

Gulf Power Company
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RECEIVED

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ADMINISTRATION
MAIL ROOM

the southern electric system

Jack L. Haskins
Manager of Rates and Regulatory Matters
and Assistant Secretary

March 12, 1992

920236-EB

Mr. Steve Tribble, Director
Division of Records and Reporting
Florida Public Service Commission
101 East Gaines Street
Tallahassee FL 32399-0870

Dear Mr. Tribble:

EI 804

Enclosed are an original and fifteen copies of Gulf Power Company's Petition for approval of its proposed implementation of its HVAC Duct & Infiltration and HVAC Tune-up Programs as pilot study programs under Culf's approved Energy Conservation Plan.

Sincerely,

Jack L. Haskins
lw

Enclosures

DOCUMENT NUMBER-DATE

"Our business is customer satisfaction" 02537 MAR 13 1992

FPSC-RECORDS/REPORTING

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Gulf Power Company's)
petition for approval of its)
proposed implementation of its) Docket No. 920236-EG
HVAC Duct & Infiltration and HVAC) Date filed: Mar. 13, 1992
Tune-up Programs as pilot study)
programs under Gulf's approved)
Energy Conservation Plan.)
_____)

PETITION

Gulf Power Company ("Gulf Power", "Gulf", or "the Company"), by and through its undersigned attorneys, hereby petitions the Florida Public Service Commission ("Commission") to authorize the Company to implement, for pilot study purposes, the Company's proposed HVAC Duct & Infiltration Program and HVAC Tune-up Program as approved conservation programs under the Company's approved Energy Conservation Plan, with recovery of related expenses through the Conservation Cost Recovery docket. In order to facilitate the data collection efforts of these two pilot programs, Gulf further requests that the Commission consider and approve this request under its Proposed Agency Action procedures as soon as possible.

In support of this petition, the Company states:

1. Notices and communications with respect to this petition and docket should be addressed to:

G. Edison Holland, Jr.
Jeffrey A. Stone
Beggs and Lane
P. O. Box 12950
Pensacola, FL 32576-2950

Jack L. Haskins
Mgr. Rates & Regulatory Mtrs.
Gulf Power Company
P. O. Box 13470
Pensacola, FL 32591-3470

DOCUMENT NUMBER-DATE

02537 MAR 13 1992

FPSC-RECORDS/REPORTING

2. Gulf Power Company is an electric utility providing retail electric service to customers within Northwest Florida and, pursuant to the provisions of Chapter 366 of the Florida Statutes, is subject to regulation by the Florida Public Service Commission.

BACKGROUND

3. On October 2, 1990, by Order No. 23561, the Commission agreed with Staff's recommendation and approved the Energy Conservation Plan by Gulf Power Company consisting of 11 programs listed in Appendix A to Order No. 23561. The HVAC Duct & Infiltration Program and the HVAC Tune-up Program were two of the programs so listed. As indicated by the description for each program contained in Appendix A to Order No. 23561, these programs were in the developmental stages and were not then being proposed for immediate implementation. Gulf has now completed the pre-pilot study development of these two programs and seeks authority to implement each program on a pilot study basis beginning with the 1992 Summer cooling season.

GULF'S HVAC DUCT & INFILTRATION PROGRAM

4. The Company's proposed HVAC Duct & Infiltration program, which will be referred to as the Blower Door Pilot Program, is described in detail in Appendix I to this petition. The cost effectiveness evaluation is set forth in Appendix II. The Company's proposed participation standards are set forth in Appendix III.

4. Briefly, the purpose of the HVAC Duct & Infiltration or Blower Door Program is to encourage Gulf's residential customers to adopt additional energy conservation measures through identification of total house infiltration rates and air duct leakage that can affect consumer energy (KWH) and demand (KW) usage. The results of the diagnostic testing will be used to initiate duct leakage repairs. After needed repairs are identified and completed, Gulf will conduct a post-repair test to verify the adequacy of the work and will monitor the resulting change in demand and energy usage to validate the assumptions on which the cost effectiveness of full scale implementation of the program will be based.

5. Unless the results of the pilot study dictate otherwise, Gulf intends to propose a full scale permanent program after completion of the pilot study. It is anticipated that the pilot study will last 12 months and a final report will be filed within 90 days of completion of the study.

GULF'S HVAC TUNE-UP PROGRAM

6. The Company's proposed HVAC Tune-up program is described in detail in Appendix IV to this petition. The cost effectiveness evaluation is set forth in Appendix V. The Company's proposed participation standards are set forth in Appendix VI.

7. Briefly, the purpose of the HVAC Tune-up Program is to determine the value servicing the air conditioning of Gulf's residential customers provides in relation to peak demand (KW)

and energy (KWH) usage by evaluating the direct effect of such servicing and maintenance through HVAC tune-ups performed as part of the pilot study. Gulf will conduct both a pre- and a post-repair test to verify the adequacy of the work and will monitor the resulting change in demand and energy usage to validate the assumptions on which the cost effectiveness of full scale implementation of the program will be based.

8. Unless the results of the pilot study dictate otherwise, Gulf intends to propose a full scale permanent program after completion of the pilot study. It is anticipated that the pilot study will last 12 months and a final report will be filed within 90 days of completion of the study.

CONCLUSION

9. In order to achieve prompt results and maximum value from the two pilot study programs proposed herein, it is important that the Company be authorized to proceed to implement the programs prior to the start of the 1992 Summer cooling season. Gulf hereby requests authority from the Commission to implement the as set forth in Appendices I and IV respectively, as part of the Company's approved conservation plan effective May 1, 1992, with funding of the pilot program costs to come through the Gulf's Conservation Cost Recovery Factor. The Company's projected costs for these two programs were incorporated in the Company's filings supporting its proposed Conservation Cost Recovery Factor for use during the period April 1, 1992 through September 30, 1992.

WHEREFORE, Gulf Power Company respectfully requests that the Florida Public Service Commission, under its procedures for Proposed Agency Action enter its order approving the Company's implementation of its proposed HVAC Duct & Infiltration Program and the HVAC Tune-up Program as Conservation Cost Recovery programs under the Company's approved Energy Conservation Plan, for pilot study purposes, effective May 1, 1992.

Respectfully submitted this 12th day of March, 1992.



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HVAC DUCT AND INFILTRATION PROGRAM

(Blower Door Program)

Gulf Power Company's HVAC Duct and Infiltration Program is designed to encourage additional energy conservation measures by identifying duct and infiltration leakage. The testing will identify total house infiltration rates and air duct leakage that can affect consumer KWH energy usage and KW demand. The results of the diagnostic testing will initiate duct leakage repairs that can be achieved by sealing supply and return ducts of central HVAC systems. Following a Blower Door Post Test, Gulf will then monitor the results to determine the reduction of demand and energy savings for the consumer.

The test group for the pilot program will consist of 100 customers identified through Gulf's residential audits. A thorough analysis will be performed to identify customers who may benefit from the Blower Door Test as a conservation measure. Customers will be made aware of the testing procedures and potential savings before they sign an agreement to participate in the program. Once an agreement has been confirmed, a pre-test is done on the home's central duct system. This will identify any air leaks that could cause energy loss by infiltration or duct leakage.

Trained Gulf Power Representatives will conduct all pre-testing and post-repair diagnostics to assure the program of consistent and accurate results. One licensed HVAC contractor has been selected to perform all duct repairs. The post test will be performed after all identified duct leakage has been repaired and verified by Gulf Power.

Testing currently being conducted on homes in central Florida, have shown losses in HVAC efficiency of up to 40% due to duct leakage and repair cost averaging approximately \$200 per home. This cost is based on the central Florida results and a survey of our local HVAC dealers. With similar HVAC code requirements existing in northwest Florida, KW demand and KWH energy savings can be realized through duct leakage repair.

Previous blower door testing has determined that house air infiltration occurs when the air handler is on and not due to natural infiltration of outdoor wind pressures. With this in mind, ACCA Manual J can be used to determine the house heat gain reduction from the reduction of its air change per hour. Once a load calculation has been completed, Gulf's Residential Building Energy Program (RBEP) can be utilized to run a cost benefit analysis and project the KW and KWH reduction. (See Attachment "A")

Actual results of the pilot project will be used to evaluate the Blower Door diagnostics. Unless results dictate elimination of the program, a permanent program (based on actual results) complete with valid procedural changes and any incentives that might be warranted, will be submitted. Anticipated duration of the Pilot Program will be one year beginning with the last quarter of 1991. Gulf plans to file with the commission, a final report within 90 days from the completion of the program.

Customers eligible to participate in this program will receive an energy audit and must meet the following criteria:

- * All participants in the pilot program will be identified and offered the opportunity to participate as a result of Gulf's residential energy auditing process and must receive electric service from Gulf Power Company.

- * The residential single family detached house must have an easily accessible duct system and be in good enough condition for the duct test to be performed.

The program will be conducted as follows:

- * Participants will be made fully aware of the program testing procedures and agree in writing to participate. (See Attachment "B")

- * Pre and post blower door testing will be completed by Gulf Power representatives. (See Attachment "C")

- * All duct repairs will be performed by an approved licensed contractor that will agree to follow specific guidelines stated by Gulf Power. The repairs will be in accordance to the residential duct ceiling requirements as specified in the Florida Energy Code for building construction 1989.

Program Benefits

The benefits to the customer derived from this program are as follows:

1. Reduced KWH Energy Usage.
2. Increased HVAC System Efficiency and Run Time.
3. Increased Comfort and Humidity Control.
4. Increased Distribution of Air Flow.
5. Improved Indoor Air Quality.
6. Identify Supply/Return Duct Leakage Location.
7. Quantifiable Reduction of Air Duct Leakage Following Repairs and Post Testing.

The benefits to the Company derived from this program are as follows:

1. Reduced KW Demand.
2. Reduced KWH Energy.
3. Increased Customer Satisfaction.
4. Increased consumer education about duct leakage by providing information based on actual test results.

ATTACHMENT "A"

Determination of KW Demand/KWH Reduction

Procedures and Methodology to determine KW Demand Reduction:

1. List of assumptions
2. Determine percentage of duct leakage
3. Calculate ACH @ percentage duct leakage
4. Run RBEP computer simulations with pre and post tests results to determine actual KW demand reduction

Assumptions:

1. ACH = Air Change per Hour
2. ACH @ 0% duct leakage = .5 summer, 1.0 winter
3. CFM₅₀ = cubic feet per minute at 50 pascals
(see attached for formulas and definitions)
4. CFM₅₀ 1 = Pre Test
5. CFM₅₀ 2 = Post Test

Methodology:

Step I Calculation of Duct Leakage:

Formula:

$$\frac{\text{CFM}_{50} 1 - \text{CFM}_{50} 2}{\text{CFM}_{50} 1} \times 100 = \% \text{ Duct Leakage}$$

Example:

$$\frac{2069 \text{ CFM} - 1655 \text{ CFM}}{2069 \text{ CFM}} \times 100 = 20\% \text{ Duct Leakage}$$

Step II Calculation ACH @ 20% Duct Leakage

- A) Subtract percentage Duct Leakage from 100% ACH
100% - 20% = 80% ACH contributions other than Duct Leakage
- B) Divide remaining percentage ACH into .5 ACH @ 0% Duct Leakage as per Manual J, table 5.
[.5 ÷ 80% = .63 ACH for House]

Step III KW Demand Reduction is determined by calculating summer KW demand for pre and post test RBEP computer simulations.

$$[4.3 \text{ KWD} - 4.1 \text{ KWD} = .2 \text{ KWD Reduction (Table 1)}]$$

Procedures and Methodology to determine KWH Reduction:

1. List of assumptions
2. Calculate new MAN J due to Duct Leakage Reduction
3. RBEP Analysis for annual KWH Reduction
4. Calculate additional KWH Reduction due to increased equipment capacity

Assumptions:

- o 20% Duct Leakage has been repaired to 0% Duct Leakage
- o 10% capacity increase in equipment due to decreased annual run hours
- o Equipment rated @ 4.285 KW (2.5 ton @ 7.0 SEER)
- o 2000 Cooling Hours for Northwest Florida (Based on A.R.I. Directory)

Methodology:

Step I Re-calculate Manual J load calculations.

1734 BTU-H reduction in heat gain calculation due to 0% duct leakage with ACH @ .5 summer and 1.0 winter. (Table 1)

Step II Re-calculate RBEP analysis with new Manual J load calculation.

1311 Annual KWH Reduction as per RBEP simulation. (Table 1)

Step III Determine estimated additional KWH Reduction due to increase of Equipment Capacity.

Formula: % increase capacity X Cooling Hours X Equipment KW = KWH Reduction

Example: 10% X 2000 X 4.285 KW = 857 KWH Reduction

Step IV Annual KWH Reduction is determined by adding together the total KWH Reduction from RBEP analysis and increased equipment capacity.

[1311 KWH + 857 KWH = 2168 Annual KWH Reduction]

FORMULAS AND CALCULATIONS

VOLUME

$$\text{Vol} = \text{Sqft} \times \text{Height}$$

AIRFLOW

$$Q = C \times \Delta P^n$$

Q=cfm

C=Flow constant

ΔP =Pressure Difference

n=Flow exponent (typically = 0.65)

REDUCTION PERCENT

$$\% \text{ Reduction} = \frac{\text{CFM}_{50 \text{ pre}} - \text{CFM}_{50 \text{ post}}}{\text{CFM}_{50 \text{ pre}}} \times 100$$

AIR CHANGE RATE

$$\text{ACH}_{50} = \frac{\text{CFM}_{50} \times 60 \text{ minutes}}{\text{Volume}}$$

ESTIMATED INFILTRATION

$$\text{ach}_{\text{estimated}} = \frac{\text{ACH}_{50}}{C \times H \times S \times L}$$

C=Climate Factor (40:Florida)

H=Height (1: 1-story, 0.9: 1.5-story, 0.8: 2-story)

S=Shielding (1.2:well, 1:average, 0.9:exposed)

L=Leakiness (1.4:small cracks, 1:ave, 0.7:large holes)

EQUIVALENT LEAK AREA @ 50 PASCALS

$$\text{FLA} = \text{CFM}_{50} \times .13$$

EQUIVALENT LEAK AREA @ 10 PASCALS

$$\text{EqLA} = \text{CFM}_{10} \times .2939 = \text{CFM}_{50} \times .103$$

EFFECTIVE LEAK AREA @ 4 PASCALS

$$\text{ELA} = \text{CFM}_4 \times .2835 = \text{CFM}_{50} \times .055$$

AIRFLOW @ 10 PASCALS

$$\text{CFM}_{10} = \text{CFM}_{50} \times .351$$

AIRFLOW @ 4 PASCALS

$$\text{CFM}_4 = \text{CFM}_{50} \times .194$$

POUNDS PER SQUARE INCH

$$\text{P.S.I.} = \text{Pascals} \times .000145$$

INCHES OF WATER COLUMN

$$\text{In. W.C.} = \text{Pascals} \times .004$$

OTHERS: 1 PSI = 6894.8 Pascals

.2 in w.c. = 50 Pascals

1 Pascal = .00014 PSI

1 Pascal = .004 in w.c.

Natural Florida Retrofit, Inc. 407-469-2173

DUCT TEST AND REPAIR PROGRAM

_____ and GULF POWER COMPANY

Agreement For
Residential Duct Leakage Test Pilot Study

Agreement, made this _____ day of _____, 19____, by and between Gulf Power Company, a corporation, (the "Company"); and _____, (hereinafter called "Customer").

It is hereby agreed:

1. Customer volunteers to participate in Gulf Power Company's residential energy management pilot study which has been approved by the Florida Public Service Commission. This study includes a pre and post testing of duct leakage and associated repairs of the air distribution system.
2. Gulf Power Company will provide necessary equipment, free of charge, for use on the Customer's premises during the pilot study. Gulf will pay all cost for testing and duct leakage repairs.
3. The customer will provide reasonable access for installing, maintaining, inspecting, testing, and/or removing Company-owned equipment.
4. Customer's electrical equipment and appliances are in working condition. Gulf Power Company will not be responsible for the repair, maintenance, or replacement of the Customer's electrical equipment, appliances or HVAC equipment.
5. Customer understands and acknowledges that inspections and testing of the equipment will continue during the period of the pilot study which is planned to end after 12 months.
6. This agreement supersedes all previous agreements and representations, either written or oral, heretofore made between the Company and the Customer with respect to matters herein contained. Any modification(s) to this Agreement must be approved, in writing, by the Company and the Customer.

Gulf Power Company

Representative of
Gulf Power Company

Customer

Address

Telephone

Account Number



DUCT REPAIR DIAGRAM

NAME		ACCOUNT NUMBER	INVOICE NUMBER
ADDRESS		CITY, STATE	DATE TESTED
PHONE (HOME)	(WORK)	ZIP	CONTRACTOR NUMBER
CONTRACTOR NAME			

PRE-TEST

Δ P Readings

Doors Open
Doors Closed
Master Suite
Bedroom 1
Bedroom 2
Bedroom 3
Bath
CFM-50
Wind
Technician
Duct CFM Air Handler

POST TEST

Δ P Readings

Doors Open
Doors Closed
Master Suite
Bedroom 1
Bedroom 2
Bedroom 3
Bath
CFM-50
Wind
Technician
Duct CFM Air Handler

I authorize the repairs to be performed.

CUSTOMER APPROVAL

FOR CUSTOMER: Your fireplace flue damper was left in the OPEN/CLOSED POSITION. When starting a fire, be sure to check and make sure that the flue is in the open position. I acknowledge that the TEST was COMPLETED at the above address.

CUSTOMER SIGNATURE

DATE

ATTACHMENT "D"
 CONTRACTOR CAPACITY CHECK

	Pre	Post
Total CFM	_____	_____
Return Drybulb Temp.	_____	_____
Return Wetbulb Temp.	_____	_____
Supply Drybulb Temp.	_____	_____
Supply Wetbulb Temp.	_____	_____

FORMULA FOR BTUH CAPACITY CALCULATION

Total Cooling Capacity = CFM x 4.5 x Change in Enthalpy

Total Sensible Cooling Capacity = CFM x 1.08 x Change in Default Temperature

Latent Capacity = Total Capacity - Sensible Capacity

Definition:

- * 4.5 constant = 60/13.33
(60 min. = 1 hr., 13.33 = Cu. ft./lb. Dry Air @ 70° D.B. temp.)
- * 1.08 Constant = 4.5 x .24 (.24 = BTU Req. to raise one pound of air one degree F).
- * Enthalpy = Heat content in BTU per pound of dry air.
- * Change in Ethalpy is determined from chart on attached page.

ENTHALPY* IN BTU PER POUND OF DRY AIR

Wet Bulb Temperature F	TENS OF A DEGREE									
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
35	13.01	13.05	13.10	13.14	13.18	13.23	13.27	13.31	13.35	13.40
36	13.44	13.48	13.53	13.57	13.61	13.66	13.70	13.75	13.79	13.83
37	13.87	13.91	13.96	14.00	14.05	14.09	14.14	14.18	14.23	14.27
38	14.32	14.37	14.41	14.46	14.50	14.55	14.59	14.64	14.68	14.73
39	14.77	14.82	14.86	14.91	14.95	15.00	15.05	15.09	15.14	15.18
40	15.23	15.28	15.32	15.37	15.42	15.46	15.51	15.56	15.60	15.65
41	15.70	15.75	15.80	15.84	15.89	15.94	15.99	16.03	16.08	16.13
42	16.17	16.22	16.27	16.32	16.36	16.41	16.46	16.51	16.56	16.61
43	16.66	16.71	16.76	16.81	16.86	16.91	16.96	17.00	17.05	17.10
44	17.15	17.20	17.25	17.30	17.35	17.40	17.45	17.50	17.55	17.60
45	17.65	17.70	17.75	17.80	17.85	17.91	17.96	18.01	18.06	18.11
46	18.16	18.21	18.26	18.32	18.37	18.43	18.47	18.52	18.58	18.63
47	18.68	18.73	18.79	18.84	18.89	18.95	19.00	19.05	19.10	19.16
48	19.21	19.26	19.32	19.37	19.43	19.48	19.53	19.59	19.64	19.70
49	19.75	19.81	19.86	19.92	19.97	20.03	20.08	20.14	20.19	20.25
50	20.30	20.36	20.41	20.47	20.52	20.58	20.64	20.69	20.75	20.80
51	20.86	20.92	20.97	21.03	21.09	21.15	21.20	21.26	21.32	21.38
52	21.44	21.50	21.56	21.62	21.67	21.73	21.79	21.85	21.91	21.97
53	22.02	22.08	22.14	22.20	22.26	22.32	22.38	22.44	22.50	22.56
54	22.62	22.68	22.74	22.80	22.86	22.92	22.98	23.04	23.10	23.16
55	23.22	23.28	23.34	23.41	23.47	23.53	23.59	23.65	23.72	23.78
56	23.84	23.90	23.97	24.03	24.10	24.16	24.22	24.29	24.35	24.42
57	24.48	24.54	24.61	24.67	24.74	24.80	24.86	24.93	24.99	25.06
58	25.12	25.19	25.25	25.32	25.38	25.45	25.52	25.58	25.65	25.71
59	25.78	25.85	25.92	25.98	26.05	26.12	26.19	26.26	26.32	26.39
60	26.46	26.53	26.60	26.67	26.74	26.81	26.87	26.94	27.01	27.08
61	27.15	27.22	27.29	27.36	27.43	27.50	27.57	27.64	27.71	27.78
62	27.85	27.92	27.99	28.07	28.14	28.21	28.28	28.35	28.43	28.50
63	28.57	28.64	28.72	28.79	28.87	28.94	29.01	29.09	29.16	29.24
64	29.31	29.39	29.46	29.54	29.61	29.69	29.76	29.84	29.91	29.99
65	30.06	30.14	30.21	30.29	30.37	30.45	30.52	30.60	30.68	30.75
66	30.83	30.91	30.99	31.07	31.15	31.23	31.30	31.38	31.46	31.54
67	31.62	31.70	31.78	31.86	31.94	32.02	32.10	32.18	32.26	32.34
68	32.42	32.50	32.59	32.67	32.75	32.84	32.92	33.00	33.08	33.17
69	33.25	33.33	33.42	33.50	33.59	33.67	33.75	33.84	33.92	34.01
70	34.09	34.18	34.26	34.35	34.43	34.52	34.61	34.69	34.78	34.86
71	34.95	35.04	35.13	35.21	35.30	35.39	35.48	35.57	35.65	35.74
72	35.83	35.92	36.01	36.10	36.19	36.29	36.38	36.47	36.56	36.65
73	36.74	36.83	36.92	37.02	37.11	37.20	37.29	37.38	37.48	37.57
74	37.66	37.76	37.85	37.95	38.04	38.14	38.23	38.33	38.42	38.52
75	38.61	38.71	38.80	38.90	38.99	39.09	39.19	39.28	39.38	39.47
76	39.57	39.67	39.77	39.87	39.97	40.07	40.17	40.27	40.37	40.47
77	40.57	40.67	40.77	40.87	40.97	41.06	41.16	41.26	41.36	41.46
78	41.56	41.66	41.76	41.86	41.96	42.05	42.15	42.25	42.35	42.45
79	42.62	42.72	42.82	42.92	43.02	43.11	43.21	43.31	43.41	43.51
80	43.69	43.79	43.89	43.99	44.09	44.18	44.28	44.38	44.48	44.57
81	44.78	44.88	44.98	45.08	45.17	45.27	45.37	45.47	45.56	45.66
82	45.95	46.05	46.15	46.24	46.34	46.44	46.54	46.64	46.74	46.83
83	47.04	47.14	47.24	47.34	47.43	47.53	47.63	47.73	47.83	47.92
84	48.22	48.32	48.42	48.52	48.62	48.72	48.82	48.92	49.02	49.11
85	49.43	49.53	49.63	49.73	49.83	49.92	50.02	50.12	50.22	50.31

TABLE 1

Assumption of Home Characteristics

1680 Square Foot Home

R-13 Ceiling Insulation
 R-11 Wall Insulation
 7.0 EER Air Conditioner

Single Paned Windows
 Wood Exterior Doors
 Electric Furnace

Base Home .5 ACH Summer 1.0 ACH Winter

(ACH = Air Change/Hour)

(Determined from Manual J Book Seventh Edition, Second Printing, Table 5)

Duct Leakage Affect on Air Change Per Hour

(Summer Peak)

<u>ACH & Loss</u>	<u>0</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>
Base ACH (Manual J)	1.0W .5S	1.0W .5S	1.0W .5S	1.0W .5S	1.0W .5S
% ACH	100	90	80	70	60
Home ACH (Increase Due to Duct Leakage)	1.0W	1.11W	1.25W	1.43W	1.67W
Base ACH/% ACH	.5S	.56S	.63S	.71S	.83S
Heat Gain Calc (BTUH) (Manual J)	34,216	35,017	35,950	37,017	38,617
KW Demand Summer	4.1	4.2	4.3	4.4	4.6
Summer KW Demand Increase Due to Duct Leakage	-	.1	.2	.3	.5
Annual KWH Increase Due to Duct Leakage	-	582	1,311	2,234	3,477
KWH Savings @ 7¢	-	\$41	\$92	\$156	\$243

DIRECTORY OF CERTIFIED



UNITARY
AIR-
CONDITIONERS

Section A1



UNITARY
AIR-SOURCE
HEAT PUMPS

Section III



SOUND-RATED
OUTDOOR
UNITARY EQUIPMENT

NOTICE

During the period this directory is effective, some manufacturers may be added or deleted from the programs; also some models may be added, deleted or revised. Any questions about listings should be directed to ARI at the address below.

SPONSORED AND ADMINISTERED BY



11 WILSON BOULEVARD, 6TH FLOOR ARLINGTON, VIRGINIA 22209
ADDRESS INQUIRIES TO-VICE PRESIDENT, ENGINEERING

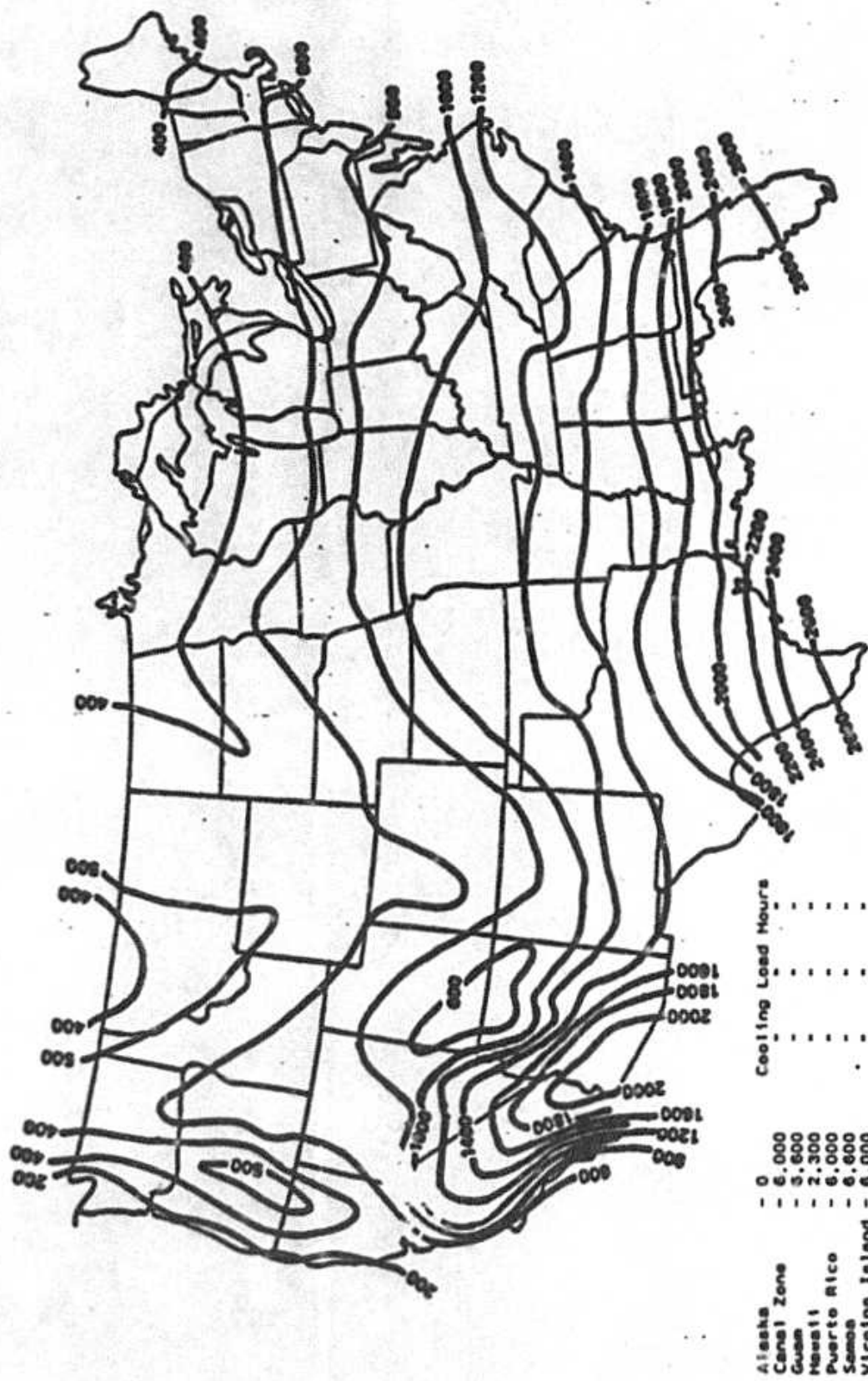


FIG 1. SUMMER COOLING LOAD HOURS

P_11

PSC FORM CE 1.1
PAGE 1 OF 1
Run date: 04-Mar-92
11:37 AM

INPUT DATA -- PART 1
Blower Door Permanent - 21 year
..... DSN_RULE PROGRAM

I. PROGRAM DEMAND SAVINGS AND LINE LOSSES

- (1) CUSTOMER KWH REDUCTION AT THE METER 0.20 KWH /CUST
- (2) GENERATOR KWH REDUCTION PER CUSTOMER 0.26 KWH GEN/CUST
- (3) KWH LINE LOSS PERCENTAGE 12.6 %
- (4) GENERATION KWH REDUCTION PER CUSTOMER 2,334.9 KWH/CUST/YR
- (5) KWH LINE LOSS PERCENTAGE 7.7 %
- (6) GROUP LINE LOSS MULTIPLIER 1.0034
- (7) CUSTOMER KWH PROGRAM INCREASE AT METER 0.0 KWH/CUST/YR
- (8)* CUSTOMER KWH REDUCTION AT METER 2,168.0 KWH/CUST/YR

IV. AVOIDED GENERATOR, TRANS. AND DIST. COSTS

- (1) BASE YEAR 1992
- (2) IN-SERVICE YEAR FOR AVOIDED GENERATING UNIT 1995
- (3) IN-SERVICE YEAR FOR UNIDED T & D 1995
- (4) BASE YEAR AVOIDED GENERATING UNIT COST 345.00 \$/KWH
- (5) BASE YEAR AVOIDED TRANSMISSION COST 100.00 \$/KWH
- (6) BASE YEAR DISTRIBUTION COST 57.00 \$/KWH
- (7) GEN, TRAN, & DIST COST ESCALATION RATE 4.3 %
- (8) GENERATOR FIXED O & R COST 2.40 \$/KWH/YR
- (9) GENERATOR FIXED O&M ESCALATION RATE 4.3 %
- (10) TRANSMISSION FIXED O & R COST 0.32 \$/KWH/YR
- (11) DISTRIBUTION FIXED O & R COST 0.00 \$/KWH/YR
- (12) T&D FIXED O&M ESCALATION RATE 4.3 %
- (13) AVOIDED GEN UNIT VARIABLE O & R COSTS 0.550 CERTS/KWH
- (14) GENERATOR VARIABLE O&M COST ESCALATION RATE 4.3 %
- (15) GENERATOR CAPACITY FACTOR 3.4 %
- (16) AVOIDED GEN UNIT FUEL COST 3.890 CERTS/KWH
- (17) AVOIDED GEN UNIT FUEL ESCALATION RATE 11 %
- (18)* AVOIDED PURCHASE CAPACITY COST PER KWH 0.00 \$/KWH/YR
- (19)* CAPACITY COST ESCALATION RATE 4.3 %

II. ECONOMIC LIFE AND K FACTORS

- (1) STUDY PERIOD FOR CONSERVATION PROGRAM 21 YEARS
- (2) GENERATOR ECONOMIC LIFE 30 YEARS
- (3) T & D ECONOMIC LIFE 30 YEARS
- (4) K FACTOR FOR GENERATION 1.4893
- (5) K FACTOR FOR T & D 1.4893
- (6)* SWITCH REV REQ(0) OR VAL-OF-DEF (1) 0

III. UTILITY AND CUSTOMER COSTS

- (1) UTILITY NONRECURRING COST PER CUSTOMER 200.00 \$/CUST
- (2) UTILITY RECURRING COST PER CUSTOMER 0.00 \$/CUST/YR
- (3) UTILITY COST ESCALATION RATE 4.3 %
- (4) CUSTOMER EQUIPMENT COST 1.00 \$/CUST
- (5) CUSTOMER EQUIPMENT ESCALATION RATE 4.3 %
- (6) CUSTOMER O & R COST 0.00 \$/CUST/YR
- (7) CUSTOMER O & R ESCALATION RATE 4.3 %
- (8)* CUSTOMER TAX CREDIT PER INSTALLATION 0.00 \$/CUST
- (9)* CUSTOMER TAX CREDIT ESCALATION RATE 0.0 %
- (10)* INCREASED SUPPLY COSTS 0.00 \$/CUST/YR
- (11)* SUPPLY COSTS ESCALATION RATE 0.0 %
- (12)* UTILITY DISCOUNT RATE 9.50%
- (13)* UTILITY AFUDC RATE 11.16%
- (14)* UTILITY NON RECURRING REBATE/INCENTIVE 0.00 \$/CUST
- (15)* UTILITY RECURRING REBATE/INCENTIVE 0.00 \$/CUST/YR
- (16)* UTILITY REBATE/INCENTIVE ESCAL RATE 0.0 %

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

STOP REV LOSS: NO
INCLUDE BENEFITS: NO

V. NON-FUEL ENERGY AND DEMAND CHARGES

- (1) NON-FUEL COST IN CUSTOMER BILL 3.490 CERTS/KWH
- (2) NON-FUEL ESCALATION RATE 3.9 %
- (3) CUSTOMER DEMAND CHARGE PER KWH 0.00 \$/KWH/MO
- (4) DEMAND CHARGE ESCALATION RATE 5.0 %
- (5)* DIVERSITY AND ANNUAL DEMAND ADJUSTMENT FACTOR FOR CUSTOMER BILL 1.0

File: d:\CE_RULES GULF VERSION: BASES 02/20/92

TOTAL RESOURCE TEST: 8.66
PARTICIPANT TEST: 1623.54
RATE IMPACT TEST: 0.95

CALCULATION OF AFUDC AND IN-SERVICE COST OF PLANT
PLANT: 1995 AVOIDED UNIT

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
YEAR	NO. YEARS BEFORE INSERVICE	PLANT ESCALATION RATE (%)	CUMULATIVE ESCALATION FACTOR	YEARLY EXPENDITURE (%)	ANNUAL SPENDING (\$/KW)	CUMULATIVE AVERAGE SPENDING (\$/KW)	CUMULATIVE SPENDING WITH AFUDC (\$/KW)	YEARLY TOTAL AFUDC (\$/KW)	INCREMENTAL YEAR-END BOOK VALUE (\$/KW)	CUMULATIVE YEAR-END BOOK VALUE (\$/KW)
1986	-9	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1987	-8	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1988	-7	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1989	-6	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1990	-5	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1991	-4	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1992	-3	4.1%	1.0410	1.2%	4.31	2.15	2.15	0.24	4.55	4.55
1993	-2	4.0%	1.0826	8.7%	32.50	20.56	20.00	2.32	34.82	39.37
1994	-1	4.2%	1.1281	87.4%	340.16	206.88	209.45	23.37	363.53	402.90
1995	0	4.5%	1.1789	2.7%	10.98	382.46	408.39	45.58	56.56	459.46
				1.00	387.95			71.51	459.46	

IN-SERVICE YEAR = 1995
PLANT COSTS (1992 \$) \$345.0
AFUDC RATE: 11.16%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
YEAR	CUMULATIVE TOTAL PARTICIPATING CUSTOMERS	ADJUSTED CUMULATIVE PARTICIPATING CUSTOMERS	UTILITY AVERAGE SYSTEM FUEL COSTS (C/KWH)	AVOIDED MARGINAL FUEL COST (C/KWH)	INCREASED MARGINAL FUEL COST (C/KWH)	REPLACEMENT FUEL COST (C/KWH)	PROGRAM KV EFFECTIVENESS FACTOR	PROGRAM KWH EFFECTIVENESS FACTOR	OTHER COSTS (\$000)	OTHER BENEFITS (\$000)
1992	100	100	2.30	2.55	0.00	2.30	1.00	1.00	0	0
1993	100	100	2.25	2.84	0.00	2.30	1.00	1.00	0	0
1994	100	100	2.33	3.15	0.00	2.35	1.00	1.00	0	0
1995	100	100	2.41	3.50	0.00	2.44	1.00	1.00	0	0
1996	100	100	2.54	3.88	0.00	2.58	1.00	1.00	0	0
1997	100	100	2.58	4.36	0.00	2.63	1.00	1.00	0	0
1998	100	100	2.63	4.91	0.00	2.70	1.00	1.00	0	0
1999	100	100	2.49	5.52	0.00	2.58	1.00	1.00	0	0
2000	100	100	2.54	6.21	0.00	2.65	1.00	1.00	0	0
2001	100	100	2.72	7.02	0.00	2.85	1.00	1.00	0	0
2002	100	100	2.92	7.65	0.00	3.06	1.00	1.00	0	0
2003	100	100	3.09	8.35	0.00	3.25	1.00	1.00	0	0
2004	100	100	3.29	9.13	0.00	3.47	1.00	1.00	0	0
2005	100	100	3.51	9.97	0.00	3.70	1.00	1.00	0	0
2006	100	100	3.72	10.89	0.00	3.93	1.00	1.00	0	0
2007	100	100	3.85	11.89	0.00	4.10	1.00	1.00	0	0
2008	100	100	4.07	12.98	0.00	4.34	1.00	1.00	0	0
2009	100	100	4.49	14.18	0.00	4.78	1.00	1.00	0	0
2010	100	100	4.84	15.48	0.00	5.16	1.00	1.00	0	0
2011	100	100	5.10	16.91	0.00	5.45	1.00	1.00	0	0
2012	100	100	5.30	18.46	0.00	5.69	1.00	1.00	0	0

AVOIDED GENERATION UNIT Benefits
Blower Door Permanent - 21 year
DSM_RULE PROGRAM

* UNIT SIZE OF AVOIDED GENERATION UNIT = 26.0 KW
* INSERVICE COSTS OF AVOIDED GEN. UNIT (000) \$11.9

(1) YEAR	(1A)* REVENUE REQUIREMENT FACTOR	(2) AVOIDED GEN UNIT CAPACITY COST \$(000)	(2A)* AVOIDED ANNUAL UNIT KWH GEN (000)	(3) AVOIDED UNIT FIXED COST \$(000)	(4) AVOIDED GEN UNIT VARIABLE COST \$(000)	(5) AVOIDED GEN UNIT FUEL REPLACEMENT COST \$(000)	(6) AVOIDED PURCHASED CAPACITY COSTS \$(000)	(7) AVOIDED GEN UNIT BENEFITS \$(000)
1992	0.000	0	0	0	0	0	0	0
1993	0.000	0	0	0	0	0	0	0
1994	0.000	0	0	0	0	0	0	0
1995	0.208	2	8	0	0	0	0	3
1996	0.200	2	8	0	0	0	0	3
1997	0.191	2	8	0	0	1	0	3
1998	0.182	2	8	0	0	1	0	3
1999	0.174	2	8	0	0	1	0	3
2000	0.167	2	8	0	0	1	0	3
2001	0.160	2	8	0	0	1	0	3
2002	0.153	2	8	0	0	1	0	3
2003	0.146	2	8	0	0	1	0	3
2004	0.139	2	8	0	0	1	0	3
2005	0.132	2	8	0	0	1	0	3
2006	0.124	1	8	0	0	1	0	3
2007	0.117	1	8	0	0	1	0	3
2008	0.110	1	8	0	0	2	0	3
2009	0.103	1	8	0	0	2	0	3
2010	0.097	1	8	0	0	2	0	3
2011	0.093	1	8	0	0	2	0	3
2012	0.089	1	8	0	0	2	0	3
MORTAL		31	139	2	1	21	5	50
MPY		14		1	0	6	2	19

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

AVOIDED T & D AND PROGRAM FUEL SAVINGS
Blower Door Permanent - 21 year
----- DSM_RULE PROGRAM -----

* INSERVICE COSTS OF AVOIDED TRANS. (000) = \$3.0
* INSERVICE COSTS OF AVOIDED DIST. (000) = \$1.3

(1) YEAR	(2) AVOIDED TRANSMISSION CAPACITY COST \$(000)	(3) AVOIDED TRANSMISSION O&M COST \$(000)	(4) TOTAL AVOIDED TRANSMISSION COST \$(000)	(5) AVOIDED DISTRIBUTION CAPACITY COST \$(000)	(6) AVOIDED DISTRIBUTION O&M COST \$(000)	(7) TOTAL AVOIDED DISTRIBUTION COST \$(000)	(8) PROGRAM FUEL SAVINGS \$(000)
1992	0	0	0	0	0	0	3
1993	0	0	0	0	0	0	7
1994	0	0	0	0	0	0	7
1995	1	0	1	0	0	0	8
1996	1	0	1	0	0	0	9
1997	1	0	1	0	0	0	10
1998	1	0	1	0	0	0	12
1999	1	0	1	0	0	0	13
2000	0	0	1	0	0	0	15
2001	0	0	0	0	0	0	16
2002	0	0	0	0	0	0	18
2003	0	0	0	0	0	0	20
2004	0	0	0	0	0	0	21
2005	0	0	0	0	0	0	23
2006	0	0	0	0	0	0	26
2007	0	0	0	0	0	0	28
2008	0	0	0	0	0	0	30
2009	0	0	0	0	0	0	33
2010	0	0	0	0	0	0	36
2011	0	0	0	0	0	0	40
2012	0	0	0	0	0	0	43
NOMINAL	8	0	8	3	0	3	419
NPV:	3	0	3	1	0	1	141

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
YEAR	REDUCTION IN KWH GENERATION NET NEW COST KWH (000)	AVOIDED MARGINAL FUEL COST - REDUCED KWH \$(000)	INCREASE IN KWH GENERATION NET NEW COST KWH (000)	INCREASED MARGINAL FUEL COST - INCREASE KWH \$(000)	NET AVOIDED PROGRAM FUEL SAVINGS \$(000)	EFFECTIVE PROGRAM FUEL SAVINGS \$(000)
1992	117	3	0	0	3	3
1993	235	7	0	0	7	7
1994	235	7	0	0	7	7
1995	235	8	0	0	8	8
1996	235	9	0	0	9	9
1997	235	10	0	0	10	10
1998	235	12	0	0	12	12
1999	235	13	0	0	13	13
2000	235	15	0	0	15	15
2001	235	16	0	0	16	16
2002	235	18	0	0	18	18
2003	235	20	0	0	20	20
2004	235	21	0	0	21	21
2005	235	23	0	0	23	23
2006	235	26	0	0	26	26
2007	235	28	0	0	28	28
2008	235	30	0	0	30	30
2009	235	33	0	0	33	33
2010	235	36	0	0	36	36
2011	235	40	0	0	40	40
2012	235	43	0	0	43	43
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NONINAL	4,815	419	0	0	419	419
NPV:		141		0	141	141

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

(1)	(2) (3) (4)			(5) (6) (7)			(8)	(9)	(10)	(11) (12) (13) (14) (15) (16) (17) (18)							
	UTILITY PROGRAM COSTS & REBATES			TOTAL REBATE/			PARTIC.	PARTIC.	TOTAL	PARTICIPATING CUSTOMER COSTS & BENEFITS							
YEAR	UTIL NONREC. COSTS \$(000)	UTIL RECUR COSTS \$(000)	TOTAL UTIL PGM COSTS \$(000)	UTIL NONREC. REBATES \$(000)	UTIL RECUR. REBATES \$(000)	TOTAL REBATE/ INCENT. COSTS \$(000)	PARTIC. CUST EQUIP COSTS \$(000)	PARTIC. CUST O & M COSTS \$(000)	TOTAL COSTS CUST \$(000)	REDUCT. IN CUST. KWH (000)	RED. REV. - FUEL PORTION \$(000)	RED. REV. NONFUEL PORTION \$(000)	EFFECT. REV. REDUCT. IN BILL \$(000)	INC. IN CUST. KWH (000)	INC. REV. - FUEL PORTION \$(000)	INC. REV. NONFUEL PORTION \$(000)	EFFECT. REV. INC. IN BILL \$(000)
1992	20	0	20	0	0	0	0	0	108	2	4	6	0	0	0	0	
1993	0	0	0	0	0	0	0	0	217	5	8	13	0	0	0	0	
1994	0	0	0	0	0	0	0	0	217	5	8	13	0	0	0	0	
1995	0	0	0	0	0	0	0	0	217	5	8	14	0	0	0	0	
1996	0	0	0	0	0	0	0	0	217	6	9	14	0	0	0	0	
1997	0	0	0	0	0	0	0	0	217	6	9	15	0	0	0	0	
1998	0	0	0	0	0	0	0	0	217	6	10	15	0	0	0	0	
1999	0	0	0	0	0	0	0	0	217	5	10	15	0	0	0	0	
2000	0	0	0	0	0	0	0	0	217	6	10	16	0	0	0	0	
2001	0	0	0	0	0	0	0	0	217	6	11	17	0	0	0	0	
2002	0	0	0	0	0	0	0	0	217	6	11	17	0	0	0	0	
2003	0	0	0	0	0	0	0	0	217	7	12	18	0	0	0	0	
2004	0	0	0	0	0	0	0	0	217	7	12	19	0	0	0	0	
2005	0	0	0	0	0	0	0	0	217	8	12	20	0	0	0	0	
2006	0	0	0	0	0	0	0	0	217	8	13	21	0	0	0	0	
2007	0	0	0	0	0	0	0	0	217	8	13	22	0	0	0	0	
2008	0	0	0	0	0	0	0	0	217	9	14	23	0	0	0	0	
2009	0	0	0	0	0	0	0	0	217	10	14	24	0	0	0	0	
2010	0	0	0	0	0	0	0	0	217	11	15	25	0	0	0	0	
2011	0	0	0	0	0	0	0	0	217	11	16	27	0	0	0	0	
2012	0	0	0	0	0	0	0	0	217	12	16	28	0	0	0	0	
	20	0	20	0	0	0	0	0	4,444	148	235	383	0	0	0	0	
	20	0	20	0	0	0	0	0		58	95	153	0	0	0	0	

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

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TOTAL RESOURCE COST TESTS
Blower Door Permanent - 21 year
----- DSM_RULE PROGRAM -----

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
YEAR	INCREASED SUPPLY COSTS \$(000)	UTILITY PROGRAM COSTS \$(000)	PARTICIPANT PROGRAM COSTS \$(000)	OTHER COSTS \$(000)	TOTAL COSTS \$(000)	AVOIDED GEN UNIT BENEFITS \$(000)	AVOIDED T & D BENEFITS \$(000)	PROGRAM FUEL SAVINGS \$(000)	OTHER BENEFITS \$(000)	TOTAL BENEFITS \$(000)	NET BENEFITS \$(000)	CUMULATIVE DISCOUNTED NET BENEFITS \$(000)
1992	0	20	0	0	20	0	0	3	0	3	(17)	(17)
1993	0	0	0	0	0	0	0	7	1	7	7	(10)
1994	0	0	0	0	0	0	0	7	1	8	8	(3)
1995	0	0	0	0	0	3	1	8	1	13	13	7
1996	0	0	0	0	0	3	1	9	1	14	14	16
1997	0	0	0	0	0	3	1	10	1	15	15	25
1998	0	0	0	0	0	3	1	12	1	16	16	34
1999	0	0	0	0	0	3	1	13	1	17	17	44
2000	0	0	0	0	0	3	1	15	1	19	19	53
2001	0	0	0	0	0	3	1	16	1	21	21	62
2002	0	0	0	0	0	3	1	18	1	22	22	71
2003	0	0	0	0	0	3	1	20	1	24	24	80
2004	0	0	0	0	0	3	1	21	1	26	26	88
2005	0	0	0	0	0	3	1	23	1	28	28	97
2006	0	0	0	0	0	3	1	26	1	30	30	105
2007	0	0	0	0	0	3	1	28	1	32	32	114
2008	0	0	0	0	0	3	0	30	1	35	35	122
2009	0	0	0	0	0	3	0	33	1	38	38	130
2010	0	0	0	0	0	3	0	36	1	41	41	138
2011	0	0	0	0	0	3	0	40	2	45	45	146
2012	0	0	0	0	0	3	0	43	2	49	49	154
NOMINAL	0	20	0	0	20	50	11	419	22	502	482	
NPV:	0	20	0	0	20	19	5	141	9	174	154	
Discount Rate	9.50%											
Benefit/Cost Ratio: col (11) / col (6)	8.7											

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PARTICIPANT COSTS AND BENEFITS
Blower Door Permanent - 21 year
----- DSM_RULE PROGRAM -----

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
YEAR	CUSTOMER EQUIPMENT COSTS \$(000)	CUSTOMER O & M COSTS \$(000)	OTHER COSTS \$(000)	TOTAL COSTS \$(000)	SAVINGS IN PARTICIPANTS BILL \$(000)	TAX CREDITS \$(000)	UTILITY REBATES \$(000)	OTHER BENEFITS \$(000)	TOTAL BENEFITS \$(000)	NET BENEFITS \$(000)	CUMULATIVE DISCOUNTED NET BENEFITS \$(000)
1992	0	0	0	0	6	0	0	0	7	7	7
1993	0	0	0	0	13	0	0	1	14	14	19
1994	0	0	0	0	13	0	0	1	14	14	31
1995	0	0	0	0	14	0	0	1	15	15	42
1996	0	0	0	0	14	0	0	1	15	15	52
1997	0	0	0	0	15	0	0	1	16	16	62
1998	0	0	0	0	15	0	0	1	16	16	72
1999	0	0	0	0	15	0	0	1	16	16	80
2000	0	0	0	0	16	0	0	1	17	17	88
2001	0	0	0	0	17	0	0	1	18	18	96
2002	0	0	0	0	17	0	0	1	18	18	103
2003	0	0	0	0	18	0	0	1	19	19	111
2004	0	0	0	0	19	0	0	1	20	20	117
2005	0	0	0	0	20	0	0	1	21	21	124
2006	0	0	0	0	21	0	0	1	22	22	130
2007	0	0	0	0	22	0	0	1	23	23	136
2008	0	0	0	0	23	0	0	1	24	24	142
2009	0	0	0	0	24	0	0	1	26	26	147
2010	0	0	0	0	26	0	0	1	27	27	152
2011	0	0	0	0	27	0	0	2	28	28	157
2012	0	0	0	0	28	0	0	2	29	29	162
NOMINAL	0	0	0	0	383	0	0	22	405	405	
NPV:	0	0	0	0	153	0	0	9	162	162	
In service year of gen unit:											
Discount rate:			1995								
Benefit/Cost Ratio: col (10) / col (5)			9.50%		1623.5						

RATE IMPACT TEST
Blower Door Permanent - 21 year
----- DSM_RULE PROGRAM -----

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
YEAR	INCREASED SUPPLY COSTS \$(000)	UTILITY PROGRAM COSTS \$(000)	INCENTIVES \$(000)	REVENUE LOSSES \$(000)	OTHER COSTS \$(000)	TOTAL COSTS \$(000)	AVOIDED GEN UNIT BENEFITS \$(000)	AVOIDED T & D BENEFITS \$(000)	PROGRAM FUEL BENEFITS \$(000)	REVENUE GAINS \$(000)	OTHER BENEFITS \$(000)	TOTAL BENEFITS \$(000)	NET BENEFITS TO ALL CUSTOMERS \$(000)	CUMULATIVE DISCOUNTED NET BENEFIT \$(000)
1992	0	20	0	6	0	26	0	0	3	0	0	3	(23)	(23)
1993	0	0	0	13	0	13	0	0	7	0	0	7	(6)	(29)
1994	0	0	0	13	0	13	0	0	7	0	0	7	(6)	(34)
1995	0	0	0	14	0	14	3	1	8	0	0	12	(2)	(35)
1996	0	0	0	14	0	14	3	1	9	0	0	13	(2)	(36)
1997	0	0	0	15	0	15	3	1	10	0	0	14	(1)	(37)
1998	0	0	0	15	0	15	3	1	12	0	0	15	(0)	(37)
1999	0	0	0	15	0	15	3	1	13	0	0	16	1	(36)
2000	0	0	0	16	0	16	3	1	15	0	0	18	2	(35)
2001	0	0	0	17	0	17	3	1	16	0	0	20	3	(34)
2002	0	0	0	17	0	17	3	1	18	0	0	21	4	(33)
2003	0	0	0	18	0	18	3	1	20	0	0	23	5	(31)
2004	0	0	0	19	0	19	3	1	21	0	0	25	6	(29)
2005	0	0	0	20	0	20	3	1	23	0	0	27	7	(27)
2006	0	0	0	21	0	21	3	1	26	0	0	29	8	(25)
2007	0	0	0	22	0	22	3	1	28	0	0	31	9	(22)
2008	0	0	0	23	0	23	3	0	30	0	0	34	11	(20)
2009	0	0	0	24	0	24	3	0	33	0	0	37	12	(17)
2010	0	0	0	26	0	26	3	0	36	0	0	40	14	(14)
2011	0	0	0	27	0	27	3	0	40	0	0	43	16	(11)
2012	0	0	0	28	0	28	3	0	43	0	0	47	19	(8)
NOMINAL	0	20	0	383	0	403	50	11	419	0	0	480	77	
NPV:	0	20	0	153	0	173	19	5	141	0	0	165	(8)	
Discount rate:				9.50%										
Benefit / Cost Ratio - Col (12)/Col (7)				0.95										

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PARTICIPATION STANDARDS

Customers eligible to participate in this program will receive an energy audit and must meet the following criteria:

- * All participants in the pilot program will be identified and offered the opportunity to participate as a result of Gulf's residential energy auditing process and must receive electric service from Gulf Power Company.

- * The residential single family detached house must have an easily accessible duct system and be in good enough condition for the duct test to be performed.

The program will be conducted as follows:

- * Participants will be made fully aware of the program testing procedures and agree in writing to participate. (See Attachment "B")

- * Pre and post blower door testing will be completed by Gulf Power representatives. (See Attachment "C")

- * All duct repairs will be performed by an approved licensed contractor that will agree to follow specific guidelines stated by Gulf Power. The repairs will be in accordance to the residential duct ceiling requirements as specified in the Florida Energy Code for building construction 1989.

HVAC TUNE-UP PROGRAM

This pilot program is being conducted to determine the value servicing air conditioning equipment provides in relation to peak KW demand and energy (KWH) reduction, and equipment efficiency. Most homeowners do not maintain an ongoing annual clean and check (preventive maintenance agreement) of their HVAC equipment. Preventive maintenance is necessary to maintain the efficiencies originally designated by the manufacturer of the equipment. Gulf Power Company will evaluate the direct effect of such servicing and maintenance through its HVAC Tune-up Program.

A total of 200 air conditioner unit tune-ups will be conducted and evaluated during our peak weather conditions (May - September). These tune-ups will be performed by five (5) HVAC contractors selected by Gulf. The average cost for these tune-ups will be approximately \$150 each depending on the condition of the equipment. This cost estimate was determined by consulting our local HVAC contractors and asking them to provide information on a HVAC Tune-Up using our predesigned checklist (Attachment "A").

Participant eligibility and selection for the program will be determined as follows:

- * The residential single family detached home must be receiving electric service from Gulf Power Company.
- * All participants in the pilot program will be identified and offered the opportunity to participate as a result of Gulf's residential energy auditing process.
- * All work will be performed during the pilot program by licensed contractors selected and approved by Gulf Power.
- * Contractors will be required to check a minimum number of items and complete a pre and post servicing checklist. The checklist will be the basis to quantify the improvements in efficiency, BTUH capacity and compressor wattage reduction.
- * All program participating contractors will submit the completed required checklists and a complete work order. The work order will identify diagnostic comments of the condition of the equipment with the specific job time start to completion.
- * All customers participating in the pilot program will be personally contacted by a Gulf Power representative to verify all contractor tune-up program jobs reported.

Program Benefits

The benefits to the customer derived from this program are multiple. They include:

1. Reduced A/C Run Time.
2. Reduced Energy Usage.
3. Lower Humidity Levels.
4. Increased Distribution of Air Flow.
5. Increased Customer Comfort.

The benefits are not only limited to the customer. The Company will also benefit for their conservation effort by:

1. Reduced KW Demand.
2. Reduced KWH Energy.
3. Increased Energy Audit Demand to Promote Additional Energy Conservation Measures.
4. Increased customer education about preventive maintenance by providing information based on actual test results.

In addition, Attachment "C" enclosed for review identifies an actual house case study.

ATTACHMENT "A"

CONTRACTOR

CENTRAL AIR CONDITIONING CHECKLIST

SERVICE CHECKLIST

Date: _____

Company Name _____

Customer Name _____

Unit Location (or #) _____

1. Filter condition _____ Extremely Dirty _____ Average
2. Install new air filter(s) _____ Yes _____ No
3. Lubricate bearings (except permanent sealed bearings).
4. Check for excess vibration and noise.
- *5. Check evaporator and condenser coils, condensate drains and pans and clean as necessary.
6. Check belts, bearings and electrical components.
7. Check electrical devices and electrical connections within units.
8. Check all operation modes for proper function.
9. Check proper voltage and amperage to units.
- *10. Check for proper refrigerant charge.
11. Confirm proper CFM per ton.
12. Provide a written report on the condition of the system to the homeowner and Gulf Power Company.

*NOTE: If coils need to be pulled for proper cleaning, and/or refrigerant leaks are evident, advise owner of recommendations for repair and additional charges for work.

ATTACHMENT "B"

CONTRACTOR

CENTRAL AIR CONDITIONER TUNE-UP PROGRAM

TEST CHECKLIST

Contractor Company _____
 Customer Name _____
 Customer Address _____
 Customer Phone _____
 Unit Location (or #) _____

Manufacturer _____
 I.D.U. Mod. # _____
 O.D.U. Mod. # _____
 Equipment Age _____

SERVICE WORK

<u>ITEM</u>	<u>PRE-TEST</u>	<u>POST TEST</u>
1. All Supply Grilles Open	_____	_____
2. All Interior Doors Open	_____	_____
3. Total Volts Indoor Fan/Unit	_____	_____
4. Total Amps Indoor Fan	_____	_____
5. Return Drybulb Temp. (°F)	_____	_____
6. Return Wetbulb Temp. (°F)	_____	_____
7. Supply Drybulb Temp. (°F)	_____	_____
8. Supply Wetbulb Temp. (°F)	_____	_____
9. Supply Drybulb Temp. Drop Across Coil	_____	_____
10. Total CFM Measured By _____	_____	_____
11. Total Volts Outdoor Unit	_____	_____
12. Total Amps Outdoor Unit	_____	_____
13. Outdoor Temp. (°F)	_____	_____
14. Compressor Head Pressure (PSIG)	_____	_____
15. Compressor Suction Pressure (PSIG)	_____	_____
16. Suction Line Temp. (°F)	_____	_____
17. Temp. Rise on Water at HRU (N/A if no HRU)	_____	_____

Comments:

ATTACHMENT "C"

CONTRACTOR

CENTRAL AIR CONDITIONER TUNE-UP PROGRAM

TEST CHECKLIST

Contractor Company Acme Air
 Customer Name _____
 Customer Address 6282 Forest Pines Dr
 Customer Phone _____
 Unit Location (or #) _____

Manufacturer Rheem
 I.D.U. Mod. # RACC 018
 O.D.U. Mod. # RHOA-08-RACB
-A021

SERVICE WORK

<u>ITEM</u>	<u>PRE-TEST</u>	<u>POST TEST</u>
1. All Supply Grilles Open	<u>X</u>	<u>X</u>
2. All Interior Doors Open	<u>X</u>	<u>X</u>
3. Total Volts Indoor Fan/Unit	<u>233</u>	<u>236</u>
4. Total Amps Indoor Fan	<u>1.3</u>	<u>1.4</u>
5. Return Drybulb Temp. (°F)	<u>79°</u>	<u>84°</u>
6. Return Wetbulb Temp. (°F)	<u>70°</u>	<u>68°</u>
7. Supply Drybulb Temp. (°F)	<u>69°</u>	<u>69°</u>
8. Supply Wetbulb Temp. (°F)	<u>64°</u>	<u>61°</u>
9. Supply Drybulb Temp. Drop Across Coil	<u>10°</u>	<u>15°</u>
10. Total CFM Measured By <u>Temp. Rise.</u>	<u>865</u>	<u>998</u>
11. Total Volts Outdoor Unit	<u>239</u>	<u>239</u>
12. Total Amps Outdoor Unit	<u>11.0</u>	<u>9.2</u>
13. Outdoor Temp. (°F)	<u>78°</u>	<u>79°</u>
14. Compressor Head Pressure (PSIG)	<u>357</u>	<u>215</u>
15. Compressor Suction Pressure (PSIG)	<u>90</u>	<u>78</u>
16. Suction Line Temp. (°F)	<u>59°</u>	<u>69°</u>
17. Temp. Rise on Water at HRU (N/A if no HRU)	<u>N/A</u>	<u>N/A</u>

Comments: Contractor cleaned outdoor and indoor coil and then properly charged system.

Attachment "C"
(page 2)

Benefits from Tune-up Servicing (Example from Attachment "C")

1. KW Reduction - .43

(Compressor reduction amperage of 1.8 amps x 239 volts = 430 watts)

Efficiency loss due to:

- * High compressor head pressure
- * Clogged outdoor coil restricting air flow and heat transfer
- * Dirty indoor coil restricting air flow and heat transfer

2. Air Conditioner BTUH capacity increase which will offer additional potential peak hour unit cycling.

3. Customer energy use reduction and increased comfort.

TYPICAL CAUSES OF EFFICIENCY LOSS

1. Dirty outdoor coil restricting air flow and heat transfer.
2. Dirty indoor coil restricting air flow and heat transfer.
3. Incorrect refrigerant charge.
4. Refrigerant leakage.
5. Return air infiltration.
6. Dirty air filter.
7. Lack of proper air filtration.
8. Improper air values (CFM) per tonnage.

DETERMINATION OF KW DEMAND/KW REDUCTION

KW Demand Reduction

KW Reduction = Pretest (Indoor Volts x Amps + Outdoor Unit Volts x Amps) - Post Test (Indoor Volts x Amps + Outdoor Volts x Amps)/1,000.

Example from Attachment "C":

$$\begin{aligned} & (233 \times 1.3 + 239 \times 11.0) - (236 \times 1.4 + 239 \times 9.2) / 1,000 \\ = & \quad (2931.9 \quad - \quad 2529.2) / 1,000 \\ = & \quad \underline{.4 \text{ KW Reduction}} \end{aligned}$$

KWH Reduction

KWH Reduction = KW Reduction x (Typical Annual Run Hours + Additional Run Hours Due to Efficiency loss).

Typical Annual Run Hours = 2000 (Based on A.R.I. Directory Map)

Additional Run Hours due to Efficiency Loss = BTUH Capacity Percentage increase after servicing x Typical Annual Run Hours.

Example from Attachment "C":

$$\begin{aligned} = & .4 \text{ KW} \times [2000 + (23404 - 18399/18399 \times 2000)] \\ = & .4 \times [2000 + 544] \\ = & .4 \times 2544 \\ = & 1018 \text{ KWH Reduction} \end{aligned}$$

FORMULA FOR BTUH CAPACITY CALCULATION

Total Cooling Capacity = CFM x 4.5 x Change in Enthalpy

Total Sensible Cooling Capacity = CFM x 1.08 x Change in Default Temperature

Latent Capacity = Total Capacity - Sensible Capacity

Definition:

- * 4.5 constant = $60/13.33$
(60 min. = 1 hr., 13.33 = Cu. ft./lb. Dry Air @ 70° D.B. temp.)
- * 1.08 Constant = $4.5 \times .24$ (.24 = BTU Req. to raise one pound of air one degree F.)
- * Enthalpy = Heat content in BTU per pound of dry air.
- * Change in Ethalpy is determined from chart on attached page.

ENTHALPY* IN BTU PER POUND OF DRY AIR

Wet Bulb Temperature F	TENTHS OF A DEGREE									
	0	1	2	3	4	5	6	7	8	9
35	13.01	13.05	13.10	13.14	13.18	13.23	13.27	13.31	13.35	13.40
36	13.44	13.48	13.53	13.57	13.61	13.66	13.70	13.75	13.79	13.83
37	13.87	13.91	13.96	14.00	14.05	14.09	14.14	14.18	14.23	14.27
38	14.33	14.37	14.41	14.46	14.50	14.55	14.59	14.64	14.68	14.73
39	14.77	14.82	14.86	14.91	14.95	15.00	15.05	15.09	15.14	15.18
40	15.23	15.28	15.33	15.37	15.42	15.46	15.51	15.56	15.60	15.65
41	15.70	15.75	15.80	15.84	15.89	15.94	15.99	16.03	16.08	16.13
42	16.17	16.22	16.27	16.32	16.36	16.41	16.46	16.51	16.56	16.61
43	16.66	16.71	16.76	16.81	16.86	16.91	16.96	17.00	17.05	17.10
44	17.15	17.20	17.25	17.30	17.35	17.40	17.45	17.50	17.55	17.60
45	17.65	17.70	17.75	17.80	17.85	17.91	17.96	18.01	18.06	18.11
46	18.16	18.21	18.26	18.32	18.37	18.42	18.47	18.52	18.58	18.63
47	18.68	18.73	18.79	18.84	18.89	18.95	19.00	19.06	19.11	19.16
48	19.21	19.26	19.32	19.37	19.43	19.48	19.53	19.59	19.64	19.70
49	19.75	19.81	19.86	19.92	19.97	20.03	20.08	20.14	20.19	20.25
50	20.30	20.36	20.41	20.47	20.53	20.58	20.64	20.69	20.75	20.80
51	20.86	20.92	20.97	21.03	21.09	21.15	21.20	21.26	21.32	21.38
52	21.44	21.50	21.56	21.62	21.67	21.73	21.79	21.85	21.91	21.97
53	22.02	22.08	22.14	22.20	22.26	22.32	22.38	22.44	22.50	22.56
54	22.62	22.68	22.74	22.80	22.86	22.92	22.98	23.04	23.10	23.16
55	23.22	23.28	23.34	23.41	23.47	23.53	23.59	23.65	23.71	23.78
56	23.84	23.90	23.97	24.03	24.10	24.16	24.22	24.29	24.35	24.42
57	24.48	24.54	24.61	24.67	24.74	24.80	24.86	24.93	24.99	25.06
58	25.12	25.19	25.25	25.32	25.38	25.45	25.52	25.58	25.65	25.71
59	25.78	25.85	25.92	25.98	26.05	26.12	26.19	26.26	26.32	26.39
60	26.46	26.53	26.60	26.67	26.74	26.81	26.87	26.94	27.01	27.08
61	27.15	27.22	27.29	27.36	27.43	27.50	27.57	27.64	27.71	27.78
62	27.85	27.92	27.99	28.07	28.14	28.21	28.28	28.35	28.43	28.50
63	28.57	28.64	28.72	28.79	28.87	28.94	29.01	29.09	29.16	29.24
64	29.31	29.39	29.46	29.54	29.61	29.69	29.76	29.84	29.91	29.99
65	30.06	30.14	30.21	30.29	30.37	30.45	30.52	30.60	30.68	30.75
66	30.83	30.91	30.99	31.07	31.15	31.23	31.30	31.38	31.46	31.54
67	31.62	31.70	31.78	31.86	31.94	32.02	32.10	32.18	32.26	32.34
68	32.42	32.50	32.59	32.67	32.75	32.84	32.92	33.00	33.08	33.17
69	33.25	33.33	33.42	33.50	33.59	33.67	33.75	33.84	33.92	34.01
70	34.09	34.18	34.26	34.35	34.43	34.52	34.61	34.69	34.78	34.86
71	34.95	35.04	35.13	35.21	35.30	35.39	35.48	35.57	35.65	35.74
72	35.83	35.92	36.01	36.10	36.19	36.29	36.38	36.47	36.56	36.65
73	36.74	36.83	36.92	37.02	37.11	37.20	37.29	37.38	37.48	37.57
74	37.66	37.76	37.85	37.95	38.04	38.14	38.23	38.33	38.42	38.52
75	38.61	38.71	38.80	38.90	38.99	39.09	39.19	39.28	39.38	39.47
76	39.57	39.67	39.77	39.87	39.97	40.07	40.17	40.27	40.37	40.47
77	40.57	40.67	40.77	40.87	40.97	41.08	41.18	41.28	41.38	41.48
78	41.58	41.68	41.79	41.89	42.00	42.10	42.20	42.31	42.41	42.52
79	42.62	42.73	42.83	42.94	43.05	43.16	43.26	43.37	43.48	43.58
80	43.69	43.80	43.91	44.02	44.13	44.24	44.34	44.45	44.56	44.67
81	44.78	44.89	45.00	45.12	45.23	45.34	45.45	45.56	45.68	45.79
82	45.90	46.01	46.13	46.24	46.36	46.47	46.58	46.70	46.81	46.93
83	47.04	47.16	47.28	47.39	47.51	47.63	47.75	47.87	47.98	48.10
84	48.23	48.34	48.46	48.58	48.70	48.83	48.95	49.07	49.19	49.31
85	49.43	49.55	49.68	49.80	49.93	50.05	50.17	50.29	50.41	50.54

CTORY OF CERTIFIED

UNITARY
AIR-
CONDITIONERS

Section A

UNITARY
AIR-SOURCE
HEAT PUMPS

Section III

SOUND-RATED
OUTDOOR
UNITARY EQUIPMENT

NOTICE

During the period this directory is effective, some manufacturers may be added or deleted from the programs; also some models may be added, deleted or revised. Any questions about listings should be directed to ARI at the address below.

SPONSORED AND ADMINISTERED BY



501 WILSON BOULEVARD, 6TH FLOOR ARLINGTON, VIRGINIA 22209
ADDRESS INQUIRIES TO—VICE PRESIDENT, ENGINEERING

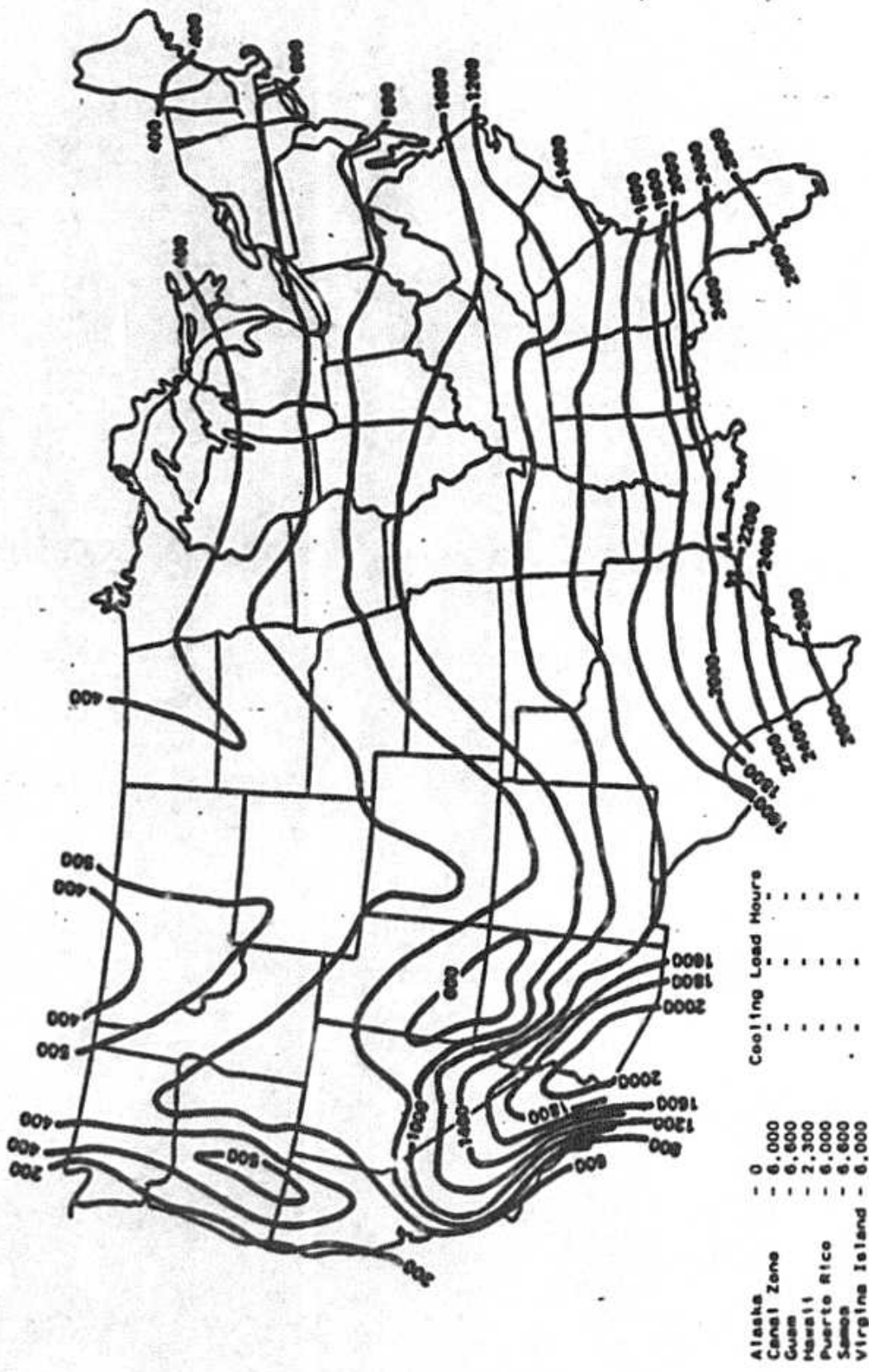


FIG 1. SUMMER COOLING LOAD HOURS

I. PROGRAM DEMAND SAVINGS AND LINE LOSSES

(1) CUSTOMER KW REDUCTION AT THE METER	0.40 KW /CUST
(2) GENERATOR KW REDUCTION PER CUSTOMER	0.52 KW GEN/CUST
(3) KW LINE LOSS PERCENTAGE	12.6 %
(4) GENERATION KWH REDUCTION PER CUSTOMER	1,096.4 KWH/CUST/YR
(5) KWH LINE LOSS PERCENTAGE	7.7 %
(6) GROUP LINE LOSS MULTIPLIER	1.0034
(7) CUSTOMER KWH PROGRAM INCREASE AT METER	0.0 KWH/CUST/YR
(8)* CUSTOMER KWH REDUCTION AT METER	1,018.0 KWH/CUST/YR

II. ECONOMIC LIFE AND K FACTORS

(1) STUDY PERIOD FOR CONSERVATION PROGRAM	16 YEARS
(2) GENERATOR ECONOMIC LIFE	30 YEARS
(3) T & D ECONOMIC LIFE	30 YEARS
(4) K FACTOR FOR GENERATION	1.4893
(5) K FACTOR FOR T & D	1.4893
(6)* SWITCH REV REQ(0) OR VAL-OF-DEF (1)	0

III. UTILITY AND CUSTOMER COSTS

(1) UTILITY NONRECURRING COST PER CUSTOMER ...	150.00 \$/CUST
(2) UTILITY RECURRING COST PER CUSTOMER	0.00 \$/CUST/YR
(3) UTILITY COST ESCALATION RATE	4.3 %
(4) CUSTOMER EQUIPMENT COST	1.00 \$/CUST
(5) CUSTOMER EQUIPMENT ESCALATION RATE	4.3 %
(6) CUSTOMER O & M COST	0.00 \$/CUST/YR
(7) CUSTOMER O & M ESCALATION RATE	4.3 %
(8)* CUSTOMER TAX CREDIT PER INSTALLATION	0.00 \$/CUST
(9)* CUSTOMER TAX CREDIT ESCALATION RATE	0.0 %
(10)* INCREASED SUPPLY COSTS	0.00 \$/CUST/YR
(11)* SUPPLY COSTS ESCALATION RATE	0.0 %
(12)* UTILITY DISCOUNT RATE	9.50%
(13)* UTILITY AFUDC RATE	11.16%
(14)* UTILITY NON RECURRING REBATE/INCENTIVE ..	0.00 \$/CUST
(15)* UTILITY RECURRING REBATE/INCENTIVE	0.00 \$/CUST/YR
(16)* UTILITY REBATE/INCENTIVE ESCAL RATE	0.0 %

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

STOP REV LOSS: NO
INCLUDE BENEFITS: NO

IV. AVOIDED GENERATOR, TRANS. AND DIST. COSTS

(1) BASE YEAR	1992
(2) IN-SERVICE YEAR FOR AVOIDED GENERATING UNIT	1995
(3) IN-SERVICE YEAR FOR AVOIDED T & D	1995
(4) BASE YEAR AVOIDED GENERATING UNIT COST	345.00 \$/KW
(5) BASE YEAR AVOIDED TRANSMISSION COST	100.00 \$/KW
(6) BASE YEAR DISTRIBUTION COST	57.00 \$/KW
(7) GEN, TRAN, & DIST COST ESCALATION RATE ...	4.3 %
(8) GENERATOR FIXED O & M COST	2.40 \$/KW/YR
(9) GENERATOR FIXED O&M ESCALATION RATE	4.3 %
(10) TRANSMISSION FIXED O & M COST	0.32 \$/KW/YR
(11) DISTRIBUTION FIXED O & M COST	0.00 \$/KW/YR
(12) T&D FIXED O&M ESCALATION RATE	4.3 %
(13) AVOIDED GEN UNIT VARIABLE O & M COSTS ...	0.550 CENTS/KWH
(14) GENERATOR VARIABLE O&M COST ESCALATION RATE	4.3 %
(15) GENERATOR CAPACITY FACTOR	3.4 %
(16) AVOIDED GENERATING UNIT FUEL COST	3.880 CENTS/KWH
(17) AVOIDED GEN UNIT FUEL ESCALATION RATE	11 %
(18)* AVOIDED PURCHASE CAPACITY COST PER KW	0.00 \$/KW/YR
(19)* CAPACITY COST ESCALATION RATE	4.3 %

V. NON-FUEL ENERGY AND DEMAND CHARGES

(1) NON-FUEL COST IN CUSTOMER BILL	3.490 CENTS/KWH
(2) NON-FUEL ESCALATION RATE	3.9 %
(3) CUSTOMER DEMAND CHARGE PER KW	0.00 \$/KW/MO
(4) DEMAND CHARGE ESCALATION RATE	5.0 %
(5)* DIVERSITY and ANNUAL DEMAND ADJUSTMENT FACTOR FOR CUSTOMER BILL	1.0

File: d:\CE_RULE\

GULF VERSION: BASE5 02/20/92

TOTAL RESOURCE TEST:	6.26
PARTICIPANT TEST:	639.05
RATE IMPACT TEST:	1.21

CALCULATION OF AFUDC AND IN-SERVICE COSTS OF PLANT
PLANT: 1995 AVOIDED UNIT

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
YEAR	NO. YEARS BEFORE INSERVICE	PLANT ESCALATION RATE (%)	CUMULATIVE ESCALATION FACTOR	YEARLY EXPENDITURE (%)	ANNUAL SPENDING (\$/KW)	CUMULATIVE AVERAGE SPENDING (\$/KW)	CUMULATIVE SPENDING WITH AFUDC (\$/KW)	YEARLY TOTAL AFUDC (\$/KW)	INCREMENTAL YEAR-END BOOK VALUE (\$/KW)	CUMULATIVE YEAR-END BOOK VALUE (\$/KW)
1986	-9	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1987	-8	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1988	-7	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1989	-6	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1990	-5	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1991	-4	0.0%	1.0000	0.0%	0.00	0.00	0.00	0.00	0.00	0.00
1992	-3	4.1%	1.0410	1.2%	4.31	2.15	2.15	0.24	4.55	4.55
1993	-2	4.0%	1.0826	8.7%	32.50	20.56	20.80	2.32	34.82	39.37
1994	-1	4.2%	1.1281	87.4%	340.16	206.88	209.45	23.37	363.53	402.90
1995	0	4.5%	1.1789	2.7%	10.98	382.46	408.39	45.58	56.56	459.46
				1.00	387.95			71.51	459.46	

IN-SERVICE YEAR = 1995

PLANT COSTS (1992 \$) \$345.0
AFUDC RATE: 11.16%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
YEAR	CUMULATIVE TOTAL PARTICIPATING CUSTOMERS	ADJUSTED CUMULATIVE PARTICIPATING CUSTOMERS	UTILITY AVERAGE SYSTEM FUEL COSTS (C/KWH)	AVOIDED MARGINAL FUEL COST (C/KWH)	INCREASED MARGINAL FUEL COST (C/KWH)	REPLACEMENT FUEL COST (C/KWH)	PROGRAM KW EFFECTIVENESS FACTOR	PROGRAM KWH EFFECTIVENESS FACTOR	OTHER COSTS (\$000)	OTHER BENEFITS (\$000)
1992	200	200	2.30	2.55	0.00	2.30	1.00	1.00	0	0
1993	200	200	2.28	2.84	0.00	2.30	1.00	1.00	0	0
1994	200	200	2.33	3.15	0.00	2.35	1.00	1.00	0	0
1995	200	200	2.41	3.50	0.00	2.44	1.00	1.00	0	0
1996	200	200	2.54	3.88	0.00	2.58	1.00	1.00	0	0
1997	200	200	2.58	4.36	0.00	2.63	1.00	1.00	0	0
1998	200	200	2.63	4.91	0.00	2.70	1.00	1.00	0	0
1999	200	200	2.49	5.52	0.00	2.58	1.00	1.00	0	0
2000	200	200	2.54	6.21	0.00	2.65	1.00	1.00	0	0
2001	200	200	2.72	7.02	0.00	2.85	1.00	1.00	0	0
2002	200	200	2.92	7.65	0.00	3.06	1.00	1.00	0	0
2003	200	200	3.09	8.35	0.00	3.25	1.00	1.00	0	0
2004	200	200	3.29	9.13	0.00	3.47	1.00	1.00	0	0
2005	200	200	3.51	9.97	0.00	3.70	1.00	1.00	0	0
2006	200	200	3.72	10.89	0.00	3.93	1.00	1.00	0	0
2007	200	200	3.85	11.89	0.00	4.10	1.00	1.00	0	0

AVOIDED GENERATION UNIT BENEFITS
HVAC TUNEUP PILOT
----- DSH_RULE PROGRAM -----

* UNIT SIZE OF AVOIDED GENERATION UNIT = 104.0 KW
* INSERVICE COSTS OF AVOIDED GEN. UNIT (000) \$47.6

(1)	(1A)* REVENUE REQUIREMENT FACTOR	(2) AVOIDED GEN UNIT CAPACITY COST \$(000)	(2A)* AVOIDED ANNUAL UNIT KWH GEN (000)	(3) AVOIDED UNIT FIXED COST \$(000)	(4) AVOIDED GEN UNIT VARIABLE COST \$(000)	(5) AVOIDED GEN UNIT FUEL COST \$(000)	(6) FUEL REPLACEMENT COST \$(000)	(6A)* AVOIDED PURCHASE CAPACITY COSTS \$(000)	(7) AVOIDED GEN UNIT BENEFITS \$(000)
1992	0.000	0	0	0	0	0	0	0	0
1993	0.000	0	0	0	0	0	0	0	0
1994	0.000	0	0	0	0	0	0	0	0
1995	0.208	10	31	0	0	2	1	0	11
1996	0.200	10	31	0	0	2	1	0	11
1997	0.191	9	31	0	0	2	1	0	11
1998	0.182	9	31	0	0	2	1	0	11
1999	0.174	8	31	0	0	2	1	0	11
2000	0.167	8	31	0	0	3	1	0	11
2001	0.160	8	31	0	0	3	1	0	10
2002	0.153	7	31	0	0	3	1	0	10
2003	0.146	7	31	0	0	4	1	0	10
2004	0.139	7	31	0	0	4	1	0	10
2005	0.132	6	31	0	0	5	1	0	11
2006	0.124	6	31	0	0	5	1	0	11
2007	0.117	6	31	0	0	6	1	0	11
NOMINAL		100	401	5	3	43	12	0	139
MPV		49		2	1	18	5	0	65

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

AVOIDED T & D AND PROGRAM FUEL SAVINGS*
HVAC TUNELUP PILOT
----- DSN_RULE PROGRAM -----

* INSERVICE COSTS OF AVOIDED TRANS. (000) = \$11.8
* INSERVICE COSTS OF AVOIDED DIST. (000) = \$5.2

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
YEAR	AVOIDED TRANSMISSION CAPACITY COST \$(000)	AVOIDED TRANSMISSION CSM COST \$(000)	TOTAL AVOIDED TRANSMISSION COST \$(000)	AVOIDED DISTRIBUTION CAPACITY COST \$(000)	AVOIDED DISTRIBUTION CSM COST \$(000)	TOTAL AVOIDED DISTRIBUTION COST \$(000)	PROGRAM FUEL SAVINGS \$(000)
1992	0	0	0	0	0	0	3
1993	0	0	0	0	0	0	6
1994	0	0	0	0	0	0	7
1995	2	0	2	1	0	1	8
1996	2	0	2	1	0	1	9
1997	2	0	2	1	0	1	10
1998	2	0	2	1	0	1	11
1999	2	0	2	1	0	1	12
2000	2	0	2	1	0	1	14
2001	2	0	2	1	0	1	15
2002	2	0	2	1	0	1	17
2003	2	0	2	1	0	1	18
2004	2	0	2	1	0	1	20
2005	2	0	2	1	0	1	22
2006	1	0	1	1	0	1	24
2007	1	0	1	1	0	1	26
NOMINAL	25	1	25	11	0	11	222
NPV:	12	0	12	5	0	5	99

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

(1)	(2)	(3)	(4)	(5)	(6)	(7)
YEAR	REDUCTION IN KWH GENERATION NET NEW COST KWH (000)	AVOIDED MARGINAL FUEL COST - REDUCED KWH \$(000)	INCREASE IN KWH GENERATION NET NEW COST KWH (000)	INCREASED MARGINAL FUEL COST - INCREASE KWH \$(000)	NET AVOIDED PROGRAM FUEL SAVINGS \$(000)	EFFECTIVE PROGRAM FUEL SAVINGS \$(000)
1992	110	3	0	0	3	3
1993	221	6	0	0	6	6
1994	221	7	0	0	7	7
1995	221	8	0	0	8	8
1996	221	9	0	0	9	9
1997	221	10	0	0	10	10
1998	221	11	0	0	11	11
1999	221	12	0	0	12	12
2000	221	14	0	0	14	14
2001	221	15	0	0	15	15
2002	221	17	0	0	17	17
2003	221	18	0	0	18	18
2004	221	20	0	0	20	20
2005	221	22	0	0	22	22
2006	221	24	0	0	24	24
2007	221	26	0	0	26	26
NOMINAL	3,419	222	0	0	222	222
NPV:		99		0	99	99

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
-----> UTILITY PROGRAM COSTS & REBATES <-----							-----> PARTICIPATING CUSTOMER COSTS & BENEFITS <-----										
YEAR	UTIL NONREC. COSTS \$(000)	UTIL RECUR COSTS \$(000)	TOTAL UTIL PGM COSTS \$(000)	UTIL NONREC. REBATES \$(000)	UTIL RECUR. REBATES \$(000)	TOTAL REBATE/ INCENT. COSTS \$(000)	PARTIC. CUST EQUIP COSTS \$(000)	PARTIC. CUST O & M COSTS \$(000)	TOTAL CUST PARTIC. COSTS \$(000)	REDUCT. IN CUST. KWH (000)	RED. REV. - FUEL PORTION \$(000)	RED. REV. NONFUEL PORTION \$(000)	EFFECT. REV. REDUCT. IN BILL \$(000)	INC. IN CUST. KWH (000)	INC. REV. - FUEL PORTION \$(000)	INC. REV. NONFUEL PORTION \$(000)	EFFECT. REV. REVENUE INC. IN BILL \$(000)
1992	30	0	30	0	0	0	0	0	0	102	2	4	6	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	204	5	7	12	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	204	5	8	12	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	204	5	8	13	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	204	5	8	13	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	204	5	9	14	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	204	5	9	14	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	204	5	9	14	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	204	5	10	15	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	204	6	10	16	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	204	6	10	16	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	204	6	11	17	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	204	7	11	18	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	204	7	12	19	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	204	8	12	20	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	204	8	13	20	0	0	0	0
	30	0	30	0	0	0	0	0	0	3,156	90	150	240	0	0	0	0
	30	0	30	0	0	0	0	0	0		45	75	121		0	0	0

* SUPPLEMENTAL INFORMATION NOT SPECIFIED IN WORKBOOK

TOTAL RESOURCE COST TESTS
 HVAC TUNEUP PILOT
 ----- DSM_RULE PROGRAM -----

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
YEAR	INCREASED SUPPLY COSTS	UTILITY PROGRAM COSTS	PARTICIPANT PROGRAM COSTS	OTHER COSTS	TOTAL COSTS	AVOIDED GEN UNIT BENEFITS	AVOIDED T & D BENEFITS	PROGRAM FUEL SAVINGS	OTHER BENEFITS	TOTAL BENEFITS	NET BENEFITS	CUMULATIVE DISCOUNTED NET BENEFITS
	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)
1992	0	30	0	0	30	0	0	3	0	3	(27)	(27)
1993	0	0	0	0	0	0	0	6	1	7	7	(21)
1994	0	0	0	0	0	0	0	7	1	8	8	(14)
1995	0	0	0	0	0	11	4	8	1	23	23	3
1996	0	0	0	0	0	11	3	9	1	24	24	20
1997	0	0	0	0	0	11	3	10	1	25	25	36
1998	0	0	0	0	0	11	3	11	1	25	25	50
1999	0	0	0	0	0	11	3	12	1	27	27	64
2000	0	0	0	0	0	11	3	14	1	28	28	78
2001	0	0	0	0	0	10	3	15	1	30	30	91
2002	0	0	0	0	0	10	3	17	1	31	31	104
2003	0	0	0	0	0	10	3	18	1	32	32	115
2004	0	0	0	0	0	10	2	20	1	34	34	127
2005	0	0	0	0	0	11	2	22	1	36	36	138
2006	0	0	0	0	0	11	2	24	1	38	38	149
2007	0	0	0	0	0	11	2	26	1	40	40	159
NOMINAL	0	30	0	0	30	139	36	222	14	410	380	
NPV:	0	30	0	0	30	65	18	99	7	189	159	

Discount Rate 9.50%
 Benefit/Cost Ratio: col (11) / col (6) 6.3

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PARTICIPANT COSTS AND BENEFITS
 HVAC TUNEUP PILOT
 ----- DSM_RULE PROGRAM -----

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
YEAR	CUSTOMER EQUIPMENT COSTS \$(000)	CUSTOMER O & M COSTS \$(000)	OTHER COSTS \$(000)	TOTAL COSTS \$(000)	SAVINGS IN PARTICIPANTS BILL \$(000)	TAX CREDITS \$(000)	UTILITY REBATES \$(000)	OTHER BENEFITS \$(000)	TOTAL BENEFITS \$(000)	NET BENEFITS \$(000)	CUMULATIVE DISCOUNTED NET BENEFITS \$(000)
1992	0	0	0	0	6	0	0	0	6	6	6
1993	0	0	0	0	12	0	0	1	13	13	18
1994	0	0	0	0	12	0	0	1	13	13	29
1995	0	0	0	0	13	0	0	1	14	14	39
1996	0	0	0	0	13	0	0	1	14	14	49
1997	0	0	0	0	14	0	0	1	15	15	58
1998	0	0	0	0	14	0	0	1	15	15	67
1999	0	0	0	0	14	0	0	1	15	15	75
2000	0	0	0	0	15	0	0	1	16	16	83
2001	0	0	0	0	16	0	0	1	16	16	90
2002	0	0	0	0	16	0	0	1	17	17	97
2003	0	0	0	0	17	0	0	1	18	18	104
2004	0	0	0	0	18	0	0	1	19	19	110
2005	0	0	0	0	19	0	0	1	20	20	116
2006	0	0	0	0	20	0	0	1	21	21	122
2007	0	0	0	0	20	0	0	1	22	22	128
NOMINAL	0	0	0	0	240	0	0	14	254	254	
NPV:	0	0	0	0	121	0	0	7	128	128	
In service year of gen unit:			1995								
Discount rate:			9.50%								
Benefit/Cost Ratio: col (10) / col (5)				639.0							

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RATE IMPACT TEST
 HVAC TUNEUP P.I.C.
 ----- DSM_RULE PROGRAM -----

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
YEAR	INCREASED SUPPLY COSTS	UTILITY PROGRAM COSTS	INCENTIVES	REVENUE LOSSES	OTHER COSTS	TOTAL COSTS	AVOIDED GEN UNIT BENEFITS	AVOIDED T & D BENEFITS	PROGRAM FUEL BENEFITS	REVENUE	OTHER BENEFITS	TOTAL BENEFITS	NET BENEFITS TO ALL CUSTOMERS	CUMULATIVE DISCOUNTED NET BENEFIT
	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)	\$(000)
1992	0	30	0	6	0	36	0	0	3	0	0	3	(33)	(33)
1993	0	0	0	12	0	12	0	0	6	0	0	6	(6)	(38)
1994	0	0	0	12	0	12	0	0	7	0	0	7	(5)	(43)
1995	0	0	0	13	0	13	11	4	8	0	0	23	10	(36)
1996	0	0	0	13	0	13	11	3	9	0	0	23	10	(29)
1997	0	0	0	14	0	14	11	3	10	0	0	24	10	(23)
1998	0	0	0	14	0	14	11	3	11	0	0	25	10	(17)
1999	0	0	0	14	0	14	11	3	12	0	0	26	11	(11)
2000	0	0	0	15	0	15	11	3	14	0	0	27	12	(5)
2001	0	0	0	16	0	16	10	3	15	0	0	29	13	1
2002	0	0	0	16	0	16	10	3	17	0	0	30	14	7
2003	0	0	0	17	0	17	10	3	18	0	0	31	14	12
2004	0	0	0	18	0	18	10	2	20	0	0	33	15	17
2005	0	0	0	19	0	19	11	2	22	0	0	35	16	22
2006	0	0	0	20	0	20	11	2	24	0	0	37	17	27
2007	0	0	0	20	0	20	11	2	26	0	0	39	19	31
NOMINAL	0	30	0	240	0	270	139	36	222	0	0	396	126	
NPV:	0	30	0	121	0	151	65	18	99	0	0	182	31	

Discount rate: 9.50%
 Benefit / Cost Ratio - Col (12)/Col (7) 1.21

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PARTICIPATION STANDARDS

Participant eligibility and selection for the program will be determined as follows:

- * The residential single family detached home must be receiving electric service from Gulf Power Company.
- * All participants in the pilot program will be identified and offered the opportunity to participate as a result of Gulf's residential energy auditing process.
- * All work will be performed during the pilot program by licensed contractors selected and approved by Gulf Power.
- * Contractors will be required to check a minimum number of items and complete a pre and post servicing checklist. The checklist will be the basis to quantify the improvements in efficiency, BTUH capacity and compressor wattage reduction.
- * All program participating contractors will submit the completed required checklists and a complete work order. The work order will identify diagnostic comments of the condition of the equipment with the specific job time start to completion.
- * All customers participating in the pilot program will be personally contacted by a Gulf Power representative to verify all contractor tune-up program jobs reported.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Gulf Power Company's)
petition for approval of its)
proposed implementation of its)
HVAC Duct & Infiltration and)
HVAC Tune-up Programs as pilot)
study programs under Gulf's)
approved Energy Conservation Plan)

Docket No. 92 _____ -EG

Certificate of Service

I HEREBY CERTIFY that a true copy of the foregoing has been furnished this 12th day of March, 1992 by U.S. Mail to the following:

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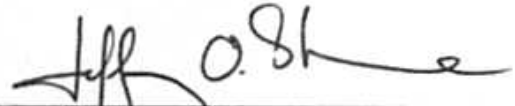
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