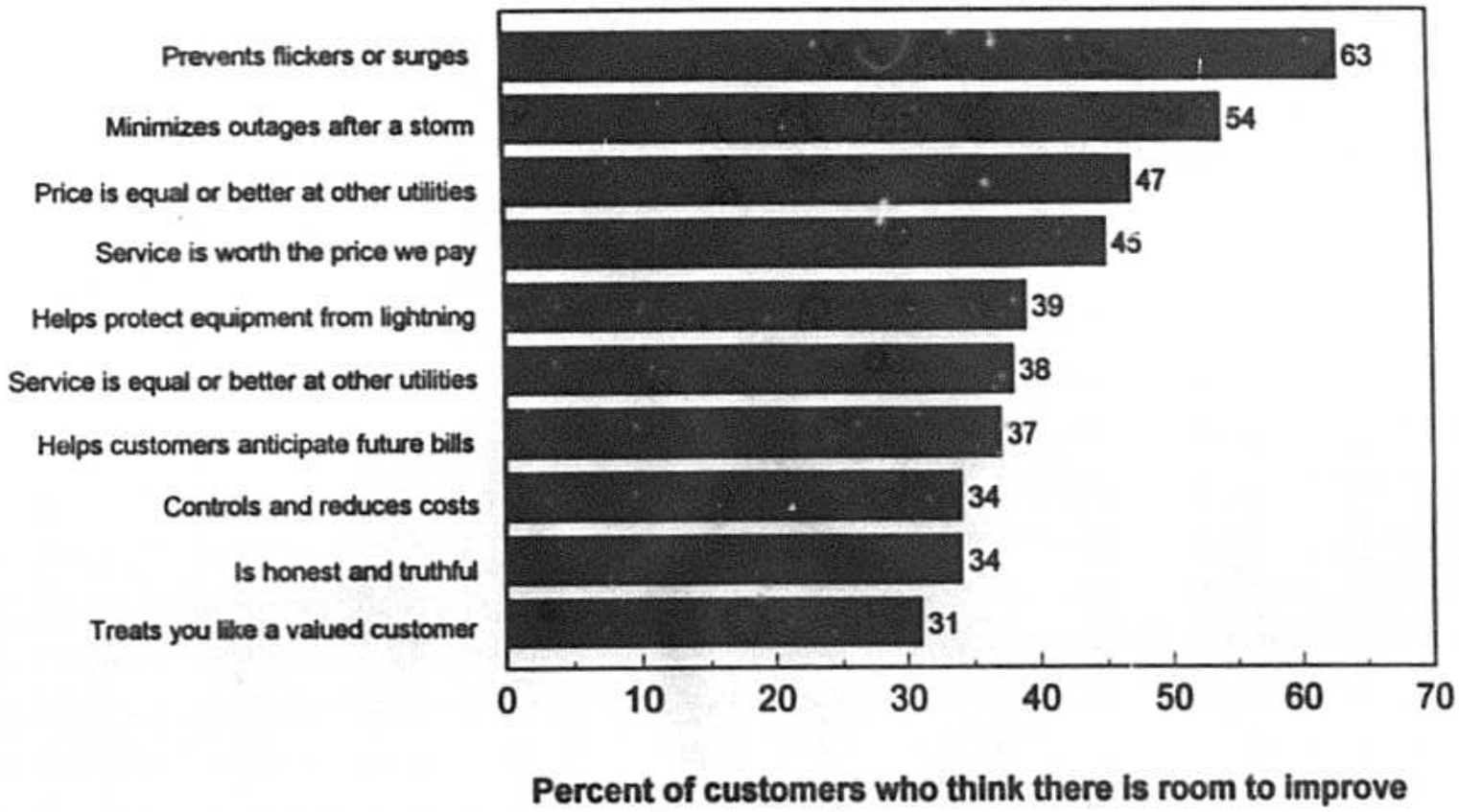
*Problem incidence at Gulf Power: Residential customers**

Percent of customers having problem



* For each image and performance factor, the chart shows the percent of customers who indicated that there was a problem with some aspect of service delivery on that factor. This means the customer gave the company a low rating (between 0 and 5) on a 0 to 10 scale.

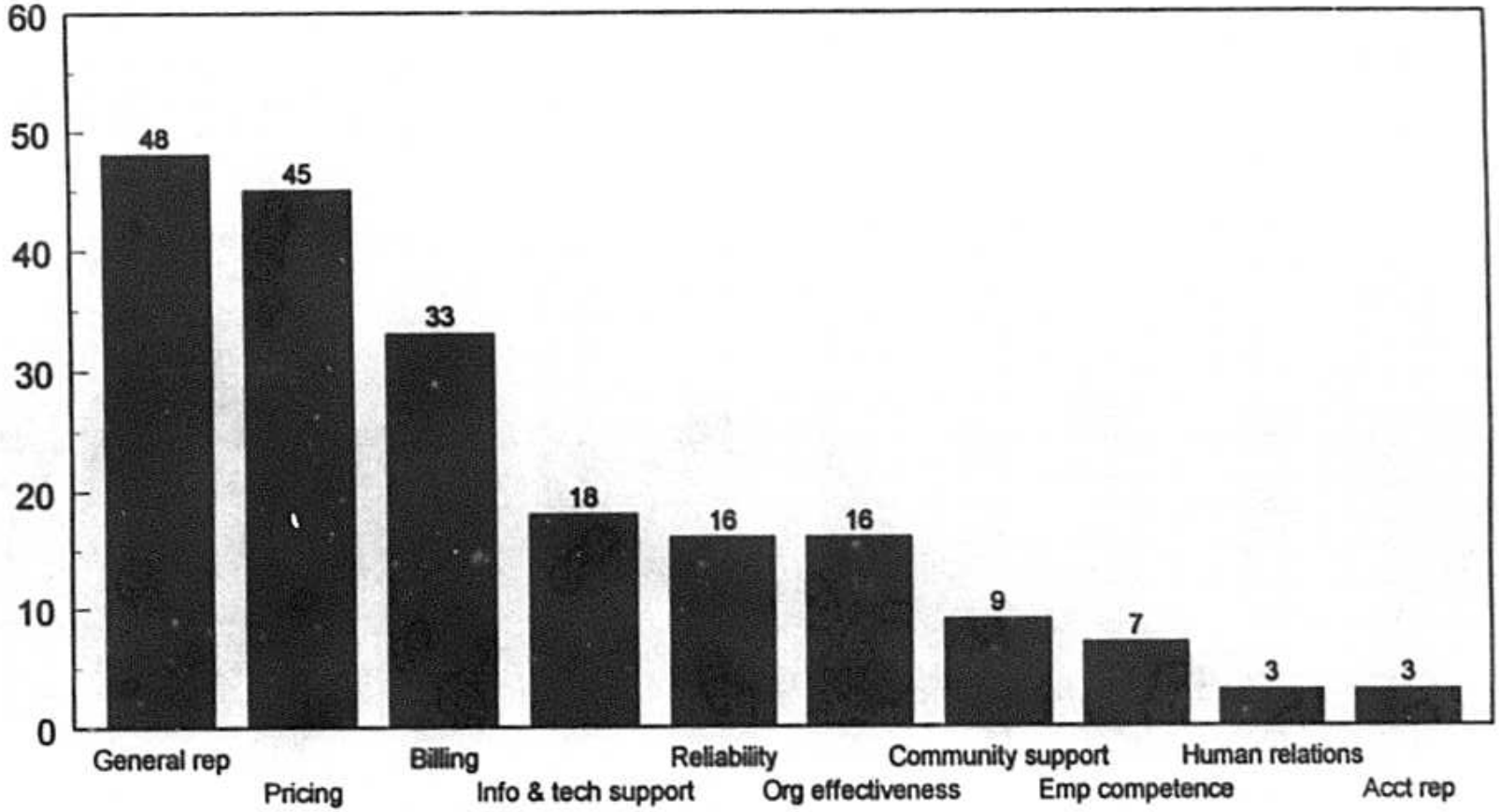
op 10 critical incidents at Gulf Power: Residential customers*



* For each image and service attribute, the chart shows the percent of customers who indicated that there was room for improvement. This means the customer gave the company a low rating (between 0 and 5) on a 0 to 10 scale.

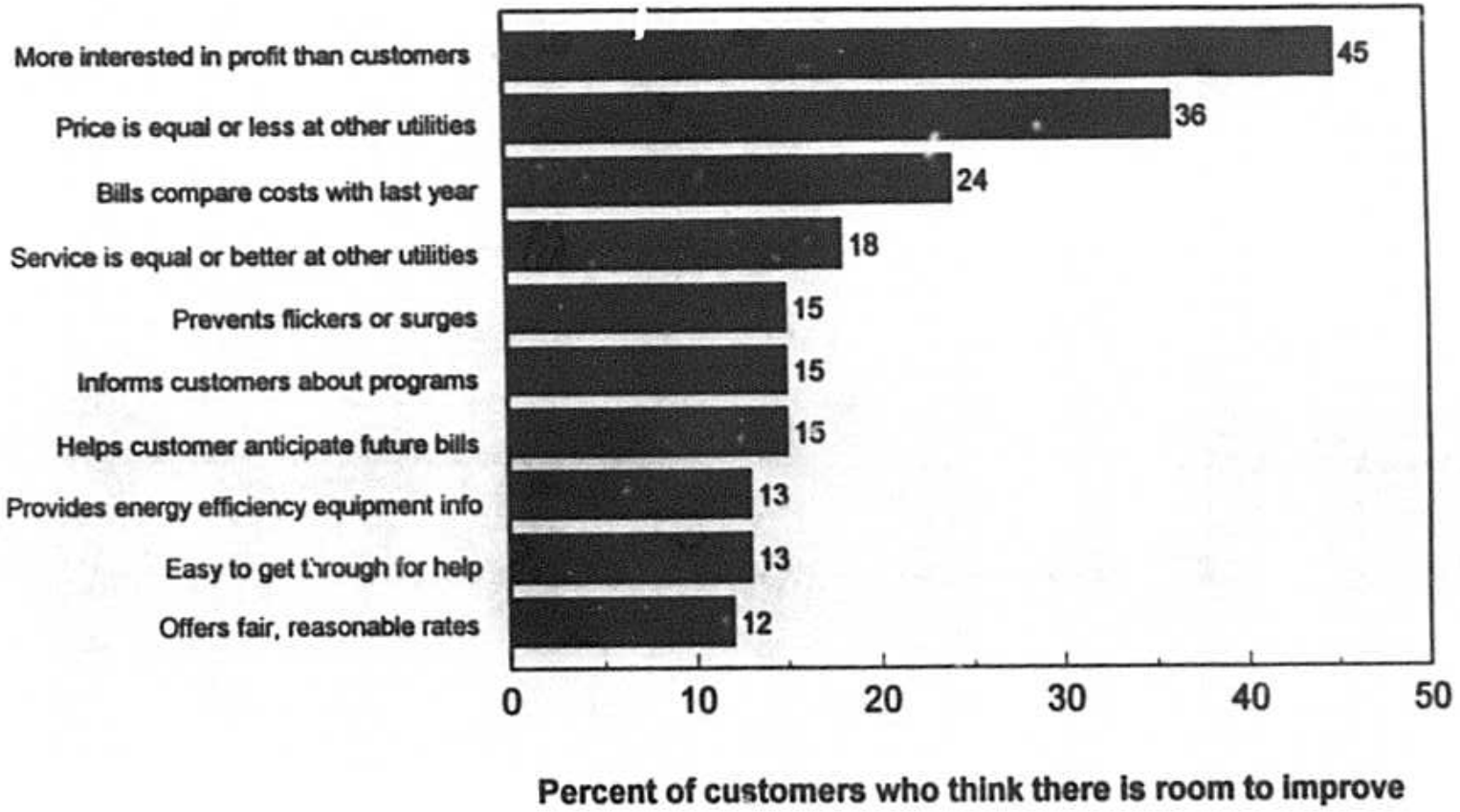
*Problem incidence at Gulf Power: General business customers**

Percent of customers having problem



* For each image and performance factor, the chart shows the percent of customers who indicated that there was a problem with some aspect of service delivery on that factor. This means the customer gave the company a low rating (between 0 and 5) on a 0 to 10 scale.

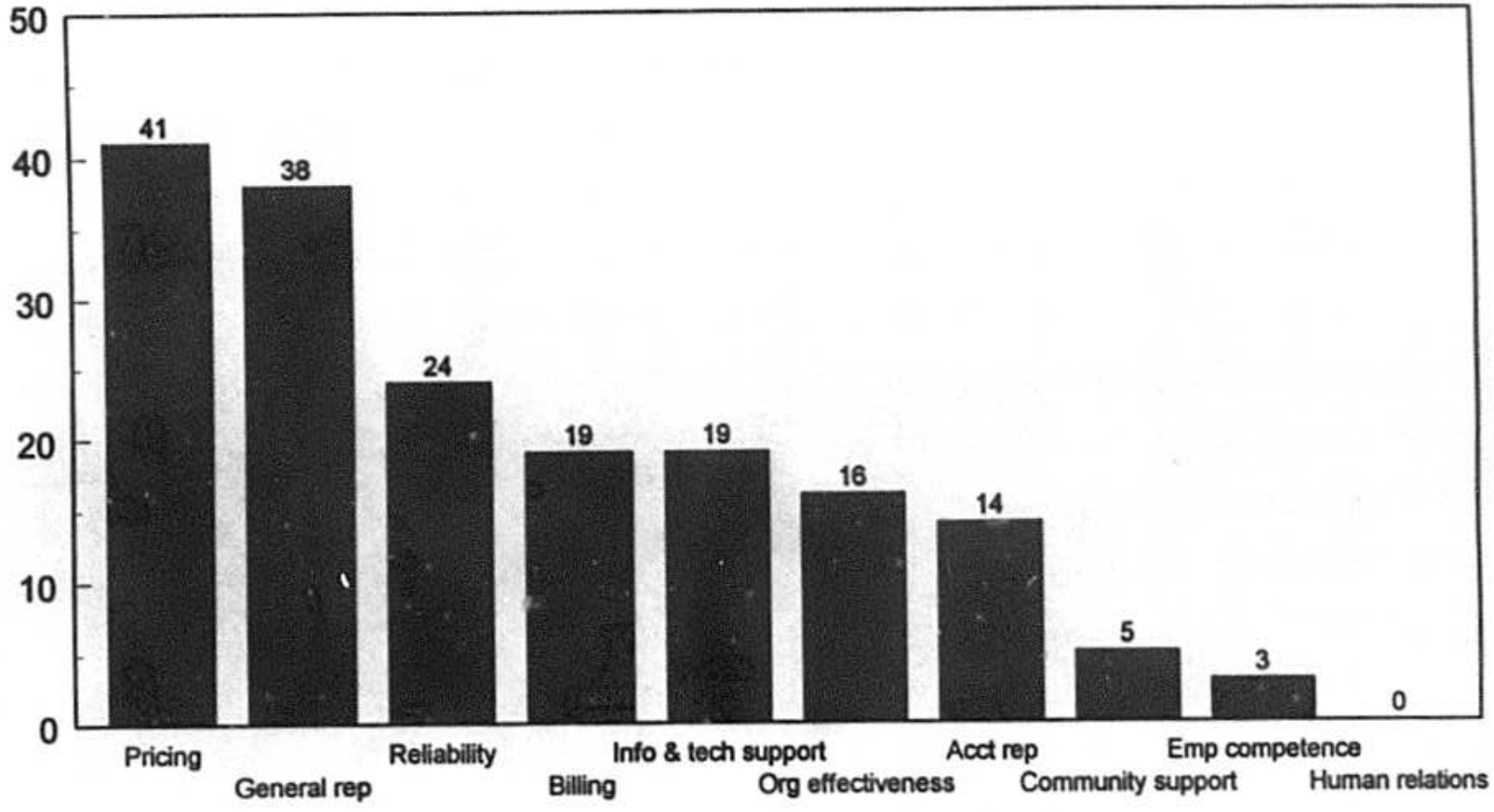
Top 10 critical incidents at Gulf Power: General business customers*



* For each image and service attribute, the chart shows the percent of customers who indicated that there was room for improvement. This means the customer gave the company a low rating (between 0 and 5) on a 0 to 10 scale.

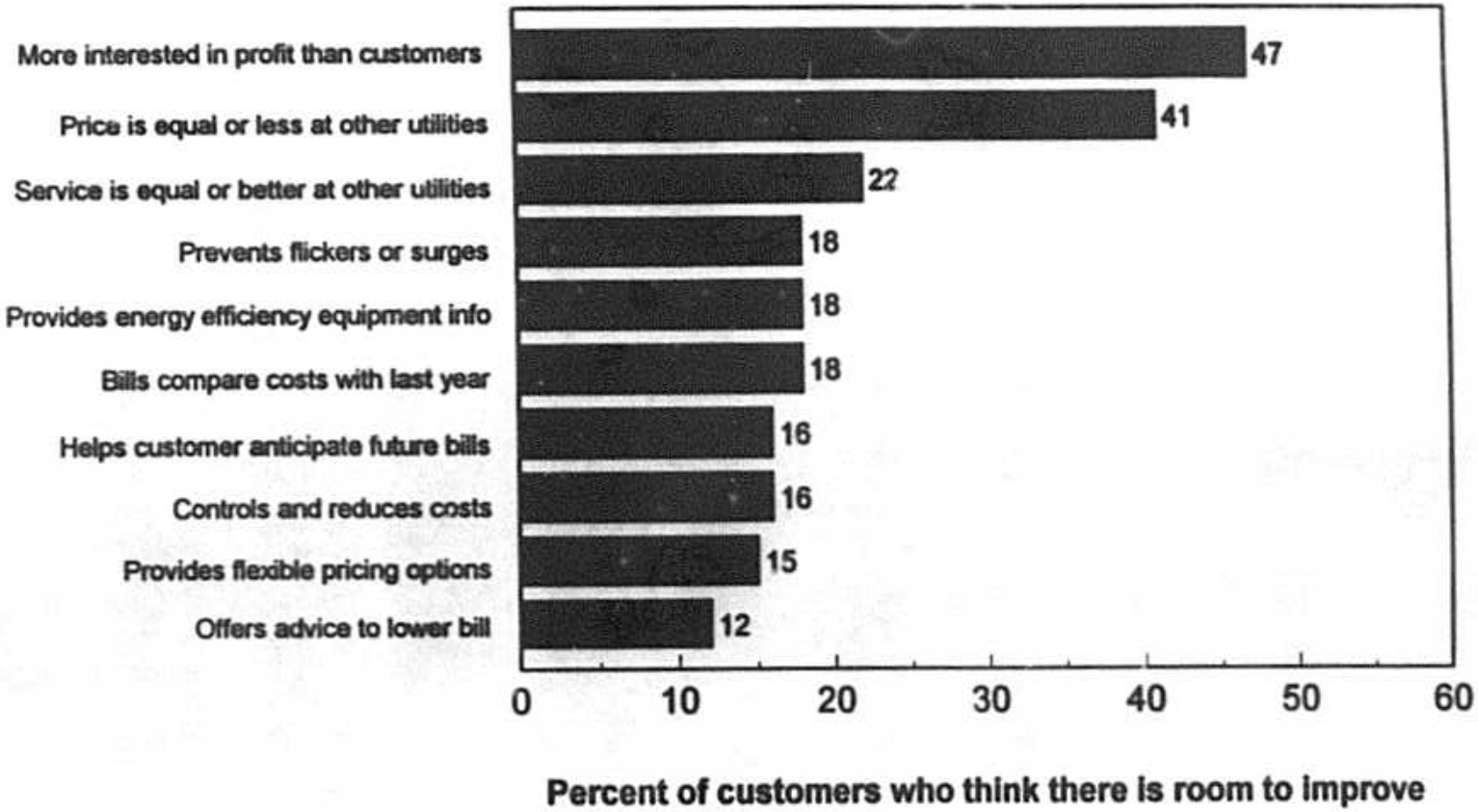
*Problem incidence at Gulf Power: Large business customers**

Percent of customers having problem



* For each image and performance factor, the chart shows the percent of customers who indicated that there was a problem with some aspect of service delivery on that factor. This means the customer gave the company a low rating (between 0 and 5) on a 0 to 10 scale.

Top 10 critical incidents at Gulf Power: Large business customers*



* For each image and service attribute, the chart shows the percent of customers who indicated that there was room for improvement. This means the customer gave the company a low rating (between 0 and 5) on a 0 to 10 scale.

CONFIDENTIAL

ESO-3 Item Number 1 (attachment 1a)
1996 Residential Satisfaction Benchmark Survey

This document consists of pages 1 - 8. Each page in its entirety is confidential, including all tables, graphs and accompanying text.

Florida Public Service Commission
Audit Document/Record Request
GULF POWER COMPANY
Request Number ESQ-3
October 14, 1997

Question 1.

Provide a copy of the 1996 Customer Satisfaction benchmark survey and results. Include a listing of companies included in the benchmark comparison, and a company code description, if companies are not readily identifiable or are number coded.

Attachment 1A: 1996 Residential Benchmark Questionnaire
Attachment 2B: 1996 Commercial and Industrial Questionnaire
Attachment 5: 1996 Customer Satisfaction Results

The entirety of this document is confidential

CONFIDENTIAL

PROPRIETARY

NFO
National Family Opinion

P.O. Box 474 Toledo, OH 43654
Toll-Free Number: 1-800-537-4097
Monday through Friday, 8:00 AM to 11:00 PM
Saturday through Sunday, 10:00 AM to 6:00 PM
Eastern Time

Shaping the Future with Your Opinions

30215-1

Dear NFO Member,

Please give this questionnaire to the person in your household who has the **most** contact with your home's **electric service company** (e.g., pays your monthly electric bill, requests changes in electric service) *(this may be you)*. Thank you!

TO THE PERSON HELPING WITH THIS STUDY:

You are among a special group of individuals across the country selected to participate in a study about the **electric service company** which **currently** provides electric service to your home. My questions today ask about your experience with your electric service company as well as specific questions about your level of satisfaction with the services they provide. You do not need a copy of your electric bill to answer my questions.

I believe you will find my survey very easy to answer. Most of my questions may be answered by simply placing an "X" in the appropriate box or boxes. Where I have asked you to write in your response, please be as specific as possible.

I very much want to include your opinions in our survey and have enclosed a $1 bill as a token of my appreciation. Please complete this survey and return it in the enclosed postage-paid envelope as soon as possible. Thank you very much for your continued help.

Sincerely,

Carol

Carol Adams

1. Overall, how **satisfied** are you with the services provided by your **current** electric comp

Completely Dissatisfied					Neutral					
0	1	2	3	4	5	6	7	8	9	10
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

2. As you know, electric service is provided by different companies throughout the country. Compared to other electric companies, how would you rate the **performance** of **your** electric company on each of the items listed below? Please base your response on anything you may have seen, heard or experienced. **(X ONE Box For EACH Item)**

	My Electric Company is...					
	Much Worse	A Little Worse	About The Same	A Little Better	Much Better	Don't Know
Level of rates (price)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
Overall service quality (outages, power restoration, employee courtesy and knowledge, customer programs, billing, information and technical support)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐

3. For each of the items listed below, please indicate the **amount of improvement**, if any, you feel your electric company **needs** to make. **(X ONE Box For EACH)**

	Needs A Great Deal Of Improvement				Needs Some Improvement						No Improvement Needed At All	Don't Know
	0	1	2	3	4	5	6	7	8	9	10	11
Company is easy to do business with	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees handle inquiries promptly	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
No flickers or surges to make clocks blink on and off	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees always know the answers to customer questions	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Provides information on how to choose energy-efficient appliances	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Easy to pay bill at their office	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
No outages, even in bad weather	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees treat customers with respect	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Restores service quickly after a storm	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees do things right the first time	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Offers good practical advice on how to save money on my electric bill	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees care about helping customers	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees are friendly and courteous	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Company provides a single contact point for all questions and problems	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Bills are easy to read and understand	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Helps me anticipate what next month's bill will be	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Works hard to keep electricity prices low	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Company has a workable system to handle after-hours problems	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Works with me if I am having a problem paying my bill	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Rates are among the lowest in the country	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Bills explain changes from month to month	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Offers fair, reasonable rates	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Helps me protect sensitive electric equipment from damage due to lightning or power surges	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐

4. Listed below are phrases that people may use to describe a company. For each phrase, please indicate how well it **describes** your electric company. **(X ONE Box For EACH)**

	Does Not Describe At All				Neutral						Describes Very Well	Don't Know
	0	1	2	3	4	5	6	7	8	9	10	11
Is honest and truthful with customers	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Is a reputable, well-run company	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Actively supports community projects	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Plans for future energy needs	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Attracts new business and industry to the state	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Shows concern for the environment	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Is an industry leader	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Provides good value to its shareholders; is a good investment	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Controls and reduces costs	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Uses energy efficiently	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Treats you like a valued customer	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Encourages customers to use energy efficiently	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐

5a. For each service listed below, please indicate in Column "A" . . .

- If the service is **offered** by your electric company and your household **participates**
- If the service is **offered** by your electric company and your household **does not participate**
- If the service is **not offered** by your electric company, **OR**
- If you are not sure if the service is offered by your electric company

(X ONE Box For EACH In Column "A")

5b. For each service in which your household does not currently participate, that is, you "X'ed" a box in the shaded area for Column A below, please indicate in Column "B" how interested you would be in participating in the service. **(X ONE Box For Each NOT Currently Participating In Column "B")**

	"A" The Service . . .				"B" How Interested?				
	Is Offered And Participate	Is Offered, But Do Not Participate	Is Not Offered	Not Sure If Offered	Not At All Interested 1	2	3	4	Very Interested 5
A billing plan that averages payments so that you pay about the same amount each month	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Devices to protect sensitive electric equipment from damage due to lightning or electric surges	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Recommendations about how to best light your home inside	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Rebates for buying energy-efficient electric equipment	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
A lower rate for customers who let the power company turn off their air conditioning for short periods	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Sells home security systems	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Maintenance or repair of electric appliances	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Bill payment assistance for families with low incomes	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Customer service phone center available 24 hours per day	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Leasing or renting of outdoor lights	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Insurance against damage to sensitive electric equipment (computers, TV's, stereos, VCR's etc.)	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
A pricing plan that saves you money if you use electricity during off-peak periods such as mornings, evenings or weekends	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Energy conservation information	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Low-interest loans for major appliances, heating, and air conditioning	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Discount for senior citizens with a low income	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Electricity safety tips and information	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Draft payment plans that automatically deduct your electric bill from your bank account	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Free inspections to check home energy efficiency	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Coupons to provide discounts at shops or restaurants in your area	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐
Sells major electric appliances, such as refrigerators, clothes dryers, and water heaters	1☐	2☐	3☐	4☐	1☐	2☐	3☐	4☐	5☐

6. Think about the **overall service** (price, reliability, responsiveness, etc.) that your electric company provides. In providing this service, how much **improvement**, if any, does your electric company need to make? **(X ONE Box)**

Needs A Great Deal Of Improvement					Needs Some Improvement					No Improvement Needed At All
0	1	2	3	4	5	6	7	8	9	10
00☐	01☐	02☐	03☐	04☐	05☐	06☐	07☐	08☐	09☐	10☐

7. In the future, households such as yours may be able to **choose** their electric company in a marketplace. Please indicate how much you **agree** or **disagree** with each of the following **(X ONE Box For EACH)**

	Strongly Disagree 0 1 2 3 4 5 6 7 8 9 10 Strongly Agree	Don't Know 11
In a competitive marketplace, I would recommend my electric company to friends.	00 ☐ 01 ☐ 02 ☐ 03 ☐ 04 ☐ 05 ☐ 06 ☐ 07 ☐ 08 ☐ 09 ☐ 10 ☐	11 ☐
The products and services that my electric company provides are worth what I pay for them.	00 ☐ 01 ☐ 02 ☐ 03 ☐ 04 ☐ 05 ☐ 06 ☐ 07 ☐ 08 ☐ 09 ☐ 10 ☐	11 ☐
If a new electric company offered me a 10% lower rate, I would be very concerned about receiving reliable electric service.	00 ☐ 01 ☐ 02 ☐ 03 ☐ 04 ☐ 05 ☐ 06 ☐ 07 ☐ 08 ☐ 09 ☐ 10 ☐	11 ☐

8. If another electric company offered electric service to your home, how **likely** would you be to **switch** if the new company had the **same** electric rates as your **current** electric company? **(X ONE Box)**

No Chance	Very Slight Chance	Slight Chance	Some Chance	Fair Chance	Even Chance	Good Chance	Likely	Very Likely	Almost Sure	Certain
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

9. If another electric company offered electric service to your home, how **likely** would you be to **switch** for a **5% reduction** in your electric bill? **(X ONE Box)**

No Chance	Very Slight Chance	Slight Chance	Some Chance	Fair Chance	Even Chance	Good Chance	Likely	Very Likely	Almost Sure	Certain
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

10. If another electric company offered electric service to your home, how **likely** would you be to **switch** for a **10% reduction** in your electric bill? **(X ONE Box)**

No Chance	Very Slight Chance	Slight Chance	Some Chance	Fair Chance	Even Chance	Good Chance	Likely	Very Likely	Almost Sure	Certain
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

11. If another electric company offered electric service to your home, how **likely** would you be to **switch** for a **15% reduction** in your electric bill? **(X ONE Box)**

No Chance	Very Slight Chance	Slight Chance	Some Chance	Fair Chance	Even Chance	Good Chance	Likely	Very Likely	Almost Sure	Certain
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

12. Suppose two new electric companies offer to serve your home, and the price and reliability of service varies from company to company. Assume that **your local newspaper** has compared each of the new companies to your current electric company and has summarized their findings in the table below. Please review the information presented and indicate which supplier you would choose: one of the **new** electric companies or your **current** electric company. **(X ONE Box)**

PERFORMANCE FACTORS:	**FIRST New Electric Company**	**SECOND New Electric Company**	**CURRENT Electric Company**
PRICE	15% lower rates	15% higher rates	Same as today
NUMBER OF OUTAGES	5% fewer outages	5% more outages	Same as today
DURATION OF OUTAGES	15% longer outages	5% shorter outages	Same as today
Based on the above factors, which electric company would you choose? **(X ONE Box)** → → →	1 ☐	2 ☐	3 ☐

13. Please review each of the options below and indicate which electric company you would select. (X ONE Box)

PERFORMANCE FACTORS:	FIRST New Electric Company	SECOND New Electric Company	CURRENT Electric Company
PRICE	5% higher rates	5% lower rates	Same as today
NUMBER OF OUTAGES	5% more outages	5% fewer outages	Same as today
DURATION OF OUTAGES	5% longer outages	15% shorter outages	Same as today
Based on the above factors, which electric company would you choose? (X ONE Box) → → →	1 ☐	2 ☐	3 ☐

14. Please review each of the options below and indicate which electric company you would select. (X ONE Box)

PERFORMANCE FACTORS:	FIRST New Electric Company	SECOND New Electric Company	CURRENT Electric Company
PRICE	5% lower rates	5% higher rates	Same as today
NUMBER OF OUTAGES	15% more outages	15% fewer outages	Same as today
DURATION OF OUTAGES	5% longer outages	15% shorter outages	Same as today
Based on the above factors, which electric company would you choose? (X ONE Box) → → →	1 ☐	2 ☐	3 ☐

15. Please review each of the options below and indicate which electric company you would select. (X ONE Box)

PERFORMANCE FACTORS:	FIRST New Electric Company	SECOND New Electric Company	CURRENT Electric Company
PRICE	15% higher rates	15% lower rates	Same as today
NUMBER OF OUTAGES	15% fewer outages	15% more outages	Same as today
DURATION OF OUTAGES	15% longer outages	5% shorter outages	Same as today
Based on the above factors, which electric company would you choose? (X ONE Box) → → →	1 ☐	2 ☐	3 ☐

16. Please review each of the options below and indicate which electric company you would select. (X ONE Box)

PERFORMANCE FACTORS:	FIRST New Electric Company	SECOND New Electric Company	CURRENT Electric Company
PRICE	Same as today	5% lower rates	Same as today
NUMBER OF OUTAGES	15% fewer outages	Same as today	Same as today
DURATION OF OUTAGES	15% shorter outages	Same as today	Same as today
Based on the above factors, which electric company would you choose? (X ONE Box) → → →	1 ☐	2 ☐	3 ☐

17. If you were able to choose among several power companies to get electric service for your home, how much **importance** would you give to quality and price? Please write in below the number of points you would give to quality and the number of points you would give to price when choosing the company that provides electric service to your home. The total of both must equal 100. **(Write In Below)**

	Importance
Quality	_____
Price	_____
	TOTAL = 100

18a. Within the **past six months**, have you **contacted** your electric company with a question or service request? **(X ONE Box)**

1 ☐ Yes → **(Continue)**
2 ☐ No
3 ☐ Not sure _____ → **(Skip To Qu. 19)**

18b. Please indicate the service request you made **most recently. (X ONE Box)**

- 01 ☐ To connect first-time service
- 02 ☐ To relocate service
- 03 ☐ To report outage or restore service
- 04 ☐ To have service turned off
- 05 ☐ To install outdoor lighting
- 06 ☐ To make billing inquiry
- 07 ☐ To request a bill payment extension
- 08 ☐ To request information about uti
- 09 ☐ To request information about electric equipment
- 10 ☐ To request information about conservation
- 11 ☐ To request other information
- 12 ☐ To complain about a service issue
- 13 ☐ Other

18c. Overall, how **satisfied** were you with your electric company in handling your **most recent** request? **(X ONE Box)**

Completely Dissatisfied					Neutral					Completely Satisfied
0	1	2	3	4	5	6	7	8	9	10
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

19. Please indicate the electric company that **currently provides** service to your home. **(X ONE Box)**

- 01 ☐ Alabama Power
- 02 ☐ American Electric Power (AEP)
- 03 ☐ Appalachian Power Company
- 04 ☐ Arkansas Power & Light
- 05 ☐ Baltimore Gas & Electric
- 06 ☐ Central & South West
- 07 ☐ Central Power and Light
- 08 ☐ CINergy
- 09 ☐ City of Chattanooga
- 10 ☐ City of Huntsville
- 11 ☐ City of Johnson
- 12 ☐ City of Memphis
- 13 ☐ City of Nashville
- 14 ☐ City of Knoxville
- 15 ☐ Columbus Southern Power Company
- 16 ☐ Cumberland Electric Member Corp.
- 17 ☐ Duke
- 18 ☐ Entergy
- 19 ☐ Florida Power Corporation
- 20 ☐ Florida Power and Light
- 21 ☐ Georgia Power
- 22 ☐ Gulf Power
- 23 ☐ Gulf States Utilities
- 24 ☐ Indiana Michigan Power Company
- 25 ☐ Kentucky Power Company
- 26 ☐ Kingsport Power Company
- 27 ☐ Louisville Gas & Electric
- 28 ☐ Louisiana Power & Light
- 29 ☐ MEAG
- 30 ☐ Michigan Power Company
- 31 ☐ Middle Tennessee EMC
- 32 ☐ Mississippi Power
- 33 ☐ Mississippi Power & Light
- 34 ☐ New Orleans Public Service
- 35 ☐ Oglethorpe Power
- 36 ☐ Ohio Power Company
- 37 ☐ Public Service Company of Oklahoma
- 38 ☐ Public Service of Colorado
- 39 ☐ Savannah Electric
- 40 ☐ South Carolina Electric & Gas
- 41 ☐ Southwestern Electric Power Company
- 42 ☐ TVA
- 43 ☐ UtiliCorp
- 44 ☐ Virginia Electric Power
- 45 ☐ Volunteer Electric Coop
- 46 ☐ West Texas Utilities Company
- 47 ☐ Wheeling Power Company
- ☐ Other (Specify): _____

20. Do you **own** stock in the company that **currently provides** electric service to your home? **(X ONE Box)**

1 ☐ Yes 2 ☐ No 3 ☐ Not sure

21. How frequently do you **read** the bill inserts, bill stuffers, newsletters, or other pieces of information that come with your monthly electric bill? **(X ONE Box)**

- 1 ☐ Always
- 2 ☐ Almost Always
- 3 ☐ Often
- 4 ☐ Occasionally
- 5 ☐ Seldom
- 6 ☐ Almost Never
- 7 ☐ Never
- 8 ☐ Don't Know

22. Please indicate your age and sex. Age: _____ Sex: 1 ☐ Male 2 ☐ Female

Thank you for your help with this study. Please return your completed questionnaire in the enclosed postage-paid envelope as soon as possible.

CONFIDENTIAL

Staff Work Papers

(2) INTERVIEW SUMMARY:

1. Louis Rouillier is responsible for the Distribution function on a corporate wide basis. The goal is to support each other as a team. Distribution has a series of measurement indices captured in the Distribution Trouble Report (DTR). Gulf's performance for the last 10 years focused on reducing outages through improving these indices. Customer Minutes of Interruption (CMI) is the primary indicator of customer service quality for Gulf.
2. For the last 4 years Gulf has been organized into four major business units, Marketing, Customer Accounting, Power Generation and Power Delivery. This is a major departure from their previous Division geographical organizational structure.
3. Approximately 5 years ago Gulf began reducing small wire (#6) as an attempt to reduce outages. They also recognized that tree trimming needed additional budget dollars and have provided additional dollars to increase the program. Steve Burns, Line Clearing Supervisor, has put together programs to address tree related outages. EPRI testing of cable injection over the last 2-3 years has improved underground results.
4. Approximately 5 years ago Gulf conducted a series of team projects directed at improving Gulf's overall service quality. The teams were directed at reducing outages and improving service quality. The three teams were called the Momentary Outage Reduction Team (MORT), Sustained Outage Reduction Team (SORT) and the Transmission Outage Reduction Team (TORT).
5. MORT identified problems with the number of momentaries experienced by customers due to automatic reclose devices. These devices were set to reclose in approximately 2 seconds, which caused test alarm clocks to be reset. GPC tests, with a large number of clocks on the market, showed that the optimum reclose interval, so that clocks would not reset, was .5 seconds. At that setting approximately .75 of the clocks tested did not reset. The faster reset interval appears to reduce the number of momentaries experienced by GPC customers. Also as a result of the MORT effort, GPC has established a Power Quality group that deals with C/I customers to solve power related commercial and industrial customer problems. Often they recommend what the customer should buy to eliminate power problems on the customer side of the circuit. GPC has also developed a worst feeders program to work on momentaries from the worst feeders and substations.
6. Distribution has more recently completed studies that allowed downsizing of construction crews from 3 to 2 man crews and maintenance crews from 2 to 1 troubleman crews. They took off the apprentice person and added trucks to create smaller crews. This provides Gulf with more productive, smaller crews and requires them to go fewer miles to get to the work. It also allows them greater flexibility in moving the proper number of small crews to other higher work areas when needed. Gulf has also staggered work schedules Gulf was able to downsize between 82-85 Full Time Equivalent employees. Gulf eliminated contractors and began using company employees to replace certain types of work done by contractors.
7. Most downsizing occurred in middle management and supervision, creating a wider span for upper management. Functionalizing allows Gulf to respond more promptly to the customer because resources are not limited by geographical boundaries. Outages have also been smaller and more isolated.
8. For the last 12-18 months GPC has been using duct for underground cable, and has given developers options in placing underground cable, and placing duct with other utilities. GPC has discounted or deferred installation to decrease the cost of duct installation for developers. GPC pulls the cable when the dveloper is ready to serve homes in the development. This reduces number of cable cuts and UG outages in new developments. GPC has also begun identifying underground cables with >3 outages. These UG cables are targeted for replacement, or injection to prolong the life of the cable. GPC has experienced a reduction in UG outages, in pilot locations, due to

(3) CONCLUSIONS:

1. GPC established three TQM improvement teams in the 1994-95 time frame addressing the reduction of outages. The MORT Team looked at momentary outages, the SORT looked at sustained outages and the TORT Team looked at Transmission ans Substation outages. These programs resulted in GPC programs that reduced the number of outages and improved service to customers since 1995.
2. Distribution has a series of measurement indices captured in the Distribution Trouble Report (DTR). Gulf's performance for the last 10 years focused on reducing outages through improving these indices. Customer Minutes of Interruption (CMI) is the primary indicator of customer service quality for Gulf.
3. Approximately 5 years ago Gulf conducted a series of team projects directed at improving Gulf's overall service quality. The teams were directed at reducing outages and improving service quality. The three teams were called the Momentary Outage Reduction Team (MORT), Sustained Outage Reduction Team (SORT) and the Transmission Outage Reduction Team (TORT).
4. MORT identified problems with the number of momentaries experienced by customers due to automatic reclose devices. GPC tests, with a large number of clocks on the market, showed that the optimum reclose interval, so that clocks would not reset, was .5 seconds. Also as a result of the MORT effort, GPC has established a Power Quality group that deals with C/I customers to solve power related commercial and industrial customer problems. Often they recommend what the customer should buy to eliminate power problems on the customer side of the circuit. GPC has supposedly developed a worst feeders program to work on momentaries from the worst feeders and substations.
5. As a result of the TQM teams approximately 5 years ago Gulf began reducing small wire (#6) as an attempt to reduce outages. They also recognized that tree trimming needed additional budget dollars and have provided additional dollars to increase the program. Steve Burns, Line Clearing Supervisor, has put together programs to address tree related outages. EPRI testing of cable injection over the last 2-3 years has helped improve underground outage results.
6. Distribution has more recently completed studies that allowed downsizing of construction crews from 3 to 2 man crews and maintenance crews from 2 to 1 trouble man crews. They took off the apprentice person and added trucks to create smaller crews. This provides Gulf with more productive, smaller crews and requires them to go fewer miles to get to the work. Gulf has also staggered work schedules Gulf was able to downsize between 82-85 Full Time Equivalent employees. Gulf eliminated contractors and began using company employees to replace certain types of work done by contractors.
7. Most downsizing occurred in middle management and supervision, creating a wider span for upper management. Functionalizing allows Gulf to respond more promptly to the customer because resources are not limited by geographical boundaries.
8. For the last 12-18 months GPC has been using duct for underground cable, and has given developers options in placing underground cable, and placing duct with other utilities. This reduces number of cable cuts and UG outages in new developments. GPC has also begun identifying underground cables with >3 outages. These UG cables are targeted for replacement, or injection to prolong the life of the cable.
9. Gulf centralized their control center 3 years ago (1994) from three division operations to one located in Pensacola. Greatest benefits are a reduction in personal needed to perform the function and a company wide standard methodology for distribution dispatch.
10. For damage claims against GPC, anything >$5,000, has attorney involvement, or has personal liability is referred to the Claim Administrator.(Employee Relations and Risk Manager) Agent in the field can cut a check for other claims <$5,000.

(2) INTERVIEW SUMMARY:

1. Approximately 2-2.5 yrs. ago brought tree-trimming under 1 person. Prior to that tree trimming was managed at the division/districts with guidance from corporate. There was not consistency between divisions and districts company-wide. Final call was made by the division or district, not corporate. Responsible for all Transmission, Substation and Distribution Vegetation Management. If any trees are located around a substation, or possibly endanger customers or employees, they are removed. Also is responsible for assisting with any land management special projects related to forestry. An example is the old sod farm was converted to a tree farm, which required Steve's involvement.
2. Measurement used to examine performance include: 1) tree trimming cost/mile 2) 6 yr. average for tree caused outages (DTR) and 3) customer satisfaction survey results.
3. Since re-organization approximately 2-2.5 yrs ago emphasis has been more consistency in the tree trimming effort. In 1996 began to address policies and measurements changes for tree trimming. Costs are better measured now because the costs are based on circuit trimming. A report is issued for each circuit for costs. Wants to be able to re-examine the cost per circuit. Must balance the three to get best results (policies, measurements and costs per circuit).
4. In 1997 re-negotiated the trimming contract. Had routinely re-bid contract and had some of the lowest rates, but the contractor could not maintain quality people. Negotiated with the contractor and gave them additional money and some equipment. The contractor had a benchmark of $2,000 cost/mile by end of 96. Was at $3,000/mile in late 95 and early 96. By late 96 contractor beat the target for 96 and hit $1,700/mile. If contractor did not perform as agreed a penalty (sliding scale to $100,000) would have been assessed for non-performance.
5. The Distribution Line Clearing System (DLCS)(NOMAD data base) is old and outdated. The Tree Reverse Invoice Management System (TRIMS) is not yet on-line. TRIMS will download data to Accounts Payable and automate the whole tree trimming process. It can give a cost by circuit, activity type, and many others. Will bring on by the end of the year.
6. Based on customer calls, engineering concerns or the DTR, a report is generated that ranks circuits by outages and minutes of customer interruption. An engineering assistant will ride the circuits identified and determine what work needs to be done. This information feeds to the budget and Steve submits a budget request based on estimated costs of spot trim work and completing a trim cycle of 3-4 years. Budget dollars are received and appropriated based on the customers, engineering and districts priorities. Maintains a presence throughout the company. Considering cost per tree as a productivity/cost measurement.
7. Quality of work is monitored by the Engineering Rep w/the contractor Supervisor after a circuit is completed. Most common difficulty is having to remind people that there is more to tree trimming than simply cost/mile.

(Attach Extension Sheets as Required)

(Continued on reverse)

Interview Summary *(Continued)*

(3) CONCLUSIONS:

1. Approximately 2-2.5 yrs. ago brought tree-trimming under 1 person. Prior to that tree trimming was managed at the division/district with guidance from corporate. There was no consistency between divisions and districts company-wide. Responsible for all Transmission, Substation and Distribution Vegetation Management.
2. Measurement used to examine performance include: 1) tree trimming cost/mile 2) 6 yr. average for tree caused outages (DTR) and 3) customer satisfaction survey results.
3. Since re-organization approximately 2-2.5 yrs ago emphasis has been more consistency in the tree trimming effort. In 1996 began to address policies and measurements changes for tree trimming. Costs are better measured now because the costs are based on circuit trimming. A report is issued for each circuit for costs. Wants to be able to re-examine the cost per circuit.
4. In 1997 re-negotiated the trimming contract. Had routinely re-bid contract and had some of the lowest rates, but the contractor could not maintain quality people. Negotiated with the contractor and gave them additional money and some equipment. The contractor had a benchmark of $2,000 cost/mile by end of 96. Was at $3,000/mile in late 95 and early 96. By late 96 contractor beat the target for 96 and hit $1,700/mile. If contractor did not perform as agreed a penalty (sliding scale to $100,000) would have been assessed for non-performance.
5. Based on customer calls, engineering concerns or the DTR, a report is generated that ranks circuits by outages and minutes of customer interruption. Budget dollars are received and appropriated based on the customers, engineering and districts priorities. Maintains a presence throughout the company. Considering cost per tree as a productivity/cost measurement.
6. Quality of work is monitored by the Engineering Rep w/the contractor Supervisor after a circuit is completed.

(4) DATA REQUEST(S) GENERATED:

(5) FOLLOW-UP REQUIRED:

Reviewed By: _____

Project Manager

56

1

(2) INTERVIEW SUMMARY:

1. The Pensacola area is different than the other areas because the system is older and has more small wire. Probably half of Pensacola customers are residential. In 1990, Pensacola outage was at about 80 minutes and other areas were at 40 or so. We are concentrating on not locking down the main feeder. Since 1990, have concentrated on sectionalizing main line feeders in Pensacola. This reduces the number of customers affected by an outage. Started an Osmose pole treatment program in 1990-91 and are finishing it up this year (3/4 through). We have commitment to start again in 1998 and finish treating poles w/CCA (Chromium Arsenic). Will do 20,000 poles a yr. in '98 and have all complete w/in 3-4 years (300,000 total). Have a 25% rejection rate for poles. Pensacola still has quite a bit of #3 and #6 copper wire in service. Back in the 50's aluminum was introduced and began taking over for copper. Pensacola has approximately 7500 miles of distribution line in the district. About 300-400 miles of it are #6 copper.
2. TQM teams, in 1994, began moving the company away from wooden pole arms and porcelain insulators near beaches Sustained Outage Reduction Team (SORT). Went to fiberglass arms and polymer insulators near the beaches, to reduce rotting and the need to wash insulators to prevent arching. All new installations and repair problems are going to polymer insulators to relieve salt problems.
3. Was on the Momentary Outage Reduction Team (MORT) in 1993-95. Identified the primary contributors for momentaries as trees and lightning. Had feeder breakers set for reclosing at 2 seconds. Found that if they re-closed faster (20-30 cycles) about 3/4 of the clocks tested would not notice the outage. Substation breakers re-close faster and clocks do not register an outage.
4. Jim Parker is doing a trial this fall for a home operated devise to recognize momentaries.
5. The DTR report was not set up to track customer minutes of interruption. It measures outage until the last customer is restored to service. The operator measures the outage by current on the system. Fluctuations indicate opens and closes. The DCC is responsible for calculating customer minutes of outages. Trouble Call Analysis (TCA) has been running parallel to the manual system of trouble reporting. Have used TCA since June 97.
6. One man crews do the inspections and records are maintained by the E&C Supervisor.
7. The budget committee consists of the 3 Power Delivery Managers, the Distribution Manager and Tom Scarborough from Finance.
8. Venture Out was a cable injection pilot located in Panama City.
9. By end of 97 will pilot ARMS in Pensacola and do the rest of Gulf in 1998.
10. Service employees have two shifts, 7am-2:30pm and 2:00PM-10:30pm. Linemen and Transmission work 4 days/week. Pensacola works the Central Transmission & Substation maintenance. Panama City does substation construction work. PC does line work.
11. The # of trouble tickets/feeder & breaker operations were used to identify worst feeders and put weighting factors on them. Probably still doing the top 20-30 feeders (unsure)? Molino is a sparse feeder that covers a large area which should be improved in 1997.

(Attach Extension Sheets as Required) *(Continued on reverse)*

Interview Summary (Continued)

(3) CONCLUSIONS:

1. The Pensacola area is different than the other areas because the system is older and has more small wire. Probably half of Pensacola customers are residential. In 1990, Pensacola outage was at about 80 minutes and other areas were at 40 or so. We are concentrating on not locking down the main feeder. Since 1990, have concentrated on sectionalizing main line feeders in Pensacola. This reduces the number of customers affected by an outage. Started an Osmose pole treatment program in 1990-91 and are finishing it up this year (3/4 through). We have commitment to start again in 1998 and finish treating poles w/CCA (Chromium Arsenic). Will do 20,000 poles a yr. in '98 and have all complete w/in 3-4 years (300,000 total). Have a 25% rejection rate for poles. Pensacola still has quite a bit of #3 and #6 copper wire in service. Back in the 50's aluminum was introduced and began taking over for copper. Pensacola has approximately 7500 miles of distribution line in the district. About 300-400 miles of it are #6 copper.
2. TQM teams, in 1994, began moving the company away from wooden pole arms and porcelain insulators near beaches Sustained Outage Reduction Team (SORT).
3. Was on the Momentary Outage Reduction Team (MORT) in 1993-95. Identified the primary contributors for momentaries as trees and lightning. Had feeder breakers set for reclosing at 2 seconds. Found that if they re-closed faster (20-30 cycles) about 3/4 of the clocks tested would not notice the outage. Substation breakers re-close faster and clocks do not register an outage.
4. Jim Parker is doing a trial this fall for a home operated devise to recognize momentaries.
5. One man crews do the inspections and records are maintained by the E&C Supervisor.
6. Service employees have two shifts, 7am-2:30pm and 2:00PM-10:30pm. Linemen and Transmission work 4 days/week. Pensacola works the Central Transmission & Substation maintenance. Panama City does substation construction work. PC does line work.
7. The # of trouble tickets/feeder & breaker operations were used to identify worst feeders and put weighting factors on them. Probably still doing the top 20-30 feeders (unsure)? Molino is a sparse feeder that covers a large area which should be improved in 1997.

(4) DATA REQUEST(S) GENERATED:

(5) FOLLOW-UP REQUIRED:

Reviewed By: _____

Project Manager

(2) INTERVIEW SUMMARY:

1. Responsible for the support of TCMS, ARMS, JETS, GAMMA, EMS and metering programs, re-design of mapping system, and PC version of system maps on the Internet. The Metering Engineer attends Southern system meetings and other seminars, etc. related to metering improvements. Metering in Fort Walton & Panama City report to the Power Delivery Manager in those areas. Many metering studies from GPC and Southern Company have been conducted. Currently reviewing the metering organization. Now it is a mixed bag, and some streamlining will probably occur.

2. The Power Quality group was started in late 1989, as the company was struggling with whether or not to get into power quality. The Power Quality Group is more directed to providing good service to the I/C customers. The group often recommends what the customer should use to keep power problems from recurring. They work with the customer in solving behind the meter problems affecting power quality. They act as a customer advocate in determining the causes and solutions for PQ problems and getting Gulf to assist with needed system changes that may improve the quality of service to the I/C customer.

3. in 1989 Jim watched trouble tickets being sorted manually. GPC began visiting other companies and what they were doing with automation of trouble tickets. In 1993 Southern began a system - wide team to address trouble reporting mechanization. Alabama and Gulf were the test sights for the Southern system. The 2nd qtr. 95 Gulf began using the new Trouble Call Management System (TCMS). Tickets come in from the customer information system and the Integrated Voice Recording (IVR) unit. The IVR was originally used as an overflow for representatives in the customer call center. The IVR emulates a terminal, and based on input from the customer, it now identifies the customer, type of trouble and generates a repair ticket from the Customer Accounting system (CICS/GOLS). In 1995, developed a way to have IVR call the customer back, after ticket was worked, to verify lights back on. Did not have this feature during the two hurricanes of 1995. From the Transformer Load System the TLN was downloaded to TCMS and cross-referenced with the customer account number to identify customers affected by outages. Operators are not currently using the system to the fullest because all areas are not energized at this time. The system will locate the problem in TCMS, but will not predict the outage type. By the end of 1997 operators should have full utilization of the system. For measuring outages GPC will not be moving from the operator manual entry yet (the system will eventually calculate the outage length, number of customers affected, location and cause type of outage. Currently use field estimate, actual check and feeder count information to extrapolate number of customers affected by an outage. The system will also allow measurement to the meter when fully implemented. In December 1997 and June 1998 two release versions will provide replacement, or feed from DTR for time measurement. This should provide better accuracy of the number of customers and minutes of outage. DTR also has historical data. A system interface may be developed between both systems, the systems may remain separate or the DTR may be discarded. In 1995, had 17,000 mistakes in system location data. Have worked that down to 2,00-3,000 now. This too will be corrected prior to final implementation.

4. MORT in 1992, started in 1991, identified lightning, animals and trees as major causes of momentaries. GPC began a program to improve grounding and bonding on transformer banks. Ongoing program to measure grounding called an ohmer. OCRs and at the substation changed the reclose time to .5 seconds or less. Placed animal guards on transformers where an animal outage had previously occurred.

5. ARMS will allow orders to the truck and provide mapping to assist in completing the work. GPC is emphasizing new service and other orders, not repair work, initially. Repair orders later.

Interview Summary (Continued)

(3) CONCLUSIONS:

1. Responsible for the support of TCMS, ARMS, JETS, GAMMA, EMS and metering programs, redesign of mapping system, and PC version of system maps on the Internet. Metering in Fort Walton & Panama City report to the Power Delivery Manager in those areas. Currently reviewing the metering organization. now it is a mixed bag, and some streamlining will probably occur.
2. The Power Quality group was started in late 1989. They act as a customer advocate in determining the causes and solutions for PQ problems and getting Gulf to assist with needed system changes that may improve the quality of service to the I/C customer.
3. ~~They act as a customer advocate in determining the causes and solutions for PQ problems and getting Gulf to assist with needed system changes that may improve the quality of service to the I/C customer.~~ The IVR was originally used as an interface for representatives in the customer call center. The IVR emulates a terminal, and based on input from the customer, it now identifies the customer, type of trouble and generates a repair ticket from the Customer Accounting system (CICS/GOLS). In 1995, developed a way to have IVR call the customer back, after ticket was worked, to verify lights back on. Operators are not currently using the system to the fullest because all areas are not energized at this time. The system will locate the problem in TCMS, but will not predict the outage type. By the end of 1997 operators should have full utilization of the system. For measuring outages GPC will not be moving from the operator manual entry yet (the system will eventually calculate the outage length, number of customers affected, location and cause type of outage. Currently use field estimate, actual check and feeder count information to extrapolate number of customers affected by an outage. The system will also allow measurement to the meter when fully implemented. In December 1997 and June 1998 two release versions will provide replacement, or feed from DTR for time measurement. This should provide better accuracy of the number of customers and minutes of outage.
4. MORT in 1992, started in 1991, identified lightning, animals and trees as major causes of momentaries.
5. ARMS will allow orders to the truck and provide mapping to assist in completing the work. GPC is emphasizing new service and other orders, not repair work, initially. Repair orders later.

(Attach Extension Sheets as Required) *(Continued on reverse)*

(4) DATA REQUEST(S) GENERATED:

(5) FOLLOW-UP REQUIRED:

Reviewed By: _____
Project Manager

CONFIDENTIAL

ESQ-3 Item Number 1 (attachment 2b)
1996 Commercial and Industrial Satisfaction Benchmark Survey

This document consists of pages 1 - 6. Each page in its entirety is confidential, including all tables, graphs and accompanying text.

Pages 1-6 are Confidential

ESQ-1 Item 1 Attachment 2b

1996 COMMERCIAL AND INDUSTRIAL SATISFACTION BENCHMARK SURVEY
[DRAFT - 8/23/96]

1. What is the name of the electric company that provides service to your business at [insert location]?

_____

2. Overall, how satisfied are you with the services provided by your current electric company? (Circle one number)

Completely dissatisfied										Completely satisfied
0	1	2	3	4	5	6	7	8	9	10

3. For each of the items listed below, please indicate the ***amount of improvement***, if any, you feel your electric company needs to make. (Circle one number for each item)

	Needs a great deal of improvement					Needs some improvement				No improvement needed at all
Employee competence										
Employees always know the answers to our questions	0	1	2	3	4	5	6	7	8	9	10
Employees handle inquiries promptly	0	1	2	3	4	5	6	7	8	9	10
Employees respond quickly to service requests	0	1	2	3	4	5	6	7	8	9	10
Work crews show up when you need them [for C&I]	0	1	2	3	4	5	6	7	8	9	10
Work crews come when they say they will [for C&I]	0	1	2	3	4	5	6	7	8	9	10
Work crews do things right the first time [for C&I]	0	1	2	3	4	5	6	7	8	9	10
Human relations skills of employees										
Employees care about helping customers	0	1	2	3	4	5	6	7	8	9	10
Employees treat customers with respect	0	1	2	3	4	5	6	7	8	9	10
Employees are friendly and courteous	0	1	2	3	4	5	6	7	8	9	10
Organizational effectiveness										
Company has a workable system to handle after-hours problems	0	1	2	3	4	5	6	7	8	9	10
Company provides a single contact point for all questions and problems [for key accounts]	0	1	2	3	4	5	6	7	8	9	10

Is easy to get through to someone who can help [for C&I]	0	1	2	3	4	5	6	7	8	9	10
Company is easy to do business with	0	1	2	3	4	5	6	7	8	9	10
Is flexible enough to meet business customers' individual needs and preferences	0	1	2	3	4	5	6	7	8	9	10
<u>Information and technical support</u>											
Always willing to come out and check things when we have a problem	0	1	2	3	4	5	6	7	8	9	10
Offers good practical advice on how to save money on my electric bill	0	1	2	3	4	5	6	7	8	9	10
Informs us about programs they offer	0	1	2	3	4	5	6	7	8	9	10
Provides information on how to choose energy-efficient equipment	0	1	2	3	4	5	6	7	8	9	10
<u>Billing and financial</u>											
Offers fair, reasonable rates	0	1	2	3	4	5	6	7	8	9	10
Provides flexible pricing options that are tailored to our business operations	0	1	2	3	4	5	6	7	8	9	10
Bills are easy to read and understand	0	1	2	3	4	5	6	7	8	9	10
Bills clearly compare this year's costs to last year's	0	1	2	3	4	5	6	7	8	9	10
Works with us to resolve billing disputes and payment problems	0	1	2	3	4	5	6	7	8	9	10
Helps us anticipate what future bills will be	0	1	2	3	4	5	6	7	8	9	10
<u>Reliability and power quality</u>											
Restores service quickly after an outage	0	1	2	3	4	5	6	7	8	9	10
Prevents flickers or surges that interfere with equipment operation	0	1	2	3	4	5	6	7	8	9	10
Minimizes outages, even in bad weather	0	1	2	3	4	5	6	7	8	9	10

4. Do you have an account representative from your power company that calls or visits with you? (Circle one number)

Yes	1	
No	2	**(Skip to question 6)**
Not sure	3	**(Skip to question 6)**

5. How would you rate the account rep's performance in the following areas? (Circle one number for each statement)

	Needs a great deal of improvement					Needs some improvement					No improvement needed at all
Knows and understands your business	0	1	2	3	4	5	6	7	8	9	10
Is easy to reach	0	1	2	3	4	5	6	7	8	9	10
Helps us solve problems	0	1	2	3	4	5	6	7	8	9	10
Treats us like a valued business customer	0	1	2	3	4	5	6	7	8	9	10

6. Think about all of the services provided to your business by your electric company. In providing those services, how much improvement, if any, does your electric company need to make. (Circle one number)

Needs a great deal of improvement					Needs some improvement					No improvement needed at all
0	1	2	3	4	5	6	7	8	9	10

7. Here are some phrases that people sometimes use in describing an electric company. For each phrase, please indicate how well it describes the electric company that serves your business. (Circle one number for each item)

	Does not describe at all										Describes very well
Controls and reduces costs	0	1	2	3	4	5	6	7	8	9	10
Actively supports the local community	0	1	2	3	4	5	6	7	8	9	10
Attracts new business to the state	0	1	2	3	4	5	6	7	8	9	10
Shows concern for the environment	0	1	2	3	4	5	6	7	8	9	10
Is honest and truthful with customers	0	1	2	3	4	5	6	7	8	9	10
Provides good value to its shareholders	0	1	2	3	4	5	6	7	8	9	10
Offers products and services that are worth what we pay for them	0	1	2	3	4	5	6	7	8	9	10
Is more interested in making money than in satisfying customers	0	1	2	3	4	5	6	7	8	9	10

8. In the future, companies such as yours may be able to choose their electricity supplier in a competitive marketplace. Please indicate how much you agree or disagree with each of the following statements. (Circle one number for each statement)

	Strongly disagree										Strongly agree
In a competitive marketplace, I would strongly recommend our electric company to other businesses	0	1	2	3	4	5	6	7	8	9	10
If a new electric company offered our business a 10% lower rate, I would be concerned about receiving reliable electric service	0	1	2	3	4	5	6	7	8	9	10
Upper management at our electric company is looking forward to competition in the electric utility industry	0	1	2	3	4	5	6	7	8	9	10
We benefit from special services or billing options that might not be available from a new electric company	0	1	2	3	4	5	6	7	8	9	10

9. If another electric company offered electric service to your business, how likely would you be to switch if the new company had the same electric rates as your current electric company? (Circle one number)

Would definitely not switch	Very slight chance	Slight chance	Some chance	Fair chance	Even chance	Good chance	Likely	Very likely	Almost sure	Would definitely switch
0	1	2	3	4	5	6	7	8	9	10

10. If another electric company offered electric service to your business, how likely would you be to switch for a 5% reduction in your electric bill? (Circle one number)

Would definitely not switch	Very slight chance	Slight chance	Some chance	Fair chance	Even chance	Good chance	Likely	Very likely	Almost sure	Would definitely switch
0	1	2	3	4	5	6	7	8	9	10

11. If another electric company offered electric service to your business, how likely would you be to switch for a 10% reduction in your electric bill? (Circle one number)

Would definitely not switch	Very slight chance	Slight chance	Some chance	Fair chance	Even chance	Good chance	Likely	Very likely	Almost sure	Would definitely switch
0	1	2	3	4	5	6	7	8	9	10

12. If another electric company offered electric service to your business, how likely would you be to switch for a 15% reduction in your electric bill? (Circle one number)

Would definitely not switch	Very slight chance	Slight chance	Some chance	Fair chance	Even chance	Good chance	Likely	Very likely	Almost sure	Would definitely switch
0	1	2	3	4	5	6	7	8	9	10

13. As you know, different companies provide electricity in different parts of the country. Compared to other electric companies, how would you rate the price your business currently pays for electricity? (Circle one number)

Much lower 1
A little lower 2
About the same 3
A little higher 4
Much higher 5

14. Think about the overall quality of service you receive from your current electric company -- things like the number of outages, the courtesy and competence of employees, the information and technical support that your electric company provides. Compared to other electric companies, how would you rate the service quality that your business currently receives? (Circle one number)

Much worse 1
A little worse 2
About the same 3
A little better 4
Much better 5

15. If you were able to choose among several power companies to get electricity for your business, you might base your decision partly on price and partly on service quality? Please write the number of points you would give to price and the number of points you would give to service quality when choosing the company that provides electricity to your business. The total of both must equal 100.

Price ..... _____

Service quality ..... _____

Total 100

16. If your business had the opportunity to choose another electric supplier, what role would you play in the decision? (Circle one number)

Would make the final choice 1
Would provide major input 2
Would provide minor input 3
Would not be involved 4
Not sure 5

17. Within the past six months, have you contacted your electric company for a question or service request? (Circle one number)

Yes	1	
No	2	**(Skip to question 19)**
Not sure	3	**(Skip to question 19)**

18. Overall, how satisfied were you with the way your electric company handled your most recent request? (Circle one number)

Completely dissatisfied										**Completely satisfied**
0	1	2	3	4	5	6	7	8	9	10

19. Thanks for your help.

CONFIDENTIAL

ESO-3 Item Number 2 (attachment 1b)
1997 Commercial and Industrial Satisfaction Benchmark Survey

This document consists of pages 1 - 6. Each page in its entirety is confidential, including all tables, graphs and accompanying text.

Pages 1-6 are Confidential

ESQ-1
Item 2
Attachment 1b

1997 COMMERCIAL AND INDUSTRIAL SATISFACTION BENCHMARK SURVEY
[DRAFT - 8/28/97]

1. What is the name of the electric company that provides service to your business at [insert location]?

_____

2. Overall, how satisfied are you with the services provided by your current electric company? (Circle one number)

Completely dissatisfied										Completely satisfied
0	1	2	3	4	5	6	7	8	9	10

3. For each of the items listed below, please indicate the ***amount of improvement***, if any, you feel your electric company needs to make. (Circle one number for each item)

	Needs a great deal of improvement					Needs some improvement				No improvement needed at all	
<u>Employee competence</u>											
Employees always know the answers to our questions	0	1	2	3	4	5	6	7	8	9	10
Employees handle inquiries promptly	0	1	2	3	4	5	6	7	8	9	10
Employees respond quickly to service requests	0	1	2	3	4	5	6	7	8	9	10
Work crews show up when you need them [for C&I]	0	1	2	3	4	5	6	7	8	9	10
Work crews come when they say they will [for C&I]	0	1	2	3	4	5	6	7	8	9	10
Work crews do things right the first time [for C&I]	0	1	2	3	4	5	6	7	8	9	10
<u>Human relations skills of employees</u>											
Employees care about helping customers	0	1	2	3	4	5	6	7	8	9	10
Employees treat customers with respect	0	1	2	3	4	5	6	7	8	9	10
Employees are friendly and courteous	0	1	2	3	4	5	6	7	8	9	10
<u>Organizational effectiveness</u>											
Company has a workable system to handle after-hours problems	0	1	2	3	4	5	6	7	8	9	10
Company provides a single contact point for all questions and problems [for key accounts]	0	1	2	3	4	5	6	7	8	9	10

Is easy to get through to someone who can help [for C&I]	0	1	2	3	4	5	6	7	8	9	10
Company is easy to do business with	0	1	2	3	4	5	6	7	8	9	10
Is flexible enough to meet business customers' individual needs and preferences	0	1	2	3	4	5	6	7	8	9	10
<u>Information and technical support</u>											
Always willing to come out and check things when we have a problem	0	1	2	3	4	5	6	7	8	9	10
Offers good practical advice on how to save money on my electric bill	0	1	2	3	4	5	6	7	8	9	10
Informs us about programs they offer	0	1	2	3	4	5	6	7	8	9	10
Provides information on how to choose energy-efficient equipment	0	1	2	3	4	5	6	7	8	9	10
<u>Billing and financial</u>											
Offers fair, reasonable rates	0	1	2	3	4	5	6	7	8	9	10
Provides flexible pricing options that are tailored to our business operations	0	1	2	3	4	5	6	7	8	9	10
Bills are easy to read and understand	0	1	2	3	4	5	6	7	8	9	10
Bills clearly compare this year's costs to last year's	0	1	2	3	4	5	6	7	8	9	10
Works with us to resolve billing disputes and payment problems	0	1	2	3	4	5	6	7	8	9	10
Helps us anticipate what future bills will be	0	1	2	3	4	5	6	7	8	9	10
<u>Reliability and power quality</u>											
Restores service quickly after an outage	0	1	2	3	4	5	6	7	8	9	10
Prevents flickers or surges that interfere with equipment operation	0	1	2	3	4	5	6	7	8	9	10
Minimizes outages, even in bad weather	0	1	2	3	4	5	6	7	8	9	10

4. Do you have an account representative from your power company that calls or visits with you? (Circle one number)

Yes	1	
No	2	**(Skip to question 6)**
Not sure	3	**(Skip to question 6)**

5. How would you rate the account rep's performance in the following areas? (Circle one number for each statement)

	Needs a great deal of improvement				Needs some improvement						No improvement needed at all
Knows and understands your business	0	1	2	3	4	5	6	7	8	9	10
Is easy to reach	0	1	2	3	4	5	6	7	8	9	10
Helps us solve problems	0	1	2	3	4	5	6	7	8	9	10
Treats us like a valued business customer	0	1	2	3	4	5	6	7	8	9	10

6. Think about all of the services provided to your business by your electric company. In providing those services, how much improvement, if any, does your electric company need to make. (Circle one number)

Needs a great deal of improvement					Needs some improvement					No improvement needed at all
0	1	2	3	4	5	6	7	8	9	10

7. Here are some phrases that people sometimes use in describing an electric company. For each phrase, please indicate how well it describes the electric company that serves your business. (Circle one number for each item)

	Does not describe at all										Describes very well
Controls and reduces costs	0	1	2	3	4	5	6	7	8	9	10
Actively supports the local community	0	1	2	3	4	5	6	7	8	9	10
Attracts new business to the state	0	1	2	3	4	5	6	7	8	9	10
Shows concern for the environment	0	1	2	3	4	5	6	7	8	9	10
Is honest and truthful with customers	0	1	2	3	4	5	6	7	8	9	10
Provides good value to its shareholders	0	1	2	3	4	5	6	7	8	9	10
Offers products and services that are worth what we pay for them	0	1	2	3	4	5	6	7	8	9	10

8. In the future, companies such as yours may be able to choose their electricity supplier in a competitive marketplace. Please indicate how much you agree or disagree with each of the following statements. (Circle one number for each statement)

	Strongly disagree										Strongly agree
In a competitive marketplace, I would strongly recommend our electric company to other businesses	0	1	2	3	4	5	6	7	8	9	10
If a new electric company offered our business a 10% lower rate, I would be concerned about receiving reliable electric service	0	1	2	3	4	5	6	7	8	9	10
Upper management at our electric company is looking forward to competition in the electric utility industry	0	1	2	3	4	5	6	7	8	9	10
We benefit from special services that might not be available from a new electric company	0	1	2	3	4	5	6	7	8	9	10

9. If another electric company offered electric service to your business, how likely would you be to switch if the new company had the same electric rates as your current electric company? (Circle one number)

Would definitely not switch	Very slight chance	Slight chance	Some chance	Fair chance	Even chance	Good chance	Likely	Very likely	Almost sure	Would definitely switch
0	1	2	3	4	5	6	7	8	9	10

10. If another electric company offered electric service to your business, how likely would you be to switch for a 5% reduction in your electric bill? (Circle one number)

Would definitely not switch	Very slight chance	Slight chance	Some chance	Fair chance	Even chance	Good chance	Likely	Very likely	Almost sure	Would definitely switch
0	1	2	3	4	5	6	7	8	9	10

11. If another electric company offered electric service to your business, how likely would you be to switch for a 10% reduction in your electric bill? (Circle one number)

Would definitely not switch	Very slight chance	Slight chance	Some chance	Fair chance	Even chance	Good chance	Likely	Very likely	Almost sure	Would definitely switch
0	1	2	3	4	5	6	7	8	9	10

12. Think about the relationship you have with your currently electric company. To what extent would the "depth of relationship with your current provider" be a barrier for switching to a new electric company? Please indicate your opinion on a "0" to "10" scale, where "0" means not at all likely to be a barrier" and "10" means " highly likely to be a barrier".

Not at all likely to be a barrier										**Highly likely to be a barrier**
0	1	2	3	4	5	6	7	8	9	10

13. As you know, different companies provide electricity in different parts of the country. Compared to other electric companies, how would you rate the price your business currently pays for electricity? (Circle one number)

Much lower	1
A little lower	2
About the same	3
A little higher	4
Much higher	5

14. Think about the overall quality of service you receive from your current electric company -- things like the number of outages, the courtesy and competence of employees, the information and technical support that your electric company provides. Compared to other electric companies, how would you rate the service quality that your business currently receives? (Circle one number)

Much worse	1
A little worse	2
About the same	3
A little better	4
Much better	5

15. If you were able to choose among several power companies to get electricity for your business, you might base your decision partly on price and partly on service quality? Please write the number of points you would give to price and the number of points you would give to service quality when choosing the company that provides electricity to your business. The total of both must equal 100.

Price	.....	_____
Service quality	.....	_____
Total	.....	100

16. If your business had the opportunity to choose another electric supplier, what role would you play in the decision? (Circle one number)

Would make the final choice	1
Would provide major input	2
Would provide minor input	3
Would not be involved	4
Not sure	5

17. Within the past six months, have you contacted your electric company for a question or service request? (Circle one number)

Yes	1	
No	2	**(Skip to question 19)**
Not sure	3	**(Skip to question 19)**

18. Overall, how satisfied were you with the way your electric company handled your most recent request? (Circle one number)

Completely dissatisfied										**Completely satisfied**
0	1	2	3	4	5	6	7	8	9	10

19. How many different sites or locations does your company operate in the state of [insert state where company is located]? (If the respondent asks what we mean by "locations", here is the answer. By "location", we mean a building or group of buildings in close proximity to each other. Thus, a business campus or an office or a manufacturing plant on the same site would be one location.)

    Number of locations: _____

20. And by the year 2000, about how many locations will your company operate in the state of [insert state where company is located]? (If the respondent asks what we mean by "locations", here is the answer. By "location", we mean a building or group of buildings in close proximity to each other. Thus, a business campus or an office or a manufacturing plant on the same site would be one location.)

    Number of locations: _____

21. Think about your standard operating hours on Tuesdays. Considering your location at [insert address], how many hours does this location operate between 7:00 am and 7:00 pm? (This must not exceed 12 hours. Please record "0" whenever the answer is none.")

    Number of hours: _____

22. And how many hours on Tuesdays does this location operate between 7:00 pm and 7:00 am? (This must not exceed 12 hours. Please record "0" whenever the answer is none.")

    Number of hours: _____

23. Thanks for your help.

CONFIDENTIAL

ESQ-3 Item Number 2 (attachment 2a)
1997 Residential Satisfaction Benchmark Survey

This document consists of pages 1 - 8. Each page in its entirety is confidential, including all tables, graphs and accompanying text.

The entirety of this document is CONFIDENTIAL

1997

CONFIDENTIAL

PROPRIETARY

NFO
National Family Opinion

P.O. Box 474 Toledo, OH 43654
Toll-Free Number: 1-800-537-4097
Mon - Fri, 8:00 AM to 11:00 PM EST
Sat & Sun, 10:00 AM to 6:00 PM EST
e-mail address: carol@nfoi.com

Shaping the Future with Your Opinions

33631-4

Dear NFO Member,

Please give this questionnaire to the person in your household who has the **most** contact with your home's **electric service company** (e.g., pays your monthly electric bill, requests changes in electric service) *(this may be you)*. Thank you!

TO THE PERSON HELPING WITH THIS STUDY:

You are among a special group of individuals across the country selected to participate in a study about the **electric service company** which **currently** provides electric service to your home. My questions today ask about your experience with your electric service company as well as your satisfaction with the services they provide. You **do not** need a copy of your electric bill to answer my questions.

I believe you will find my survey very easy to answer. Most of my questions may be answered by simply by placing an "X" in the appropriate box or boxes. Where I have asked you to write in your response, be as specific as possible.

I very much want to include your opinions in our survey and have enclosed a $1 bill as a token of my appreciation. Please complete this survey and return it in the enclosed postage-paid envelope as soon as possible. Thank you very much for your continued help.

Sincerely,

Carol

Carol Adams

1. What is the name of the electric company that provides service to your home? **(X ONE Box)**

01 ☐ Alabama Power Company
02 ☐ Albany Water Gas & Light
03 ☐ American Electric Power (AEP)
04 ☐ ~~Baldwin County EMC~~
05 ☐ Boston Edison
06 ☐ Central Alabama EC
07 ☐ Choctawhatchee EC
08 ☐ Cincinnati Gas & Electric Company
09 ☐ Cinergy
10 ☐ City of Alexander
11 ☐ City of College Park
12 ☐ City of Covington
13 ☐ City of Dothan
14 ☐ City of East Point
15 ☐ City of Fairhope
16 ☐ City of Foley (Riviera Utility)
17 ☐ City of Griffin
18 ☐ City of Lafayette
19 ☐ City of LaGrange
20 ☐ City of Lanett
21 ☐ City of Lawrenceville
22 ☐ City of Luverne
23 ☐ City of Marietta
24 ☐ City of Moultrie
25 ☐ City of Pelika
26 ☐ City of Piedmont
27 ☐ City of Syacauga
28 ☐ City of Thomasville
29 ☐ City of Tuskegee
30 ☐ Clarke-Washington EMC
31 ☐ Cobb EMC
32 ☐ Coosa Valley EC
33 ☐ Covington EC
34 ☐ Dixie EC
35 ☐ Duke
36 ☐ Enron
37 ☐ Entergy
38 ☐ Flint EMC
39 ☐ Florida Power & Light
40 ☐ Florida Power Corporation
41 ☐ Georgia Power Company
42 ☐ Grey Stone Power Corp
43 ☐ Gulf Power Company
44 ☐ Houston Lighting & Power
45 ☐ Jackson EMC
46 ☐ Louisville Gas & Electric
47 ☐ Mississippi Power Company
48 ☐ Pacific Gas & Electric
49 ☐ Pacific Power
50 ☐ PacifiCorp
51 ☐ Pea River EC
52 ☐ Portland General Electric
53 ☐ Public Service of Indiana (PSI)
54 ☐ San Diego Gas & Electric
55 ☐ Sawnee EMC
56 ☐ Savannah Electric
57 ☐ South Carolina Electric & Power
58 ☐ Southern California Edison Company
59 ☐ Southern Pine EC
60 ☐ Union Heat Light & Power
61 ☐ Utah Power & Light
62 ☐ UtiliCorp
63 ☐ Walton EMC
64 ☐ West Florida EC
65 ☐ Wiregrass EC
66 ☐ Other (Specify): _____

2. Overall, how **satisfied** are you with the services provided by your **current** electric company? **(X ONE Box)**

Completely Dissatisfied					Neutral					Completely Satisfied
0	1	2	3	4	5	6	7	8	9	10
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

3. For each of the items listed below, please indicate the **amount of improvement**, if any, you feel your electric company **needs** to make. **(X ONE Box For EACH)**

	Needs A Great Deal Of Improvement				Needs Some Improvement						No Improvement Needed At All	Don't Know
	0	1	2	3	4	5	6	7	8	9	10	11
Company is easy to do business with	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees handle inquiries promptly	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
No flickers or surges to make clocks blink on and off	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees always know the answers to customer questions	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Provides information on how to choose energy-efficient appliances	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Easy to pay bill at their office	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
No outages, even in bad weather	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees treat customers with respect	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Restores service quickly after a storm	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees do things right the first time	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Offers good practical advice on how to save money on my electric bill	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees care about helping customers	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Employees are friendly and courteous	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Company provides a single contact point for all questions and problems	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐
Bills are easy to read and understand	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐

Question 3 Continued On Next Page

Question 3 Continued

	Needs A Great Deal Of Improvement 0	1	2	3	4	Needs Some Improvement 5	6	7	8	9	No Improvement Needed At All 10	Don't Know 11
Helps me anticipate what next month's bill will be	00	01	02	03	04	05	06	07	08	09	10	11
Works hard to keep electricity prices low	00	01	02	03	04	05	06	07	08	09	10	11
Company has a workable system to handle after-hours problems	00	01	02	03	04	05	06	07	08	09	10	11
Works with me if I am having a problem paying my bill	00	01	02	03	04	05	06	07	08	09	10	11
Rates are among the lowest in the country	00	01	02	03	04	05	06	07	08	09	10	11
Bills explain changes from month to month	00	01	02	03	04	05	06	07	08	09	10	11
Offers fair, reasonable rates	00	01	02	03	04	05	06	07	08	09	10	11
Helps me protect sensitive electric equipment from damage due to lightning or power surges	00	01	02	03	04	05	06	07	08	09	10	11
Provides products and services that are worth what I pay for them	00	01	02	03	04	05	06	07	08	09	10	11

4. Listed below are phrases that people may use to describe a company. For each phrase, please indicate how well it **describes** your electric company. **(X ONE Box For EACH)**

	Does Not Describe At All 0	1	2	3	4	Neutral 5	6	7	8	9	Describes Very Well 10	Don't Know 11
Is honest and truthful with customers	00	01	02	03	04	05	06	07	08	09	10	11
Is a reputable, well-run company	00	01	02	03	04	05	06	07	08	09	10	11
Actively supports community projects	00	01	02	03	04	05	06	07	08	09	10	11
Plans for future energy needs	00	01	02	03	04	05	06	07	08	09	10	11
Attracts new business and industry to the state	00	01	02	03	04	05	06	07	08	09	10	11
Shows concern for the environment	00	01	02	03	04	05	06	07	08	09	10	11
Is an industry leader	00	01	02	03	04	05	06	07	08	09	10	11
Provides good value to its shareholders; is a good investment	00	01	02	03	04	05	06	07	08	09	10	11
Controls and reduces costs	00	01	02	03	04	05	06	07	08	09	10	11
Uses energy efficiently	00	01	02	03	04	05	06	07	08	09	10	11
Treats you like a valued customer	00	01	02	03	04	05	06	07	08	09	10	11
Encourages customers to use energy efficiently	00	01	02	03	04	05	06	07	08	09	10	11

5. As you know, electric service is provided by different companies throughout the country. Compared to other electric companies, how would you rate the **performance** of **your** electric company on each of the items listed below? Please base your response on anything you may have seen, heard or experienced.
(X ONE Box For EACH Item)

	My Electric Company Is... Much Worse	A Little Worse	About The Same	A Little Better	Much Better	Don't Know
Level of rates (price)	1	2	3	4	5	6
Overall service quality (outages, power restoration, employee courtesy and knowledge, customer programs, billing, information and technical support)	1	2	3	4	5	6

6. Think about the **overall service** (price, reliability, responsiveness, etc.) that your electric company provides. In providing this service, how much **improvement**, if any, does your electric company need to make?
(X ONE Box)

Needs A Great Deal Of Improvement 0	1	2	3	4	Needs Some Improvement 5	6	7	8	9	No Improvement Needed At All 10
00	01	02	03	04	05	06	07	08	09	10

7. In the future, households such as yours may be able to **choose** their electric company in a competitive marketplace. Please indicate how much you **agree** or **disagree** with the following statement. **(X ONE Box ONLY)**

	Strongly Disagree				Neutral					Strongly Agree	Don't Know
	0	1	2	3	4	5	6	7	8	9	10	11
In a competitive marketplace, I would recommend my electric company to friends.	00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐	11 ☐

8. If another electric company offered electric service to your home, how **likely** would you be to **switch** if the new company had the **same** electric rates as your **current** electric company? **(X ONE Box)**

No Chance	Very Slight Chance	Slight Chance	Some Chance	Fair Chance	Even Chance	Good Chance	Likely	Very Likely	Almost Sure	Certain
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

9. If another electric company offered electric service to your home, how **likely** would you be to **switch** for a **5% reduction** in your electric bill? **(X ONE Box)**

No Chance	Very Slight Chance	Slight Chance	Some Chance	Fair Chance	Even Chance	Good Chance	Likely	Very Likely	Almost Sure	Certain
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

10. If another electric company offered electric service to your home, how **likely** would you be to **switch** for a **10% reduction** in your electric bill? **(X ONE Box)**

No Chance	Very Slight Chance	Slight Chance	Some Chance	Fair Chance	Even Chance	Good Chance	Likely	Very Likely	Almost Sure	Certain
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

11. If another electric company offered electric service to your home, how **likely** would you be to **switch** for a **15% reduction** in your electric bill? **(X ONE Box)**

No Chance	Very Slight Chance	Slight Chance	Some Chance	Fair Chance	Even Chance	Good Chance	Likely	Very Likely	Almost Sure	Certain
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

12. If you were able to choose among several power companies to get electric service for your home, how much **importance** would you give to quality and price? Please write in below the number of points you would give to quality and the number of points you would give to price when choosing the company that provides electric service to your home. The total of both must equal 100. **(Write In Below)**

	Importance
Quality	_____
Price	_____
TOTAL =	**100**

13a. Within the **past six months**, have you **contacted** your electric company with a question or service request? **(X ONE Box)**

1 ☐ Yes → **(Continue)**
2 ☐ No
3 ☐ Not sure → **(Skip To Qu. 14)**

13b. Please indicate the service request you made **most recently**. **(X ONE Box)**

01 ☐ To connect first-time service
02 ☐ To relocate service
03 ☐ To report outage or restore service
04 ☐ To have service turned off
05 ☐ To install outdoor lighting
06 ☐ To make billing inquiry
07 ☐ To request a bill payment extension
08 ☐ To request information about utility programs
09 ☐ To request information about electric equipment
10 ☐ To request information about conservation
11 ☐ To request other information
12 ☐ To complain about a service issue
13 ☐ Other

13c. Overall, how **satisfied** were you with your electric company in handling your **most recent** request? **(X ONE Box)**

Completely Dissatisfied					Neutral					Completely Satisfied
0	1	2	3	4	5	6	7	8	9	10
00 ☐	01 ☐	02 ☐	03 ☐	04 ☐	05 ☐	06 ☐	07 ☐	08 ☐	09 ☐	10 ☐

BELOW ARE THREE PRICING PLANS THAT MIGHT BE OFFERED BY YOUR ELECTRIC COMPANY.

14a. In **Column "A"** below, please indicate how interested your household would be in each pricing plan. **(X ONE Box For EACH Service In Column "A")**

14b. Then, in **Column "B"**, please "X" the ONE pricing plan your household would like the BEST. **(X ONE Box In Column "B")**

	"A" Not At All Interested 0	1	2	3	4	5	6	7	8	9	Extremely Interested 10	"B" Most Preferred Plan
CONSTANT RATE PLAN: You pay the same amount for electricity (per kilowatt hour) regardless of when you use it; in other words, the price does not vary by time of day, day of week, or season. This plan is best for people who don't want to be bothered with changing prices. *Constant rate plan is similar to the "15¢ a minute - anytime, anywhere" rates sometimes offered by long distance phone companies*	00☐	01☐	02☐	03☐	04☐	05☐	06☐	07☐	08☐	09☐	10☐	1☐
TIME OF USE RATE PLAN: Electricity prices are higher than current standard rates during peak periods (weekdays from 2:00 to 7:00 p.m.) and lower than current rates in off-peak periods. This rate is designed to offer savings to customers who are able to shift some of their use of energy away from peak periods and is good for households in which no one is home during the day. *Time of use rates are similar to the rate plans offered by most long distance phone services, where it is most expensive to make calls during the day, and less expensive to make calls during evenings and weekends*	00☐	01☐	02☐	03☐	04☐	05☐	06☐	07☐	08☐	09☐	10☐	2☐
FIXED BILL PLAN: This plan offers you unlimited use of electricity for a fixed total price. In other words, you pay the same total bill each month, regardless of how much electricity you actually use. This rate is good for people who have higher than average electricity usage, given the size of their home. *Fixed bill plan is similar to plans offered by many Internet Access services, or to local phone plans that offer unlimited local toll calls for a fixed amount each month*	00☐	01☐	02☐	03☐	04☐	05☐	06☐	07☐	08☐	09☐	10☐	3☐

BELOW IS A LIST OF FREE SERVICES.

15a. In **Column "A"** below, please indicate how interested your household is in using this service. **(X ONE Box For EACH Service In Column "A")**

15b. Then, in **Column "B"**, please "X" the box for each service in Column "A" that your household has used in the past. **(X ALL That Apply In Column "B")**

	"A" Definitely Would NOT Use Service ← 0 1 2 3 4 5 6 7 8 9 10 → Definitely Would Use Service	"B" Have Used In The Past
ENERGY USE REPORT: A report on your electric bill showing how much energy was used by each of your main household appliances	00☐ 01☐ 02☐ 03☐ 04☐ 05☐ 06☐ 07☐ 08☐ 09☐ 10☐	1☐
MAIL-IN ENERGY EFFICIENCY AUDIT: Complete a survey about your home, and mail it to your electric company. Based on your answers, you get an evaluation of your home's insulation and energy systems, and tips on saving money	00☐ 01☐ 02☐ 03☐ 04☐ 05☐ 06☐ 07☐ 08☐ 09☐ 10☐	2☐
INTERNET INFORMATION CENTER: Monthly electric bills can be viewed on-line, along with information about your billing history, different types of rate plans, and so on. You can also get an Energy Efficiency Audit just like the mail-in audit above, except that you fill out the survey and get the results on-line	00☐ 01☐ 02☐ 03☐ 04☐ 05☐ 06☐ 07☐ 08☐ 09☐ 10☐	3☐
ENERGY SWITCH PROGRAM: In this program, your electric company switches off your air conditioners for short periods (typically less than 6 hours). This only happens on rare weekday afternoons in the summer when the electric company needs extra power to meet critical peak demands. For participating in the program, you get a free programmable thermostat ($150 retail value)	00☐ 01☐ 02☐ 03☐ 04☐ 05☐ 06☐ 07☐ 08☐ 09☐ 10☐	4☐
BUDGET BILLING, ALSO CALLED "LEVELIZED BILLING": A billing option that reduces the impact of extreme weather on your monthly electric bill by billing you 1/12 of your past 12 months electric service. It doesn't save money; it just makes your monthly bill less variable and more predictable	00☐ 01☐ 02☐ 03☐ 04☐ 05☐ 06☐ 07☐ 08☐ 09☐ 10☐	5☐
CREDIT CARD WITH "ENERGY POINTS" REWARDS: A Visa or MasterCard issued by your electric company, in cooperation with a bank. For every $1000 you spend on the credit card, you get $1 off of your electric bill. No annual fee. Competitive interest rates	00☐ 01☐ 02☐ 03☐ 04☐ 05☐ 06☐ 07☐ 08☐ 09☐ 10☐	6☐

BELOW IS A LIST OF SERVICES AVAILABLE FOR AN ADDITIONAL COST.

16a. In **Column "A"** below, please indicate how interested your household is in getting this service. (If you already have a product or service similar to the one described, indicate how likely you would be to get this SPECIFIC service). **(X ONE Box For EACH Service In Column "A")**

16b. Then, in **Column "B"**, please "X" the box next to each product or service indicated in Column "A" that your household already receives. **(X ALL That Apply In Column "B")**

	"A" Definitely Would NOT Get Service ← 0 1 2 3 4 5 6 7 8 9 10 → Definitely Would Get Service	"B" Already Get This Service
SURGE PROTECTION: A high quality surge protector is placed on your electric meter, providing surge protection to all outlets in your home. Cost $10 per month.	00 01 02 03 04 05 06 07 08 09 10	01
SYSTEMS WARRANTY: Provides protection from unexpected repair costs for household heating, cooling, and water heating systems. Includes an annual, in-home system inspection and tune-up. Cost $16 per month.	00 01 02 03 04 05 06 07 08 09 10	02
APPLIANCES WARRANTY: Provides protection from unexpected repair costs for appliances such as washers, dryers, and dishwashers. Includes an annual, in-home appliance inspection and tune-up. Cost $20 per month.	00 01 02 03 04 05 06 07 08 09 10	03
HOME WARRANTY: Combines both the "Systems Warranty" and "Appliances Warranty" listed above. Cost $33 per month.	00 01 02 03 04 05 06 07 08 09 10	04
OUTDOOR LIGHTING: Outdoor security lighting and/or decorative post lamps may be leased or rented. Includes cost of electricity and maintenance of equipment. Cost $12 per month.	00 01 02 03 04 05 06 07 08 09 10	05
INSURANCE OF ELECTRONIC EQUIPMENT: Extended warranty and insurance program that protects you against damage to sensitive electronic equipment such as computers, TVs, stereos, VCRs, etc. Cost $4 per month for each piece of equipment insured.	00 01 02 03 04 05 06 07 08 09 10	06
LOW INTEREST LOANS: Loans that bear low interest rates for major household appliances and/or heating and air-conditioning systems. Interest rate 13%.	00 01 02 03 04 05 06 07 08 09 10	07
PROGRAMMABLE THERMOSTAT: A thermostat that you can program to change your thermostat temperature automatically, even when you are not home, providing convenience and money savings. Cost $8 per month.	00 01 02 03 04 05 06 07 08 09 10	08
WATER HEATER TIMER: Similar to the "programmable thermostat" described above, except that it works for your water heater. Instead of heating water all the time, you only heat water during times that you usually need hot water. Cost $4 per month.	00 01 02 03 04 05 06 07 08 09 10	09
OUTAGE ALERT: A monitoring system automatically notifies the electric company if your power goes out, allowing them to get your power back on as quickly as possible even if you are not home. Cost $8 per month.	00 01 02 03 04 05 06 07 08 09 10	10
WIRE WARRANTY: Provides maintenance and repairs for electrical wiring inside your home. Cost $8 per month.	00 01 02 03 04 05 06 07 08 09 10	11
UNINTERRUPTED POWER SUPPLY: A device that provides electricity for several hours even if your power goes out. Provides power for one appliance (PC, refrigerator, medical device) even during a power outage. Cost to lease: $25 per month.	00 01 02 03 04 05 06 07 08 09 10	12

17a. How many times, if at all, have you switched long distance telephone companies in the past THREE YEARS? **(If None, Please Write In "0" And Skip To Qu. 18)**

Of Times: _____

17b. Please indicate the reasons you switched. **(X ALL That Apply)**

1 ☐ Was offered a check or cash to switch
2 ☐ To obtain a better price
3 ☐ For better customer service
4 ☐ For frequent flyer miles
5 ☐ For more reliable service
6 ☐ For a rewa[illegible]ogram
7 ☐ Because of [illegible] company's reputation
8 ☐ So that we could get more than one service from a single company
9 ☐ Other

18. How frequently do you read the bill inserts, bill stuffers, newsletters, or other pieces of information that come with your monthly electric bill? **(X ONE Box)**

1 ☐ Always
2 ☐ Almost always
3 ☐ Often
4 ☐ Occasionally
5 ☐ Seldom
6 ☐ Almost never
7 ☐ Never
8 ☐ Don't know

19. Please indicate your age and sex. Age: _____ Sex: 1 ☐ Male 2 ☐ Female

Thank you for your help with this study. Please return your completed questionnaire in the enclosed postage-paid envelope as soon as possible.

ESQ-5
Item 1
Page 1 of 3

1992 Gallup Benchmark Studies
Residential Customers
Percent Very Satisfied

92 Rank	91 Rank	Company Name	91 Gallup 6 point	92 Gallup 6 point	92 Gallup 4 point	92 SC 4 point
1	2	Monongahela Power	47	57	82	
2	1	Delmarva Power & Light	54	55	79	
3	New	Ohio Power		55	79	
4	5	Mississippi Power	41	52	74	67 68
5	3	Potomac Electric & Power	45	51	73	
6	9	Southern California Edison	37	48	69	
7	6	Appalachian Power	40	47	67	
8	22	Florida Power & Light	28 →	47	67	
9	7	Virginia Electric & Power	39	46	66	
10	18	Georgia EMC's	31	46	66	
11	12	Pacific Gas & Electric	36	45	64	
12	16	Georgia Municipalities	33	45	64	
13	New	Chattanooga Electric		45	64	
14	19	Carolina Power & Light	30	44	63	
15	8	South Carolina Electric & Gas	39	43	61	
16	10	Duke Power	37	43	61	
17	14	Central Louisiana Electric	35	43	61	
18	20	Gulf States Utilities	29	43	61	
19	15	Baltimore Gas & Electric	34	42	60	
20	17	Alabama Power	32	42	60	58 59
21	26	Georgia Power	23 →	41	59	56 -
22	New	Huntsville Utilities		41	59	
23	11	Savannah Electric & Power	37	40	57	65 -
24	13	Florida Power Corporation	36	40	57	
25	4	Potomac Edison	42	39	56	
26	New	Louisville Gas & Electric		39	56	
27	23	Tampa Electric	28	38	54	
28	20	Gulf Power	29	36	50	53 -
29	28	Arkansas Power & Light	20	34	49	
30	New	Detroit Edison		34	49	
31	25	Mississippi Power & Light	24	33	47	
32	27	Louisiana Power & Light	21	33	47	
33	New	Memphis Light, Gas & Water		32	46	
34	24	New Orleans Public Service	26	26	37	

ESQ-5
Item 1
Page 2 of 3

1992 Gallup Benchmark Studies
Large Industrial Customers
Percent Very Satisfied

92 Rank	Company Name	92 Gallup 6 point	92 Gallup 4 point
1	South Carolina Electric & Gas	80	95
2	Mississippi Power	69	82
3	Duke Power	67	79
4	Savannah Electric & Power	64	76
5	Potomac Edison	63	75
6	Delmarva Power & Light	62	73
7	Louisiana Power & Light	58	69
8	Mississippi Power & Light	56	66
9	Georgia EMC's	54	64
10	Georgia Power	54	64
11	Appalachian Power	52	62
12	Ohio Power	52	62
13	Southern California Edison	52	62
14	Memphis Light, Gas & Water	51	60
15	TVA Directs	51	60
16	Alabama Power	50	59
17	Central Louisiana Electric	50	59
18	Carolina Power & Light	46	54
19	Florida Power & Light	45	53
20	Baltimore Gas & Electric	43	51
21	Georgia Municipalities	43	51
22	Chattanooga Electric	42	50
23	Gulf States Utilities	42	50
24	Detroit Edison	40	47
25	Florida Power Corporation	39	46
26	Gulf Power	39	46
27	Virginia Electric & Power	39	46
28	Louisville Gas & Electric	37	44
29	Arkansas Power & Light	36	43
30	Tampa Electric	28	33
31	Pacific Gas & Electric	27	32
32	Monongahela Power	25	30

SCS - INDUSTR.
YTD - SEPT
4POINT
67
76
60
58
51

Note - Some companies were omitted due to very small sample sizes.

ESQ-5
Item 1
Page 3 of 3

1992 Gallup Benchmark Studies
Commercial and Industrial Customers
Percent Very Satisfied

92 Rank	Company Name	92 Gallup 6 point	92 Gallup 4 point	92 SC 4 point	
1	Mississippi Power	64	76	68	71 63
2	Georgia Municipalities	57	68		
3	Duke Power	57	68		
4	Georgia Power	55	65	57	63 64
5	Delmarva Power & Light	54	64		
6	Pacific Gas & Electric	53	63		
7	Central Louisiana Electric	53	63		
8	Louisiana Power & Light	53	63		
9	Ohio Power	52	62		
10	Savannah Electric & Power	52	62	76	73
11	Monongahela Power	51	61		
12	Southern California Edison	51	61		
13	Potomac Edison	50	59		
14	Georgia EMC's	49	58		
15	Alabama Power	49	58	57	57 60
16	Potomac Electric & Power	48	57		
17	Baltimore Gas & Electric	46	55		
18	Huntsville Utilities	46	55		
19	Florida Power Corporation	46	55		
20	Arkansas Power & Light	46	55		
21	Mississippi Power & Light	46	55		
22	Gulf States Utilities	45	53		
23	Louisville Gas & Electric	45	53		
24	Virginia Electric & Power	44	52		
25	Appalachian Power	43	51		
26	Chattanooga Electric	43	51		
27	Carolina Power & Light	42	50		
28	South Carolina Electric & Gas	42	50		
29	Gulf Power	39	46	51	58 25
30	Detroit Edison	39	46		
31	Tampa Electric	37	44		
32	Memphis Light, Gas & Water	37	44		
33	Florida Power & Light	34	40		
34	New Orleans Public Service	30	36		

CONFIDENTIAL

ESQ-2 Item Number 7

Southern Company Substation Maintenance Study Volume I and II

These documents consists of Volume I, pages 1 - 221, and Volume II, pages 1 - 160. Each page in its entirety is confidential, including all tables, graphs and accompanying text.

Florida Public Service Commission
Audit Document/Record Request
Request # ESQ-2 9/12/97

Question #7:

Provide a copy of the Southern Company Substation Maintenance Study of Prodictive Maintenance for STOMP.

Answer:

See Books - Volumes I and II Substation Maintenance
(Instructions and Specifications for Substation Equipment)

Pages 1-221 are Confidential

Substation Maintenance

Instructions and Specifications

Volume 1 for Substation Equipment

/

POWER TRANSFORMERS

1. Receiving Inspection of Free Breathing Power Transformers
2. Receiving Inspection of Sealed Vacuum Rated Power Transformers
3. Receiving Inspection of Sealed Non-Vacuum Rated Power Transformers
4. Receiving Inspection of C.O.P.S. Tank Power Transformers
5. Storage of Free Breathing Power Transformers
6. Storage of Sealed Vacuum Rated Power Transformers
7. Storage of Sealed Non-Vacuum Rated Power Transformers
8. Storage of C.O.P.S. Tank Power Transformers
9. Shipping of Free Breathing Power Transformers
10. Shipping of Sealed Vacuum Rated Power Transformers
11. Shipping of Sealed Non-Vacuum Rated Power Transformers
12. Shipping of Sealed C.O.P.S. Tank Power Transformers
13. Installation of Free Breathing Power Transformers
14. Installation of Sealed Vacuum Rated Power Transformers
15. Installation of Sealed Non-Vacuum Rated Power Transformers
16. Installation of C.O.P.S. Tank Power Transformers
17. Processing of Free Breathing Power Transformers
18. Processing of Sealed Vacuum Rated Power Transformers 115kV and Above
19. Processing of Sealed Non-Vacuum Rated Power Transformers
20. Processing of C.O.P.S. Tank Power Transformers 115kV and Above
21. Drying of Free Breathing Power Transformers
22. Drying of Sealed Vacuum Rated Power Transformers
23. Drying of Sealed Non-Vacuum Rated Power Transformers
24. Drying of C.O.P.S. Tank Power Transformers
25. Preventive Diagnostic Inspection and External Maintenance of Power Transformers
26. Internal Inspection of Arcing Load Tap Changers
27. Internal Inspection of Resistance Type Load Tap Changers
28. Internal Inspection of Vacuum Type Load Tap Changers

INSTRUCTIONS

OIL

1. Dielectric Breakdown Testing of Insulating Oil per ASTM D-877
2. Dielectric Breakdown Testing of Insulating Oil per ASTM D-1816
3. Color Testing of Insulating Oil per ASTM D-1500
4. Acidity Testing of Insulating Oil
5. Dissolved Gas-In-Oil Sampling

POWER CIRCUIT BREAKERS

1. Motion Analysis Testing
2. Low Resistance Ohmmeter Testing
3. Measuring the Moisture Content of SF_6 Gas
4. Hipotential Testing of Vacuum Circuit Breaker Interrupters
5. Measurement of Insulation Resistance
6. Testing Capacitor Trip Devices on Power Circuit Breakers

POWER TRANSFORMERS

1. Performing a Transformer Turns Ratio Test
2. Total Combustible Gas Testing of the Nitrogen Blanket of Power Transformers
3. Testing the Oxygen Content in the Nitrogen Blanket of Power Transformers
4. Purging Sealed Power Transformers
5. Flashing Sealed Power Transformers
6. Measurement of Dewpoint in Transformer Gas Space
7. Measuring the Core Ground Insulation Resistance
8. Calibration of Temperature Gauges

OTHERS

1. Station Battery Impedance Testing
2. Integrity Testing of Station Battery Installations
3. Capacity Testing of Station Batteries

TABLE OF CONTENTS

POWER TRANSFORMERS

1. Receiving Inspection of Free Breathing Power Transformers
2. Receiving Inspection of Sealed Vacuum Rated Power Transformers
3. Receiving Inspection of Sealed Non-Vacuum Rated Power Transformers
4. Receiving Inspection of C.O.P.S. Tank Power Transformers
5. Storage of Free Breathing Power Transformers
6. Storage of Sealed Vacuum Rated Power Transformers
7. Storage of Sealed Non-Vacuum Rated Power Transformers
8. Storage of C.O.P.S. Tank Power Transformers
9. Shipping of Free Breathing Power Transformers
10. Shipping of Sealed Vacuum Rated Power Transformers
11. Shipping of Sealed Non-Vacuum Rated Power Transformers
12. Shipping of Sealed C.O.P.S. Tank Power Transformers
13. Installation of Free Breathing Power Transformers
14. Installation of Sealed Vacuum Rated Power Transformers
15. Installation of Sealed Non-Vacuum Rated Power Transformers
16. Installation of C.O.P.S. Tank Power Transformers
17. Processing of Free Breathing Power Transformers
18. Processing of Sealed Vacuum Rated Power Transformers 115kV and Above
19. Processing of Sealed Non-Vacuum Rated Power Transformers
20. Processing of C.O.P.S. Tank Power Transformers 115kV and Above
21. Drying of Free Breathing Power Transformers
22. Drying of Sealed Vacuum Rated Power Transformers
23. Drying of Sealed Non-Vacuum Rated Power Transformers
24. Drying of C.O.P.S. Tank Power Transformers
25. Preventive Diagnostic Inspection and External Maintenance of Power Transformers
26. Internal Inspection of Arcing Load Tap Changers
27. Internal Inspection of Resistance Type Load Tap Changers
28. Internal Inspection of Vacuum Type Load Tap Changers

OTHERS

1. Preventive Diagnostic Inspection of Step Voltage Regulators
2. Internal Inspection of Single Phase Step Voltage Regulators
3. Preventive Diagnostic Inspection of Station Battery Installations
4. Preventive Diagnostic Inspection of Manually Operated Switches
5. Preventive Diagnostic Inspection of Motor Operated Switches

INSTRUCTIONS

OIL

1. Dielectric Breakdown Testing of Insulating Oil per ASTM D-877
2. Dielectric Breakdown Testing of Insulating Oil per ASTM D-1816
3. Color Testing of Insulating Oil per ASTM D-1500
4. Acidity Testing of Insulating Oil
5. Dissolved Gas-In-Oil Sampling

POWER CIRCUIT BREAKERS

1. Motion Analysis Testing
2. Low Resistance Ohmmeter Testing
3. Measuring the Moisture Content of SF_6 Gas
4. Hipotential Testing of Vacuum Circuit Breaker Interrupters
5. Measurement of Insulation Resistance
6. Testing Capacitor Trip Devices on Power Circuit Breakers

POWER TRANSFORMERS

1. Performing a Transformer Turns Ratio Test
2. Total Combustible Gas Testing of the Nitrogen Blanket of Power Transformers
3. Testing the Oxygen Content in the Nitrogen Blanket of Power Transformers
4. Purging Sealed Power Transformers
5. Flashing Sealed Power Transformers
6. Measurement of Dewpoint in Transformer Gas Space
7. Measuring the Core Ground Insulation Resistance
8. Calibration of Temperature Gauges

OTHERS

1. Station Battery Impedance Testing
2. Integrity Testing of Station Battery Installations
3. Capacity Testing of Station Batteries

STANDARDS

1. Maintenance Criteria of Substation Equipment
2. Approved Lubricants, Inhibitors, and Adhesives and their Application
3. Contact Resistance of Power Circuit Breakers
4. Timing Power Circuit Breakers 69kV through 230kV
5. Test Equipment for Substations
6. Test Equipment Verification and Calibration
7. New Insulating Oil
8. Reclaimed Insulating Oil
9. Reusable Insulating Oil

the southern electric system

SUBSTATION MAINTENANCE INTERVALS FOR THE SOUTHERN ELECTRIC SYSTEM

DATE: 11/15/94

SUBSTATION MAINTENANCE INTERVALS FOR THE SOUTHERN ELECTRIC SYSTEM

1.0 APPLICATION

This procedure is applicable for all substation equipment on the Southern Electric System. However, it is recognized that unique situations exist where area supervision, who are accountable, should differ from these standards to best protect the interest of the Southern Company.

Spare equipment will be treated as if in service for these schedules. Emergency replacement equipment may fall under a different schedule, consult local operating authority.

2.0 SUBSTATION INSPECTIONS

Anytime a substation is entered, a general security inspection shall be performed where the fence and grounds are visually inspected to insure the protection of the general public. A visual inspection shall be performed of busses, structures and equipment noting any abnormal conditions. Appropriate parties must be notified of problems detected.

1. STATIONS WITHOUT SUPERVISORY CONTROL WITH D.C. SYSTEMS

These stations shall be inspected once a month due to battery systems. Measurements and test shall be performed as outlined in Section 8.1 for these systems.

2. STATIONS WITHOUT SUPERVISORY CONTROL WITHOUT D.C. SYSTEMS

These stations shall be inspected once a month during peak periods. For summer peaking stations these inspections should be performed during the months of June, July and August. For winter peaking stations these inspections should be performed during the months of December, January and February. Abnormal operating conditions may dictate additional inspections at area supervisions direction.

3. STATIONS WITH SUPERVISORY AND D.C. SYSTEMS

These stations shall be inspected in conjunction with the battery testing described in Section 8.2.

3.0 INFRARED INSPECTIONS

1. GENERATING STATIONS AND SUBSTATIONS 230KV AND ABOVE

These stations shall be inspected annually.

2. STATIONS BELOW 230KV

The stations shall be inspected once every three years.

4.0 POWER CIRCUIT BREAKERS GREATER THAN 69KV

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Infrared Scanning	Every 3 Years
Dielectric (Oil) Breakdown Test (applies to Oil Circuit Breakers)	Every 2 Years
Dielectric (Oil) Breakdown Test on Capacitor Bank OCB's	Yearly
Operational Test and Preventative Diagnostic (Compressor Maintenance, Lubrication Check Belts, Compressor Oil)	Yearly
Power Factor Test	Every 6 Years
Contact Resistance Test	Every 6 Years
Motion Analyzer	Every 6 Years
Major Inspection and Tear Down	As Indicated

2. SPECIAL CASE

1. SF_6 Puffer type breakers all out of service tests will be performed on a 12 Year cycle.

2. Oil circuit breakers used for capacitor bank switching should have Annual Dielectric break down testing performed.

3. Live tank breakers not utilizing voltage grading capacitors will not be routinely Power Factor tested.

5.0 POWER CIRCUIT BREAKERS 69KV AND BELOW

1. TEST AND INSPECTION TABLES

Type Breaker	Infrared Scan	Oil Dielectric Color	Preventative Diagnostic
Metal Clad Also Air Blast	Every 3 Years	N/A	Yearly
OCB	Every 3 Years	Yearly	Yearly
VCB	Every 3 Years	N/A	Yearly
SF_6	Every 3 Years	N/A	Yearly
OCR PR & ES	Every 3 Years	Yearly	Yearly
OCR Kyle	Every 3 Years	Yearly	Yearly
Vacuum Reclosers	Every 3 Years	N/A	Yearly
CAP Oil Switch With Fuses	Every 3 Years	N/A	N/A
CAP Oil Switch W/O Fuses	Every 3 Years	N/A	N/A
CAP VAC Switch	Every 3 Years	N/A	N/A
CAP 3 Ph Oil	Every 3 Years	Yearly	Yearly

Type Breaker	Meggar Ductor	Power Factor	Internal	Hi-pot
Metal Clad Also Air Blast	As Ind	N/A	Every 4 Years	As Ind
OCB	As Ind	As Ind	As Ind	N/A
VCB	Every 10 Yrs	As Ind	Every 10 Yrs	As Ind
SF_6	Every 10 Yrs	As Ind	Every 10 Yrs	N/A
OCR PR & ES	As Ind	As Ind	Yearly	N/A
OCR Kyle	As Ind	As Ind	Every 3 Years	N/A
Vacuum Reclosers	As Ind	As Ind	Every 10 Yrs	As Ind
Cap Oil Switch With Fuses	As Ind	As Ind	Every 3 Years	N/A
Cap Oil Switch W/O Fuses	As Ind	As Ind	Every 3 Years	N/A
Cap VAC Switch	As Ind	As Ind	N/A	As Ind
Cap 3 Ph Oil	As Ind	As Ind	Every 3 Years	N/A

6.0 POWER TRANSFORMERS AND REACTORS

All transformers connected to a generator bus shall be considered as generator step-up transformers for schedule purposes.

1. GENERATOR STEP UP TRANSFORMER
(High side voltage 230kV or higher)

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas-In-Oil, Color and Moisture	Every 6 Months
Acid and IFT	As Required
Transformer Combustible Gas Oxygen	When Power Factored
Oil Dielectric	As Required
Infrared	Yearly
Preventative Diagnostic	Yearly
Power Factor Test	Every 4 Years
Transformer Turns Ratio Test	Every 4 Years
Winding Resistance Test	As Required
Insulation Resistance Test	As Required

2. GENERATOR STEP UP TRANSFORMER
(High side voltage 115kV or 161kV)

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas in Oil, Color and Moisture	Yearly
Acid and IFT	As Required
Transformer Combustible Gas Oxygen	As Required
Oil Dielectric	As Required
Infrared	Yearly
Preventative Diagnostic	Yearly
Power Factor Test	Every 4 Years
Transformer Turns Ratio Test	When Power Factored
Winding Resistance Test	As Required
Insulation Resistance Test	As Required

3. GENERATOR STEP UP TRANSFORMER 69KV AND BELOW (With Dry Nitrogen Blanket)

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas In Oil, Color and Moisture	Yearly
Acid and IFT	As Required
Transformer Combustible Gas Oxygen	As Required
Oil Dielectric	As Required
Infrared	Yearly
Preventative Diagnostic	Yearly
Power Factor Test	Every 6 Years
Transformer Turns Ratio Test	When Power Factored
Winding Resistance Test	As Required
Insulation Resistance Test	As Required

4. 500KV TRANSFORMERS

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas In Oil, Color and Moisture	Every 6 Months
Acid and IFT	As Required
Transformer Combustible Gas Oxygen	When Power Factored
Oil Dielectric	As Required
Infrared	Yearly
Preventative Diagnostic	Yearly
Power Factor Test	Every 4 Years
Transformer Turns Ratio Test	When Power Factored
Winding Resistance Test	As Required
Insulation Resistance Test	As Required

5. 500 AND 230KV REACTORS

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas In Oil, Color and Moisture	Every 6 Months
Acid and IFT	As Required
Transformer Combustible Gas Oxygen	When Power Factored
Oil Dielectric	As Required
Infrared	Yearly
Preventative Diagnostic	Yearly
Power Factor Test	Every 4 Years
Transformer Turns Ratio Test	When Power Factored
Winding Resistance Test	As Required
Insulation Resistance Test	As Required

6. HIGH VOLTAGE 230KV
(Not a generator step up)

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas In Oil, Color and Moisture	Yearly
Acid and IFT	As Required
Combustible Gas and Oxygen	When Power Factored
Oil Dielectric	As Required
Infrared	Yearly
Preventative Diagnostic	Yearly
Power Factor Test	Every 4 Years
Transformer Turns Ratio Test (Test Tap as found only)	When Power Factored
Winding Resistance Test	As Required
Insulation Resistance Test	As Required

7. TRANSFORMER 161 OR 115KV HIGH SIDE (With Nitrogen Blanket)

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas In Oil, Color and Moisture	Yearly
Acid and IFT	As Required
Transformer Combustible Gas Oxygen	When Power Factored
Oil Dielectric	As Required
Infrared	Every 3 Years
Preventative Diagnostic	Yearly
Power Factor Test	Every 6 Years
Transformer Turns Ratio Test	When Power Factored
Winding Resistance Test	As Required
Insulation Resistance Test	As Required

8. TRANSFORMER 115KV HIGH SIDE VOLTAGE (Free Breathing)

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas In Oil	As Required
Acid and IFT	As Required
Transformer Combustible Gas Oxygen	N/A
Oil Dielectric and Color	Yearly
Infrared	Every 3 Years
Preventative Diagnostic	Yearly
Power Factor Test	Every 6 Years
Transformer Turns Ratio	When Power Factored
Winding Resistance	As Required
Insulation Resistance Test	As Required

9. TRANSFORMER WITH HIGH SIDE VOLTAGE 69KV AND BELOW (Sealed Unit With Dry Nitrogen in Gas Space)

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas In Oil	As Required
Acid and IFT	As Required
Transformer Combustible Gas Oxygen	Yearly
Oil Dielectric and Color	Yearly
Infrared	Every 3 Years
Preventative Diagnostic	Yearly
Power Factor Test	As Required
Transformer Turns Ratio	As Required
Winding Resistance Test	As Required
Insulation Resistance Test	As Required

10. TRANSFORMER WITH HIGH SIDE VOLTAGE 69KV AND BELOW (Free Breathing)

1. TEST AND INSPECTION TABLE

TASK	FREQUENCY
Gas In Oil	As Required
Acid and IFT	As Required
Transformer Combustible Gas Oxygen	N/A
Oil Dielectric and Color	Yearly
Infrared	Every 3 Years
Preventative Diagnostic	Yearly
Power Factor Test	As Required
Transformer Turns Ratio	As Required
Winding Resistance Test	As Required
Insulation Resistance Test	As Required

11. LOAD TAP CHANGERS

The standard covers single phase and three phase units

1. TEST AND INSPECTION TABLES

Type Switch	Infrared Scanning	Combustible Gas	Gas In Oil	Dielectric Color	Prevent Diagnostic
Resistive	Every 3 Years	As Req	As Req	Yearly	Yearly
Reactive	Every 3 Years	As Req	As Req	Yearly	Yearly
Vacuum	Every 3 Years	As Req	As Req	Yearly	Yearly

Other service tests (Turns Ratio, Power Factor, etc.) will be performed in conjunction with the transformer schedule.

12. INSTRUMENT TRANSFORMERS

Service testing of this equipment will not be routinely performed unless problems are indicated by infrared or operational history.

7.0 VOLTAGE REGULATORS

1. DISTRIBUTION VOLTAGE REGULATOR

1. TEST AND INSPECTION TABLE

	Infrared Scanning	Combustible Gas	Gas In Oil	Dielectric Color	Prevent Diagnostic
Single Phase	Every 3 Years	N/A	As Required	Every 2 Years	Every 2 Years
Three Phase	Every 3 Years	N/A	As Required	Every 2 Years	Every 2 Years

2. THREE PHASE 46KV REGULATORS

1. TEST AND INSPECTION TABLE

	Infrared Scanning	Comb Gas	Gas In Oil	Acid & IFT	Dielectric & Color	% O_2	Oper Test
Switch Comp	Every 3 Years	N/A	N/A	N/A	Yearly	N/A	As Req
Winding Comp	Every 3 Years	Yearly	As Req	As Req	Yearly	Yearly	N/A
Preventative Diagnostic Yearly							

8.0 STATION BATTERIES

TASK	FREQUENCY
Check cell voltage and straps (All Cells and Straps)	Quarterly
Impedance/Integrity Test	Every 4 Years
Load Test	At acceptance

NOTE: Specific gravity tests will not be routinely performed unless other tests indicate a need for the test.

NOTE: Some battery types and/or installations require water levels to be maintained on a more frequent interval than specified. Past experience should establish those intervals.

9.0 LIGHTNING ARRESTERS

1. MOV TYPE

No out of service tests are routinely scheduled.

2. NON-MOV TYPE

Power Factor Test with associated equipment when possible.

10.0 MOTOR OPERATORS (NOT ON CIRCUIT SWITCHERS)

Operational test once every five years in the coupled position.

11.0 RATED LOAD BREAK SWITCH WITH MOTOR OPERATOR

1. S&C CIRCUIT SWITCHER AND TRANSRUPTERS

Operational test once every 10 years unless done in conjunction with associated equipment.

2. ALL OTHERS (LINE BACKERS, V2LB AND ANY OTHERS THAN S&C)

Operational test once every five years unless done in conjunction with associated equipment.

12.0 AIR SWITCH

Perform an operational test in conjunction with the Preventive Diagnostic Test and/or maintenance of associated equipment.

the southern electric system

PROCEDURE FOR

RECEIVING

POWER CIRCUIT BREAKERS

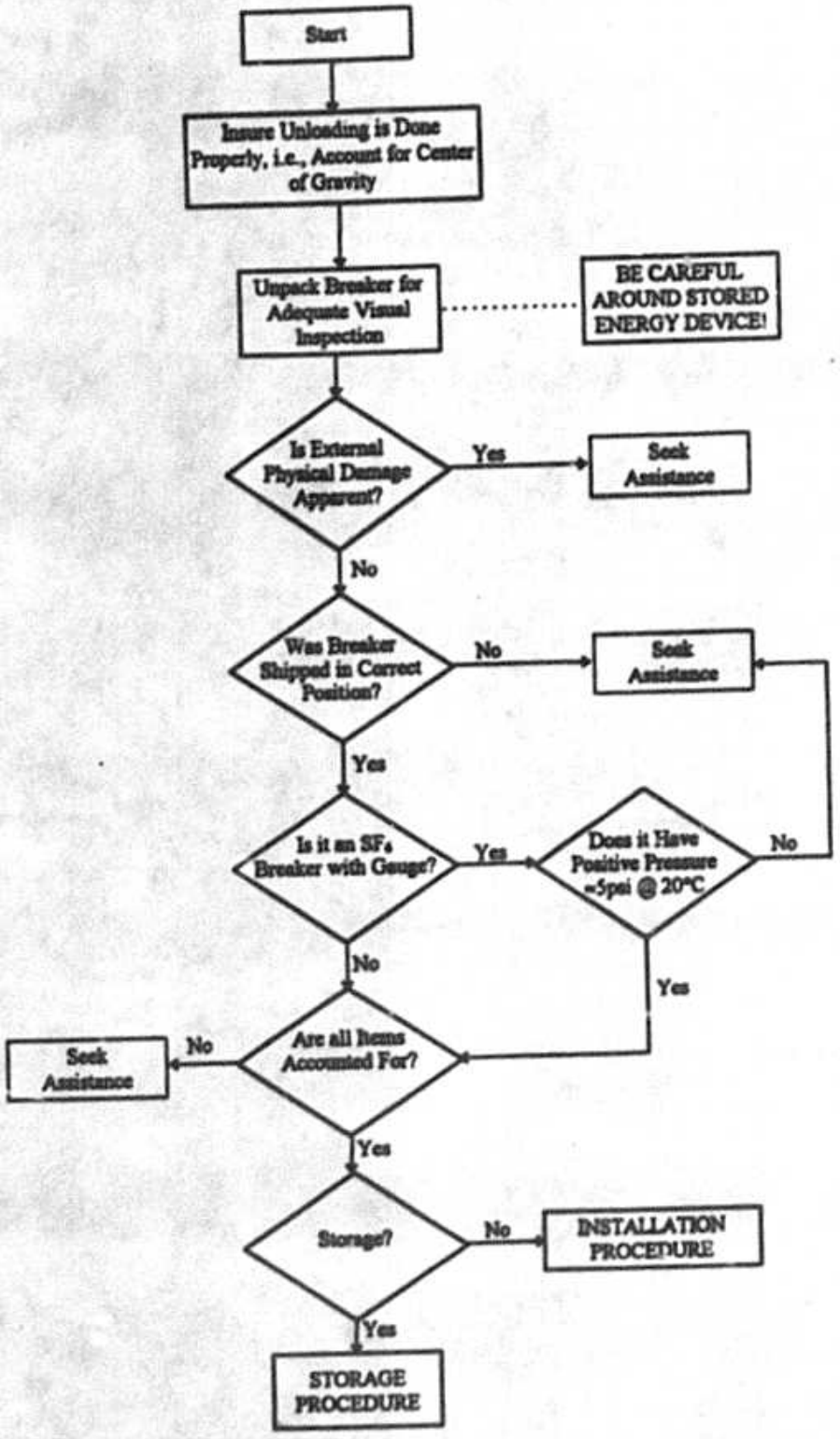
DATE: 9/20/94

5.0 INVENTORY

Account for all items on shipping document. Notify appropriate parties of missing items.

NOTE: Prepare breaker for either storage or installation. Refer to appropriate procedure.

RECEIVING POWER CIRCUIT BREAKERS



RECEIVING POWER CIRCUIT BREAKERS

1.0 APPLICATION

This specification applies to all power circuit breakers.

2.0 PREPARATION

1. Prior to unloading, consult the manufacturer's instruction book for lifting instructions.

2. Visually inspect the package for external damage prior to unloading. If external damage is observed, seek assistance before off-loading.

3.0 UNLOADING

After taking proper precautions, unload the breaker.

4.0 UNPACK AND INSPECT

1. Remove sufficient shipping material to perform a complete visual inspection of the breaker.

NOTE: The stored energy device may still be charged; take appropriate precautions.

2. Perform a visual inspection of the breaker. Note any damage found and seek assistance, if necessary.

3. Perform a visual inspection of the control cabinet and mechanism. Note any loose or damaged wiring, loose or excessively lubricated or dry mechanism components, missing or broken control components. Seek assistance, if required.

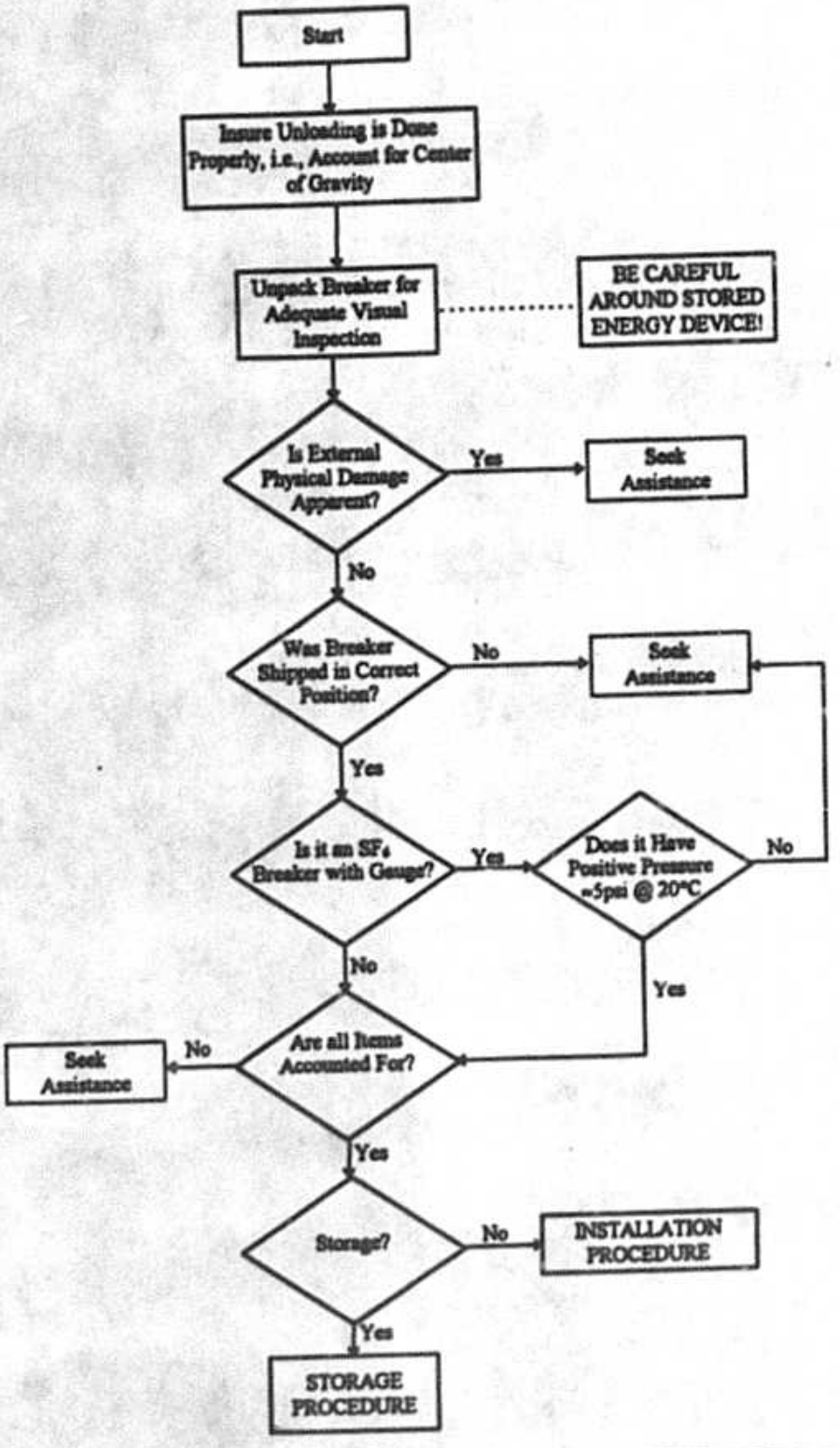
4. Note position (open or closed) breaker contacts was shipped in. If open, seek assistance.

5. If breaker is equipped with an SF_6 pressure gauge, note pressure. If this is not equivalent to approximately 5 psig at 20° C, seek assistance.

5.0 INVENTORY

Account for all items on shipping document. Notify appropriate parties of missing items.

NOTE: Prepare breaker for either storage or installation. Refer to appropriate procedure.



the southern electric system

PROCEDURE FOR STORAGE OF POWER CIRCUIT BREAKERS

DATE: 9/20/94

STORAGE OF POWER CIRCUIT BREAKERS

1.0 APPLICATION

This procedure applies to all power circuit breakers and assumes that breaker was recieved according to PROCEDURE FOR RECIEVING POWER CIRCUIT BREAKERS. If this was not done, refer to that procedure to insure breakers integrity.

2.0 STORAGE OF BREAKERS NOT TO EXCEED 90 DAYS

Store associated components where readily accessible.

3.0 STORAGE OF BREAKERS GREATER THAN 90 DAYS

1. If an oil circuit breaker, fill with oil or take appropiate steps to insure interrupters and other internal components remain dry (provide a heat source). If an SF_6 breaker, insure that the pressure is approximately 5 psig at 20° C.

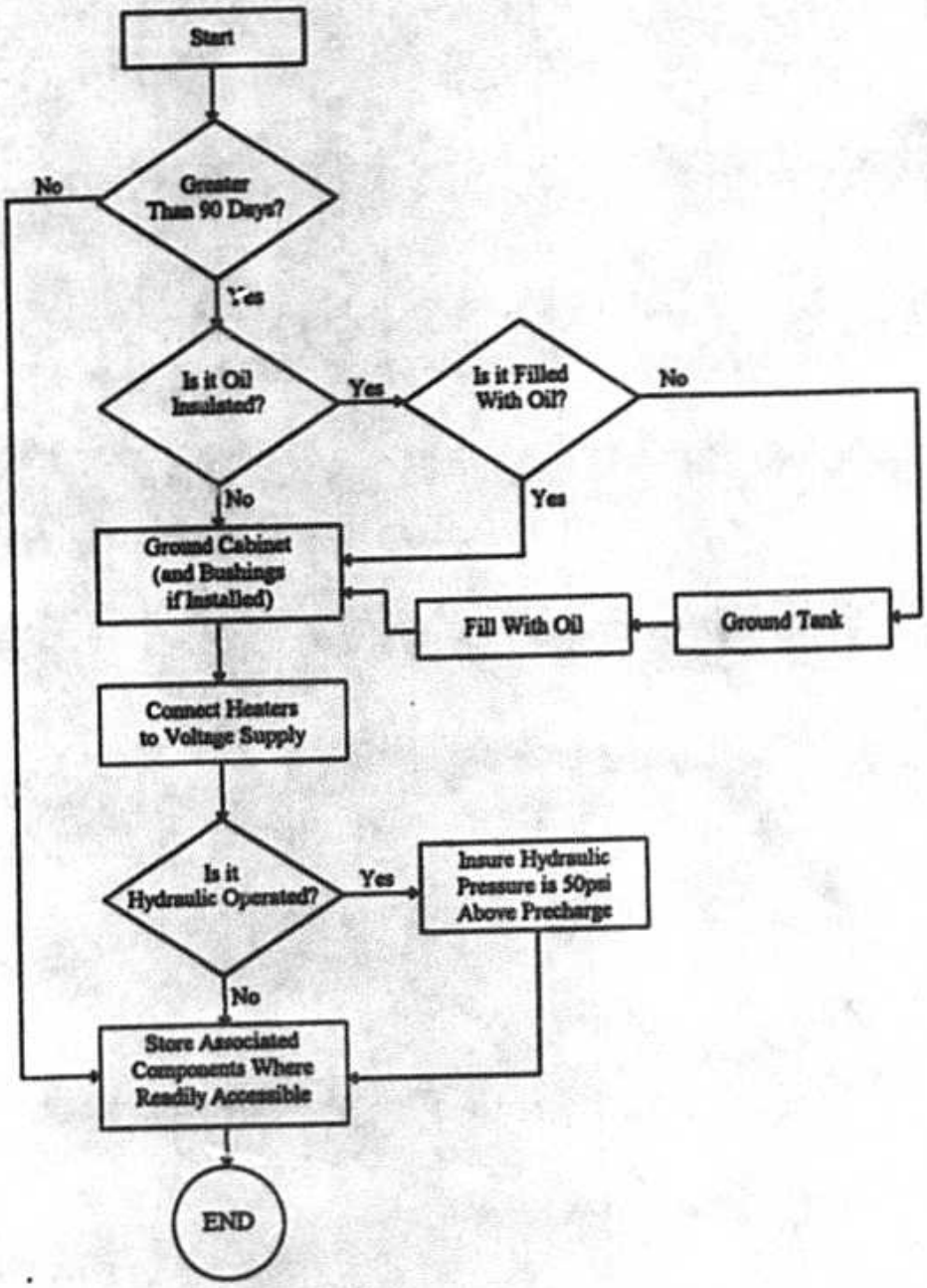
2. Ground tank, cabinet and bushings (if installed).

3. Connect heaters to supply voltage.

4. If equipped with a hydraulic operator be sure hydraulic pressure is a minimum of 50 psig above precharge pressure.

5. Store associated material where readily accessible.

STORAGE OF POWER CIRCUIT BREAKERS



the southern electric system

PROCEDURE FOR

SHIPPING

POWER CIRCUIT BREAKERS

DATE : 9/20/94

2L

SHIPPING POWER CIRCUIT BREAKERS

1.0 APPLICATION

This applies to all power circuit breakers

2.0 PREPARATION

1. Determine if disassembly is required for shipping. Disassemble as necessary. Block or secure internal parts as necessary.
2. Ensure breaker is in correct position for shipping.
3. Ensure stored energy device is discharged.
4. Ensure that breaker mechanism is blocked for shipping.
5. If SF_6 gas insulated equipment, ensure gas pressure is approximately 5 psig at 20° C.

3.0 LOADING

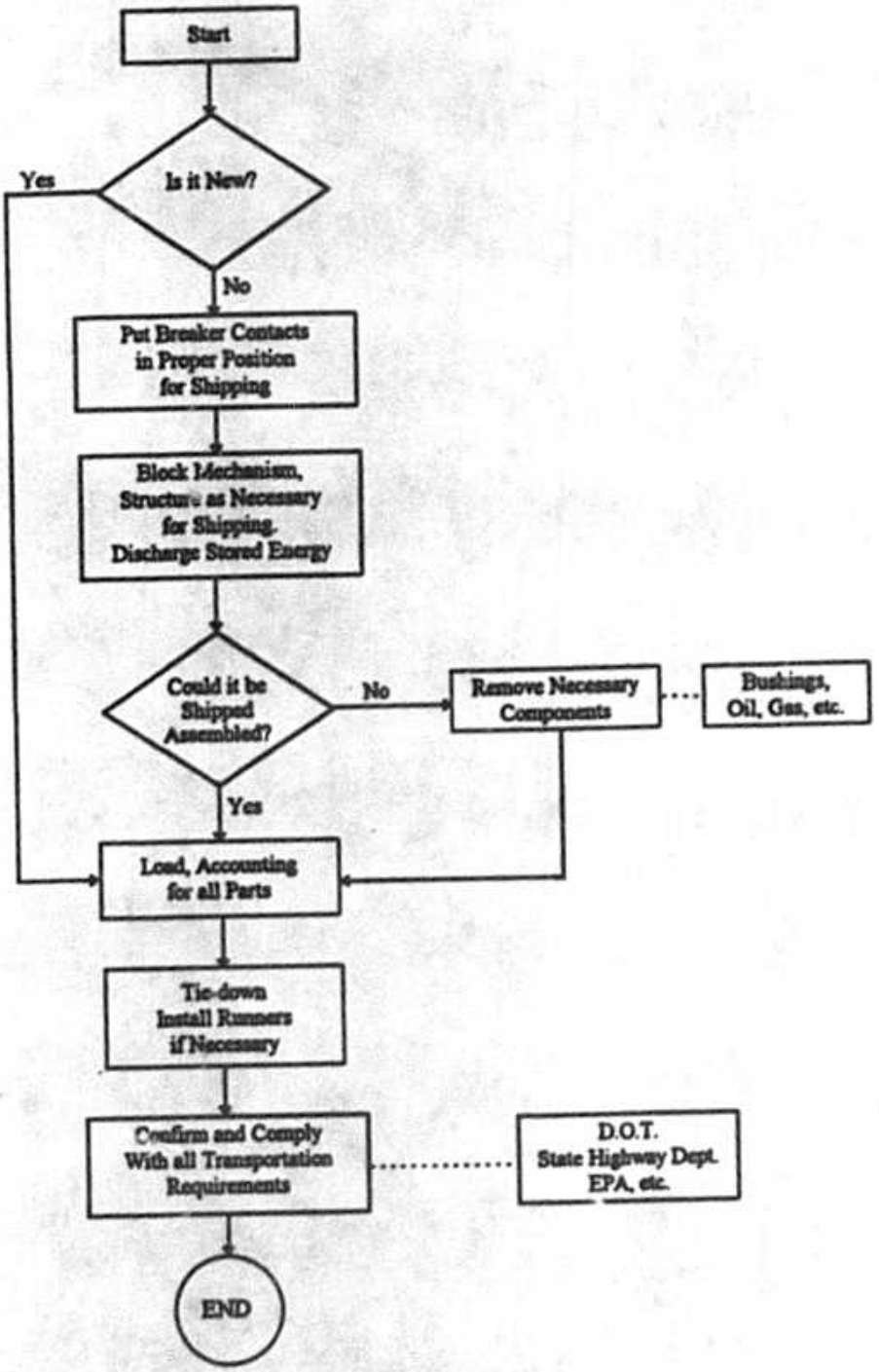
1. Load, accounting for all parts.
2. Secure load on transport.

NOTE: Install runners as required by authority.

4.0 CONFORMANCE

Before transporting the unit, confirm that all requirements of the permit have been met.

SHIPPING POWER CIRCUIT BREAKERS



the southern electric system

PROCEDURE FOR

THE

PREVENTATIVE DIAGNOSTIC

INSPECTION

OF

OIL CIRCUIT BREAKERS

DATE: 11/15/94

PREVENTATIVE DIAGNOSTIC INSPECTION OF OIL CIRCUIT BREAKERS

1.0 SCOPE

It is the intent of this procedure to include the operation and inspection of associated air break switches.

2.0 APPLICATION

This specification shall apply to oil circuit breakers with the following general ranges:

1. **VOLTAGE RANGE**
   4kV through 242kV

2. **CONTINUOUS CURRENT CAPABILITY**
   Through 3000 amperes

3. **INTERRUPTING CAPABILITY**
   Through 63 KA

3.0 GENERAL

1. **VISUAL INSPECTION**

   Perform a general visual inspection of the substation before proceeding with the detailed inspection of the breaker.

2. **FOUNDATION BOLTS**

   The breaker mounting bolts shall be visually inspected for tightness.

3. **GROUND CONNECTIONS**

   The breaker frame ground connections shall be visually inspected for tightness.

4.0 OIL TEST

Determine the dielectric strength of the insulating oil in each tank using the ASTM D-877 method. Tests below 22kV are **UNACCEPTABLE**.

Determine the color number of the oil in each tank. Values greater than 4 require are **UNACCEPTABLE**.

Unacceptable oil test results for breakers rated 69kV or below require an internal inspection.

Unacceptable oil test results for breakers rated greater than 69kV additional test to determine if an internal inspection is required or the oil requires filtering.

For these breakers, perform a contact resistance and a timing test. If the breaker fails either of these test, an internal inspection is required. If the breaker passes both of these test, filter the oil to acceptable oil test levels are obtained.

5.0 MECHANISM CABINET

Clean and inspect the cabinet thoroughly including the lubrication of all latches and hinges; the cabinet shall be weatherproof and all unnecessary holes patched. Any sign of water entry shall be corrected. Paint the mechanical trip handle red.

1. HEATERS

Inspect and replace damaged heaters and thermostats. For preset "button" type thermostats, cool the thermostat sufficiently to cause its contacts to close, then verify the heater function.

2. OPERATION COUNTER

Check the operation of the counter. Repair or replace as necessary.

3. HOUR METER

Check the operation of the hour meter, if equipped. Repair or replace as necessary.

4. WIRING

Low voltage control and C. T. wiring connections shall be checked for tightness. A visual inspection for damaged wire or corroded terminals shall be made. Correct problems as required.

6.0 BUSHINGS

Check the oil level in each bushing and if necessary top up with new or reconditioned oil that tests 30kV minimum using the D-1816 method.

7.0 OIL LEAKS

Check around bushings, manhole covers and drain valves for signs of leakage. Correct any leaks found.

8.0 TOUCH UP PAINT

Touch up paint any rusted areas as necessary.

9.0 OPERATING MECHANISM

1. GENERAL TO ALL OPERATING MECHANISM TYPES

Check for proper clearance on all moving parts and adjust per the instruction book. Insure that there is no binding in guides, supports, or adjacent frame members.

2. CLEANING AND LUBRICATION

Inspect the mechanism for abnormalities and lubricate with 300 viscosity refrigerant oil (SC00038572). Check all pins, bearings, and latches to insure that none are frozen, if any are found to be frozen, disassemble, clean and lubricate the part with Mobil 28 grease (SC00038220).

3. PNEUMATIC TYPE OPERATORS

1. CLOSING DASHPOT (G. E. ONLY)

In the open position, check fluid level, top with Exxon Univis J-13 (SC00038211) fluid if necessary. Check for proper operation.

2. PRESSURE SWITCH

Verify that the motor governor switch is operating correctly. Correct, if not.

3. LEAK

Repair leaks as required.

4. COMPRESSOR

The oil shall be changed in the compressor using SAE 20W motor oil (SC00038579) unless otherwise noted in the instruction book. Inspect the drive belt for wear and proper tension, replace and adjust as necessary. Change or clean the air intake filter as required. Drain moisture from air tank.

4. ~~HYDRAULIC TYPE OPERATORS~~

1. PRESSURE SWITCH

Verify motor governor switch is operating properly, correct as necessary.

2. LEAK

The areas around the ram, accumulator, and maintenance positioning valve (if equipped) shall be inspected for signs of leakage and corrected if necessary.

3. PRECHARGE PRESSURE

The precharge pressure shall be within a +/-50 psi tolerance of the correct pressure given in the instruction book.

NOTE: The pressure must be temperature corrected using the graph in the instruction book.

4. HYDRAULIC FLUID LEVEL

Check for proper fluid level and color; top up as necessary with EXXON UNIVIS J-13 (SC00038211) for all hydraulic mechanism other than Siemens which requires Aeroshell #4 (SC00038210).

10.0 TEST OPERATION

1. POWER CIRCUIT BREAKER RATED GREATER THAN 69KV

Before returning the breaker to service, verification of the proper operation of the breaker and of the supervisory control system shall be performed.

2. POWER CIRCUIT BREAKER RATED 69KV OR LESS

Before returning the breaker to service verify:

1. Reclose runs to lock-out
2. Non-reclosing function works
   a. Locally
   b. From supervisor control
3. Supervisor control of breaker

11.0 CAPACITOR TRIP DEVICE

Before returning the breaker to service, verify the capacitor trip device by removing A. C. control power for one minute and then trip the breaker. Correct if necessary.

CHECK LIST FOR THE PREVENTATIVE DIAGNOSTIC INSPECTION OF OIL CIRCUIT BREAKERS

COMPANY NO.:_____ DATE:_____
SUBSTATION:_____ SUBSTATION NO:_____
BREAKER SWITCH NO.:_____ CHECKED BY:_____

		CHECK IF O.K.
1.0	AIRBREAK SWITCHES	____
3.0	GENERAL TO ALL PREVENTATIVE DIAGNOSTIC INSPECTIONS	
	1. VISUAL INSPECTION	____
	2. FOUNDATION BOLTS	____
	3. GROUND CONNECTIONS	____
4.0	MECHANISM CABINET	____
	1. HEATERS	____
	2. COUNTER	____
	3. HOUR METER	____
	4. WIRING	____
5.0	BUSHINGS	____
6.0	OIL LEAKS	____
7.0	TOUCH-UP PAINT	____
8.0	OPERATING MECHANISMS	____
	1. GENERAL TO OPERATING MECHANISM TYPES	____
	2. CLEANING AND LUBRICATION	____
	3. PNEUMATIC TYPE	____
	1. CLOSING DASHPOT	____
	2. MOTOR GOVERNOR SWITCH	____
	3. LEAK	____
	4. COMPRESSOR	____
	4. HYDRAULIC TYPE	____
	1. MOTOR GOVERNOR SWITCH	____
	2. LEAK	____
	3. PRECHARGE PRESSURE	____
	4. FLUID LEVEL	____

CHECK LIST FOR THE PREVENTATIVE DIAGNOSTIC INSPECTION OF OIL CIRCUIT BREAKERS

9.0 OIL TEST

DIELECTRIC ____KV

COLOR # ____

10.0 OPERATIONAL TEST

GREATER THAN 69KV

1. STATION ____
2. SUPERVISORY ____

LESS THAN 69KV

1. RECLOSER LOCKOUT ____
2. NON-RECLOSING ____
3. SUPERVISORY ____

11.0 CAPACITOR TRIP ____

COMMENTS:

the southern electric system

PROCEDURE FOR

THE

PREVENTIVE DIAGNOSTIC INSPECTION

OF

OILLESS POWER CIRCUIT BREAKERS

THROUGH 69KV

DATE: 10/17/94

5. **HEATERS/FANS**

Inspect and replace damaged fans, heaters and thermostats.

NOTE: Do not open the high voltage compartment without first taking the necessary safety precautions.

6. **OPERATIONAL COUNTER**

Check the operation of the counter. Repair or replace as necessary.

7. **BUSHINGS**

All bushings shall be visually inspected for damage and cleanliness. Correct as necessary.

8. **WIRING**

Low voltage control and C. T. wiring connections shall be checked for tightness, wire damage or corrosion. Correct as necessary.

9. **FASTENERS**

All bolts, nuts, keepers, etc. in the low voltage compartment shall be checked for tightness.

10. **DASHPOT**

If contained in the low voltage compartment, check the dashpot for proper operation. Rebuild or replace as necessary.

11. **H.V. COMPARTMENT FILTERS**

Inspect the high voltage compartment filters from the low voltage compartment. Replace as necessary.

12. **CONTACT EROSION**

When accessible from the low voltage compartment, check the erosion of the contacts on all three bottles. Correct as necessary.

5.0 MECHANISM CABINET

Clean and inspect the cabinet thoroughly including the lubrication of all latches and hinges; the cabinet shall be weatherproof and all unnecessary holes patched. Any sign of water entry shall be corrected. Paint the mechanical trip handle red.

1. HEATERS

Inspect and replace damaged heaters and thermostats. For preset "button" type thermostats, cool the thermostat sufficiently to cause its contacts to close, then verify the heater function.

2. OPERATION COUNTER

Check the operation of the counter. Repair or replace as necessary.

3. HOUR METER

Check the operation of the hour meter, if equipped. Repair or replace as necessary.

4. WIRING

Low voltage control and C. T. wiring connections shall be checked for tightness. A visual inspection for damaged wire or corroded terminals shall be made. Correct problems as required.

6.0 TEST OPERATION

1. CAPACITOR TRIP DEVICE

With the breaker closed, remove power from the capacitor trip device. Wait one minute and then trip the breaker by the control handle. If the breaker does not open, then the capacitor trip device must be replaced.

2. TEST OPERATION

Before returning the breaker to service, verify:

1. Recloser runs to lockout.
2. Non reclosing function works
   1. Locally
   2. From supervisory control
3. Operating the breaker from SCADA.

PREVENTIVE DIAGNOSTIC INSPECTION OF OILLESS BREAKERS THROUGH 69KV

1.0 APPLICATION

This specification shall apply to vacuum, air and sealed bottle type SF_6 puffer circuit breakers with the following general ranges:

1. **MAXIMUM VOLTAGE**
   69kV

2. **CONTINUOUS CURRENT CAPABILITY**
   through 3000 amperes

3. **INTERRUPTING CAPABILITY**
   through 40kA

2.0 GENERAL

1. **VISUAL INSPECTION**

   Perform a general visual inspection of the substation before proceeding with the detailed inspection of the breaker.

2. **FOUNDATION BOLTS**

   The breaker mounting bolts shall be visually inspected for tightness.

3. **GROUND CONNECTION**

   The breaker frame grounding connections shall be visually inspected for tightness.

4. **CABINETS**

   Inspect the low voltage cabinets thoroughly including the lubrication of all latches and hinges. The cabinets shall be weatherproof, free of debris, and all unnecessary holes patched. Paint the mechanical trip handle red.

NOTE: Seal all exposed conduit openings.

5. HEATERS/FANS

Inspect and replace damaged fans, heaters and thermostats.

NOTE: Do not open the high voltage compartment without first taking the necessary safety precautions.

6. OPERATIONAL COUNTER

Check the operation of the counter. Repair or replace as necessary.

7. BUSHINGS

All bushings shall be visually inspected for damage and cleanliness. Correct as necessary.

8. WIRING

Low voltage control and C. T. wiring connections shall be checked for tightness, wire damage or corrosion. Correct as necessary.

9. FASTENERS

All bolts, nuts, keepers, etc. in the low voltage compartment shall be checked for tightness.

10. DASHPOT

If contained in the low voltage compartment, check the dashpot for proper operation. Rebuild or replace as necessary.

11. H.V. COMPARTMENT FILTERS

Inspect the high voltage compartment filters from the low voltage compartment. Replace as necessary.

12. CONTACT EROSION

When accessible from the low voltage compartment, check the erosion of the contacts on all three bottles. Correct as necessary.

3.0 OPERATING MECHANISM

1. GENERAL

Visually inspect the mechanism for abnormalities.

2. CLEANING AND LUBRICATION

Lubricate the mechanism with 300 viscosity refrigerant oil (SC00038572) unless otherwise noted. Check all pins, bearings, and latches to insure that none are frozen. If any are found to be frozen, disassemble, clean, and lubricate the part with Mobile # 28 grease (SC00038220) unless otherwise noted.

3. SPRING AND MOTOR CUTOFF

Check for proper spring charge cutout and motor cutoff as described in the instruction book.

4. PNEUMATIC OPERATORS

1. PRESSURE SWITCH

Verify that the motor governor switch is operating correctly. Correct, if not.

2. LEAKS

Repair leaks as required.

3. COMPRESSOR

The oil shall be changed in the compressor using SAE 20W motor oil (SC00038579) unless otherwise noted in the instruction book. Inspect the drive belt for wear and proper tension, replace and adjust as necessary. Change or clean the air intake filter as required. Drain moisture from air tank.

5.0 MECHANISM CABINET

Clean and inspect the cabinet thoroughly including the lubrication of all latches and hinges; the cabinet shall be weatherproof and all unnecessary holes patched. Any sign of water entry shall be corrected. Paint the mechanical trip handle red.

1. HEATERS

Inspect and replace damaged heaters and thermostats. For preset "button" type thermostats, cool the thermostat sufficiently to cause its contacts to close, then verify the heater function.

2. OPERATION COUNTER

Check the operation of the counter. Repair or replace as necessary.

3. HOUR METER

Check the operation of the hour meter, if equipped. Repair or replace as necessary.

4. WIRING

Low voltage control and C. T. wiring connections shall be checked for tightness. A visual inspection for damaged wire or corroded terminals shall be made. Correct problems as required.

6.0 TEST OPERATION

1. CAPACITOR TRIP DEVICE

With the breaker closed, remove power from the capacitor trip device. Wait one minute and then trip the breaker by the control handle. If the breaker does not open, then the capacitor trip device must be replaced.

2. TEST OPERATION

Before returning the breaker to service, verify:

1. Recloser runs to lockout.
2. Non reclosing function works
   1. Locally
   2. From supervisory control
3. Operating the breaker from SCADA.

CHECK LIST FOR THE PREVENTIVE DIAGNOSTIC INSPECTION OF OILLESS BREAKERS THROUGH 69KV

COMPANY NO.:_____ DATE:_____
SUBSTATION:_____ SUBSTATION NO:_____
BREAKER SWITCH NO.:_____ CHECKED BY:_____

	CHECK IF O.K.
2.0 VISUAL INSPECTION	____
1. BOLTS TIGHT	____
2. GROUND CONNECTIONS TIGHT	____
3. CABINETS	____
4. HEATERS	____
5. OPERATION COUNTER	____
6. BUSHINGS	____
7. WIRING	____
8. TIGHTNESS	____
9. DASH POT	____
10. FILTERS	____
11. CONTACT EROSION (IN.)	____ ____ ____
3.0 OPERATING MECHANISM	
1. GENERAL	____
2. CLEANING & LUBRICATION	____
3. SPRING & MOTOR CUT OFF	____ ____
4.0 PNEUMATIC MECHANISM	____
1. CLOSING DASHPOT	____
2. MOTOR GOVERNOR SWITCH	____
3. LEAK	____
4. COMPRESSOR	____
5.0 HYDRAULIC TYPE	____
1. MOTOR GOVERNOR SWITCH	____
2. LEAK	____
3. PRECHARGE PRESSURE	____
4. FLUID LEVEL	____

6.0 OPERATIONAL TESTS

1. CAPACITOR TRIP DEVICE ____
2. TEST OPERATION
   1. RECLOSER TO LOCKOUT ____
   2. NON-RECLOSING FUNCTION ____
   3. OPERATE FROM SCADA ____

COMMENTS:

the southern electric system

PROCEDURE FOR

THE

INTERNAL INSPECTION

OF

OIL CIRCUIT BREAKERS

115KV & ABOVE

DATE: 9/28/94

INTERNAL INSPECTION OF OIL CIRCUIT BREAKERS 115KV & ABOVE

1.0 APPLICATION

This specification applies to substation oil circuit breakers rated 115kV and above driven by the preventive diagnostic inspection or scheduled test with the following general ranges:

1. CONTINUOUS CURRENT CAPABILITY
   Through 3000 Amperes

2. INTERRUPTING CAPABILITY
   Through 63kV

2.0 VISUAL INSPECTION

Perform a general visual inspection of the substation before proceeding with the detailed inspection of the breaker.

3.0 PREPARATION

Prior to beginning the internal inspection, perform a contact resistance, motion analysis and power factor test. Transfer the insulating oil via filters into a suitable vessel (bladder or tank). Clean the inside of the breaker tanks with insulating oil and lint free cotton wipes.

4.0 MOISTURE

Inspect the area around the dome of the tank, including the bushings, level gauges, fill valves and all plugs for signs of moisture entry. Correct any leaks before proceeding. All gaskets shall be Armstrong NC-710 (SC000XXXXX) material. Spliced gaskets are not acceptable on bushing flanges.

5.0 OPERATING MECHANISMS

1. PNEUMATIC TYPE OPERATORS - PRESSURE SWITCH ADJUSTMENT

All pressure switch adjustments (motor governor, low pressure alarm, and low pressure cut-out) shall be set to a tolerance of +/- 5 psi of the nameplate value. The pressure gauge shall be verified using a gauge of known accuracy.

2. SPRING TYPE OPERATORS - SPRING CUTOUT AND MOTOR CUTOFF

Check for proper spring charge cutout and motor cutoff as described in the instruction book.

3. SOLENOID

Inspect solenoid for defects and abnormalities. Replace if necessary.

1. AGING RESISTOR

Check the ohmic value of the aging resistor. It shall be within 10% of the nameplate value. If no nameplate rating is given, record the measured value for future reference.

4. HYDRAULIC TYPE OPERATORS - PRESSURE SWITCH ADJUSTMENT

All pressure switch adjustments (motor governor, low pressure alarm, and low pressure cut-out) shall be set to a tolerance of +/- 25 psi of the nameplate value. The pressure gauge shall be verified using a gauge of known accuracy.

6.0 INTERRUPTING SYSTEM

1. INTERRUPTERS

Make an initial visual inspection of the contacts and grid plates. If the grid plates and contacts are satisfactory, complete disassembly is not required. If the condition of the contacts and grid plates cannot be visually determined, then disassemble to the point at which a visual determination can confirm the condition will be required.

2. CONTACTS

Inspect the moving and stationary contacts for wear and arc erosion. The contacts shall be considered usable if:

1. proper penetration or compression can be attained and,

2. resistance is within the limits given in the CONTACT RESISTANCE STANDARDS and,

3. the contact current carrying surface is not eroded more than 50 percent from its original surface.

Excluding the A.C./SIEMENS (all), PENN/TRAN (all), and the WESTINGHOUSE (GMB63), removal of the interrupters will only be necessary if the stationary contacts and intermediate contacts (if equipped) are <u>not</u> visible by removing the arcing probes, exhaust plates, etc. or by means of an inspection mirror. Upon reinstallation, care must be taken to assure alignment of the moving contact with the interrupter throughout the entire travel of the moving contact.

NOTE: An example of this case would be the G.E. type FK-439-115 breaker in which case the moving contact internal to the interrupter must be removed in order to view the stationary contacts.

3. LIFTRODS

The liftrods shall be inspected for cracks, breaks, and evidence of moisture. An insulation test using at least 1000 volt insulation tester shall be performed and resistances below 10,000 megohms for 115kV through 230kV shall be considered **UNACCEPTABLE**. Moisture damaged rods shall be dried and retested or replaced as necessary.

Proper liftrod travel, as outlined in the correct breaker instruction book, shall be per the specified limits.

Finally, proper liftrod alignment in the guide shall be assured before proceeding. This shall include two items:

1. The liftrod shall be free to hang level without hindrance of the guide.

2. There shall be 1/16 inch minimum clearance on all sides of the liftrod guide.

4. LIFTROD GUIDES

The liftrod guides shall be inspected for cracks, breaks, evidence of moisture and binding. An insulation test using at least a 1000 volt insulation tester shall be performed and resistances below 10,000 megohms shall be considered **UNACCEPTABLE**. Moisture damaged guides shall be dried and retested or replaced as necessary.

5. **OPENING DASHPOTS**

Check the opening dashpots for proper operation. Rebuild if the evidence of leakage is present. Replace if the evidence of binding is present.

6. **TANK LINERS (IF EQUIPPED)**

Liners shall be visually inspected for cracks and evidence of moisture. If questionable, replace.

7. **GRADING RESISTORS (IF EQUIPPED)**

Check the ohmic value of each resistor. Resistors within a phase shall have ohmic values within 10 percent of each other.

NOTE: Former capacitor bank breakers in the 115kV class may have resistor values different from the values given in the instruction book.

8. **BELL CRANK**

Check the toggle and/or alignment measurement if applicable, correct if necessary.

9. **POLE TOP ASSEMBLIES**

Verify the toggle measurements if applicable, correct if necessary

10. **OVER TRAVEL AND LIFTROD STOPS**

Measure the clearance of the stops as outlined in the correct breaker instruction book. If any are found out of adjustment, consult the instruction book for the proper method of resetting.

11. CONTACT RESISTANCE

Before filling with oil, measure the contact resistance. Compare the readings obtained to the limits given in the CONTACT RESISTANCE STANDARDS publication. Readings not complying with these standards are UNACCEPTABLE and shall be investigated for cause and repairs made.

NOTE: Steps may be necessary to isolate the circuit breaker from the differential scheme if so equipped.

12. REFILLING WITH INSULATING OIL

Before closing the breaker door, make certain that no foreign objects have been left behind. Check door gasket and if necessary, replace with Armstrong Type NC-710 or other acceptable gasket material. (Scarfed joints are acceptable at this location). Lubricate the door gasket with a light coat of neutral vaseline for corkprene, gaskets silicon if rubber gaskets, before final closing. Fill the breaker with insulating oil via filters.

7.0 OPERATIONAL TESTS

1. INSULATION RESISTANCE

Test the insulation resistance of the breaker using at least a 1000 volt insulation tester. Readings below 10,000 megohms are UNACCEPTABLE and shall be corrected before proceeding.

2. OIL TESTS

Test the dielectric strength of the insulating oil in each tank using the ASTM D-877 method. Oil testing less than 30kV is UNACCEPTABLE and shall be filtered until the test value is acceptable. Test oil color using color comparator. Test greater than 2.5 require further filtering of oil.

3. REFILLING DASHPOTS

The OCB shall be manually slow operated 2 times to insure that the opening dashpots have been refilled with oil.

NOTE: This step is not necessary for OCB'S with sealed type dashpots.

8.0 MOTION ANALYSIS

Motion analysis shall be performed on all breakers covered under this specification. Recorder charts shall contain the following:

1. Close-open or trip free line
2. Open-close or reclose line
3. Trip Line
4. Close Line
5. Low pressure close line
6. Main contact indication

9.0 TEST OPERATION

Before returning the breaker to service, verification of the proper operation of the breaker and of the SCADA system shall be performed.

COMPANY NO.:_____ DATE: _____

SUBSTATION: _____ SUBSTATION NO.: _____

BREAKER SWITCH NO.:_____ CHECKED BY: _____

(CHECK IF O.K.)

2.0 VISUAL INSPECTION

3.0 PREPARATION ____

CONTACT RESISTANCE (AS FOUND) (μΩ) ____ ____ ____

INSULATION RESISTANCE (AS FOUND) (MΩ) ____ ____ ____

CLEAN TANKS ____

4.0 MOISTURE ____

5.0 OPERATING MECHANISM

1. PNEUMATIC TYPE OPERATORS - PRESSURE SWITCH ADJUSTMENT ____
2. SPRING TYPE OPERATORS - SPRING CUTOUT AND MOTOR CUTOFF ____
3. SOLENOID OPERATOR ____
   1. AGING RESISTOR ____
4. HYDRAULIC TYPE OPERATORS - PRESSURE SWITCH ADJUSTMENT ____

5.0 INTERRUPTING SYSTEM

1. INTERRUPTERS ____
2. CONTACTS ____
3. LIFTRODS ____
4. LIFTROD GUIDES ____
5. DASHPOTS ____
6. TANK LINERS ____
7. GRADING RESISTORS (Ω) ____
8. BELL CRANK ____
9. POLE TOP ASSEMBLIES ____
10. STOPS (OPEN) ____
    (CLOSED) ____
11. CONTACT RESISTANCE (μΩ) (AS LEFT) ____ ____ ____
12. REFILLING PROCESS ____

4.0 OPERATIONAL TESTS

1. INSULATION RESISTANCE (MΩ) (AS LEFT) ____ ____ ____
2. OIL TESTS (KV) ____ ____ ____
3. COLOR (NUMBER) ____
4. REFILLING THE DASHPOTS ____
5. TIMING TESTS
   1. TRIP TEST (PART TIME, FEET/SEC) ____ / ____
   2. CLOSE TEST (TOTAL CLOSE TIME, FEET/SEC) ____ / ____
   3. CLOSE-OPEN TEST (MAKE TIME) ____
   4. OPEN-CLOSE TEST (CYCLES) ____
   5. LOW PRESSURE CLOSE TEST ____
   6. CONTACT INDICATION (IN) ____ ____ ____

COMMENTS _____

the southern electric system

PROCEDURE FOR

THE

INTERNAL INSPECTION

OF

OIL CIRCUIT BREAKERS

THROUGH 69KV

DATE: 10/17/94

INTERNAL INSPECTION OF OIL CIRCUIT BREAKERS THROUGH 69KV

1.0 APPLICATION

This specification shall apply to oil circuit breakers through 69kV with the following general ranges as driven by a preventive diagnostic inspection.

1. Maximum Voltage
   69kV

2. Continuous Current Capability
   through 3000 amperes

3. Interrupting Capability
   through 40 kA

2.0 VISUAL INSPECTION

Perform a general visual inspection of the substation and a detailed inspection of the breaker.

1. POLE TOP ASSEMBLIES

Inspect and lubricate all bearings, including the bell crank, in the pole top assemblies. Use 300 viscosity refrigerant oil (SC00038572) for lubrication. Inspect all visible pins, locknuts, bushings, etc. and check for tightness and/or damage. Relubricate the cover gasket with a light coat of vaseline (SC00038223) for corkprene, silicon for rubber gaskets.

2. BUSHINGS

Check all lead connections for tightness. If necessary, paint the bushing caps. Check the porcelain for cleanliness. Correct as required.

3.0 TANKS

Remove the insulating oil into an appropriate storage vessel through oil filters. Clean the inside of the tank with insulating oil using lint free cloths. Inspect the bushings, level gauges, fill valves, pipe plugs, etc. for signs of water entry. Regasket, rebuild, or replace as necessary.

52

4.0 INTERRUPTING SYSTEM

1. FASTENERS

All bolts, nuts, or other fasteners on bushings, liftrods, guides, etc. shall be checked for tightness by using the appropriate wrench.

2. INTERRUPTERS (Siemens SDO, ITE KS)

Identify by location, then remove, disassemble, and clean the interrupters (shell and grid plates) with clean insulating oil. Measure the throat of each grid plate and replace if eroded more than 0.125 inches. Using the specific breaker instruction book as a guide, reassemble the interrupter grid plates. **REASSEMBLY IN THE REVERSE ORDER OF DISASSEMBLY MAY NOT BE CORRECT.** Upon reinstallation of the interrupters, care must be taken to assure alignment of the moving contact with the interrupter throughout the entire travel of the moving contact.

All Others:
Clean the interrupters thoroughly by flowing insulating oil into the top and side orifices so as to flush the interrupter of carbon and arc by-products. After cleaning, check the baffle stacks for tightness.

3. CONTACTS

Inspect the moving and stationary contacts (see note below) for wear and/or erosion. The contacts shall be considered usable if:

1. proper alignment and penetration or compression can be attained and,
2. resistance is within the limits given in the CONTACT RESISTANCE STANDARD and,
3. the contact current interrupting surface is not eroded more than 50% from its original surface.

NOTE: Removal of the interrupters will only be necessary if the stationary contacts are not visible by removing the arcing probe or by means of an inspection mirror. Upon reinstallation, care must be taken to assure alignment of the moving contact with the interrupter throughout the entire travel of the moving contact.

4. LIFTRODS

Liftrods shall be inspected for cracks, breaks, and evidence of moisture. An insulation test using at least a 1000 volt insulation tester shall be performed and resistance below 2,000 megohms shall be considered UNACCEPTABLE. Moisture damaged rods shall be replaced as necessary. Proper liftrod travel, as outlined in the instruction book, shall be checked to the specified limits. Finally, proper liftrod alignment in the guide shall be assured before proceeding with the inspection. This shall include two items:

1. The liftrod shall be free to hang level without hindrance of the guide.

2. There shall be approximately 1/16" clearance on all sides of the liftrod guide.

5. LIFTROD GUIDES

Liftrod guides shall be checked for cracks, breaks, and evidence of moisture and binding. An insulation test using at least a 1000 volt insulation tester shall be performed and resistance below 2,000 megohms shall be considered UNACCEPTABLE. Moisture damaged guides shall be replaced as necessary.

6. DASHPOTS (IN TANK)

Check the opening dashpots to insure plunger operates freely and properly. Rebuild or replace as necessary.

7. TANK LINERS

Liners shall be visually inspected for cracks and evidence of moisture. If questionable, replace.

8. GRADING RESISTORS (IF EQUIPPED)

Check the ohmic value of each resistor. Resistors within a phase shall have ohmic values within 10 percent of each other.

5.0 OPERATING MECHANISMS

1. PNEUMATIC TYPE OPERATORS - PRESSURE SWITCH ADJUSTMENT

All pressure switch adjustments (motor governor, low pressure alarm, and low pressure cut-out) shall be set to a tolerance of +/- 5 psi of the nameplate value. The pressure gauge shall be verified using a gauge of known accuracy.

2. SPRING TYPE OPERATORS - SPRING CUTOUT AND MOTOR CUTOFF

Check for proper spring charge cutout and motor cutoff as described in the instruction book.

3. SOLENOID

Inspect solenoid for defects and abnormalities. Replace if necessary.

1. AGING RESISTOR

Check the ohmic value of the aging resistor. It shall be within 10% of the nameplate value. If no nameplate rating is given, record the meacured value for future reference.

4. HYDRAULIC TYPE OPERATORS - PRESSURE SWITCH ADJUSTMENT

All pressure switch adjustments (motor governor, low pressure alarm, and low pressure cut-out) shall be set to a tolerance of +/- 25 psi of the nameplate value. The pressure gauge shall be verified using a gauge of known accuracy.

6.0 OPERATIONAL TESTS

1. OVERTRAVEL AND LIFTROD STOPS (if equipped)

Measure the clearance of the stops as outlined in the instruction book.

2. CONTACT WIPE

Measure the electrical wipe of each contact. Most instruction books give a minimum acceptable dimension for this. Ascertain that the moving contact is properly aligned with the stationary contact.

3. CONTACT RESISTANCE

Before filling with oil, measure the contact resistance. Compare the readings obtained to the limits given in the CONTACT RESISTANCE STANDARDS publication. Readings not complying with these standards are UNACCEPTABLE and shall be investigated for cause and repairs made.

NOTE: Steps may be necessary to isolate the circuit breaker from the differential scheme, if so equipped.

4. INSULATION RESISTANCE

After refilling the breaker through oil filters, check the insulation resistance of the breaker using at least a 1000 volt insulation resistance tester. Readings below 2,000 megohms are UNACCEPTABLE and shall be investigated for cause so that repairs can be made.

NOTE: Some older breakers covered under this specification will not test 2000 megohms. In these rare cases, historical data and experience should serve as a guide.

7.0 OIL TEST

Test the dielectric strength of the insulating oil in each tank using the ASTM D-877 method. Tests below 30KV are UNACCEPTABLE and the oil shall be filtered until the test value is acceptable. Test oil color using color comparator. Test greater than 2.5 require further filtering of oil.

8.0 OIL LEAKS

Check around all oil tank flanges and drain valves for signs of leakage. Correct any leak found.

9.0 REFILLING DASHPOT(S)

The OCB shall be manually slow closed twice to insure that the opening dashpot(s) have been refilled with oil.

NOTE: This step is not necessary for OCB's with sealed type dashpots.

10.0 FUNCTIONAL TEST

Before proceeding to the Timing Tests section, the breaker must be operated electrically, including:

1. Open
2. Close
3. Open-close (reclose)

1. ANTI-PUMP SCHEME

Verify the operation of the anti-pump scheme.

2. TIMING TESTS

NOTE: If problems are detected in the timing test that are not readily solved, a motion analysis test may be required to detect the problem.

If the OCB has a pneumatic or hydraulic operator, perform the following timing test:

1. Trip Time
2. Close Time
3. Close-open (Tripfree) Time
4. Open-close (Reclose) Time
5. Low pressure close time (if pneumatic operator)
6. Main contact indication (all three phases)

If the OCB had burned baffle plates in the interrupters or other significant evidence is found indicating that the breaker is probably slow, perform a timing test for the breaker trip time. Experience has shown that the SDO, KS, OZ are most susceptible to burning because of slow speeds.

3. TEST OPERATION

Before returning the breaker to service, verify

1. Recloser runs to lock out,
2. Non-reclosing function works locally and from supervisory control,
3. Supervisory, control of breaker

COMPANY NO.:_____ DATE: _____

SUBSTATION: _____ SUBSTATION NO.: _____

BREAKER SWITCH NO.:_____ CHECKED BY: _____

	CHECK IF O.K.
2.0 VISUAL INSPECTION	____
1. POLE TOP ASSEMBLIES	____
2. BUSHINGS	____
3.0 TANKS	____
4.0 INTERRUPTING SYSTEM	
1. FASTENERS	____
2. INTERRUPTERS	____
3. CONTACTS	____
4. LIFTRODS	____ ____ ____
5. LIFTROD GUIDES	____ ____ ____
6. DASHPOTS (IN TANK)	____ ____ ____
7. TANK LINERS	____ ____ ____
8. RESISTORS	____ ____ ____
5.0 OPERATING MECHANISM	
1. PNEUMATIC TYPE OPERATORS - PRESSURE SWITCH ADJUSTMENT	____
2. SPRING TYPE OPERATORS - SPRING CUTOUT AND MOTOR CUTOFF	____
3. SOLENOID OPERATOR	____
1. AGING RESISTOR	____
4. HYDRAULIC TYPE OPERATORS - PRESSURE SWITCH ADJUSTMENT	____
6.0 OPERATIONAL TEST	
1. OVERTRAVEL AND LIFTROD STOPS	____
2. CONTACT WIPE	____
3. CONTACT RESISTANCE (MICROHMS)	____ ____ ____
4. INSULATION RESISTANCE (MEGOHMS)	____ ____ ____

CHECKLIST FOR THE COMPLETE INSPECTION OF OIL CIRCUIT BREAKERS THROUGH 69KV

	kV	kV	kV
7.0 OIL TEST (D-877)			
OIL COLOR			
8.0 OIL LEAKS			
9.0 REFILL DASHPOTS			
10.0 FUNCTIONAL TEST			
1. OPEN			
2. CLOSE			
3. OPEN - CLOSE (RECLOSE)			
1. ANTI-PUMP SCHEME			
2. TIMING TEST			
3. TEST OPERATION			
1. RECLOSER TO LOCKOUT			
2. NON-RECLOSING			
1. LOCALLY			
2. SUPERVISORY			
3. SUPERVISORY			

COMMENTS: _____

44

the southern electric system

PROCEDURE FOR THE INTERNAL INSPECTION OF OILLESS CIRCUIT BREAKERS THROUGH 69kV

DATE: 10/17/94

65

INTERNAL INSPECTION OF OILLESS POWER CIRCUIT BREAKERS THROUGH 69KV

1.0 APPLICATION

This specification shall apply to vacuum, air, and sealed bottle type SF_6 puffer circuit breakers as required by a preventive diagnostic inspection with the following general ranges:

1. Maximum Voltage
   69kV

2. Continuous Current Capability
   through 3000 amperes

3. Interrupting Capability
   through 40 KA

2.0 VISUAL INSPECTION

Perform a general visual inspection of the substation before proceeding with the detailed inspection of the breaker.

1. FOUNDATION BOLTS

The breaker mounting bolts shall be visually inspected for tightness.

2. GROUND CONNECTION

The breaker frame grounding connections shall be visually inspected for tightness.

3.0 CABINETS

Inspect the high and low voltage cabinets and gaskets thoroughly including the lubrication of all latches and hinges. The cabinets shall be weather proof, free of debris, and all unnecessary holes patched. Paint the mechanical trip handle red.

NOTE: Seal all exposed conduit openings.

1. HEATERS/FANS

Inspect and replace damaged fans, heaters and thermostats.

66

2. OPERATIONAL COUNTER

Check the operation of the counter. Repair or replace as necessary.

3. WIRING

Low voltage control and C. T. wiring connections shall be checked for tightness and corrosion. All wiring harnesses, especially the ones in the high voltage compartment, shall be inspected for tightness and/or damage. Tighten or replace any damaged harnesses.

4. BUSHINGS

All bushings and stand-off insulators shall be visually inspected for damage and cleanliness. Correct any deficiencies before proceeding with inspection. If necessary, clean the porcelain.

5. FASTENERS

All bolts, nuts, keepers, etc., on bushings, bottles, push rods, shunts, etc. shall be checked for tightness.

NOTE: Do not twist the end of the vacuum bottle as this may cause damage to the bellows.

6.0 DASH POT

Check the dash pot for proper operation. Rebuild or replace as necessary.

7.0 FILTERS

Service the high voltage compartment filters by either cleaning or replacing the element.

8.0 CONTACT RESISTANCE

The contact resistance shall be measured. Compare the readings obtained to the limits given in the CONTACT RESISTANCE STANDARDS procedure. Readings not complying with these standards are **UNACCEPTABLE** and shall be investigated for cause and repairs made.

NOTE: Steps may be necessary to isolate the circuit breaker from the differential scheme if so equipped.

9.0 INSULATION RESISTANCE

With the breaker closed, check the insulation resistance of the breaker using at least a 1000V insulation tester. Readings below 10,000 megohms are **UNACCEPTABLE** and shall be investigated for cause and repairs made.

10.0 OVERTRAVEL

Check contact spring overtravel as described in the instruction book. Correct if necessary.

NOTE: Some SF_6 breakers do not have this feature.

11.0 CONTACT EROSION

Check contact erosion on each bottle.* Change bottle if eroded more than .125 inches. (VACUUM ONLY)

NOTE: Some newer design vacuum and SF_6 bottles have scribe marks on the contact rod or bottle stem for erosion indication.

12.0 CONTACT TRAVEL

Check the travel of the moving contacts on all three bottles. Adjust if necessary for the proper travel as outlined in the instruction book.

GP

13.0 MECHANISM GENERAL

Check for proper clearance on all moving parts and adjust per the instruction book. Insure that there is no binding in guides, supports, or adjacent frame members.

14.0 CLEANING AND LUBRICATION

Inspect the mechanism for abnormalities and lubricate with 300 viscosity refrigerant oil (SC00038572) unless otherwise noted. Check all pins, bearings, and latches to insure that none are frozen. If any are found to be frozen, disassemble, clean, and lubricate the part with Mobil # 28 (SC00038220) unless otherwise noted.

15.0 SPRING AND MOTOR CUTOFF

Check for proper spring charge cutout and motor cutoff as described in the instruction book.

16.0 CAPACITOR TRIP DEVICE

With the breaker closed, remove power from the capacitor trip device. Wait one minute and then trip the breaker by the control handle. If the breaker does not open, then the capacitor trip device must be repaired.

17.0 ANTI-PUMP SCHEME

Verify the operation of the anti-pump scheme.

18.0 TEST OPERATION

Before returning the breaker to service, verification of the proper operation of the breaker and of the SCADA system shall be performed. This will include:

1. Test the Recloser to lockout.
2. Verifying the non reclosing function.
3. Operate the breaker from SCADA.

CHECKLIST FOR THE INTERNAL INSPECTION OF OILLESS POWER CIRCUIT BREAKERS THROUGH 69KV

COMPANY NO.:_____ DATE: _____
SUBSTATION: _____ SUBSTATION NO.: _____
BREAKER SWITCH NO.:_____ CHECKED BY: _____

	(CHECK IF O.K.)
2.0 VISUAL INSP.	____
1. FOUNDATION BOLTS TIGHT	____
2. GROUND CONNECTIONS TIGHT	____
3.0 CABINETS	____
1. HEATERS/FANS	____
2. OPERATION COUNTER	____
3. WIRING	____
4.0 BUSHINGS	____
5.0 FASTENERS	____
6.0 DASH POT	____
7.0 FILTERS	____
8.0 CONTACT RESISTANCE (μΩ)	____ ____ ____
9.0 INSULATION RESISTANCE (MΩ)	____ ____ ____
10.0 OVERTRAVEL (IN.)	____ ____ ____
11.0 CONTACT EROSION (IN.)	____ ____ ____
12.0 CONTACT TRAVEL (IN.)	____ ____ ____
13.0 MECHANISM	____
14.0 CLEANING AND LUBRICATION	____
15.0 SPRING AND MOTOR CUTOFF	____
16.0 CAPACITOR TRIP DEVICE	____
17.0 ANTI-PUMP SCHEME	____

7.

18.0 TEST OPERATE

1. RECLOSE TO LOCKOUT ____
2. NON RECLOSING ____
   1. LOCAL ____
   2. SUPERVISORY ____
3. SUPERVISORY CONTROL ____

COMMENTS:

91

the southern electric system

PROCEDURE FOR THE PREVENTIVE DIAGNOSTIC INSPECTION OF SWITCHGEAR BREAKERS

DATE: 10/11/94

PREVENTIVE DIAGNOSTIC INSPECTION OF SWITCHGEAR BREAKERS

1.0 APPLICATION

This specification shall apply to vacuum and air switchgear breakers with the following general ranges:

2.0 GENERAL

1. VISUAL INSPECTION

Perform a general visual inspection of the substation before proceeding with the detailed inspection of the breaker.

2. SWITCHGEAR HOUSING

1. Inspect the condition of the switchgear housing including the lubrication of all latches and hinges. The cabinets shall be weatherproof, free of debris, and all unnecessary holes patched.

NOTE: Seal all exposed conduit openings.

2. Inspect compartment filters, clean or replace as necessary.

NOTE: Do not open the high voltage compartment without first taking the necessary precautions.

3. GROUND CONNECTION

The housing frame grounding connections shall be visually inspected for tightness.

4. PRIMARY DISCONNECTS

1. Remove breaker from service.
2. Disconnect operating power.
3. Remove breaker from cubical.
4. Inspect primary stabs on breaker and behind shutters on switchgear for corrosion or damage.

NOTE: Shutters cover energized parts.

5. Lubricate stabs on breaker when necessary with (SC0000XXXXX).

73

5. **SECONDARY DISCONNECTS**

Inspect low voltage disconnects for corrosion or damage.

6. **RACKING MECHANISM**

Inspect racking mechanism for proper operation and lubricate if necessary.

7. **HEATERS**

Inspect and replace damaged heaters and thermostats.

NOTE: Do not open the high voltage compartment without first taking the necessary precautions.

8. **CLEANING**

Clean breaker and cubical as necessary.

9. **BUSHINGS**

All bushings shall be visually inspected for damage and cleanliness. Correct as necessary.

10. **WIRING**

Low voltage control and C. T. wiring connections shall be visually checked for tightness, wire damage or corrosion. Correct as necessary.

11. **FASTENERS**

All bolts, nuts, keepers, etc. in the cubical and on the breaker shall be checked for tightness.

NOTE: Perform a visual inspection of fasteners near energized parts.

12. **ELECTRICAL TESTS**

1. Perform an insulation resistance test.
2. Perform a digital low resistance ohmmeter test.

3.0 OPERATING MECHANISM

1. GENERAL

Visually inspect the mechanism for abnormalities.

2. CLEANING AND LUBRICATION

Lubricate the mechanism with 300 viscosity refrigerant oil (SC00038572) unless otherwise noted. Check all pins, bearings, and latches to insure that none are frozen. If any are found to be frozen, disassemble, clean, and lubricate the part with Mobile # 28 grease (SC00038220) unless otherwise noted.

3. SPRING OPERATOR

Check for proper spring charge cutout and motor cutoff as described in the instruction book, if equipped.

4. HYDRAULIC OPERATOR

1. Check cubical for signs of leaks and repair as necessary.
2. Check fluid level.
3. Check precharge.

4.0 AIR CIRCUIT BREAKERS

Inspect arc chutes for damage.

5.0 VACUUM BREAKERS

1. CONTACT EROSION

Visually check the erosion of the contacts on all three bottles. Correct as necessary.

2. HIGH POTENTIAL TESTING

Perform a high potential test on any bottles that were not found in service.

6.0 TEST OPERATION

1. TEST OPERATION

1. Place breaker in test position.
2. Restore operating power.
3. Operate breaker electrically and manually; observe to detect any electrical or mechanical malfunction.
4. Before returning the breaker to service, verify:
   1. Recloser runs to lockout.
   2. Non reclosing function works:
      a. Locally
      b. From supervisory control
   3. Operating the breaker from SCADA.

2. OPERATIONAL COUNTER

Check the operation of the counter. Repair or replace as necessary.

PREVENTIVE DIAGNOSTIC INSPECTION OF SWITCHGEAR BREAKERS

COMPANY NO.:_____ DATE:_____
SUBSTATION:_____ SUBSTATION NO:_____
BREAKER SWITCH NO.:_____ CHECKED BY:_____

GENERAL

1. VISUAL INSPECTION _____
2. SWITCHGEAR HOUSING
   1. CABINET CONDITION _____
   2. FILTERS _____
3. GROUND CONNECTION _____
4. PRIMARY DISCONNECTS _____
5. SECONDARY DISCONNECTS _____
6. RACKING MECHANISM _____
7. HEATERS _____
8. CLEANING _____
9. BUSHINGS _____
10. WIRING _____
11. FASTENERS _____
12. ELECTRICAL TESTS
    1. INSULATION RESISTANCE _____
    2. LOW RESISTANCE OHMMETER _____

OPERATING MECHANISM

1. VISUAL INSPECTION _____
2. LUBRICATION _____
   1. SPRING CHARGE AND MOTOR _____
   2. HYDRAULICS
      1. LEAKS _____
      2. FLUID LEVEL _____
      3. PRECHARGE _____

ACB

1. ARC CHUTES _____

77

PREVENTIVE DIAGNOSTIC INSPECTION OF SWITCHGEAR BREAKERS

VCB

1. CONTACT EROSION _____
2. HIPOT _____

TEST OPERATION

1. TEST OPERATION COUNTER _____

COMMENTS: _____

the southern electric system

PROCEDURE FOR THE RECEIVING INSPECTION OF FREE BREATHING POWER TRANSFORMERS

DATE: 10/18/94

RECEIVING INSPECTION FOR FREE BREATHING POWER TRANSFORMERS

1.0 IMPACT RECORDER INSPECTION

1. Notify appropriate parties of inspection.

2. Determine if transformer should have been shipped with an impact recorder (normally transformers shipped by rail or larger than 50 MVA). If it should have and none is found, seek assistance.

3. If equipped with an impact recorder, inspect chart and notify appropriate authority for excursions outside zone 3, failure of recorder to run entire trip, or other irregularities of recorder.

2.0 EXTERNAL PHYSICAL INSPECTION

1. Check exterior of transformer for damage.

2. Check condition of accessories; be sure accessories are accounted for (Bill of Lading).

3. Report any damage prior to unloading, notify appropriate authority.

3.0 OIL FILLED

1. If oil filled determine:

    1. Oil Dielectric by ASTM D-877 should be equal to or greater than 22kV.
    2. Oil color by ASTM D-1500 should be equal to or less than 3.0. If this test fails, compare to previous readings to determine if further action is required.

2. If not oil filled, proceed to internal inspection.

4.0. INTERNAL INSPECTION:

1. Check gases for personnel entry.

2. Prepare for entry into transformer. Take all necessary precautions.

3. Check core ground with an insulation resistance test set set at 500 volts. Notify appropriate authority if reading is less than 100 megohms.

80

4. Visually inspect:

    1. Gaskets.
    2. Core steel and coils.
    3. Lead insulation.
    4. Blocking and clamping.
    5. C.T. leads and junction box/block.
    6. No load tap changer.
    7. For foreign material/objects in tank.
    8. Interior of tank for evidence of flashovers, rust.
    9. Check oil level gauge for proper operation.

5. Report any discrepancies to appropriate personnel.

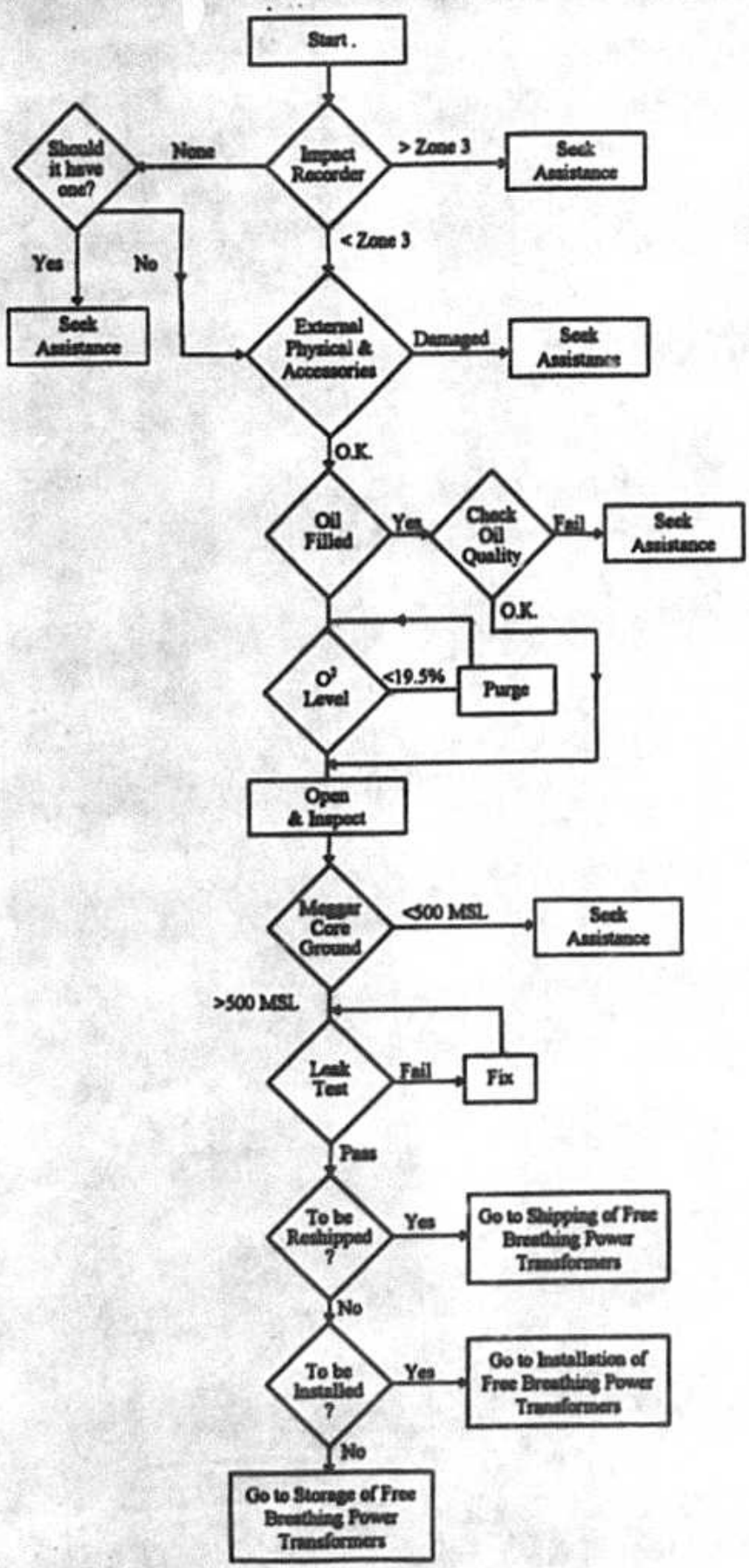
6. Reseal and secure transformer after inspection.

7. Unload transformer.

5.0. TRANSFORMER ASSIGNMENT

1. If transformer is not to be placed in service, go to STORAGE OF FREE BREATHING POWER TRANSFORMER procedure.

2. If transformer is to be placed in service, go to INSTALLATION OF FREE BREATHING POWER TRANSFORMER procedure.


Start .
Should it have one?
None
Impact Recorder
> Zone 3
Seek Assistance
Yes
No
< Zone 3
Seek Assistance
External Physical & Accessories
Damaged
Seek Assistance
O.K.
Oil Filled
Yes
Check Oil Quality
Fail
Seek Assistance
O.K.
O² Level
<19.5%
Purge
Open & Inspect
Megger Core Ground
<500 MSL
Seek Assistance
>500 MSL.
Leak Test
Fail
Fix
Pass
To be Reshipped ?
Yes
Go to Shipping of Free Breathing Power Transformers
No
To be Installed ?
Yes
Go to Installation of Free Breathing Power Transformers
No
Go to Storage of Free Breathing Power Transformers

the southern electric system

PROCEDURE FOR

THE

RECEIVING INSPECTION

OF

SEALED VACUUM RATED

POWER TRANSFORMERS

DATE: 10/18/94

RECEIVING INSPECTION FOR SEALED VACUUM RATED POWER TRANSFORMERS

1.0 IMPACT RECORDER INSPECTION

1. Notify appropriate parties of inspection.

2. Determine if transformer should have been shipped with an impact recorder (normally transformers shipped by rail or larger than 50 MVA). If it should have and none is found, seek assistance.

3. If equipped with an impact recorder, inspect chart and notify appropriate authority for excursions outside zone 3, failure of recorder to run entire trip, or other irregularities of recorder.

2.0 EXTERNAL PHYSICAL INSPECTION

1. Check exterior of transformer for damage.

2. Check condition of accessories; be sure accessories are accounted for (Bill of Lading).

3. Report any damage prior to unloading, notify appropriate authority.

3.0 OIL FILLED

1. Determine dew point of gas space and note pressure at time of receipt. If greater than -40° F, notify appropriate authority.

2. If oil filled determine the:

    1. Oil Dielectric by ASTM D-1816 should be greater than or equal to 25kV.
    2. Oil color by ASTM D-1500 should be less than or equal to 2.
    3. Take sample of oil for further laboratory analysis.

3. If not oil filled, proceed to internal inspection.

4.0 INTERNAL INSPECTION

1. Check gases for personnel entry.

2. Prepare for entry into transformer. Take all necessary precautions.

3. Check core ground with an insulation resistance test set, set at 500 volts. Notify appropriate authority if reading is less than 100 megohms.

4. Visually inspect:

    1. Gaskets.
    2. Core steel and coils.
    3. Lead insulation.
    4. Blocking and clamping.
    5. C.T. leads and junction box/block.
    6. No load tap changer.
    7. For foreign material/objects in tank.
    8. Interior of tank for evidence of flashovers or rust.
    9. Check oil level gauge for proper operation.

5. Report any discrepancies to appropriate personnel.

6. Reseal and secure transformer after inspection.

7. Pressurize transformer to 3 psi.

8. Unload transformer.

5.0 PERFORM LEAK TEST

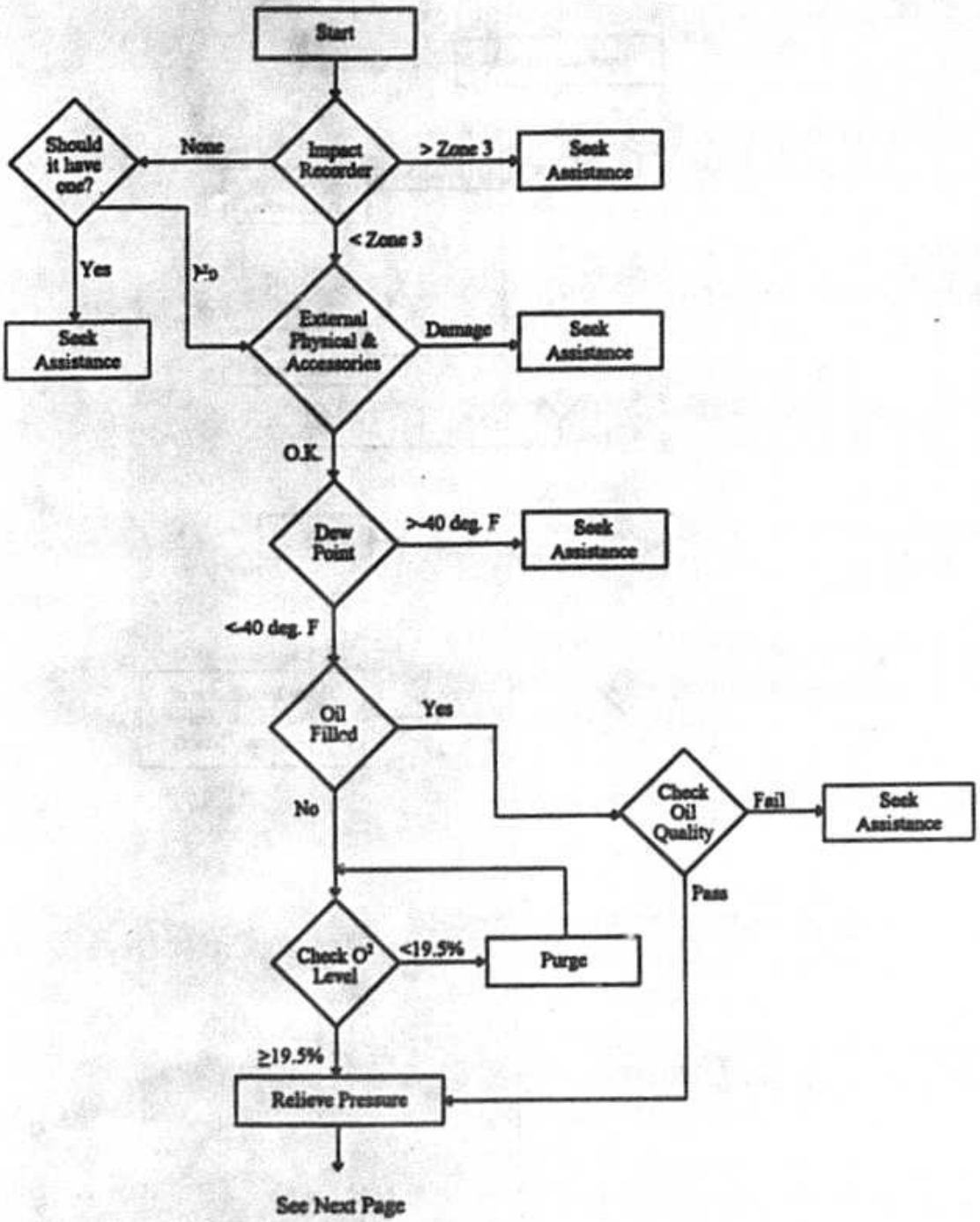
1. Pressurize sealed transformer to 3 psi. Maximum leak rate is 0.5 psi/hour. If greater than, correct leak and retest.

6.0 TRANSFORMER ASSIGNMENT

1. If transformer is not to be placed in service, go to STORAGE OF FREE BREATHING POWER TRANSFORMER procedure.

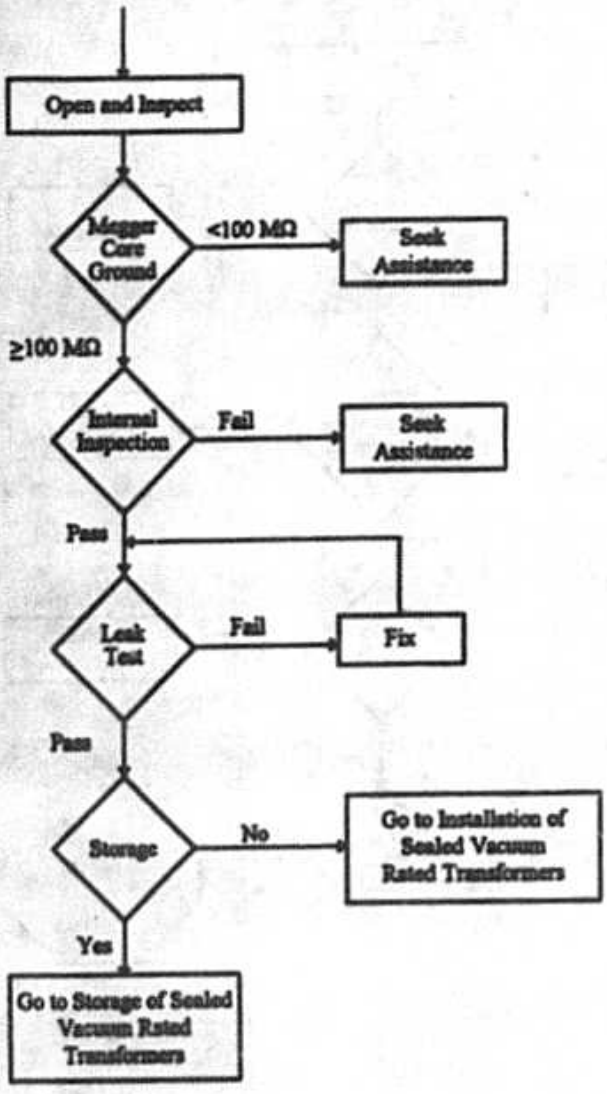
2. If transformer is to be placed in service, go to INSTALLATION OF FREE BREATHING POWER TRANSFORMER procedure.

RECEIVING INSPECTION FOR SEALED VACUUM RATED POWER TRANSFORMERS



02RECSVR.DOC
DATE: 10/18/94

86



the southern electric system

PROCEDURE FOR THE *RECEIVING INSPECTION* OF *SEALED NON-VACUUM RATED POWER TRANSFORMERS*

DATE: 10/18/94

88

RECEIVING INSPECTION FOR SEALED NON-VACUUM RATED POWER TRANSFORMERS

1.0 IMPACT RECORDER INSPECTION

1. Notify appropriate parties of inspection.
2. Determine if transformer should have been shipped with an impact recorder (normally transformers shipped by rail or larger than 50 MVA). If it should have and none is found, seek assistance.
3. If equipped with an impact recorder, inspect chart and notify appropriate authority for excursions outside zone 3, failure of recorder to run entire trip, or other irregularities of recorder.

2.0 EXTERNAL PHYSICAL INSPECTION

1. Check exterior of transformer for damage.
2. Check condition of accessories; be sure accessories are accounted for (Bill of Lading).
3. Report any damage prior to unloading, notify appropriate authority.

3.0. OIL FILLED

1. Determine dew point of gas space and note pressure at time of receipt. If greater than -40° F, notify appropriate authority.
2. If oil filled check:
    1. Oil Dielectric by ASTM D-1816 should be greater than or equal to 25kV.
    2. Oil color by ASTM D-1500 should be less than or equal to 2.
    3. Take sample of oil for further laboratory analysis.
3. If not oil filled proceed to internal inspection.

4.0 INTERNAL INSPECTION:

1. Check gases for personnel entry.
2. Prepare for entry into transformer. Take all necessary precautions.

3. Check core ground with a 500 volt or greater meggar. Notify appropriate authority if reading is less than 500 Meg Ohms.

4. Visually Inspect:

    1. Gaskets.
    2. Core steel and coils.
    3. Lead insulation.
    4. Blocking and clamping.
    5. C.T. leads and junction box/block.
    6. No load tap changer.
    7. For foreign material/objects in tank.
    8. Interior of tank for evidence of flashovers or rust.
    9. Check oil level gauge for proper operation

5. Report any discrepencies to appropriate personnel.

6. Reseal and secure transformer after inspection.

7. Pressurize transformer to 3 psi.

8. Unload transformer.

5.0 PERFORM LEAK TEST

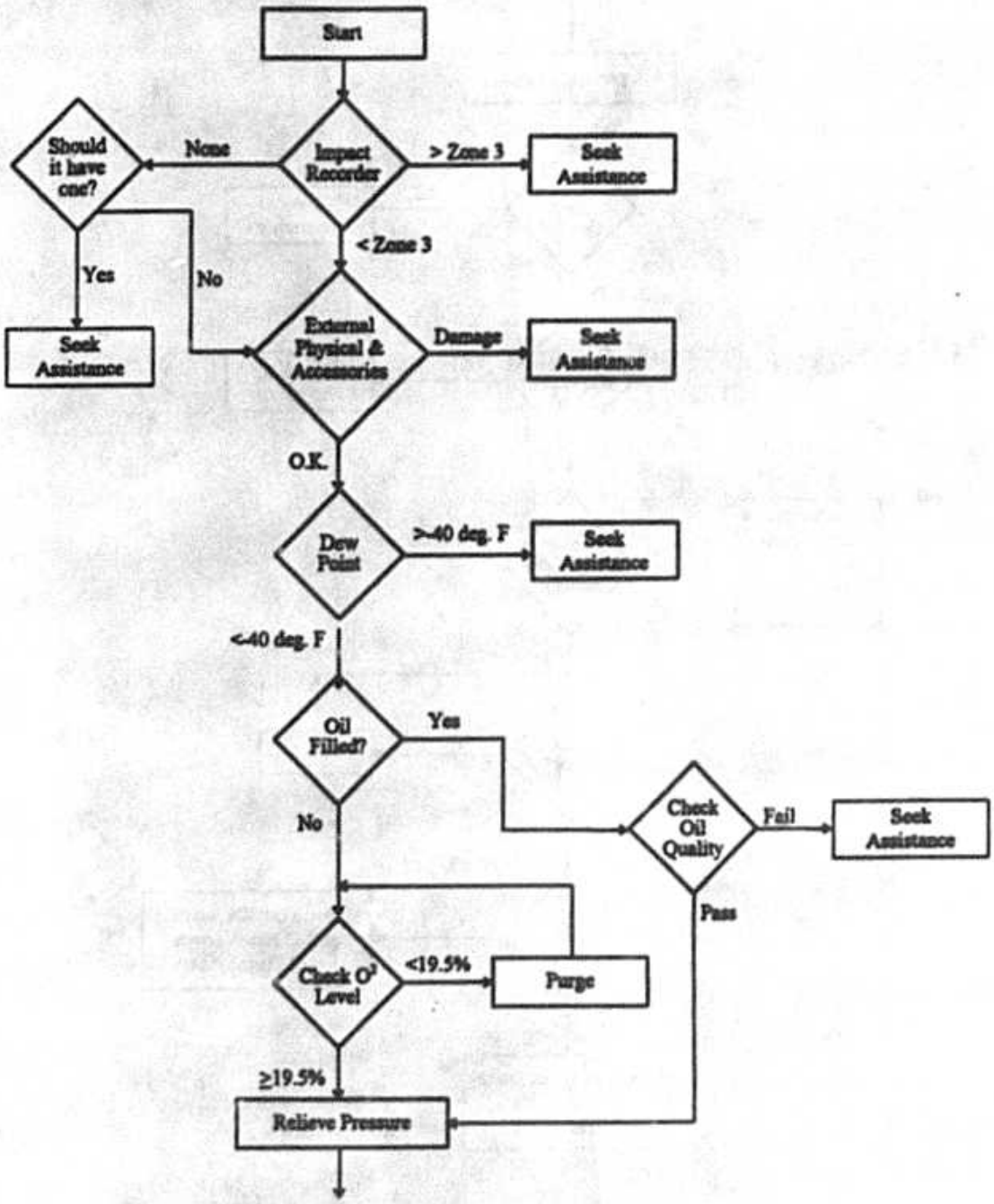
1. Pressurize sealed transformer to 3 psi. Maximum leak rate is 0.5 psi/hour. If greater than, correct leak and retest.

6.0 TRANSFORMER ASSIGNMENT

1. If transformer is not to be placed in service, go to STORAGE OF FREE BREATHING POWER TRANSFORMER procedure.

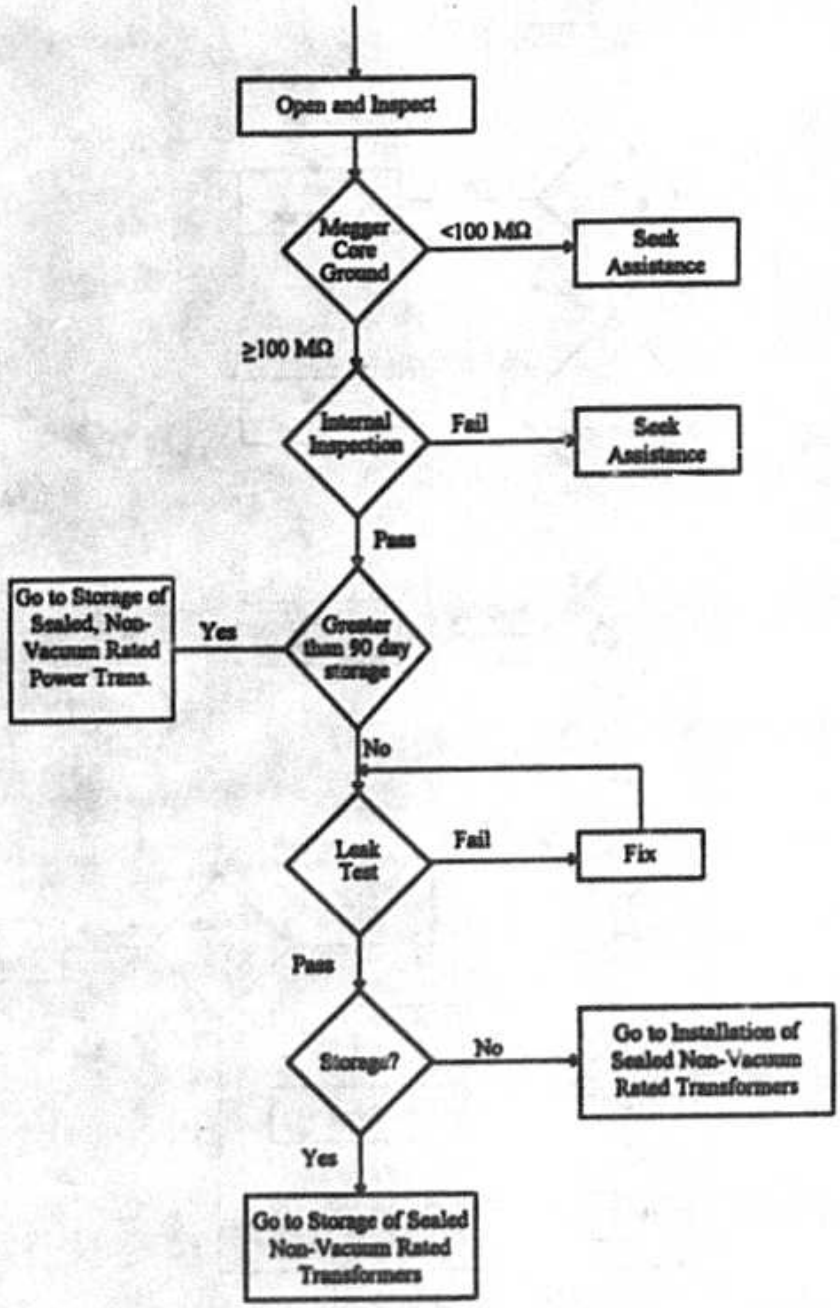
2. If transformer is to be placed in service, go to INSTALLATION OF FREE BREATHING POWER TRANSFORMER procedure.

RECEIVING INSPECTION FOR SEALED NON-VACUUM RATED POWER TRANSFORMERS



See Next Page

RECEIVING INSPECTION FOR SEALED NON-VACUUM RATED POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR

THE

RECEIVING INSPECTION

OF

C.O.P.S TANK

POWER TRANSFORMERS

DATE: 10/18/94

RECEIVING INSPECTION FOR C.O.P.S TANK POWER TRANSFORMERS

1.0 IMPACT RECORDER INSPECTION

1. Notify appropriate parties of inspection.

2. Determine if transformer should have been shipped with an impact recorder (normally transformers shipped by rail or larger than 50 MVA). If it should have and none is found, seek assistance.

3. If equipped with an impact recorder, inspect chart and notify appropriate authority for excursions outside zone 3, failure of recorder to run entire trip, or other irregularities of recorder.

2.0 EXTERNAL PHYSICAL INSPECTION

1. Check exterior of transformer for damage.

2. Check condition of accessories; be sure accessories are accounted for (Bill of Lading).

3. Report any damage prior to unloading, notify appropriate authority.

3.0 OIL FILLED

1. Determine dew point of gas space and note pressure at time of receipt. If greater than -40° F, notify appropriate authority.

2. If oil filled determine the:

    1. Oil Dielectric by ASTM D-1816 should be greater than or equal to 25kV.
    2. Oil color by ASTM D-1500 should be less than or equal to 2.
    3. Take sample of oil for further laboratory analysis.

3. If not oil filled, proceed to internal inspection.

4.0 INTERNAL INSPECTION

1. Check gases for personnel entry.

2. Prepare for entry into transformer. Take all necessary precautions.

94

3. Check core ground with a 500 volt or greater meggar. Notify appropriate authority if reading is less than 500 megohms.

4. Visually inspect:

   1. Gaskets.
   2. Core steel and coils.
   3. Lead insulation.
   4. Blocking and clamping.
   5. C.T. leads and junction box/block.
   6. No load tap changer.
   7. For foreign material/objects in tank.
   8. Interior of tank for evidence of flashovers or rust.
   9. Check oil level gauge for proper operation.

5. Report any discrepancies to appropriate personnel.

6. Reseal and secure transformer after inspection.

7. Pressurize transformer to 3 psi.

8. Unload transformer.

5.0 PERFORM LEAK TEST

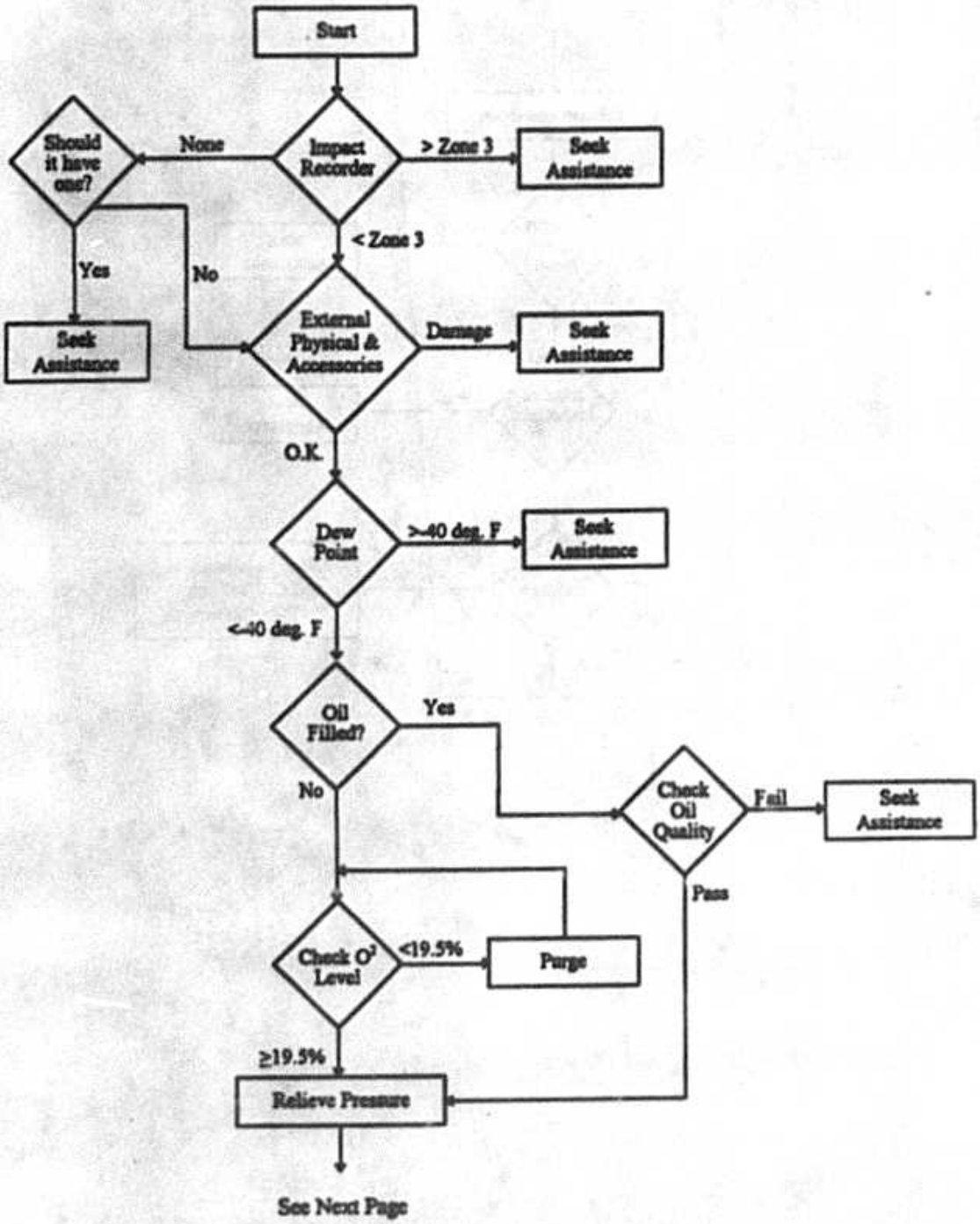
1. Pressurize sealed transformer to 3 psi. Maximum leak rate is 0.5 psi/hour. If greater than, correct leak and retest.

6.0 TRANSFORMER ASSIGNMENT

1. If transformer is not to be placed in service, go to STORAGE OF FREE BREATHING POWER TRANSFORMER procedure.

2. If transformer is to be placed in service, go to INSTALLATION OF FREE BREATHING POWER TRANSFORMER procedure.

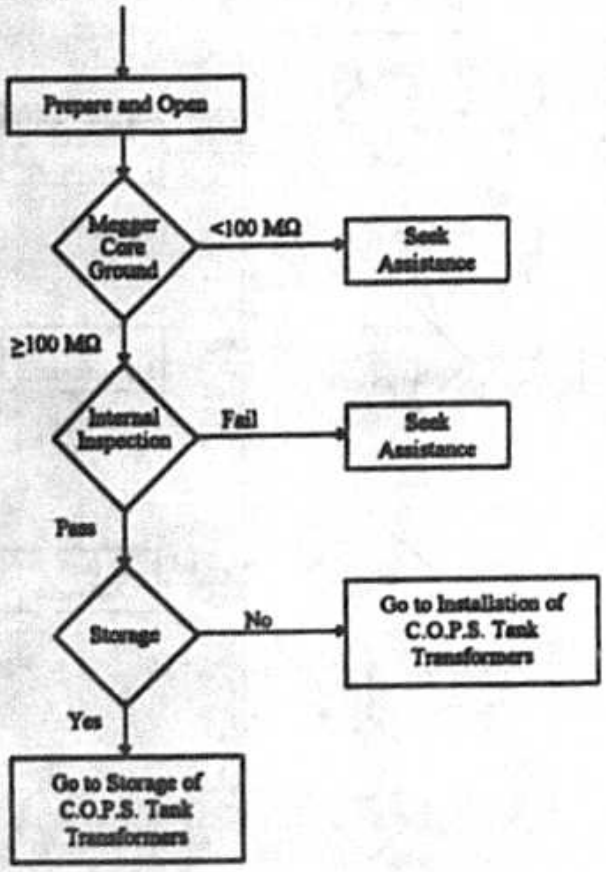
RECEIVING INSPECTION FOR C.O.P.S TANK POWER TRANSFORMERS



04RECCOP.DOC
DATE: 10/18/94

9c

RECEIVING INSPECTION FOR C.O.P.S TANK POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR THE STORAGE OF FREE BREATHING POWER TRANSFORMERS

DATE: 10/18/94

98

STORAGE OF FREE BREATHING POWER TRANSFORMERS

1.0 GROUND TANK

2.0 STORAGE TIME OF UNIT

1. If storage time is less than 90 days oil filling is not required.
2. If storage time is more than 90 days:
    1. Install bushings and other accessories as appropriate. If radiators are not installed, they must be sealed with ¼" steel with gaskets and pressurized.
    2. Verify oil quality meets SES Specifications.
    3. Fill with oil.

3.0 PERFORM TEST

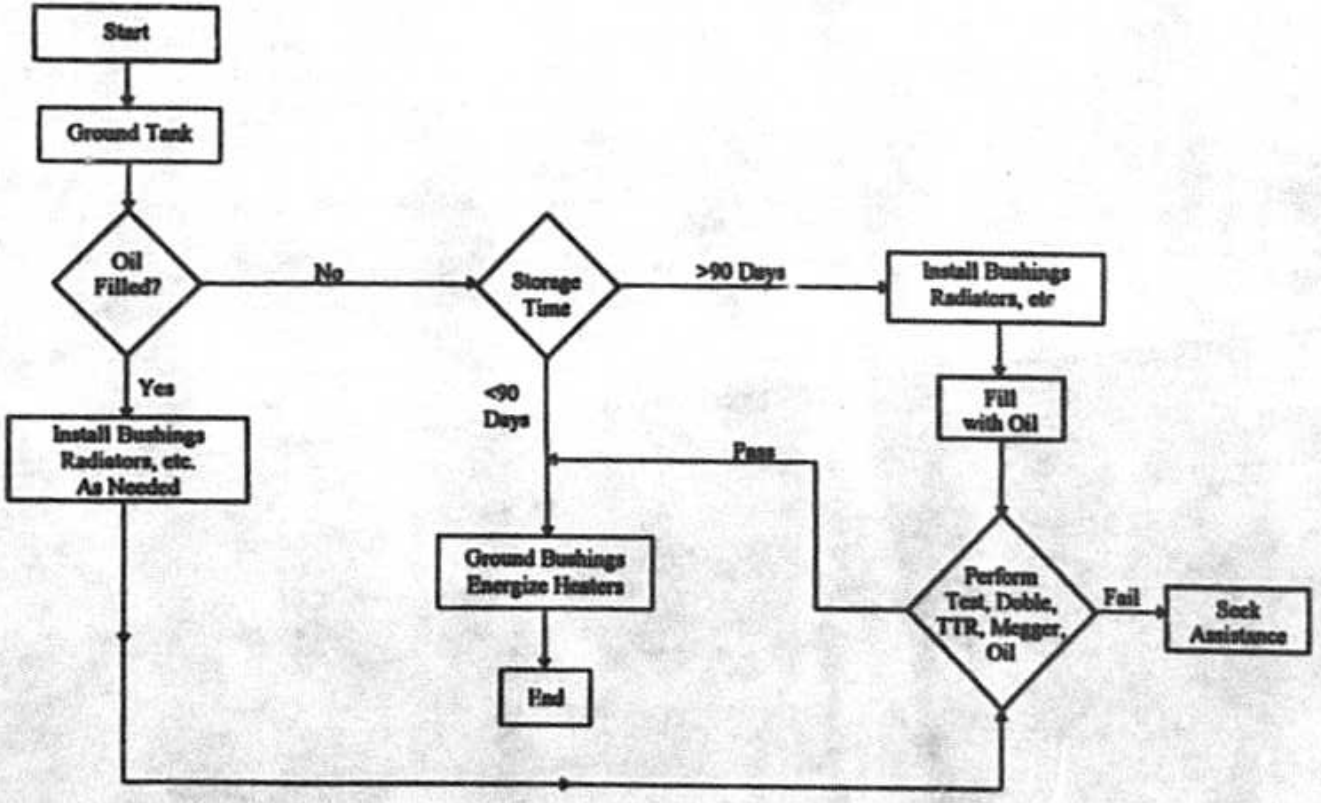
If bushings are installed and unit is oil filled, perform test as described below.

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

4.0 GROUND BUSHINGS (IF INSTALLED) AND ENERGIZE HEATERS

5.0 ACCESSORIES

Be sure accessories are installed properly.



the southern electric system

PROCEDURE FOR THE STORAGE OF SEALED VACUUM RATED POWER TRANSFORMERS

DATE: 10/18/94

101

STORAGE OF SEALED VACUUM RATED POWER TRANSFORMERS

1.0 GROUND TANK

2.0 DEW POINT

If dew point is greater than -40°F, flash with dry gas and test after waiting a minimum of 24 hours for gas to reach equilibrium. If still greater than -40°F, then vacuum to two (2) millimeters of mercury. Break vacuum with dry gas and retest. If dew point is still greater than -40°F, then continue to vacuum processing and testing until -40°F is obtained. When dew point is less than -40°F proceed.

3.0 STORAGE TIME OF UNIT

1. If storage time is less than 90 days:
    1. Purge gas space and activate nitrogen system.
    2. Check oxygen content; if greater than 2%, purge gas space and activate nitrogen system. If less than 2% perform leak test.
    3. Leak test unit by pressurizing unit to 3 psi and monitor leak rate for one hour, maximum leak rate 0.5 psi per hour. If greater than 0.5 psi, repair leak and retest.
2. If storage time is 90 days or greater:
    1. Install bushings and other accessories necessary to ensure the integrity of the sealed vessel. If radiators are not installed seal with ¼" steel plate with gaskets and pressurize. Take suitable steps to ensure that these devices are clean, dry and available for immediate service.
    2. If rated less than 69kV and not to be connected to a generator bus, fill with oil.
    3. If rated 69kV or greater or to be connected to a generator bus, refer to PROCESSING OF SEALED VACUUM RATED POWER TRANSFORMER procedure (fill with oil).

4.0 PERFORM THE FOLLOWING TESTS

If transformer is oil filled and bushings are installed perform test as prescribed below.

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

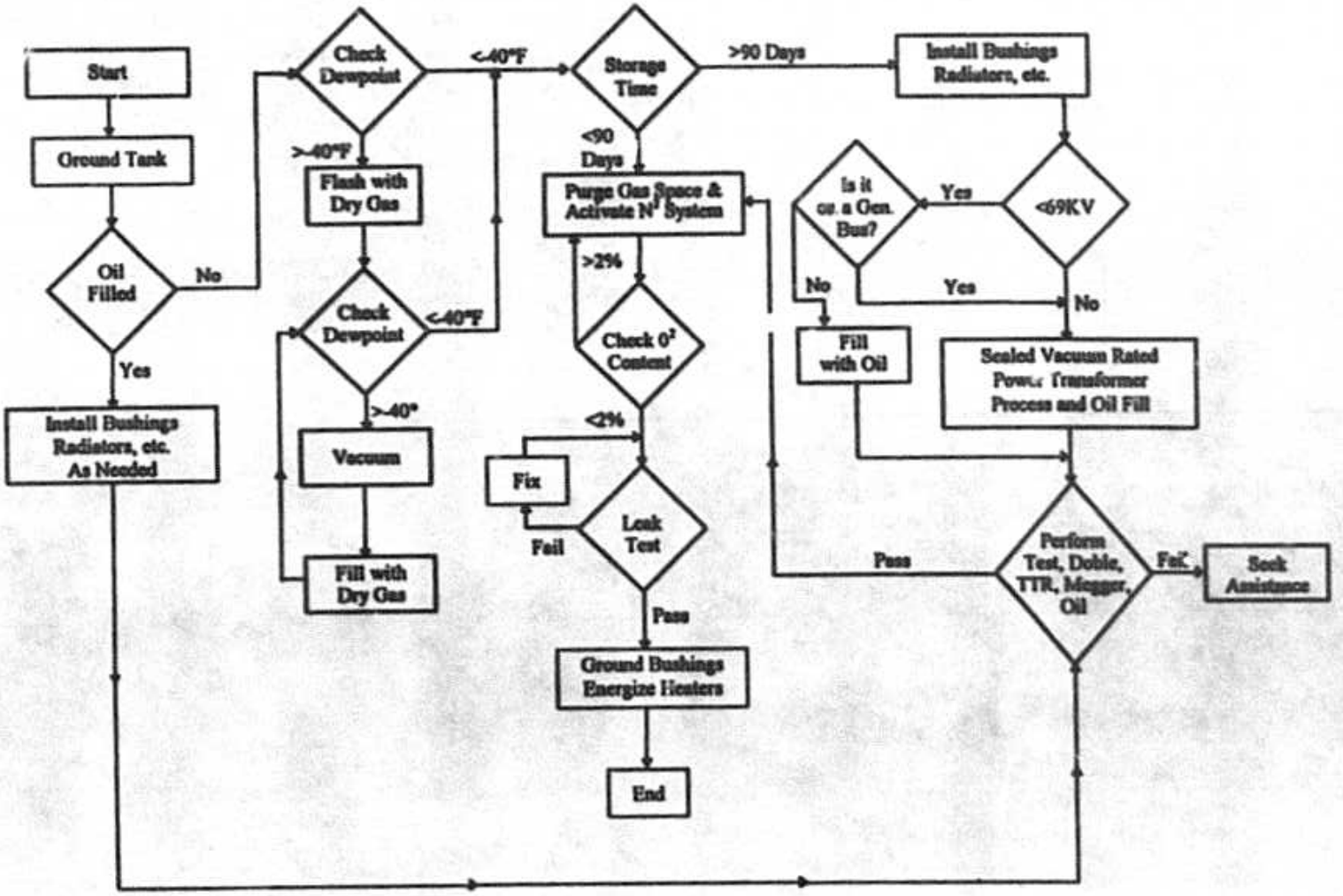
NOTE: For new transformers being accepted on the property, additional tests may be required by manufacturer.

5.0 GROUND BUSHINGS AND ENERGIZE HEATERS

6.0 ACCESSORIES

Ensure accessories are stored properly.

STORAGE OF SEALED VACUUM RATED POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR

THE

STORAGE OF

SEALED NON-VACUUM RATED

POWER TRANSFORMERS

DATE: 10/18/94

STORAGE OF SEALED NON-VACUUM RATED TRANSFORMERS

1.0 GROUND TANK

2.0 DEW POINT

If dew point is greater than -40°F, flash with dry gas and test. If still greater than -40°F, then continue to flash until -40°F is obtained. Allow 24 hours for gas to reach equilibrim before retesting.

3.0 STORAGE TIME OF UNIT

1. If storage time is less than 90 days:

    1. Purge gas space and activate nitrogen system.
    2. Check oxygen content; if greater than 2%, purge gas space and activate nitrogen system. If less than 2% perform Leak Test.
    3. Leak test unit by pressurizing unit to 3 psi and monitor leak rate for one hour, maximum leak rate 0.5 psi per hour. If greater than 0.5 psi, repair leak and retest.

2. If storage time is 90 days or greater:

    1. Install bushings and other accessories as appropriate. If radiators are not installed seal with ¼" steel plate with gaskets and pressurize. Take suitable steps to ensure that these devices are clean, dry and available for immediate service.
    2. If rated less than 69kV and not to be connected to a generator bus, fill with oil.
    3. If rated 69kV or greater or to be connected to a generator bus, refer to PROCESSING SEALED VACUUM RATED POWER TRANSFORMERS procedure and oil fill.

/06

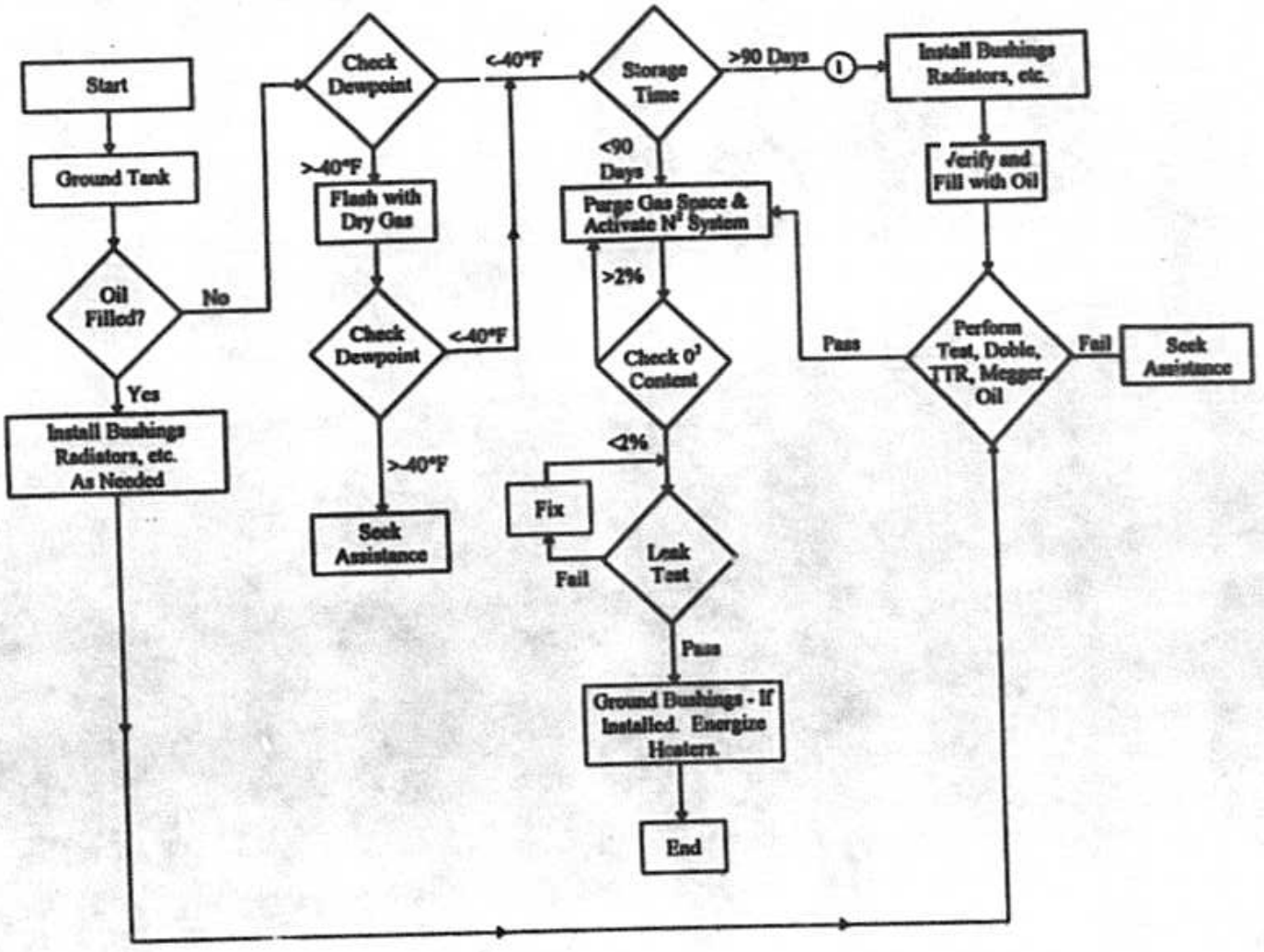
4.0 PERFORM THE FOLLOWING TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

5.0 GROUND BUSHINGS AND ENERGIZE HEATERS

6.0 ACCESSORIES

Be sure accessories are stored properly.



201

the southern electric system

PROCEDURE FOR

THE

STORAGE OF

C.O.P.S. TANK

POWER TRANSFORMERS

DATE: 10/18/94

STORAGE OF C.O.P.S. TANK POWER TRANSFORMERS

1.0 GROUND TANK

2.0 DEW POINT

If dew point is greater than -40°F, flash with dry gas and test. If still greater than -40°F, then vacuum to two (2) millimeters of mercury. Break vacuum with dry gas and retest. If dew point is still greater than -40°F, then continue to vacuum processing and testing until -40°F is obtained. When dew point is less than -40°F proceed.

3.0 STORAGE TIME OF UNIT

1. If storage time is less than 90 days:

    1. Purge gas space and activate nitrogen system.
    2. Check oxygen content; if greater than 2%, purge gas space and activate nitrogen system. If less than 2% perform Leak Test.
    3. Leak test unit by pressurizing unit to 3 psi and monitor leak rate for one hour, maximum leak rate 0.5 psi per hour. If greater than 0.5 psi, repair leak and retest.

2. If storage time is 90 days or greater:

    1. Install bushings and other accessories necessary to ensure operation of oil preservation system. If radiators are not installed seal with ¼" steel plate with gaskets and pressurize. Take suitable steps to ensure that these devices are clean, dry and available for immediate service.
    2. If rated less than 69kV and not to be connected to a generator bus, fill with oil.
    3. If rated 69kV or greater or to be connected to a generator bus, refer to PROCESSING SEALED VACUUM RATED POWER TRANSFORMERS procedure and oil fill.

4.0 PERFORM THE FOLLOWING TESTS

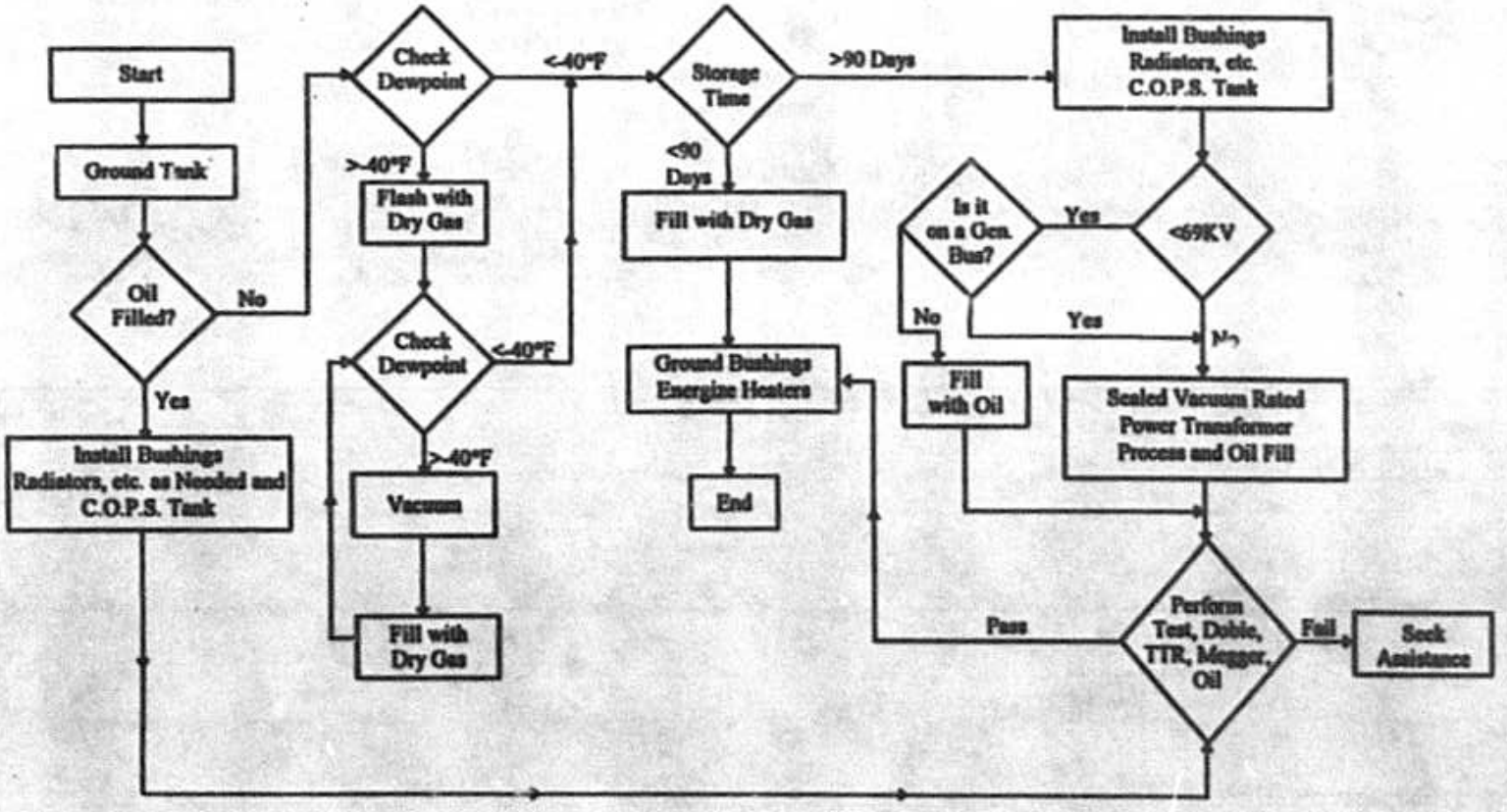
TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

5.0 GROUND BUSHINGS AND ENERGIZE HEATERS

6.0 ACCESSORIES

Ensure accessories are stored properly.

STORAGE OF C.O.P.S. TANK POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR THE SHIPPING OF FREE BREATHING POWER TRANSFORMERS

DATE: 10/18/94

SHIPPING FREE BREATHING POWER TRANSFORMERS

1.0 TRANSFORMER TESTS

Perform appropriate tests on the transformer to determine the condition prior to shipping. These tests will be performed on all transformers prior to disassembly.

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	No
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes
Acid (Neutralization Number)	Yes	Yes

Seek assistance if any test fails established criteria.

2.0 SHIPPING REQUIREMENTS

Consult with the appropriate authorities to determine permit requirements (height, weight, width, route, etc.).

3.0 PREPARATION

1. Disassemble in accordance with the permit requirements.

2. Install all necessary bracing and shipping covers; plug the breather for transport.

NOTE: Shipping covers shall be constructed of metal and be at least .25" thick (if other than original) with gaskets installed.

3. Secure and protect all components removed for shipping.

4.0 LOADING

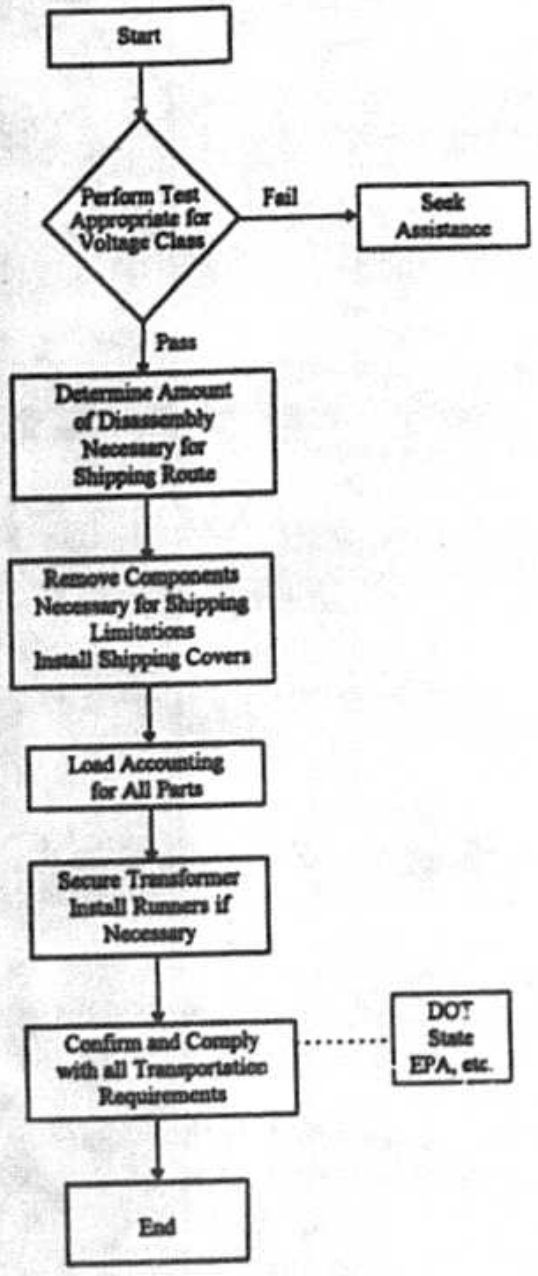
Load the transformer for shipping; account for all parts. Properly secure the transformer for transit.

NOTE: Install runners as required by authority.

5.0 CONFORMANCE

Before transporting the unit, confirm that all requirements of the permit have been met.

SHIPPING FREE BREATHING POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR THE SHIPPING OF SEALED VACUUM RATED POWER TRANSFORMERS

DATE: 10/18/94

SHIPPING SEALED VACUUM RATED POWER TRANSFORMERS

1.0 TRANSFORMER TESTS

Perform appropriate tests on the transformer to determine the condition prior to shipping. These tests will be performed on all transformers prior to disassembly.

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

Seek assistance if any test fails established criteria.

2.0 SHIPPING REQUIREMENTS

Consult with the appropriate authorities to determine permit requirements (height, weight, width, route, etc.).

3.0 PREPARATION

1. Disassemble in accordance with the permit requirements.
2. Install all necessary bracing and shipping covers; plug the breather for transport.

NOTE: Shipping covers shall be constructed of metal and be at least .25" thick (if other than original) with gaskets installed.

3. Secure and protect all components removed for shipping.
4. Flash the gas space with dry breathing quality air. Pressurize to 3 psig and monitor the leak rate for one hour. Leakage in excess of .5 psig per hour shall be considered unacceptable and repairs shall be made.

4.0 LOADING

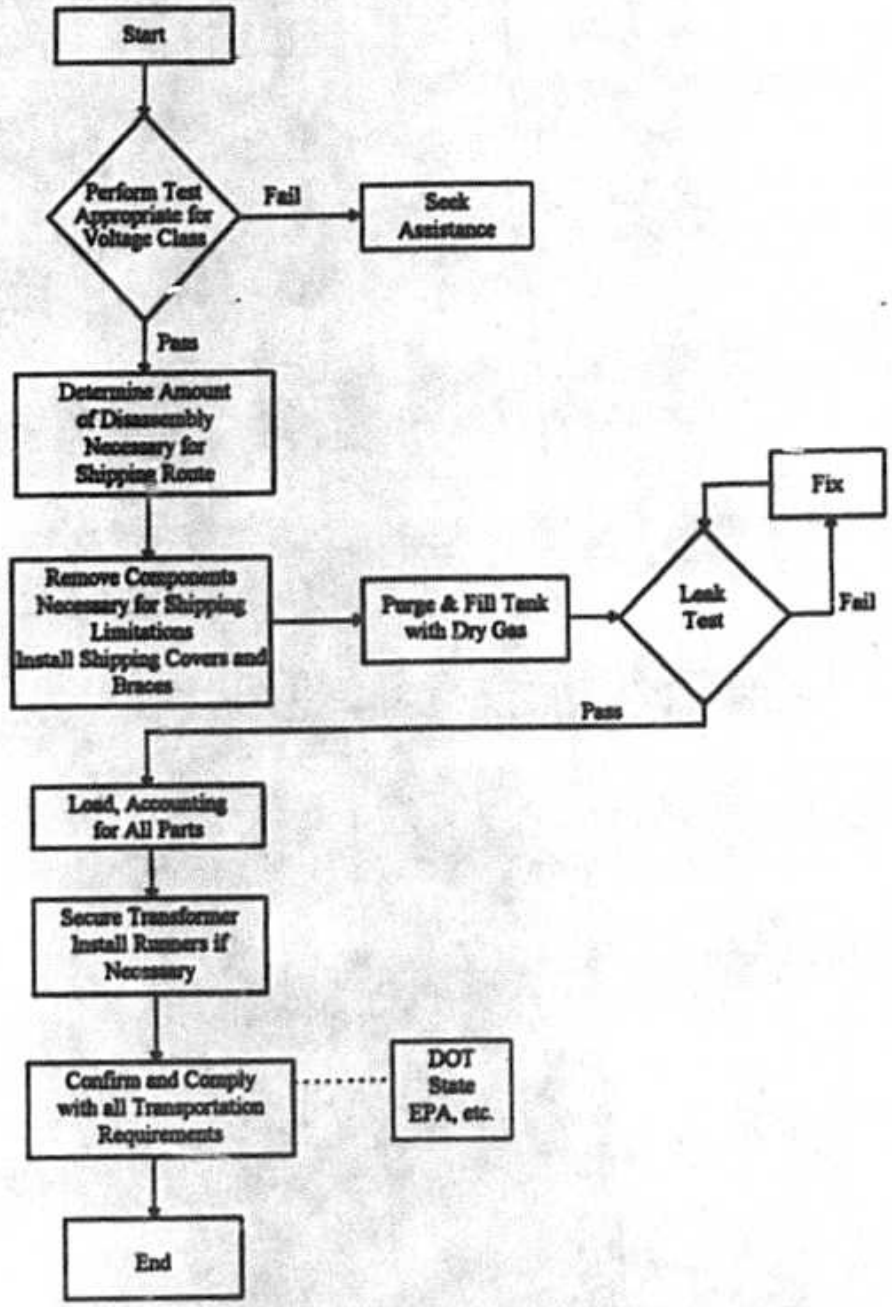
Load the transformer for shipping; account for all parts. Properly secure the transformer for transit.

NOTE: Install runners as required by authority.

5.0 CONFORMANCE

Before transporting the unit, confirm that all requirements of the permit have been met.

SHIPPING SEALED VACUUM RATED POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR

THE

SHIPPING OF

SEALED NON-VACUUM RATED

POWER TRANSFORMERS

DATE: 10/18/94

1.0 TRANSFORMER TESTS

Perform appropriate tests on the transformer to determine the condition prior to shipping. These tests will be performed on all transformers prior to disassembly.

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

Seek assistance if any test fails established criteria.

2.0 SHIPPING REQUIREMENTS

Consult with the appropriate authorities to determine permit requirements (height, weight, width, route, etc.).

3.0 PREPARATION

1. Disassemble in accordance with the permit requirements.

2. Install all necessary bracing and shipping covers; plug the breather for transport.

NOTE: Shipping covers shall be constructed of metal and be at least .25" thick (if other than original) with gaskets installed.

3. Secure and protect all components removed for shipping.

4. Flash the gas space with dry breathing quality air. Pressurize to 3 psig and monitor the leak rate for one hour. Leakage in excess of .5 psig per hour shall be considered unacceptable and repairs shall be made.

4.0 LOADING

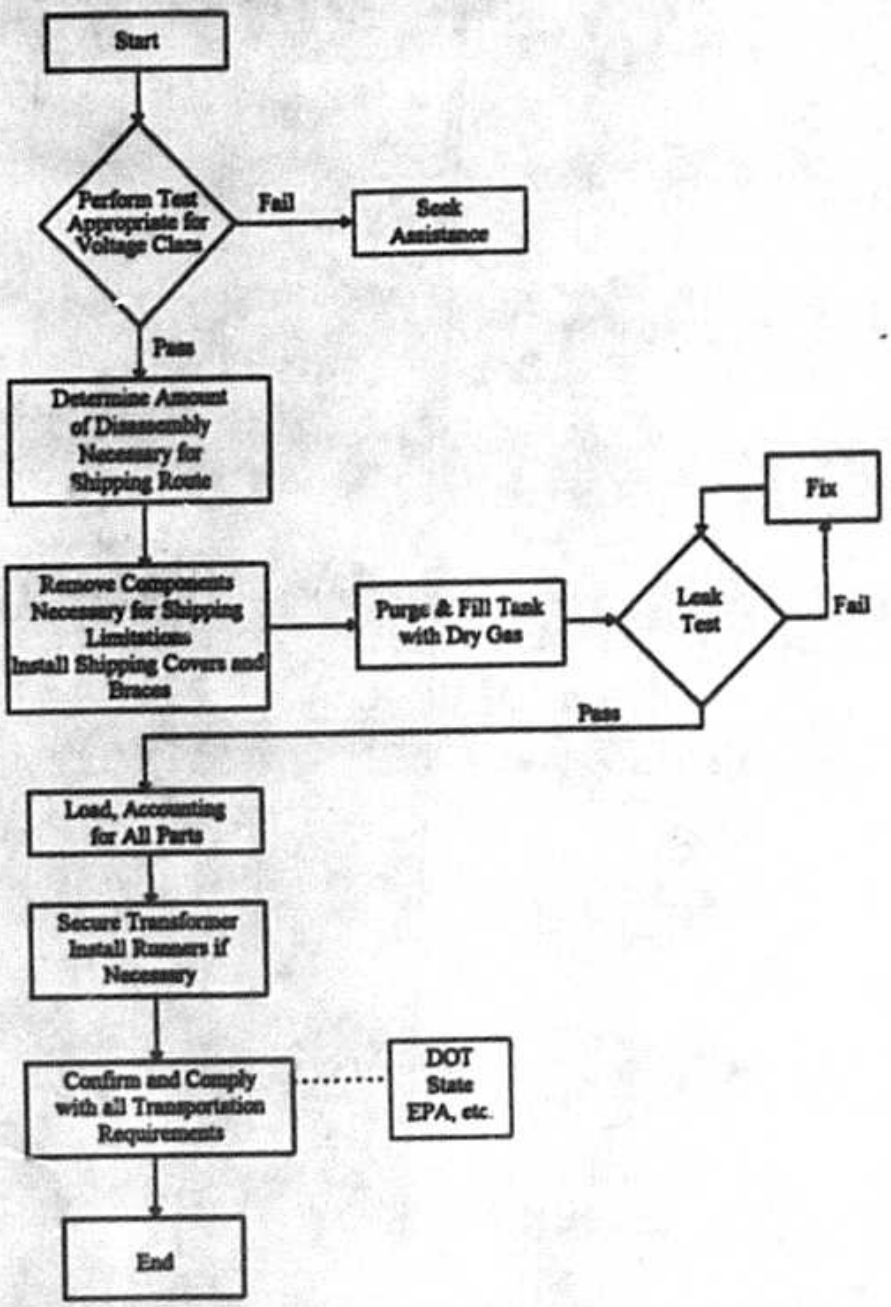
Load the transformer for shipping; account for all parts. Properly secure the transformer for transit.

NOTE: Install runners as required by authority.

5.0 CONFORMANCE

Before transporting the unit, confirm that all requirements of the permit have been met.

SHIPPING SEALED NON-VACUUM RATED POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR

THE

SHIPPING OF

C.O.P.S. TANK

POWER TRANSFORMERS

DATE: 10/18/94

SHIPPING C.O.P S F OWER TRANSFORMERS

1.0 TRANSFORMER TESTS

Perform appropriate tests on the transformer to determine the condition prior to shipping. These tests will be performed on all transformers prior to disassembly.

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

Seek assistance if any test fails established criteria.

2.0 SHIPPING REQUIREMENTS

Consult with the appropriate authorities to determine permit requirements (height, weight, width, route, etc.).

3.0 PREPARATION

1. Disassemble in accordance with the permit requirements.

2. Install all necessary bracing and shipping covers; plug the breather for transport.

NOTE: Shipping covers shall be constructed of metal and be at least .25" thick (if other than original) with gaskets installed.

3. Flash the gas space with dry breathing quality air. Pressurize to 3 psig and monitor the leak rate for one hour. Leakage in excess of .5 psig per hour shall be considered unacceptable and repairs shall be made.

1/24

4.0 LOADING

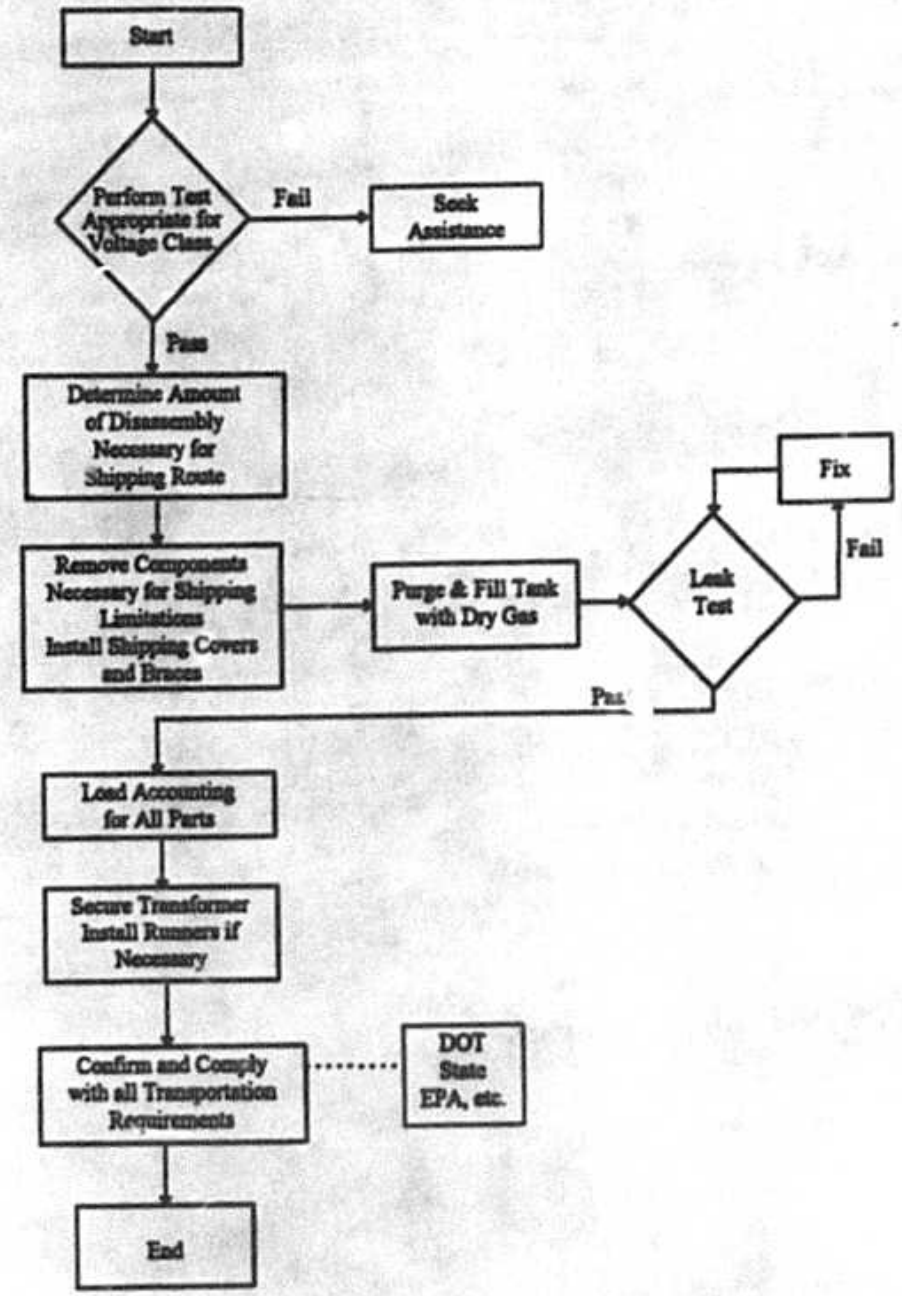
Load the transformer for shipping; account for all parts. Properly secure the transformer for transit.

NOTE: Install runners as required by authority.

5.0 CONFORMANCE

Before transporting the unit, confirm that all requirements of the permit have been met.

SHIPPING C.O.P.'S POWER TRANSFORMERS



12SHIPCO.DOC
DATE: 10/18/94

128

the southern electric system

PROCEDURE FOR THE INSTALLATION OF FREE BREATHING POWER TRANSFORMERS

DATE: 10/18/94

INSTALLATION OF FREE BREATHING POWER TRANSFORMERS

1.0 GROUNDING

Bond transformer tank to substation grid.

2.0 TANK ACCESSORIES

Install oil pumps, radiators/coolers/heat exchangers as equipped and detailed in manufacturer's drawings.

3.0 BUSHINGS

Install all bushings as required, ground all bushings upon completion of installation.

4.0 OIL FILLING

1. If transformer was shipped gas filled, go to PROCESSING FREE BREATHING TRANSFORMER procedure.

2. Check oil level and adjust.

    1. From nameplate data, determine correct oil level.
    2. Remove manhole cover and adjust oil to appropriate level.
    3. Replace manhole cover.
    4. Run oil pumps for two hours (no more, no less).

5.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	No Yes	Yes No
Dielectric Breakdown (D-877)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

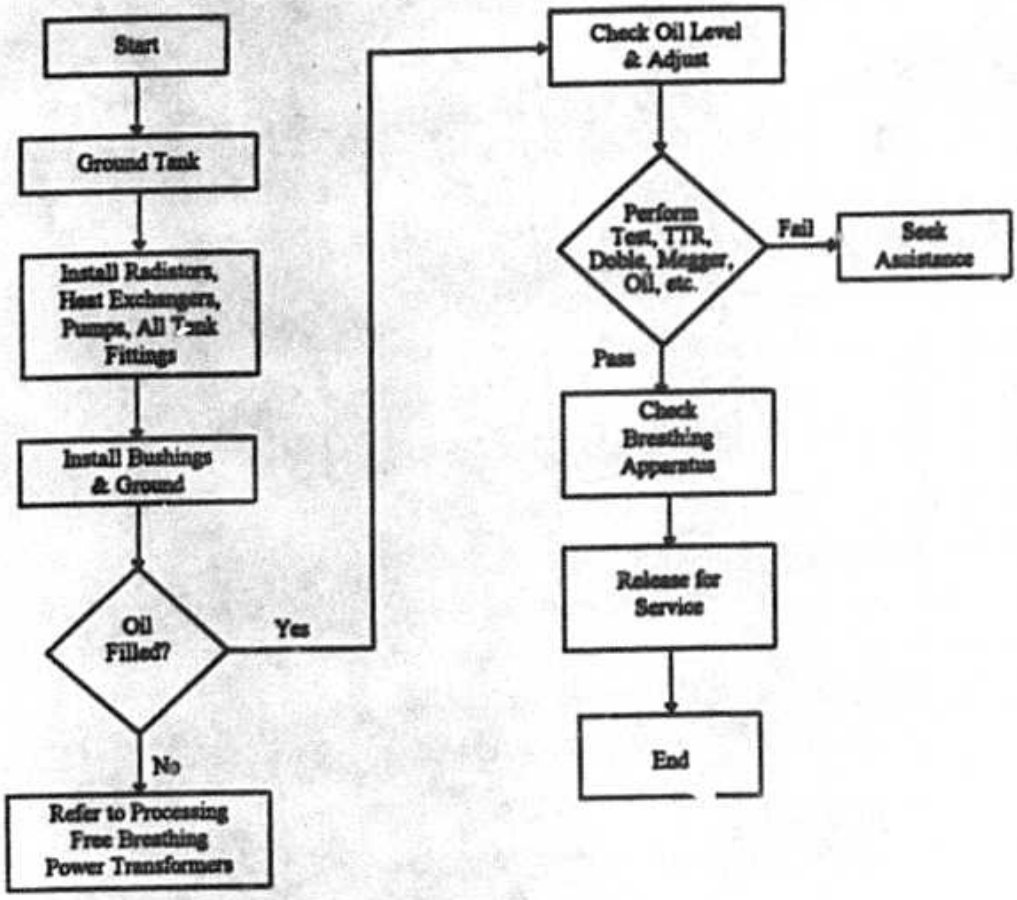
6.0 OIL STABILIZATION

Allow transformer filled with oil to sit for a minimum of 8 hours after final fill, prior to energization.

NOTE: Emergency conditions may require that this be reduced; seek assistance before reducing time).

7.0 RELEASE FOR SERVICE

INSTALLATION OF FREE BREATHING POWER TRANSFORMERS



132

the southern electric system

PROCEDURE FOR THE INSTALLATION OF SEALED VACUUM RATED POWER TRANSFORMERS

DATE: 10/18/94

INSTALLATION OF SEALED VACUUM RATED POWER TRANSFORMER

1.0 GROUNDING

Bond transformer tank to substation grid.

2.0 TANK ACCESSORIES

Install oil pumps, radiators/coolers/heat exchangers as equipped and detailed on manufacturer's drawings.

3.0 BUSHINGS

Install all bushings as required, ground all bushings upon completion of installation.

4.0 OIL FILLING

1. If transformer was shipped gas filled, go to PROCESSING SEALED VACUUM RATED TRANSFORMER procedure.

2. If transformer was shipped oil filled:

    1. From nameplate data, determine correct oil level.
    2. Remove manhole cover and adjust oil to appropriate level.
    3. Replace manhole cover.
    4. Run oil pumps for two hours (no more, no less).

5.0 OIL PRESERVATION SYSTEM

1. Purge gas space with dry nitrogen to less than 2% oxygen content.

2. Make permanent connections to Nitrogen (N_2) System.

3. Leak test unit by pressurizing unit to 3 psi and monitor leak rate for one hour, maximum leak rate 0.5 psi per hour. If greater than 0.5 psi, repair leak and retest.

4. Insure proper operation of regulator, check system for leaks.

6.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	~~No~~ Yes	~~Yes~~ NO
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

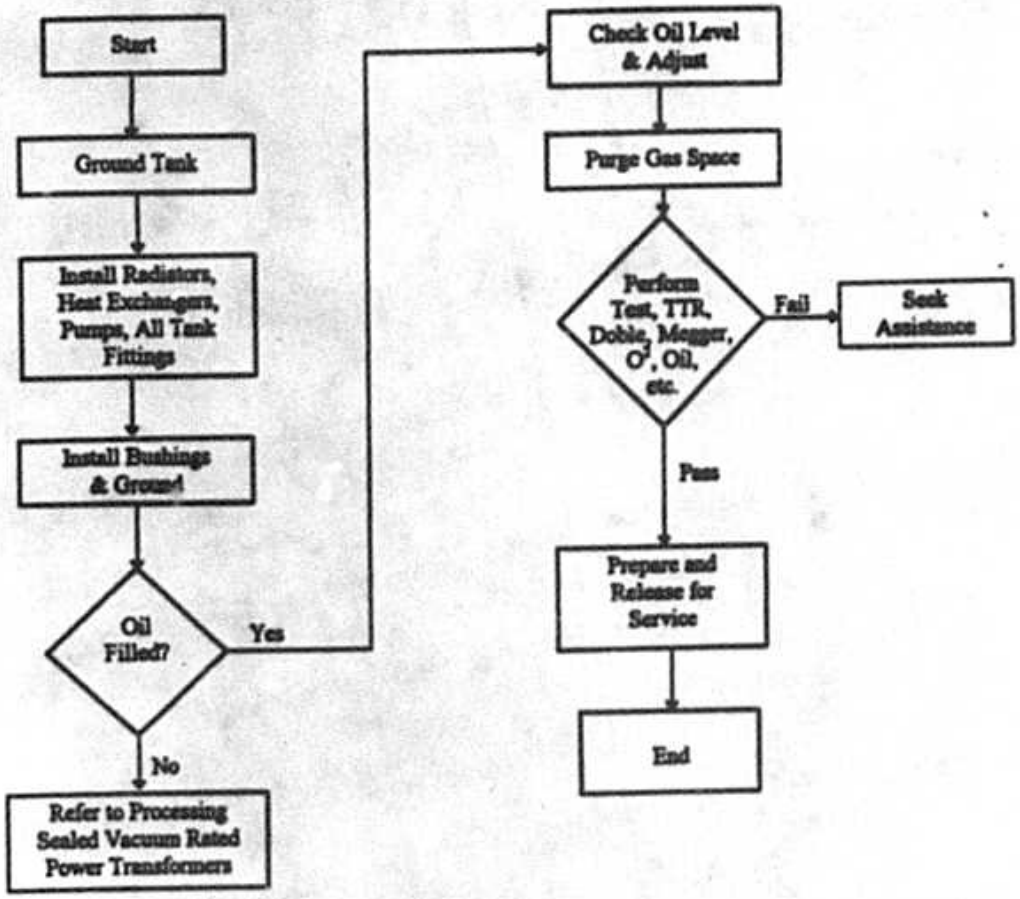
7.0 OIL STABILIZATION

Allow transformer filled with oil to sit for a minimum of 8 hours after final fill, prior to energization.

NOTE: Emergency conditions may require that this be reduced; seek assistance before reducing time).

8.0 RELEASE FOR SERVICE

INSTALLATION OF SEALED VACUUM RATED POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR

THE

INSTALLATION OF

SEALED NON-VACUUM RATED

POWER TRANSFORMERS

DATE: 10/18/94

INSTALLATION OF SEALED NON-VACUUM RATED POWER TRANSFORMER

1.0 GROUNDING

Bond transformer tank to substation grid.

2.0 TANK ACCESSORIES

Install oil pumps, radiators/coolers/heat exchangers as equipped and detailed on manufacturer's drawings.

3.0 BUSHINGS

Install all bushings as required, ground all bushings upon completion of installation.

4.0 OIL FILLING

1. If transformer was shipped gas filled, go to PROCESSING SEALED VACUUM RATED TRANSFORMER procedure.
2. Check oil level and adjust.
    1. From nameplate data, determine correct oil level.
    2. Remove manhole cover and adjust oil to appropriate level.
    3. Replace manhole cover.
    4. Run oil pumps for two hours (no more, no less).

5.0 OIL PRESERVATION SYSTEM

1. Purge gas space with dry nitrogen (N_2) to less than 2% oxygen (O_2) content.
2. Make permanent connections to Nitrogen (N_2) System.
3. Leak test unit by pressurizing unit to 3 psi and monitor leak rate for one hour, maximum leak rate 0.5 psi per hour. If greater than 0.5 psi, repair leak and retest.
4. Insure proper operation of regulator, check system for leaks.

6.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

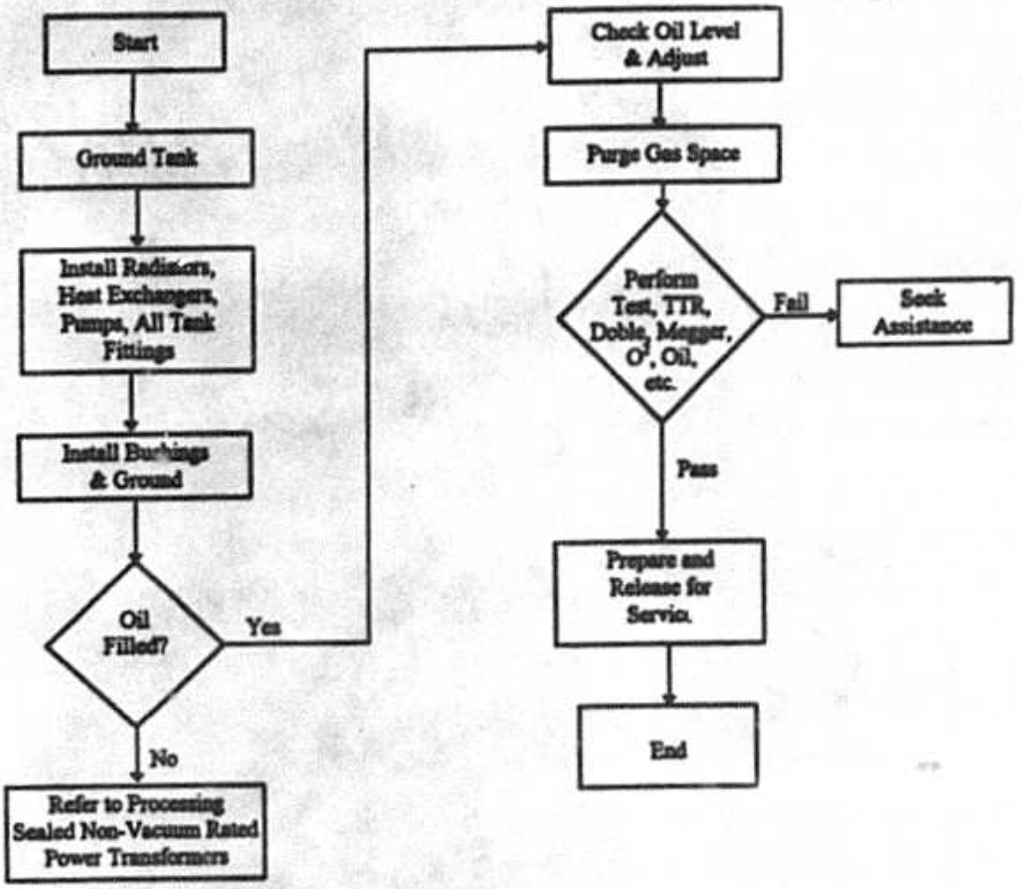
7.0 OIL STABILIZATION

Allow transformer filled with oil to sit for a minimum of 8 hours after final fill, prior to energization.

NOTE: Emergency conditions may require that this be reduced. Seek assistance before reducing time.

8.0 RELEASE FOR SERVICE

INSTALLATION OF SEALED NON-VACUUM RATED POWER TRANSFORMER



the southern electric system

PROCEDURE FOR

THE

INSTALLATION OF

C.O.P.S. TANK

POWER TRANSFORMERS

DATE: 10/18/94

141

INSTALLATION OF C.O.P.S. TANK POWER TRANSFORMERS

1.0 GROUNDING

Bond transformer tank to substation grid.

2.0 TANK ACCESSORIES

Install oil pumps, radiators/coolers/heat exchangers, C.O.P.S. tank and other such devices that might be appropriate at this time per manufacturer's drawings.

3.0 BUSHINGS

Install all bushings as required, ground all bushings upon completion of installation.

4.0 OIL FILLING

1. If transformer is not filled with oil, refer to PROCESSING OF C.O.P.S. TANK POWER TRANSFORMERS procedure.

2. If transformer is oil filled, adjust oil level.

    1. Remove breather and install gauges as necessary to inflate bladder to 0.5 psig.
    2. Fill with oil closing weep plugs as eight foot of oil flows through tubing, continuing until the last plug (conservator tank) is closed.
    3. Determine correct oil level from nameplate data.
    4. Relieve pressure on bladder, then remove conservator breather access plug and adjust oil level to measurement.
    5. Replace conservator breather access plate.
    6. Run oil pumps for two hours (no more, no less) to eliminate voids.
    7. Bleed combustible gas detector until 2 clear (no air bubbles) oil filled syringes are obtained and gas gauge reads zero.

5.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

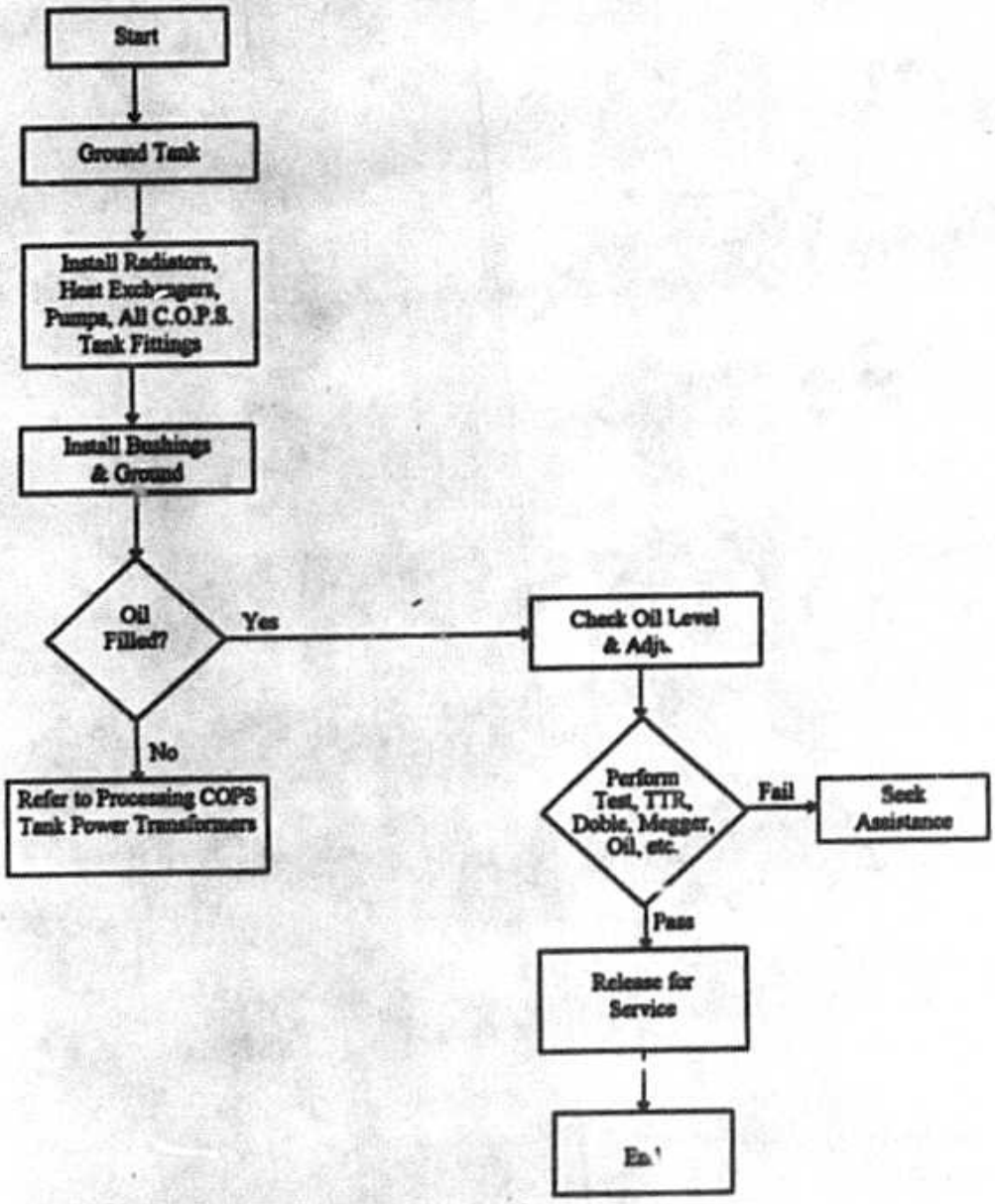
6.0 OIL STABILIZATION

Allow transformer filled with oil to sit for a minimum of 8 hours after final fill, prior to energization.

NOTE: Emergency conditions may require that this be reduced. Seek assistance before reducing time.

7.0 RELEASE FOR SERVICE

INSTALLATION OF C.O.P.S. TANK POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR THE PROCESSING OF FREE BREATHING POWER TRANSFORMERS

DATE: 10/18/94

PROCESSING FREE BREATHING POWER TRANSFORMERS

1.0 PREPARATION

1. Insure oil handling equipment and transformer are bonded and grounded.
2. Isolate auxiliary equipment (low oil trip, etc.).
3. Insure all radiator valves are open.
4. Verify oil quality.
    1. New oil must meet transformer oil purchase specifications, color less than or equal to 0.5 and dielectric (D-877) greater than or equal to 20kV.
    2. Used oil must meet minimum specifications, color less than or equal to 2.0 and dielectric (D-877) greater than or equal to 20kV.
    3. If above specifications are not met, seek assistance.

2.0 FILLING

1. Determine correct oil level from nameplate data.
2. Fill through top manhole cover with new filters.
3. Remove manhole cover and adjust oil to appropriate level.
4. Replace manhole cover.

3.0 AUXILIARY EQUIPMENT

Install other auxiliary equipment.

4.0 OIL STABILIZATION

Allow transformer filled with oil to sit for a minimum of 8 hours after final fill, prior to energization.

NOTE: Emergency conditions may require that this be reduced. Seek assistance before reducing time.

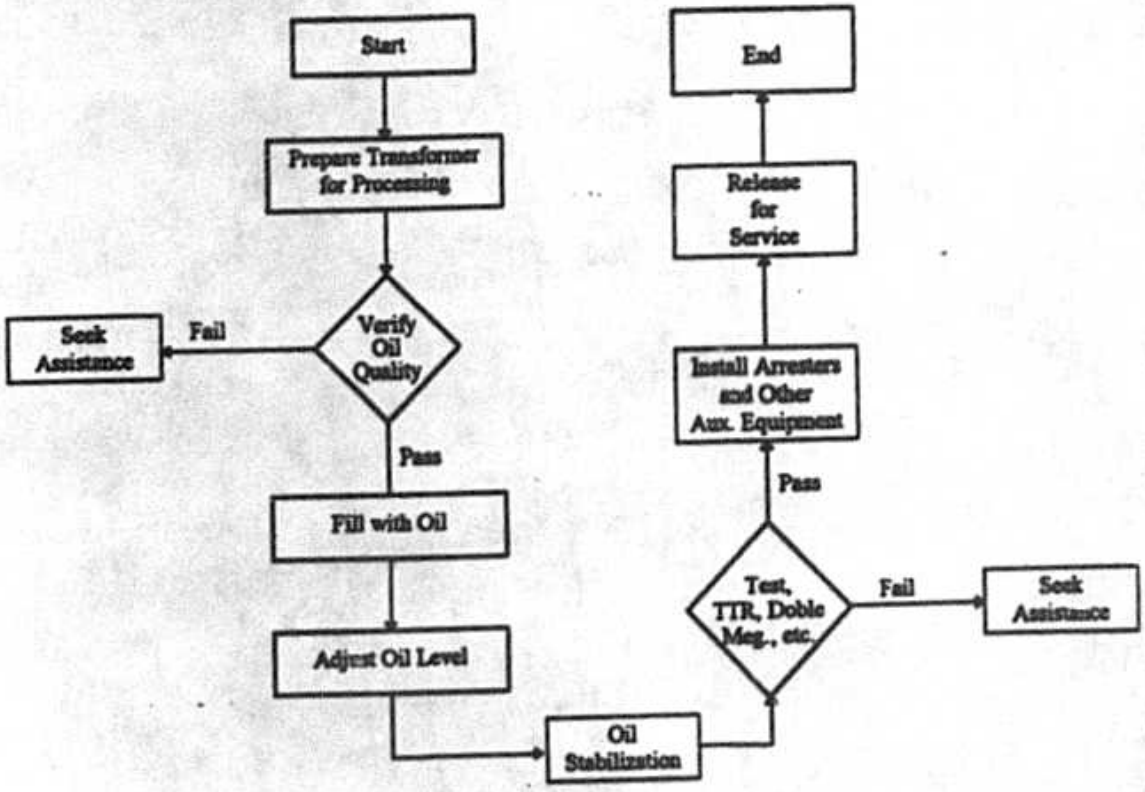
146

5.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

6.0 RELEASE FOR SERVICE

PROCESSING FREE BREATHING POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR THE PROCESSING OF SEALED VACUUM RATED POWER TRANSFORMERS 115KV AND ABOVE

DATE: 10/18/94

PROCESSING SEALED VACUUM RATED POWER TRANSFORMERS 115KV AND ABOVE

1.0 PREPARATION

1. Remove or valve off auxiliary equipment (lightning arresters, sudden pressure relay, etc.) as required for vacuum processing.

2. Electrically isolate auxiliary equipment (low oil trip, sudden pressure relay, etc.).

3. Insure transformer oil processing and vacuum equipment are properly bounded and grounded.

4. Insure all radiator valves are open.

5. Verify oil quality.

    1. New oil must meet transformer oil purchase specifications, color less than or equal to 0.5 and dielectric (D-877) greater than or equal to 20kV.
    2. Used oil must meet minimum specifications, color less than or equal to 2.0 and dielectric (D-877) greater than or equal to 20kV.
    3. If above specs are not met, seek assistance.

2.0 BLANK OFF TEST

1. Pull vacuum to 2mm (2,000 microns), leakage rate should not exceed 10 mm in 30 minutes.

2. If leakage is excessive, correct and retest.

3.0 PULL VACUUM TO 2 MM OR LESS AND CONTINUE ACCORDING TO SPECIFICATIONS BELOW:

1. 500kV - pull vacuum until 3 consecutive tests for 8 hours produce less than 8 oz. of water each or dewpoint is -65° F.

2. 230kV - 161kV pull vacuum until 2 consecutive tests for 8 hours produce less than 8 oz. of water each or dewpoint is -65° F.

3. 115kV - 6 hours + 1 hour for every tank open or dewpoint is -65° F.

NOTE: While pulling vacuum on transformer, when available circulate oil through processing unit for drying and degassification.

4.0 FILLING

While maintaining a vacuum of 2 mm or less, fill with oil to level appropriate for oil temperature.

1. Voltages above 115kV require dehumidification and degassing of the oil during filling.
2. Voltage 115kV requires filling through new filters while maintaining vacuum on transformer.

5.0 BREAK VACUUM

1. Adjust pressure to zero psig with dry nitrogen.
2. Open valves to auxiliary equipment.
3. Remove vacuum hardware and install pressure relief device, if required.

6.0 ADJUST OIL LEVEL

1. Determine correct oil level from nameplate data.
2. Remove manhole cover and adjust oil to appropriate level.
3. Replace manhole cover.
4. Run oil pumps for 2 hours (no more, no less).

7.0 CONNECT OIL PRESERVATION SYSTEM

1. Purge gas space with dry nitrogen to less than 2% oxygen.
2. Make permanent connections to nitrogen system on transformer.
3. Leak test unit by pressurizing unit to 3 psi and monitor leak rate for one hour, maximum leak rate 0.5 psi per hour. If greater than 0.5 psi, repair leak and retest.
4. Insure proper operations of regulator, check system for leaks.

8.0 AUXILIARY EQUIPMENT

Install other auxiliary equipment.

9.0 OIL IMPREGNATION

1. Natural impregnation (preferred method).

    1. 500kV allowed to stand, full of oil, for 96 hours.
    2. 230/161kV allowed to stand, full of oil, for 48 hours.
    3. Below 161kV allowed to stand, full of oil, for 24 hours.

NOTE: For transformer previously filled, time maybe reduced after consultation with proper authority.

2. Forced impregnation.

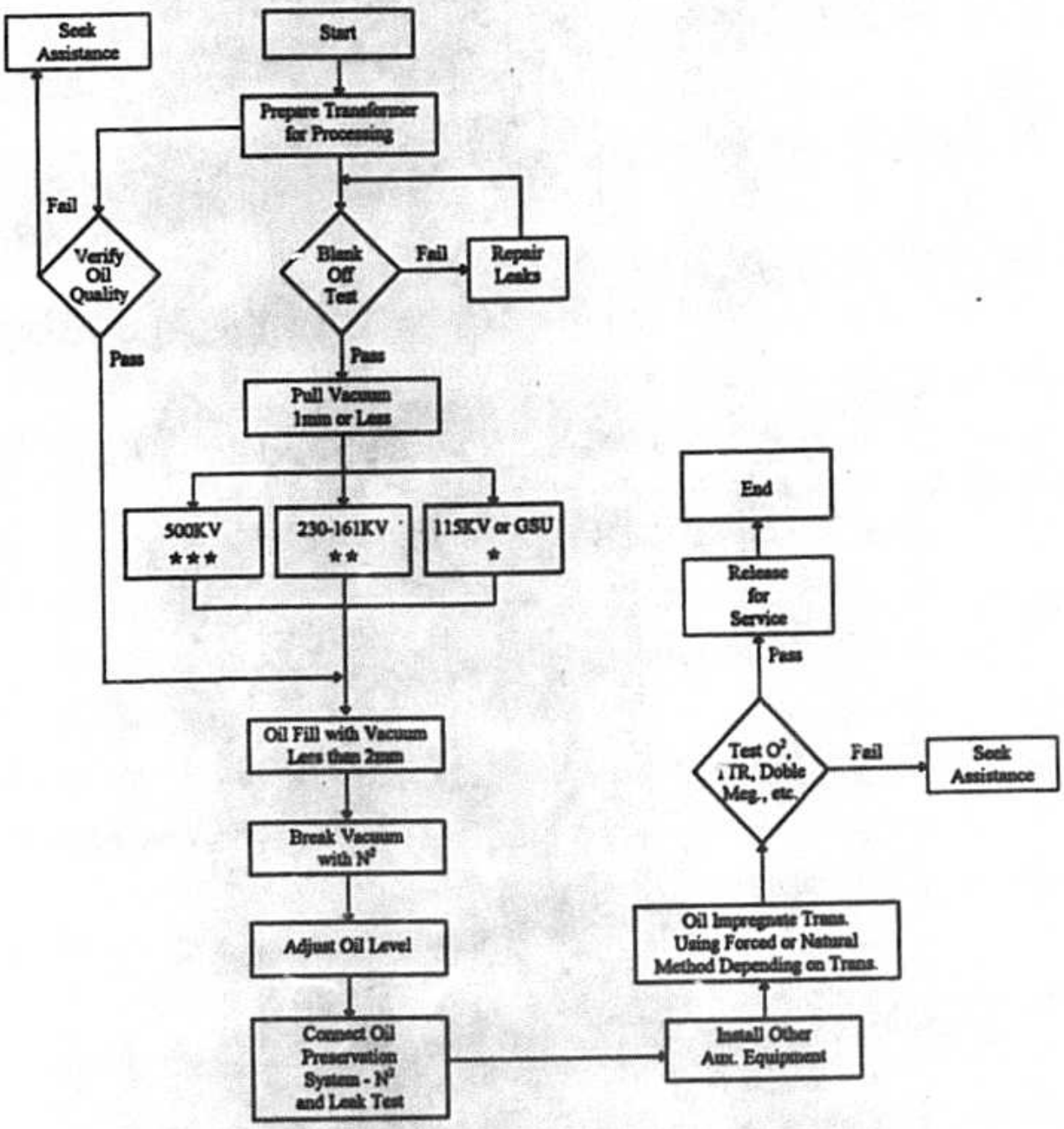
    1. Circulate heated oil until inlet and outlet temperatures are within 10° C of 70° C.

10.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

11.0 RELEASE FOR SERVICE

PROCESSING SEALED VACUUM RATED POWER TRANSFORMERS 115KV AND ABOVE



★ 6 hrs. + 1 hr. for every hour tank open to atmosphere (minimum of 8 hrs.)

★ ★ Pull vacuum until 2 consecutive tests for 8 hrs. produce less than 8 oz. of water each.

★ ★ ★ Pull vacuum until 3 consecutive tests for 8 hrs. produce less than 8 oz. of water each.

or achieve -55°F dewpoint.

the southern electric system

PROCEDURE FOR THE PROCESSING OF SEALED NON-VACUUM RATED POWER TRANSFORMERS

DATE: 10/18/94

PROCESSING SEALED NON-VACUUM RATED POWER TRANSFORMERS

1.0 PREPARATION

1. Remove or valve off auxiliary equipment as required for processing.
2. Isolate auxiliary equipment (low oil trip, etc.).
3. Insure transformer, oil processing equipment are properly bounded and grounded.
4. Insure all radiator valves are on.
5. Verify oil quality.
    1. New oil must meet transformer oil purchase specifications, color less than or equal to 0.5 and di. ectric (D-877) greater than or equal to 20kV.
    2. Used oil must meet minimum specifications, color less than or equal to 2.0 and dielectric (D-877) greater than or equal to 20kV.
    3. If above specifications are not met, seek assistance.
6. Check dew point of transformer. If greater than -40 ° F, seek assistance.

2.0 FILLING

Fill transformer through new filters.

3.0 ADJUST OIL LEVEL

1. Determine correct oil level from nameplate data.
2. Remove manhole cover and adjust oil to appropriate level.
3. Replace manhole cover.
4. Run oil pumps for 2 hours (no more, no less).

155

4.0 CONNECT OIL PRESERVATION SYSTEM

1. Purge gas space with dry nitrogen to less than 2% oxygen.
2. Make permanent connections to nitrogen system on transformer.
3. Leak test unit by pressurizing unit to 3 psi and monitor leak rate for one hour, maximum leak rate 0.5 psi per hour. If greater than 0.5 psi, repair leak and retest.
4. Insure proper operations of regulator, check system for leaks.

5.0 AUXILIARY EQUIPMENT

Install auxiliary equipment as necessary.

6.0 IMPREGNATION

1. Natural impregnation (preferred method).
    1. Below 161kV allowed to stand, full of oil, for 24 hours.

NOTE: For transformer previously filled, time maybe reduced after consultation with proper authority.

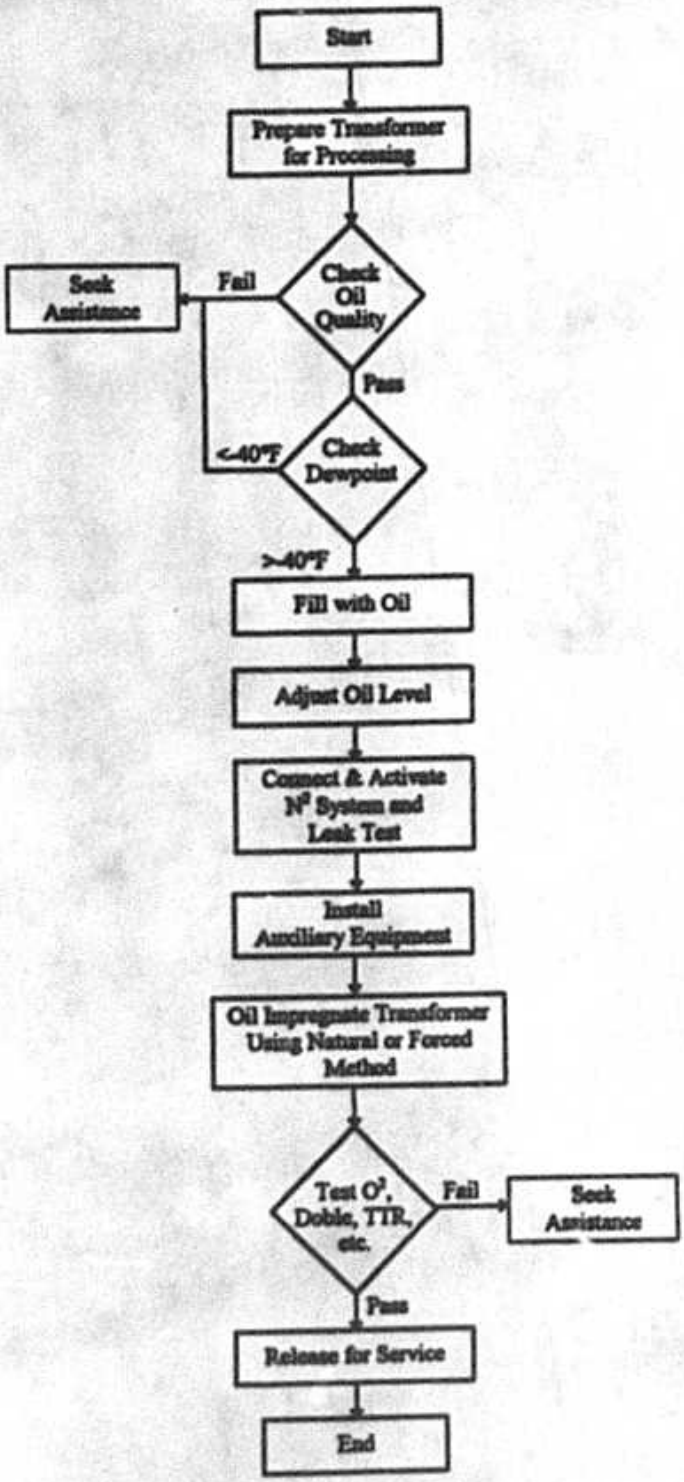
2. Forced Impregnation.
    1. Circulate heated oil until inlet and outlet temperatures are within 10° C of 70° C.

7.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	No Yes	Yes No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

8.0 RELEASE FOR SERVICE

PROCESSING SEALED NON-VACUUM RATED POWER TRANSFORMERS



158

the southern electric system

PROCEDURE FOR

THE

PROCESSING

OF

C.O.P.S. TANK

POWER TRANSFORMERS

115KV AND ABOVE

DATE: 10/18/94

PROCESSING C.O.P.S. TANK POWER TRANSFORMERS 115KV AND ABOVE

1.0 PREPARATION

1. Remove or valve off auxiliary equipment as required for vacuum processing.

2. Isolate auxiliary equipment (low oil trip, etc.).

3. Insure transformer oil processing and vacuum equipment are properly bonded and grounded.

4. Insure all radiator valves are open.

5. Verify oil quality.

    1. New oil must meet transformer oil purchase specifications, color less than or equal to 0.5 and dielectric (D-877) greater than or equal to 20kV.
    2. Used oil must meet minimum specifications, color less than or equal to 2.0 and dielectric (D-877) greater than or equal to 20kV.
    3. If above specifications are not met, seek assistance.

2.0 BLANK OFF TEST

1. Pull vacuum to 2mm (2,000 micron), leakage rate should not exceed 10 mm in 30 minutes.

2. If leakage is excessive, correct and retest.

3.0 PULL VACUUM TO 2 MM OR LESS AND CONTINUE PROCESSING ACCORDING TO SPECIFICATION BELOW

1. 500kV - pull vacuum until 3 consecutive tests for 8 hours produce less than 8 oz. of water each or dewpoint is -65° or less. Circulate oil through oil treatment plant, heating and degassing during time of vacuum.

2. 230kV - 161kV pull vacuum until two consecutive tests for 8 hours produce less than 8 oz. of water each. Circulate oil through oil treatment plant, heating and degassing during time of vacuum.

160

3. 115kV - 6 hours + 1 hour for every tank open to atmosphere or dewpoint is -65° or less.

NOTE: While pulling vacuum on transformer, when available circulate oil through processing unit for drying and degassification.

4.0 FILLING

1. While maintaining a vacuum of 2 mm or less, fill with oil until it reaches sight glass.

NOTE: On 500-230kV transformers, oil must be greater than 50°C before entering transformer.

2. Voltages above 115kV require dehumidification and degassing of the oil during filling through new filters.

3. Voltage 115kV requires filling through new filters while maintaining vacuum on transformer.

5.0 BREAK VACUUM

1. Adjust pressure to zero psig with dry nitrogen.

2. Open valves to auxiliary equipment.

3. Remove vacuum hardware and install pressure relief device, if required.

4. Connect conservator tank plumbing and open valve.

5. Inflate bladder to 0.5 psi.

6. Open all weep plugs (bushing wells, pressure relief, etc.),. installing at least eight foot of Tygon tubing from plugs to common oil collection site.

6.0 ADJUST OIL LEVEL

1. Fill with oil closing weep plugs as eight foot of oil flows through tubing, continuing until the last plug (conservator tank) is closed.

2. Determine correct oil level from nameplate data.

3. Remove conservator breather access plug and adjust oil level.

4. Install conservator breather.

5. Run oil pumps for 2 hours (no more, no less).

6. Bleed combustible gas detector until 2 clear (no air bubbles) oil filled syringes are obtained and gas gauge reads zero.

7.0 AUXILIARY EQUIPMENT

Install other auxiliary equipment as necessary.

8.0 OIL IMPREGNATION

1. Natural impregnation (preferred method).

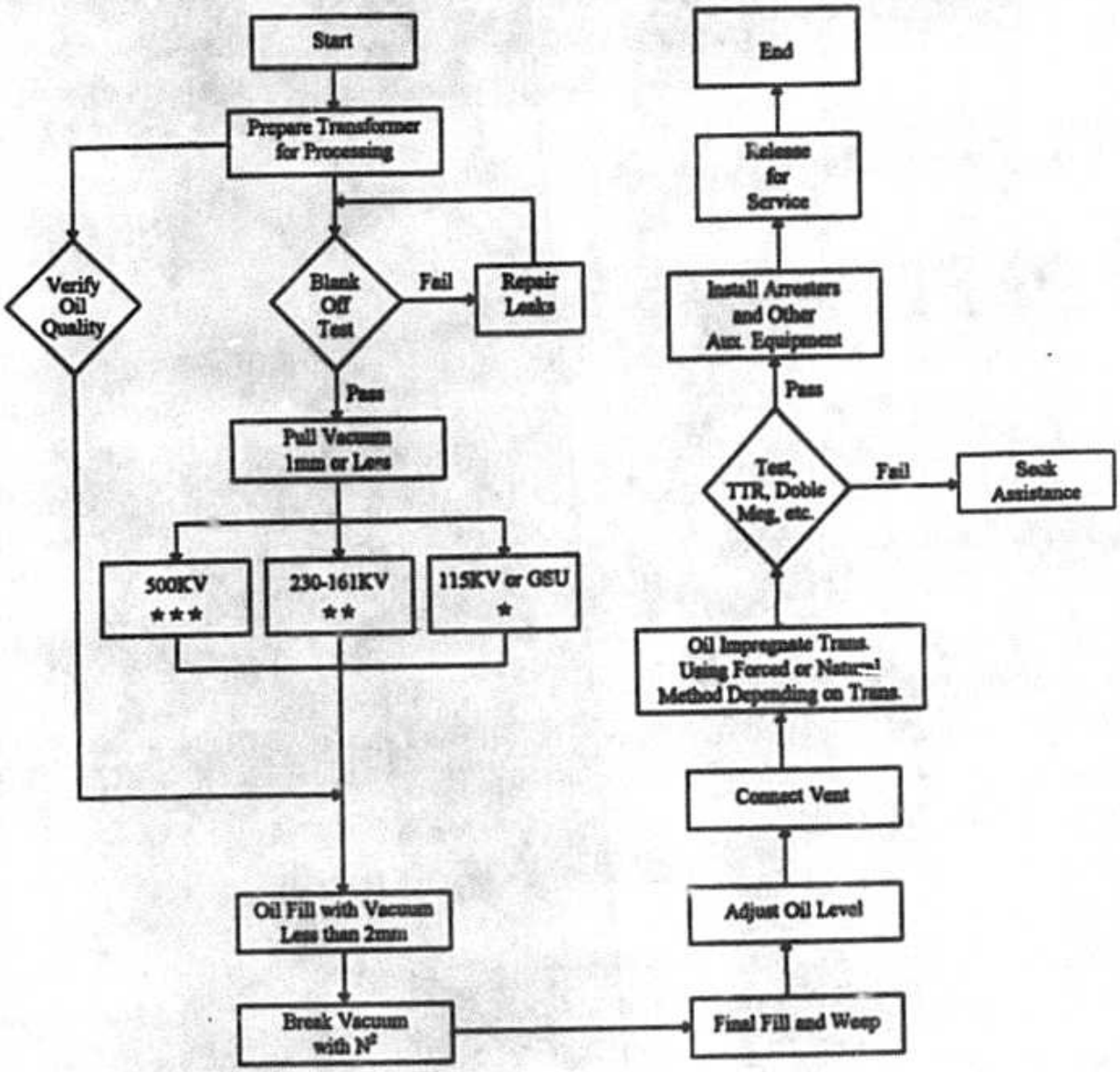
    1. 500KV allowed to stand full of oil for 96 hours.
    2. 230/161kV allowed to stand full of oil for 48 hours.
    3. Below 161kV allowed to stand full of oil for 24 hours.

NOTE: For transformer previously filled time maybe reduced after consultation with proper authority.

2. Forced impregnation.

    1. Circulate heated oil until inlet and outlet temperatures are within 10° C of 70° C.

PROCESSING GSU'S TANK POWER TRANSFORMERS 115KV AND ABOVE



* 6 hrs. + 1 hr. for every hour tank open to atmosphere (minimum of 8 hrs.)

** Pull vacuum until 2 consecutive tests for 8 hrs. produce less than 8 oz. of water each.

*** Pull vacuum until 3 consecutive tests for 8 hrs. produce less than 8 oz. of water each.

— or -65°F dewpoint

20PCOP8.DOC
DATE: 10/18/94

the southern electric system

PROCEDURE FOR

DRYING

FREE BREATHING

POWER TRANSFORMERS

DATE: 10/18/94

RLY

DRYING FREE BREATHING TRANSFORMERS

1.0 EVALUATION

Based on amount of oil, size of core and coil and test results, determine the degree of processing required.

2.0 PROCESSING PROCEDURES

1. Hot oil circulation.

    1. Prepare for hot oil circulation.

        1. Isolate auxiliary equipment from control schemes.
        2. Insure transformer and auxiliary equipment is electrically bonded and grounded.
        3. Close top radiator valves.

    2. Circulate hot oil.

        1. With outlet temperature of heating unit limited to approximately 70°C circulate hot oil.
        2. When inlet temperature is within 10° of outlet temperature (70°), determine dryness of transformer. Transformer is dry when processing unit inlet oil dew point measures less than -40°F with a hygrometer.

3.0 ADJUST OIL LEVEL

1. Open radiator valves.
2. Determine correct oil level from nameplate data.
3. Remove manhole cover and adjust oil to appropriate level.
4. Replace manhole cover.

5.0 BREATHER

Verify breather is free of obstructions.

6.0 PREPARE FOR SERVICE

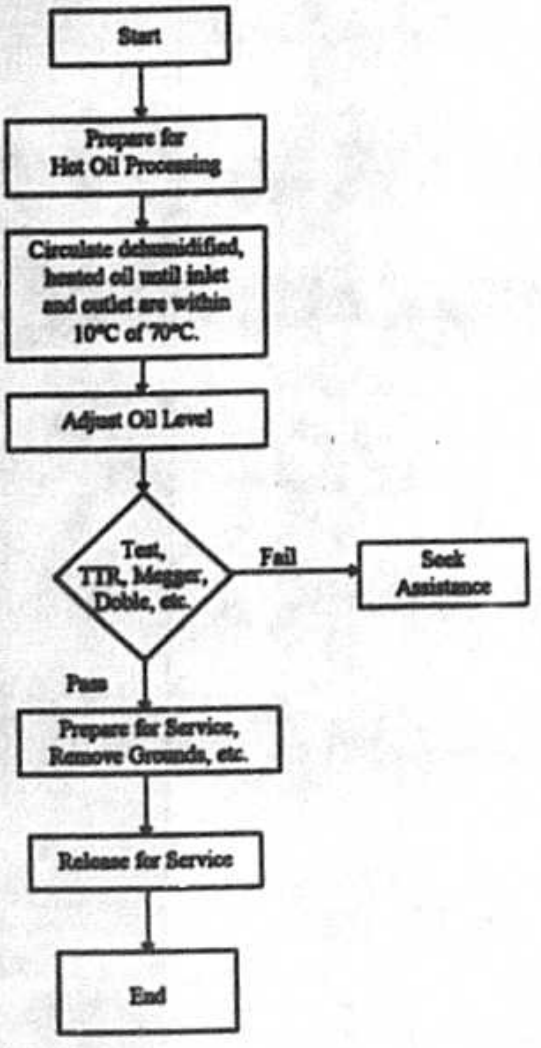
Reinstall all auxiliary devices if not previously done.

7.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	No Yes	Yes No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

8.0 RELEASE FOR SERVICE

DRYING FREE BREATHING TRANSFORMERS



the southern electric system

PROCEDURE FOR DRYING SEALED VACUUM RATED POWER TRANSFORMERS

DATE: 10/18/94

168

DRYING SEALED VACUUM RATED POWER TRANSFORMERS

1.0 EVALUATION

Based on amount of oil, size of core and coil and test results, determine the degree of processing required.

2.0 PROCESSING PROCEDURES

1. FULL HOT OIL - VACUUM PROCESSING

1. Prepare for vacuum processing by:
    1. Remove or valve off auxiliary equipment.
    2. Isolate auxiliary equipment from control schemes.
    3. Ensure transformer and processing equipment are effectively bonded and grounded.
2. With an oil treatment plant, circulate hot oil until inlet and outlet temperatures are within 10° C of each other with outlet at 70° C.
3. Drain oil from tank. The intent is to leave sufficient oil in tank so that circulation is continuous and to maximize exposure of core and winding.
4. Circulate heated oil. While pulling vacuum, circulate oil heated to approximately 75° C, as measured at output of processing unit.
5. Continue processing until one of the following criteria are met:
    1. Vacuum of 1 mm Hg or less is obtained.
    2. Hygrometer reading at inlet of processing unit is less than -40° C.
    3. Moisture from cold trap is less than 8 oz. in 8 hours.
6. Go to 4.0.

2. VACUUM PROCEDURE ONLY

1. Prepare for vacuum processing by:
    1. Remove or valve off auxiliary equipment.
    2. Isolate auxiliary equipment from control schemes.
    3. Ensure transformer and processing equipment are effectively bonded and grounded.

2. Drain oil from transformer.

3. Pull vacuum on transformer to 2mm or less and the applicable criteria below are met:

   1. 500kV pull vacuum until three consecutive tests for 8 hours produce less than 8 oz. of water each or a dewpoint of -65° C is obtained.
   2. 230-161kV pull vacuum until two consecutive tests for 8 hours produce less than 8 oz. of water each or a dewpoint of -65° C is obtained.
   3. 115-6 hours + 1 hour for every four hours tank open to atmosphere or a dewpoint of -65° C is obtained.

4. When the above appropriate criteria is met, go to 5.0.

NOTE: While pulling vacuum on transformer, when available circulate oil through processing unit for drying and degassification.

3. HOT OIL CIRCULATION

1. Prepare for hot oil circulation by:

   1. Isolate auxiliary equipment from control schemes.
   2. Insure transformer and auxiliary equipment is effectively bonded and grounded.
   3. Insure all radiator valves are open.

2. Circulate hot oil with outlet of heating unit limited temperature at approximately 95° C. When inlet temperature is within 10 degrees C of outlet temperature (95°), determine dryness of transformer by measuring dewpoint. Transformer is dry when processing unit inlet oil dew point measures less than -40° F.

NOTE: Effective oil flow may require the use of a positive displacement pump.

3. Go to 7.0.

3.0 OIL EVACUATION

1. Stop all processing.
2. Break vacuum with dry nitrogen.
3. Remove all oil from transformer, maintaining pressure with nitrogen.

4.0 VACUUM ON TRANSFORMER

Pull vacuum to 2 mm of mercury (Hg) on transformer tank.

5.0 FILLING

While maintaining a vacuum of 2 mm or less, fill with oil to level appropriate for oil temperature.

1. Voltages above 115kV require dehumidification and degassing of the oil during filling through new filters.
2. Voltage 115kV requires filling through new filters while maintaining vacuum on transformer.

6.0 BREAK VACUUM

1. Adjust pressure to zero psig with dry nitrogen.
2. Open valves to auxiliary equipment.
3. Remove vacuum hardware and install pressure relief device, if required.

7.0 ADJUST OIL LEVEL

1. Determine correct oil level form nameplate data.
2. Remove manhole cover and adjust oil to appropriate level.
3. Replace manhole cover.
4. Run oil pumps for 2 hours (no more, no less).

8.0 CONNECT OIL PRESERVATION SYSTEM

1. Purge gas space with dry nitrogen to less than 2% oxygen.
2. Make permanent connections to nitrogen system on transformer.
3. Leak test unit by pressurizing unit to 3 psi and monitor leak rate for one hour, maximum leak rate 0.5 psi per hour. If greater than 0.5 psi, repair leak and retest.
4. Insure proper operations of regulator, check system for leaks.

9.0 PREPARE FOR SERVICE

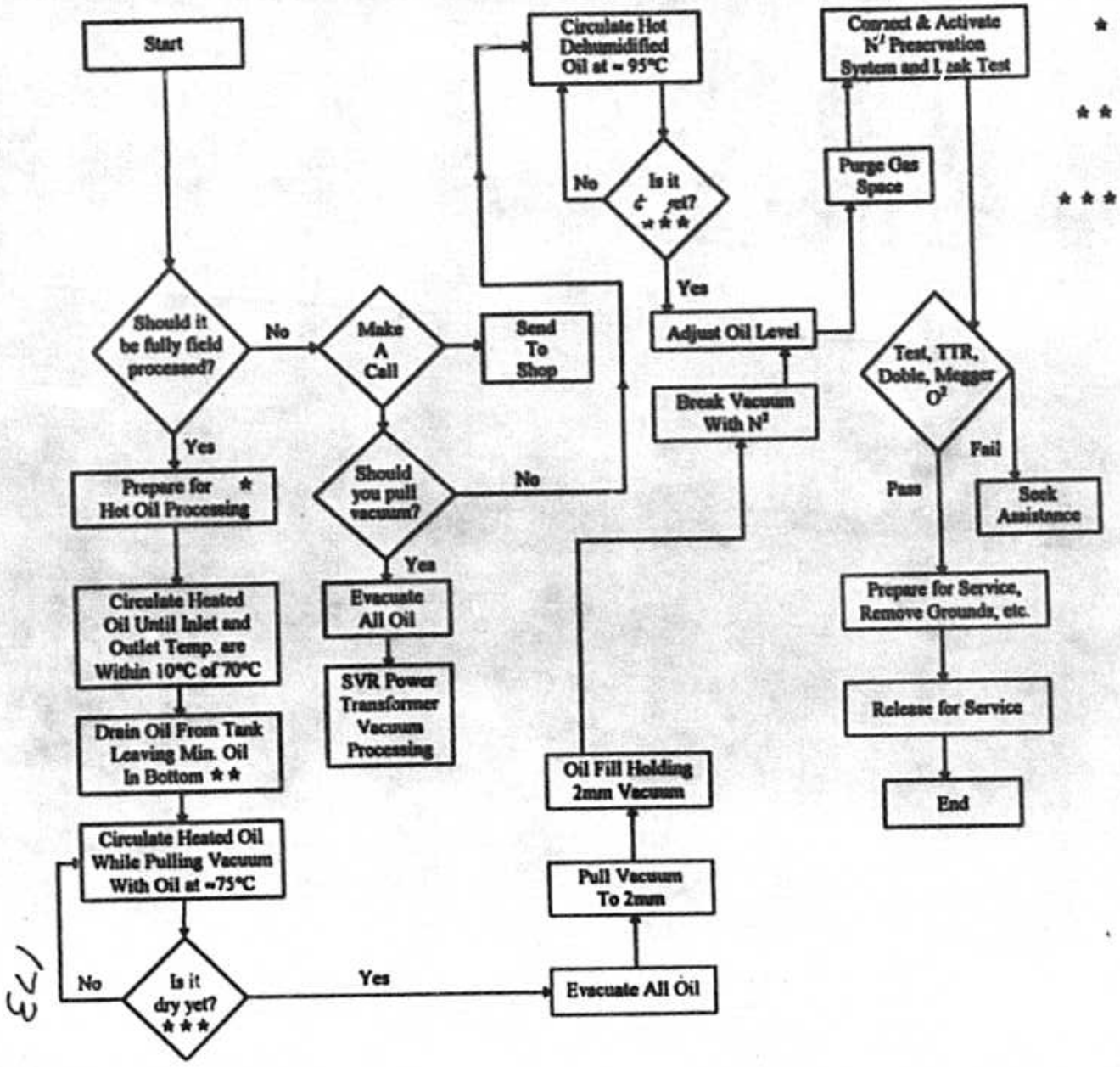
Reinstall all auxiliary devices if not previously done.

10.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

12.0 RELEASE FOR SERVICE

DRYING SEALED VACUUM RATED POWER TRANSFORMERS



★ Obtain clearance, observe all safety rules, i.e., ground, disable protective relaying schemes, set up hot oil processing unit.

★★ Intent here is to leave sufficient oil in tank so that circulation is continuous, and maximize exposure of core and windings.

★★★ Is vacuum at 1mm?
or
is hygrometer reading at inlet of P.U. less than -40°F?
or
is moisture from cold trap less than 8 oz. for 8 hours?

the southern electric system

PROCEDURE FOR

DRYING

SEALED NON-VACUUM RATED

POWER TRANSFORMERS

DATE: 10/18/94

DRYING SEALED NON-VACUUM RATED POWER TRANSFORMERS

1.0 EVALUATION

Based on amount of oil, size of core and coil and test results, determine the degree of processing required.

2.0 PROCESSING PROCEDURES

1. HOT OIL CIRCULATION

1. Prepare for hot oil circulation.

    1. Isolate auxiliary equipment from control schemes.
    2. Insure transformer and auxiliary equipment is effectively bonded and grounded.
    3. Close top radiator valves.

2. CIRCULATE HOT OIL

1. With outlet temperature of heating unit to approximately 70°C, circulate hot oil.
2. When inlet temperature is within 10° C of outlet temperature (70°C), determine dryness of transformer. Transformer is dry when inlet oil dew point measures less than -40° F with a hygrometer.

3.0 ADJUST OIL LEVEL

1. Open top radiator valve.
2. Determine correct oil level from nameplate data.
3. Remove manhole cover, adjust oil to appropriate level.
4. Replace manhole cover.

4.0 OIL PRESERVATION SYSTEM

1. Purge gas space with dry nitrogen to less than 2% oxygen.

2. Make permanent connections to nitrogen system on transformer.

3. Leak test unit by pressurizing unit to 3 psi and monitor leak rate for one hour, maximum leak rate 0.5 psi per hour. If greater than 0.5 psi, repair leak and retest.

4. Ensure proper operations of regulator, check system for leaks.

7.0 PREPARE FOR SERVICE

Reinstall all auxiliary devices if not previously done.

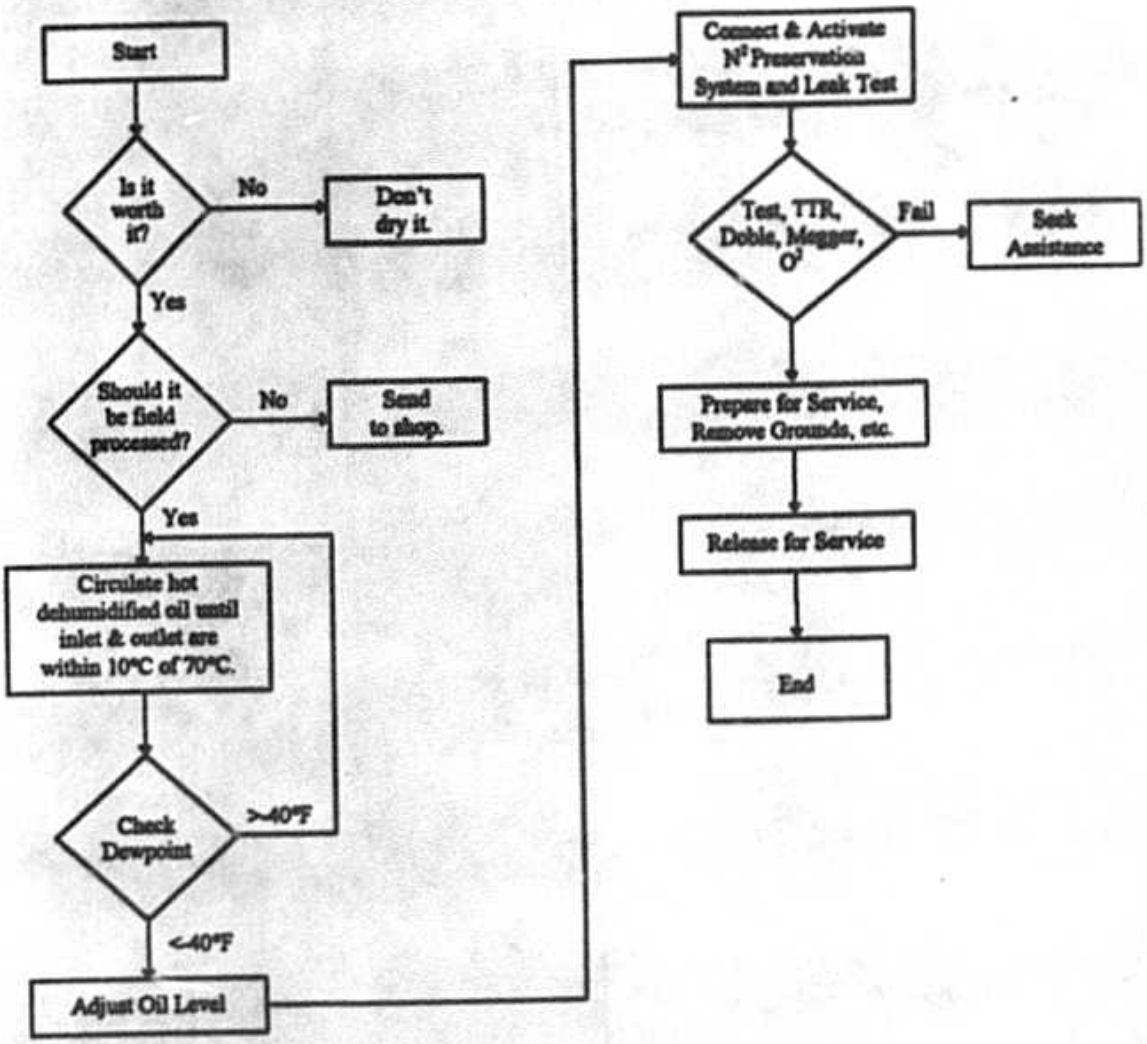
8.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

9.0 RELEASE FOR SERVICE

176

DRYING SEALED NON-VACUUM RATED POWER TRANSFORMERS



the southern electric system

PROCEDURE FOR

DRYING

C.O.P.S. TANK

POWER TRANSFORMERS

DATE: 10/18/94

178

5.0 OIL EVACUATION

1. Stop all processing.
2. Break vacuum with dry gas.
3. Remove all oil from transformer.

6.0 VACUUM ON TRANSFORMER

Pull vacuum to 2 mm of mercury (Hg) on transformer tank.

7.0 FILLING

1. While maintaining a vacuum of 2 mm or less, fill with oil until it reaches sight glass.
2. Voltages above 115kV require dehumidification and degassing of the oil during filling through new filters.
3. Voltage 115kV requires filling through new filters while maintaining vacuum on transformer.

8.0 BREAK VACUUM

1. Adjust pressure to zero psig with dry nitrogen.
2. Open valves to auxiliary equipment.
3. Remove vacuum hardware and install pressure relief device, if required.
4. Connect conservator tank plumbing and open valve.
5. Inflate bladder to 0.5 psi.
6. Open all weep plugs (bushing wells, pressure relief, etc.),. installing at least eight foot of Tygon tubing from plugs to common oil collection site.

DRYING C.O.P.S. TANK POWER TRANSFORMERS

1.0 PREPARATION

1. Remove or valve off auxiliary equipment.
2. Isolate auxiliary equipment from control schemes (low oil trip, etc.).
3. Ensure that all processing equipment and transformers are properly bonded and grounded.
4. Ensure all top cooler (radiator) valves are closed.

2.0 HOT OIL CIRCULATION

Circulate heated oil until inlet and outlet temperatures are within 10° C of each other with the outlet temperature of the processing unit at 70° C. This is to heat the core and coil.

3.0 DRAIN OIL FROM TANK

Intent here is to leave sufficient oil in tank so the circulation is continuous and to maximize exposure of core and windings. As a first setup, drain approximately 3/4 of oil volume from transformer. During processing adjust oil level as required to maintain effective oil flow or maximize exposure of windings.

NOTE: Effective oil flow may require the use of a positive displacement pump.

4.0 CIRCULATE HEATED OIL

While pulling vacuum on transformer tank begin circulating oil heated to approximately 75° C measured at output of processing unit.

Continue circulating oil and pulling vacuum until one of the following criteria are met:

1. Vacuum is at 1 mm of mercury (Hg) or less.
2. Hygrometer reading at inlet of processing unit is less than -40° C.
3. Moisture from cold trap is less than 8 oz. in 8 hours.

5.0 OIL EVACUATION

1. Stop all processing.
2. Break vacuum with dry gas.
3. Remove all oil from transformer.

6.0 VACUUM ON TRANSFORMER

Pull vacuum to 2 mm of mercury (Hg) on transformer tank.

7.0 FILLING

1. While maintaining a vacuum of 2 mm or less, fill with oil until it reaches sight glass.
2. Voltages above 115kV require dehumidification and degassing of the oil during filling through new filters.
3. Voltage 115kV requires filling through new filters while maintaining vacuum on transformer.

8.0 BREAK VACUUM

1. Adjust pressure to zero psig with dry nitrogen.
2. Open valves to auxiliary equipment.
3. Remove vacuum hardware and install pressure relief device, if required.
4. Connect conservator tank plumbing and open valve.
5. Inflate bladder to 0.5 psi.
6. Open all weep plugs (bushing wells, pressure relief, etc.),. installing at least eight foot of Tygon tubing from plugs to common oil collection site.

9.0 ADJUST OIL LEVEL

1. Fill with oil, closing weep plugs as eight foot of oil flows through tubing, continuing until the last plug (conservator tank) is closed.
2. Determine correct oil level from nameplate data.
3. Remove conservator breather access plug and adjust oil level.
4. Replace conservator breather.
5. Run pumps for two hours (no more no less) to eliminate voids.
6. Bleed combustible gas detector until 2 clear (no air bubbles) oil filled syringes are obtained and gas gauge reads zero.

10.0 AUXILIARY EQUIPMENT

Install other auxiliary equipment as necessary.

11.0 OIL IMPREGNATION

1. Natural impregnation (preferred method).
    1. 500kV allowed to stand full of oil for 96 hours.
    2. 230/161kV allowed to stand full of oil for 48 hours.
    3. Below 161kV allowed to stand full of oil for 24 hours.

NOTE: For transformer previously filled time may be reduced after consultation with proper authority.

2. Forced impregnation.
    1. Circulate heated oil until inlet and outlet temperatures are within 10° C of 70° C.

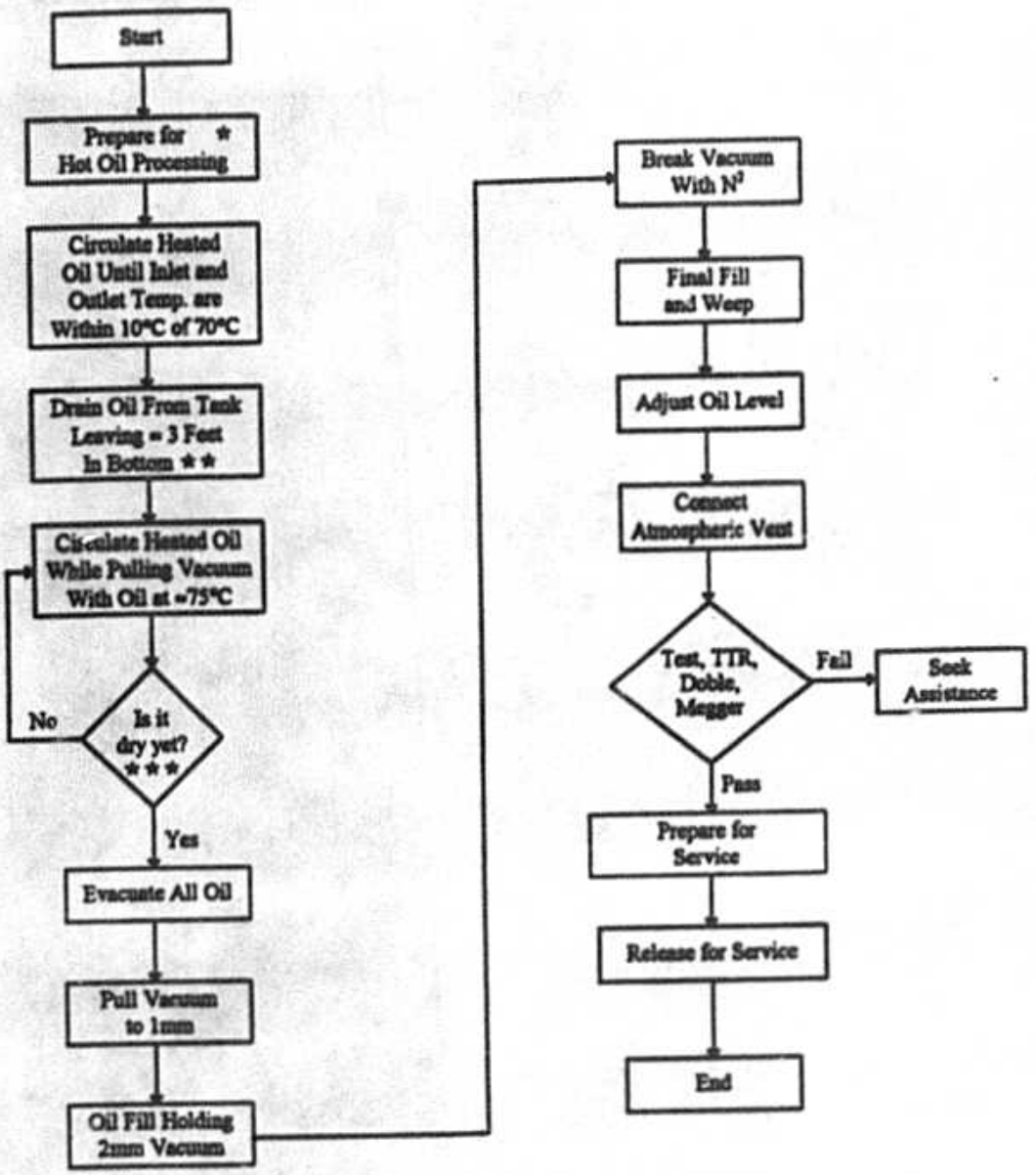
12.0 TRANSFORMER TESTS

TRANSFORMER TEST	≤ 69KV	> 69KV
Power Factor (Percent)	No	Yes
Transformer Turns Ratio (TTR)	Yes	Yes
Insulation Resistance (MΩ)	Yes	No
Dielectric Breakdown (D-1816)	Yes	Yes
Color (Number)	Yes	Yes
Dissolved Gas Analysis (DGA)	No	Yes
Moisture (ppm)	No	Yes
Interfacial Tension (IFT)	No	Yes

13.0 RELEASE FOR SERVICE

192

DRYING C.O.P.S. TANK POWER TRANSFORMERS



★ Obtain clearance, observe all safety rules, i.e., ground, disable protective relaying schemes, set up hot oil processing unit.

★★ Intent here is to leave sufficient oil in tank so that circulation is continuous, and maximize exposure of core and windings.

★★★ Is vacuum at 1mm?
or
is hygrometer reading at inlet of P.U. less than -40°F?
or
is moisture from cold trap less than 8 oz. for 8 hours?

the southern electric system

PROCEDURE FOR THE PREVENTIVE DIAGNOSTIC INSPECTION AND EXTERNAL MAINTENANCE OF POWER TRANSFORMERS

DATE: 10/17/94

PREVENTATIVE DIAGNOSTIC INSPECTION AND EXTERNAL MAINTI NANCE OF POWER TRANSFORMERS

1.0 APPLICATION

This specification applies to substation transformers with high side voltages rated 4kV and above on the high side.

2.0 VISUAL INSPECTION

Perform a general visual inspection of the substation and a detailed inspection of the piece of equipment to be worked on.

1. VISUAL INSPECTION OF LOAD TAP CHANGERS

NOTE: Check LTC operating range. If LTC is not operating through neutral, notify appropiate authority.

3.0 GROUND CONNECTIONS

Visually inspect tank grounds for tightness.

4.0 CABINETS

The cabinets are designed to be weather proof. Correct for any sign of water entry. Lubricate latches and hinges with (SC000XXXXX) lubricant or equivalent. Seal all unnecessary holes.

1. HEATERS

If cabinet has heaters, inspect and replace damaged heaters. Verify correct operation of thermostat.

5.0 COOLING EQUIPMENT

1. Remove debris from radiators and fans. If necessary, spray clean heat exchangers using pressure washer with water only or approved cleaning agent.
2. Visually inspect contactors for burnt or pitted contacts. Clean with a burnishing tool or replace if damage can not be corrected.
3. Check operation of fans and pumps and return to AUTO position.
4. Change staging of cooling.

5. Inspect fans for loose or cracked blades.
6. Lubricate fan motors if equipped with grease fittings. Use Mobil #28 grease (SC00038220).

6.0 OIL LEAKS

Inspect for oil leaks, referring to procedures for cleanup. Take required action if oil leaks are detected, and report immediately so further actions can be determined.

7.0 OIL QUALITY AND GAS BLANKET TESTS

NOTE: Do not open the sample valve when the transformer has a vacuum.

1. **115, 161, 230, AND 500KV CLASS AND SEALED TRANSFORMERS AND GSU:**

   Obtain an oil sample for dissolved gas analysis, color, and moisture tests as required by Southern Electric System schedule.

2. **69KV CLASS AND BELOW AND FREE BREATHING**

   Obtain an oil sample for dielectric and color tests per Southern Electric System schedule.

   Measure oil dielectric.

TYPE TRANSFORMER	TEST	MINIMUM TEST KV	
		69KV & BELOW	115KV
FREE BREATHING	D-877	22	22
GAS BLANKETED	D-1816	25	N/A
C.O.P.S TANK	D-1816	25	N/A

LTC COMPARTMENT	TEST	MINIMUM KV
NON-VACUUM	D-877	22
VACUUM	D-877	22

If the transformer oil test results are not within the acceptable limits, seek assistance. If the LTC compartment oil test results are not within acceptable limits perform an internal inspection.

3. OIL COLOR TEST

TYPE TRANSFORMER	MAXIMUM COLOR 69KV & BELOW	115KV
FREE BREATHING	3.0	3.0
GAS BLANKETED	2.0	N/A
C.O.P.S. TANK	2.0	N/A

LTC COMPARTMENT	MINIMUM KV
NON-VACUUM	≤ 3
VACUUM	≤ 1

If the transformer oil test results are not within the acceptable limits, seek assistance. If the LTC compartment oil tast results are not within acceptable limits perform an internal inspection.

4. COMBUSTIBLE GAS TEST (for Nitrogen Blanketed Transformers)

Use approved combustible gas analyzer to determine combustible gas content of transformer nitrogen blanket. Log test value on Nitrogen Use Card.

If the result is ≥ 0.06 on the scale and has increased since the last test: Seek assistance.

5. OXYGEN CONTENT TEST (For Gas Blanketed Transformers)

Use approved oxygen analyzer to measure oxygen content of nitrogen blanket. If oxygen level is greater than 2% purge nitrogen blanket until less than 2%. Purge Nitrogen blanket until less than 2%.

If this has happened before, determine the source of the oxygen and repair.

3.0 CALIBRATE GAUGES

Temperature gauges are normally very reliable and do not require calibration. If there is evidence that the calibration or proper operation of temperature gauges is not correct, perform the following tests:

1. **OIL TEMPERATURE GAUGES**

   Calibrate oil temperature gauges according to manufacturer's handbook and wiring drawings.

2. **WINDING TEMPERATURE GAUGE**

   Use JOFRA Temperature Gauge Calibrator or equivalent. Calibrate winding temperature gauge according to manufacturer's handbook and wiring drawings.

3. **NITROGEN GAUGE**

   Verify operation of nitrogen gauge by raising and lowering the pressure to determine free movement of needle.

4.0 ADDITIONAL INSPECTION OF POWER TRANSFORMERS RATED 69KV AND BELOW (If required due to test results or performance)

If oil or gas blanket diagnostic results are out of limits, perform the additional tests of this section.

1. **INSULATION RESISTANCE TESTS**

   The insulation resistance between the high voltage and low voltage windings should not be less than the value shown for HV winding to ground.

   The minimum acceptable values are:

WINDING PHASE-PHASE KV	MIN. ACCEPT MEGOHMS
5 or less	5
>5	10 per kV

   Correct measured values for temperature by using chart in MEASUREMENT OF INSULATION RESISTANCE procedure.

2. RATIO TESTS

Perform Ration Test.

Any deviation from previous readings is cause for further evaluation.

3. ANALYSIS OF ADDITIONAL TEST RESULTS

Unacceptable insulation resistance or TTR results indicate winding or core problems. Seek assistance for discussion of the results and determination of further action.

5.0 ADDITIONAL INSPECTION OF POWER TRANSFORMERS RATED 115KV AND ABOVE

When the oil or gas blanket diagnostic results are out of limits, seek assistance to determine which additional tests are required.

COMMENTS:

POWER TRANSFORMER PREVENTATIVE/DIAGNOSTIC CHECK LIST

COMPANY NO.:_____ DATE:_____
SUBSTATION:_____ SUBSTATION NO:_____
BREAKER SWITCH NO.:_____ CHECKED BY:_____

CHECK IF O.K.

		COOLING EQUIPMENT	
GROUND CONNECTIONS	____	OPERATION	____
CABINET MOISTURE	____	RADIATORS	____
HEATERS	____	COOLERS	____
PAINT	____	CONTACTORS	____
		FANS	____

OIL AND GAS BLANKET TESTS (RECORD RESULTS)

OIL TESTS:		GAS BLANKET TESTS:
OIL DIELECTRIC	____KV	COMBUSTIBLE GAS__%
OIL COLOR	____	OXYGEN CONTENT__%
LTC OIL DIELECTRIC	____KV	
LTC OIL COLOR	____KV	

GAUGES (IF CALIBRATED)

	FOUND	LEFT
TOP OIL GAUGE	ALARM ____	____
WINDING TEMP GAUGE	1ST STAGE____	____
NITROGEN GAUGE	2ND STAGE____	____
	ALARM ____	____

190

COMMENTS:

the southern electric system

PROCEDURE FOR

THE

INTERNAL INSPECTION

OF

ARCING LOAD TAP CHANGERS

DATE: 10/18/94

192

INTERNAL MAINTENANCE OF ARCING LOAD TAP CHANGERS

1.0 APPLICATION

This specification shall apply to oil insulated arcing type load tap changers with the following general ranges:

2.0 VISUAL INSPECTION

Perform a general vision inspection of the substation before proceeding with the detailed inspection of the load tap changer.

3.0 PREPARATION

Transfer the insulating oil via filters into a suitable vessel (Bladder or Tank). Take care to properly vent the oil compartment prior to transfer.

4.0 INSPECTION OF SWITCHING COMPARTMENT

1. Flush the switching compartment with clean filtered insulating oil and drain.
2. Inspect the switching compartment for moisture (rust or tracks).
3. Determine the source of the moisture and correct.
4. Check for physical damage and correct.
5. Use clean, dry, lint free cloths to remove all carbon deposited on insulating surfaces. If necessary, flush and clean with clean, filtered oil.
6. Check tap selector panel for leaks. Check for oil seepage at gasketed points and on the terminal board. If panel leaks, seek assistance to determine course of action.
7. When applicable, check the stuffing box for evidence of oil leaks. If there is sign of oil leaks, determine the cause and correct.
8. Manually operate the L.T.C., using hand crank operator, from full lower to full raise. Observe that the mechanism stops at the mechanical stops. Any excessive binding, make repairs if needed.

NOTE: Do not operate L.T.C. manually or electrically when transformer is under vacuum.

9. Thoroughly inspect all contact surfaces for proper surface area wipe and proper contact to contact pressure according to the instruction book. Replace as necessary.

10. Inspect the movable arcing contacts and measure the erosion. Replace contacts when wear amount equals that shown in the manufacturer's instruction book.

11. Inspect the stationary arcing contacts front and back and measure the erosion. Replace contacts when wear amount equals the manufacturer's recommendation.

12. Inspect the moving reversing contacts for mechanical wear. Consult the manufacturer's instruction book to determine the amount of wear requiring change-out.

13. Inspect the stationary reversing contacts for mechanical wear. Some manufacturers plate these contacts. Check for wear of plating on contacts. Consult the manufacturer's instruction book to determine the amount of wear requiring change-out.

14. Check all fasteners, lockstrips, and electrical connections for tightness.

5.0 CONTACT REPLACEMENT PROCEDURE

NOTE: Reduce main tank pressure to zero (0) psi before changing contacts.

Replace as per manufacturer's instructions in manual with transformer.

1. Handcrank the LTC step-by-step through its entire range to be sure there is no mechanical interference and that new contacts are properly installed. Handcrank the LTC to the neutral position.

6.0 BREATHERS

Check the breathing system on the LTC compartment for obstructions, maintain as per instruction book.

7.0 UPPER COMPARTMENT DOOR GASKET

Check gaskets for signs of deterioration. Replace if necessary.

8.0 PRESSURE TEST TAP CHANGER COMPARTMENT IF NECESSARY

If there is evidence of leaks or gaskets were replaced, perform a leak test as follows:

1. Plug openings.
2. Remove any pressure bleeder devices subject to damage by pressure or that have a low pressure setting.
3. Pressurize the LTC compartment to 3 psi with dry nitrogen and hold for 30 minutes.
4. Check for leaks using liquid leak detector.
5. Repair any leaks detected.
6. Fill compartment with filtered oil.
7. Test the oil after refilling the tap-selector compartment. The oil must test 30kV minimum with ASTM D877.

9.0 INSPECTION AND MAINTENANCE OF LOWER COMPARTMENT

1. CONTROL CIRCUIT

Energize the control circuit, taking care not to backfeed the internal potential transformer. Operate the mechanism by electrical hand control, step by step, through the entire range for at least 5 minutes. This eliminates any air pockets from oil filling.

While operating, check the following:

2. POSITION INDICATOR

Watch the position indicator and ON-POSITION pointer. Make sure the drive unit stops on position.

3. **COUNTER**

Check that the operation counter is functioning.

4. **LIMIT SWITCH**

Check the limit-switch settings. Try to operate the control beyond the limit position. If the motor operates, the limit switches are faulty or out of adjustment. Adjust the limit switches or replace as required. Refer to manfacturer's instruction book for the procedure to adjust the limit switches. While operating the motor to test the limit switches, check that the position indicator on the drive unit indicates neutral. If there is a neutral light, check that it is on at neutral.

5. **DRIVE MOTOR**

Lubricate motor bearings if not sealed with Mobil # 28 grease (SC00038220).

6. **DRIVE SHAFTS, GEARS**

Inspect shafts and/or gears for binding or wear. Grease universal joints if present with Mobil grease # 28 (SC00038220) for bearings with grease fittings. Lubricate with bearing lubricating grease commodity (type). Lubricate drive gears with Mobil grease # 28 (SC00038220).

7. **MOTOR BRAKES**

Some LTC mechanisms have dynamic motor brakes. If present, check for looseness. Check that the drive stops exactly on position. Adjust the brake if stopping time is too long. Each brake system may be different. Refer to manufacturer's instruction book for specific measurements.

8. **HANDCRANK PROTECTION SCHEMES**

Verify the proper operation of the manual operation protection scheme. Refer to manufacturer's instruction book for details.

9. **ELECTRICAL CONNECTIONS**

De-energize control circuit. Visually inspect all electrical connections to terminal blocks and relay terminal studs for wire damage, looseness, and corrosion. Visually check control power connections for tightness.

196

10. RELAYS AND CONTACTS

Visually inspect all relays for proper contact and wipe, correct as necessary. Visually check motor operating relay terminals for tightness and contact for make and wipe, correct as necessary.

APPENDIX A
ARCING LOAD TAP CHANGER TYPES

TYPE	INSTRUCTION BOOK
GENERAL ELECTRIC	
LR-19	GEI 11628
LR-65	GEI 37501A
LR-83	GEK-16326
LRS-65	GEK 5651A
LRT-38	GEI 20032
LRT-48	GEI 41950B
LRT-59	
LRT-65	GEK 5651A
LRT-65A	GEK 5651A
LRT-68	GEI 54768A
LRT-83	GEI 37504A
MOLONEY	
MA	25308.
MA-1	LTCIL-T4
MA-2	LTCIL-63-R1
MB	LTCIL-T4
MCS	
NORTH AMERICAN AND FEDERAL PACIFIC	
TC-25	FPE IN-TG-502
TC-525	IN-T-5020, 5040
TC546	FPE IT-TG-501

APPENDIX A
ARCING LOAD TAP CHANGER TYPES

ALLIS CHALMERS AND SIEMENS

TLH	01X8306C
TLH-10	TRANS. SPEC. 82.1
TLH-20	01X8306
TLH-21	01X4591-01
TU	

WESTINGHOUSE

UNR	535726D
UR	3648
URS	48-900-11
URT	48-902-1
UTN	
UTT	IL 48-064-26A
UTT-A	IL 48-064-35
UTT-B	IL 48-064-41

COOPER POWER SYSTEMS AND McGRAW EDISON

550	PTI 195-1
550B	PTI 198-1
550BL	S210-40-9
550BLS	S210-40-9
550C	S210-40-3
550CS	S210-40-3

INSPECTION REPORT
A[illegible]CING LOAD TAP CHANGER

COMPANY NO: _____ DATE: _____
SUBSTATION: _____ SUBSTATION NO: _____
OPERATING SWITCH NO.: _____ CHECKED BY: _____

UPPER COMPARTMENT

Flush Compartment _____ Oil Dielectric _____ kV (as left)
Moisture Check _____ Oil Color _____
Physical Damage Yes _____ No _____
Wipe Down _____
Pressure Test _____
Board Leak _____
Stuffing Box _____
External Shaft _____
Handcrank _____

CONTACT MEASUREMENTS
BYPASS OR TRANSFER CONTACTS
(Wear in Inches)

Phase 1 Phase 2 Phase 3

_____ _____ _____ _____ _____ _____ _____ _____ _____

REPLACE CONTACTS: YES _____ NO _____

TAP SELECTOR SWITCH CONTACTS
(Wear in Inches)

Phase 1

_____ _____ _____ _____ _____ _____ _____ _____ _____

Phase 2

_____ _____ _____ _____ _____ _____ _____ _____ _____

Phase 3

_____ _____ _____ _____ _____ _____ _____ _____ _____

REPLACE CONTACTS: YES _____ NO _____

2.00

INSPECTION REPORT - ARCING LOAD TAP CHANGER

	PHASE 1	PHASE 2	PHASE 3
MOVING REVERSE	_____	_____	_____
STATIONARY	PHASE 1	PHASE 2	PHASE 3
REVERSING	_____ _____	_____ _____	_____ _____

REPLACEMENT CONTACTS: YES _____ NO: _____

BREATHER BLUE _____ PINK _____ (When applicable)

UPPER DOOR GASKET _____ PRESSURE TEST COMP._____
REFILL _____

CHECK WHILE OPERATING BE CONTROLS:

POSITION INDICATOR _____
OPERATION COUNTER _____
NEUTRAL POSITION _____
LIMIT SWITCHES _____

CHECK AND LUBRICATE:
DRIVE MOTOR _____
DRIVE SHAFT _____
GEARS _____

INSPECT:
MOTOR BRAKE _____
HANDCRANK PROT. _____
ELEC CONN _____
RELAYS, CONTACTS _____
TTR _____ (Attach record if performed)
SET TO NEUTRAL _____
FINAL COUNTER READING _____

COMMENTS: _____

the southern electric system

PROCEDURE FOR THE INTERNAL INSPECTION OF RESISTANCE TYPE LOAD TAP CHANGERS

DATE: 10/19/84

202

INTERNAL INSPECTION OF RESISTANCE LOAD TAP CHANGERS

1.0 APPLICATION

This specification shall apply to oil insulated load tap changers equipped for resistance type switching.

2.0 VISUAL INSPECTION

Perform a general vision inspection of the substation before proceeding with the detailed inspection of the load tap changer.

3.0 PREPARATION

Transfer the insulating oil via filters into a suitable vessel (Bladder or Tank). Take care to properly vent the oil compartment prior to transfer.

4.0 INSPECTION OF SWITCHING COMPARTMENT

1. Flush the switching compartment with clean filtered insulating oil and drain.
2. Inspect the switching compartment for moisture (rust or tracks).
3. Determine the source of the moisture and correct.
4. Check for physical damage and correct.
5. Use clean, dry, lint free cloths to remove all carbon deposited on insulating surfaces. If necessary, flush and clean with clean, filtered oil.
6. Check tap selector panel for leaks. Check for oil seepage at gasketed points and on the terminal board. If panel leaks, seek assistance to determine course of action.
7. When applicable, check the stuffing box for evidence of oil leaks. If there is sign of oil leaks, determine the cause and correct.
8. When applicable, slide the shaft up and down slightly to make sure there is no binding.

NOTE: Do not operate L.T.C. manually or electrically when transformer is under vacuum.

10. Thoroughly inspect all contact surfaces for proper surface area wipe and proper contact to contact pressure according to the instruction book. Replace as necessary.

11. Measure the amount of contact burning. Record for comparison with the condition at the next inspection. DO NOT file or smooth the burnt and pitted surfaces. Replace the fixed contacts when about .04 inches remains of the width of the arcing tips measured from the edge of the contact burning to the soldering of the tip. If measurements show that contacts need to be changed, refer to manufacturer's instruction book for change-out procedure.

12. Check the diameter of the contact rolls against the instruction book to determine if replacement is required. Replace contact rolls if the fixed contact arcing tips are burnt down in a way that causes arcing between the tongue of the fixed contacts and moving main contacts.

13. Inspect the non-arcing change-over selector contacts for mechanical wear. Replace the contacts if the amount of wear prevents good contact. Check for wear of the silver plating on the contacts. Refer to manufacturer's instruction book for change-out procedure.

14. Visually check all fasteners, lockstrips, and electrical connections for tightness.

5.0 CONTACT REPLACEMENT PROCEDURE

NOTE: Reduce main tank pressure to zero (0) psi before changing contacts.

Replace contacts when the amount of wear reaches the manufacturer's recommendation. Replace as per manufacturer's instructions in manual with transformer.

After contact replacement, handcrank the LTC step-by-step through its entire range to be sure there is no mechanical interference and that new contacts are properly installed. Handcrank the LTC to the neutral position.

6.0 TRANSITION RESISTORS

1. Using an ohmmeter, measure the resistance of the resistors in all three phases.

2. If the resistance of all resistors are equal, the resistors are good.

3. If there is a deviation, check for broken or melted resistors. Check tightness of bolted joints on the resistor contacts and at both ends of each resistor.

4. Recheck resistance, if there is still a deviation, replace the resistor which is different from the average resistance value.

7.0 BREATHERS

Check the breathing system on the LTC compartment for obstructions, maintain as per instruction book.

8.0 UPPER COMPARTMENT DOOR GASKET

Check gaskets for signs of deterioration. Replace if necessary.

9.0 PRESSURE TEST TAP CHANGER COMPARTMENT (IF NECESSARY)

If there is evidence of leaks or gaskets were replaced, perform a leak test as follows:

1. Plug openings.

2. Remove any pressure bleeder devices subject to damage by pressure or that have a low pressure setting.

3. Pressurize the LTC compartment to 3 psi with dry nitrogen and hold for 30 minutes.

4. Check for leaks using liquid leak detector.

5. Repair any leaks detected.

6. Fill compartment with filtered oil.

7. Test the oil after refilling the tap-selector compartment. The oil must test 30kV minimum with ASTM D-877.

10.0 INSPECTION AND MAINTENANCE OF DRIVING SPRING COMPARTMENT (BRAKE AND SPRING INSPECTION)

1. Remove access covers to allow inspection of brake and spring. Check tightness of seals in bearings.
2. Adjust the brake tightness and spring tension according to manufacturer's instruction book.
3. Lubricate mechanism as required.

11.0 MOTOR DRIVE COMPARTMENT

1. Check drive train according to manufacturer's instruction book. Adjust if loose or too tight.
2. Visually check for burnt contactors. Replace contactor if burnt.
3. Visually check motor operating relay terminals for tightness and contact for make and wipe.
4. Clean brake disc on motor brakes (if equipped).
5. Check the brake tightness, adjust according to instruction manual.
6. Lubricate the bearing points of the brake blocks and links sparingly with 300 viscosity refrigerant oil (SC00038572).
7. Lubricate the toothed, gears, wear surfaces of geneva gears, cam disks, and cam bars sparingly with Mobil grease # 28 (SC00038220).

12.0 CONTROL CIRCUIT

1. Energize the control circuit, taking care not to backfeed the internal potential transformer.
2. Operate the mechanism by electrical hand control, step by step, through the entire range for at least 5 minutes. This eliminates any air pockets from oil filling.

INTERNAL INSPECTION OF RESISTANCE LOAD TAP CHANGERS

TYPE	INSTRUCTION BOOK
RTE/ABB	
UZD	5430-05
UZE	5409-869E-1 REV. 4

3. Observe the position indicator and ON-POSITION pointer. Make sure the drive unit stops on position.

4. Check that the operation counter is functioning.

5. Check the limit-switch settings. Try to operate the control beyond the limit position. If the motor operates, the limit switches are faulty or out of adjustment. Adjust the limit switches or replace as required.

6. Refer to manufacturer's instruction book for the procedure to adjust the limit switches.

7. While operating the motor to test the limit switches, check that the position indicator on the drive unit indicates neutral. If there is a neutral light, check that it is on at neutral.

13.0 HANDCRANK PROTECTION SCHEMES

1. Verify proper operation of the manual operation protection scheme. Refer to manufacturer's instruction book for details.

2. Operate the control switch. If the motor operates, the handcrank switch may be faulty.

3. Some tap changers do not have handcranks. The instruction book will detail how to check the manual operation protection schemes.

14.0 ELECTRICAL CONNECTIONS

1. De-energize control circuit.

2. Visually inspect all electrical connections to terminal blocks and relay terminal studs for wire damage, looseness, and corrosion.

3. Visually check control power connections for tightness.

15.0 RETURN THE TAP CHANGER TO SERVICE

INSPECTION REPORT
RESISTANCE SWITCHED LOAD TAP CHANGERS

COMPANY NO: _____ DATE: _____
SUBSTATION: _____ SUBSTATION NO: _____
OPERATING SWITCH NO.: _____ CHECKED BY: _____

UPPER COMPARTMENT

Flush Compartment _____ Oil Dielectric _____ kV (as left)
Moisture Check _____ Oil Color _____
Physical Damage Yes ____ No ____
Wipe Down _____
Pressure Test _____
Board Leak _____
Stuffing Box _____
External Shaft _____
Handcrank _____

CONTACT MEASUREMENTS
FIXED CONTACTS
(Width Of Arcing Types)

PHASE 1 _____ _____ _____ _____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____ _____ _____

PHASE 2 _____ _____ _____ _____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____ _____ _____

PHASE 3 _____ _____ _____ _____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____ _____ _____

CONTACT ROLLS
(Diameter)

PHASE 1 _____ PHASE 2 _____ PHASE 3 _____
_____ _____ _____ _____ _____ _____ _____ _____ _____

(Width of Tips)

MOVING REVERSING PHASE 1 _____ PHASE 2 _____ PHASE 3 _____

STATIONARY REVERSING PHASE 1 _____ _____ PHASE 2 _____ _____ PHASE 2 _____ _____

INSPECTION REPORT
RESISTANCE SWITCHED LOAD TAP CHANGERS

TRANSITION RESISTORS
(Enter Resistance in Ohms)

PHASE 1	PHASE 2	PHASE 3
_____	_____	_____
_____	_____	_____

MISCELLANEOUS

BREATHER BLUE _____ PINK _____
UPPER DOOR GASKET _____
PRESSURE TEST COMP. _____
REFILL _____

DRINVING SPRING COMPARTMENT:

BRAKE _____
SPRING _____
LUBRICANT _____

MOTOR DRIVE COMPARTMENT:

DRIVE BELT _____
CONTACTORS _____
RELAYS _____
POTENTIOMETER _____
BRAKES _____
MAINTAIN CONTACT
BRAKE _____
LUBRICATE _____

CHECK WHILE OPERATING BY CONTROLS:

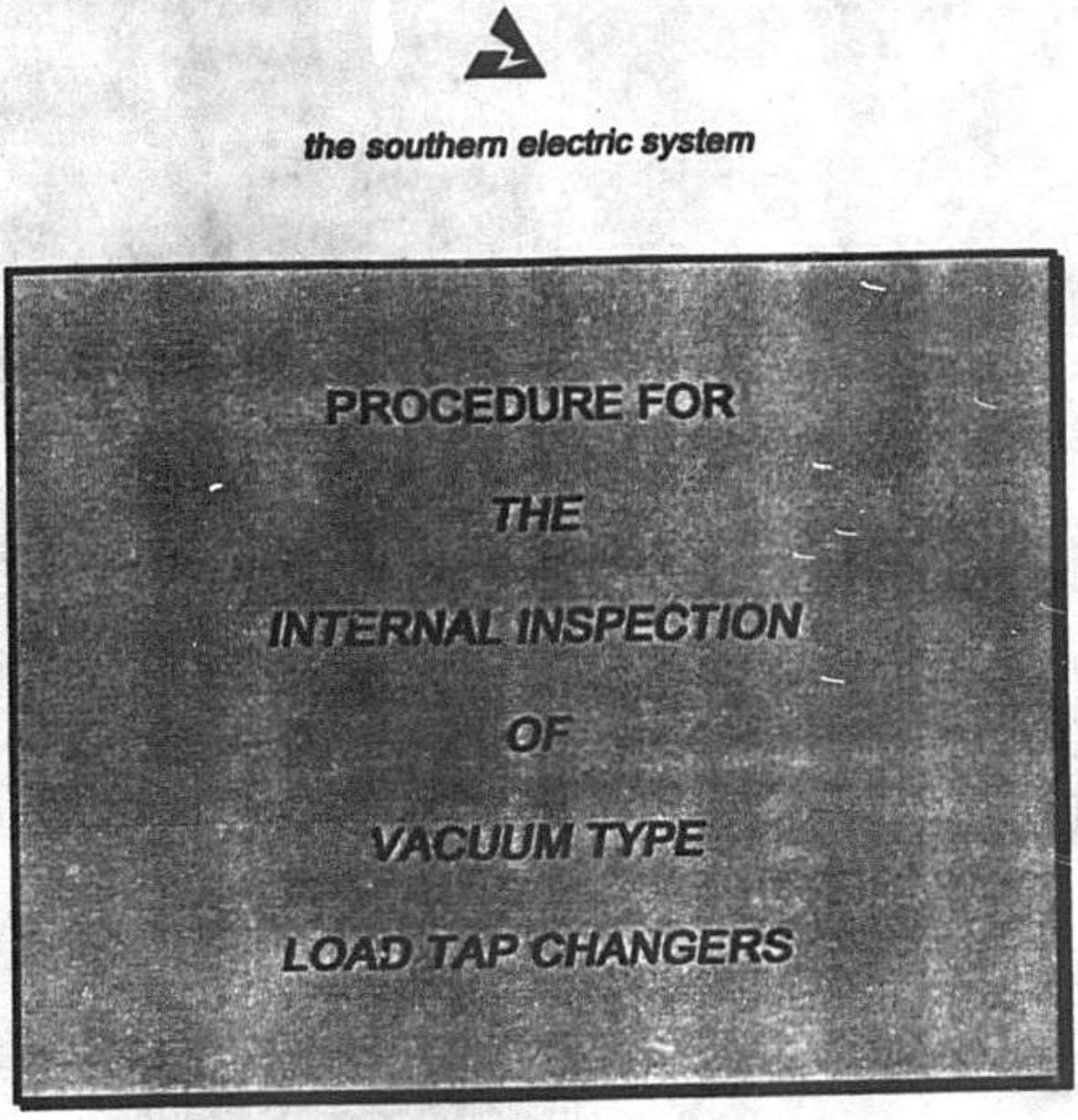
POSITION INDICATOR _____
OPERATION COUNTER _____
LIMIT SWITCHES _____
HANDCRANK PROT. _____
NEUTRAL POSITION _____
SET TO NEUTRAL _____

INSPECT:

ELECT. CONN. _____
RELAYS _____
CONTACTS _____

FINAL COUNTER READING _____

COMMENTS: _____



the southern electric system

PROCEDURE FOR

THE

INTERNAL INSPECTION

OF

VACUUM TYPE

LOAD TAP CHANGERS

DATE: 10/19/94

INTERNAL INSPECTION OF VACUUM TYPE LOAD TAP CHANGERS

1.0 APPLICATION

This specification shall apply to oil insulated load tap changers equipped with vacuum interrupters.

2.0 VISUAL INSPECTION

Perform a general vision inspection of the substation before proceeding with the detailed inspection of the load tap changer.

3.0 PREPARATION

Transfer the insulating oil via filters into a suitable vessel (Bladder or Tank). Take care to properly vent the oil compartment prior to transfer.

4.0 INSPECTION OF SWITCHING COMPARTMENT

NOTE: Ground vacuum interrupter shield to discharge stored static charges.

1. Flush the switching compartment with clean filtered insulating oil and drain.
2. Inspect the switching compartment for moisture (rust or tracks).
3. Determine the source of the moisture and correct.
4. Check for physical damage and correct.
5. Use clean, dry, lint free cloths to remove all carbon deposited on insulating surfaces. If necessary, flush and clean with clean, filtered oil.
6. Check tap selector panel for leaks. Check for oil seepage at gasketed points and on the terminal board. If panel leaks, seek assistance to determine course of action.
7. When applicable, check the stuffing box for evidence of oil leaks. If there is any sign of oil leaks, determine the cause and correct.
8. Manually operate LTC, using hand crank operator, from full lower to full raise. Observe that mechanism stops at mechanical stops. Note any excessive binding. Make repairs if need.

NOTE: Do not operate LTC manually or electrically when transformer is under vacuum.

9. Thoroughly inspect all contact surfaces for proper surface area wipe and proper contact to contact pressure according to manufacturer's instruction book. Replace as necessary.

10. Inspect for wear and pitting. Measure the contacts as per manufacturer's instructions. Record on inspection report. Replace the contacts if the amount of wear exceeds the manufacturer's recommendations.

11. Inspect the non-arcing moving reversing contacts for mechanical wear. Measure the contact wear and record. Consult the manufacturer's instruction book to determine the amount of wear requiring change-out, replace as necessary.

12. Inspect the non-arcing stationary reversing contacts for mechanical wear. Some manufactures plate these contacts. Check for wear of plating on contacts. Consult the manufacturer's instruction book to determine the amount of wear requiring change-out, replace as necessary.

13. Inspect for mechanical wear or pitting. Replace if wear exceeds manufacturer's recommendation.

14. Visually check all fasteners, lockstrips, and electrical connections for tightness.

5.0 CONTACT REPLACEMENT

Replace contacts when the amount of wear equals the manufacturer's recommendation. Replace as per manufacturer's instructions in manual with transformer.

NOTE: Reduce main tank pressure to zero (0) psi before changing contacts.

Handcrank the LTC step-by-step through its entire range to be sure there is no mechanical interference and that new contacts are properly installed. Handcrank the LTC to the neutral position.

6.0 VACUUM INTERRUPTERS

Perform the following two major inspection checks on internal inspections:

- Check for loss of vacuum.
- Check and log results of contact wear indicators.

1. If vacuum bottle integrity is questioned, refer to manufacturers instruction book for specific test. Replace if necessary.
2. Measure and record on the inspection report the amount of contact wear. Replace if wear is greater than manufacturers limits.
3. Vacuum Bottle Replacement

   The procedure is manufacturer specific. Refer to the manufacturers instruction book for the type tap changer involved.
4. If a bottle is replaced, handcrank the LTC step-by-step through its entire range to be sure there is no mechanical interference and that new bottles operate properly. Record the wear indicator for the new bottle. Handcrank the LTC to the neutral position.

7.0 BREATHERS

Check the breathing system on the LTC compartment for obstructions, maintain as per instruction book.

8.0 UPPER COMPARTMENT DOOR GASKET

Check gaskets for signs of deterioration. Replace if necessary.

9.0 PRESSURE TEST TAP CHANGER COMPARTMENT (IF NECESSARY)

If there is evidence of leaks or gaskets were replaced, perform a leak test as follows:

1. Plug openings.
2. Remove any pressure bleeder devices subject to damage by pressure or that have a low pressure setting.
3. Pressurize the LTC compartment to 3 psi with dry nitrogen and hold for 30 minutes.
4. Check for leaks using liquid leak detector.
5. Repair any leaks detected.
6. Fill compartment with filtered oil.
7. Test the oil after filling the tap-selector compartment. The oil must test 30kV minimum ASTM D-877, color must be less than 2.0.

NOTE: Westinghouse type UVT tap changers require vacuum filling. Refer to manufacturers instruction book.

10.0 INSPECTION AND MAINTENANCE OF LOWER COMPARTMENT

1. Energize the control circuit taking precautions not to energize the internal potential transformer. Operate the mechanism by electrical hand control step by step, through the entire range for at least 5 minutes. This eliminates any air pockets from oil filling.
2. Observe the position indicator and ON-POSITION pointer, make sure the drive unit stops properly on position.
3. Check that the operation counter is functioning.

4. Check the limit-switch settings. Try to operate the control beyond the limit position. If the motor operates, the limit switches are faulty or out of adjustment. Adjust the limit switches or replace as required. Refer to manufacturers instruction book for the procedure to adjust the limit switches. While operating the motor to test the limit switches, check that the position indicator on the drive unit indicates neutral. If there is a neutral light, check that it is on at neutral.

5. Clean and repack motor bearings <u>if not sealed</u> with Mobil grease #28 (SC00038220).

6. Inspect shafts and/or gears for binding or wear. Grease universal joints, if present with type. Lubricate drive gears with Mobil grease #28 (SC00038220).

7. **MOTOR BRAKES**

   If motor brakes present, check for looseness. Check that the drive stops exactly on position. Adjust the brake if stopping time is too long. Each brake system may be different. Refer to manufacturers instruction book for specific measurements.

8. **HANDCRANK PROTECTION SCHEMES**

   Operate the control switch. If the motor operates, the handcrank switch may be faulty. Verify proper operation of the manual operation protection scheme. Refer to manufacturers instruction book for details. Some tap changers do not have hand cranks. The instruction book will detail how to check the manual operation protection schemes.

9. **ELECTRICAL CONNECTIONS**

   De-energize control circuit breaker. Visually inspect all electrical connections to terminal blocks and relay terminal studs for corrosion, damage and looseness. Correct as necessary. Visually check control power connections for tightness. Correct as necessary.

10. **RELAYS AND CONTACTS**

    Visually inspect all relays for proper contact and wipe. Correct as necessary. Visually check motor operating relay terminals for tightness and contact for make and wipe. Correct as necessary.

11.0 VACUUM BOTTLE PROTECTION SCHEME

Refer to manufacturers instruction manual to determine appropriate test to verify correct operation of vacuum bottle protection scheme.

12.0 VERIFICATION TESTING

If during the replacement or adjustment of any component in the LTC compartment a tap load was removed, perform a TTR on all tap positions. Compare to previous test results. Any deviation is cause for further investigation.

APPENDIX A
INTERNAL INSPECTION OF VACUUM TYPE LOAD TAP CHANGERS

TYPE	INSTRUCTION BOOK
GENERAL ELECTRIC	
LRT-200	
LRT-200-2	GEK 73012A
WESTINGHOUSE AND ABB	
UVT	UCS2917
COOPER POWER SYSTEMS AND McGRAW EDISON	
V1	
V2A	S210-40-17
REINHAUSEN	
RMV-1	INT-201
RMV-II	TL7002.00

INSPECTION REPORT
VACUUM TYPE LOAD TAP CHANGER

COMPANY NO: _____ DATE: _____
SUBSTATION: _____ SUBSTATION NO: _____
OPERATING SWITCH NO.: _____ CHECKED BY: _____

UPPER COMPARTMENT

Flush Compartment _____ Oil Dielectric _____ kV (as left)
Moisture Check _____ Oil Color _____
Physical Damage Yes _____ No _____
Wipe Down _____
Pressure Test _____
Board Leak _____
Stuffing Box _____
External Shaft _____
Handcrank _____

CONTACT MEASUREMENTS
BYPASS OR TRANSFER CONTACTS
(Wear in Inches)

Phase 1 Phase 2 Phase 3

_____ _____ _____ _____ _____ _____ _____ _____ _____

REPLACE CONTACTS: YES _____ NO _____

TAP SELECTOR SWITCH CONTACTS
(Wear in Inches)

Phase 1

_____ _____ _____ _____ _____ _____ _____ _____ _____

Phase 2

_____ _____ _____ _____ _____ _____ _____ _____ _____

Phase 3

_____ _____ _____ _____ _____ _____ _____ _____ _____

REPLACE CONTACTS: YES _____ NO _____

220

INSPECTION REPORT
VACUUM TYPE LOAD TAP CHANGER

	PHASE 1	PHASE 2	PHASE 3
MOVING REVERSE	_____	_____	_____
STATIONARY	PHASE 1	PHASE 2	PHASE 3
REVERSING	_____ _____	_____ _____	_____ _____

REPLACEMENT CONTACTS: YES _____ NO: _____

VACUUM INTERRUPTERS

LOSS OF VACUUM TEST

WEAR INDICATORS: _____ _____ _____

BREATHER BLUE _____ PINK _____ (When applicable)

UPPER DOOR GASKET _____ PRESSURE TEST COMP._____
REFILL _____

CHECK WHILE OPERATING BE CONTROLS:

POSITION INDICATOR _____
OPERATION COUNTER _____
NEUTRAL POSITION _____
LIMIT SWITCHES _____

CHECK AND LUBRICATE:
DRIVE MOTOR _____
DRIVE SHAFT _____
GEARS _____

INSPECT:
MOTOR BRAKE _____
HANDCRANK PROT. _____
ELEC CONN _____
RELAYS, CONTACTS _____
VACUUM BOTTLE PROTECTION _____
TTR _____ (Attach record if performed)
SET TO NEUTRAL _____
FINAL COUNTER READING _____

COMMENTS: _____

Pages 1-160 are Confidential

Substation Maintenance

Instructions and Specifications

Volume II for Substation Equipment

the southern electric system

PROCEDURE FOR THE PREVENTIVE DIAGNOSTIC INSPECTION OF STEP VOLTAGE REGULATORS

DATE: 10/19/94

PREVENTIVE DIAGNOSTIC INSPECTION OF STEP VOLAGE REGULATORS

1.0 APPLICATION

This specification applies to substation single phase or three phase step voltage regulators rated 4kV and above.

2.0 GENERAL

1. VISUAL INSPECTION OF REGULATORS

Perform a general visual inspection of the substation and a detailed inspection of the piece of equipment to be worked on.

2. OPERATING RANGE OF REGULATORS

Note operating range and reset drag hands. If drag hands show regulator has not been operating through neutral, notify the appropriate authority.

3. GROUND CONNECTIONS

Visually check tank grounds for tightness.

4. CABINETS

The cabinets are designed to be water proof. Correct for any sign of water entry. Lubricate latches and hinges with Tri-Flow lubricant (SC00038224). Seal all unnecessary holes.

5. VENTS

Visually check the vent for obstructions.

6. COOLING EQUIPMENT AND FANS (IF EQUIPPED)

1. Place fan control on manual and off.
2. Remove debris from radiators and fans.
3. Visually inspect contractors for burnt or pitted contacts. Clean with a burnishing tool or replace if damage can not be corrected.
4. Inspect fans for loose or cracked blades.
5. Lubricate fan motors if equipped with grease fittings using general purpose bearing grease (SC000XXXXX).
6. Return fan control to automatic.

3

7. CONTROLS

Visually inspect control for malfunction. Check controls for watchdog or error codes. Visually inspect wiring for damage, contamination. Inspect door gaskets.

8. OIL CONTROL

Obtain oil sample for dielectric and color test using oil SAMPLING/TESTING procedure.

1. OIL DIELECTRIC TEST

Measure oil dielectric using the D-877 test.

The MINIMUM allowable value is 22kV. If less than 22kV, an internal inspection is required.

2. OIL COLOR TEST

Determine the oil color.

The MAXIMUM color allowable is 3.0. Values greater than 3.0 requires an internal inspection.

3.0 BUSHINGS

Visually inspect bushings, correct as required.

1. BYPASS ARRESTER (IF EQUIPPED)

Visually inspect arrester. Correct as indicated.

CHECK LIST FOR THE PREVENTIVE DIAGNOSTIC INSPECTION OF STEP VOLAGE REGULATORS

COMPANY NO.:_____ DATE: _____
SUBSTATION: _____ SUBSTATION NO.: _____
BREAKER SWITCH NO.:_____ CHECKED BY: _____

(CHECK IF O.K.)

2.0 GENERAL
1. VISUAL INSPECTION _____
2. DRAG HANDS (OPERATING RANGE) _____
3. GROUND CONNECTION _____
4. CABINETS _____
5. VENTS _____
6. COOLING EQUIPMENT
   1. CONTROLS _____
   2. CLEAR _____
   3. MOTOR CONTACTORS _____
   4. FANS _____
   5. LUBRICATE MOTORS _____
   6. AUTOMATIC OPERATION _____
7. VOLTAGE CONTROLS _____
8. OIL
   1. DIELECTRIC _____kV
   2. COLOR _____

3.0 BUSHINGS _____
1. BY-PASS ARRESTER _____

COMMENTS: _____

5

the southern electric system

PROCEDURE FOR

THE

INTERNAL INSPECTION

OF

SINGLE PHASE

STEP VOLTAGE REGULATORS

DATE: 10/19/94

6

INTERNAL INSPECTIO OF STEP VOLTAGE REGULATORS

1.0 APPLICATION

This procedure is applicable for all single phase step voltage regulators.

2.0 INSPECTION

Perform a general inspection of the substation and a visual inspection of the voltage regulator to be maintained.

3.0 CALIBRATE TEMPERATURE GAUGES (IF PRESENT)

If there is any evidence or concern that the calibration or proper operation of temperature gauges is not correct, calibrate according to manufacturer's instruction book and drawings.

4.0 REGULATOR INTERNAL INSPECTION

1. EVALUATE OIL FOR REUSES

If the oil color is greater than 5, do not reuse the oil.

2. CHANGING REGULATOR OIL AND INSPECTING CORE & COIL ASSEMBLY

1. Vent the regulator.
2. If oil will be reused, drain oil through filter into a clean container; otherwise, dispose of properly.
3. Untank regulator. Inspect for cause of internal inspection. Correct as required.
4. Inspect liquid level gauges. Correct if necessary.
5. Flush regulator windings with clean, filtered insulation oil.
6. Drain flush oil.
7. Check for evidence of moisture entry. Correct as necessary.
8. Retank regulator. Check condition of gaskets. Replace if damaged.
9. Refill regulator with clean, filtered during filling insulation oil.

STEP VOLTAGE REGULATOR INTERNAL CHECKLIST

COMPANY NO.: _____ DATE: _____
SUBSTATION: _____ SUBSTATION NO: _____
BREAKER SWITCH NO: _____ CHECKED BY: _____

CHECKLIST (CHECK OFF)

GROUND CONNECTIONS ____
CABINET MOISTURE ____
PAINT ____
BUSHINGS ____
ARRESTER ____
CONTROLS ____

COOLING EQUIPMENT (IF EQUIPPED)

OPERATION ____
RADIATORS ____
CONTACTORS ____
FANS ____
TEMPERATURE GAUGES (CALIBRATED) ____

OILS TESTS (RECORD RESULTS)

OIL DIELECTRIC: ____KV OIL COLOR: ____

INSULATION RESISTANCE TESTS (IF PERFORMED)

PHASE - G____MEGOHMS

COMMENTS: _____

8

the southern electric system

PROCEDURE FOR

THE

PREVENTIVE DIAGNOSTIC

INSPECTION FOR

STATION BATTERY

INSTALLATIONS

DATE: 10/19/94

PREVENTIVE DIAGNOSTIC INSPECTION FOR STATION BATTERY INSTALLATIONS

1.0 APPLICATION

This procedure is applicable to all batteries installed or intended for use in substations.

2.0 GENERAL

The majority of station battery installations are intended to operate at values listed in the table below. However, exceptions do exist and local operation personnel should be consulted for those installations.

At 77° F

	Float	Equalize	Equalize Time (Hours)
NiCad	1.46	1.6	24
Lead Calcium	2.25	2.33	72
Plante	2.23	2.33	72

Nominal voltage (VDC)	No. of cells lead acid & Plante	NiCad
48	24	36
125	120	92
250	120	184

Equalizing should not be required if batteries are set to the recommended float voltages. Equalize would only be needed for a deep discharge, if water was added, or the spread between individual cell voltages are more than .04 volts.

3.0 INSTALLATION NOT MONITORED BY SUPERVISORY

Complete the following task monthly (as defined by the SES Substation Maintenance Schedule):

1. Visually inspect the battery installation. Correct as required.
2. Measure the voltage of one cell. Correct as required. Rotate cell selection monthly.
3. Measure the voltage of the battery string. Correct as required.
4. Verify that battery charger voltage and current output are within operating range. Correct as required.

10

4.0 ALL INSTALLATIONS

1. Complete the following task quarterly (as defined by the SES Substation Maintenance Schedule):

    1. Visually inspect the battery installation. Correct as required.
    2. Measure the voltage of each cell. Record the cell number and voltage for each cell outside the limits for the battery type. Correct as required.

2. Complete the following task every four years (as defined by the SES Substation Maintenance Schedule):

    1. Visually inspect the battery installation. Correct as required.
    2. Perform an Impedance/Integrity test (dependent upon available test gear). Correct as required.
    3. Verify proper operation of all alarm points.

the southern electric system

PROCEDURE FOR

THE

PREVENTIVE DIAGNOSTIC INSPECTION

OF

MANUALLY OPERATED SWITCHES

DATE : 10/19/94

PREVENTIVE DIAGNOSTI INSPECTION OF MANUALLY OPERATI D SWITCHES

1.0 APPLICATION

This specification shall apply to all manually operated switches installed in substations.

2.0 GENERAL

1. VISUAL INSPECTION

Perform a general visual inspection of the substation and a detailed visual inspection of the piece of equipment to be worked on.

2. BASE MOUNTING BOLTS

The switch base mounting bolts shall be visually checked for tightness.

3. GROUND CONNECTIONS (IF EQUIPPED)

The switch frame ground connections shall be visually checked for tightness.

4. PORCELAIN

Visually inspect porcelain for chips, cracks and contamination or evidence of tracking.

5. OPERATING PIPE AND INTERPHASE LINKAGE (GANG SWITCHES)

Visually check operating pipe and interphase linkage for tightness. Inspect for abnormalities and lubricate as needed with 300 viscosity refrigerant oil (SC00038572). Check all pins, bearings, chains and latches to insure that they operate freely. If any are frozen, disassemble, clean and lubricate with Mobil 28 grease (SC00038220).

3.0 HOT PARTS AND INTERRUPTERS

1. CONTACTS

Observe switch contact alignment and condition. Visually inspect for loose connections and corrosion and signs of overheating.

2. INTERRUPTERS (IF EQUIPPED)

1. FAST OPENING AUXILIARY BLADE (BUGGY WHIP)

Observe buggy whip and cradle for alignment and condition. Visually check for signs of overheating (discoloration) or permanent distortion of the whip.

2. VACUUM AND ARC EXPULSION UNITS

Visually inspect the unit for cracks and chips. Check position indicator for proper operation.

3. SF_6 GAS UNITS

Visually inspect the unit for cracks and chips. Check for targets indicating loss of gas pressure. Check position indicator for proper operation.

4.0 OPERATION

1. GANG OPERATED SWITCH

Operate switch through three open-close operations. Check for binding and simultaneous operation of blade and interrupter.

2. HOOKSTICK SWITCHES

Operate each switch, check for binding.

PREVENTIVE DIAGNOSTIC INSPECTION OF MANUALLY OPERATED SWITCHES

COMPANY NO: _____ DATE: _____
SUBSTATION: _____ SUBSTATION NO: _____
OPERATING SWITCH NO.: ___ CHECKED BY: _____

2.0 GENERAL TO ALL INSPECTIONS

1. VISUAL INSPECTION ____
2. BASE MOUNTING BOLTS ____
3. GROUND CONNECTIONS ____
4. PORCELAIN ____
5. OPERATING PIPE AND INTERPHASE LINKAGE ____

3.0 HOT PARTS AND INTERRUPTERS

1. CONTACTS ____
2. INTERRUPTERS
    1. FAST OPENING AUXILIARY BLADE TYPE ____
    2. VACUUM TYPE ____
    3. ARC EXPULSION TYPE ____
    4. SF_6 GAS TYPE ____

4.0 OPERATION

1. GANG SWITCHES ____
2. HOOKSTICK SWITCHES ____

COMMENTS: _____

the southern electric system

PROCEDURE FOR

THE

PREVENTIVE DIAGNOSTIC

INSPECTION

OF

MOTOR OPERATED SWITCHES

DATE: 10/19/94

16

PREVENTIVE DIAGNOSTIC INSPECTION OF MOTOR O PERATED SWITCHES

1.0 APPLICATION

This specification shall apply to all motor operated switches installed in substations.

2.0 GENERAL

1. VISUAL INSPECTION

Perform a general visual inspection of the substation and a detailed visual inspection of the piece of equipment to be worked on.

2. BASE MOUNTING BOLTS

The switch base mounting bolts shall be visually checked for tightness.

3. GROUND CONNECTIONS

The switch frame ground connections shall be visually checked for tightness.

4. PORCELAIN

Visually inspect porcelain for chips, cracks, and contamination or evidence of tracking.

5. OPERATING PIPE AND INTERPHASE LINKAGE

Check operating pipe and interphase linkage for tightness. Inspect for abnormalities and lubricate with 300 viscosity refrigerant oil (SC00038572). Check all pins, bearings, chains and latches to insure that they operate freely. If any are frozen, disassemble, clean and lubricate with Mobile 28 grease (SC00038220).

3.0 HOT PARTS AND INTERRUPTERS

1. CONTACTS

Observe switch contact alignment and condition. Visually inspect for loose connections, corrosion, and signs of overheating.

17

2. INTERRUPTERS (IF EQUIPPED)

1. FAST OPENING AUXILIARY BLADE (BUGGY WHIP)

Observe buggy whip and cradle for alignment and condition. Visually check for signs of overheating (discoloration) or permanent distortion of the whip.

2. VACUUM AND ARC EXPULSION UNITS

Visually inspect the unit for cracks and chips. Check position indicator for proper operation.

3. SF_6 GAS UNITS

Visually inspect the unit for cracks and chips. Check for targets indicating loss of gas pressure. Check position indicator for proper operation.

4.0 MOTOR OPERATOR

1. CABINET

Inspect the cabinet for source of water or dirt and correct as necessary. Lubricate latches and hinges as necessary.

2. HEATERS

Inspect and replace damaged heaters and thermostats as necessary.

3. WIRING

Check all wiring and terminals for tightness. Check auxiliary switch and relay contact for pitting and burnish as necessary.

4. CLEANING AND LUBRICATION

Inspect the motor mechanism, drive train and gear boxes for abnormalities and lubricate with 300 viscosity refrigerant oil (SC00038572). Check all pins, bearings, chains and latches to insure that they operate freely. If any are found to be frozen, disassemble, clean and lubricate the part with Mobile 28 grease (SC00038220).

For Johnson motor operator reduction gearboxes, drain the fluid, and replace with one-half pint of antifreeze topped off with three quarts of Dexron Auto Transmission Fluid (SC00038573).

5.0 AUXILIARY EQUIPMENT (IF EQUIPPED)

1. OPERATIONS COUNTER

Check operations counter for proper operation. Replace if necessary.

2. AUTOMATIC GROUNDING SWITCH

Check ground switch trip coil and spring.

3. BYPASS SWITCH

Check bypass switch for proper operation. Check contacts for proper alignment.

6.0 OPERATION

Decouple the motor operator and operate it through two close-open cycles. Check for proper operation. Recouple the motor operator and operate the switch through two close-open operations. Check for proper operation.

1. SF_6 INTERRUPTERS

Insert the manual handcrank and operate the switch through one close-open cycle. Check for binding and simultaneous operation of blade and interrupter.

PREVENTIVE DIAGNOSTIC INSPECTION OF MOTOR OPERATED SWITCHES CHECKLIST

COMPANY NO: _____ DATE: _____
SUBSTATION: _____ SUBSTATION NO: _____
OPERATING SWITCH NO.: ___ CHECKED BY: _____

2.0 GENERAL TO ALL INSPECTIONS
- 1. VISUAL INSPECTION _____
- 2. BASE MOUNTING BOLTS _____
- 3. GROUND CONNECTIONS _____
- 4. PORCELAIN _____
- 5. OPERATING PIPE AND INTERPHASE LINKAGE _____

3.0 HOT PARTS AND INTERRUPTERS
- 1. CONTACTS _____
- 2. INTERRUPTERS

4.0 MOTOR OPERATOR
- 1. CABINET _____
- 2. HEATERS _____
- 3. WIRING _____
- 4. CLEANING AND LUBRICATION _____

5.0 AUXILIARY EQUIPMENT
- 1. COUNTER _____
- 2. AUTOMATIC GROUNDING SWITCH _____
- 3. BY-PASS SWITCH _____

6.0 OPERATION
- 1. SF_6 INTERRUPTERS _____

COMMENTS: _____

the southern electric system

INSTRUCTION FOR

THE

DIELECTRIC BREAKDOWN TESTING

OF INSULATING OIL

PER ASTM D-877

DATE: 10/19/94

DIELECTRIC BREAKDOWN TESTING OF INSULATING OIL PER ASTM D-877

1.0 APPLICATION

This test is used to determine the dielectric integrity of the insulating oil used in free breathing apparatus (free breathing transformers, oil circuit breakers, free breathing tap changers) and all single phase regulators. This procedure uniformily establishes the testing method to be used throughout the Southern Electric System.

2.0 GENERAL

The test is performed using a dielectric test set approved for use on the Southern Electric System. ASTM D-877 uses a 1" diameter flat electrode with a spacing of 0.100 inches. The voltage during the test is increased at 3,000 volts per second

3.0 SAMPLING

NOTE: In taking a sample of oil, the intent is to obtain a sample representative of the oil in the vessel. Samples should never be taken from an oil circuit breaker, drum, tanker, an unenergized free-breathing transformer or regulator when the temperature is below 0° C or 32° F due to temperature effects on water content of oil. Never take samples during rain. Never take an oil sample from a piece of equipment under a vacuum

1. From Equipment Valves;

   Samples should be taken from the bottom valve; do not take the sample from the sampling valve. With the valve closed, remove the plug. With a clean, dry, lint free cloth wipe the interior of the valve to remove foriegn materials. Install a reducer sized for the valve down to a 1/4" O.D. hose bib. On the hose bib install a section of tygon tubing and drain enough oil to flush the valve and pipe assembly. Take the sample into a clear glass container and visually inspect the sample for color, water, carbon or other impurities. Fill the sample container to the neck of the bottle and seal until used for test.

2. From Tank Trailers;

   Take the sample in the same manner as from equipment. The valve and pipe assembly is usually much larger and will requre more oil to be drained to effectively flush it.

3. From Storage Drums and Storage Tanks;

   Using a clean metallic pipe, longer than the height of the drum, remove the bung hole cover and insert the pipe into the bottom center of the drum holding your thumb over the pipe. Remove your thumb to allow oil to seep into the pipe. Cover the pipe end and remove from drum, allow sample to drain into a clean glass container. Repeat until sample container is approximately 4/5 full and seal until used for test.

4.0 TESTING

NOTE: The temperature of the test cup and the oil sample should be approximately the same, this is to prevent the sample from being affected by condensation

1. Check the electrode gap in the test cup and adjust to 0.100 inches if required. Inspect the electrodes for burrs or other surface abnormalities. Replace if necessary.

2. Clean the electrodes and the cup with a dry, lint free, clean paper or cloth and rinse with sample oil.

3. Gently invert and swirl the sample container to mix the impurities in the oil. Care should be taken not to agitate or introduce air into the sample.

4. Carefully add sample oil to the test cell until oil is at level close to the top, aproximately 3/4" above the electrodes. Allow the cup to sit for at least two (2) but no more than three (3) minutes before testing.

5. Apply voltage and increase it from zero at a uniform rate of 3,000 volts per second until breakdown occurs. Record the highest voltage reached just as breakdown occurs.

6. On the same sample in the test cup, wait one minute between dielectric breakdowns and repeat voltage application four additional times recording each dielectric breakdown value.

7. If the lowest test value in the sample is greater than the minimum acceptable value for the device, then omit the standard deviation calculation. Average the five (5) dielectric breakdown values and record this value as the dielectric value of the oil.

Example: The minimum acceptable oil dielectric value for the device under test is 25kV.

Dielectric Breakdown Values

Test 1	27kV
Test 2	28kV
Test 3	30kV
Test 4	27kV
Test 5	29kV

All values are greater than the minimum acceptable value for the device under test. The average of these test, 28kV, should be recorded as the dielectric value of the oil.

8. Standard Deviation Calculation

Subtract the minimum dielectric breakdown value from the maximum. Multipy this value by three (3). If the product is less than the next to the lowest dielectric breakdwon, the standard deviation is acceptable and the resulting average of the five (5) dielectric breakdowns should be recorded as the dielectric breakdown.

Example:

Dielectric Breakdown Values

Test 1	22kV	Minimum Value is 18kV
Test 2	24kV	Maximum Value is 26kV
Test 3	18kV	
Test 4	20kV	26kV - 18kV = 8kV
Test 5	26kV	8kV x 3= 24kV

24kV is greater than the next lowest value (22kV). The test should be repeated on a new test cup sample (repeat steps c thru f) and average all ten (10) dielectric breakdown values. That average is the dielectric value of the oil to be recorded.

5.0 TEST CELL MAINTENANCE

When the cell is not in use it should be kept in a metal container filled with clean oil.

the southern electric system

INSTRUCTION FOR

THE

DIELECTRIC BREAKDOWN TESTING

OF INSULATING OIL

PER ASTM D-1816

DATE: 10/20/94

DIELECTRIC BREAKDOWN TESTING OF INSULATION OIL PER ASTM D-1816

1.0 APPLICATION

This test is used to determine the dielectric integrity of the insulating oil used in sealed apparatus (sealed transformers, non-arcing load tap changers). This procedure uniformly established the test method to be used throughout the Southern Electric System.

2.0 GENERAL

The test is performed using a dielectric test set approved for use on the Southern Electric System. ASTM D-1816 uses sphere shaped electrodes with a spacing of 0.040 inches. The voltage during this test is increased at 500 volts per second.

3.0 SAMPLING

In taking a sample of oil, the intent is to obtain a sample representative of the oil in the vessel.

NOTE: Samples should never be taken from a drum, storage tank, tanker, an unenergized sealed transformer of three phase voltage regulator transformer compartment when the temperature is below 0° C or 32° F due to temperature effects on water content of oil. Care should be taken to seal the sample container as soon as practical to minimize contamination from atmosphere. Never take an oil sample from a piece of equipment under a vacuum.

FROM EQUIPMENT VALVES

Samples should be taken from the bottom valve; **do not take the sample from the sampling valve.** With the valve closed, remove the plug. With a clean, dry, lint free cloth wipe the interior of the valve to remove foreign materials. Install a reducer sized for the valve down to a 1/4" O.D. hose bib. On the hose bib install a section of Tygon tubing and drain enough oil to flush the valve and pipe assembly. Take the sample into a clear glass container and visually inspect the sample for color, water, carbon or other impurities. Fill the sample container to the neck of the bottle and seal until used for test.

4.0 TESTING

NOTE: The temperature of the test cup and the oil sample should be approximately the same, this is to prevent the sample from being affected by condensation.

1. Check the electrode gap in he test cup and adjust to 0.0400 inches if required. Inspect the electrodes for scratches, dents or surface abnormalities. Replace if necessary.

2. Clean the electrodes, stirrer and the cup with a dry, lint free, clean paper or cloth and rinse with sample oil.

3. Gently invert and swirl the sample container to mix the impurities in the oil. Care should be taken not to agitate or introduce air into the sample.

4. Carefully add sample oil to the test cell until oil is at level approximately 1/4" from the top. Allow the cup to sit and stir for at three (3) minutes before testing.

5. Apply voltage and increase it from zero at a uniform rate of 500 volts per second until breakdown occurs. Record the highest voltage reached just as breakdown occurs.

6. On the same sample in he test cup, wait one minute between dielectric breakdown value.

7. If the lowest test value in the sample is greater than the minimum acceptable value for the device, then omit the standard deviation calculation. Average the five (5) dielectric breakdown values and record this value as the dielectric value of the oil.

   Example: The minimum acceptable oil dielectric value for the device under test is 25kV.

Dielectric Breakdown Values	
Test 1	27kV
Test 2	28kV
Test 3	30kV
Test 4	27kV
Test 5	29kV

- All values are greater than the minimum acceptable value for the device under test. The average of these test, 28kV, should be recorded as the dielectric value of the oil.

5.0 STANDARD DEVIATION CALCULATION

Subtract the minimum dielectric breakdown value from the maximum. Multiply this value by three (3). If the product is less than the next to the lowest dielectric breakdown, the standard deviation is acceptable and the resulting average of the five (5) dielectric breakdowns should be recorded as the dielectric breakdown.

Example:

Dielectric Breakdown Values		
Test 1	22kV	Minimum Value is 18kV
Test 2	24kV	Maximum Value is 26kV
Test 3	18kV	
Test 4	20kV	26kV - 18kV = 8kV
Test 5	26kV	8kV x 3 = 24kV

24kV is greater than the next lowest value (22kV). The test should be repeated on new test cup sample (repeat steps c through f) and average all ten (10) dielectric breakdown values. That average is the dielectric value of the oil to be recorded.

6.0 TEST CELL MAINTENANCE:

When the cell is not in use it should be kept filled with clean oil.

the southern electric system

INSTRUCTION FOR

THE

COLOR TESTING

OF INSULATING OIL

PER ASTM D-1500

DATE: 10/20/94

COLOR TESTING OF INSULATING OIL PER ASTM D-1500

1.0 APPLICATION

The purpose of this test is to establish the color of insulating oil by comparison to a national standard. The color number reference is used in determining the general condition of insulating oil. This procedure uniformly establishes the testing method to be used throughout the Southern Electric System.

2.0 GENERAL

New insulating oil has a color of 0.5 or less on a scale of 0.5 (clear) to 8 (very dark). The color test is made by comparing the oil being tested with a color standard manufactured to meet ASTM D-1500. This information should be used in conjunction with other oil test, not solely used in determining the disposition or condition of insulating oil. Many older transformers were manufactured with varnished dipped insulation, which darkens the oil color but has no affect on other oil quality parameter, i.e. dielectric.

3.0 SAMPLING

In taking a sample of oil, the intent is to obtain a sample representative of the oil in the vessel.

1. FROM EQUIPMENT VALVES:

NOTE: Never take an oil sample from a piece of equipment under a vacuum.

Samples should be taken from the bottom valve; do not take the sample from the sampling valve. With the valve closed, remove the plug. With a clean, dry, lint free cloth wipe the interior of the valve to remove foreign materials. Install a reducer sized for the valve down to a 1/4" O.D. hose bib. On the hose bib install a section of Tygon tubing and drain enough oil to flush the valve and pipe assembly. Take the sample into a clear glass container and visually inspect the sample for color, water, carbon or other impurities. Fill the sample container to the neck of the bottle and seal until used for test.

2. FROM TANK TRAILER:

Take the sample in the same manner as from equipment. The valve and pipe assembly is usually much larger and will require more oil to be drained to effectively flush it.

3. FROM STORAGE DRUMS AND STORAGE TANKS

Using a clean metallic pipe, longer than the height of the drum, remove the bung hole cover and insert the pipe into the bottom center of the drum holding your thumb over the pipe. Remove your thumb to allow oil to seep into the pipe. Cover the pipe and remove from drum, allow sample to drain into a clean glass container. Repeat until sample container is to the neck of the bottle and seal until used for test.

4.0 TESTING

Due to the number of color comparators in use around the Southern Electric System which when used properly work correctly, a detailed procedure for each test device is not practical. However, the principles established in the following test method for the Gerin Color Comparator are applicable and should be applied in all cases.

1. USING THE GERIN COLOR COMPARATOR:

The Gerin Color Comparator comes with two color blocks. The low color limit block represents colors from 0.5 to 4 and the high color limit block represents colors from 4.5 to 8 making up a complete color comparison from 0.5 to 8.0. To make the test complete the following steps:

1. Fill the special test vial with oil to the level line marked "Fill to here."
2. Choose the color block that is the closest match to the oil and insert the vial into the block.
3. Holding the test block about ten (10) inches from your eye, compare the oil sample with the color standard. The observation should be from 10 to 15 seconds. Do not prolong the observation. For very accurate readings, let you eyes rest between intervals. While making the test, the frosted glass plate at the back of the viewer block should face directly toward natural light. Make sure there are not shadows on the viewer. If the daylight is not strong enough a fluorescent lamp can be used as a light source.

2. MATCHING THE COLOR:

If the color match is the same as one of the color samples, record that match as the color. If the color of the oil is between two of the color samples, you may estimate the color as more than the least and less than the most and record that estimate as the color.

the southern electric system

INSTRUCTION FOR THE ACIDITY TESTING OF INSULATING OIL

DATE: 10/20/94

ACIDITY TESTING OF INSULATING OIL

1.0 APPLICATION

The purpose of this test is to find the appropriate neutralization number of insulating oil in the field. It will establish consistent testing throughout the Southern Electric System.

2.0 GENERAL

As oil ages it is invaded by acids that later change to peroxides and then to a gummy substance called sludge. Sludge collects on all of the internal parts of the equipment causing a reduction in heat transfer and impairing the flow of oil through the heat ducts and reducing the dielectric strength of the oil. It can be controlled by keeping the acid content below 0.3 milligrams of potassium hydroxide per gram of oil. The ASTM standard for this test has been discontinued. However, the Gerin Corporation supplies a kit for making this test. The test will determine how much potassium hydroxide necessary to neutralize the acid present in the oil. This measurement is referred to as the "Neutralization Number".

3.0 SAMPLING KIT

The sampling kit used to determine if the neutralization is below a 0.3 consists of the following:

1. GRADUATE:

The graduate is a 1" I.D.X 6" flat bottom test tube with calibration marks at 5, 10, 15 and 50 ml and fitted with a cork stopper.

2. SOLVENT:

The solvent is supplied in a kit in one quart bottles. It is a technical grade or better 50:50 mixture of isopropyl alcohol and benzene with a phenolphthalein indicator added.

3. AMPULES:

The ampules are sealed glass containers of potassium hydroxide (lye) in very accurate measure. They are prepared by Gerin in a number of various sizes, but for the purpose of this test, only the number 3A ampule shall be used.

4.0 TESTING

1. Pour the oil to be tested into the graduate until the 10 ml mark is reached. Next, pour solvent in with the oil until the 50 ml mark is reached.

2. Add the contents of one number 3A ampule into the graduate, put the stopper in and shake well.

NOTE: To open the ampule, first hold it erect and tap it gently until the contents have all settled to the bottom. Score the neck with the file provided and break sharply.

5.0 INTERPRETATION OF RESULTS

If the solution turns pink (and any trace of pink is sufficient), the oil has a neutralization number of less than 0.3 MgKOH/g (milligrams of potassium hydroxide per gram). If the solution does not turn pink the neutralization number is above 0.3 MgKOH/g of oil. If necessary, add the contents of an additional number 3A ampule into the graduate, put the stopper in and shake well.

If the solution then turns pink, the oil has a neutralization number of less than 0.6 MgKOH/g. If the solution does not turn pink, the neutralization number is above 0.6 MgKOH/g of oil. Typically oil with a neutralization number above 0.6 MgKOH/g of oil should be reclaimed or scrapped.

Seek assistance if more accurate values are necessary.

the southern electric system

INSTRUCTION FOR

DISSOLVED GAS-IN-OIL

ANALYSIS SAMPLING

DATE: 10/20/94

DISSOLVED GAS-IN-OIL ANALYSIS SAMPLING

1.0 APPLICATION

This procedure outlines a sampling method designed to insure that syringes are filled properly and samples obtained are representative of the oil in the device. This will insure sampling techniques are uniform across the Southern Electric System.

2.0 GENERAL

Dissolved Gas-In-Oil analysis is used to determine the internal integrity of electrical apparatus. This test can be adversely affected by poor sampling technique. This procedure establishes the sampling method to be used for the Southern Electric System, intended to eliminate sampling errors.

3.0 MATERIALS NEEDED

- Tygon tubing I.D. 1/4" x O.D. 3/8"
- Tygon tubing I.D. 1/8" x O.D. 1/4"
- Insert small tubing into the larger tubing approximately 1", using a small cable tie to bind the two together to form a piece approximately four (4) feet long.
- One 1/4" Hose Bibb Connector and assortment of reducers for the oil drain valves.
- Ground Glass Syringe of appropriate size

4.0 SAMPLING

1. With the valve closed, remove the plug. With a clean, dry, lint free cloth wipe the interior of the valve to remove foreign materials. Install a reducer sized for the valve down to a 1/4" O.D. hose bib. Drain enough oil to flush the valve and pipe assembly.

NOTE: Never take an oil sample from a piece of equipment under a vacuum. Samples should be taken from the bottom valve; do not take the sample from the sampling valve.

2. On the hose bib install the section of Tygon tubing sampling hose. Insert the syringe, with the sampling cock in the drain position into the other end of the sampling hose. Crack the main oil drain valve and thoroughly flush the Tygon tubing.

3. When a steady oil flow is obtained turn sample cock to the fill position. Allow oil pressure to fill syringe, turn sample cock to the drain position and empty syringe by applying pressure to the plunger. Repeat this process once more to flush the syringe.

4. Turn sample cock to fill position and allow oil pressure to move syringe until the appropriate volume is obtained. Inspect syringe to insure no air bubbles are in the syringe. If air bubbles are present, empty syringe by moving sampling cock to drain position and applying pressure to the plunger. Refill using the same procedure.

5. When syringe is filled properly, turn sampling cock to the drain position, close main oil drain valve and remove syringe. Clean syringe and place in shipping container to shield from sunlight.

6. After restoring main oil drain valve plug, complete the shipping papers and properly identify the device the sample was taken from with appropriate equipment identification and top oil temperature.

the southern electric system

INSTRUCTION FOR

MOTION ANALYSIS

TESTING

DATE: 10/17/94

MOTION ANALYSIS TESTING

1.0 TRIP TEST

Observe the trip line for smoothness of run and rebound. Rebound shall not be more than 5% of the stroke unless otherwise noted in the instruction book. The contact part time shall be within the limits specified in the instruction book. Contact velocity shall be measured as described in the instruction book with an additional 10% margin allowed for age, for distribution breakers. For transmission breakers, see Timing Standards.

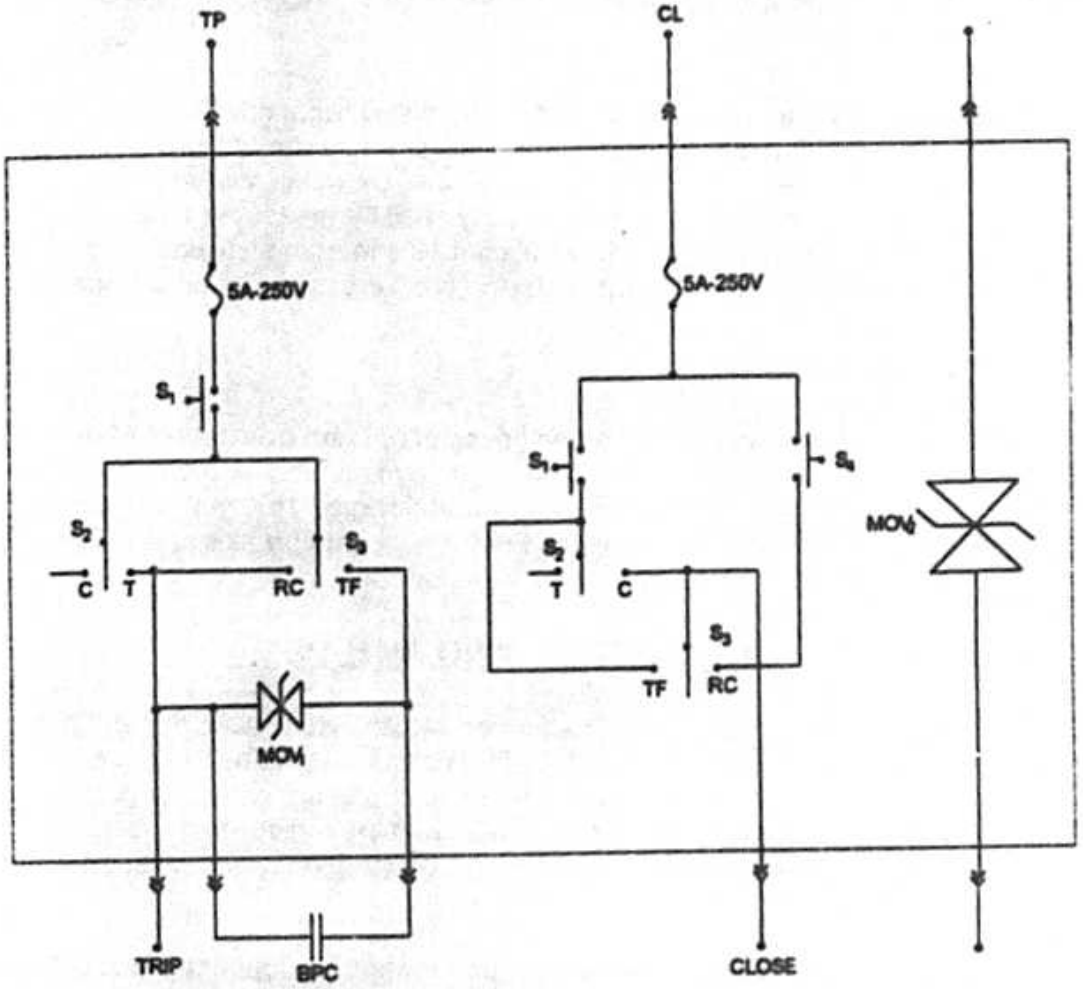
2.0 CLOSE TEST

Observe the closing line for smoothness of run and overtravel. Measure total closing time. Contact velocity shall be measured by the method described in the instruction book with an additional 10% margin allowed for age, for distribution breakers. For transmission breakers, see Timing Standards.

3.0 CLOSE-OPEN, TRIP FREE, AND ANTI-PUMP TESTS

A trip free operation shall be performed, which also checks the anti-pump scheme. A trip free operation is defined as an instantaneous close-open operation. To perform this test, use a circuit breaker controller (schematic attached), which uses MOV's in parallel with the trip coil and main contacts to prevent a voltage spike from bridging relay contacts, possibly causing a differential.

Start with the breaker open and control power off. Connect circuit breaker controller connections as described on the schematic. Select trip free mode (the main contacts shall be in series with the trip coil) and press operate button. The breaker shall close-open and remain in the open position. If the breaker "pumps or cycles closed and open" continuously, the anti-pump scheme is defective and the cause shall be investigated and repairs made. Contact make time should be a maximum of one cycle longer than contact part time as measured on an opening operation.



4.0 OPEN-CLOSE OR RECLOSE TEST

Reclose time is measured from the point of trip coil energization to contact make. Record time as left.

5.0 LOW PRESSURE CLOSE TEST (PNEUMATIC AND HYDRAULIC OPERATORS ONLY)

A low pressure close operation shall be performed at the cutout pressure as specified on the nameplate. Do not perform this test at a pressure lower than that specified on nameplate.

6.0 CONTACT INDICATION

Separate lines indicating the main contact make points for poles 1, 2, and 3 shall be contained on the chart.

the southern electric system

INSTRUCTION FOR

LOW RESISTANCE OHMMETER

TESTING

DATE: 10/20/94

HOW TO FOR LOW RESISTANCE OHMMETER TESTING

1.0 APPLICATION

The low resistance ohmmeter accurately measures the resistance of current carrying components of power equipment. These instructions establish the procedure to measure this resistance throughout the Southern Electric System.

2.0 INSTRUMENTATION

The instrument used to perform this test shall meet the minimum requirements for a low resistance ohmmeter on the Southern Electric System. The device applies a 100 amp pulse of current while measuring the voltage rise across the point of connection of the device under test. The pulse supplied is a D.C. pulse which will not saturate any current transformers to cause false relay operations. The calibration of the meter should be verified if questionable readings are encountered. The test leads may be moved closer to each other to aid in locating the cause of an unsatisfactory reading.

3.0 SPECIFIC TESTS

1. POWER CIRCUIT BREAKERS

Measure the resistance of each pole assembly from bushing terminal to bushing terminal with the breaker in the closed position. If unsatisfactory readings are encountered the leads may be relocated to determine the cause of the reading. Refer to POWER CIRCUIT BREAKER CONTACT RESISTANCE STANDARDS for acceptable values.

2. OTHER APPARATUS

The principal outlined in 4.1 allows the low resistance ohmmeter to be used to verify the current path in switches, battery straps, bus connections and the like. Care should be taken to ensure that the current capacity of the item under test is not exceeded and that any windings are properly discharged.

the southern electric system

INSTRUCTION FOR MEASUREMENT OF THE MOISTURE CONTENT OF SF_6 GAS

DATE: 10/20/94

MEASUREMENT OF MOISTURE IN SF_6 GAS

1.0 APPLICATION

These instructions establish the procedure to measure the moisture content of SF_6 gas throughout the Southern Electric System.

2.0 GENERAL

Most equipment manufacturers require that SF_6 gas be checked in parts per million (PPM) absolute for moisture, while some foreign manufacturers require a PPM test at a certain temperature and pressure. The Hygrometers used in this procedure measure dew point and/or PPM in SF_6 gas absolute. Unlike a transformer, there is no waiting time required after filling with gas before making a moisture test.

The type and length of tubing used to connect the test instrument to the sample vessel is of great importance since the drying time of tubing materials varies over a wide range. Wet tubing will cause enough instability in the meter reading. Either stainless steel braided teflon lined or stainless steel tubing should be used.

When measuring moisture levels in gas at elevated pressure, any change in the overall pressure will change the water vapor pressure and in turn, the hygrometer reading. Moisture measurements on bottled gasses, compressed air, gas circuit breakers, transformers and gas lines is to establish how wet the gas is in absolute terms (i.e., to obtain a moisture measurement which is independent of both temperature and pressure). If the reading must be temperature and pressure corrected, refer to the manufacturers formulas or correcting curves.

3.0 TESTING

1. MCM Hygrometer:

PERFORMING THE TEST

Connect the MCM hygrometer to the vessel to be tested using teflon lined stainless steel tubing and fittings as shown in the illustration below.

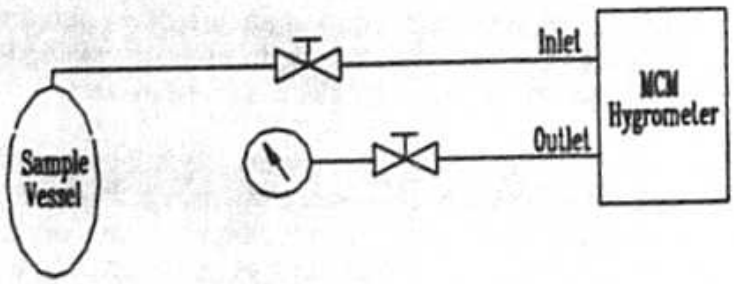


Figure 1. MCM Hygrometer Connection

After the meters have been connected as illustrated above and the hygrometer has been zeroed, proceed with step number one.

1. Close the fine metering valve located just ahead of the hygrometer.
2. Open the fine meter valve ahead of the flow meter to the full open position.
3. Open the sample valve located on the gas supply and check for pressure on the inlet gauge (if so equipped).
4. Adjust the fine metering valve located just ahead of the hygrometer to obtain a 500cc per minute flow.
5. When the meter has become steady on the lowest possible reading, read and record the PPM (parts per million).
6. Press the "PUSH PURGE" button for approximately 15 seconds (long enough to drive the meter off scale). After releasing the button, allow the meter to stabilize.

7. Note this reading.

8. If this reading is lower than the previous reading, the previous test is void due to either a contaminated system or sensor. Repeat steps 4 through 7. If the reading after pushing "PUSH PURGE" is lower once again, refer to the manufacturers instruction book for cleaning the sensor and system.

2. **SHAW:**

1. **CALIBRATION**

1. If the instrument is a dual range model, select the standard (less sensitive range).

2. Ensure that no gas sample is connected to the instrument head connections.

3. Raise the head of the instrument by the hand and pump it up and down a few times, ending in the raised position.

4. After about 1 minute (not critical, but not more than a few minutes) check the instrument reading. It should be at the Automatic Calibration line. It is not critical within 1 or 2 degrees.

5. If the reading requires adjustment locate the Automatic Calibration control, which is to be found on the front panel of the instrument, and using the small screwdriver provided, turn the control clockwise to increase the reading (wetter) or anticlockwise to decrease it.

6. Close the instrument head.

7. Calibration is complete.

2. **PERFORMING THE TEST**

1. Switch the instrument on, and check the battery condition.

2. At the sample point to be tested open the sample valve or regulator slightly and check that no dirt or condensation is expelled. (If any dirt or condensation is present, wait until it is cleared, or abandon the test).

The pressure of the sample source is not important; the instrument simply needs a small sample of the air or gas which has been reduced to atmospheric pressure at the sample point - easily achieved by opening the valve just enough to allow a small flow to escape through the dewpoint meter.

3. Connect the PTFE sample pipe supplied with the instrument between the sample tapping point and the instrument, using either of the connections of the head/sensor assembly.

4. Adjust the sample valve or regulator to the give a gentle flow through the instrument, 5 to 10 L/min. is ideal.

5. Allow the sample to flow for 2 or 3 minutes in order to purge the sample pipe (a longer time might be needed if testing very dry gas -drier than 10 ppm). Then place a finger over the outlet connection of the instrument head, and the sample pressure will cause the head to open. Remove finger from the instrument when the head is fully open. (If there is insufficient sample pressure, fit a length of 1 or 2 meters of any flexible pipe to the outlet connection of the instrument head, and slowly raise the head by hand).

6. The instrument reading will move up the scale (wetter), and then stabilize. When there is no further change in reading, note the final result. If the reading moves up the scale (wetter) and then moves down the scale (drier) then either the sample pipe was not purged enough before the head was raised, or the sample is becoming drier during the test. (Perhaps by taking the sample from a pipe in which the gas has been stagnant for some time).

   If in doubt about the suitability of the sample flow rate, or the materials of the sample pipe being used, increase the sample flow rate after the final reading has been obtained. If the instrument moves to a drier reading, this indicates that the original flow rate was too low, or that there is a leak in the system allowing ambient moisture into the sample, or that the sample pipe itself is still wet.

7. After the test is complete, and if continuous reading is not needed, close the instrument head.

the southern electric system

INSTRUCTION FOR HIPOTENTIAL TESTING OF VACUUM CIRCUIT BREAKER INTERRUPTERS

DATE: 10/12/94

50

HIPOTENTIAL TESTING OF VACUUM CIRCUIT BREAKER INTERRUPTERS

1.0 APPLICATION

These instructions establish the procedure to perform a high potential test on vacuum circuit breakers throughout the Southern Electric System.

2.0 GENERAL

All vacuum circuit breakers have a specified test voltage and a normal contact gap when the breaker is in the open position that must be adhered to while testing. All vacuum breakers are tested in the same way by applying a specified A.C. (rms) voltage across the breaker with the contacts in the open position for a specified amount of time. The purpose of the test is to determine if a sufficient vacuum is present in the interrupter. The test is not to measure the amount of current flow across the interrupter at any certain voltage.

NOTE: Special consideration must be given to these tests since high voltage across a gap in a vacuum can produce x-rays. Contact spacing and test voltage levels are crucial to the test results and to the amount of radiation emitted. Due to the high test voltage and the possibility of radiation, emission safety must be the first consideration

3.0 PERFORMING THE TEST

1. HIPOTRONICS VACUUM BOTTLE TEST SET

1. Determine from the instruction book the proper test voltage and contact gap for the unit being tested.

2. Remove the breaker side panels and inspect the vacuum bottles, operating rods, bushings, and stand-off insulators.

3. Check the contact gap (spacing) with the breaker in the open position and adjust to the manufacturer's specification if necessary.

4. Replace the side panels.

5. Place the transformer section of the hi-pot test set on the top of the breaker and connect the ground terminal to ground.

6. Connect the high voltage test leads across pole one (1), bushings one (1) and two (2).

7. Connect all control and power cables to the test set.

8. With the breaker in the open position, turn the test set power on, set the timer for the manufacturer's specified time, set the rate of rise switch to 3,000 volts per second and press the start button.

9. Monitor the red light for a pass/fail indication. If the test passes, the red light will stay out. If the test fails, the red light will come on before the timer times out.

10. Press the reset button and turn the test set power off.

11. Repeat steps seven (7) through nine (9) on poles two (2) and three (3).

12. Remove the test set, clean and replace the leads.

the southern electric system

INSTRUCTION FOR

MEASURING

INSULATION RESISTANCE

DATE: 10/20/94

HOW TO MEASURE INSULATION RESISTANCE

1.0 PURPOSE:

This procedure will provide detail instructions on how to perform Insulation Resistance Test and will provide consistent testing throughout the Southern Electric System.

2.0 GENERAL

Periodic measurements of electrical equipment insulation resistance and the comparison of the measurements with acceptable values will give an indication of the equipment in meg ohms, is performed to obtain the insulation resistance between insulation windings and ground of power transformers. The test is further used to determine insulation resistance between insulated parts and ground on equipment such as circuit breakers, regulators, bushings, control or power cables, etc. Measurements taken at periodic intervals and compared to previous readings will aid in determining if insulation deterioration is occurring and the rate of deterioration. When a rapid reduction of the insulation values is found, an investigation should be made to determine the cause.

1. THE TEST INSTRUMENT

The instrument has three connection terminals; line, ground, and guard. The tests will indicate the resistance in megohms of any insulation connected between the line terminal and the ground terminal with direct meter readout. Multiple range selection for the meg ohm readout is provided by a selector switch. A discharge position is also provided on the selector switch. The guard circuit and selector discharge provide the following functions:

The instrument used to perform this test shall meet the minimum criteria established for the Southern Electric System.

1. THE GUARD CIRCUIT

The guard circuit allows the isolation of the component under test from external influences. It is typically not used unless suspicious readings are obtained.

2. THE SELECTOR DISCHARGE

The selector discharge is provided to discharge the output of the test set and specimen following the completion of the test.

3: TEST PROCEDURE

The test reading should be recorded at the end of the first one (1) minute along with the temperature of the equipment being tested. If the equipment being tested has an oil temperature gauge, the reading from this gauge can be used and recorded in degrees centigrade. Due to time-absorption characteristics and capacitance meter swing. It is essential that cranking speed be maintained and the reading recorded at one (1) minute.

2. SPECIFIC TESTS

1. TRANSFORMERS

Insulation resistance tests shall be performed from each accessible winding to ground and from each accessible winding to all other accessible windings.

2. CIRCUIT BREAKERS

Insulation resistance tests shall be performed on each bushing to ground, with the breaker open, each pole to ground with the breaker closed.

3. REGULATORS

Insulation resistance tests shall be performed on regulators from one bushing to ground and continuity shall be checked from common to every bushing.

4. ANY OTHER DEVICE

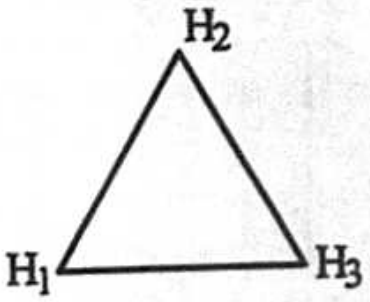
Insulation resistance test shall be performed from the normally energized portion to the normally grounded portion.

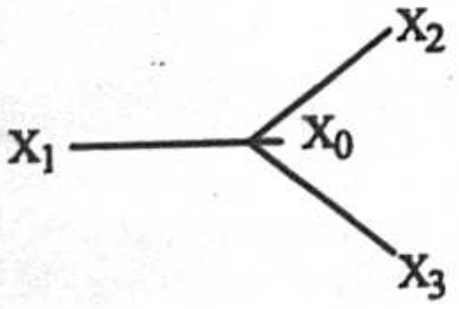
NOTE: The voltage to be applied by the megger shall not exceed the rating of the device being tested.

HOW TO MEASURE INSULATION RESISTANCE

EXAMPLES:

1. TRANSFORMER



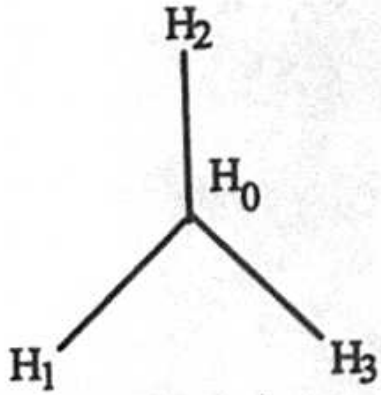


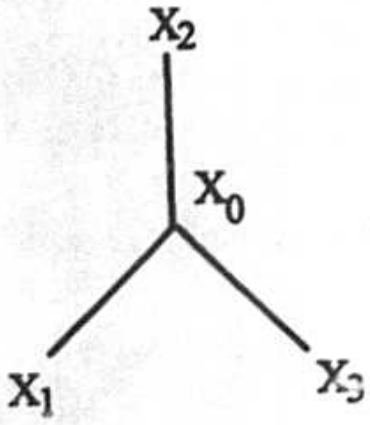
H-G _____ Meg Ohm
X-G _____ Meg Ohm
H-X _____ Meg Ohm

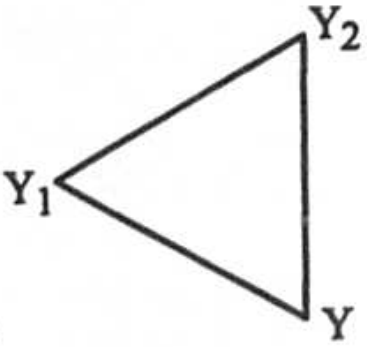
Continuity

H_1- H_2	X_0- X_1
H_1- H_3	X_1- X_2
H_2- H_3	X_2- X_3

2. TRANSFORMER



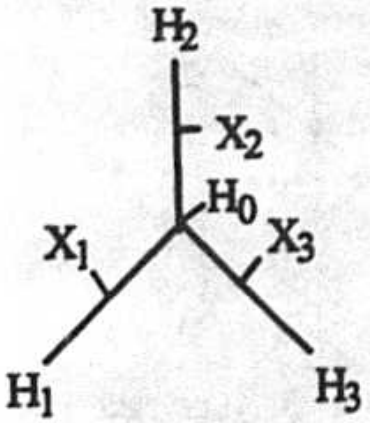


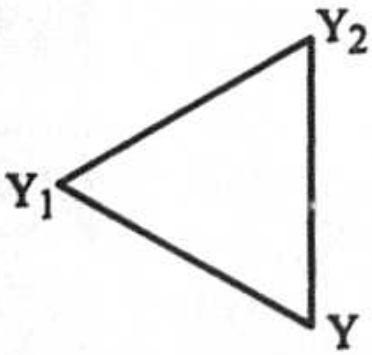


H-G _____ Meg Ohm
X-G _____ Meg Ohm
Y-G _____ Meg Ohm
X-H _____ Meg Ohm
Y-H _____ Meg Ohm
X-Y _____ Meg Ohm

	Continuity	
H_2-H_0	X_2-X_0	Y_1-Y_2
H_2-H_0	X_2-X_0	Y_2-Y_3
H_2-H_0	X_2-X_0	Y_1-Y_3

3. TRANSFORMER





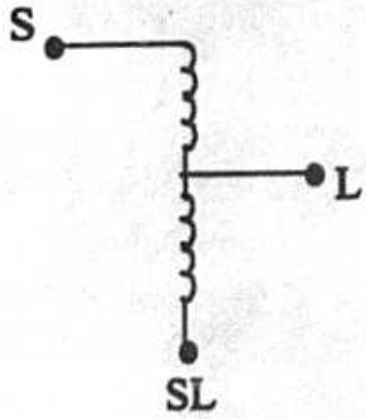
H-G _____ Meg Ohm
Y-G _____ Meg Ohm
H-Y _____ Meg Ohm

Continuity

X_0H_0-X_1
X_0H_0-H_1
X_0H_0-X_2
X_0H_0-H_2
X_0H_0-X_3
X_0H_0-H_3

Y_1-Y_2
Y_2-Y_3
Y_1-Y_3

3. REGULATORS



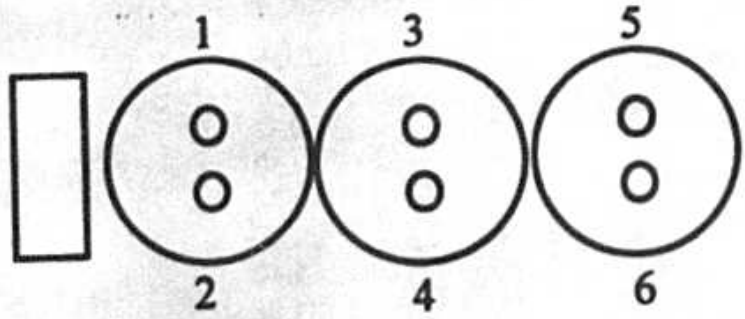
S - L _____ Meg Ohm

Continuity

S-L
S-SL
L-SL

HOW TO MEASURE INSULATION RESISTANCE

4. CIRCUIT BREAKERS



BREAKER OPEN:

1-G _____ Meg Ohm
2-G _____ Meg Ohm
3-G _____ Meg Ohm
4-G _____ Meg Ohm
5-G _____ Meg Ohm
6-G _____ Meg Ohm

BREAKER CLOSED

1,2 - GND _____ Meg Ohm
3,4 - GND _____ Meg Ohm
5,6 - GND _____ Meg Ohm

INTERPRETATION OF RESULTS:

Correct all of the readings to 20° C using the following multipliers:

Transformer Temperature in C°	Multiplier
0	.25
5	.36
10	.50
15.6	.74
20	1.00
25	1.40
30	1.98
35	2.80
40	3.95
45	5.60
50	7.85
55	11.20
60	15.85
65	22.40
70	31.75
75	44.70
80	63.50

the southern electric system

INSTRUCTION FOR

TESTING

CAPACITOR TRIP DEVICES

ON

POWER CIRCUIT BREAKERS

DATE: 10/20/94

60

TESTING CAPACITOR TRIP DEVICES ON POWER CIRCUIT BREAKERS

1.0 APPLICATION

The purpose of this procedure is to provide detailed instructions on how to test capacitor trip devices and will insure consistent testing throughout the Southern Electric System.

2.0 GENERAL

The capacitor trip device is used as a power source to trip power circuit breaker where no battery powered control system is being used. The device works by rectifying A.C. control power (usually 230 V.A.C.) and charging a D.C. capacitor. On command the capacitor is discharged into the trip coil and operates the trip solenoid armature. The rectifier circuit is equipped with a resistor to prevent the trip coil from drawing more current from the A.C. supply than the value of the diodes in the rectifier circuit, thus protecting the diodes from damage. Most trip devices built since 1972 have a charge of approximately 340 V.D.C. when applied to a 240 V.A.C. circuit. Some older devices using transformers in the capacitor circuit have voltage as high as 575 to 750 V.D.C., but with much less current. The older devices will not hold a charge much longer than 90 seconds after the A.C. supply has been removed while the later models (since about 1972) will hold a charge indefinitely. The capacitor trip device can be tested by removing the A.C. source to the trip circuit and attempting to trip the breaker from the control switch or by hand operating one of the over-current relays.

NOTE: Discharge the capacitor trip device when working around the operating mechanism or the trip circuit to prevent personal injury or electrical shock.

3.0 CAPACITOR TESTING

1. With all of the control power on, close the circuit breaker using the control switch.

2. Open the power circuit to the capacitor trip device and observe the time at which it was opened.

3. Sixty seconds after removing the power from the capacitor trip device trip the breaker. If the breaker does not trip the diodes or rectifiers in the capacitor trip device are defective or the capacitor is bad. Repair or replace before returning to service.

the southern electric system

INSTRUCTION FOR PERFORMING A TRANSFORMER TURNS RATIO TEST

DATE: 10/20/94

62

TRANSFORMER TURNS RATIO TEST

1.0 APPLICATION

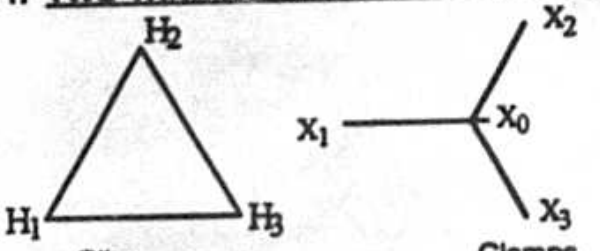
The purpose of this test is to provide detailed instructions on how to measure the ratio of the number of turns between transformer windings and will insure consistent testing throughout the Southern Electric System.

2.0 GENERAL

The TTR test set has an AC source and a variable ratio reference transformer. The ratio of the reference transformer is adjusted until the output of the windings under test are balanced to the winding of the reference transformer. The ratio of the reference transformer is the ratio of the windings under test.

3.0 TESTING

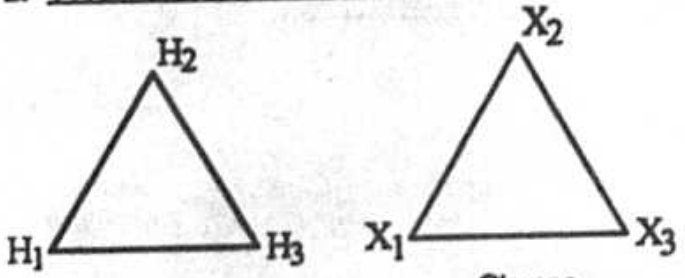
1. TWO-WINDING TRANSFORMER CONNECTED DELTA-WYE



Clips	
Red-Black	
1. H_1 - H_2	
2. H_2 - H_3	
3. H_3 - H_1	

Clamps	
Red-Black	
X_0 - X_2	
X_0 - X_3	
X_0 - X_1	

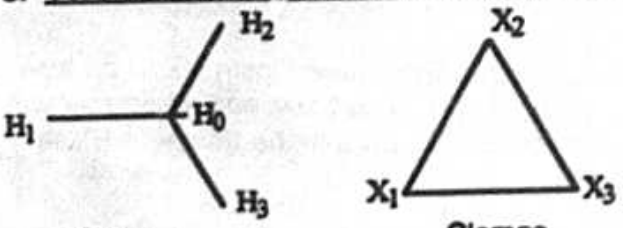
2. TWO-WINDING TRANSFORMER CONNECTED DELTA-DELTA



Clips	
Red-Black	
1. H_1 - H_2	
2. H_2 - H_3	
3. H_3 - H_1	

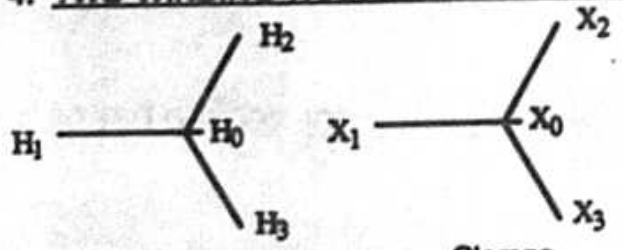
Clamps	
Red-Black	
X_1 - X_2	
X_2 - X_3	
X_3 - X_1	

3. TWO-WINDING TRANSFORMERS CONNECTED WYE-DELTA



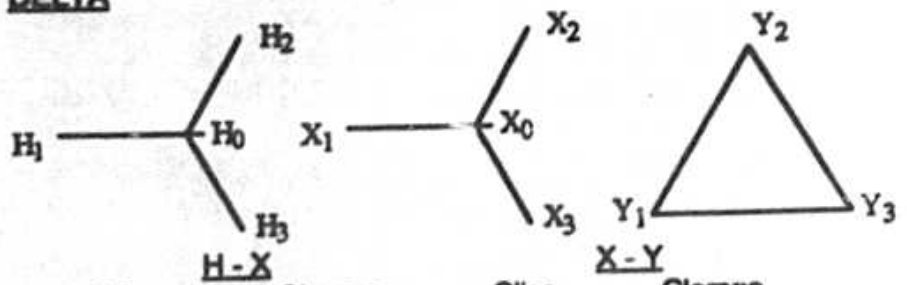
Clips Red-Black	Clamps Red-Black
1. H_1 - H_0	X_1 - X_3
2. H_2 - H_0	X_2 - X_1
3. H_3 - H_0	X_3 - X_2

4. TWO-WINDING TRANSFORMER CONNECTED WYE-WYE



Clips Red-Black	Clamps Red-Black
1. H_1 - H_0	X_1 - X_0
2. H_2 - H_0	X_2 - X_0
3. H_3 - H_0	X_3 - X_0

5. THREE-WINDING TRANSFORMER CONNECTED WYE-WYE-DELTA



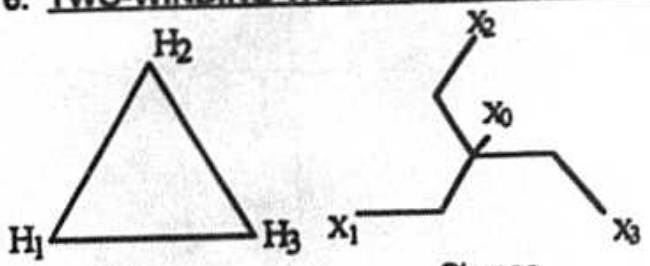
H - X

Clips Red-Black	Clamps Red-Black
1. H_1 - H_0	X_1 - X_0
2. H_2 - H_0	X_2 - X_0
3. H_3 - H_0	X_3 - X_0

X - Y

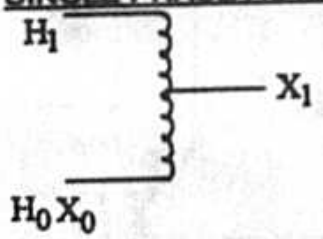
Clips Red-Black	Clamps Red-Black
X_1 - X_0	Y_1 - Y_3
X_2 - X_0	Y_2 - Y_1
X_3 - X_0	Y_3 - Y_2

6. TWO-WINDING TRANSFORMER CONNECTED DELTA-ZIGZAG



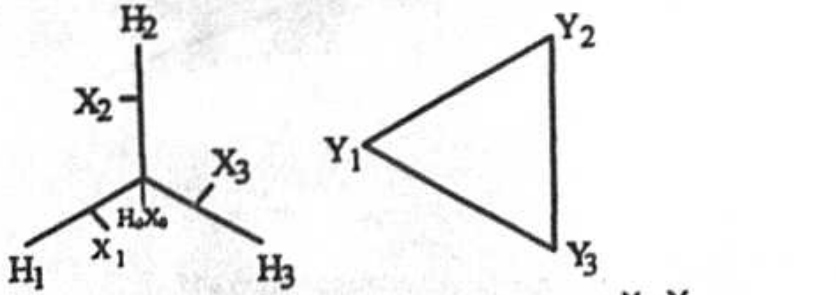
Clips Red-Black	Clamps Red-Black
1. H_1 - H_2	X_1 - X_0
2. H_2 - H_3	X_2 - X_0
3. H_3 - H_1	X_3 - X_0

7. SINGLE PHASE AUTO TRANSFORMER



Clips Red-Black	Clamps Red-Black
1. H_1 - H_0X_0	X_1 - H_0X_0

8. AUTO TRANSFORMER WITH DELTA TERTIARY



H - X

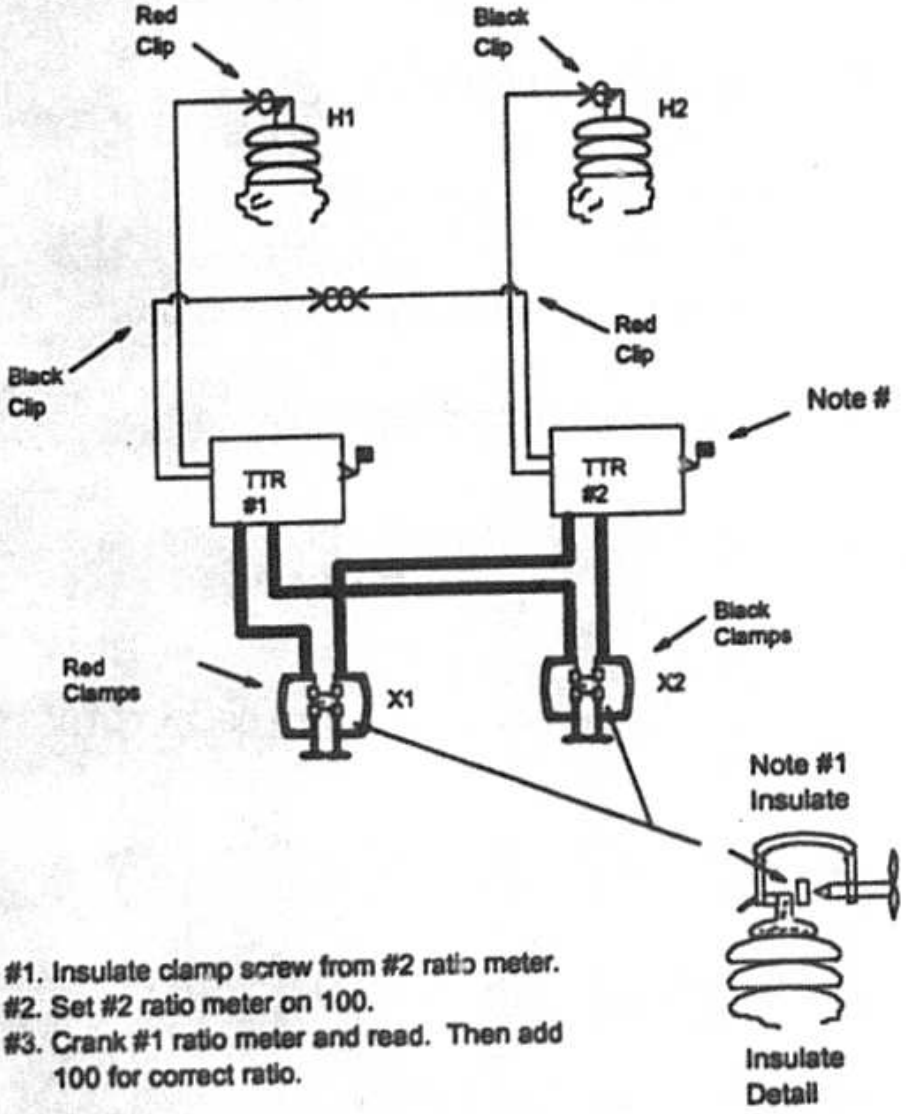
Clips Red-Black	Clamps Red-Black
1. H_1 - H_0X_0	X_1 - H_0X_0
2. H_2 - H_0X_0	X_2 - H_0X_0
3. H_3 - H_0X_0	X_3 - H_0X_0

X - Y

Clips Red-Black	Clamps Red-Black
X_1 - H_0X_0	Y_1 - Y_2
X_2 - H_0X_0	Y_2 - Y_3
X_3 - H_0X_0	Y_3 - Y_1

C5

9. **FOR RATIOS ABOVE 129.999 USE ONE OF THE FOLLOWING DIAGRAMS:**



NOTE: #1. Insulate clamp screw from #2 ratio meter.
#2. Set #2 ratio meter on 100.
#3. Crank #1 ratio meter and read. Then add 100 for correct ratio.

TRANSFORMER TURNS RATIO TEST

1. Ratio test auxiliary transformer.
2. Connect auxiliary transformer to transformer for test as shown.
3. Connect ratio meter to both transformers as shown.
4. Add the ratio of the auxiliary transformer to the reading for correct ratio.
5. Observe polarities.

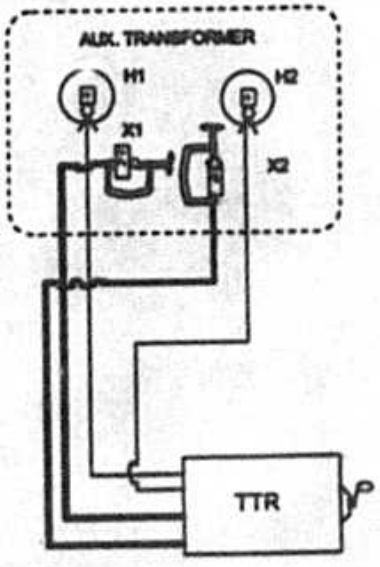


Figure 1
Verifying Ratio of
of Auxiliary Transformer

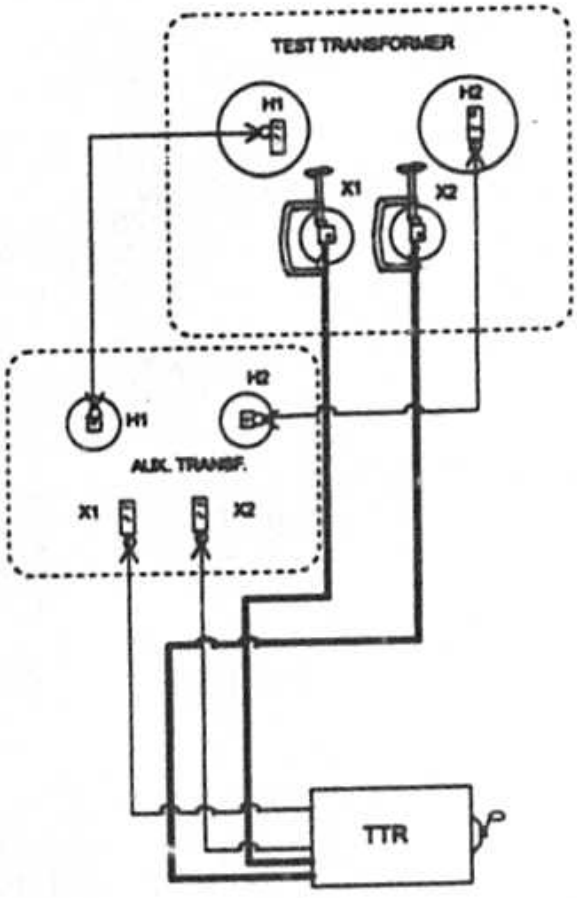


Figure 2
Determining Ratio
with Auxiliary Transformer

CALCULATIONS FOR A TRANSFORMER TURNS RATIO TEST

COMPANY NO: _____ DATE: _____
SUBSTATION: _____ SUBSTATION NO: _____
OPERATING SWITCH NO.: _____ CHECKED BY: _____

Tap	High (Ø-Ø)	Low Ø-Ø/Ø-G	Calculated Ratio	H_-H_ X_-X_	H_-H_ X_-X_	H_-H_ X_-X_	Max Diff.	Max % Error
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

	Low Ø-Ø/Ø-G	Tertiary (Ø-Ø)	Calculated Ratio	X_-X_ Y_-Y_	X_-X_ Y_-Y_	X_-X_ Y_-Y_	Max Diff.	Max % Error
LTC								
1L								
1R								
2R								
3R								
4R								
5R								
6R								
7R								
8R								
9R								
10R								
11R								
12R								
13R								
14R								
15R								
16R								

COMMENTS: _____

Calculated Ratio=High Voltage (Ø-Ø) /Low Voltage (Ø-Ø) (if delta or zig-zag)
Calculated Ratio=High Voltage (Ø-Ø) /Low Voltage (Ø-G) (if wye)
Calculated Ratio=High Voltage/Low Voltage (if single phase)
Maximum % Error=(Maximum Difference - Calculated Ratio / Calculated Ratio) X 100

the southern electric system

INSTRUCTION FOR TOTAL COMBUSTIBLE GAS TESTING OF THE NITROGEN BLANKET OF POWER TRANSFORMERS

DATE: 10/20/94

69

TOTAL COMBUSTIBLE GAS TESTING OF THE NITROGEN BLANKET OF POWER TRANSFORMERS

1.0 APPLICATION

This test is to used to detect problems in power transformers which generate explosive gasses. These gasses are normally caused by abnormal heat in the transformer. This procedure uniformly establishes the testing method to be used throughout the Southern Electric System.

2.0 GENERAL

Decomposition of oil or insulation in transformers will cause explosive gas to be generated which is caused by abnormal heat in the transformer. The amount and kind of gases generated are determined by the amount and duration of the heat. A hot spot slightly higher than normal temperature may cause gases such as ethane and methane to be generated while an arc or extremely high corona may cause acetylene. Hydrogen gas in the lightest of gases generated in transformers and will be present before any of the other gases. The J-W sniffer is designed to detect hydrogen, but other gases will contribute to the reading. The reading taken from the curve in this procedure will be correct for Total Combustible Gases (TCG).

Since transformers do not have oxygen present in them, it is necessary to use a sniffer with a range multiplier cock to mix air with the sample so it will burn when passed over the detector. The range multiplier cock has settings marked two (2) and five (5), Sample (S) and Atmosphere (A). The two (2) setting has a dilution of one part air to one part sample. It is the setting to be used for testing the nitrogen blanket of power transformers.

NOTE: The J-W "Sniffer" is not reliable with the varying pressure from one transformer to another because it must burn all of the gas that passes over the detector. To overcome the problem, a bladder must be used to gather the sample from the transformer and the test must be made from the bladder.

3.0 TESTING

1. Deflate the bladder as completely as possible.

2. Connect the bladder to the gas sample valve and allow it to fill until fully inflated, but only under a very slight pressure. (Stop just before the pleats are pulled tight.)

3. Adjust the "Sniffer" to zero.

   1. Turn Sniffer on by rotating aspirator bulb clockwise at least 1/4 turn. Position right hand, palm down so that thumb and forth fingers rotate the bulb. Thumb and forefinger should be free to turn **VOLT ADJ** knob.

   2. Press **VOLT TEST** button with left hand. Meter's hand should point to the arrow on the scale. If not, then adjust by simultaneously lifting and turning the **VOLT ADJ** knob with right thumb and forefinger. (Both **VOLT ADJ** and **ZERO ADJ** are equipped with clutches to prevent accidental turning. The knobs must be lifted to engage clutches while adjusting.) Release the **VOLT TEST** button.

   3. With the bulb in right hand, rotated to a convenient operating position (usually a little less than 1/2 turn from initial rest position), squeeze bulb 2 or 3 times to clear Sniffer of any residual gases.

   4. Lift and turn **ZERO ADJ** knob to run meter hand up and down the scale a few times, set meter hand at zero.

4. Turn the range multiplier cock to position two (2).

5. Allow the bladder to deflate until the contents are essentially at atmospheric pressure.

6. Connect the bladder tube to the inlet nipple and immediately begin pumping the aspirator bulb as rapidly as possible. Watch the meter carefully and record the highest reading, which should occur after about five or six squeezes on the bulb.

4.0 INTERPRETING THE RESULTS

Meter Reading with Sample Cock on 2	
< 0.2	No action
0.2 to 0.5	If no previous record, take sample for DGA analysis. If it has not increased from previous reading, take no action. If increasing, seek assistance
>0.5	If it has not increased from previous reading, take no action. If increasing, seek assistance

NOTE: Readings taken after operation of the transformer protective scheme should be compared to previous readings. If higher than previous test results, other electrical test may be performed to determine transformers condition. If reading is in explosive zone on scale, purge nitrogen blanket before performing any electrical test.

5.0 REFERENCE TABLE

The following table is to be used for reference purposes only.

J-W INDICATOR Calibration Table for Interpreting Readings of Model G when Testing for Combustibles in Nitrogen (based on Hydrogen)		
Meter Reading	Sample Cock Setting per cent Combustible	
	5	2
0.025	0.75	0.30
0.050	1.25	0.50
0.075	2.00	0.80
0.100	2.50	1.00
0.125	3.25	1.30
0.150	3.75	1.50
0.175	4.50	1.80
0.200	5.00	2.00
0.225	5.75	2.30
0.250	6.50	2.60
0.275	7.00	2.80
0.300	7.50	3.00
0.325	8.25	3.30
0.350	9.00	3.60
0.375	9.50	3.80
0.400	10.50	4.20
0.425	12.25	4.50
0.450		4.80
0.475		5.00
0.500		5.40
0.550		5.90
0.600		6.60
0.650		7.40
0.700		8.00
0.750		8.70
0.800		9.50
0.850		10.40
0.900		11.00

NOTE: The straight sample cock setting should not be used for transformer nitrogen blanket testing. It is shown for reference only and may be used for other testing where oxygen is present.

the southern electric system

INSTRUCTION FOR TESTING THE OXYGEN CONTENT IN THE NITROGEN BLANKET OF POWER TRANSFORMERS

DATE: 10/20/94

TESTING THE OXYGEN CONTENT IN THE NITROGEN BLANKET OF POWER TRANSFORMERS

1.0 APPLICATION

This test is to be used to measure the oxygen content of the nitrogen blanket of power transformers. This procedure uniformly establishes the testing method to be used throughout the Southern Electric System.

2.0 GENERAL

Oxygen with heat and in the presence of insulating oil allows the formation of acids. These acids attack the insulating oil, leading to sludge and further deterioration of the insulating oil and insulating members of the transformer. To limit the amount of oxygen in the nitrogen blanket, all SES substation maintenance procedures require the sealed system to be purged until the oxygen content is less than 2%.

This procedure utilizes a Bacharach Fyrite O_2 Indicator. The indicator measures the product of a chemical reaction between oxygen and chromous choloride. For further details concerning the operation of this device, refer to the instruction book.

NOTE: This device measures a chemical reaction. Consult manufacturers instruction book for precautions and handling methods.

3.0 CALIBRATION

1. Release prescure by depressing plunger valve. Invert and allow all fluid to drain into top reservoir by holding container at a slight angle. Invert, holding container at a slight angle, and allow all fluid to drain into bottom reservoir. Release prescure by depressing plunger valve. Repeat this process two additional times.

2. Zero scale on liquid column by adjusting scale zero (0) to top liquid level. If scale cannot be zeroed consult the manufacturers instruction book.

3. Slightly moisten the wool filter in the sampling hose.

4. Connect sample hose to plunger valve. Squeeze bulb eighteen (18) times, sampling breathing atmosphere.

5. Invert and allow all fluid to drain into top reservoir by holding container at a slight angle. Invert, holding container at a slight angle, and allow all fluid to drain into bottom reservoir. Repeat this two additional times.

6. With tester on level surface, read fluid level on scale. This is the percentage of oxygen measured. If not greater than 20 %, consult instruction book.

4.0 TESTING

1. Release pressure by depressing plunger valve. Invert and allow all fluid to drain into top reservoir by holding container at a slight angle. Invert, holding container at a slight angle, and allow all fluid to drain into bottom reservoir. Release pressure by depressing plunger valve. Repeat this process two additional times.

2. Zero scale on liquid column by adjusting scale zero (0) to top liquid level. If scale cannot be zeroed consult the manufacturers instruction book.

4. Connect sample hose to nitrogen blanket sample port and allow nitrogen to flow through hose. Squeeze bulb several times to purge hose of atmosphere.

5. Connect other end of sample hose to plunger valve assembly on tester. Squeeze bulb eighteen (18) times.

6. Invert and allow all fluid to drain into top reservoir by holding container at a slight angle. Invert, holding container at a slight angle, and allow all fluid to drain into bottom reservoir. Repeat this two additional times.

7. With tester on level surface, read fluid level on scale. This is the percentage of oxygen measured in the transformer nitrogen blanket. Record this value as required.

NOTE: If this value is greater than 2%, retest. If still greater than 2%, purge transformer gas space and retest later if this is the first O_2 test of this transformer. If value is still greater than 2% corrective measures is required.

8. To perform test on additional transformers, repeat steps 4.1 through 4.7.

5.0 STORAGE

1. If last sample was less than 2% Oxygen, no additional steps are necessary to prepare unit for storage.

2. If last sample was greater than 2% Oxygen, repeat testing procedure steps 4.1 through 4.7 on a nitrogen cylinder or a pure nitrogen space.

the southern electric system

INSTRUCTION FOR PURGING SEALED POWER TRANSFORMERS

DATE: 10/20/94

78

PURGING SEALED POWER TRANSFORMERS

1.0 APPLICATION

This instruction describes how to obtain an acceptable level of oxygen in the gas space of a sealed Power Transformer.

2.0 GENERAL

Purging a Power Transformer is performed to replace the existing atmosphere of the gas space with dry nitrogen. It requires testing to verify that the final content is less than 2.0% oxygen.

3.0 PURGING TRANSFORMERS EQUIPPED WITH INERT AIR SYSTEM

1. To minimize the risk of gas bubble formation, install a .050" orifice on sample valve before opening.
2. Close valve on high pressure nitrogen cylinder. Open sample valve on transformer. Drain existing pressure from tank to zero psig
3. Repressurize transformer to 3 psig. It is not necessary to fill through orifice.
4. Repeat steps 1-3 until oxygen content is less than 2%.

4.0 PURGING TRANSFORMERS NOT EQUIPPED WITH INERT AIR SYSTEM

1. To minimize the risk of gas bubble formation, install a .050" orifice on sample valve before opening.
2. Open sample valve on transformer. Drain existing pressure from tank to zero psig.
3. Repressurize transformer to 3 psig. It is not necessary to fill through orifice.
4. Repeat steps 1-3 until oxygen content is less than 2%.

the southern electric system

INSTRUCTION FOR FLASHING SEALED POWER TRANSFORMERS

DATE: 10/20/94

80

FLASHING SEALED POWER TRANSFORMERS

1.0 APPLICATION

This instruction describes how to expel surface moisture from a sealed Power Transformer.

2.0 GENERAL

Flashing is performed to remove surface moisture from the interior of a Sealed Power Transformer. It is most commonly performed after an internal inspection or repair. It requires a dry gas to be injected into the transformer so that the gas can become saturated with the surface moisture on the internal components of the transformer. The gas is then bleed from the transformer and replaced with dry gas.

3.0 FLASHING

1. Close valve on high pressure nitrogen cylinder, if equipped. Open sample valve on transformer. Drain existing pressure from tank to zero psig.
2. Repressurize transformer to 3 psig.
3. Allow gas to saturate with moisture by leaving it filled for a minimum of 20 minutes.
4. Repeat steps 1-3 for a minimum number of three cycles.
5. Test oxygen content of transformer. If greater than 2%, purge the transformer.
6. If equipped, return transformer preservation system to service.

the southern electric system

INSTRUCTION FOR MEASUREMENT OF DEWPOINT IN TRANSFORMER GAS SPACE

DATE: 10/20/94

MEASUREMENT OF DEWPOINT IN TRANSFORMER GAS SPACE

1.0 APPLICATION

This instruction establishes the procedure to measure the dewpoint in the gas space of power transformers throughout the Southern Electric System.

2.0 GENERAL

Gas in a power transformer has a moisture content dependent upon the level of moisture in the insulation and oil. To obtain an accurate measurement of the moisture level, equilibrium must be reached between the oil, insulation and gas space. The time necessary to reach equilibrium in a gas filled transformer is approximately 24 hours, while the time for oil filled equipment is approximately 72 hours. Prior to making the dew point test make certain the transformer has had sufficient time to reach equilibrium before testing.

The type and length of tubing used to connect the test instrument to the transformer is of great importance since the drying time of tubing materials varies over a wide range. Wet tubing will cause enough instability in the meter reading that it will be of no value. Stainless steel braided teflon lined or stainless steel should be used.

When measuring moisture levels in gas at elevated pressure any change in the overall pressure will change the water vapor pressure and in turn, the hygrometer reading. Transformers can be tested in dew point with no consideration given to temperature or pressure.

MEASUREMENT OF DEWPOINT IN TRANSFORMER GAS SPACE

3.0 TESTING

1. MCM HYGROMETER:

PERFORMING THE TEST

Connect the MCM hygrometer to the vessel to be tested using teflon lined stainless steel tubing and fittings as shown in the illustration below:

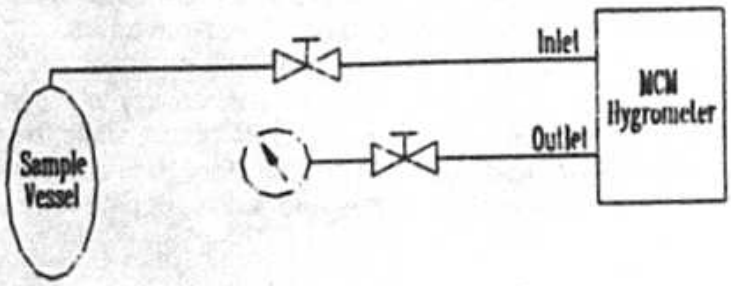


Figure 1. MCM Hygrometer Connection

NOTE: Care should be exercised to insure that no oil is present in the sample line.

After the meters have been connected as illustrated above and the hygrometer has been zeroed, proceed with step number one.

1. Close the fine metering valve located just ahead of the hygrometer.
2. Open the fine meter valve ahead of the flow meter to the full open position.
3. Open the sample valve located on the gas supply and check for pressure on the inlet gauge (if so equipped).
4. Adjust the fine metering valve located just ahead of the hygrometer to obtain a 500cc per minute flow.
5. When the meter has become steady on the lowest possible reading, read and record the PPM (parts per million).

2. PERFORMING THE TEST

1. Switch the instrument on, and check the battery condition.

2. At the sample point to be tested open the sample valve or regulator slightly and check that no dirt or condensation is expelled. (If any dirt or condensation is present, wait until it is cleared, or abandon the test).

   The pressure of the sample source is not important; the instrument simply needs a small sample of the air or gas which has been reduced to atmospheric pressure at the sample point - easily achieved by opening the valve just enough to allow a small flow to escape through the dewpoint meter.

3. Connect the PTFE sample pipe supplied with the instrument between the sample tapping point and the instrument, using either of the connections of the head/sensor assembly.

4. Adjust the sample valve or regulator to the give a gentle flow through the instrument, 5 to 10 L/min. is ideal.

5. Allow the sample to flow for 2 or 3 minutes in order to purge the sample pipe (a longer time might be needed if testing very dry gas -drier than -65°C). Then place a finger over the outlet connection of the instrument head, and the sample pressure will cause the head to open. Remove finger from the instrument when the head is fully open. (If there is insufficient sample pressure, fit a length of 1 or 2 meters of any flexible pipe to the outlet connection of the instrument head, and slowly raise the head by hand).

6. The instrument reading will move up the scale (wetter), and then stabilize. When there is no further change in reading, note the final result. If the reading moves up the scale (wetter) and then moves down the scale (drier) then either the sample pipe was not purged enough before the head was raised, or the sample is becoming drier during the test. (Perhaps by taking the sample from a pipe in which the gas has been stagnant for some time).

86

6. Press the "PUSH PURGE" button for approximately 15 seconds (long enough to drive the meter off scale). After releasing the button, allow the meter to stabilize.

7. Note this reading.

8. If this reading is lower than the previous reading, the previous test is void due to either a contaminated system or sensor. Repeat steps 4 through 7. If the reading after pushing "PUSH PURGE" is lower once again, refer to the manufacturers instruction book for cleaning the sensor and system.

2. **SHAW:**

   1. **CALIBRATION**

      1. If the instrument is a dual range model, select the standard (less sensitive range).

      2. Ensure that no gas sample is connected to the instrument head connections.

      3. Raise the head of the instrument by the hand and pump it up and down a few times, ending in the raised position.

      4. After about 1 minute (not critical, but not more than a few minutes) check the instrument reading. It should be at the Automatic Calibration line. It is not critical within 1 or 2 degrees.

      5. If the reading requires adjustment locate the Automatic Calibration control, which is to be found on the front panel of the instrument, and using the small screwdriver provided, turn the control clockwise to increase the reading (wetter) or anticlockwise to decrease it.

      6. Close the instrument head.

      7. Calibration is complete.

If in doubt about the suitability of the sample flow rate, or the materials of the sample pipe being used, increase the sample flow rate after the final reading has been obtained. If the instrument moves to a drier reading, this indicates that the original flow rate was too low, or that there is a leak in the system allowing ambient moisture into the sample, or that the sample pipe itself is still wet.

7. After the test is complete, and if continuous reading is not needed, close the instrument head.

the southern electric system

INSTRUCTION FOR

MEASURING

CORE GROUND

INSULATION RESISTANCE

DATE: 10/20/94

88

MEASURING CORE GROUND INSULATION RESISTANCE

1.0 PURPOSE:

This instruction establishes the procedure to measure the core ground insulation resistance throughout the Southern Electric System.

2.0 GENERAL

Transformers have an intentional ground placed between the iron core and tank. This is done to prevent the formation of electrostatic fields between the core and coil assembly and transformer tank. The connection is made in one location to prevent circulating currents. Multiple core grounds may cause circulating currents which may lead to premature failure or operating problems.

Manufacturers commonly grounded the core in either one of two places. One being under a manhole cover, the other being brought out through the tank wall using a small bushing. Both are tested in the same manner. Other locations may be found on older transformers, consult the manufacturers instruction book or transformer nameplate.

3.0 PERFORMING THE TEST

1. Determine location of core ground and requirements for making it accessible.
2. After taking appropriate steps, isolate core ground from case.
3. Determine insulation resistance using an insulation resistance test set on the 500v scale.
4. If a reading is obtained which is less than 100 Megohms, seek assistance.
5. Reinstall core ground.

the southern electric system

INSTRUCTION FOR THE CALIBRATION OF TEMPERATURE GAUGES

DATE: 10/20/94

90

2. Follow "CALIBRATION" procedure.
3. When switch closes, the light comes on, and goes out when the switch opens.
4. Verify that the contacts operate at the correct temperature.
5. Repeat steps 1 through 4 for each therm switch.
6. If temperature gauge reading varies by more than ±5°C from test set setting, replace gauge.

NOTE: Never use test leads on energized circuit..

the southern electric system

INSTRUCTION FOR

IMPEDANCE TESTING

OF

STATION BATTERIES

DATE: 10/20/94

93

4. After connecting the test set to an appropriate AC supply, turn the power switch to the on position. When the "READY" light comes on (after approximately 30 seconds) a current is being supplied through the battery and cell connections from the test set.

5. With an AC Clamp-On ammeter, measure the total AC current flowing in the string. If an open cell exists in the string, current supplied by the test set will not be indicated on the test set "AC SOURCE CURRENT" meter. If the current measured with the clamp-on ammeter is greater than 5 amps investigate the battery charger. Values greater than 5 amps may include an AC ripple component from the battery charger which could interfere with the test. If necessary, relocate the test source leads so that half the battery string is between the lead terminals. Repeat this step.

6. Record the temperature of a pilot test cell and ambient conditions. Impedance values may be affected by temperature.

7. Attach the clamp-on receiver of the test set between an inter-tier jumper or other location which is between the positive and negative terminal connections to the battery string of the test set.

8. Firmly (to insure a good connection) place the receiver probes across the battery cell terminal and record impedance of cell. Repeat for each cell. Values which vary 20% from the average of all cell values should be investigated.

NOTE: If the installation under test consists of multiple cells in a single jar which do not have individual cell terminals, place probes across available cell terminals for the jar. Modify test sheet accordingly.

9. Firmly place the receiver probes across the cell connections (positive post of one battery jar to negative post of adjoining battery jar) and read impedance. Repeat for each connection. Values which vary 25% above the average of all cell connections should be investigated and corrected.

APPENDIX A - IMPEDANCE TESTING OF STATION BATTERIES

COMPANY NO.:_____ DATE:_____
SUBSTATION:_____ SUBSTATION NO:_____
CHECKED BY:_____

Cell Numbers	Impedance	Cell Numbers	Impedance
1		48	
2		49	
3		50	
4		51	
5		52	
6		53	
7		54	
8		55	
9		56	
10		57	
11		58	
12		59	
13		60	
14		61	
15		62	
16		63	
17		64	
18		65	
19		66	
20		67	
21		68	
22		69	
23		70	
24		71	
25		72	
26		73	
27		74	
28		75	
29		76	
30		77	
31		78	
32		79	
33		80	
34		81	
35		82	
36		83	
37		84	
38		85	
39		86	
40		88	
41		89	
42		90	
43		91	
44		92	
45		93	
46		94	
47		95	

COMMENTS: _____

96

the southern electric system

INSTRUCTION FOR INTEGRITY TESTING OF STATION BATTERY INSTALLATIONS

DATE: 9/23/94

INTEGRITY TESTING OF STATION BATTERY INSTALLATIONS

1.0 APPLICATION

This specification applies to substation batteries which include lead calcium, lead antimony, nickel cadmium and driven by the preventive diagnostic inspection or scheduled test.

1. Voltage Ranges.
   48 - 135 Volts.

2. The integrity test is a short duration, high current load test to check for weak cells or conduction path problems which account for approximately 80% of all battery system problems.

2.0 VISUAL INSPECTION

Perform a general visual inspection of the substation batteries before proceeding with the detailed test.

1. Inspect battery straps.
2. Inspect battery connectors.
3. Inspect battery seals.
4. Inspect battery plates and electrolyte.
5. Inspect battery rack for corrosion.

NOTE: If any problems exist in the above inspections, correct before proceeding.

3.0 PREPARATION

1. Insure the battery bank has received an equalized charge for at least three days, but no more than seven days prior to the test.

2. Measure and record the specific gravity of all cells.

3. Measure and record the electrolyte temperature of all cells and calculate average temperature.

4. Measure and record cell float voltages

5. Parallel portable battery with station battery.

6. Isolate the station battery from the DC system and charger.

98

7. Connect test equipment to battery bank (according to manufacturer recommendations).

4.0 PERFORM INTEGRITY TEST

The integrity test consists of loading the battery with at least 100 amperes of test current for 30 seconds and then measuring all individual cell voltages, including the voltage drop in the intercell connectors which account for approximately 80% of all battery system problems.

5.0 TERMINATION OF TEST

1. Disconnect test equipment from station batteries.
2. Connect station batteries to battery charges.
    1. Monitor initial recharge and, if necessary, assist in adjustment of charger current limit and output voltage levels.
1. Parallel station batteries to DC system.
2. Disconnect portable battery bank.
3. Check station batteries overall voltage and alarms.

6.0 GENERATE REPORT

the southern electric system

INSTRUCTION FOR CAPACITY TESTING OF STATION BATTERIES

DATE: 10/20/94

100

CAPACITY TESTING OF STATION BATTERIES

1.0 APPLICATION

This procedure establishes the method for capacity testing station batteries on the Southern Electric System.

2.0 GENERAL

Battery capacity is specified in ampere hours at the 8 hour rate. For example, a 200 ampere hour battery can deliver 25 amps for 8 hours (200 ÷ 8 = 25). Normally a battery's capacity is tested at a higher rate, either 1, 2 or 3 hours. The battery manufacturers data sheet will provide the ampere hour ratings for these rates. The advantage to testing at these higher rates is that less time is required and the conducting path is subjected to a higher test current.

The ampere hour rating of the battery is very temperature sensitive, ratings by manufacturers are specified at 25°C (77°F). To compare test data with manufacturers data a correction has to be made. Correction factors are established by IEEE in Standard 450, Temperature Correction Table.

The fully discharged voltage level of a battery is also provided on the manufacturer's data sheet, for example 1.75 V D.C. for lead acid. The test duration of a capacity test is the length of time it takes for the overall battery voltage to reach the fully discharged voltage level. This translates for example on a 60 cell lead acid bank to 105 V D.C. (60 x 1.75 = 105).

The actual capacity of a battery, as measured by test results, is determined by the formula below;

$$\% \text{ capacity} = \frac{\text{Actual Test Time}}{\text{Battery Manufacturer's Rated Time}} \times 100\%$$

For example:

If a battery test lasted 2 hours 45 minutes on a battery that was rated 3 hours, then the capacity of that battery is:

$$C = \frac{165}{180} \times 100\% = 91.7\%$$

The test is performed using a battery capacity test set approved for use on the Southern Electric System.

3.0 PERFORMING THE TEST

1. ACCEPTANCE TEST

NOTE: Prior to commencing with this test an alternate source for DC should be obtained and precautions taken to prevent damage to adjacent equipment in the event of a violent failure.

1. LEAD ACID BATTERIES

Verify that the battery set has had an equalizing charge completed more than 3 days but less than 7 days prior to the test. This equalizing charge should be continuous for 72 hours or as specified by the manufacturer.

NICAD BATTERIES

Verify that the battery set has had an equalizing charge completed more than 1 days but less than 7 days prior to the test. This equalizing charge should be continuous for 72 hours or as specified by the manufacturer.

2. Check all battery connections to insure that they are clean, tight and free of corrosion.

3. Read and record the specific gravity and float voltage (do not measure the specific gravity of NiCad batteries) of each cell.

4. Read and record the average temperature of the battery electrolyte by measuring the temperature of every sixth cell.

5. Read and record the battery string float voltage.

6. Disconnect the charger from the battery string.

7. Determine test duration, fully discharged voltage level and temperature correction factor from manufacturers data sheet.

8. Connect the test set sense leads to the battery string and the ECU (Electronic Control Unit).

9. Connect the load control cable(s).

10. Connect the load cables to the CLU(s) (Continuous Load Unit) and power up the CLU.

11. Perform the test by pushing the Start key. When the load is first applied, the battery voltage will drop rapidly to what is referred to as its "initial level" and from there it will recover to a slightly higher voltage. This is normal.

    The first few minutes of the test are most critical. Individual cell readings should be checked to see if any of them are tracking more than 0.03 V below the average. This is an indication of a high-resistance intercell connection. This could allow heat to build up and cause major damage. If a cell reading appears low verify if it is the cell itself or an intercell problem by checking the Cell Voltage readings with either a hand-held digital voltmeter or by moving the sense leads directly across that cell.

    If necessary "Pause" the test using the Start/Stop key and take corrective action.

12. Disconnect the test system, disconnecting the load cables first.

13. Evaluate test results, printing and recording any results that may be needed.

14. Restore battery string to service only after corrections have been made and batteries are at a state of charge that is suitable for service.

2. PERFORMANCE TEST

NOTE: Prior to commencing with this test an alternate source for DC should be obtained and precautions taken to prevent damage to adjacent equipment in the event of a violent failure.

1. Read and record the specific gravity and float voltage (do not measure the specific gravity of NiCad batteries) of each cell.

2. Read and record the average temperature of the battery electrolyte by measuring the temperature of every sixth cell.

3. Read and record the battery string float voltage.

4. Disconnect the charger from the battery string.

5. Determine test duration, fully discharged voltage level and temperature correction factor from manufacturers data sheet.

6. Connect the test set sense leads to the battery string and the ECU (Electronic Control Unit).

7. Connect the load control cable(s).

8. Connect the load cables to the CLU(s) (Continuous Load Unit) and power up the CLU.

9. Perform the test by pushing the Start key. When the load is first applied, the battery voltage will drop rapidly to what is referred to as its "initial level" and from there it will recover to a slightly higher voltage. This is normal.

   The first few minutes of the test are most critical. Individual cell readings should be checked to see if any of them are tracking more than 0.03 V below the average. This is an indication of a high-resistance intercell connection. This could allow heat to build up and cause major damage. If a cell reading appears low verify if it is the cell itself or an intercell problem by checking the Cell Voltage readings with either a hand-held digital voltmeter or by moving the sense leads directly across that cell.

   If necessary "Pause" the test using the Start/Stop key and take corrective action.

10. Disconnect the test system, disconnecting the load cables first.

11. Evaluate test results, printing and recording any results that may be needed.

12. Restore battery string to service only after corrections have been made and batteries are at a state of charge that is suitable for service.

TABLE 1 - CAPACITY TESTING OF STATION BATTERIES

DISCHARGE CURRENT CORRECTION
Factor *K* for Temperature

Initial Temperature (°C)	(°F)	Factor *K*
-3.9	25	1.520
-1.1	30	1.430
1.7	35	1.350
4.4	40	1.300
7.2	45	1.250
10.0	50	1.190
12.8	55	1.150
15.6	60	1.110
18.3	65	1.080
18.9	66	1.072
19.4	67	1.064
20.0	68	1.056
20.6	69	1.048
21.1	70	1.040
21.7	71	1.034
22.2	72	1.029
22.8	73	1.023
23.4	74	1.017
23.9	75	1.011
24.5	76	1.006
25.0	77	1.000
25.6	78	0.994
26.1	79	0.987
26.7	80	0.980
27.2	81	0.976
27.8	82	0.972
28.3	83	0.968
28.9	84	0.964
29.4	85	0.960
30.0	86	0.956
30.6	87	0.952
31.1	88	0.948
31.8	89	0.944
32.2	90	0.940
35.0	95	0.930
37.8	100	0.910
40.6	105	0.890
43.3	110	0.880
46.1	115	0.870
48.9	120	0.860
51.7	125	0.850

NOTE: This table is based on nominal 1.210 specific gravity cells. For cells with other specific gravities refer to the manufacturer. The manufacturers recommend battery testing be performed between 65° F and 90° F.

CHECKLIST - CAPACITY TESTING OF STATION BATTERIES

COMPANY NO.:_____ DATE:_____
SUBSTATION:_____ SUBSTATION NO:_____
CHECKED BY:_____ TOTAL VOLTAGE:_____
TOTAL CAPACITY:_____ LOAD AMPS:_____
TIME FOR 100% CAP:_____ ACTUAL TEST TIME:_____

Cell Numbers	Measured SG	Measured Electro Temp	Measured Cell Voltage	Cell Numbers	Measured SG	Measured Electro Temp	Measured Cell Voltage
1				48			
2				49			
3				50			
4				51			
5				52			
6				53			
7				54			
8				55			
9				56			
10				57			
11				58			
12				59			
13				60			
14				61			
15				62			
16				63			
17				64			
18				65			
19				66			
20				67			
21				68			
22				69			
23				70			
24				71			
25				72			
26				73			
27				74			
28				75			
29				76			
30				77			

COMMENTS:_____

the southern electric system

STANDARD FOR MAINTENANCE CRITERIA OF SUBSTATION EQUIPMENT

DATE: 11/15/94

MAINTENANCE CRITERIA OF SUBSTATION EQUIPMENT

1.0 APPLICATION

This specification establishes the minimum values acceptable for in service equipment on the Southern Electric System. Values measured which do not meet or exceed these values will require corrective action.

2.0 POWER CIRCUIT BREAKERS GREATER THAN 69KV

1. **Infrared Scanning**

1. **Terminal Connectors**	0-10° C no action 11-30° C correct within 12 months 31-60° C correct within 3 months 61° C or greater correct immediately
2. **Bushings**	0-5° C no action 6-10° C correct within 3 months 11° C or greater immediate action required
3. **Interrupter Housing**	Detectable difference requires immediate action

NOTE: Past experience may dictate deviation from the recommendations.

2. **Oil Dielectric Test** **Test per ASTM D-877**	Values 22kV or greater require no action. Values less than 22kV require correction.
3. **Color Test** **Test per ASTM D-1500**	Values 0-4 no action is required Values greater than 4 require correction
4. **Power Factor**	Follow Doble recommendations
5. **Low-Resistance Ohm Meter**	See Southern Electric System Contact Resistance Standard
6. **Insulation Resistance**	The nominal value should be 5000 megohms or greater at 20° C historical data and experience should act as a guide

7. Timing Analysis	See Southern Electric System Contact Velocity Standard
8. Preventative Diagnostic	See applicable SES procedure

NOTE: The recommendations for testing to be followed for a preventative diagnostic are representative. Past experience and operating history must serve as a guide to the necessary maintenance.

3.0 POWER CIRCUIT BREAKERS 69KV AND BELOW

1. Infrared Scanning

1. Terminal Connectors	0-10° C no action 11-30° C correct within 12 months 31-60° C correct within 3 months 61° C or greater correct immediately
2. Bushings	0-5° C no action 6-10° C correct within 3 months 11° C or greater immediate action required
3. Interrupter Housing	Detectable difference requires immediate action

NOTE: Past experience may dictate deviation from the recommendations.

2. Oil Dielectric Test Test per ASTM D-877	Values 22kV or greater require no action. Values less than 22kV require an internal inspection.
3. Color Test Test per ASTM D-1500	Values 0-4 no action is required Values greater than 4 require an internal inspection.
4. Preventative Diagnostic	See applicable SES procedure

NOTE: The recommendations for testing to be followed for a preventative diagnostic are representative. Past experience and operating history must serve as a guide to the necessary maintenance.

5. **Meggar Test**

1. **Oil Circuit Breakers**	The nominal value should be 2,000 megohms or greater at 20° C historical data and experience should act as a guide
2. **Oilless Circuit Breakers**	The nominal value should be 10,000 megohms
6. **Low Resistance Ohm Meter**	Follow Southern Electric System Contact Resistance Standard
7. **Power Factor**	Follow Doble Engineering Guide
8. **High Potential Test**	Follow Southern Company guidelines

4.0 POWER TRANSFORMERS

1. **Infrared Scan**

1. **Terminal Connectors**	0-10° C no action 11-30° C correct within 12 months 31-60° C correct within 3 months 61° C or greater correct immediately
2. **Bushings**	0-5° C no action 6-10° C correct within 3 months 11° C or greater immediate action required
3. **Tank and Radiators**	Any localized hot spot or cold spot requires attention

2. Sealed Power Transformers

The following tests are applicable to sealed transformers with dry nitrogen in the gas space. Readings outside the indicated range require action. Readings within the indicated range which are changing rapidly from the previous readings may also require action.

Oil Dielectric (ASTM D-1816)	500kV >30kV
	230kV and below>25kV
Oil Color	500kV less than or equal to 1
	230kV and below less than or equal to 2
Moisture	500kV <15
	230kV <30
Acid (KOH/GRAM)	500kV <0.015
	230kV <0.02
IFT (DYNES/CM)	500kV >36
	230kV >30

3. Free Breathing Power Transformer

The following readings are applicable to free breathing transformers. Readings outside the absolute range require attention, readings within the absolute range which are changing rapidly from the previous test may also require attention.

Oil Dielectric (ASTM D-877)	>22kV
Oil Color	less than or equal to 3
Acid (KOH/GRAM)	<0.03
IFT	>22

4. All Power Transformers

The following indicators are applicable to all power transformers. The readings outside the absolute limit established require attention, changes from the previous reading, while still inside the absolute limit, may also require attention.

Gas In Oil	Change from the previous reading
Total Combustable Gas	0.06 lower explosive level or has increased since previous test
Oxygen Content	<2%
Power Factor	Follow Doble Engineering Recommendations
Insulation Resistance	Less than or equal to 5kV, 5 meg ohm. Greater than 5kV, 10 meg ohm per kV. per winding
TTR	<0.5% calculated, no deviation from previous test
Winding Resistance	No deviation from previous test
Preventative Diagnostic	Fans mounted on radiators are not lubricated.

NOTE: The recommendations for testing to be followed for a preventative diagnostic are representative. Past experience and operating history must serve as a guide to the necessary maintenance.

5. Load Tap Changers

1. **Infrared Scan** — If the switch compartment is detectable hotter that the winding compartment, immediate action is required
2. **Oil Color**
   1. **Vacuum** — Color greater than 1 requires action
   2. **Arcing** — Color greater than 3 requires action

3. Oil Dielectric

1. Vacuum ASTM D-877 test — < 25kV requires action
2. Arcing ASTM D-877 test — < 22kV requires action

6. Instrument Transformers

1. Infrared Scan — Any detectable difference requires immediate attention

5.0 VOLTAGE REGULATORS

1. Distribution Voltage Regulators

1. Infrared Test

1. Terminal Connectors — 0-10° C no action
11-30° C correct within 12 months
31-60° C correct within 3 months
61° C or greater correct immediately
2. Bushings — 0-5° C no action
6-10° C correct within 3 months
11° C or greater immediate action required
3. Tank — 0-3° C for switch compartment hotter than the winding no action
Switch compartment > 3° C hotter than the winding immediate action required

2. Oil Dielectric — ASTM D-877 <22kV requires action
3. Oil Color — Color greater than 3 requires action

2. 46kV Regulators

1. Infrared Scan — If the switch compartment is detectable hotter than the winding compartment, immediate action is required

2. **Oil Color**

1. **Vacuum Type**	Color greater than 1 requires action
2. **Arcing Type**	Color greater than 3 requires action

3. **Oil Dielectric**

1. **Vacuum Type ASTM D-877 Test**	< 25kV requires action
2. **Arcing Type ASTM D-877 Test**	< 22kV requires action

6.0 BATTERY

1. **Charger Output**	Verify current output voltage 133 V for 125 VDC system 52 V for 48 VDC system
2. **Cell Voltage**	2.2-2.25 VDC for lead acid 1.4-1.45 VDC for NI CAD

NOTE: Readings outside the guide values require action. Other guidelines for battery testing will be issued by the battery committee.

7.0 LIGHTNING ARRESTERS

1. **Infrared Scan**	Any detectable difference requires immediate attention
2. **Power Factor (non-MOV)**	Follow Doble Engineering Recommendations

8.0 SWITCH

1. **Infrared Scan**	Any detectable difference requires attention

the southern electric system

STANDARD FOR APPROVED LUBRICANTS, INHIBITORS, AND ADHESIVES AND THEIR APPLICATION

DATE: 10/11/94

115

APPROVED LUBRICANTS, INHIBITORS, AND ADHESIVES AND THEIR APPLICATION

SIIS #	COMPOUND	APPLICATION
SC00038210	AEROSHELL #4 5 Gal Can	Breakers: Hydraulic fluid used in Siemens type 3AT and TCP SF_6 breakers.
SC00038211	EXXON UNIVIS J-13 5 Gal Can	Breakers: Hydraulic fluid used in all other pneudraulically operated breakers except for those above.
SC00038213	DENATURED ALCOHOL 1 Gal Can	Breakers, transformers, and switches: Used as a cleaning agent for bushings, porcelain, and inside SF_6 environment.
SC00038216	ARMSTRONG 520 1/2 Pint CAN	Breakers, transformers, and switches: Used as a gasket adhesive during regasketting.
SC00038217	ANTIFREEZE	Switches: Used in Johnson switch gear boxes to prevent freezing (mix with transmission fluid).
SC00038218	SELIG Linebacker Grease 18 Oz Can	Breakers: Anti-corrosive inhibitor used to treat flanges on some air blast and SF_6 breakers.
SC00038219	DOW CORNING 738 Silicone Sealer 10.3 Oz Carton	Breakers: Sealer used to waterproof covers and flanges on some air blast and SF_6 breakers.
SC00038220	MOBILE 28	Breakers: Used for general lubrication on all mechanisms. Tap changers: Used for general lubrication of bearings, gear case, cams, etc.
SC00038221	CENTOPLEX 24 DL 1 Pint Can	Breakers: Siemens type 3AT and TCP lubrication within the SF_6 environment.
SC00038222	RITZOL 7-2 50CC Bottle	Breakers: Static 0-ring treatment for Siemens type 3AT and TCP SF_6 breakers.
SC00038223	NEUTRAL VASELINE 8420 1 Pint Can	Breakers: Static 0-ring lubricant for Siemens type 3AT and TCP SF_6 breakers.
SC00038224	TRI-FLOW 6 Oz Can	Breakers: Local lubrication of cabinet hinges, latch linkage, cables, chains etc. Switches: Lubrication of chains.

116

APPROVED LUBRICANTS, INHIBITORS, AND ADHESIVES AND THEIR APPLICATION

SC00038225	SHELL TURBO T-46 1 Qt Bottle	Breakers: Mitsubishi type SFM and SFMT compressor lubrication oil for use in the type IWATA comp.
SC00038227	SHELL CLAVUS 32 1 Qt Bottle	Breakers: Mitsubishi type SFM and SFMT compressor lubrication oil for use in the type KAJI comp.
SC00038228	TECTYL 506 1 Gal Can	Breakers: Anti-corrosive inhibitor used to treat the sealing flanges on Siemens type 3AT and TCP type SF_6 breakers.
SC00038229	ZINC CHROMATE 1 Gal Can	Breakers: Treatment of terminal pads on G.E. type ATB air blast breakers.
SC00003268	G.E. TYPE D50H15 GREASE 4 oz Tube	Breakers : General lubrication of silicon and some other o-rings associated with air blast circuit breakers.
SC00038572	300 VISCOSITY REFRIGERATION OIL 1 Gal. Can	Breakers : General lubrication of bearings, linkages, latches, etc. when disassembly is not required. Load tap changers : General lubrication of bearings, gear case, cams, etc. Switches : General lubrication of mechanisms and linkages when disassembly is not required.
SC00038573	DEXRON AUTO TRANS FLUID 1 Qt. Bottles	Breakers : Lubrication of bearings and bushings in Siemens SDV vacuum breakers.
SC00038574	EXXON BEACON GREASE #325	Breakers : General lubrication of Siemens SDV and Westinghouse type R vacuum breakers. General lubrication in the SF_6 atmosphere.
SC00038575	FLUOROLUBE 25 Gram Jar	Breakers : Lubrication of contacts and linkage in Westinghouse type SF breakers.
SC00038576	MOLYKOTE GN 2.8 Oz Tube	Breakers : General metal to metal lubrication on Westinghouse type SFA breakers.
SC00038577	DOW CORNING 111 5.3 Oz Tube	Breakers : Static o-ring lubricant for air and SF_6 gas breaker sealing flanges.
SC00008278	DOW CORNING 55M 5.3 Oz Tube	Breakers : Dynamic o-ring lubricant for air blast breakers.

the southern electric system

STANDARD FOR

CONTACT RESISTANCE

FOR

POWER CIRCUIT BREAKERS

DATE: 10/14/94

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS

The Normal value is the resistance that can be obtained for a specific breaker type. (During installation, the resistance value must be within the normal range). The Caution value is 125% of the normal value. Reaching the Caution value does not require immediate attention, however, if an upward trend is observed that approaches the Limit value, the cause should be investigated and repairs made. If the contact resistance reaches or exceeds the Limit value, the cause must be investigated and repairs made before returning the circuit breaker to service

NOTE: An asterisk in the normal column indicates that the contact resistance is per interrupter on multiple interrupter air-blast and SF_6 breakers.

NOTE: The values contained in this document supersede any and all values given in the various instruction books or manufacturers notices.

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
144-GC-1500	14	3000	1500	O	75	95	115
144-GC-250	14	600	250	O	180	225	270
144-GC-250	14	1200	250	O	130	160	195
144-GC-500	14	1200	500	O	110	135	165
200-SFMT-50	242	4000	50	G	80	150	200
200-SFMT-50B	242	2000	50	G	165	320	400
200-SFMT-63B	242	2000	63	G	80	160	220
200-SFMT-63B	242	3000	63	G	80	160	220
23-KS-500-12B	23	1200	500	O	150	185	225
23-KS-500-12B	23	1200	1500	O	150	185	225
23-KS-500-12C	23	1200	500	O	140	175	210
23-KS-500-12D	23	1200	500	O	140	175	210
23-KS-500-20D	23	1600	500	O	150	185	225
23-KS-500-20D	23	2000	500	O	110	135	165
230-G-1500	23	1200	1500	O	90	110	135
230-GS-1500	23	1200	1500	O	235	295	355
230-KM-15000-16	230	1600	15000	O	300	375	450
230-KM-20000-16	230	1600	20000	O	300	375	450
230-KM-20000-20B	230	2000	20000	O	600	750	900
230-KM-20000-30B	230	3000	20000	O	30	375	450
2300-GW-10000	230	1600	10000	O	350	435	525
2300-GW-15000	230	1600	15000	O	350	435	525
2300-GW-20000	230	1600	20000	O	350	435	525
2300-GW-20000	230	2000	20000	O	400	500	600
2300-SF-10000	230	1600	10000	G	120	150	180

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
0241	14	3000	0	O	25	31	38
100-SFMT-40/63B	115	2000	50	G	113	140	170
100-SFMT-40/63B	121	2000	63	G	113	140	170
115-KM-10000-16	115	1600	10000	O	260	325	390
115-KM-5000-12	115	1200	5000	O	230	285	345
115-KM-5000-12B	115	1200	5000	O	230	285	345
1150-GM-10000	115	1600	63	O	400	500	600
1150-GM-10000	115	1600	10000	O	300	375	450
121-GM-63	121	1600	63	O	400	500	600
121-GMA-40	121	1600	40	O	300	375	450
121-GMA-40	121	2000	40	O	250	310	375
121-GMA-63	121	1600	10000	O	330	410	495
121-GMB-63	121	2000	63	O	150	185	225
121-GMB-63, CAP DUTY	121	2000	63	O	150	185	225
14.4-KS-500-12B	14	1200	500	O	100	125	150
14.4-KS-500-12C	14	1200	500	O	120	150	180
14.4-KS-500-16D	14	1600	18	O	120	150	180
14.4-KS-500-20C	14	2000	500	O	100	125	150
14.4-KS-500-20D	14	2000	500	O	100	125	150
144-G-100	14	600	100	O	200	250	300
144-G-1000	14	1200	1000	O	130	160	195
144-G-1500	14	3000	1500	O	45	60	70
144-G-250	14	600	250	O	180	225	270
144-G-250	14	1200	250	O	130	160	195
144-GC-100	14	600	100	O	250	310	375

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
144-GC-1500	14	3000	1500	O	75	95	115
144-GC-250	14	600	250	O	180	225	270
144-GC-250	14	1200	250	O	130	160	195
144-GC-500	14	1200	500	O	110	135	165
200-SFMT-50	242	4000	50	G	80	150	200
200-SFMT-50B	242	2000	50	G	165	320	400
200-SFMT-63B	242	2000	63	G	80	160	220
200-SFMT-63B	242	3000	63	G	80	160	220
23-KS-500-12B	23	1200	500	O	150	185	225
23-KS-500-12B	23	1200	1500	O	150	185	225
23-KS-500-12C	23	1200	500	O	140	175	210
23-KS-500-12D	23	1200	500	O	140	175	210
23-KS-500-20D	23	1600	500	O	150	185	225
23-KS-500-20D	23	2000	500	O	110	135	165
230-G-1500	23	1200	1500	O	90	110	135
230-GS-1500	23	1200	1500	O	235	295	355
230-KM-15000-16	230	1600	15000	O	300	375	450
230-KM-20000-16	230	1600	20000	O	300	375	450
230-KM-20000-20B	230	2000	20000	O	600	750	900
230-KM-20000-30B	230	3000	20000	O	30	375	450
2300-GW-10000	230	1600	10000	O	350	435	525
2300-GW-15000	230	1600	15000	O	350	435	525
2300-GW-20000	230	1600	20000	O	350	435	525
2300-GW-20000	230	2000	20000	O	400	500	600
2300-SF-10000	230	1600	10000	G	120	150	180

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
2300-SF-15000	230	1600	15000	G	120	150	180
2300-SF-15000	230	2000	15000	G	120	150	180
2300-SF-20000	230	2000	20000	G	120	150	180
2300-SF-20000	230	3000	20000	G	110	135	165
2300-SF-63	230	2000	63	G	120	150	180
242-GMA-40	242	2000	40	O	440	550	660
242-GMA-40	242	3000	40	O	340	425	510
242-GMA-63	242	2000	63	O	440	550	660
242-KM-40-20C	242	2000	31	O	240	300	360
242-KM-40-20C	242	2000	40	O	250	310	375
242-KM-40-20C	242	2000	63	O	240	300	360
242-KM-40-30C	242	3000	34	O	350	435	525
242-KM-40-30C	242	3000	40	O	310	385	465
242-KM-63-20C	242	2000	63	O	220	275	330
242-PA-63-30A	242	3000	63	G	110	135	165
345-G-1500	35	2000	1500	O	80	100	120
345-SP-1500	35	2000	20	G	75	95	110
38-PM-31-30	38	3000	31	G	100	125	150
3AT2	242	3000	63	G	75	95	110
3AT2	242	3500	63	G	75	95	110
3AT3	242	3000	63	G	75	95	110
3AT3	242	3500	63	G	75	95	110
46-KS-1500-12B	46	1200	1500	O	240	300	360
46-KS-1500-12D	46	1200	1500	O	240	300	360
460-G-1500	46	1200	1500	O	140	175	210

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
460-G-500	46	600	500	O	125	155	185
460-G-500	46	1200	500	O	140	175	210
460-GS-1500	46	1200	1500	O	220	275	330
460-SF-500	46	1200	500	G	100	125	150
48-SP-23	48	1200	23	G	100	125	150
46PM31-12	48	1200	31	G	100	125	150
500-SFM-63B	500	3000	63	G	65	80	100
500-SFM-50B	500	4000	50	G	150	185	225
550-SFA-40	550	3000	40	G	*70	85	105
550-SFA-63	550	3000	63	G	*70	85	105
550LWER63	550	3000	63	G	*80	100	120
550SFA50	550	3000	50	G	*70	85	105
69-KS-2500-12D	69	1200	2500	O	160	200	240
690-G-1000	69	600	1000	O	150	185	225
690-G-1000	69	1200	1000	O	140	175	210
690-G-2500	69	1200	2500	O	140	175	210
AD-28-14.4-500	14	1200	500	O	115	145	175
AHE-48-115-5000	115	1200	5000	O	225	280	335
AHE-48-121-20	115	1200	20	O	225	280	335
AHE-48-121-20	115	1200	5000	O	225	280	335
AHE-48-121-5000	115	1200	5000	O	225	280	335
AHJ-54-115-10000	115	1600	10000	O	130	160	195
ALP-54-121-40	115	1600	40	O	130	160	195
ALP-54-121-40	115	2000	40	O	130	160	195
ALP-60-121-63	115	2000	63	O	130	160	195

125

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
ATB-115-10000-4S	115	2000	110000	A	140	175	210
ATB-242-33000-7Y	230	1600	15000	A	*120	150	180
ATB-242-40000-71	230	2000	40000	A	*90	110	140
ATB-242-43000-7A	230	1600	20000	A	*120	150	180
ATB-242-43000-7A	230	2000	20000	A	*90	110	140
ATB-242-43000-7A	230	2500	20000	A	*90	110	140
ATB-242-43000-7A	230	3000	20000	A	*90	110	140
ATB-242-43000-7AY	230	2500	20000	A	*120	150	180
ATB-242-43000-7Y	230	2000	20000	A	*90	110	140
ATB-550-3	500	3000	38000	A	*70	85	105
BZO-115-05-4	115	1200	5000	O	250	315	400
BZO-115-10000	115	1200	10000	O	250	315	400
BZO-115-10000-2	115	1200	5000	O	250	315	400
BZO-115-10000-2	115	1200	10000	O	250	315	400
BZO-115-10000-2	115	1600	10000	O	200	300	400
BZO-115-10000-3	115	1600	10000	O	200	300	400
BZO-115-10000-6	115	1600	10000	O	200	300	400
BZO-115-10000-6	115	2000	10000	O	200	300	400
BZO-115-10000-H	115	1600	10000	O	200	300	400
BZO-115-5000-2	115	1200	5000	O	250	300	400
BZO-115-5000-2	115	1200	10000	O	250	300	400
BZO-115-5000-4	115	1200	5000	O	250	300	400
BZO-115-5000-H	115	1200	5000	O	250	300	400
BZO-115-5000-H-2	115	1200	5000	O	250	300	400
BZO-121-63	115	2000	63	O	200	300	400

/26

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
BZO-121-63-6	115	2000	63	O	200	300	400
BZO-121-63-6C	115	2000	63	O	200	300	400
BZO-160-115J	115	1200	3500	O	250	300	400
BZO-230-10000-2	230	1600	10000	O	300	375	450
BZO-230-10000-2	230	1600	15000	O	300	375	450
BZO-230-15000-2	230	1600	15000	O	300	375	450
BZO-230-20000	230	1600	20000	O	300	375	450
BZO-230-20000-3	230	2000	20000	O	285	355	430
BZO-242-40-3	230	2000	40	O	400	500	600
BZO-242-50-3	230	1600	20000	O	250	300	400
BZO-242-50-3	230	2000	50	O	250	300	450
BZO-242-63	230	2000	63	O	400	500	600
BZO-242-63-3	230	2000	63	O	400	500	600
BZO-242-63-3	230	3000	63	O	300	375	450
CF-40-46-1500	46	1200	1500	O	250	310	375
CF-40-46-1500	46	2000	1500	O	250	310	375
CF-48-69-2500	69	1200	2500	O	250	310	375
CG-38	46	1200	20	O	150	185	225
CG-38-48.3-20-1200	46	1200	20	O	150	185	225
DLVFK 550 PC 4T	500	3000	63	A	*65	85	100
FBS-2211540	26	1200	40	G	120	150	180
FCS-1251140	14	2500	1000	G	100	125	150
FCS-2121225	23	1200	25	G	100	125	150
FCS-1251140	14	2500	40	G	100	125	150
FCS-2121225	23	1200	25	G	100	125	150

127

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
FCS-2201225	23	2000	25	G	100	125	150
FCS-2201225	25	2000	25	G	100	125	150
FCS-2201240	23	2000	40	G	100	125	150
FCS-2201525	23	2000	25	G	100	125	150
FCS-3201532	35	2000	32	G	100	125	150
FDK-15.5-18000-5	14	1200	500	O	130	160	200
FGK-161-10000	161	1600	36	O	650	810	975
FGK-230-10000-5	230	1600	10000	O	1000	1250	1500
FGK-230-10000-6	230	1600	10000	O	1000	1250	1500
FGS-1301140	16	2000	40	G	125	155	190
FGS2201540	26	2000	40	O	125	155	190
FHKO-139-360-S	23	400	358	O	20	25	30
FHKO-239-60CF2	115	600	1500	O	1300	1625	1950
FHKO-339-32AL	46	600	500	O	1000	1250	1500
FK-115-5000	115	1200	5000	O	1350	1685	2025
FK-115-5000-2	115	1200	5000	O	1350	1685	2025
FK-121-22000-2	115	1200	5000	O	1350	1685	2025
FK-121-22000-2	115	1200	5000	O	1350	1685	2025
FK-121-22000-2Y	115	1200	5000	O	1350	1685	2025
FK-121-40000-6	115	1600	40	O	450	560	675
FK-121-40000-6	115	1600	10000	O	450	560	675
FK-121-43000-2	115	1600	10000	O	450	560	675
FK-121-43000-3	115	1600	10000	O	450	560	675
FK-121-43000-4	115	1600	10000	O	420	525	630
FK-121-43000-5	115	1600	10000	O	420	525	630

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
FK-121-63000-1	115	2000	63	O	420	525	630
FK-14.4-100	14	600	100	O	210	260	315
FK-14.4-100-1	14	600	100	O	210	260	315
FK-14.4-250	14	600	250	O	210	260	315
FK-14.4-250	14	1200	250	O	210	260	315
FK-14.4-500-1	14	1200	500	O	140	175	210
FK-14.4-500-2	14	600	500	O	210	260	315
FK-14.4-500-2	14	1200	500	O	140	175	210
FK-20-1500-2	20	1200	1500	O	275	345	410
FK-242-31500-0	230	200	31	O	460	560	675
FK-25.8-45000 4Y	23	1200	1500	O	210	260	315
FK-339	161	1200	5000	O	750	930	1125
FK-339-1000	14	1200	1000	O	135	165	205
FK-339-2500	115	800	2500	O	1300	1650	2000
FK-339-46-500-4Y	46	600	500	O	350	435	525
FK-339-500	23	600	500	O	225	280	340
FK-339-500	46	600	500	O	350	435	525
FK-339-500-3	46	600	500	O	350	435	525
FK-439-115-3500-1	115	1200	3500	O	1000	1600	2000
FK-439-115-3500-2	115	1200	3500	O	1000	1600	2000
FK-439-115-3500-3	115	1200	3500	O	1000	1600	2000
FK-439-115-5000-3	115	1200	5000	O	1000	1600	2000
FK-439-115-5000-5	115	1200	5000	O	1000	1600	2000
FK-439-1500	115	800	1500	O	1000	1600	2000
FK-439-1500-1	115	800	1500	O	1000	1600	2000

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
FK-439-161-3500-1	161	1200	12	O	1000	1600	2000
FK-439-161-5000-1	161	1200	11	O	1000	1600	2000
FK-439-161-5000-1	161	1200	18	O	1000	1600	2000
FK-439-23-500	23	1200	500	O	350	435	525
FK-439-2500	115	800	2500	O	1000	1600	2000
FK-439-3500	161	1200	3500	O	1000	1600	2000
FK-439-46-500	46	600	500	O	300	375	450
FK-439-46-500R	46	600	500	O	200	250	300
FK-439-5000	161	1200	3500	O	1000	1600	2000
FK-439-69-1000-3	69	600	1000	O	320	400	480
FK-439-69-1000-4	69	600	1000	O	320	400	480
FK-46-1500-3	46	1200	1500	O	200	250	300
FK-46-1500-3R	46	1200	1500	O	200	250	300
FK-46-500	46	600	500	O	250	315	375
FK-46-500-1	46	600	500	O	250	315	375
FK-46-500-1R	43	600	500	O	250	315	375
FK-46-500-2	46	1200	500	O	250	315	375
FK-46-500-3	46	1200	500	O	250	315	375
FK-46-500-R	46	600	500	O	250	315	375
FK-48.3-17000-4	46	1200	1500	O	325	400	490
FK-48.3-17000-4R	46	1200	1500	O	325	400	490
FK-69-1000-1	69	600	1000	O	325	400	490
FK-48.3-17000-6	46	1200	21	O	200	250	300
FKD-14.4-250-2	14	600	250	O	210	260	315
FKD-14.4-250-2	14	1200	250	O	110	135	165

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
FKD-14.4-250-3	14	600	250	O	210	260	315
FKD-14.4-500-3	14	1200	500	O	125	155	190
FKD-14.4-500-4	14	1200	500	O	125	155	190
FKD-15.5-18000-4	14	1200	18	O	150	185	225
FKD-15.5-18000-4	14	1200	500	O	150	185	225
FKD-15.5-18000-4	14	2000	500	O	110	135	165
FKD-15.5-18000-5	14	1200	18	O	150	185	225
FKD-15.5-18000-5	14	1200	500	O	150	185	225
FKD-15.5-8900-4	14	600	250	O	210	260	315
FKD-25.8-11000-3	23	1200	500	O	150	185	225
FKD-25.8-11000-4	23	1200	11	O	150	185	225
FKD-25.8-11000-4	23	1200	500	O	150	185	22
FKO-227-50	8	600	50	O	75	90	115
FLO-14.4-100-1	14	600	100	O	120	150	180
FLO-14.4-100-2	14	600	100	O	120	150	180
FLO-14.4-100-3	14	600	100	O	120	150	180
FLO-14.4-100-4	14	600	100	O	120	150	180
FLO-14.4-100-5	14	600	100	O	120	150	180
FLO-14.4-250-2	14	600	250	O	120	150	180
FLO-14.4-250-3	14	600	250	O	120	150	180
FLO-14.4-250-4	14	600	250	O	120	150	180
FLO-14.4-250-4	14	1200	250	O	90	110	135
FLO-14.4-250-5	14	600	250	O	120	150	180
FLO-15-100	15	600	100	O	120	150	180
FLO-15-100-1	15	600	100	O	120	150	180

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
FLO-15-250	15	600	250	O	120	150	180
FLO-15-250	15	1200	250	O	90	110	135
FLO-15-50	15	600	50	O	120	150	180
FLO-15-50-1	15	600	50	O	120	150	180
FO-22-A	8	400	50	O	100	125	150
FO-22-A	8	600	50	O	70	85	105
FO-24	14	400	0	O	100	125	150
FVB-1518-12	15	1200	18	V	85	105	130
FVB-1518-20	15	2000	18	V	60	75	90
FVB-2511-20	25	2000	11	V	60	75	90
FVBS1121120	12	1200	20	V	85	105	130
FVBS1121120A	12	1200	20	V	85	105	130
FVBS1121125	12	1200	25	V	85	105	130
FVBS1201120	12	2000	20	V	60	75	90
FVBS1301120	12	3000	20	V	50	60	75
FVBS2121212	20	1200	12	V	85	105	130
FVBS2121212	20	1200	12	V	85	105	130
FVBS2201212	20	2000	12	V	60	75	90
FVBS2201212	20	3000	12	V	50	60	75
FVBS2301212	20	3000	12	V	50	60	75
FX-12-DN	121	2000	63	G	28	30	35
FX-123-12DN	121	2000	50	G	28	30	35
FX-123-12DN	121	2000	63	G	28	30	35
FX-12D	121	2000	50	G	28	30	35
FX-12D-121	121	2000	50	G	28	30	35

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
FX-22D	242	3000	63	G	28	30	35
FZO-150-46	46	600	500	O	350	435	525
FZO-150-46B	46	600	500	O	500	625	750
FZO-151-690	69	600	1000	O	450	560	675
FZO-23-1500	23	1200	1500	O	230	285	345
FZO-46-500H	46	600	500	O	170	210	255
FZO-46-500H	46	1200	500	O	400	500	600
GM-3	115	800	1500	O	540	675	810
GM-3	115	800	3000	O	540	675	810
GM-3S	115	800	3000	O	540	675	810
GM-4	115	800	2500	O	640	800	960
GM-5	115	1200	3500	O	420	525	630
GM-5A	115	1200	3500	O	420	525	630
GM-5S	115	1200	3500	O	420	525	630
GM-6A	115	1200	5000	O	440	550	660
GM-6B	115	1200	5000	O	420	525	630
GO-1B	14	600	100	O	140	175	210
GO-2	23	600	500	O	140	175	210
GO-2	23	1200	500	O	150	185	225
GO-2	23	2000	500	O	30	38	45
GO-2	46	600	500	O	275	340	415
GO-2-B	14	600	10	O	210	260	315
GO-2-B	14	1200	10	O	120	150	180
GO-2A	46	600	500	O	275	340	410
GO-2B	14	600	250	O	140	175	210

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
GO-2B	14	1200	250	O	70	85	105
GO-3B	69	600	1000	O	150	185	225
GO-4-A	14	3000	1000	O	40	50	60
GO-4A	14	1200	1000	O	100	125	150
GO-4A	14	3000	1500	O	40	50	60
GO-B	14	600	50	O	100	125	150
GO-B	14	600	100	O	90	110	135
HPL123T	121	2000	40	G	35	40	50
HPL123T	121	2000	50	G	35	40	50
HPL123T	121	2500	50	G	35	40	50
HPL123T/25A1	121	2000	50	G	35	40	50
HVB-121-50000-1	121	2000	50	G	105	130	155
JCE-17-B	14	600	100	O	170	210	255
JE-42-E	69	600	1000	O	300	375	450
O221	25	2000	333	O	70	85	105
OZ-110	14	600	100	O	160	200	240
OZ-110	14	600	250	O	160	200	240
OZ-15-100	15	600	100	O	250	315	375
OZ-15-250	15	600	100	O	190	235	285
OZ-15-250	15	600	250	O	250	315	375
OZ-15-250	15	1200	250	O	120	150	180
OZ-15-250-4	15	600	250	O	160	200	240
OZ-15-250-5	15	1200	250	O	70	85	105
OZ-15-250-6	15	600	250	O	200	250	300
OZ-15-500	15	1200	500	O	260	325	390

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
OZ-15-500-6	15	1200	500	O	100	125	150
OZ-210	14	600	250	O	150	185	225
OZ-210	14	1200	250	O	55	75	80
OZ-23-250-6	23	600	250	O	190	235	285
OZ-23-500-6	23	1200	500	O	170	210	255
OZ-35-B2	35	1200	500	O	250	315	375
PK-6D	500	3000	40	A	*150	185	225
PR-400	14	400	83	O	350	435	525
PR-560	14	560	166	O	325	405	485
PR-560	14	560	188	O	325	405	485
PR-560	14	560	200	O	325	405	485
PVDB1-15.5-20	16	1200	20	O	90	110	135
PVDB1-15.5-20-1200	16	1200	20	O	90	110	135
PVDB1-15.5-25	16	2000	25	O	50	65	75
R	14	50	62	O	900	1125	1350
R	14	70	83	O	900	1125	1350
R	14	140	0	O	900	1125	1350
R	14	140	83	O	900	1125	1350
R	14	185	10	O	900	1125	1350
R	14	225	500	O	900	1125	1350
R	14	280	83	O	700	875	1050
R	14	280	96	O	700	875	1050
R	14	560	0	O	300	375	450
R	14	560	83	O	150	185	225
R-2	14	1200	16	V	200	250	300

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
R-2	23	1200	16	V	200	250	300
R-2	25	1200	16	V	200	250	300
R-3	14	1200	20	V	200	250	300
R-3	14	1200	500	V	200	250	300
R-3	14	2000	20	V	200	250	300
R-4	14	2000	500	V	200	250	300
RHE-78-161-10000	161	1600	10000	O	375	470	565
RHE-84-230-15000	230	1600	15000	O	375	470	565
RHE-90-230-20000	230	1600	20000	O	500	625	750
RHE-90-230-20000	230	2000	20000	O	475	590	710
RHF-90-242-63	242	2000	63	O	290	360	435
RHF-90-242-63-2000	242	2000	63	O	290	360	435
RHF-90-242-63-3000	242	3000	63	O	290	360	435
RHF-90-242-63-2000	242	2000	63	O	290	360	435
RHF-90-242-63-3000	242	3000	63	O	290	360	435
RV	23	400	6	O	750	935	1125
RV	35	400	0	O	750	935	1125
SDO-15-250	15	600	250	0	160	200	240
SDO-15-500	15	1200	18	0	150	185	225
SDO-15-500	15	1200	500	0	150	185	225
SDO-23-500	23	1200	11	0	150	185	225
SDO-23-500	23	1200	18	0	150	185	225
SDO-23-500	23	1200	500	0	150	185	225
SDO-23-500	23	1200	500	0	150	185	225
SDV-15-20	15	1200	20	V	90	110	135

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
SDV-15-20	15	2000	20	V	70	85	105
SDV-15-20	15	2000	500	V	70	85	105
SDV-15-20-1200	15	1200	20	V	90	110	135
SDV-15-20-2000	15	2000	20	V	50	60	75
SDV-15-25	15	1200	25	V	90	110	135
SDV--38-20	38	2000	20	V	85	105	130
TCP-121-50	115	2000	50	G	150	185	220
TCP-121-50	121	3000	50	G	105	130	155
VAC-15-5	16	1200	18	V	75	95	115
VAC-15.5	16	1200	20	V	75	95	115
VAC-15.5.20-1200	16	1200	20	V	75	95	115
VAC-25.8-12.5-1200	26	1200	12	V	75	95	115
VACV-15.5-20-1200	16	1200	20	V	75	95	115
VBK-15-20	15	1200	20	V	100	125	150
VCR	14	400	0	V	850	1050	1275
VIB-15.5-12000-2	16	600	300	V	125	155	190
VIB-15.5-20000-1	16	1200	20	V	90	110	135
VSC-15	15	300	0	V	180	225	270
VSC-15	15	400	0	V	180	225	270
VSC-69	69	300	0	V	350	435	525
W	14	140	166	0	725	905	1085
W	14	185	80	0	725	905	1085
W	14	400	86	0	725	905	1085
W	14	400	865	0	725	905	1085
W	14	560	86	0	350	435	525

CONTACT RESISTANCE FOR POWER CIRCUIT BREAKERS.

Type	Kv	Amps	MVA/Ka	Int	Normal	Caution	Limit
W	14	560	166	0	350	435	525
W	14	560	200	0	350	435	525

the southern electric system

STANDARD FOR

TIMING

POWER CIRCUIT BREAKERS

69KV THROUGH 230KV

DATE: 10/14/94

TIMING POWER CIRCUIT BREAKERS 69KV THROUGH 230KV

1.0 APPLICATION

These standards shall apply to all power circuit breakers 69kV through 230kV on the Southern Electric System.

2.0 PERFORMING THE TIMING TEST

The contact part time, maximum c-o, electrical wipe, reclose time, and contact velocity (both opening and closing) shall be verified to be within the limits as outlined in this specification. These tests shall be made with a timer capable of measuring the:

- contact part time
- contact velocity on a one to one ratio
- reclose time (trip coil energization to contact make)
- close-open time (total contact live time)
- total closing time

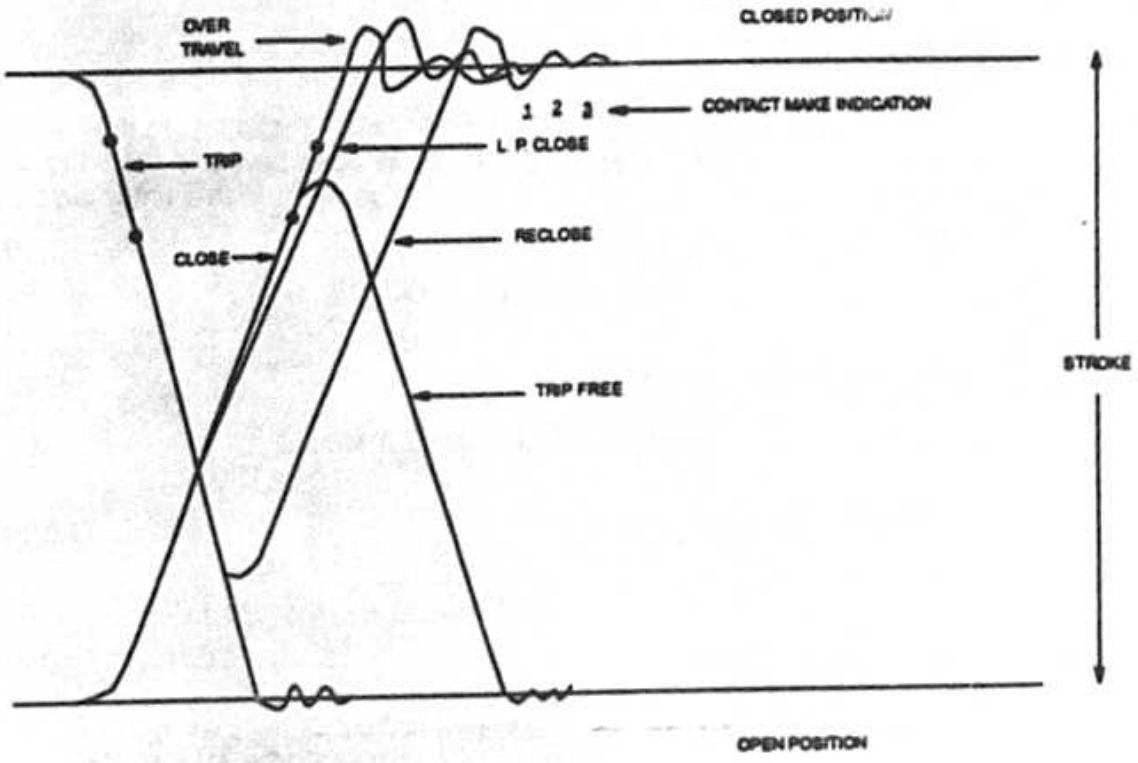
3.0 INTERPRETATION

This standard lists power circuit breakers 69kV through 230kV by **TYPE**, followed by **MAXIMUM PART TIME, MAXIMUM CLOSE-OPEN TIME, POINT 1 OPEN, POINT 2 OPEN, POINT 1 CLOSE, POINT 2 CLOSE, ELECTRICAL WIPE, OPENING VELOCITY (FPS), CLOSING VELOCITY (FPS).** The data outlined in this specification shall be defined as:

MAXIMUM PART TIME: The maximum contact part time shall be defined as the time, in cycles, from trip coil energization to contact part. The time given is the MAXIMUM allowable part time. Values greater than the maximum are UNACCEPTABLE and shall be corrected before returning the PCB to service.

NOTE: The maximum part time shall be measured on the primary and secondary trip coils if so equipped.

MAXIMUM CLOSE-OPEN TIME: The close-open time shall be defied as the **MAXIMUM** time in cycles that the main contacts may remain **CLOSED** on a close-open operation. Values greater than this are UNACCEPTABLE and shall be corrected before returning the PCB to service.



TYPICAL MOTION ANALYSIS CHART

POINT 1 (OPEN OR CLOSE): Point 1 shall be defined as the point closest to the fully closed line. The distance given is measured vertically in inches from the fully closed line to the point that intersects the travel line.

POINT 2 (OPEN OR CLOSE): Point 2 shall be defined as the point furthest from the fully closed line. The distance given is measured vertically in inches from the fully closed line to the point that intersects the travel line.

These two points on the travel line can be referred to as tangent points as they form the basis for the line from which the velocity will be calculated.

141

ELECTRICAL WIPE: The electrical wipe measurement shall be defined as the **MINIMUM** acceptable dimension in inches as obtained on "jack in". Values less than the stated minimum are UNACCEPTABLE and shall be corrected before returning the PCB to service.

OPENING VELOCITY (FPS): The opening velocity in feet per second shall be defined as a **MINIMUM** acceptable velocity. The actual velocity is derived from the line drawn between points 1 and 2 as described earlier in this section. Velocities out of the range or below the minimum are UNACCEPTABLE and shall be corrected before returning the PCB to service.

CLOSING VELOCITY (FPS): The closing velocity in feet per second shall be defined as a **RANGE** or as a **MINIMUM** acceptable velocity. The actual velocity is derived from the line drawn between points 1 and 2 as described earlier in this section. Velocities out of the range or below the minimum are UNACCEPTABLE and shall be corrected before returning the PCB to service.

RECLOSING TIME: The reclosing time shall be defined as the time between energization of the trip coil and the closing of the main contacts. For 115 and 230kV PCBs, the reclosing time should be between 18 and 22 cycles; however, most pneumatically operated PCBs are not capable of this time in which case the reclosing time should be as close to 18 cycles as possible.

NOTE: No minimum reclosing time has been set for 46kV and below PCBs.

TIMING POWER CIRCUIT BREAKERS 69KV THROUGH 230KV

TYPE	MAX PT	MAX C-O	PT 1 OPEN	PT 2 OPEN	PT 1 CLOSE	PT 2 CLOSE	ELECT WIPE	OPEN VEL (FPS)	CLOSE VEL (FPS)
115-KM-10000-16	2.0	3.0	1.0	5.0	1.25	2.25	1.13	11.5	18
115-KM-5000-12	2.0	3.0	1.0	5.0	1.25	2.25	1.13	11.5	18
115-KM-5000-12B	2.0	3.0	1.0	5.0	1.25	2.25	1.13	11.5	18
1150-GM-10000	2.0	3.0	1.0	5.0	0.75	1.75	0.30	13.5	8
121-GM-63	2.0	3.0	1.0	5.0	0.75	1.75	0.30	13.5	8
121-GMA-40	2.0	3.0	1.0	5.0	1.0	2.0	0.25	14.5	8
121-GMA-63	2.0	3.0	1.0	5.0	1.0	2.0	0.25	14.5	8
121-GMB-63	2.0	3.0	1.0	5.0	1.0	2.0	0.79	18	11
121-GMV-40	1.5	2.5	1.0	5.0	1.25	2.25	1.0	14	11.5
230-KM-15000-16	2.0	3.0	1.0	5.0	1.0	5.0	0.69	10.5	12.5
230-KM-20000-16	2.0	3.0	1.0	5.0	1.0	5.0	0.69	10.5	12.5
230-KM-20000-20B	2.0	3.0	1.0	5.0	1.0	5.0	0.69	10.5	12.5
230-KM-20000-20B	2.0	3.0	1.0	5.0	1.0	5.0	0.69	10.5	12.5
2300-GW-10000	2.0	3.0	1.0	5.0	1.0	2.0	0.5	13.5	8
2300-GW-15000	2.0	3.0	1.0	5.0	0.75	1.75	0.31	14.5	6
2300-GW-20000	2.0	3.0	1.0	5.0	0.75	1.75	0.31	14.5	6.5
242-GMA-40	2.0	3.0	1.0	5.0	1.0	2.0	0.25	14.5	5
242-GMA-63	2.0	3.0	1.0	5.0	1.0	2.0	0.25	14.5	5
242-KM-40-20C	2.0	3.0	1.0	5.0	1.0	5.0	0.62	10.5	13
242-KM-40-30C	2.0	3.0	1.0	5.0	1.0	5.0	0.62	10.5	13
242-KM-63-20C	2.0	3.0	1.0	5.0	1.0	5.0	0.62	10.5	13
46-KS-1500-12B	2.5	3.5	1.5	3.5	1.5	3.5	1.13	8	12
46-KS-1500-12D	2.5	3.5	1.5	3.5	1.5	3.5	1.06	8	12
460-G-1500	3.0	4.0	1.0	5.0	1.0	2.0	0.5	7	6
460-G-500	5.0	6.0	1.0	5.0	1.0	2.0	0.5	7	6
460-GS-1500	3.0	4.0	1.0	5.0	1.0	2.0	0.44	7.5	8
69-KS-2500-12D	2.5	3.5	1.5	3.5	1.5	3.5	1.06	8	12
690-G-1000	3.0	4.0	1.0	5.0	1.0	2.0	0.5	8	6
690-G-2500	3.0	4.0	1.0	5.0	1.0	2.0	0.5	8	6
AHE-48 * NOTE	2.0	3.0	1.25	7.25	1.25	7.25		16.5	15.0-18
AHE-48-115-5000	2.0	3.0	1.25	7.25	1.25	7.25	0.87	16.5	16.5-18
AHE-48-121-20	2.0	3.0	1.25	7.25	1.25	7.25	0.87	16.5	16.5-18
AHE-48-121-5000	2.0	3.0	1.25	7.25	1.25	7.25	0.87	16.5	16.5-18
AHJ-54-115-10000	2.0	3.0	0.75	6.75	0.75	6.75	0.55	14.5	18-22
ALP-54-121-40	2.0	3.0	1.0	7.0	1.0	7.0	0.8	15.0	16-17
ALP-60-121-63	2.0	3.0	1.0	7.0	1.0	7.0	0.8	15.0	16-17
BZO-115-10000	2.0	3.0	1.13	5.13	1.25	2.25	0.87	13.5	20
BZO-115-10000-2	2.0	3.0	1.13	5.13	1.25	2.25	0.87	13.5	20
BZO-115-10000-3	2.0	3.0	1.13	5.13	1.25	2.25	0.87	13.5	20
BZO-115-10000-6	2.0	3.0	1.13	5.13	1.13	5.13	0.87	13.5	20
BZO-115-10000H	2.0	3.0	1.13	5.13	1.25	2.25	0.5	11.5	10

04BRKTRA.DOC
DATE: 10/14/94

TIMING POWER CIRCUIT BREAKERS 69KV THROUGH 230KV

TYPE	MAX PT	MAX C-O	PT 1 OPEN	PT 2 OPEN	PT 1 CLOSE	PT 2 CLOSE	ELECT WIPE	OPEN VEL (FPS)	CLOSE VE (FPS)
BZO-115-5000-2	2.0	3.0	1.13	5.13	1.25	2.25	0.87	13.5	20
BZO-115-5000-4	2.0	3.0	1.13	5.13	1.25	2.25	0.87	13.5	14
BZO-115-5000-H	2.0	3.0	1.13	5.13	1.25	2.25	0.87	13.5	20
BZO-115-5000-H-2	2.0	3.0	1.13	5.13	1.25	2.25	0.87	13.5	20
BZO-121-63	2.0	3.0	1.13	5.13	1.13	5.13	0.87	13.5	19
BZO-121-63-6	2.0	3.0	1.13	5.13	1.13	5.13	0.87	13.5	19
BZO-121-63-6C	2.0	3.0	1.44	4.44	1.44	4.44	0.87	14.5	19
BZO-160-115J	2.0	3.0	1.0	5.0	1.25	2.25	0.95	9.5	14
BZO-230-10000-2	2.0	3.0	1.13	5.13	1.25	2.25	0.87	13.5	16
BZO-230-15000-2	2.0	3.0	1.13	5.13	1.25	2.25	0.87	13.5	16
BZO-230-20000	2.0	3.0	1.13	5.13	1.13	5.13	0.87	12	15
BZO-230-20000-3	2.0	3.0	1.13	5.13	1.13	5.13	0.87	12	15
BZO-242-40-3	2.0	3.0	1.13	5.13	1.13	5.13	0.87	12	15.5
BZO-242-50-3	2.0	3.0	1.13	5.13	1.13	5.13	0.87	12	15.5
BZO-242-63	2.0	3.0	1.13	5.13	1.13	5.13	0.87	11.5	15.5
BZO-242-63-3	2.0	3.0	1.13	5.13	1.13	5.13	0.87	12	15.5
CF-40-46-1500	2.0	3.0	1.25	7.25	1.25	7.25	1.0	14	14.5-19.5
CF-48-69-2500	2.0	3.0	1.25	7.25	1.25	7.25	1.0	14.5	15.5-17.5
CG-38	2.0	3.0	1.0	7.0	1.0	7.0	0.61	13	16-17
FGK-161-10000	2.0	3.0	0.5	8.5	1.0	2.0	0.37	10.5	[illegible]
FGK-230-10000-5	2.0	3.0	0.5	8.5	6.0	7.0	0.44	12	[illegible]
FGK-230-10000-6	2.0	3.0	0.5	8.5	4.0	5.0	0.44	12	[illegible]
FK-115-5000	2.0	3.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-115-5000-2	2.0	3.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-121-20000-2	2.0	3.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-121-22000-2	2.0	3.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-121-22000-2Y	2.0	3.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-121-40000-6	2.0	3.0	0.5	8.5	0.5	1.5	0.44	10.5	6
FK-121-43000-2	2.0	3.0	0.5	8.5	0.5	1.5	0.44	10.5	6
FK-121-43000-3	2.0	3.0	0.5	8.5	0.5	1.5	0.44	10.5	6
FK-121-43000-4	2.0	3.0	0.5	8.5	0.5	1.5	0.44	10.5	6
FK-121-43000-5	2.0	3.0	0.5	8.5	0.5	1.5	0.44	10.5	6
FK-121-63000-1	2.0	3.0	0.5	8.5	0.5	1.5	0.44	10.5	6
FK-242-31500-0	2.0	3.0	0.5	8.5	0.5	1.5	0.44	10.5	6
FK-339	*	*	*	*	*	*	*	*	*
FK-339-2500	3.0	4.0	0.38	8.38	1.0	3.0	0.56	7.5	4
FK-339-46-500-4Y	4.0	5.0	0.63	8.63	0.63	1.63	0.5	5.5	6
FK-339-500	4.0	5.0	0.63	8.63	0.63	1.63	0.5	5	6
FK-339-500-3	4.0	5.0	0.63	8.63	0.63	1.63	0.5	5	6
FK-439-115-3500-1	3.0	4.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-439-115-3500-2	3.0	4.0	0.38	8.38	0.38	3.38	0.36	6.5	6

144

TIMING POWER CIRCUIT BREAKERS 69KV THROUGH 230KV

TYPE	MAX PT	MAX C-O	PT 1 OPEN	PT 2 OPEN	PT 1 CLOSE	PT 2 CLOSE	ELECT WIPE	OPEN VEL (FPS)	CLOSE VEL (FPS)
FK-439-115-3500-3	3.0	4.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-439-115-5000-3	2.0	3.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-439-115-5000-5	2.0	3.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-439-1500	3.0	4.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-439-161-3500-1	2.0	3.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-439-161-5000-1	2.0	3.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-439-2500	3.0	4.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-439-3500	3.0	4.0	0.38	8.38	0.38	3.38	0.36	6.5	6
FK-439-46-500	3.0	4.0	0.38	5.38	0.38	1.38	0.36	7.5	6
FK-439-46-500R	5.0	6.0	0.38	5.38	0.38	1.38	0.33	8	6
FK-439-5000	5.0	6.0	0.5	5.5	0.5	1.5	0.33	6.5	6
FK-439-69-1000-3	5.0	6.0	0.38	5.38	0.38	1.38	0.33	8	8
FK-439-69-1000-4	5.0	6.0	0.38	5.38	0.38	1.38	0.33	8	8
FK-46-1500-3	5.0	6.0	1.13	6.13	1.13	2.13	0.5	8	8
FK-46-1500-3R	5.0	6.0	1.13	6.13	1.13	2.13	0.5	8	8
FK-46-500	5.0	6.0	0.38	5.38	0.38	1.38	0.33	8	APP 11
FK-46-500-1	3.0	4.0	0.38	5.38	0.38	1.38	0.33	8	APP 12
FK-46-500-1R	5.0	6.0	0.38	5.38	0.38	1.38	0.33	8	APP 13
FK-46-500-2	5.0	6.0	0.38	5.38	0.38	1.38	0.33	8	APP 12
FK-46-500-3	5.0	6.0	1.5	6.5	1.5	2.5	0.75	8	APP 11
FK-46-500-R	5.0	6.0	0.38	5.38	0.38	1.38	0.33	8	APP 13
FK-48.3-17000-4	3.0	4.0	1.13	6.13	1.13	2.13	0.75	8	9
FK-48.3-17000-4R	3.0	4.0	1.13	6.13	1.13	2.13	0.75	8	9
FK-69-1000-1	5.0	6.0	0.38	5.38	0.38	1.38	0.33	8	APP 11
FKA-48.3-17000-6	3.0	4.0	1.13	6.13	1.13	2.13	0.75	8	8
FZO-150-46	5.0	6.0	1.25	5.25	1.25	2.25	1.0	6	11
FZO-150-46B	5.0	6.0	1.25	5.25	1.25	2.25	1.0	6	11
FZO-151-690	*	*	*	*	*	*	*	*	*
FZO-46-500H	3.5	4.5	1.75	5.75	1.75	2.75	0.16	6.5	12
GM-3	3.0	4.0	0.38	4.38	0.38	1.38	0.19	5.5	6
GM-3S	3.0	4.0	0.38	4.38	0.38	1.38	0.19	5.5	6
GM-4	3.0	4.0	0.38	4.38	0.38	1.38	0.19	5.5	6
GM-5	3.0	4.0	0.38	4.38	0.38	1.38	0.19	5	6
GM-5A	2.5	3.5	0.38	4.38	0.38	1.38	0.19	5	6
GM-5S	3.0	4.0	0.38	4.38	0.38	1.38	0.19	5	6
GM-6A	1.5	2.5	0.38	4.38	0.38	1.38	0.19	11.5	6
GM-6B	1.5	2.5	1.0	5.0	0.38	1.38	0.19	10.5	5.5
GO-2	4.0	5.0	0.75	3.75	1.0	2.0	0.46	6	6.5
GO-2A	4.5	5.5	0.75	3.75	1.0	2.0	0.46	6.5	6.5
GO-3B	5.0	6.0	1.25	5.25	1.25	2.25	1.25	7	8
JE-42-E	4.0	5.0	1.5	5.5	1.75	2.75	1.38	11	8
RHE-78-161-10000	2.0	3.0	1.0	7.0	1.0	7.0	0.65	13.5	15-17

145

TIMING POWER CIRCUIT BREAKERS 69KV THROUGH 230KV

TYPE	MAX PT	MAX C-O	PT 1 OPEN	PT 2 OPEN	PT 1 CLOSE	PT 2 CLOSE	ELECT WIPE	OPEN VEL (FPS)	CLOSE VEL (FPS)
RHE-84-230-15000	2.0	3.0	1.0	7.0	1.0	7.0	0.65	13.5	15-17
RHE-90-230-20000	2.0	3.0	1.0	7.0	1.0	7.0	0.65	13.5	15-17
RHF-90-242-63	2.0	3.0	1.25	7.25	1.25	7.25	0.80	13.5	21.0-22.5
RHF-90-242-63-2000	2.0	3.0	1.25	7.25	1.25	7.25	0.80	13.5	21.0-22.5
RHF-90-242-63-3000	2.0	3.0	1.25	7.0	1.25	7.0	0.80	13.5	21.0-22.5

the southern electric system

STANDARD FOR TEST EQUIPMENT FOR SUBSTATIONS

DATE: 10/14/94

STANDARD TEST EQUIPMENT FOR SUBSTATIONS

1.0 APPLICATION

This procedure establishes the specifications or models for test equipment to be used on the Southern Electric System.

2.0 EQUIPMENT LIST

1. MULTI-METERS

Digital - Fluke Model 77 or equivalent.
Analog - Triplet Model 615, Simpson Model 260 or equivalent.

2. HIGH POTENTIAL TEST SET

0-60kV RMS, Automatic voltage ramp up, transportable.

3. TEMPERATURE PROBE

Self contained, scale available in degrees Celsius and Fahrenheit.

4. OIL TEST SYRINGE

Ground glass type with glass plunger.

5. OIL TEST BOTTLE

Flint glass only.

6. MOTION ANALYZER

Multiple break per phase interrupter - Digital and graphical output required, electrostatic shielding sufficient for operation in 750kV switchyard, transportable; requiring no more than two persons for handling, minimum capability to monitor 3 contact points with 3 auxiliary points and velocity.

7. SF_6 HYDROMETER

Measure moisture in direct reading of parts per million, must read in less than 5 minutes, must read for moisture in an inert gas i.e. nitrogen, must be field transportable, self contained and portable.

8. **OXYGEN ANALYZER**

(Confined Space Type), continuous reading, alarm for low O_2 level, meets O.S.H.A. standards, transportable, self contained and portable.

9. **OIL DIELECTRIC TEST SET**

Self contained, performs both D-877 and D-1816 tests as per the ASTM standard in every particular, programmable controller automatic type preferred, portable type designed for truck transport.

10. **MEGGAR TEST SET**

Output voltage to 5kV, multiple ranges starting at 0-500 volts, minimum of 100 megohm scale, continuous output (not hand cranked), portable for truck transport.

11. **TRANSFORMER TURNS RATIO TESTER**

Ratio to three significant figures, excited from the low side, ratio 44,000/277 volts without the need for an auxiliary transformer, excitation current meter, portable for truck transport, requires a maximum of two electricians for transport.

12. **DUCTOR TESTER**

100 amp output, must meet ANSI standard for test including duration requirement, scale reads from 1.0 microhm, portable for truck transport.

13. **TOTAL COMBUSTIBLE GAS**

Self contained, direct reading, not liquid type detector (McGraw Edison type not acceptable), range of reading 0-10% lower explosive limit, readily transportable.

14. **OXYGEN DETECTOR**

(For transformers not confined space use) not continuous reading, self contained, direct reading, range of reading 0-22% oxygen, readily transportable.

15. INFRARED CAMERA

Not gas or liquid cooled, must be electronic, still picture and video, 2 degrees fahrenheit resolution, digital indication of absolute temperature.

16. VACUUM GAUGES

Mercury type not acceptable, readings in millimeters of mercury of microns, equipped with calibration bulb.

the southern electric system

STANDARD FOR TEST EQUIPMENT VERIFICATION AND CALIBRATION

DATE: 10/11/94

TEST EQUIPMENT VERIFICATION AND CALIBRATION EQUIPMENT STATUS CHANGE

1.0 APPLICATION

This standard establishes the requirements for verification and calibration of test equipment used on the Southern Electric System.

2.0 GENERAL

Appropriate documentation shall be maintained which records the date of calibration.

TEST EQUIPMENT TYPE	VERIFICATION/CALIBRATION SCHEDULE	VERIFICATION METHOD / CALIBRATION SOURCE
Volt Ohm Meters - Simpson, Fluke	Verified as needed	Known Standard
	Calibrated when repaired	National Bureau of Standards
Insulation Resistance Meter	Verified semiannually	Known Standard
	Calibrated when repaired	Known Standard
Ground Meggar	Verified prior to use	Known Standard
	Calibrated when repaired	Known Standard
Transformer Turns Ratio	Verified semiannually	Self
	Calibrated when needed	Reference Transformer
Combustible Gas Analyzer - J. W. Sniffer	Verified annually	Known Gas
	Calibrated when repaired	Standard Gas
Oxygen Gas Indicating Meter - Fyrite	Verified prior to use	Atmosphere
	Calibrated when reagent replaced	Atmosphere
Ammeter (clamp on and series)	Verified as needed	Known Standard
	Calibrated when repaired	Known Standard
Circuit Breaker Analyzer - Timing and Motion	Verified when questioned	Known Standard
	Calibrated when repaired	Known Standard
Ductor (low resistance ohm meter)	Verified semiannually	Standard Shunts
	Calibrated when repaired	Standard Shunts
Oil Test Set	Verified when questioned	Standard Cell
	Calibrated when repaired	Standard Cell
Hipot AC Test Set	Verified when questioned	Known Standard
	Calibrated when repaired	Known Standard
Temperature Calibrator - Jofra	Verified when questioned	Known Standard
	Calibrated when repaired	Known Standard

the southern electric system

STANDARD FOR NEW INSULATING OIL

DATE: 9/20/94

NEW INSULATING OIL

1.0 APPLICATION

The procedure establishes the specifications for new oil purchased for use on the Southern Electric System.

2.0 SPECIFICATIONS

TYPE TEST	ASTM METHOD	TEST LIMITS
ANILINE POINT	D-611	80 MAX
COLOR	D-1500	0.5 MAX
CORROSIVE SULFUR	D-1275	NONCORROSIVE
DIELECTRIC BREAKDOWN	D-877	20 MIN
DIELECTRIC BREAKDOWN	D-1816	30 MIN
MOISTURE CONTENT	D-1315 OR D-1533	30 MAX
FLASH POINT	D-92	145 MIN
INTERFACIAL TENSION	D-971	40 MIN
NEUTRALIZATION NUMBER	D-974	0.015 MAX
POUR POINT	D-97	-40 MAX
POWER FACTOR @ 100° C	D-924	0.3 MAX
POWER FACTOR @ 25° C	D-924	0.05 MAX
SPECIFIC GRAVITY	D-1298	0.865-0.910
VISCOSITY, 40° C	D-455-D-2161	11.0 MAX
SUS, 40° C	D-88	62 MAX
OXIDATION INHIBITOR CONTENT	D-2668	0.08 MAX

155

NEW INSULATING OIL

SLUDGE-FREE LIFE	DOBLE PROCEDURE	64 MIN
OXIDATION STABILITY % 72 HR SLUDGE BY WT TOTAL ACID NO. MG.KOH/G 164 HR SLUDGE BY WT TOTAL ACID NO MG.KPH/G	D-2440	 0.15 MAX 0.5 MAX 0.3 MAX 0.6 MAX
OXIDATION STABILITY	D-2112	195 MIN
GASSING TENDENCY	D-2300	NEGATIVE
POLYCHLORINATED BYPHENALS	D-4059-86	NON DETECTED

156

the southern electric system

STANDARD FOR RECLAIMED INSULATING OIL

DATE: 10/11/94

RECLAIMED INSULATING OIL

1.0 APPLICATION

This standard establishes the criteria oil, which has been reclaimed, must meet across the Southern Electric System.

2.0 SPECIFICATIONS

TYPE TEST	ASTM METHOD	TEST LIMITS
COLOR	D-1500	1.0 MAX
DIELECTRIC BREAKDOWN (KV)	D-1816	32 MIN
WATER CONTENT (PPM)	D-1315	20 MAX
INTERFACIAL TENSION (DYNES/CENTIMETER)	D-971	35 MIN
NEUTRALIZATION NUMBER	D-974	0.03 MAX
OXIDATION INHIBITOR CONTENT	D-2668	0.08 MAX
POLYCLORINATED BIPHENALS (PPM)	D-4059	2 MAX

158

the southern electric system

STANDARD FOR REUSABLE INSULATING OIL

DATE: 10/11/94

159

REUSABLE INSULATING OIL

1.0 APPLICATION

This standard establishes the criteria oil should meet for use without need for reclaiming across the Southern Electric System.

2.0 SPECIFICATIONS

TYPE TEST	ASTM METHOD	TEST LIMITS
COLOR	D-1500	1.5 MAX
DIELECTRIC BREAKDOWN (KV)	D-1816	28 MIN
WATER CONTENT (PPM)	D-1315	20 MAX
INTERFACIAL TENSION (DYNES/CENTIMETER)	D-971	30 MIN
NEUTRALIZATION NUMBER	D-974	1 MAX
POLYCLORINATED BIPHENALS (PPM)	D-4059	2 MAX

160