One Energy Place Pensacola, Florida 32520

850.444.6111

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ED )A PUBLIC CION 63  $^{\prime}$ GUL POV A SOUTHERN COMPANY

ORIGINAL

July 21, 1999

Ms. Blanca S. Bayo, Director Division of Records and Reporting Florida Public Service Commission 2540 Shumard Oak Boulevard Tallahassee FL 32399-0870

Dear Ms. Bayo:

RE: Docket No. 981591-EG

Attached is an original and fifteen copies of the testimony of T. S. Spangenberg filed on behalf of Gulf Power Company in the above docket.

Sincerely,

usan Ritenaur

Susan D. Ritenour Assistant Secretary and Assistant Treasurer

lw

Attachment

cc: FA NPP CAF CMA CTFOPC RRR SEC WAW OTH

Beggs and Lane Jeffrey A. Stone, Esquire

DOCUMENT NUMBER-DATE

08689 JUL 22 8 FPSC-RECORDS/REPORTING

# BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for authority to implement) Good Cents Conversion Program by ) Gulf Power Company )

Docket No. 981591-EG

## Certificate of Service

I HEREBY CERTIFY that a copy of the foregoing has been furnished this <u>22nd</u> day of July 1999 by U.S. Mail or hand delivery to the following:

Tiffany R. Collins, Esquire Staff Counsel FL Public Service Commission 2540 Shumard Oak Boulevard Tallahassee FL 32399-0863

Robert Elias, Esquire Staff Counsel FL Public Service Commission 250 Shumard Oak Boulevard Tallahassee FL 32399-0863

JEFFREY A. STONE Florida Bar No. 225953 RUSSELL A. BADDERS Florida Bar No. 0007455 Beggs & Lane P. O. Box 12950 Pensacola FL 32576 850 432-2451 Attorneys for Gulf Power Company

# THE FLORIDA PUBLIC SERVICE COMMISSION GOODCENTS CONVERSION PROGRAM GULF POWER COMPANY DOCKET NO: 981591-EG TESTIMONY AND EXHIBIT OF TED S. SPANGENBERG JULY 22, 1999

1		GULF POWER COMPANY
2		Before the Florida Public Service Commission Direct Testimony of
3		T. S. Spangenberg, Jr. Docket No. 981591-EG
4		Date of Filing: July 22, 1999
5	Q.	Please state your name, business address, and
6		occupation.
7	Α.	My name is T. S. (Ted) Spangenberg, Jr. My business
8		address is One Energy Place, Pensacola, Florida
9		32520. I am employed by Gulf Power Company as its
10		Residential Marketing Manager.
11		
12	Q.	Please summarize your educational and professional
13		background.
14	A.	I hold Bachelor's and Master's degrees in Electrical
15		Engineering from Auburn University. I have worked for
16		Gulf Power Company and its affiliates within the
17		Southern Company for the past 23 years. My experience
18		during that time frame includes positions and direct
19		work involvement in the areas of load research, market
20		research, demand forecasting, cogeneration, customer
21		service, line service, distribution field engineering,
22		transmission, executive administration, substation
23		engineering, and residential marketing. I am licensed
24		in several states, including Florida, as a Professional
25		Engineer.

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Do you have an exhibit to which you will refer in your 1 Ο. testimony? 2 Yes, I have an exhibit consisting of one schedule. 3 Α. (TSS-1) which is a written description of the 4 GoodCents Conversion Program as filed with the Florida 5 Public Service Commission (the Commission) for 6 approval. This exhibit was prepared under my 7 supervision and direction. 8 9 10 Counsel: We ask that Mr. Spangenberg's Schedule TSS-1 be marked as 11 12 Exhibit \_\_\_\_\_. 13 What is the purpose of your testimony in this Ο. 14 proceeding? 15 The purpose of my testimony is to provide information 16 Α. 17 about Gulf Power Company's proposed GoodCents Conversion Program (the Program) and to encourage the 18 Commission to approve it as a conservation program 19 eligible for cost recovery under the Energy 20 Conservation Cost Recovery (ECCR) mechanism as 21 provided by the Florida Energy Efficiency and 22 Conservation Act (FEECA). 23 24 25

Q. What are the key elements of the GoodCents Conversion
 Program?

The GoodCents Conversion program proposes the use of 3 Α. cash incentives to encourage Gulf Power's residential 4 customers to replace old and inefficient electric air 5 conditioners and fossil-fueled combustion home heating 6 devices with new, efficient, electric heat pumps. 7 Customer participation in the Program will result in 8 reduced annual electrical energy consumption and 9 significantly reduced summer peak electric demand. 10 Further, participating customers will also benefit as 11 a result of significantly reducing the total energy 12 requirements of their home. Customers who make this 13 replacement under the Program would receive a \$200 14 cash incentive, with their heating, ventilation and 15 air conditioning (HVAC) dealer receiving a \$50 cash 16 The GoodCents Conversion name reflects 17 incentive. the nature of the program, which is intended to 18 encourage customers to convert from older, less 19 efficient equipment to new, more efficient equipment. 20 A more complete description of the elements of the 21 GoodCents Conversion Program is contained in Schedule 22 As noted in that exhibit, the expected change TSS-1. 23 in peak kilowatt demand at the meter is a reduction of 24 1.90 kW per participant and the expected change in 25

Docket No. 981591-EG

Witness: T. S. Spangenberg, Jr.

annual electrical energy consumption is a reduction of 1,030 kWh at the meter. When the reduction in the participant's natural gas requirements are included, the typical impact is the conservation of 33.7 million Btu's of energy per year per participant at the meter.

Q. Were any recognized methodologies used to assess the
cost effectiveness of the GoodCents Conversion
Program?

10 Α. Yes. The Commission has an established, approved methodology for assessing the cost effectiveness of 11 12 energy conservation programs. This approved methodology is described in the publication "Florida 13 14 Public Service Commission Cost Effectiveness Manual for Demand Side Management Programs and Self-Service 15 16 Wheeling Proposals" adopted by the Commission in Rule 25-17.008, Florida Administrative Code. The approved 17 18 methodology was used in performing the assessments of the Program. The manual sets forth three critical 19 20 cost-effectiveness tests, the Ratepayer Impact Measure (RIM) Test, the Participant's Test, and the Total 21 Resource Cost (TRC) Test. In order to be cost-22 effective under any of these tests, a program must have 23 a benefits to cost ratio greater than 1.0. 24

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1 Using the approved methodology just described, is the 2 Q. 3 GoodCents Conversion Program cost effective? Yes. As depicted in Schedule TSS-1, all three key 4 Α. measures were at least 1.00. 5 In other words, the GoodCents Conversion Program passes all three tests of 6 cost-effectiveness specified in the Commission's 7 manual on cost effectiveness of conservation programs. 8 9 Please describe the assumptions that have been 10 Q. 11 incorporated in the cost-effectiveness analysis for the 12 GoodCents Conversion Program. The base home for modeling purposes is a 1680 square 13 Α. 14 foot home with an inefficient central air conditioning unit having an effective Seasonal Energy Efficiency 15 Ratio (SEER) of 7.0 and a central gas furnace with a 16 17 68% Annual Fuel Utilization Efficiency (AFUE). In Gulf's assumptions, the entire existing heating and 18 19 cooling system has been removed and replaced with a

- 20 heat pump having a SEER of 11.0 and a Heating Season
  21 Performance Factor (HSPF) of 7.4.
- 22

Q. Are the assumptions incorporated in the cost effectiveness analysis regarding summer peak demand,

A. Yes. These cost effectiveness evaluations are the
 result of the aforementioned system assumptions input

Docket No. 981591-EG

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Witness: T. S. Spangenberg, Jr.

into the Residential Building Energy Program (RBEP),
 which is an engineering model developed by the
 Southern Company and used by Gulf Power on many
 occasions for regulatory filings. Results from the
 RBEP program have been previously accepted by the
 Commission.

7

8 Q. How is it that the GoodCents Conversion Program
9 projects a reduction in annual kWh per participant
10 when a non-electric heating source is being replaced
11 by an electric one?

The typical efficiency rating of the equipment to be 12 Α. 13 replaced under this proposed program is 7.0 SEER. In order to qualify for the Program incentive, the 14 participant must install a heat pump with a rating of 15 at least 11.0 SEER. For the typical home, this yields 16 a reduction of 2,933 kWh for the cooling season, with 17 an addition of 1,903 kWh for the home's heating needs. 18 The net result is an expected reduction in annual 19 electricity use of 1,030 kWh. This is in addition to 20 the conservation of 302 therms of natural gas that is 21 also achieved. 22

- 23
- 24
- 25

What does FEECA require in terms of energy or demand 1 0. impact and cost effectiveness in order for a program 2 to be considered a qualifying conservation program? 3 Chapter 366.81, in its opening sentence, pronounces a 4 Α. legislative finding that "it is critical to utilize 5 the most efficient and cost-effective energy conservation systems. . . ". It is obvious from the 7 electrical kWh and natural gas therm reductions just 8 cited that encouraging the conversion of existing 9 furnace and air conditioner combinations to new heat 10 pumps promotes "the most efficient and cost-effective 11 conservation systems." Further, Chapter 366.81 states 12 that FEECA is to be "liberally construed" in order to 13 increase the "efficiency and cost-effectiveness of 14 electricity and natural gas use." There are two 15 specific requirements in FEECA to which our Program 16 applies. These are (1) reducing and controlling the 17 growth rate of electric consumption; and (2) reducing 18 the growth rate of weather-sensitive peak demand. 19 An electrical program that achieves either one of these 20 would qualify. The GoodCents Conversion Program 21 reduces annual kWh consumption and qualifies on that 22 count. It also reduces summer peak electric demand, 23 which is when Gulf Power's annual peak demand occurs, 24 so it would also qualify on that count. The proposed 25

Docket No. 981591-EG

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Witness: T. S. Spangenberg, Jr.

program also has the added benefit of reducing the growth rate of the weather-sensitive peak demand for natural gas, which in Northwest Florida is the winter peak demand for gas, hence, it would also qualify on that count.

8 Q. If this program did not produce a reduction in winter
9 electrical demand, a reduction in peak natural gas
10 demand, or a reduction in annual kWh but did cause a
11 reduction in Gulf's peak electrical demand, would it
12 qualify as a conservation program?

Absolutely. Any impact of this or any other Gulf 13 Α. Power program on winter electrical demand is 14 irrelevant as far as FEECA is concerned so long as the 15 summer demand is Gulf Power's weather-sensitive system 16 peak demand. Gulf Power plans additional generating 17 resources on the basis of reserves at the time of 18 summer peak demand. While any program that can help 19 reduce the growth rate of annual energy consumption, 20 reduce weather-sensitive peak electrical demand or 21 reduce weather sensitive natural gas peak demand 22 brings added appeal, as long as one of these three 23 criteria is addressed, it satisfies the requirements 24 25 of FEECA.

6

7

Witness: T. S. Spangenberg, Jr.

1 2 3 Ο. Is there any precedent before the Commission in which 4 a program has been approved for cost recovery under the ECCR clause when there was not a reduction in more 5 than one criterion e.g. weather-sensitive peak 6 electrical demand and annual kWh? 7 8 Yes, there is. Several utilities have received Α. 9 approval for ECCR recovery load management programs 10 that reduce peak demand with no reduction in annual 11 energy consumption. 12 13 Was this program designed simply as a sales tool for 14 Ο. competing against natural gas? 15 No, it was not. Gulf Power Company has a long history 16 Α. 17 of pioneering efforts to help customers conserve 18 energy, dating at least as far back as the initiation 19 of our nationally acclaimed GoodCents Home program in 20 the 1970s. Continuing that tradition, we are 21 constantly pursuing ideas for new programs to enhance energy efficiency. The HVAC system is the single 22 23 largest energy user in a typical home. As the company 24 went about planning a program to increase the energy efficiency of HVAC systems, thereby reducing summer 25

1 electrical demand, the use of promotional incentives were considered because those seem to be one of the 2 3 most effective tools in today's marketplace for encouraging consumer action. However, the company 4 wanted to ensure that all promotional offerings to 5 6 customers were cost-effective. In all our 7 considerations for potential HVAC upgrade programs, 8 with the natural exception of our geothermal initiatives, we assumed that the cooling aspect of 9 existing and replacement systems would be the 10 traditional refrigerant cycle with air-to-air heat 11 12 exchange. For the heating cycle we analyzed electric 13 resistance heat, gas furnaces, and air-to-air heat 14 pumps. While knowing that 7.0 SEER was a good average 15 for existing systems, we also considered higher SEER's, i.e. newer equipment, for the system being replaced, 16 17 realizing that the higher SEER's would make the cost-18 effectiveness tests more difficult to pass. The company did everything reasonable to ensure rigor in 19 20 its analyses. The cost effectiveness tests results for 21 these other variations are shown in Schedule TSS-1 and 22 indicate that the only combination that passed the necessary cost-effectiveness tests was going from a gas 23 furnace, regardless of equipment vintage, to a heat 24 25 pump. In short, an attempt was made to include the

Witness: T. S. Spangenberg, Jr.

1 cooling-only upgrade with a gas furnace, as well as the 2 change-out of an older heat pump, but these failed the 3 cost-effectiveness tests. Leaving a gas furnace in 4 place and replacing just the 7.0 SEER cooling equipment 5 with 11.0 SEER equipment only achieves a savings of 6 10.0 million Btu's, or only 30% of the 33.7 million 7 Btu's conserved with this proposed Program.

9 Q. Is there any precedent for the Commission approving a
10 program for cost recovery under the ECCR clause when
11 the program benefits the requesting company's product
12 sales in lieu of a competing product?

In fact the Commission has approved electric 13 Α. Yes. replacement programs for ECCR treatment for natural gas 14 distributors that provide significant cash rebates to 15 participants only if they are replacing electric 16 heating equipment with natural gas equipment. Given 17 this established practice of the Commission, the 18 company sees no reason why the GoodCents Conversion 19 program should not also be approved. The Program as 20 proposed results in cost-effective conservation by 21 reducing the growth rates of weather-sensitive peak 22 electrical demand and electric consumption. 23

24

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1 Ο. Why does Gulf Power believe it is necessary to use 2 incentives to encourage its customers to install 3 energy-efficient, electric heat pumps? Α. The decision to install a high-efficiency heat pump, 4 5 either as a replacement to an older heat pump or as a replacement to a gas furnace, has been impeded by false 6 and/or deceptive advertising about the benefits of 7 8 natural gas use in Northwest Florida. This use of advertising and promotional materials has confused 9 10 consumers by portraying the operating costs of heat 11 pumps using national average heat pump efficiencies. 12 national average electricity costs and national average 13 natural gas costs. Typically, the above mentioned 14 advertising and promotional materials falsely portray resistance heating efficiencies as typical electrical 15 heating efficiencies, and/or base cost comparisons on 16 Btu's entering the home without consideration for heat 17 18 transfer equipment efficiencies, which must be considered in determining what customers will actually 19 In addition to the presence of such false and/or 20 pay. deceptive advertising in the marketplace, most gas 21 distributors in Northwest Florida have been providing 22 cash incentives to consumers to replace heat pumps with 23 gas furnaces. The costs of these incentives and the 24 associated advertising are passed directly through to 25

Witness: T. S. Spangenberg, Jr.

the general body of customers either through the ECCR 1 mechanism or through rates that are not subject to 2 review and approval by the Florida Public Service 3 Commission. I feel the \$200 customer incentive that is an element of the GoodCents Conversion Program is 5 needed in order to help get the individual consumer's 6 attention long enough for them to understand the 7 energy saving and household budget benefits of 8 installing a highly efficient heat pump. 9

10

As a rule, are customers likely to replace existing 11 0. inefficient HVAC equipment only when it fails? 12 No. The best quantitative data available for Northwest 13 Α. Florida on this issue is from a mid-1980's study of 14 over 400 consumers who changed out their HVAC systems 15 to heat pumps. Only 27.3% of those consumers gave 16 "needed major repairs" as the reason for replacing 17 their system. Other predominant reasons given included 18 "operating cost too high"-18.2% and "rebate"-19.9%. 19 Regardless of how likely consumers are to replace their 20 equipment only when it fails absent a rebate or other 21 promotional incentive, they are much less likely to 22 replace it only for that reason when an effective 23 incentive is available, such as the one included in our 24 proposed Program. I believe the earlier 73.7% finding 25

for replacing a system for reasons other than failure
 is generally representative of what could be expected
 with our proposed Program.

4 5

6 Q. Do you believe the Commission should approve this7 program for ECCR treatment?

Since this program, as demonstrated through the 8 Α. Yes. 9 RIM test, provides benefits to all ratepayers, the ECCR 10 funding mechanism provides a means for those ratepayers 11 to financially contribute to its success. Absent ECCR. 12 while it might remain cost-effective from a ratepayer 13 perspective, the delay in a positive impact on the company's financial earnings and stockholder benefits 14 15 make the program a difficult proposition for moving 16 ahead under normal cost recovery mechanisms. This Program reduces peak summer electrical demand, 17 reduces annual kWh consumption, and is cost-effective 18 under the RIM Test, Participant Test, and TRC Test. 19 The GoodCents Conversion Program promotes energy-20 21 efficiency and reduces Florida's dependence on outside energy sources, all consistent with FEECA and good 22 public policy. As an unintended benefit, it also 23 reduces weather-sensitive peak natural gas demand. 24 Because of the intended, expected results and the 25

Docket No. 981591-EG

1		consistency with past practice, I believe the
2		Commission should approve this Program.
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5	Q.	Does this conclude your testimony?
6	Α.	Yes.
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#### AFFIDAVIT

STATE OF FLORIDA ) ) COUNTY OF ESCAMBIA )

Docket No. 981591-EG

Before me the undersigned authority, personally appeared T. S. Spangenberg, Jr., who being first duly sworn, deposes and says that he is the Residential Marketing Manager of Gulf Power Company, a Maine Corporation, that the foregoing is true and correct to the best of his knowledge, information and belief. He is personally known to me.

Fr. S. Spangenberg, т.

Residential Marketing Manager

Sworn to and subscribed before me this <u>9</u> day of \_\_\_\_\_\_ day of \_\_\_\_\_\_, 1999.

State of Florida at Large Notary Public,



Florida Public Service Commission Docket No. 981591\_EG Gulf Power Company Witness: T. S. Spangenberg Exhibit No. \_\_\_\_ (TSS-1) Page 1 of 9

# **GoodCents**<sup>®</sup> Conversion Program

### **Program Description**

The objective of the **GoodCents**<sup>®</sup> Conversion Program is to provide Gulf Power Company's residential customers and equipment contractors an incentive to replace inefficient gas furnace and air conditioning systems with high efficiency heat pump systems. This program will encourage earlier replacement of these equipment types resulting in immediate energy savings for the customer, an increase in ground source efficiency, and energy and peak demand reductions benefiting Gulf Power Company and its general body of customers.

Gulf Power will identify potential program participants through the Residential Energy Audit Program as well as through educational and promotional activities.

#### Program Guidelines

In order to qualify for participation in the **GoodCents**<sup>®</sup> *Conversion Program*, customers must have an On-site Energy Audit performed by a Gulf Power Residential Energy Consultant. Each Energy Audit will result in written recommendations to the customer, which may include lifestyle factors, improvements to the home's thermal envelope, and mechanical equipment upgrades/modifications. In addition, the Energy Consultant may provide detailed computer analysis of the customer's home in order to determine proper equipment sizing and demonstrate potential savings to the customer.

All heat pump installations must meet mechanical code requirements and have a minimum Seasonal Energy Efficiency Rating (SEER) of 11.0. Described heat pump installations replacing primary heating systems fueled by gas, propane, or fuel oil will qualify the customer for a rebate of \$200 and the installing heating and cooling contractor or salesperson an incentive of \$50 per system. Installations occurring without the necessary Gulf Power Energy Audit will not qualify for any incentive.

Qualifying installations will be reported by the Gulf Power Residential Energy Consultant to the appropriate support personnel located in Gulf Power's Corporate Office Residential Marketing Department in order to facilitate payment. A sample rebate form is included on page 4 of this exhibit.

Florida Public Service Commission Docket No. 981591\_EG Gulf Power Company Witness: T. S. Spangenberg Exhibit No. \_\_\_\_ (TSS-1) Page 2 of 9

#### **Participation Standards**

The **GoodCents**<sup>®</sup> *Conversion Program* is available to all residential customers within Gulf Power's service territory with an existing combustion furnace as the primary source of heating for the home and to cooling and heating equipment contractors performing work for these customers.

#### **Benefits and Costs**

Participating customers will benefit from reduced energy consumption in their homes resulting in lower energy bills. Energy calculations indicate an expected or average annual reduction of 1,030 kWh and 302 therms of natural gas. Additional benefits related to cost of maintenance and repair of customers' cooling and heating systems will be realized by early retirement of this equipment and replacement with new heat pump systems. Our environment will benefit by these customer actions because of a 39% reduction in ground source BTU consumption.

For Gulf Power Company, benefits include kWh reduction, kW demand savings, consumer education, and customer satisfaction. The kWh and kW demand savings are based on Residential Building Energy Program (RBEP) computer simulations. This analysis assumes that a customer in an average home of 1,680 square feet replaces a three ton air conditioner with a Seasonal Energy Efficiency Rating (SEER) of 7.0 and a 68% Annual Fuel Utilization Efficiency (AFUE) gas furnace with a heat pump having a SEER of 11.0 and a Heating Season Performance Factor (HSPF) of 7.4. RBEP comparisons based on these assumptions indicate that these installations will result in an annual energy reduction of 1,030 kWh and a summer demand reduction of 1.9 kW.

#### **Monitoring and Evaluation**

Gulf Power will monitor this program through its existing Gulf Account Reporting System (GARS) which will enable the tracking of homes making this equipment change. Gulf Power will validate engineering analysis of energy and demand savings with billing data and sample metering of customer equipment.

## **Cost Effectiveness**

This program is cost effective using the Commission's approved methodology (Rule 25-17.008). The cost-effectiveness calculation is included on pages 5 - 8.



While the assumptions used in calculating the cost effectiveness of the program as filed were the most logical and most probable, other scenarios were analyzed as a matter of interest and rigor. The results of those analyses are shown on page 9.

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Florida Public Service Commission Docket No. 981591-EG Gulf Power Company Witness: T.S. Spangenberg Exhibit No. \_\_\_\_ (TSS-1) Page 4 of 9

# **GoodCents**<sup>®</sup> Conversion Program

### **\$200 Customer Rebate**

Customer Name

Installation Address

Gulf Power Account Number

Social Security Number

Mailing Address

City, State & Zip Code

**§50 Salesman Rebate** 

HVAC Dealer Name

Salesman/Rebate Payee

Social Security Number

Mailing Address

City, State & Zip Code

Equipment Installation Date

Equipment Model Number (Outdoor Unit)

Efficiency Rating (SEER)

Gulf Power Energy Consultant

Date

Page 1 of 1 10-Nov+98 Run Date: 09:12 AM Filename: gthp\_1

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#### **INPUT DATA - PART 1**

#### Cost-Effectiveness Analysis per Rule 25-17.008 Florida Administrative Code

Program Demand impacts and Line Losses			1
(1) Change in Peak kW Customer at meter	-1.90	kW/Cus	I
(2) Change in Peak kW per Customer at generator	-2.46	kW Gen/Cu:	1
(3) kW Line Loss Percentage	12.60%		I
(4) Change in KWh per Customer at generator	(1,109)	kWh/Cus/Yr	۱
(5) kWh Line Loss Percentage	7.70%		I
(6) Group Line Loss Multiplier	1.0014		1
(7) Annual Change in Customer kWh at Meter	(1,030)	kWh/Cus/Yr	ł
* (8) Change in Winter kW per Cust at meter	4.40	kW/Cus	Ì
	Program Demand Impacts and Line Losses         (1) Change in Peak kW Customer at meter         (2) Change in Peak kW per Customer at generator         (3) kW Line Loss Percentage         (4) Change in KWh per Customer at generator         (5) kWh Line Loss Percentage         (6) Group Line Loss Multiplier         (7) Annual Change in Customer kWh at Meter         * (8) Change in Winter kW per Cust at meter	Program Demand Impacts and Line Losses(1) Change in Peak kW Customer at meter-1.90(2) Change in Peak kW per Customer at generator-2.46(3) kW Line Loss Percentage12.60%(4) Change in KWh per Customer at generator(1,109)(5) kWh Line Loss Percentage7.70%(6) Group Line Loss Multiplier1.0014(7) Annual Change in Customer kWh at Meter(1,030)* (8) Change in Winter kW per Cust at meter4.40	Program Demand Impacts and Line Losses(1) Change in Peak kW Customer at meter-1.90kW/Cus(2) Change in Peak kW per Customer at generator-2.46kW Gen/Cus(3) kW Line Loss Percentage12.60%(4) Change in KWh per Customer at generator(1,109)kWh/Cus/Yr(5) kWh Line Loss Percentage7.70%(6) Group Line Loss Multiplier1.0014(7) Annual Change in Customer kWh at Meter(1,030)kWh/Cus/Yr* (8) Change in Winter kW per Cust at meter4.40kW/Cus

#### II. Economic Life and K-Factors

(1) DSM Program Study Period	30	Years	
(2) Economic Life of Incremental Generation	40	Years	
(3) Economic Life of Incremental T&D	30	Years	
(4) K-Factor for Generation	1.4493		
(5) K-Factor for T&D	1.4394	• . •	
(6) Switch: Rev Req (0) or Val-of-Def (1)	Ō		

#### III. Utility & Customer Costs

\$150.00	\$/Cus I
\$0.00	\$/Cus/Year
3.06%	1 Sec. 1
\$3,000.00	\$/Cus
3.06%	
(\$287.00)	\$/Cus/Year ]
3.06%	
\$0.00	\$/Cus
3.06%	1
\$0.00	\$/Cus/Year 1
3.06%	í i
8.97%	1
10.30%	
\$200.00	\$/Cus I
\$0.00	\$/Cus/Year
0.00%	
	<u> </u>
	\$150.00 \$0.00 3.06% \$3,000.00 3.06% (\$287.00) 3.06% \$0.00 3.06% \$0.00 3.06% 8.97% 10.30% \$200.00 \$0.00

 Supplemental Information Not Specifically Specified in Cost Effectiveness Manual
 The relevant avoidable generation unit is a combustion turbine peaking unit. Since the kilowatt savings occur at the time of the system peak, this is the appropriate unit against which to measure cost savings.

IV.	Incremental Generation, Transmission, & Distributi	on Costs	
	(1) Base Year	1999	
	(2) In-Service Year For Incremental Generation	2001	**
,	(3) In-Service Year For Incremental T & D	2000	
	(4) Base Year Incremental Generation Cost	\$234.85	\$/kW
	(5) Base Year Incremental Transmission Cost	\$58.75	\$/kW
	(6) Base Year Incremental Distribution Cost	\$33.00	\$/kW
	(7) Gen, Tran, & Dist Cost Escalation Rate	2.56%	
	(8) Generator Fixed O & M Cost	\$2.77	\$/kW/Yr
	(9) Generator Fixed O&M Escalation Rate	2.99%	
	(10) Transmission Fixed O & M Cost	\$0.73	\$/kW/Yr
	(11) Distribution Fixed O & M Cost	\$0.84	\$/kW/Yr
	(12) T&D Fixed O&M Escalation Rate	2.56%	
	(13) Incremental Gen Variable O & M Costs	\$0.433	\$/kW/Yr
	(14) Incre Gen Variable O&M Cost Esc Rate	3.84%	
•	(15) Incremental Gen Capacity Factor	3.40%	
e.	(16) Incremental Generating Unit Fuel Cost	\$0.0356	\$/kWh
÷.	(17) Incremental Gen Unit Fuel Esc Rate	3.00%	
1.1.1 <b>#</b> 16.2	(18) Incremental Purchased Capacity Cost	\$20.70	\$/KW/YR
ar £3 <b>⊕</b> 1	(19) Incremental Capacity Cost Esc Rate	2.56%	
11	Stop Revenue Loss at In-Service Year? (Y=1, N=0)	0	-
<u>v</u> .	(1) Non-Fuel Cost in Customer Bill (Base Year)	• •	
	(1) Non-Fuel Cost In Customer Bill (Base Year)	\$0.0352	\$/kWh
	(2) Non-Fuel Escalation Rate	Per Table	-
	(3) Customer Demand Charge Per kW (Base Year)	\$0.0000	\$/kW/Mo
	(4) Demand Charge Escalation Rate	Per Table	
•	(5) Average Annual Change in Monthly Billing kW	0	kW/Mo.

*			
5 - 11 - 11 - 11 - 11 - 11 - 11 - 11 -	Summary Results for This Analysis		
		RIM	Participants'
	NPV Benefits(\$000s)	\$7,153	\$21,592
1997 - 19	NPV Costs (\$000s)	\$4,114	\$13,094
	NPV Net Benefits (\$000s)	\$3,039	\$8,498
	Benefit:Cost Ratio	1.739	1.649

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Total Resource Cost-Effectiveness Measure

Vaa-	Change in Electric Supply Costs	Utility's Program Costs	Participants' Program Costs	Other Costs	Other Benefits	Incremental Generation Cap Costs	Incremental T&D Cap Costs	Incremental Prog Induced Fuel Costs	Total Costs	Total Benefits	Total Net Benefits	Cumulative Discounted Not Benefits
1999	(20005)	(a000s) \$75	\$1 357	(a000s) \$0	(auous) \$0	(\$35)	(\$000s) \$0	(\$0005)	(\$0005) \$1 432	(50005)	(\$1.385)	(\$1.38
2000	\$0	\$155	\$2,648	\$0	\$0	(\$106)	(\$79)	(\$36)	\$2,803	\$221	(\$2,582)	(\$3,75
2001	\$0	\$159	\$2,424	\$0	\$0	(\$185)	(\$126)	(\$60)	\$2,584	\$371	(\$2,212)	(\$5,61
2002	\$0	\$164	\$2,184	\$0	\$0	(\$263)	(\$169)	(\$86)	\$2,349	\$518	(\$1,830)	(\$7,03
2003	\$0	\$169	\$1,928	\$0 \$0	\$0 \$0	(\$348)	(\$209)	(\$112)	\$2,097	\$669	(\$1,428)	(\$8,04
2004	\$U \$U	907 \$07	₹70 (¢1 720)	30 \$0	a)U ¢n	(\$400) (\$/13)	(\$222)	(\$120)	\$103 ¢0	ቅ/48 ድጋ ለ75	\$363 \$2.475	(\$/,00 (\$6.10
2005	\$0	\$0	(\$1,720)	\$0 \$0	\$0	(\$422)	(\$205)	(\$130)	\$0 \$0	\$2,475 \$2,530	\$2,475	(\$0,10
2007	\$0	\$0	(\$1,827)	\$0	\$0	(\$431)	(\$197)	(\$135)	\$0	\$2,590	\$2,590	(\$3,49
2008	\$0	\$0	(\$1,883)	\$0	\$0	(\$441)	(\$189)	(\$139)	\$0	\$2,652	\$2,652	(\$2,27
2009	\$0	\$0	(\$1,940)	\$0	\$0	(\$454)	(\$181)	(\$141)	\$0	\$2,717	\$2,717	(\$1,12
2010	\$0	\$0	(\$2,000)	\$0	\$0	(\$467)	(\$173)	(\$144)	\$0	\$2,783	\$2,783	(\$4
2011	\$0	\$0	(\$2,061)	\$0	\$0	(\$480)	(\$165)	(\$149)	\$0 \$0	\$2,854	\$2,854	\$97
2012	3U	90 \$0	(\$2,124)	\$0 \$0	\$0 \$0	(\$494) /\$607)	(\$157) (\$149)	(\$154)	\$0 \$0	\$2,928 \$3,000	\$2,920	\$1,93 \$2,93
2013	30 \$0	\$0 \$0	(\$2,105)	\$0	\$0	(\$521)	(\$140)	(\$153)	\$0	\$3,000	\$3.071	\$3.68
2015	\$0	\$0	(\$2,325)	\$0	\$0	(\$535)	(\$133)	(\$154)	\$0	\$3,147	\$3,147	\$4.48
2016	\$0	\$0	(\$2,396)	\$0	\$0	(\$549)	(\$129)	(\$151)	\$0	\$3,225	\$3,225	\$5,22
2017	\$0	\$0	(\$2,470)	\$0	\$0	(\$564)	(\$126)	(\$150)	\$0	\$3,309	\$3,309	\$5,93
2018	\$0	\$0	(\$2,545)	\$0	\$0	(\$580)	(\$122)	(\$159)	\$0	\$3,406	\$3,406	\$6,59
2019	\$0	\$0	(\$2,623)	\$0	\$0	1993) - A <b>(\$603)</b>	(\$119)	(\$163)	\$0	\$3,508	\$3,508	\$7,22
2020	\$0	\$0 \$0	(\$2,703)	\$0	\$0	(\$627)	(\$115)	(\$168)	\$0	\$3,614	\$3,614	\$7,82
2021	\$U \$0	\$0 \$0	(\$2,700) (\$2,872)	ອບ \$0	04 \$0	(\$672)	(\$112)	(\$174)	30 \$0	\$3,724 \$3,831	\$3,724	30,30 \$8,91
2022	50	\$0	(\$2,959)	\$0	\$0	(\$692)	(\$106)	(\$184)	\$0	\$3,942	\$3,942	\$9,41
2024	\$0	\$0	(\$3,050)	\$0	\$0	(\$713)	(\$102	(\$190)	\$0	\$4,056	\$4,056	\$9,89
2025	\$0	\$0	(\$3,144)	\$0	\$0	(\$7.35)	(\$99	(\$196)	\$0	\$4,173	\$4,173	\$10,33
2026	\$0	\$0	(\$3,240)	\$0	\$0	(\$757)	(\$96	(\$202)	\$0	\$4,294	\$4,294	\$10,7
2027	\$0	\$0	(\$3,339)	\$0	\$0	(\$780)	(\$93)	) (\$208)	\$0	\$4,420	\$4,420	\$11,10
2028	\$0	) <b>\$</b> 0	(\$3,441)	\$0	\$0	(\$803)	) (‡an	) (\$214)	20	\$4,549	\$4,549	\$11,5
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Nomina NP1	/	\$810 \$85!	) (\$49,047) 5 (\$5,038)			(\$4,260	) (\$1.613	) (\$4,355) ) (\$1,280)	\$11,420	\$03,371 \$21,124	\$11.536	
	Discount Rate -	8.97%					LAAZ:I:::=	L,				
Be	efit/Cost Ratio	2.20				، «معرب اور ا						
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Florida Public Service Commission Docket No. 981591-EG Gulf Power Company Witness: T.S. Spangenberg Exhibit No. (TSS-1) Page 6 of 9

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Participants' Cost-Effectiveness Measure

Clashing of a strand in the strand	Cumulative		(01)	(6)	Paid			- 77	Change in	(G)	(5)		121	
5059       20       (2)       40       20	Discounted Viet Benefits	19N Stifene8	tetoT stilened (-cont)	Lotal Costs	es & sevit (20	Rebai Incen		xsT atibenO	Participants'	stilene8	Other Costs (20002)	Customer OSM Costs	Customer Equip Costs	1097
5059       20       <	66 15) (80004)	(80004)	GLGS	1000 15	001\$	noel	US	lenone	10051	05	US (soort)	(7715)	00915	6661
5059       20       (20)       20       (20)       20	6E'E <b>\$</b> )	(\$5'364)	\$728	23.092	2500		0\$		(58\$)	0\$	0\$	(***\$)	260'2	0000
5058       20       <	91' <b>9\$</b> )	(\$5,089)	260'1\$	781,5 <b>2</b>	\$500	1 T - 57	-0\$		(9615)	0\$	0\$	(\$162)	781,62	1000
5059       20       (20       (20       20	ee:9\$)	(682'1\$)	567'1\$	\$3,284	\$500	۸.	0\$		(961\$)	0\$	0\$	(001'1\$)	23,284	2002
2009       20       <	69° <b>2\$</b> )	(\$84,12)	106'1\$	586'E <b>\$</b>	2500		0\$	·	(\$544)	0\$	0\$	(254,12)	586'E <b>\$</b>	6003
5059       20       (2)       (	6 <b>6°2\$</b> )	EOES	<b>\$</b> 5,047	\$\$L'1\$	001\$		: O\$	5 · ·	(\$278)	0\$	0\$	(699'1\$)	\$1°244	<b>\$00</b>
5059       20       (2)       (	(\$9`50	966' \$	866 1\$	0\$	0\$		: 0\$	· .	(8722)	0\$	0\$	(\$1,720)	0\$	500
5058       20       20       20       20       20       20       23       20       23       20       23       20       23       20       23       20       23       20       23       20       23       20       23       20       23       20       23       20       23       20       23       20       23       20       20       20       20       20       23       23       20       23       23       20       23       20       23       23       20       23       23       20       23       23       23       20       23       23       23       23       23       23       23       23       23       23       23       <	L0' <b>S\$</b> )	\$5,053	\$5,053	0\$	0\$		0\$		(1828)	0\$	0\$	(211,12)	0\$	9008
5059       20       (2)       40       20	10' <b>1\$</b> )	\$11,5 <b>\$</b>	\$2,114	0\$	0\$		0\$		(\$288)	0\$	0\$	(\$1,827)	0\$	200
5058       20       (2)       (	10'6\$)	\$5'169	<b>\$</b> 5'169	0\$	0\$		.0\$		(2825)	0\$	0\$	(688,1 <b>2</b> )	0\$	8007
5058       20       <	(\$5'09.	\$5,230	25'230	0\$	0\$		0\$		(062\$)	0\$	0\$	(0+6'1\$)	0\$	6007
S058       20       (2)       40       (2)       20       20       20       20       20       23       200       23	21'1\$)	\$5,292	25'235	0\$	0\$		0\$		(267\$)	0\$	0\$	(\$5'000)	0\$	010
S058       20       (23/41)       20	EES)	296,58	256,357	0\$	0\$		0\$	- -	(967\$)	0\$	0\$	(190'2\$)	0\$	1107
S028       20       (23,441)       20	9 <del>1/\$</del>	25'453	25'453	0\$	0\$		0\$		(\$533)	0\$	0\$	(\$5'154)	0\$	210
5058       20       <	21,20	25'491	25'481	0\$	0\$		20		(205\$)	0\$	0\$	(25'183)	0\$	610
5058       20       <	16'1\$	25'285	25'285	0\$	20		0\$		(90£\$)	0\$	0\$	(25'522)	20	10
S058       20       <	25'2\$	25'934	25'634	0\$	20		0\$		(602\$)	0\$	20	(25'352)	0\$	SLOZ
5058       20       <	23'50	85'100	25'100	20	20	S. 10	105	1-21-22	(ELES)	0\$	20	(25'336)	20	9102
5058       20       <	23'80	25'188	25'2\$	20	0\$	1.	0\$	$\mathcal{A}_{\mathcal{X}} = \frac{1}{2}$	(2316)	20	20	(25'410)	20	2102
5058       20       <	24'36	\$5,865	25'862	20	0\$		20	1.11	(0223)	20	0\$	(25'242)	0\$	810
5058       20       <	39' <b>+</b> \$	/\$6'2\$	/#8'2\$	20	05	and, <sup>2</sup> ,	20	1.1	(\$354)	20	0\$	(25'953)	0\$	6107
S058       20       <	22'38	23'031	150'5\$	20	05		0\$		(2358)	20	20	(25'103)	0\$	070
SOSE       20       <	88'G <b>\$</b>	RLL'ES	811'5\$	20	0\$	• •	20	794 C 1	(ZEE\$)	20	20	(25'188)	20	1202
SOSE       20       <	26'30	802'208	23'508	0\$	0\$		20		(9239)	0\$	0\$	(\$2,872)	0\$	5055
S0S9       20       <	2/'9\$	23°300	23'300	20	0\$		0\$		(1+6\$)	0\$	20	(\$5'823)	0\$	5023
S0S9       20       20       20       20       20       20       20       20       20       20       20       21/200       29/4       29/4       29/4       29/4       29/4       29/4       20       20       20       20       20       20       20       20       20       20/4       29/4       29/4       29/4       29/4       29/4       20/4	21'/\$	23'368	962'28	20	0\$		.05	1.1	(9+2\$)	0\$	0\$	(090'6\$)	0\$	5024
SOS® 20 (23'441) 20 20 (234) 20 20 20 20 20 23'908 23'908 23'908 23'908 29'40 SOS\$ 20 (23'333) 20 20 (2361) 20 20 20 20 23'908 23'98 25'48 SOS€ 20 (23'540) 20 20 (23'56) 20 20 20 23'986 23'986 25'8	67'/\$	23'464	23'464	20	0\$		20		(190\$)	0\$	0\$	(\$3,144)	0\$	5052
5059 20 (23'441) 20 20 (23'441) 20 20 (23'41) 20 20 20 23'908 23'909 29'4	21'84	23'288	969'E\$	0\$	0\$		20		(2222)	0\$	20	(23'540)	0\$	<b>505</b> 6
	67'8 <b>\$</b> 67'8 <b>\$</b>	909'E\$ 202'E\$	808'E\$	0\$ 0\$	0\$ 0\$	· .	20 20		(296\$) (196\$)	0\$ 0\$	0\$ 0\$	(656,6 <b>2</b> ) (144,6 <b>2</b> )	20 20	2028 2028
									Jer og					
$r_{M,L} = r_{M,L} + r_{M$							12							
$r_{2} = \frac{r_{1}}{r_{2}} \left[ \frac{r_{1}}{r_{2}} + \frac{r_{2}}{r_{1}} + \frac{r_{2}}{r_{2}} + \frac{r_{1}}{r_{2}} + \frac{r_{2}}{r_{2}} + \frac{r_{2}}{r_{2}} + \frac{r_{2}}{r_{2}} + \frac{r_{2}}{r_{2}} + \frac{r_{1}}{r_{2}} + \frac{r_{2}}{r_{2}} + \frac$									1					
$r_{2} = \frac{1}{2} \frac{1}$														

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Ratepayers' Impact Cost-Effectiveness Measure ctiveness Analysis per Rule 25-17.008 Florida Administr Cost-Effe e Code

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Change in Bischic (monitive)         Utility Fall         Change in Incommental Incommental (Exp Casts)         Incommental (Exp Casts)         Incommental (Exp Casts)         Total Met         Canual Bendits to (Exp Casts)         Total Met (Exp Casts) <thtp> (Exp Casts)         Total Met (Exp Cas</thtp>		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Exercitic         Program         Relates & Electric         Electric         Cancel Cast         Electric         Cancel Cast         Cast <th< th=""><th></th><th></th><th>Change in</th><th>Utility's</th><th>Utility Paid</th><th>Change in</th><th>Incremental</th><th>incremental</th><th>Incremental</th><th></th><th></th><th></th><th></th><th>Total Net</th><th>Cumulative</th></th<>			Change in	Utility's	Utility Paid	Change in	Incremental	incremental	Incremental					Total Net	Cumulative
bulgpr Josta         Costa         Hermine         Cap Costa         C			Electric	Program	Rebates &	Electric	Generation	T&D	Prog Induced	Other	Other	Total	Total	Benefits to	Discounted
Team         (puccos)         (puccos) <t< th=""><th></th><th></th><th>Supply Costs</th><th>Costs</th><th>Incentives</th><th>Revenues</th><th>Cap Costs</th><th>Cap Costs</th><th>Fuel Costs</th><th>Costs</th><th>Benefits</th><th>Costs</th><th>Benefits</th><th>All Customers</th><th>Net Benefits</th></t<>			Supply Costs	Costs	Incentives	Revenues	Cap Costs	Cap Costs	Fuel Costs	Costs	Benefits	Costs	Benefits	All Customers	Net Benefits
2000         50         515         2000         (515)         (516)         60         50         203         221         12210         12211         12210         12210         12210         12210         12210         12210         12210         12210         12210         12210         12210         12210         12210         12210         12210         12211         12210         12211         12210         12211		Year 1000	(\$000s)	(\$000s)	(\$000s)	(\$000)	(\$0005)	(\$0005)	(\$0005)	(\$0005)	(\$000s)	(\$000s)	(\$000s)	(\$0005)	(\$0005)
S0         S153         S1200         (S153)         (S163)		2000	\$0 \$0	\$75 \$155	\$200	(#29) (\$85)	(606) (\$108)		(\$11) (\$26)		\$U \$0	Ф204 \$430	240 \$221	(\$100) (\$218)	(\$150) (\$358)
2002         50         \$1164         \$2000         \$1105         \$12233         \$16160         \$1200         \$100         \$1213         \$100         \$1213         \$100         \$100         \$1213         \$100		2000	\$0 \$0	\$150 \$150	\$200	(403) (\$135)	(\$100)	(\$198) (\$198)		06 N	30 \$0	\$405	\$22   \$371	(\$210)	(\$300)
2003         50         \$169         \$200         (\$200)         (\$112)         50         50         \$153         \$569         \$56         \$56         \$56         \$56         \$56         \$56         \$578         \$222         \$578         \$222         \$578         \$278         \$788         \$478         \$152           2005         \$0         \$0         \$0         \$0         \$0         \$0         \$221         \$170         \$78         \$788         \$478         \$1578         \$447         \$1577           2006         \$0         \$0         \$0         \$0         \$0         \$0         \$2288         \$783         \$447         \$573           2009         \$0         \$0         \$0         \$0         \$0         \$0         \$0         \$288         \$784         \$441         \$1,13           2010         \$0         \$0         \$0         \$0         \$2288         \$784         \$441         \$1,13           2011         \$0         \$0         \$0         \$0         \$0         \$2289         \$777         \$443         \$430         \$1,173         \$1414         \$1,05         \$1,0         \$2298         \$1412         \$1411         \$10		2001	\$0	\$164	\$200	(\$195)	(\$263)	(\$160	) (\$86) ) (\$86)	\$0 \$0	\$0	\$559	\$518	(\$41)	(\$493)
2004         50         510         617         5100         (1277)         (1400)         (1222)         (1512)         50         50         5768         5478         5175           2005         50         50         50         50         50         50         50         5768         5477         5447         5477         5447         5477         5447         5477         5447         5477         54477         54477         54777		2003	\$0	\$169	\$200	(\$244)	(\$348)	(\$209	(\$112)	· \$0	\$0	\$613	\$669	\$56	(\$454)
2005         90         90         90         9278         9777         50 <th< td=""><td></td><td>2004</td><td>\$0</td><td>\$67</td><td>\$100</td><td>(\$278)</td><td>(\$400)</td><td>(\$222</td><td>(\$126)</td><td>\$0</td><td>\$0</td><td>\$466</td><td>\$748</td><td>\$282</td><td>(\$270</td></th<>		2004	\$0	\$67	\$100	(\$278)	(\$400)	(\$222	(\$126)	\$0	\$0	\$466	\$748	\$282	(\$270
2006         50         5		2005	\$0	\$0	\$0	(\$278)	(\$413)	(\$214	(\$129)	\$0	\$0	\$278	\$756	\$478	\$15
2007         50         50         50         50         50         50         5763         5476         5763         5476         5763         5476         5516           2008         50         50         50         50         50         50         50         5777         5463         5738         5945           2010         50         <		2006	\$0	\$0	\$0	(\$281)	(\$422)	(\$205	(\$130)	\$0	\$0	\$281	\$758	\$477	\$277
2008         50         5200         5777         5463         5476         5441         51         55           2010         50         50         50         50         50         5200         5774         5461         51         55         5200         5774         5461         51         55         5200         5774         5461         51         50         50         5200         5774         5461         51         50 <td></td> <td>2007</td> <td>\$0</td> <td>\$0</td> <td>\$0</td> <td>(\$288)</td> <td>(\$431)</td> <td>(\$197</td> <td>(\$135)</td> <td>\$0</td> <td>\$0</td> <td>\$288</td> <td>\$763</td> <td>\$476</td> <td>\$516</td>		2007	\$0	\$0	\$0	(\$288)	(\$431)	(\$197	(\$135)	\$0	\$0	\$288	\$763	\$476	\$516
2000         5233         774         \$447         \$1,13           2011         50         50         50         \$50         \$523         \$774         \$447         \$1,13           2012         50         50         \$51         \$50         \$51         \$50         \$51         \$50         \$50         \$51         \$50         \$51         \$50         \$51         \$50         \$51         \$50         \$51         \$51         \$50         \$51         \$51         \$50         \$51         \$51         \$50         \$51         \$51         \$50 <td></td> <td>2008</td> <td>\$0</td> <td>\$0</td> <td>\$0</td> <td>(\$287)</td> <td>(\$441)</td> <td>(\$189</td> <td>(\$139)</td> <td>\$0</td> <td>\$0</td> <td>\$287</td> <td>\$770</td> <td>\$483</td> <td>\$739</td>		2008	\$0	\$0	\$0	(\$287)	(\$441)	(\$189	(\$139)	\$0	\$0	\$287	\$770	\$483	\$739
2010       \$0       \$0       \$239       \$4677       \$(\$173)       \$(\$149)       \$0       \$230       \$784       \$461       \$1,133         2011       \$0       \$0       \$239       \$0       \$239       \$793       \$407       \$1,313         2012       \$0       \$0       \$0       \$200       \$107       \$1516       \$0       \$239       \$804       \$505       \$1,477         2013       \$0       \$0       \$0       \$202       \$507       \$116       \$156       \$0       \$2302       \$512       \$5109       \$1,631         2014       \$0       \$0       \$0       \$300       \$300       \$300       \$301       \$313       \$222       \$512       \$5112       \$1,001         2016       \$0       \$0       \$0       \$300       \$313       \$429       \$516       \$2,221       \$10       \$212       \$133       \$223       \$212       \$12       \$100       \$10       \$212       \$10       \$10       \$10       \$10       \$10       \$10       \$10       \$212       \$10       \$200       \$212       \$10       \$10       \$10       \$10       \$10       \$10       \$212       \$10       \$10       \$223	(	2009	\$0	\$0	\$0	(\$290)	(\$454)	(\$181	) (\$141)	\$0	\$0	\$290	\$777	\$487	\$945
2011       \$0       \$0       \$266       \$1,477       \$1,313         2012       \$0       \$0       \$500       \$511,77         2015       \$50       \$50       \$50       \$50       \$50       \$50       \$500       \$516       \$2,221       \$516       \$2,209       \$516       \$2,201       \$500       \$516       \$2,221       \$516       \$2,201       \$50       \$50       \$50       \$50       \$50       \$50       \$50       \$50       \$50       \$50       \$516       \$2,221       \$516       \$2,201       \$50       \$50       \$50       \$50       \$50       \$50       \$50       \$50       \$50       \$516       \$2,238       \$2,211       \$50       \$50       \$50       \$50       \$50       \$522       \$5311       \$543       \$2,228       \$2,215       \$50       \$50       \$522       \$5311       \$543       \$2,425       \$2,425       \$2,245       \$2,245       \$2,245       \$2,245       \$2,245       \$2,245		2010	\$0	\$0	\$0	(\$293)	(\$467)	(\$173	) (\$144)	\$0	\$0	\$293	\$784	\$491	\$1,136
2012       \$0       \$0       \$0       \$299       \$804       \$505       \$1,477         2013       \$00       \$0       \$302       \$507       \$144       \$0       \$0       \$305       \$302       \$509       \$1,631         2014       \$00       \$00       \$0       \$3069       \$5352       \$6133       \$0       \$306       \$615       \$509       \$1,737         2016       \$00       \$00       \$0       \$309       \$622       \$512       \$1151       \$0       \$0       \$313       \$822       \$516       \$2,091         2016       \$00       \$0       \$30       \$0       \$313       \$822       \$516       \$2,021         2017       \$00       \$0       \$30       \$0       \$30       \$313       \$822       \$516       \$2,021         2018       \$0       \$0       \$0       \$30       \$0       \$30       \$315       \$516       \$2,292         2020       \$0       \$0       \$30       \$30       \$322       \$881       \$516       \$2,292         2020       \$0       \$0       \$30       \$30       \$30       \$338       \$860       \$2,292         2022       \$0 <td></td> <td>2011</td> <td>\$0</td> <td>\$0</td> <td>\$0</td> <td>(\$296)</td> <td>(\$480)</td> <td>) (\$165</td> <td>) (\$149)</td> <td>\$0</td> <td>\$0</td> <td>\$296</td> <td>\$793</td> <td>\$497</td> <td>\$1,313</td>		2011	\$0	\$0	\$0	(\$296)	(\$480)	) (\$165	) (\$149)	\$0	\$0	\$296	\$793	\$497	\$1,313
2013       \$0       \$0       \$302       \$50       \$50       \$50       \$502       \$812       \$509       \$1,631         2014       \$0       \$0       \$0       \$50       \$50       \$50       \$508       \$302       \$812       \$509       \$1,771         2015       \$0       \$0       \$0       \$50       \$50       \$50       \$516       \$512       \$1,001         2016       \$0       \$0       \$513       \$6464       \$1510       \$0       \$0       \$318       \$840       \$523       \$2,212         2016       \$0       \$0       \$50       \$0       \$0       \$316       \$840       \$523       \$2,223         2019       \$0       \$0       \$0       \$0       \$324       \$886       \$564       \$2,239         2020       \$0       \$0       \$0       \$30       \$30       \$324       \$886       \$564       \$2,239         2021       \$0       \$0       \$0       \$3352       \$937       \$506       \$2,243         2021       \$0       \$0       \$0       \$3366       \$477       \$4169       \$0       \$328       \$937       \$506       \$2,777       \$2,843       \$2,843 <td></td> <td>2012</td> <td>\$0</td> <td>\$0</td> <td>\$0</td> <td>(\$299)</td> <td>(\$494)</td> <td>) (\$157</td> <td>) (\$154)</td> <td>\$0</td> <td>\$0</td> <td>\$299</td> <td>\$804</td> <td>\$505</td> <td>\$1,478</td>		2012	\$0	\$0	\$0	(\$299)	(\$494)	) (\$157	) (\$154)	\$0	\$0	\$299	\$804	\$505	\$1,478
2014       \$0       \$0       \$300       \$300       \$300       \$300       \$300       \$315       \$50       \$313       \$177         2015       \$0       \$0       \$300       \$60       \$313       \$829       \$516       \$2,021         2015       \$0       \$0       \$313       \$829       \$516       \$2,021         2017       \$0       \$0       \$316       \$4544       \$1221       \$150       \$0       \$313       \$829       \$516       \$2,021         2018       \$0       \$0       \$316       \$5444       \$5221       \$159       \$0       \$0       \$322       \$861       \$541       \$2,228         2019       \$0       \$0       \$3224       \$6603       \$1619       \$0       \$0       \$322       \$981       \$563       \$2,283         2020       \$0       \$0       \$3224       \$6627       \$1151       \$6149       \$0       \$0       \$323       \$980       \$624       \$2,495         2021       \$0       \$0       \$336       \$990       \$108       \$0       \$336       \$990       \$624       \$2,613         2022       \$0       \$0       \$0       \$1008       \$1009		2013	\$0	<b>\$</b> 0	\$0	(\$302)	(\$507)	) (\$148	) (\$156)	\$0	\$0	\$302	\$812	\$509	\$1,631
2015       \$0       \$0       \$309       \$0       \$309       \$309       \$309       \$3222       \$512       \$1,901         2016       \$0       \$0       \$0       \$0       \$313       \$549       \$122       \$513       \$549       \$122       \$16       \$2022       \$512       \$1,901         2017       \$0       \$0       \$0       \$0       \$316       \$440       \$523       \$512       \$512       \$1141       \$22       \$150       \$0       \$316       \$440       \$523       \$512       \$513		2014	\$0	\$0	\$0	(\$306)	(\$521)	) (\$140	) (\$153)	\$0	\$0	\$306	\$815	\$509	\$1,771
2016       \$00       \$00       \$101       \$101       \$100       \$00       \$113       \$6249       \$113       \$00       \$00       \$313       \$6249       \$316       \$523       \$2,132         2018       \$00       \$00       \$310       \$316       \$640       \$523       \$2,132         2019       \$00       \$00       \$300       \$324       \$661       \$5,233       \$2,232         2019       \$00       \$00       \$30       \$324       \$661       \$5,233       \$2,232         2020       \$00       \$00       \$300       \$3224       \$665       \$2,239         2020       \$00       \$00       \$322       \$6632       \$(112)       \$(114)       \$0       \$00       \$332       \$337       \$606       \$2,252         2022       \$00       \$00       \$332       \$336       \$360       \$6661       \$2,252         2022       \$00       \$00       \$3346       \$461       \$2,669       \$00       \$336       \$3660       \$624       \$2,614         2022       \$0       \$00       \$30       \$30       \$30       \$30       \$366       \$1,103       \$6778       \$2,464         2026       <		2015	\$0	\$0	\$0	(\$309)	(\$535)	) (\$133	) (\$154)	50	\$0	\$309	\$822	\$512	\$1,901
2011       30       30       30       (\$10)       (\$12)       (\$10)       30       30       300       \$223       \$2,132       \$2,233       \$2,243       \$2,233       \$2,233       \$2,233       \$2,233       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243       \$2,243 <td< td=""><td></td><td>2016</td><td>20</td><td>\$U</td><td>\$U \$0</td><td>(\$313)</td><td>(\$549)</td><td>) (\$129</td><td>)(\$151) /</td><td>50 \$0</td><td>\$0 \$0</td><td>\$313</td><td>\$829</td><td>\$516</td><td>\$2,021</td></td<>		2016	20	\$U	\$U \$0	(\$313)	(\$549)	) (\$129	)(\$151) /	50 \$0	\$0 \$0	\$313	\$829	\$516	\$2,021
Z016         SO         S		2017	20 50	90 \$0	\$U \$U	(0) C\$) (0) C\$2)	(\$504	) (\$120	) (\$150) ) (\$150)	inin (1. <b>20</b>		\$32D	\$040 \$881	\$323 \$541	\$2,132 \$2,238
Z010         S0         S		2010	40 \$0	\$0 \$0	\$0	(\$324)	(\$603)	(\$110	(\$183) (\$183)	\$0	\$0	\$324	\$885	\$561	\$2,200
Z020         S0         S		2019	\$0 \$0	\$0 \$0	\$0	(\$328)	(\$627	(\$115	(\$168)	\$0	\$0	\$328	\$911	\$583	\$2,435
Z022         \$0         \$0         \$336         \$990         \$624         \$2,613           2023         \$0         \$0         \$3341         \$992         \$1060         \$1841         \$302         \$441         \$2,693           2023         \$0         \$0         \$304         \$10,005         \$560         \$2,771           2024         \$0         \$0         \$0         \$3441         \$3425         \$5141         \$2,894           2024         \$0         \$0         \$0         \$304         \$1,005         \$5660         \$2,771           2025         \$0         \$0         \$0         \$0         \$3351         \$1,005         \$5690         \$2,741           2026         \$0         \$0         \$0         \$0         \$355         \$10,300         \$5679         \$2,843           2026         \$0         \$0         \$0         \$0         \$361         \$1,081         \$719         \$2,978           2028         \$0         \$0         \$0         \$3677         \$1,030         \$3677         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$3677         \$1,107         \$741         \$3,035		2020	\$0 \$0	\$0	\$0	(\$332)	(\$652)	(\$112	(\$174)	\$0	\$0	\$332	\$937	\$606	\$2,526
2023         \$0         \$0         \$341         \$982         \$641         \$2,694           2024         \$0         \$0         \$0         \$0         \$346         \$1,005         \$660         \$2,797           2025         \$0         \$0         \$346         \$7,713         \$1,000         \$60         \$2,694           2024         \$0         \$0         \$0         \$346         \$1,005         \$660         \$2,777           2025         \$0         \$0         \$356         \$1,055         \$699         \$2,943           2026         \$0         \$0         \$301         \$7,800         \$933         \$208         \$0         \$366         \$1,055         \$699         \$2,943           2027         \$0         \$0         \$301         \$7,800         \$933         \$2083         \$0         \$0         \$361         \$1,081         \$7,19         \$2,976           2028         \$0         \$0         \$3677         \$1,803         \$2,844         \$0         \$0         \$367         \$1,107         \$7,41         \$3,035           2028         \$0         \$0         \$3,677         \$1,3,314         \$2,677         \$13,314         \$1,039         \$2,2,707		2021	\$0	\$0	\$0	(\$336)	(\$672	(\$105	(\$179)	\$0	\$0	\$336	\$960	\$624	\$2.613
2024         \$0         \$0         \$0         \$346)         \$713)         (\$102)         \$190)         \$0         \$0         \$346         \$1,005         \$660         \$2,771           2025         \$0         \$0         \$0         \$0         \$0         \$351         \$1,030         \$679         \$2,284           2026         \$0         \$0         \$0         \$0         \$356         \$1,055         \$689         \$2,844           2027         \$0         \$0         \$0         \$361         \$1,051         \$479         \$2,842           2028         \$0         \$0         \$366         \$1,055         \$689         \$2,975           2028         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$3677         \$1,000         \$3677         \$1,007         \$741         \$3,035           2028         \$0         \$0         \$3677         \$1,007         \$741         \$3,035           4544         514         \$1,000         \$8,694)         \$16,5228)         \$4,14         \$10,383         \$23,707         \$13,314           Nev         \$2055         \$213         \$24,260)		2023	\$0	\$0	\$0	(\$341)	(\$692	) (\$10E	(\$184)	\$0	\$0	\$341	\$982	\$641	\$2.694
2025         \$0         \$0         \$351         \$1,030         \$679         \$2,844           2026         \$0         \$0         \$0         \$0         \$356         \$1,055         \$4999         \$2,975           2027         \$0         \$0         \$0         \$361         \$1,790         \$2,977           2027         \$0         \$0         \$361         \$1,790         \$2,977           2028         \$0         \$0         \$367         \$1,107         \$7,41         \$3,035           2028         \$0         \$0         \$3677         \$1,107         \$7,41         \$3,035           2028         \$0         \$0         \$3677         \$1,107         \$7,41         \$3,035           2028         \$0         \$0         \$3677         \$1,107         \$7,41         \$3,035           2028         \$0         \$0         \$3677         \$1,007         \$7,41         \$3,035           2028         \$0         \$0         \$3677         \$1,007         \$1,007         \$1,017         \$1,017           2028         \$0         \$1,000         \$8,694         \$1,029         \$1,033         \$23,707         \$13,314           20         \$1,000		2024	\$0	\$0	\$0	(\$346)	(\$713	(\$102	(\$190)	\$0	\$0	\$346	\$1,005	\$660	\$2,771
2026         \$0         \$0         \$356         \$1,055         \$699         \$2,913           2027         \$0         \$0         \$0         \$361         \$1,081         \$719         \$2,972           2028         \$0         \$0         \$0         \$361         \$1,081         \$719         \$2,972           2028         \$0         \$0         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$367         \$1,001         \$367         \$1,037         \$13,314           2028         \$2010         \$1,000         \$36,584)         \$15,228)         \$4,124)         \$4,355)         \$10,393         \$23,707         \$13,314           NPV		2025	\$0	\$0	\$0	(\$351)	(\$735	) (\$98	) (\$196)	\$0	\$0	\$351	\$1,030	\$679	\$2,844
2027         \$0         \$0         \$361         \$1,081         \$719         \$2,976           2028         \$0         \$0         \$0         \$361         \$1,081         \$719         \$2,976           2028         \$0         \$0         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$367         \$1,007         \$741         \$3,035           2028         \$0         \$0         \$0         \$367         \$1,007         \$741         \$3,035           2028         \$0         \$1,000         \$1,010	Ł	2026	\$0	\$0	\$0	(\$356)	(\$757	) (\$90	(\$202	\$0	\$0	\$356	\$1,055	\$699	\$2,913
2028         \$0         \$0         \$367         \$1,107         \$741         \$3,035           2028         \$0         \$0         \$367         \$1,107         \$741         \$3,035           400         \$0         \$0         \$367         \$1,107         \$741         \$3,035           1         \$1,000         \$1,000         \$1,000         \$1,000         \$1,000         \$1,000         \$1,000         \$1,0393         \$23,707         \$13,314           Nominal         \$205         \$2013         \$2,646)         \$1,620         \$1,613         \$1,0393         \$23,707         \$13,314           NPV         \$2055         \$2013         \$2,646)         \$4,124         \$5,280         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         \$23,707         \$13,314         \$3,039         \$23,707         \$13,314		2027	\$0	\$0	\$0	(\$361)	(\$780	) (\$93	(\$208)	\$0	\$0	\$361	\$1,081	\$719	\$2,978
Nominal         \$810         \$1,000         (\$8,564)         (\$15,228)         (\$4,124)         (\$4,365)         \$10,393         \$23,707         \$13,314           Nominal         \$810         \$1,000         (\$8,564)         (\$15,228)         (\$4,124)         (\$4,365)         \$10,393         \$23,707         \$13,314           NPV         \$655         \$813         (\$2,645)         (\$16,13)         (\$1,260)         \$14,114         \$7,153         \$3,039           Discount Rate =         8.97%         843.5         \$41.14         \$7,153         \$3,039	1	2028	\$0	\$0	\$0	(\$367)	(\$803	) (\$90	) (\$214	\$0	\$0	\$367	\$1,107	\$741	\$3,039
Nominal         \$810         \$1,000         (\$8,564)         (\$15,228)         (\$4,124)         (\$4,355)         \$10,383         \$23,707         \$13,314           NPV         \$855         \$113         (\$2,646)         (\$16,228)         (\$4,124)         (\$4,355)         \$10,383         \$23,707         \$13,314           NPV         \$855         \$113         (\$2,646)         (\$16,228)         (\$4,124)         (\$4,355)         \$10,383         \$23,707         \$13,314           Discount Rate =         8.97%         813         (\$2,646)         (\$4,260)         (\$16,353)         \$114         \$7,153         \$3,039           Discount Rate =         8.97%         8.97%         \$13,14         \$1,74         \$1,74									an an star						
Nominal \$810 \$1,000 (\$8,584) (\$15,228) (\$4,124) (\$4,555) \$10,383 \$23,707 \$13,314 NPV \$855 \$913 (\$2,646) (\$15,228) (\$4,124) (\$4,555) \$10,383 \$23,707 \$13,314 NPV \$855 \$913 (\$2,646) (\$15,228) (\$4,124) (\$4,555) \$10,383 \$23,707 \$13,314 NPV \$855 \$913 (\$2,646) (\$15,228) (\$4,124) (\$4,555) \$10,383 \$23,707 \$13,314 NPV \$855 \$913 (\$2,646) (\$15,228) (\$4,260) \$10,383 \$23,039 \$23,039 \$10,383 \$23,039 \$10,383 \$23,039 \$10,000 \$1,0000 \$1,000 \$1,000 \$1,000 \$1,000 \$1,000 \$1,000 \$1,000 \$1,000 \$1								1,82							
Nominal         \$810         \$1,000         (\$8,584)         (\$15,228)         (\$4,124)         (\$4,355)         \$10,383         \$23,707         \$13,314           NPV         \$855         \$813         (\$2,646)         (\$16,528)         (\$4,124)         \$7,153         \$3,039           Discount Fiele =         8.97%         8413         \$7,153         \$3,039									, 11 11 12 14						
Nominal         \$810         \$1,000         (\$8,584)         (\$15,228)         (\$4,326)         \$10,393         \$23,707         \$13,314           NPV         \$855         \$813         (\$4,260)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         \$1,74         \$14,24         \$14,24         \$14,24         \$14,24         \$14,250         \$13,314								يتشعرون والمتحد المتحد المحد المحد المحد المحد ا		۰.					
Nominal         \$810         \$1,000         (\$8,564)         (\$15,228)         (\$4,124)         (\$4,355)         \$10,393         \$23,707         \$13,314           NPV         \$855         \$813         (\$2,846)         (\$15,228)         (\$4,124)         (\$4,355)         \$10,393         \$23,707         \$13,314           NPV         \$855         \$813         (\$2,846)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         8.97%         \$3,039         \$4,114         \$7,153         \$3,039	1							4 144	1 (5145)						
Nominal \$810 \$1,000 (\$8,564) (\$15,228) (\$4,124) (\$4,355) \$10,393 \$23,707 \$13,314 NPV \$655 \$813 (\$2,645) (\$4,260) (\$1,613) (\$1,280) \$4,114 \$7,153 \$3,039 Discount Rate = 8.97% Benefit/Cost Rate = 1.74	1							1.2	े किंग्स						
Nominal         \$810         \$1,000         (\$8,584)         (\$15,228)         (\$4,124)         (\$4,555)         \$10,383         \$23,707         \$13,314           NPV         \$855         \$813         (\$4,260)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         84,114         \$7,153         \$3,039									5. S.						
Nominal         \$810         \$1,000         (\$8,584)         (\$15,228)         (\$4,124)         (\$4,355)         \$10,393         \$23,707         \$13,314           NPV         \$655         \$813         (\$4,260)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         813,14         \$7,153         \$3,039         \$4,114         \$7,153         \$3,039								1942	j (11.85						
Nominal         \$810         \$1,000         (\$8,584)         (\$15,228)         (\$4,124)         (\$4,355)         \$10,393         \$23,707         \$13,314           NPV         \$655         \$813         (\$4,260)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         84,314         \$7,153         \$3,039	ł								5						
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Nominal         \$810         \$1,000         (\$8,584)         (\$15,228)         (\$4,124)         (\$4,355)         \$10,383         \$23,707         \$13,314           NPV         \$8055         \$813         (\$4,260)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         8.97%         \$1.74         \$3,039         \$4,114         \$7,153         \$3,039	İ.								с <u>1</u> .1.74	• .					
Nominal         \$810         \$1,000         (\$8,584)         (\$15,228)         (\$4,124)         (\$4,355)         \$10,393         \$23,707         \$13,314           NPV         \$8655         \$813         (\$4,260)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         84,114         \$7,153         \$3,039									te construction and	25.1					
Nominal         \$810         \$1,000         (\$8,564)         (\$15,228)         (\$4,355)         \$10,393         \$23,707         \$13,314           NPV         \$655         \$813         (\$2,646)         (\$4,260)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         8.97%         \$4,114         \$7,153         \$3,039								1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	iou na tender	5					
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Nominal         \$810         \$1,000         (\$8,584)         (\$15,228)         (\$4,124)         (\$4,355)         \$10,393         \$23,707         \$13,314           NPV         \$855         \$813         (\$2,648)         (\$4,260)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         Benefit/Cost Ratio =         1.74         \$3,039         \$3,039         \$3,039									والمعرف والمعادية						
NPV         \$855         \$813         (\$4,260)         (\$1,613)         (\$5,306)         \$10,393         \$23,707         \$13,314           NPV         \$655         \$813         (\$2,648)         (\$4,260)         (\$1,613)         (\$1,280)         \$4,114         \$7,153         \$3,039           Discount Rate =         8.97%         \$3,039         \$3,039         \$3,039         \$3,039	F					/						B40.000	800 30-	£10.044	
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Florida Public Service Commission Docket No. 981591-EG Gulf Power Company Witness: T.S.Spangenberg Exhibit No. \_\_\_\_\_(TSS-1) Page 8 of 9

Florida Public Service Commission Docket No. 981591-EG Gulf Power Company Witness: T. S. Spangenberg Exhibit No. \_\_\_\_ (TSS-1) Page 9 of 9

# Cost Effectiveness Analysis Cooling and Heating Efficiency Enhancement Program

Existing S	System		New Sy	ystem	Cost E	ffectiveness		
Heating Cooling			Heating	Cooling	<u>RIM</u>	PART	TRC	
68% AFUE Gas Furnace	7 SEER A/C		7.4 HSPF Heat Pump	11 SEER Heat Pump	1.74	1.65	2.20	
68% AFUE Gas Furnace	7 SEER A/C	25% Free Riders	7.4 HSPF Heat Pump	11 SEER Heat Pump	1.59	1.60	2.12	
68% AFUE Gas Furnace	7 SEER A/C	15 Yr. Program Life	7.4 HSPF Heat Pump	11 SEER Heat Pump	1.49	1.09	1.30	
68% AFUE Gas Furnace	8 SEER A/C		7.4 HSPF Heat Pump	11 SEER Heat Pump	2.45	1.45	1.85	
68% AFUE Gas Furnace	10 SEER A/C		7.4 HSPF Heat Pump	11 SEER Heat Pump	1.41	1.14	1.32	
68% AFUE Gas Furnace	10 SEER A/C	15 Yr. Program Life	7.4 HSPF Heat Pump	11 SEER Heat Pump	1.19	0.80	0.75	
Gas or Resistance Heat	7 SEER A/C		Gas or Resistance Heat	11 SEER A/C	1.06	0.87	0.93	
Gas or Resistance Heat	8 SEER A/C		Gas or Resistance Heat	11 SEER A/C	0.95	0.60	0.60	
Resistance Heat	7 SEER A/C		7.4 HSPF Heat Pump	11 SEER Heat Pump	0.75	1.46	1.07	
Resistance Heat	8 SEER A/C		7.4 HSPF Heat Pump	11 SEER Heat Pump	0.66	1.26	0.82	