RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TURKEY POINT UNITS 3 & 4

DOCKET NOS. 50-250, 251

DADE COUNTY, FLORIDA

1-1-83 TO 6-30-83

PREPARED AUGUST 1983

1625 1/1

1. INTRODUCTION

This report is submitted pursuant to Section 6.9 of the Turkey Point Plant Units 3 & 4 Technical Specifications.

Radiological environmental surveillance for the Turkey Point Plant is conducted in accordance with Section 4.12 of the plant's Technical Specifications. A summary of the samples collected and analyses performed during the period January 1, 1983 through June 30, 1983 is provided in Table 1.

2. THE MONITORING PROGRAM

Period Covered: This report covers the period from January 1, 1983 through June 30, 1983.

Analytical Responsibility: Environmental radiological monitoring for the Turkey Point Plant is conducted by the State of Florida, Department of Health and Rehabilitative Services (DHRS). Samples are collected and analyzed by DHRS personnel.

Number of Samples: During the period, a total of 707 samples were collected from 35 different locations to be analyzed for radioactivity. Table 1 summarizes the highest, lowest and mean results for all sample locations, and where applicable the highest, lowest and mean results for the sample locations which yielded the highest mean levels. The values in Table 1 are based upon only those analyses which yielded detectable measurements.

Split-Sample: During the period January 1, 1983 - June 30, 1983, in addition to the samples identified in Table 1, 11 samples were collected for comparative analysis by the DOE in accordance with the DHRS/DOE split-sampling program.

3. MISSING DATA

Due to the length of time required to perform the analyses, several ^{89}Sr, ^{90}Sr results were not available for this report. When completed, these results will be provided in a supplemental report. Based on past experience, the missing data is not expected to alter any of the conclusions of this report.

A description and explanation for missing data is contained in Table 1.

4. DISCUSSION AND INTERPRETATION OF DATA

Air Monitoring: Continous air sampling was conducted at 8 different locations surrounding the Turkey Point Plant. Samples were collected and analyzed by Florida DHRS for gross radioactivity and radioiodines (I-131) on a weekly basis. All samples from this reporting period were within the normal range of background measurements. Table 1 provides a summary of these results.

Direct Radiation Monitoring: Continuous monitoring of ambient radiation exposure rate was provided routinely at eleven different sample locations surrounding the Turkey Point Plant. Samples are collected and analyzed by Florida DHRS on a monthly basis. Results are based upon the average readings of two dosimeters at each location. All results from this reporting period were within the normal range of background measurements. Table 1 provides a summary of these results.

Other Samples: In addition to the samples described above, several other environmental samples are routinely collected from areas around the Turkey Point Nuclear Plant. These samples include precipitation, surface water, drinking water, sediment, fish, crustacea, food crops, vegetation, milk, soil and other terrestrial biota. Table 1 provides a summary of the results of these samples from January 1, 1983 through June 30, 1983.

As in the past, tritium has remained the predominant radionuclide measured around the Turkey Point Plant, with the highest concentration (7000 pCi/l) found in water samples collected from the closed cooling canal. This concentration is approximately 0.23% of the concentration which would be permitted continously in unrestricted area waters. In addition to the waterborne tritium, radionuclides of cobalt, cesium and cerium were detected in sediment and fish samples extracted from the closed cooling canal. The reported levels of these radionuclides are very low, and are consistent with past measurements, with no evidence of continued buildup. In addition, the concentrations of ^{137}Cs and ^{144}Ce in these samples are within the range of values which were obtained from similar samples during the preoperational surveillance program, and in samples which have been collected elsewhere within the State of Florida.

The results of radiological measurements for other media and other locations surrounding the Turkey Point Plant do not yield evidence of buildup in the environment when compared to past measurements, including samples collected during the preoperational surveillance program, and elsewhere within the State of Florida.

5. CONCLUSIONS

The concentration of all radionuclides reported in Table 1 is much less than that permitted for release to unrestricted areas as specified in 10 CFR 20, Appendix B, Table II. The Radiological Environmental Monitoring Program establishes that radioactivity released as a result of operation of the Turkey Point Plant Units 3 & 4 is not contributing significantly to the radiation exposure of any individual or population group.

TABLE I

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY TURKEY POINT PLANT UNITS 3 & 4 DOCKET NO. 50-250, 251

LOCATION OF FACILITY DADE COUNTY FLORIDA REPORTING PERIOD JANUARY 1, 1983 - JUNE 30, 1983

Medium or Pathway Sampled	Unit	Analysis for	Number of			All Indicator Locations		Location with Highest Mean			Control[2] Location		No. of nonroutine Reported Measurements
			Sites	Samples	Analyses	Mean[1]	Range[1]	Sample Location Distance & Direction	Mean[1]	Range[1]	Mean[1]	Range[1]	
1.1 AIR													
1. Particulates	pCi/m^3	Gross B	8	208	208	.016 (208/208)	.005-.030	T56:Princeton Substation (8 miles - NNW)	.016 (26/26)	.010-.024	.016 (26/26)	.010-.029	
2. Radioiodine	pCi/m^3	^{131}I	8	208	208	ND	NA	NA	NA	NA	ND	NA	
1.2 DIRECT RADIATION													
1. TLD	uRem/hr	Exposure Rate	11	131[3]	66	4.7 (66/66)	2.3-6.6	T64: Natoma Substation (22 miles - N)	5.9 (6/6)	5.1-6.6	5.9 (6/6)	5.1-6.6	
1.3 PRECIPITATION													
1. Rainwater	pCi/l	Gross B-DS	4	24	24	2.7 (9/24)	1.3-4.9	T52: Florida City Substation (7 miles - W)	4.9 (1/6)	NA	2.6 (2/6)	1.5-3.6	
	"	Gross B-UDS			24	4.0 (2/24)	2.0-5.9	T57: Dolan's Farm (4 miles - NW)	5.9 (1/6)	NA	2.0 (1/6)	NA	
	"	Tritium			24	270 (1/24)	NA	T72:Boy Scout Camp (Onsite - SW)	270 (1/6)	NA	ND	NA	
	"	Y emitting[4] isotopes			24	ND	NA	NA	NA	NA	ND	NA	

DS - Dissolved Solids UDS - Undissolved Solids ND - Not Detectable. NA - Not Applicable

TABLE 1

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Medium or Pathway Sampled	Unit	Analysis for	Number of			All Indicator Locations		Location with Highest Mean			Control[2] Location		No. of Nonroutine Reported Measurements
			Sites	Samples	Analyses	Mean[1]	Range[1]	Sample Location Distance & Direction	Mean[1]	Range[1]	Mean[1]	Range[1]	
2.1 SURFACE WATERS													
1. Estuarine			10	20									
(Surface Water)	pCi/l	Tritium			20	520 (1/20)	NA	T81: Card Sound (6 miles - S)	520 (1/2)	NA	NA	NA	
	"	^{89}Sr			18[3]	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			18[3]	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[4] isotopes			20	ND	NA	NA	NA	NA	NA	NA	
2. Closed Cooling Canal			2	12									
(Surface Water)	pCi/l	Tritium			12	5100 (12/12)	3900-7000	T84:Closed Cooling Canal (Onsite- SW)	5200 (6/6)	4000-7000	NA	NA	
	"	^{89}Sr			8[3]	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			8[3]	1.3 (1/8)	NA	T84: Closed Cooling Canal (Onsite - SW)	1.3 (1/4)	NA	NA	NA	
	"	γ emitting[4] isotopes			12	ND	NA	NA	NA	NA	NA	NA	

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NAME OF FACILITY TURKEY POINT PLANT UNITS 3 & 4 DOCKET NO. 50-250, 251

LOCATION OF FACILITY DADE COUNTY FLORIDA REPORTING PERIOD JANUARY 1, 1983 - JUNE 30, 1983

Medium or Pathway Sampled	Unit	Analysis for	Number of Sites	Number of Samples	Number of Analyses	All Indicator Locations Mean[1]	All Indicator Locations Range[1]	Location with Highest Mean Sample Location Distance & Direction	Location with Highest Mean Mean[1]	Location with Highest Mean Range[1]	Control[2] Location Mean[1]	Control[2] Location Range[1]	No. of Nonroutine Reported Measurements
3. Fresh Water Drainage Canals			2	12									
(Surface Water)	pCi/l	Tritium			12	390 (5/12)	210-600	T75 - Florida City Canal (2 miles - WNW)	390 (5/6)	210-600	NA NA	NA NA	
	"	Gross B-DS			12	166.9 (11/12)	3.8-370	T75: Florida City Canal (2 miles - WNW)	300 (6/6)	200-370	NA	NA	
	"	Gross B-UDS			12	ND	NA	NA	NA	NA	NA	NA	
2.2 WELLS													
1. Potable Well Water			3	6									
(Drinking Water)	pCi/l	Tritium			6	ND	NA	NA	NA	NA	NA	NA	
	"	Gross B-DS			6	6.5 (6/6)	4.2-10.9	T57: Dolan's Farm (4 miles - NW)	8.8 (2/2)	6.6-10.9	NA	NA	
	"	Gross B-UDS			6	1.5 (1/6)	NA	T57: Dolan's Farm (4 miles - NW)	1.5 (1/2)	NA	NA	NA	
2. Ground Water Wells			6	12									
(Ground Water)	pCi/l	Tritium			12	480 (4/12)	220-890	T88-Groundwater Well E-14 (5 Miles - S)	890 (1/2)	NA	NA	NA	
	"	^{89}Sr			12	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			12	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[4] isotopes			12	ND	NA	NA	NA	NA	NA	NA	

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LOCATION OF FACILITY DADE COUNTY FLORIDA REPORTING PERIOD JANUARY 1, 1983 - JUNE 30, 1983

Medium or Pathway Sampled	Unit	Analysis for	Number of Sites	Number of Samples	Number of Analyses	All Indicator Locations Mean[1]	All Indicator Locations Range[1]	Location with Highest Mean: Sample Location Distance & Direction	Location with Highest Mean: Mean[1]	Location with Highest Mean: Range[1]	Control[2] Location Mean[1]	Control[2] Location Range[1]	No. of Nonroutine Reported Measurements
3.0 BOTTOM SEDIMENTS													
1. Closed Cooling Canal			2	4									
(Sediment)	pCi/kg	^{89}Sr			4	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			4	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[4] isotopes			4								
	"	1. ^{60}Co				338 (4/4)	226-480	184-Closed Cooling Canal (Onsite - SW)	370 (2/2)	260-480	NA	NA	
	"	2. ^{58}Co				60 (1/4)	NA	T84: Closed Cooling Canal (Onsite - SW)	60 (1/2)	NA	NA	NA	
	"	3. ^{144}Ce				220 (1/4)	NA	T85: Closed Cooling Canal (Onsite - SW)	220. (1/2)	NA	NA	NA	
	"	4. ^{137}Cs				51 (1/4)	NA	T84: Closed Cooling Canal (Onsite - SW)	51 (1/2)	NA	NA	NA	
	"	5. Others				ND	NA	NA	NA	NA	NA	NA	
2. Estuarine			7	7									
(Sediment)	pCi/kg	^{89}Sr			7	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			7	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[4] isotopes			7	ND	NA	NA	NA	NA	NA	NA	

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Medium or Pathway Sampled	Unit	Analysis for	Number of			All Indicator Locations		Location with Highest Mean			Control[2] Location		No. of Nonroutine Reported Measurements
			Sites	Samples	Analyses	Mean[1]	Range[1]	Sample Location Distance & Direction	Mean[1]	Range[1]	Mean[1]	Range[1]	
4.0 AQUATIC BIOTA													
1. Crustacea			6	6									
(Blue Crab)	pCi/kg	^{89}Sr			4[3]	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			4[3]	62 (1/4)	NA	T94:Pumpkin Key (8 miles - SSE)	62 (1/1)	NA	NA	NA	
	"	γ emitting[4] isotopes			6	ND	NA	NA	NA	NA	NA	NA	
2. Fish,Carnivore			7	8									
(Mixed Species)	pCi/kg	^{89}Sr			6[3]	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			6[3]	ND	NA	NA	NA	NA	NA	NA	
		γ emitting[4] isotopes			8								
	"	1. ^{134}Cs				77 (1/8)	NA	T84 - Closed Cooling Canal (Onsite - SW)	77 (1/2)	NA	NA	NA	
	"	2. ^{137}Cs				240 (2/8)	150-320	T84:Closed Cooling Canal (Onsite - SW)	240 (2/2)	150-320	NA	NA	

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Medium or Pathway Sampled	Unit	Analysis for	Number of Sites	Number of Samples	Number of Analyses	All Indicator Locations Mean[1]	All Indicator Locations Range[1]	Location with Highest Mean Sample Location Distance & Direction	Location with Highest Mean Mean[1]	Location with Highest Mean Range[1]	Control[2] Location Mean[1]	Control[2] Location Range[1]	No. of Nonroutine Reported Measurements
3. Fish, Herbivore (Mullet)	pCi/kg	^{89}Sr	6	6	5[3]	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			5[3]	ND	NA	NA	NA	NA	NA	NA	
	"	Gamma Emitting[4] Isotopes			6	ND	NA	NA	NA	NA	NA	NA	
4. Turtle Grass (Turtle Grass)	pCi/kg	^{89}Sr	6	6	5[3]	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			5[3]	ND	NA	NA	NA	NA	NA	NA	
		Gamma Emitting[4] Isotopes			6								
	"	1. ^{137}Cs				250 (1/6)	NA	T81: Card Sound (6 miles - S)	250 (1/1)	NA	NA	NA	
	"	2. Others				ND	NA	NA	NA	NA	NA	NA	
5. Sponges (Sponge)	pCi/kg	Gamma Emitting[4] Isotopes	6	6	6	ND	NA	NA	NA	NA	NA	NA	

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Medium or Pathway Sampled	Unit	Analysis for	Number of			All Indicator Locations		Location with Highest Mean			Control[2] Location		No. of Nonroutine Reported Measurements
			Sites	Samples	Analyses	Mean[1]	Range[1]	Sample Location Distance & Direction	Mean[1]	Range[1]	Mean[1]	Range[1]	
5.0 TERRESTRIAL													
1. Small Animal (Racoon)	pCi/kg	^{89}Sr	1	1	1	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			1	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[4] isotopes			1	ND	NA	NA	NA	NA	NA	NA	
2. Food Crops (Malanga, Potatoes)	pCi/kg	^{89}Sr	3	3	2[3]	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			2[3]	ND	NA	NA	NA	NA	NA	NA	
		γ emitting[4] isotopes			3								
	"	1. ^{137}Cs				88 (1/3)	NA	152: Florida City Substation (7 miles-N)	88 (1/1)	NA	NA	NA	
	"	2. Others				ND	NA	NA	NA	NA	NA	NA	

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Medium or Pathway Sampled	Unit	Analysis for	Number of Sites	Number of Samples	Number of Analyses	All Indicator Locations Mean[1]	All Indicator Locations Range[1]	Location with Highest Mean Sample Location Distance & Direction	Location with Highest Mean Mean[1]	Location with Highest Mean Range[1]	Control[2] Location Mean[1]	Control[2] Location Range[1]	No. of Nonroutine Reported Measurements
3. Milk			1	1									
(Goat Milk)	pCi/l	^{89}Sr			1	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			1	1.4 (1/1)	NA	T99:Family Tree Farm (11 miles - NW)	1.4 (1/1)	NA	NA	NA	
		γ emitting[4] isotopes											
	"	1. ^{131}I			1	ND	NA	NA	NA	NA	NA	NA	
	"	2.Others			1	ND	NA	NA	NA	NA	NA	NA	
4. Vegetation			7	7									
(Mangrove leaves)	pCi/kg	^{89}Sr			7	ND	NA	NA	NA	NA	ND	NA	
	"	^{90}Sr			7	7.4 (1/7)	NA	T58: Entrance Road (Onsite - NW)	7.4 (1/1)	NA	ND	NA	
	"	γ emitting[4] isotopes			7	ND	NA	NA	NA	NA	ND	NA	

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5. Soil			7	7									
(Soil)	pCi/kg	^{89}Sr			7	ND	NA	NA	NA	NA	ND	NA	
	"	^{90}Sr			7	ND	NA	NA	NA	NA	ND	NA	
		γ emitting[4] isotopes			7								
	"	1. ^{144}Ce				350 (2/7)	200-500	T56: Princeton Substation (8 miles - NNW)	500 (1/1)	NA	ND	NA	
	"	2. ^{137}Cs				180 (5/7)	42-260	T56: Princeton Substation (8 miles - NNW)	260 (1/1)	NA	ND	NA	
	"	3. Others				ND	NA	NA	NA	NA	ND	NA	

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TABLE 1

NOTES

1) Mean and Range values based upon data with detectable results only.

(/) Indicates the number of analyses with detectable results compared to the numer of analyses performed.

2) Control location - T64, Florida Power & Light Company - Natoma Substation (22 Miles - N).

3) Missing Data

a. ^{89}Sr, ^{90}Sr

Analyses for ^{89}Sr and ^{90}Sr for the following samples (Date/Media/Location*) were not complete at the time of this report.

2-16-83/Crustacea/T66
3-09-83/Food Crop/T52
5-10-83/Fish, Herbivore/T81
5-11-83/Estuarine Water/T66
5-11-83/Estuarine Water/T81
5-11-83/Cooling Canal Water/T84
5-11-83/Cooling Canal Water/T97
5-11-83/Turtle Grass/T81
5-26-83/Fish, Carnivore/T81
5-27-83/Crustacea/T81
6-14-83/Cooling Canal Water/T84
6-14-83/Cooling Canal Water/T97

b. Direct Radiation

The TLD results from location T64 (control location) on 2/9/83 are based upon the results from one dosimeter. An abnormally high result was obtained on one of the two dosimeters recovered from this location. No explanation could be found for the high reading. The results from the second dosimeter were normal and were used to represent the reading at this location for February 1983.

4) Excluding Potassium - 40 (^{40}K), Radon - 226 (^{226}Ra) and Thorium - 232 (^{232}Th) which are naturally occurring radioisotopes commonly found in many environmental specimens.

* Key to sample locations is provided in Turkey Point Units 3 & 4 Technical Specifications.

P. O. BOX 14000, JUNO BEACH, FL 33408

FPL
FLORIDA POWER & LIGHT COMPANY

August 29, 1983
L-83-464

Mr. James P. O'Reilly
Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, Suite 2900
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

Re: Turkey Point Units 3 & 4
Docket Nos. 50-250 and 50-251
Radiological Environmental
Monitoring Report

Please find attached the Radiological Environmental Monitoring Report for the period January 1, 1983, to June 30, 1983, as required by Technical Specification 6.9.4.6.

Very truly yours,

Robert E. Uhrig

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/PLP/mpc

Attachment

cc: Harold F. Reis, Esquire

DESIGNATED ORIGINAL

Certified By

IE25 1/1

Comments to Draft Environmental Statement
Turkey Point Steam Generator Repairs
by Mark P. Oncavage, Intervenor
February 26, 1981

COMMENTS

Purpose of this Environmental Statement

1. The Nuclear Regulatory Commission (NRC) finds itself in the untenable position of being forced to make an important management recommendation, for a privately owned nuclear utility. The recommendation contained in the Draft Environmental Impact Statement (DEIS) will have great bearing on the outcome of the forthcoming hearings before the Atomic Safety and Licensing Board (ASLB). The DEIS recommendation should be based on health impacts, safety impacts, economic impacts, and recurrance probabilities, but the NRC has limited itself only to safety considerations for recommending the repairs in the DEIS. At best, the NRC is incapable of making an honest evaluation of the repair proposal. By publishing the DEIS, the NRC has violated 40 CFR §§ 1501.6.

The contributions the NRC can make to an honest study would be in the areas of accident risk assessment and recurrance assessment, but these areas alone are inadequate under 40 CFR § 1501.7. The NRC should disqualify itself as being the sole agency writing the DEIS and should request involvement of the Environmental Protection Agency (EPA) in assessing environmental and health impacts, and the Florida Public Service Commission (PSC) in assessing economic and social impacts. This division of interests would provide the necessary interdisciplinary approach as mandated by NEPA.

2. The DEIS is not an inhouse NRC document. It has been published for public comment and the public deserves to have the technical terms defined and, even more so, have the special significance given to some terms, fully explained. 40 CFR § 1502.8 requires that the DEIS be written in plain language as to be readily understood by the public. A glossary must be provided to include, but not be limited to, full explanations of the following terms:

1. steam generator
2. sodium phosphate secondary water chemistry treatment
3. lower assembly
4. all volatile treatment
5. full flow condensate demineralizer
6. U tube desigh
7. plugged tubes
8. wastage
9. three loop PWR's
10. caustic stress corrosion cracking
11. secondary coolant
12. radial deformation
13. "denting"
14. rectangular flow slots
15. support plate deformation
16. tube wall thinning
17. support plate flow slot hourglassing
18. plate ligament cracking
19. power derating
20. channel cut method
21. ALARA considerations
22. SA 240 type 405 ferritic stainless steel
23. inconel 600 heat exchanger tubes
24. broached hole pattern
25. quatrefoil design
26. drilled flow holes
27. corrosion products
28. shell
29. special storage facility
30. long term layup

31. reactor vessel head
32. fuel cooling
33. fuel removal
34. spent fuel storage
35. HEPA filter
36. biological shield wall
37. moisture separator
38. manway
39. feedwater inlet
40. swirl vane
41. wrapper
42. transition cone
43. tubesheet
44. channel head
45. RCS hot leg
46. 75 mr/hr (contact)
47. hydrostatic testing
48. moisture carryover
49. pipe cut method
50. radiological assessment
51. conservatisms
52. occupational dose
53. person rem
54. exposure rate values
55. source to receiver distance
56. dose reducing activities
57. whole body dose
58. remote tools
59. 10 CFR part 20 limits
60. WASH 1400
61. 10^5 person years
62. environmental pathways
63. 6 mrem
64. regulatory position
65. 16 mrem thyroid
66. Regulatory Guide
67. environmentally significant
68. 270 curies
69. 2300 m^3
70. noble gases
71. mixed fission and activation products
72. halogens
73. gamma activity
74. particulates
75. tritium
76. primary side
77. radioactive decay
78. nearest site boundary

79. Co-60
80. natural background radiation
81. heat transfer surface
82. nuclear peaking factor F_q
83. neutron flux
84. fuel burnup
85. .038/kw hr
86. $ 25/BBL
87. 0.85% capacity factor
88. 6.1 x 10^6 BTU/BBL
89. permanent storage
90. turbidity
91. condensate system
92. dredge spoils
93. sound pressure levels
94. ionic species
95. mixed bed ion exchange resin
96. backflush receiver tank
97. maximum resin loading
98. backwashed resin slurry
99. supernatant liquid
100. 1 umho/cm
101. 100 mg/l instantaneous max
102. turbulent mixing
103. biological oxygen demand
104. total organic carbon
105. biological assessment
106. limiting potential receptor
107. corrosion inhibitors
108. chemical decontamination
109. grit blast
110. state of art internals
111. in place refurbishment
112. tube sleeving
113. licensed burial facility
114. facility decommissioning
115. 2200 dpm/100 square cm
116. tare weight
117. beta radiation
118. transitiors cone end
119. gamma radiation

3. The DEIS has failed to study the 169 mile cooling canal system to gather information on the many species of marine life

that have all ready died out from the system. Studies have not been described (or performed) that would demonstrate whether the effects of the repair will initiate or hasten the extinction of the remaining species in the cooling canals. Unnatural tamperings with natural systems or critical habitats can drastically effect the food supply for endangered and threatened species. The DEIS has even failed to list the endangered and threatened species and their critical habitats living in the Turkey Point area. This lack of attention violates not only the National Environmental Policy Act, but also the Endangered Species Act.

4. The legacy of the Three Mile Island accident will be years of complex lawsuits in the attempt to hang the financial responsibility for the accident, cleanup, and loss of power costs on various parties. In the case of the Turkey Point repairs, questions of financial responsibility for accidents, cleanup, and loss of power need to be answered before the repairs are authorized and explained in the DEIS.

1. What measure of responsibility does the NRC accept for permitting the repair on the basis that the new designs will prevent the occurance of corrosion mechanisms observed to date, when in fact, they may not ?

2. In case of unacceptable contamination of public or private resources or injury, what would be the NRC's responsibility since it would have approved and licensed the activities that caused the contamination or injury ?
3. What measure of responsibility does the NRC accept for not enforcing license requirements if the nonenforcement of license requirements leads to contamination or injury ?
4. What measure of responsibility does the NRC accept for a failure to identify and remedy the conditions that lead to contamination or injury ?

Examples of accident conditions that lead to contamination or injury are numerous: release of 50,000 gallons of undecontaminated primary coolant to the environment, fires in radioactive areas, construction accidents, damage to the operating reactor's components or controls whereby a design basis or lesser accident occurs, and inadequate storage of radioactive materials during hurricanes, floods, or tornadoes.

At this late date, two years after the accident, the contamination at Three Mile Island has still not been cleaned up. The DEIS is deficient because the questions of responsibility have not been answered and litigating these questions after an accident can prevent a timely and thorough cleanup if accidental contamination were to occur.

Background

5. The NRC has intentionally avoided public input into the DEIS writing process in direct violation of 40 CFR §§ 1501.7. Starting in February 1979, two years ago, I initiated hearings and requested an EIS concerning the Turkey Point repairs. Sudsequently, I have filed numerous briefs identifying issues that have been ignored by the NRC staff in the scoping of the DEIS. In addition, numerous editorials and news stories appearing locally have also outlined public concerns about the repairs. Some of the publications that printed unaddressed issues, which the NRC closely monitors, are Miami Magazine, Miami News, Miami Herald, Southwest Monitor, and the South Dade News Leader. See Appendices I and II.

The NRC has ignored federal rules for seeking input, even adversary input, for the scoping of the DEIS. The genuine concerns of the citizens of South Florida have been ignored and a DEIS skewed in favor of the nuclear industry has been written. The citizens of South Florida deserve a much better effort than the shoddy effort that has been given thus far.

History of Steam Generator Operation

6. The DEIS has failed to recount the record of Westinghouse's poor engineering designs prior to the Surry and Turkey Point

plants. The early Westinghouse steam generators, installed in Yankee Rowe, Selni, and Sena, had stainless steel tubes and used a sodium phosphate water treatment. This combination proved to be a poor engineering choice since it led to caustic stress corrosion creacking of the stainless steel tubes. The next combination was tried at San Onofre in 1967. The choice of inconel 600 tubes and sodium phosphate treated water resulted in wastage, fretting, denting, and tube leaks. The next poor engineering decision was tried at Beznau #1, in 1969. Inconel 600 tubes and a zero solids water treatment produced intergranular cracks and tube leaks.

In 1973, Westinghouse went back to inconel 600 and sodium phosphate at Turkey Point and Surry. Wastage and stress corrosion cracking of tubes forced a change to the all volatile treatment. The changeover demonstrated classic engineering incompetence. The combination of the two water chemistries, sodium phosphate and all volatile treatment, produced rampant denting at a rapid unprecedented rate. This sordid history of poor engineering choices has made the steam generators unfit for operation and has necessitated the repairs.

As a result, the Licensee, Florida Power and Light Co. is suing Westinghouse for selling negligently designed steam generators. See Appendix III. The history of engineering failures in Westinghouse's steam generators cast serious doubt on the new experimental models proposed for Turkey Point.

The DEIS provides no positive operating experience data for the new design of the steam generators. The estimates for success of the new design are baseless and highly suspect

Staff Environmental Review

7. The NRC has accepted the Licensee's data without the least question and has written this data into the DEIS. FP&L, the Licensee, has demonstrated a poor record for estimating the negative costs of the repairs. Originally the man-rem for the repairs was estimated to be 1301, then it jumped to 2948 for the same repair. The time estimate which was 180 days has now become 270 days. Costs were to have been $ 102,000,000 but now the Licensee doesn't even total the costs. Could the estimate be as high as $ 730,000,000 now ? Low level radioactive solid waste was estimated by the Licensee was estimated to be 26,000 cu. ft but now has jumped to 38,000 cu. ft. while the generic estimate is 82,000 cu. ft. per unit.

The NRC has available consultants from outside laboratories (Battelle PNL) on this project that appear to be objective. The consultants have no obvious reason to skew estimates, yet these apparently objective estimates are rejected out of hand in the DEIS and are replaced with the apparently skewed estimates of the Licensee. The advantage the Licensee may perceive for presenting apparently skewed estimates is the notion that it will have an easier time winning approval for the repairs in the forthcoming hearings before the ASLB. Overestimating

benefits and underestimating costs can make the repairs appear beneficial in the licensing process. It is apparent that the NRC has done very little independant investigation into the Turkey Point repairs. This mode of operation abandons 40 CFR §§ 1501.2 for preparing a DEIS. The NRC has merely accepted all of the Licensee's dubious estimates. The DEIS is hardly an objective document.

8. The NRC has failed to examine the tube degradation experiences in nuclear plants using Powdex demineralizers. In the DEIS, on page 4-17 are the statements: "It is anticipated that the removal of suspended solids and ionic species from the condensate water will reduce corrosion related phenomena. The demineralizers will employ a mixed-bed ion exchange resin (Powdex) in a series of vessels."

On January 26, 1981, during a meeting with the NRC staff, FP&L, Dade County, and the Intervenor, Norman Coll, a spokesman for FP&L stated that the Powdex demineralizer design is like the Trojan and North Anna units.

The DEIS fails to state that both plants are suffering tube degradation from corrosion related phenomena. In NUREG-0523 published in January, 1979, Table 1 states: "Trojan and D.C. Cook have had indications of limited degradation in recent inspections."

North Anna #1 has suffered catastrophic resin spills

from their Powdex demineralizer. On 5 separate occasions concentrated corrosive accountings, up to 300 lbs. of it were dumped back into the steam generators thereby initiating tube degradation. A letter to NRC Commissioner Bradford from June Allen of the North Anna Environmental Coalition states that the North Anna #1 demineralizer has been placed in a bypass mode, shut off. Recent inspections of North Anna #1 show that 35% of the tubes inspected are experiencing degradation problems, also all tubes in the innermost row of all three steam generators have been plugged.

Mr. Gene Smith, on page 451 of the transcript from the 248th ACRS meeting states: "Westinghouse believes that resin discharges from the Powdex condensate polisher into the feedwater are responsible for the observed accelerated corrosion."

Further information about Powdex demineralizers can be found in the Director's Decision by Harold Denton, June 20, 1980. It is likely that the Powdex demineralizer to be installed at Turkey Point will either be a model that has been proven defective, like the unit at North Anna #1 or it will be an experimental model with no operating experience data.

The NRC has disregarded, completely, the historical, negative aspects of demineralizer operation and has delivered instead, a theoretical unproven wish that the addition of a demineralizer may be beneficial. This DEIS is a travesty perpetrated on the unsuspecting citizens of South Florida.

9. The DEIS fails to examine all the degrading corrosion mechanisms that can occur within a newly designed steam generator. One mechanism that wasn't studied is galvanic action. Steam generators can be likened to a wet cell battery. Dissimilar metals, on various levels of the galvanic scale, will send a flow of electrons from one metal to another, through an electrolyte such as water. The metals losing their electrons will erode, and lose their structural integrity. Recurrance of crippling steam generator tube corrosion through mechanisms such as galvanic action remains a strong likelihood and diminishes the potential benefit of the repair proposal. The DEIS fails to mention galvanic action as a problem and it has not offered any claims or proof that the problem can or will be solved. The DEIS seems to have omitted all information which is not favorable to the repair proposal.

Another mechanism, though poorly understood, is the strange behavior of metals in contact with demineralized water. Dr. Robert Anderson, Professor of Materials at San Jose State University has suggested that metals in contact with demineralized water actually give up their ions to replace ions which would be found in normal water but are missing from demineralized water. This phenomenon must be studied and understood before such a vast commitment of public and private resources takes place. Once again, the DEIS fails its intended function.

10. A negative aspect of the performance of the newly designed steam generators that has been overlooked by the DEIS is cracking of inconel 600 tubes at the apex of the curve. Poor performance of the new components would greatly lessen the anticipated benefits and would actually make what were lesser alternatives, superior in reality. The new quatrefoil support plates appear to have dramatically more flex than the drilled hole design. No parameters for measuring flex have been stated. There are no design features to limit or control the flex. The mechanisms for distorting or flexing the tube support plates are numerous: chemical corrosion, fretting, cyclical vibrations, uneven expansion due to uneven heating and cooling, corrosion of the carbon steel wrapper and shell, engineering defects, manufacturing defects, and human error. The DEIS has not guaranteed that the repaired steam system will operate adequately, without major repairs, until the year 2012. The DEIS has not conclusively stated what the benefits of the repair will be nor has it stated the length of time for which the repaired steam generators will safely operate. These are serious deficiencies in the DEIS.

Radiological Assessment

11. The DEIS fails to assess the postulated number of nonfatal cancers that will be contracted as a result of the repair effort. This failure violates 40 CFR §§ 1502.1 since

nonfatal cancer is a direct impact on the human environment. The classifications of study should be the workforce and plant personnel from external dose, the workforce and plant personnel from internal dose, and the public living in the general area.

12. The DEIS has completely ignored the negative health impacts and potential fatalities that will be suffered by the workforce due to internal dose from ingested radioactivity. Eighteen months of repair activity will generate copious amounts of radioactive construction dust, fumes, smoke, aerosols, and particulates. Missing from the DEIS is an inventory of all the possible airborne isotopes, the number of potentially affected persons, the severity of the contamination, the critical organs, and the size of the area that may contain airborne activity.

13. There is no data in the DEIS that pertains to the costs of mating mismatched components. The economic costs would be increased field costs, delay of entire operation, and additional fuel replacement costs to consumers. Environmental costs would be increased direct radiation, increased ingested radioactivity, increased airborne activity, and increased liquid and solid radioactive waste.

The old upper assemblies have been subject to nine years of an aggressive and strenuous environment. Corrosion, sagging

high temperatures, high pressures, transients, vibration, unequal heating and cooling, scrams, and metal fatigue could cause critical distortions from the design geometry.

The new lower assemblies have been subject to manufacturing rigors, transporter and barge travel, numerous lifts by cranes, and long term laydown at the Turkey Point site. In addition, due to the changes in Revision 7, the new lower assemblies will have to be cut below the tubesheet to implement the channel cut method.

It is rumored that Surry #2 had terrible alignment problems during the installation of their new lower assembly.

14. The DEIS states on page 4-10, that from 1975 to 1977, each nuclear unit generated about 575 cubic meters (20,297 cu. ft.) of low level radioactive waste (LLRW) annually. The sources of LLRW for a year of repair starting Oct. 1, 1981 and ending Sept. 30, 1982, must be examined. Unit #3 will be in operation and will generate about 20,297 cu. ft. of LLRW. The three old steam generators removed from the containment building will add about 10,000 cu. ft. of LLRW. Three months of operation after the repair of unit # 4 will add another 5074 cu. ft. of LLRW. There are three estimates for the amount of LLRW to be produced by a unit's repair: FP&L's at 38,830 cu. ft, Surry's at 56,480 cu. ft., and NRC generic at 81,190 cu. ft. Consider that the Surry LLRW estimate was made before the repair was completed.

The total LLRW estimates range from 74,201 cu. ft. to 116,561 cu. ft. Unfortunately, there is no proposal for post repair testing and inspections, so the LLRW estimates for this phase have not been determined.

Page A-13 in the DEIS gives the volume limitation for the burial of LLRW, from Turkey Point, at the licensed burial facility in Barnwell, South Carolina. Starting October 1981 and each month thereafter, only 2,000 cu. ft. of LLRW will be accepted for burial. By totaling the site sources and the various estimates for the repair LLRW and by subtracting the burial allotment, there will be estimated excesses of 50,201 cu. ft. to 92,561 cu. ft. of LLRW that will not be accepted by Barnwell. During the following year, starting Oct. 1, 1982, another repair will take place and the amount of LLRW not acceptable to Barnwell will double. The excess LLRW at Turkey Point will be 100,400 cu. ft. to 185,000 cu. ft. and these estimates still do not include the LLRW projections for the post repair testings and inspections.

Other than meekly saying that Barnwell may grant an additional allotment, the DEIS offers no studies or solutions for the storage of excess LLRW. This situation is exacerbated by the Licensee who has not requested an additional allotment from Barnwell, South Carolina. See Appendix V.

Will there be mountains of LLRW sitting on site ? What happens to excess LLRW during hurricanes, floods, and tornadoes ? What about leakage and leachates contamunating

Biscayne Bay and the Bisca yne Aquifer ? How badly will the LLRW containers corrode from salt spray and weathering ? Who will be liable for accidental contamination ? Will the excess LLRW be shipped to some other storage or burial site ? If so, what are the costs ? Will there be a new LLRW site in Florida ? What environmental and human costs are involved ? How much leakage from LLRW is tolerable ? The DEIS has not answered these questions.

Looking past the repairs, the prospects for landfill disposal of excess LLRW from Turkey Point seem poor. The nuclear units may continue to generate 20,297 cu. ft. of LLRW a year. But since the backwash effluent from the new demineralizers must be solidified and disposed, it is possible that the amount of LLRW will increase above historical levels.

A gradual reduction of accumulated LLRW over the years is unrealistic. 1½ years after the repairs have concluded, St. Lucie no. 2 is expected to come on line. If there is no provision for the LLRW from St. Lucie no. 2 up to Barnwell, any reduction of accumulated LLRW at Turkey Point may be permanently halted.

The DEIS studies no volume reducing techniques. What percentage of the repair wastes will be compactable ? What volume reductions can be obtained from compacting wastes ? What are the additional costs ? What are the

additional man rem commitments ? Is incineration being considered ? What are the incineration costs, effluents, and dangers ?

The DEIS is totally deficient in addressing the impacts of LLRW management, such as postulated leakage, postulated accidents, contamination of food chains, immediate cancers, delayed cancers, nonfatal cancers, mutagenic and teratogenic effects. The DEIS clearly violates 40 CFR §§ 1502.1.

15. Turkey Point sits atop the Biscayne Aquifer. It is a rock formation that is porous and permeable and is reputed to be the finest aquifer in the country. If the hydrologic gradient slopes towards the East, the water will flow east. If the gradient slopes toward the West, the water will flow west. A potentially serious condition can occur when the hydrologic gradient reverses and radioactive water from Turkey Point's low level radioactive liquid dump gets transported toward the main part of the Biscayne Aquifer. The hydrologic reversal is due to drainage of the wetlands west of Turkey Point usually for commercial enterprises. The high water table must be lowered to drain the land. Canals are dug and water flows into the bay faster than normal and drains the land. The bay, whose level doesn't change, except for the semidiurnal tides becomes the higher hydrologic level and pushes the water from Turkey Point further and further inland.

Private wells used to irrigate food crops and public wells used to provide drinking water to Homestead, Florida and the Florida Keys Aqueduct Authority (FKAA) are being threatened by the westward movement of underground water from the Turkey Point plant. The Licensee has instituted an "Interceptor Ditch Pumping Program" to mitigate the situation the plant has created, but the interceptor ditch is only 20' deep and the aquifer is 97' deep at the plant site. The pumping can scarcely be expected to affect the full depth of the aquifer when the hydrologic gradient slopes west. The hydrologic gradient normally slopes westward during the times of peak drought, but this situation will be considerably worsening as the wetlands continue to be drained. At last report, water contaminated with salt, in the vicinity of Turkey Point, was about five miles from the cones of depression caused by the Homestead and FKAA wellfields. The DEIS has completely failed to study the short and long term effects on the groundwater as a result of radioactivity from the repairs being added to the radioactivity from plant operations. The DEIS must study cumulative effects.

Economic Costs of Steam Generator Repair

16. The DEIS fails to study the effects that will occur due to the large amounts of capital that will be gathered and spent on steam generator repairs. The Licensee can generate

capital by going into debt (selling bonds) or selling off ownership in the company (selling stocks). Presently, the Licensee is trying to sell 1,750,000 shares of stock and the value of the stock in the market is dropping. The Licensee and consequently the consumers will suffer from the extraordinary high costs of generating capital in today's market. This sale of stock and other problems will force the Licensee to seek rate hikes before the Florida PSC. This situation is presently occuring.

There is a double negative effect concerned with raising capital for steam generator repairs. The Licensee will be forced to pay premium rates for this capital and once committed, there will be much less capital available to convert oil burning facilities to coal and to implement useful conservation strategies. Increasing costs will cause rates to go up. There will be a ripple effect through the economy. Conversion to coal and conservation will be delayed or forgotten and this will place additional burdens on the consumer.

The consumer sector will suffer the problems that the Licensee faces and it will also be hit with the excessive fuel replacement costs no longer charged to the Licensee. The massive withdrawal of monies from the consumer sector will seriously impair the conservation strategies that would have been implemented by the individual consumers. The Licensee will suffer, the consumers will suffer, conservation

will suffer, but Bechtel and Westinghouse will prosper. Money will be unavailable just when it's needed the most. The vast amounts of money required to repair Turkey Point will not be available to save energy. The DEIS fails to consider the full impacts of making this irreversible decision.

17. The use of $ 535,000 a day, differential fuel replacement cost makes the DEIS grossly inadequate as a study document. Much more sobering and realistic is NUREG-0685 published in August, 1980, and which can be used as a planning document for future reactor outages. NUREG-0685 states that the projected fuel replacement cost for unit no. 3 or unit no 4, as of January, 1981, is $ 20,000,000 a month. This number divided by the number of days in January gives a daily fuel replacement cost of $ 645,000 a day. Although this document does not predict future oil prices, it states that the price of oil has doubled in the past two years. Since the Licensee exclusively uses OPEC oil, it is likely that this pricing scenario will continue in the future as it has in the past. In July 1981, the daily replacement fuel cost may be $ 806,250 (beginning of the third quarter). In January 1982, the cost may be $ 967,500; in July 1982, $ 1,128,750; and in January, 1983 (repairs still in progress), $ 1,290,000. If the price of oil doubles every two years, the fuel replacement costs for the repair project will be $ 587,917,500. This fuel replacement cost figure is dependant on the ability of the

Licensee to complete the repairs within the 270 day time frame. If the repairs go past June of 1983, the costs can be expected to escalate.

Most recently, President Reagan has lifted pricing controls from domestic oil supplies. Although not directly tied to OPEC pricing, decontrol can be expected to put upward pressure on OPEC oil pricing.

The DEIS incredulously assumes that the price of oil will not rise between October 1980 and June 1983. Such skewed cost analysis violates the entire spirit of NEPA and specifically violates 40 CFR §§ 1502.22 and § 1502.23. See Appendix VI and VII.

18. The DEIS presents a completely deficient argument in justifying the repairs on an economic basis. The mistakes published in the DEIS makes it unfit for public comment. The economic errors prevent any alternative economic model from being equal or superior if the model utilizes DEIS information as being accurate information. The DEIS must be withdrawn, corrected, and resubmitted as a DEIS.

The total cost estimate fails to consider that outages of 270 days will occur twice not once, as the DEIS has calculated. Other mistakes are more sly. Intervenor's comment #17, assumes the cost of oil will continue to rise (whereas the DEIS does not). The total likely cost of replacement fuel will be $ 587,917,500. Added to the fuel replacement costs are: capital repair costs,

$ 119,000,000; new demineralizer, $ 9,000,000; condensor retubing, $ 8,000,000; startup of Cutler plant, $ 2,300,000; storage building, $ 3,000,000; and offsite shipment of lower assemblies, $ 2,500,000. In a meeting on January 26, 1981, with the NRC, the Licensee, Dade County, and the Intervenor, a spokesman for the Licensee stated that both options for lower assembly disposal are being pursued simultaneously. The storage site has been elevated to 17.5' and the barge for transport to Barnwell is being built. Consequently, the Licensee will accrue both costs. The total cost estimate for the repairs thus far are $ 731,717,500 but still all costs are not yet counted.

Not addressed by the DEIS are the additional costs of borrowing money, selling stock, NRC licensing fees, engineering studies, repair administration, environmental studies, lawyers fees, obsolete plans and studies, health physics efforts, public relations, lobbying, operations, maintenence, inflation, and the inevitable cost overruns. The DEIS must be withdrawn, corrected, and resubmitted as a DEIS.

19. The DEIS ignores the economic impact of the repairs on the FP&L consumer. Never is it mentioned that the total repair cost will not result in any new generating capacity, other than what is on line right now. Simply stated, the costs of the repairs will result in pure inflation to the customers of FP&L.

Vast monies will be spent with no appreciable gain. The cost of the repair to the average customer will be $ 332 ($ 731,717,500 divided by 2,200,000 customers). It is devastatingly significant to extract this much money from the Florida economy with no apparent gain. To make matters worse, the costs will come, entirely, from the consumers disposable income.

Some sectors of the economy can pass on these additional costs and others cannot. Commercial enterprises pass costs on to the consumer, but the consumer must absorb his own plus all the commercially passed on costs.

Within the consumer sector, cost impacts will vary. Rich and middle class consumers will survive, but the poor consumers living at the very edge of survival will suffer greatly. Consider the poor, black, fatherless families living on welfare in riot torn Liberty City, the aged retirees living on meager fixed social security allowances, on South Beach, and the terribly poor migrant families of South Dade County devastated by the Midwest droughts and the lack of work from the 1981 vegetable freeze. They all will be required to pay premium electric rates because of the incompetant engineering at Westinghouse and FP&L. The DEIS has failed these people. Sadly, even in a DEIS, corporate profits will overshadow human desperation.

A secondary impact will be the delayed investment of private

energy conservation strategies in Florida due to the loss of $ 731,000,000 in disposable income. As electric rates skyrocket and some conservation does take place, only the rich and some of the middle class consumers will be able to invest and benefit from conservation strategies. Unfortunately, the poor, who need to be the most energy efficient of all the classes, will not be able to make the necessary investments. The DEIS has failed to examine any energy conservation strategy as an alternate to steam generator repairs. Effective conservation investments will benefit the consumer, the business sector, and the Licensee, but above all, it will greatly benefit the poor people of Florida.

On a national scale; the repairs will require a vast amount of OPEC oil. The impacts of the repair will worsen America's balance of payments to OPEC nations, increase the demand for oil which usually drives prices up, and increase the consumption of oil, an irreplaceable resource. The logical direction in which to turn is conservation, the saving of energy which otherwise would be wasted. The DEIS fails again.

Assuming that the repairs are made, Turkey Point has historically worked at only a 65 % DER capacity level. This level is not unusual, it is the average level of all reactors in the country. See Appendix VI. Little more capacity can be expected from Turkey Point since it is an old reactor and it will continue to be plagued with component problems associated

with advancing age. The argument for conservation is made stronger. An added benefit will be the conservation of electricity usually provided by the burning of OPEC oil for the 35 % of capacity that Turkey Point fails to produce. Conservation can replace 100 % of Turkey Points DER capacity. By ignoring conservation, the NRC has violated 40 CFR § 1502.14 which is the very heart of the EIS process under NEPA.

20. The DEIS has not considered the negative economical impacts of the Licensee putting the capital costs of the repairs into the rate base of the utility. The customers of FP&L are all ready paying for the building of the Turkey Point plant. Now, due to some incompetent engineering decisions along with the NRC's consent on those decisions, the consumers must now pay for the repairs which will be 3 times the cost of constructing the plant. The repair costs in the rate base will have a long lasting negative effect on the Florida economy and the DEIS has failed to address that effect.

Nonradiological Environment Assessment

21. The DEIS fails to study the effects of the reopening of the Cutler plant in Dade County in response to the closing of units 3 and 4 for repairs. Cutler operations entail increased oil barge traffic, auto traffic, air pollution, noise pollution,

thermal pollution to Middle Biscayne Bay,. Chemical effluents to the bay, 24 hour disturbances to area residents, raw sewage to Biscayne Bay, and the likely lack of a valid NPDES Permit.

The surrounding residential area has grown considerably in the years the Cutler plant has been shut down. Increased auto traffic will add to rush hour congestion, increased noise levels 24 hours a day, increased traffic accidents, especially among the area resident's children.

The short stacks on the Cutler plant are known to the area residents as "loopers". The turbulence created by wind passing around the plant, drives the effluent from the short stacks down to ground level where it concentrates and damages the surrounding area. Fumes containing a sulfer smell have damaged paints on houses, cars, furnishings, and have caused corrosion of acid sensitive materials. Obviously the value of the housing in the nearby area will decline sharply as the negative impacts appear. Local vegetation and landscaping representing substantial investment, will ail and die due to the noxious fumes. There is a strong likelihood that FP&L will burn an oil with a higher sulfer content than has been burned at that plant previously.

The DEIS has failed to consider the $ 2,300,000 cost of starting up Cutler as a consequence of the Turkey Point repairs. Another cost, unknown as of now, will be the operating and maintenence expenses, which have not been included in the fuel

replacement cost estimates for the repairs. All Cutler costs will negatively affect the consumers.

The design of the Cutler plant is poor because there is no containing building. The mechanical sounds deluge the local residents and carry very far at night when ambient noise levels are low. Cutler will have to undergo substantial and expensive modifications before its operations can be made tolerable. See Appendix VIII.

Cutler is notorious for its thermal impacts on Biscayne Bay. In immediate danger is thallasia (turtle grass) in the vicinity of the plant. Thallasia is vital for keeping Biscayne Bay alive. Its importance is shown by the initiation of thallasia planting projects in the Bay, taking place where thallasia has been destroyed. The opening of the Cutler plant and the scorching of the bay bottom are important negative impacts ignored by the DEIS.

22. The DEIS discounts the effects of laundry waste water in the cooling canals. 22,000 gallons x 270 days x 2 units equals 11,880,000 gallons of wastes. The unit that is not being repaired is still generating its usual amounts of waste and the cumulative effect of both units is ignored in the DEIS. The DEIS patently states that nonphosphate detergents will be used, but it never states precisely what are the detergent compounds that will be used.

The estuarine environment in South Florida is delicate and fragile. Nowhere else in Florida are raw laundry wastes allowed to be discharged directly into canals. Is there a valid NPDES Permit in place that allows the increased dumping of this sewage ? None of the pollutants have been identified. What will the laundry waste pH be ? If the detergent is biodegradable, what is the biological oxygen demand ? What effect will an increased BOD have on the environment ? Will the radionuclides bind with organic compounds and contaminate food chains ? What effects will laundry wastes have on each of the endangered species living in the area ?

All legitimate questions concerning direct effects, indirect effects, synergistic and cumulative effects on endangered species and critical habitats have been discounted by the DEIS on a wholesale basis.

Environmental Impacts of Postulated Accidents

23. The DEIS has approved a radioactive waste storage building that is compliance with few, if any safety codes. South Florida may soon have 1200 tons of radioactive waste sitting in an experimental building atop a small manmade hill. Any sizeable hurricane can wash out the fill, since its only 1300 ft. from the shoreline, and send the splintered building and the radioactive wastes crashing into the floodwaters below.

The Licensee has stated that its storage building complies with the South Florida Building Code. Was this code devised to keep radioactive wastes isolated from the environment or was it devised to protect people ? In South Florida, buildings and residences located near the edge of the water are traditionally evacuated at the approach of each hurricane. Will the Licensee evacuate the radioactive steam generators at the approach of each hurricane ?

Each hurricane contains all the mechanisms needed to release large amounts of radioactivity from the storage building. Large waves will erode the limestone fill and undercut the concrete foundation. Concrete walls and roof will come crashing down on the steam generators breaking open the protective caps. The steam generators will go tumbling down the 18 ft. embankment and the floodwaters will flow through the units, washing out all the radioactive crud that has broken loose by the tremendous mechanical shocks. At this point Biscayne Bay is contaminated with high levels of radioactivity, including transuranics, and decontamination is impossible.

The NRC apparently has no safety codes to assure that this accident won't happen. This building will be an experimental model and will be located in the worst place in the country, hydrologically and geologically to isolate radioactive wastes from the environment. Hurricane Camille came ashore in Mississippi packing winds in excess of 200 mph, yet, the building

is only designed to withstand winds of 120 mph. The DEIS has failed to assess the extent of contamination that will occur if a 200 mph hurricane hits the site.

24. One of the alternatives to steam generator repair discussed in the DEIS is continued operation in the present or derated mode. Continued operation may be a part of an alternative strategy if other generating capability or effective conservation strategies would be implemented. The DEIS fails to study the lack of accurate information in determining the extent of damage by corrosion to the degraded steam generators.

NUREG/CR-0718 written by Battelle PNL studies the accuracy of single frequency eddy current testing, used to measure degradation in corroded tubes. Unlike field condition measurements taken in a hostile radioactive environment, Battelle performed the experiments in near perfect laboratory conditions using new tubes with intentionally machined defects. The results of this study discredit this commonly used measurement device. On page 119 of NUREG/CR-0718, is a summary of the attempts to measure groove defects by single frequency eddy current testing. Only 14 % of the measurements were accurate to within 5 % of the actual defect. 17 % of the measurements overestimated the damage, 41 % underestimated the damage, and 31 % of the measurements failed to detect any damage when the damage was present.

On page 129, an experiment showed that 34 % of the results of eddy current testing on tubes with denting and elliptical wastage, were uninterpretable. These grossly innaccurate measurement systems demonstrate that the NRC has not been able to determine the actual amount of danger to the public when dealing with reactors that have degraded steam generators. The DEIS was to have addressed dangers to the human environment, but has failed in its purpose and has violated 40 CFR §§ 1502.1.

Impacts of Alternatives

25. The DEIS considers continued operation of units 3 and 4 possibly in a derated mode, as an alternative to repairs. Derating does not require the vast resources ($ 730,000,000) or the generating of large volumes of waste. If a committment of all the resources required for the repair was made towards implementing conservation strategies, derating would become a beneficial interim strategy, unless the derated operation of Turkey Point is an unsafe alternative.

The DEIS fails to examine the dangers of operating Turkey Point in a derated condition. Unexplained references, such as " not enough heat transfer surface" leave the DEIS reader uncomfortable and uninformed. In NUREG-0523, Appendix B, safety questions are asked but not answered. The DEIS has failed to examine the safety issues raised by NUREG-0523 as it

pertains to the present and possibly future operation of Turkey Point.

What are the failure probabilities of degraded tubes ? What is the justification for continued safe operation with degraded steam generators ? What are the real consequences of LOCAs and MSLBs for reactors with degraded tubes ? What are acceptable primary to secondary leakage rates in relation to ECCS ability ? What effect will degraded tubes have on the radiological dose during postulated accidents ? Do degraded tubes increase the probability of a design basis accident ? By how much ? Will accidents be caused or exacerbated by degraded tubes ? How many tube failures can be tolerated is an accident scenario ? What are the effects of plugged tubes during accidents ?

Clearly, the DEIS is a total failure in this area and clearly, a design basis accident is a catastrophic threat to the human environment.

Conclusions

26. The DEIS fails to address the other serious impairments that the Turkey Point plant will face in its remaining operating life. These impairments must be calculated as negative costs in the cost/benefit analysis. Problems such as cracked containment walls, cracked feedwater piping, cracked

borated water piping, cracked primary coolant piping, cracked supports, pump failures, cracked reactor head and vessel, or the buildup of excessive radioactive crud (such as at Dresden) can totally negate any benefit that repaired steam generators may offer. The DEIS is deficient for not considering all the likely, disabling impairments that can shorten the life of the Turkey Point reactors.

27. The DEIS is noncommittal about the 100,000 gallons of partially decontaminated primary coolant that may or may not be discharged into the cooling canals. The DEIS is deficient for not considering the dumping as as environmental impact. See Appendix IX.

28. The DEIS fails to conclude precisely who is the beneficiary of the steam generator repairs. If it were to identify the beneficiary, it would be the Licensee, the Florida Power and Light Company. The citizens of Florida will pay the costs and be hurt by the repairs. FP&L has made this decision as it has made many other decisions. It was based on the maximization of profits so it can continue to attract investment capital. Certain obligations for maintaing the franchised monopoly will be made, such as the availability of electricity, but, the greatest benefits will go to the corporation and the stockholders.

The DEIS has forgotten the public. The "business as usual" approach by the NRC in their daily routine matters may be acceptable government practice, but this lack of objectivity and disregard of the public must not be allowed to permeate a NEPA mandated Environmental Impact Statement. Nuclear profits must not be promoted at the expense of the public good. The concept that "electricity is good", is not enough reason to dismiss public costs, public health risks, and the public's desire for a clean and healthful environment.

The public is definitely being served by increased rates, skyrocketing fuel adjustment charges, contamination of ground water and coastal waters, new local radioactive waste sites, increased cancers among workers, poor component designs, and the strong possibility that disabling tube degradation problems will recurr. In light of the advantages of a strong effective conservation program, the most beneficial plan will be to phase out the operations at Turkey Point with all of its technical problems and commit the resources to an ever expanding conservation of electricity program.

Unfortunately, the NRC is still promoting nuclear power. Conservation programs, which are the most viable and desirable energy plans, both locally and nationally, were totally ignored by the DEIS.

29. The DEIS has failed to consider the most appropriate

alternative to the steam generator repairs. The alternative is conservation of electricity. The advantages of conservation are many:

Less economic burden

Fewer health and environmental hazards

No new local nuclear waste dumps

Reduction in the usage of imported oil, and

The recurrance of tube degradation becomes unimportant.

Two recent documents submitted to the Florida PSC by FP&L prove the clear cut economic advantage of conservation over the repair option. They are "Energy Management Plan for the 80's", Nov. 1, 1980 and the "Petition For Approval Of Revised Energy Management Plan", Dec. 30, 1980. Exhibit #8 of the "Petition For Approval..." contains a detailed cost benefit analysis for electricity conservation strategies. The conservation strategies in Target Areas I, II, and III will reduce present demand by 1,871 MW capacity. The cost of implementing the conservation strategies will be $ 712,116,000 (1980 dollars) for a calculated cost of $ 380/kw.

Turkey Point units 3 and 4 are rated at 666 MW each. FP&L hopes to be able to get up to 85 % capacity for awhile, so the actual generating capacity is 666 MW x 2 x 85 % equaling 1,132,200 kw. The actual costs attributable to the repair and fuel replacement cost will depend largely on the

rates by which oil prices increase, but based on the historical data presented in NUREG-0685, the costs for the repairs will be $ 731,717,500 for a calculated cost of $ 646/kw.

Conservation will provide a cost advantage of $ 266/kw. The dollar advantage for not repairing Turkey Point is $ 301,165,200. Another advantage is that the conservation strategies will provide an additional 738.8 MW capacity while still below the repair costs. These conservation strategies can easily be expanded to reap greater economic benefits while suffering fewer health and environmental costs.

The complete cost benefit analysis for this conservation program is in Appendix X.

The DEIS is tragically faulted and is mistaken in its conclusion that the repairs is the most desirable of all options. Documents produced by Florida Power and Light have conclusively proven that the most desirable option is conservation. The DEIS must be amended to recommend that the repairs not be made.

The Miami News **Opinion** Wednesday, July 30, 1980

Turkey Point repairs everybody's business

Both the people and the government of Dade County are affected in almost every way imaginable by what happens at Turkey Point's nuclear generators. Yet Florida Power & Light Co. has the authority to make most of the decisions pertaining to the nuclear units, decisions which can have a radical impact on Biscayne Bay, on the area's water supply, on air quality, on the employes at Turkey Point, and on all the people who live here and who pay commercial and residential power bills.

So the Metro Commission was wise in agreeing to intervene in two legal proceedings involving Turkey Point: the hearing before the Nuclear Regulatory Commission on the environmental impact of FP&L's proposed replacement of the nuclear unit steam generators, and the lawsuit in which FP&L seeks damages from Westinghouse, alleging that it was negligent in the design and manufacture of the generators.

Quite apart from the halo of health and safety problems surrounding the proposed removal and storage of the damaged generators, Metro government and Dade residents have a significant financial stake in the outcome of the two actions.

Every time the nuclear units are shut down so FP&L can plug the corrosion-caused leaks which have appeared regularly since the generators were installed, the county and the business and residential users pay an added surcharge. Metro Commissioner Harvey Ruvin, who introduced the motion to intervene, estimates that the county government has paid $9 million in fuel surcharges since 1976, some $2 million of which was necessitated by repairs to the leaking generators. If damages are recovered from Westinghouse, the county, by participating in the lawsuit, might be in a position to get some of that money back.

The ongoing problems with the nuclear units, the fact that all 20 of the Westinghouse-designed steam generators in the country are leaking and corroded, the cost of temporary repair and the time-consuming and very probably dangerous nature of the replacement process all raise the inevitable question about the safety and the financial efficacy of nuclear power.

It is true that Miami schoolteacher Mark Oncavage, acting as a private citizen, has petitioned the NRC for the right to question FP&L about the impact of the repairs. But everyone who lives or works in Dade has a stake in the repair process, and therefore has the right to be represented in some manner at the NRC hearing on the environmental impact of the removal and disposition of the damaged nuclear generators.

It is only proper that Metro make its technical expertise available during the process of reviewing that potential impact, proper because Metro would be involved should the repair process result in polluting the air with radioactivity, or have an adverse effect on the bay, the water supply, even the FP&L employes doing the work.

Commissioners deserve credit for becoming involved in what may be the most significant issue Dade County has ever confronted. Their decision to intervene in a non-adversary position makes it evident that the commissioners are concerned with questions more complex and long-term than next year's budget or the next referendum. And although FP&L's intense lobbying predictably has resulted in the call for a possible reconsideration of the vote when the commission meets again in September, the commissioners should not consider backing away from one of the most responsible and progressive stands the commission has ever taken.

Appendix I

Appendix II

The Miami Herald

JOHN S. KNIGHT, Editor Emeritus JAMES L. KNIGHT, Chairman
LEE HILLS, Editorial Chrm. ALVAH H. CHAPMAN Jr., Pres. JOHN McMULLAN, Exec. Editor BEVERLY CARTER, Gen. Mgr.
JIM HAMPTON, Editor ROBERT D. INGLE, Managing Editor DON SHOEMAKER, Senior Editor

EDITORIALS

Metro: Intervene in FPL Cases

METRO commissioners were correct in July when they decided that the county attorney should participate in two complex legal proceedings involving the Turkey Point nuclear-power plant. When they reconsider the question today, the commissioners should stick with their original course.

That's not to say that there necessarily is anything wrong with the handling of the Florida Power & Light (FPL) Turkey Point plant. But very large sums of money are involved — an estimated $120 million to repair the plant's steam generators, plus another $300 million for fuel oil that wouldn't have been needed if the nuclear plant were operating properly. Further, there's obvious *potential* for environmental and health dangers from the repair process and from the proposed storage at the site of radioactive materials.

Certainly Metro Dade has every right, both as a major customer itself and as the representative of all Dade residents, to participate in the two cases. In one case, FPL is suing Westinghouse Corp., which produced Turkey Point's steam generators. That equipment has deteriorated and now requires extensive repairs and replacement after eight years of use.

If Westinghouse sold defective equipment to FPL, the utility and its customers are entitled to refunds. If, on the other hand, the courts determine that the fault is in FPL's maintenance, the consumers should look to the electric company for their refunds. There should be no opportunity for a private settlement that might make it difficult, if not impossible, for consumers to get their money back from either company.

FPL officials insist that they are both able and eager to defend their customers, Metro included. But higher charges to Metro government alone as a result of the problems at Turkey Point is estimated by the county to be more than $1 million. The commissioners should look out for their own interests rather than passively depending on FPL to do so.

In addition to the civil suit between Westinghouse and FPL, the county also should join in the FPL application to the Nuclear Regulatory Commission (NRC) for permission to repair the steam generators. This repair work is no backyard welding job. It is massive, and it involves potentially hazardous work conditions and possibilities for the escape of radiation into the air and into Biscayne Bay.

The repairs should be done. But Metro should participate in all environmental-impact reports, health-and-safety planning, and other aspects of the NRC application process. The county can participate actively as a concerned but disinterested party. It need not, and should not, oppose the company's application.

Lay citizens can hardly reach sound conclusions about the cost-effectiveness or safety of a particular power plant. Nor can private volunteer groups such as Floridians United for Safe Energy be expected indefinitely to carry the heavy burden of representing the public's interest. That's what government is for.

Metro is the government involved. The commission ought to proceed with its planned intervention in both cases.

Let's Keep Florida Safe!
CONTRIBUTE TO
FUSE 7210 Red Rd.
rm 208 Miami, 33143

Appendix III

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

CASE NO: 78-1896-Civ CA

FLORIDA POWER & LIGHT COMPANY, a Florida corporation,

Plaintiff,

vs.

WESTINGHOUSE ELECTRIC CORPORATION, a Pennsylvania corporation qualified to do business in Florida,

Defendant.

COMPLAINT FOR DAMAGES

'78 MAY 10

FLORIDA POWER & LIGHT COMPANY ("FPL" or "Plaintiff") sues WESTINGHOUSE ELECTRIC CORPORATION ("Westinghouse" or "Defendant") and says:

1. This is an action for damages in an amount which exceeds the sum of ten thousand dollars ($10,000.00), exclusive of interest and costs.

2. FPL is a corporation, incorporated under the laws of the State of Florida, having its principal place of business in the State of Florida. At all material times, it is and has been a public utility engaged in generating, transmitting, and distributing electricity to the public in the State of Florida.

3. Westinghouse is a corporation, incorporated under the laws of the State of Pennsylvania, having its principal place of business in a State other than Florida. At all material times, it has been qualified to do business in Florida and doing business in Florida, having agents or other representatives in Dade County, Florida.

4. FPL and Westinghouse entered into a Plant Equipment Contract effective November 15, 1965 (Contract).

5. Under the contract, Westinghouse was obligated to design, manufacture and furnish to FPL the nuclear steam supply systems, (Plant Equipment) including six steam generators, for FPL's Turkey Point Unit No. 3 and Unit No. 4 nuclear generating plants in Dade County, Florida.

6. At the time, Westinghouse entered into the Contract, it knew or should have known that:

(a) The operation of Turkey Point Units 3 and 4 by FPL would be dependent upon the satisfactory operation of the Plant Equipment to be supplied by Westinghouse;

(b) Any inadequate Plant Equipment supplied by Westinghouse pursuant to the Contract would have to be repaired, replaced or revised;

(c) Inadequate operating instructions supplied to FPL by Westinghouse would lead to damage and injury to Turkey Point Units 3 and 4;

(d) Upon completion, Turkey Point Units 3 and 4 would supply a significant part of the power required by FPL to fulfill its commitments to its customers;

(e) If Turkey Point Units 3 and 4 were to be inoperative for any period, FPL would be required, during that period, to produce substitute power at its other facilities and to purchase substitute power from other sources at much greater cost than it could produce power from Turkey Point Units 3 and 4.

7. In August 1974, Plaintiff first discovered substantial leaks in certain tubes comprising an an integral part of the steam generators designed, manufactured, and supplied by Westinghouse pursuant to the Contract for Turkey Point Unit 4.

8. In September 1974, Plaintiff first discovered substantial leaks in certain tubes comprising an integral part of the steam generators designed, manufactured, and supplied by Westinghouse pursuant to the Contract for Turkey Point Unit 3.

9. In April 1975, FPL first discovered that a large number of tubes comprising an integral part of the steam generators designed, manufactured, and supplied by Westinghouse pursuant to the Contract for Turkey Point Unit 4 were performing little or none of their intended function because corrosion within the tube assemblies had dented, partially closed and cracked the tubes and tube support plates.

10. In October 1975, FPL first discovered that a large number of tubes comprising an integral part of the steam generators designed, manufactured, and supplied by Westinghouse pursuant to the Contract for Turkey Point Unit 3 were performing little or none of their intended function because corrosion within the tube assemblies had dented, partially closed and cracked the tubes and tube support plates.

11. The aforesaid defects have rendered the steam generators totally unfit for their intended purposes, and reasonable efforts to render them fit or suitable have been unsuccessful.

12. Despite FPL's requests and demands that Westinghouse correct these defects, Westinghouse has failed and refused to do so.

13. FPL has fully performed all of its obligations under the Contract, including payment of the Contract price, and all conditions precedent have been performed or have occurred.

COUNT I

14. Plaintiff incorporates by reference and realleges Paragraphs 1 through 13 above.

15. Westinghouse expressly warranted and guaranteed that the equipment it furnished under the Contract would produce stated guaranteed outputs.

16. Westinghouse breached such express warranty and guarantee by supplying Plant Equipment, which, because of the defects described above, has failed to produce the stated guaranteed outputs.

17. FPL furnished Westinghouse reasonable, timely and adequate notice of the above-described breaches of Westinghouse's express warranty and guarantee.

18. As a direct result of Westinghouse's breaches of such express warranties and guarantees of the Contract, FPL has been and continues to be required to make major repairs, revisions and inspections of the Plant Equipment furnished by Westinghouse, to take Turkey Point Units 3 and 4 out of operation for extended periods of time for repair, revision and inspection, to produce substitute power at its other facilities and to purchase substitute power from other sources at much greater cost than it could produce power from Turkey Point Units 3 and 4. As a direct result of the foregoing, Plaintiff has sufferend and will continue to suffer damages, the exact amount of which is still undetermined.

COUNT II

19. Plaintiff incorporates by reference and realleges Paragraphs 1 through 13 above.

20. Under the Contract, Westinghouse expressly warranted that the work, and all parts thereof, furnished by it would be free from defects in workmanship and material and be suitable for the use intended, and further agreed that it would, without cost to FPL, promptly correct any defects.

21. Westinghouse breached such express warranties and provisions of the Contract:

(a) By supplying Plaintiff with steam generators for Turkey Point Units 3 and 4 which were:

1. not free from defects in workmanship and material; and

2. not suitable or fit for the use intended

(b) By failing to promptly or successfully correct the defects in the steam generators for Turkey Point Units 3 and 4 without cost to FPL.

22. FPL furnished Westinghouse reasonable, timely and adequate notice of the above-described breaches of the express warranties and other provisions of the Contract.

23. As a direct result of Westinghouse's breaches of such express warranties, Plaintiff has been and continues to be required to make major repairs, revisions and inspections of the Plant Equip-

ment furnished by Westinghouse, to take Turkey Point Units 3 and 4 out of operation for extended periods of time for repair, revision and inspection, to produce substitute power at its other facilities and to purchase substitute power from other sources at much greater costs than it could produce power from Turkey Point Units 3 and 4. As a direct result of the foregoing, Plaintiff has suffered and will continue to suffer substantial damages, the exact amount of which is still undetermined.

COUNT III

24. Plaintiff incorporates by reference and realleges Paragraphs 1 through 13 above.

25. Westinghouse is and was at the time of the Contract in the business of designing, manufacturing, selling, installing and furnishing nuclear steam supply systems, auxiliary equipment and auxiliary systems, including steam generators.

26. Westinghouse impliedly warranted that the steam generators designed, manufactured, furnished and sold by it to FPL pursuant to the Contract were of merchantable quality and that they were free from defects.

27. Westinghouse breached the above-described implied warranties by supplying Plaintiff steam generators pursuant to the Contract which were not of merchantable quality, and were not fit for the production of steam and which contained defects in the design, materials and workmanship.

28. FPL furnished Westinghouse reasonable, timely and adequate notice of the above-described breaches of Westinghouse's implied warranty of merchantability.

29. As a direct result of Westinghouse's breaches of such implied warranties, FPL has been and continues to be required to make major repairs, revisions and inspections of the Plant Equipment furnished by Westinghouse, to take Turkey Point Units 3 and 4 out of operation for extended periods of time for repair, revision and inspection, to produce substitute power at its other facilities and to purchase substitute power from other sources at much greater cost than it could produce power from Turkey Point

Units 3 and 4. As a direct result of the foregoing, FPL has suffered and will continue to suffer substantial damages, the exact amount of which is still undetermined.

COUNT IV

30. Plaintiff incorporates by reference and realleges Paragraphs 1 through 13 above.

31. At the time Westinghouse entered into the Contract with FPL, it knew that the Plant Equipment it was contracting to supply to Plaintiff was intended to be included in Turkey Point Units 3 and 4, and that Plaintiff was relying on Defendant's skill and judgment to supply Plant Equipment fit for the aforementioned purposes. Westinghouse impliedly warranted that the Plant Equipment it was to supply pursuant to the Contract would be fit for the aforementioned purposes.

32. Westinghouse breached such implied warranty by supplying Plant Equipment which was not fit for its intended purposes, was not fit for the production of steam and which contained defects in design, materials and workmanship.

33. As a direct result of Westinghouse's breach of such implied warranties, Plaintiff has been and continues to be required to make major repairs, revisions and inspections of the Plant Equipment furnished by Westinghouse, to take Turkey Point Units 3 and 4 out of operation for extended periods of time for repair, revision and inspection, to produce substitute power at its other facilities and to purchase substitute power from other sources at much greater cost than it could produce power from Turkey Point Units 3 and 4. As a direct result of the foregoing, FPL has suffered and will continue to suffer substantial damages, the exact amount of which is still undetermined.

COUNT V

34. Plaintiff incorporates by reference and realleges Paragraphs 1 through 13 above.

35. Defendant owed Plaintiff a duty to exercise reasonable care in the design, manufacture, and furnishing of the steam generators for Turkey Point Units 3 and 4 and in furnishing Plaintiff with operating instructions and assistance.

36. Defendant breached its duty to exercise reasonable care in the following particulars:

(a) The steam generators for Turkey Point Units 3 and 4 were negligently designed and manufactured such that certain tubes comprising an integral part leaked substantially, impairing their effectiveness;

(b) The steam generators for Turkey Point Units 3 and 4 were negligently designed and manufactured with improper materials which were not corrosion resistant, causing the tubes and tube support plates to dent, partially close and crack.

(c) The steam generators for Turkey Point Units 3 and 4 were negligently designed and manufactured so as to facilitate corrosion which caused the tubes and tube support plates to dent, partially close and crack.

(d) The operating instructions provided by Defendant negligently specified the introduction of chemicals or substances into the liquid transported around the tubes which facilitated the corrosion of the tubes and tube support plates;

(e) Although Defendant was aware of similar problems with steam generators of the same type sold to other utility customers, Defendant failed to warn Plaintiff of the possibility or likelihood of such problems occurring in the steam generators for Turkey Point Units 3 and 4.

37. As a direct and proximate result of the Defendant's negligence, Plaintiff has been and continues to be required to make major repairs, revisions and inspections of the Plant Equipment, furnished by Westinghouse, to take Turkey Point Units 3 and 4 out of operation for extended periods of time for repair, revision and inspection, to produce substitute power at its other facilities and to purchase substitute power from other sources at much greater cost than it could produce power from the Turkey Point Units 3 and

4. The foregoing has caused Plaintiff to suffer substantial and continuing damages, the exact amount of which is still undetermined.

WHEREFORE by reason of Counts I through V above, and each of them, Plaintiff demands judgment for damages in excess of ten thousand dollars ($10,000.00), together with interest, costs, and further demands trial by jury.

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BY: Thomas E. Capps
THOMAS E. CAPPS

Appendix IV

NORTH ANNA ENVIRONMENTAL COALITION

Charlottesville, Virginia
February 18, 1980

Mailing Address: 612 Owens Drive
Huntsville, Alabama 35801
(205) 536-0678

Commissioner Peter Bradford
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Defective demineralizer design
Related corrosion and cracking in
Steam Generators & turbine discs

In the Matter of Virginia Electric and Power Company
North Anna Power Station, Units 1 and 2
Docket Nos. 50-338 and 50-339 OL
Surry Nuclear Power Station, Units 1 and 2
Docket Nos. 50-280 and 50-281

Dear Commissioner Bradford:

NAEC commends the decision of the Commission to require an Environmental Impact Statement (EIS) on the experimental replacement of steam generators at the Surry Power Station.

After so many months had passed since Mr. Denton's 2-1-79 denial to NAEC of both a public hearing and an EIS, we had virtually abandoned hope. We would like to think that our letters of 3-4-79, 5-5-79, and 8-14-79 were of some use to you in your deliberations, and are grateful for your decision to review.

Our letter today would again ask your prudent action in the light of recent disturbing developments:

--Westinghouse (W) admission of turbine disc cracking
Discovered at both Surry reactors
Potential at both North Anna reactors, already under Appeal Board review for turbine missile problems

--Defective Powdex demineralizer design, leading to

--Five (5) resin spills at North Anna #1, the largest of 200-300 pounds occurring on February 27, 1979 (the same date "liquid discharge from Unit #2 VCT entered an unrestricted area in #2...Iodine 131 was 310 times value specified in 10 CFR Part 20..."); others occurring 7-19-79, 9-10-79, 9-12-79, and 9-15-79

--Secondary chemistry problems from the foregoing spills leading to corrosion and cracking in steam generator support plates and tubes as well as in turbine disc keyways leading to possible disc bursts

NAEC would call the attention of the Commission to the striking inter-relatedness--and the irony--of the foregoing problems.

Surry Conditions at North Anna

VEPCO's severe problems with Westinghouse steam generators at Surry were to be avoided at North Anna by the presence of fresh water, by the absence of chloride, and by the use of the Powdex demineralizer or polisher. Yet according to VEPCO's 12-10-79 report, the spills of the resins into the steam generators at North Anna actually created Surry-like corrosion conditions and the beginning of similar corrosion and cracking in 35% of the tubes.

Chemotherapy

One NRC engineer likens the corrosion to a "malignant tumor," all of whose cells must be removed if North Anna's steam generators are to regain health. Nevertheless, the NRC has permitted the installation of a steam generator inspection port to be put off until 1981, after the second re-fueling at North Anna #1.

Defective Demineralizer Design

According to NRC Atlanta, the damaging resin spills at North Anna were caused by a semi-automatic system malfunction with Powdex valve insufficiencies requiring redesign. Thus North Anna #1 is currently operating without demineralization.

Redesign at Surry #2

Ironically, such a Powdex demineralizer has just been installed in Surry #2, down for over a year for steam generator replacement (a difficulty some NRC engineers thought demineralizers might have prevented). It must now follow that the same redesign is required at Surry #2 to prevent a restart and subsequent resin spill which could begin Surry's $133 million steam generator repair troubles anew.

Secondary Chemistry Affects Turbines

As noted earlier, resin spill effects upon the secondary chemistry can cause corrosion and cracking not only in the steam generators, but also in the turbines. Since the turbine building at North Anna is settling abnormally, the risk to turbine integrity is enhanced; periodic shimming has already been necessary.

Surry Turbine Missile Risks

At both Surry units, the turbines are known to be cracked, with NRC staff listing Surry Unit #1 in Category AA and Surry Unit #2 in Category A. Although unlike North Anna, the Surry units are not now under review by an Appeal Board concerned with turbine missile risk, that risk would seem to be even greater under current Surry conditions and thus deserves the direct attention of the Commission.

In the light of the complexity and number of unsolved problems at North Anna and Surry (including condenser neglect described in detail 5-5-79, a leak problem at North Anna now), the Coalition hereby asks the Commissioners to take the following actions in the first instance since NRC staff approval of VEPCO's continued operation with malfunctioning steam generators is a matter of record:

1. Shut down North Anna #1 for turbine inspection, installation of steam generator inspection port, and installation of redesigned valves in the non-functioning Powdex demineralizer, proscribing restart pending adequate spill-proof test results.

2. Continue licensing moratorium on North Anna #2, requiring the same inspection and repairs as those for North Anna #1.

   (NAEC would also request that the licensing moratorium be continued for Sequoyah since this reactor also has a Westinghouse turbine.)

3. Keep Surry #1 closed, pending its steam generator replacement, as unsafe to operate with its multiple related problems: plugged steam generator tubes in excess of 25%, cracked turbine, and questionable seismic resistance.

4. Maintain Surry #2 shutdown pending repair of cracked turbines, redesign and repair of Powdex demineralizer, installation of seismic reinforcements, and stringent testing of new steam generator and condenser tubing.

The Coalition further asks the Commissioners to investigate the following related matters:

a. Why did VEPCO make no 2/79 report of the significant and damaging 200-300 pound resin spill in the North Anna steam generator of 2-27-79?

b. Why did the NRC require no report?

c. Why did the North Anna plant continue in operation after the spill as opposed to closing for clean-up of the resins from the steam generators?

d. Why did the NRC on-site inspector not know of the spill until months after it had taken place?

e. Was the NRC informed before the four (4) succeeding spills? If so, what action was taken?

f. Was the major resin spill of 2-27-79 related to the volume control tank discharge and Iodine-131 at 310 times specified value reported on 2-27-79 or to the "uncontrolled release to the storm drain" of 2-28-79? (See April and May OUSR's of 1979)

g. What are the implications of the three September 1979 spills on the 10th, 12th, and 15th, followed by the radiation release accident of September 25?

h. Have resin-spill effect warnings been sent to other licensees with Powdex demineralizers and Westinghouse steam generators?

i. Was NRC's first notice of W turbine disc cracking and missile problems the anonymous letter of November 5, 1979 suggesting a "flagrant Westinghouse violation"?

The Coalition believes that Commission investigation of the foregoing has safety significance beyond Virginia reactors. Thank you for your professional consideration.

Sincerely,

June Allen
President, NAEC

P. S. In terms of reportability, NAEC is puzzled as to why the 3-28-79 reactor scram at Browns Ferry #1 was not a reportable event since it was "due to false high pressure and low water level signals generated when concrete that was dislodged during a floor drilling operation struck a local panel."

Today we are concerned with the implications of disgruntled employees at Browns Ferry cutting the cords and removing the mouthpieces of "between 65 and 70 inplant telephones" this past weekend. What does this event say of worker responsibility or worker comprehension of the safety necessity of inplant communication? Will there be an NRC investigation?

Anti-Nuclear Group Claims Waste-Dumping Deal In Works

By MIKE LIVINGSTON
Governmental Affairs Staff

An anti-nuclear group charged Friday that private negotiations are going on to allow nuclear waste from Florida to be buried in South Carolina in violation of volume limits, but the state's health agency said the talks were open information sessions and no deal has been made.

Michael Lowe, a member of the Palmetto Alliance, said Florida Power and Light Co. wants to replace six 200-ton steam generators from the Turkey Point nuclear units 3 and 4 near Miami and bury the old ones at Chem-Nuclear Systems in Barnwell County.

Lowe said that for the generators to be buried at Chem-Nuclear, the state would have to waive the volume limit placed on low level radioactive waste disposal.

The limit, under a program initiated by the governor, would allow no more than 1.2 million cubic feet per year by October of this year. The two-year plan is aimed at gradually reducing the amount of waste received from a high of 2.4 million cubic feet.

Lowe said the disposal of the units is "approximately equal to the annual average waste volume and three times the annual curie content of waste shipped for disposal from the Turkey Point station.

"Unless a specific exemption is obtained from the state of South Carolina, the licensee would use up his allocation," he said.

But Rick Wilson, an attorney for the Department of Health and Environmental Control, said Chem-Nuclear officials have only been making DHEC aware of FP&L's problem, and that there have been no "private" negotiations.

"What is all this 'secret' talk about? We have just talked to Chem-Nuclear about the problem. All the stuff they (Palmetto Alliance) have been putting out is stuff we gave them," said Wilson.

"The problem is that if FP&L were to ship the material today they would be within their limit. But because of the volume reduction over the coming months and the fact that it will take them until 1982 to remove and ship the units will mean that by then their limit would have slid too low.

"They are anticipating this and are asking us about the situation before going through all the other permitting they would need from the Nuclear Regulatory Commission, the Coast Guard, the Corps of Engineers and the Highway Department," he said.

"We have received no formal request, and we don't know when, or if, we will get an application from FP&L. If we do get one, we will judge it as we do others — on an individual basis."

Wilson said that the situation has changed since the volume limit went into effect. Now the states have authority to enter into regional compacts for the disposal of low level atomic wastes. If a Southeast compact were formed, and approved by Congress, presumably the volume limit would be lifted.

"Presumably, under a regional compact, we would envision Florida being in our region. They are in a different spot because of their geography — they don't have a site suitable for a low level waste burial ground," said Wilson. "They must rely on someone else for their disposal."

The 1,200 tons of steam generators would have to be moved up the Savannah River by barge and then taken by truck to the Barnwell County site.

"We wouldn't see this as a precedent for any other power companies," said Wilson. "And we haven't seen FP&L's studies and showings — and they will have to do that. Until we get that, and a formal application, we are reluctant to make any kind of indication about what will happen."

Appendix V

NUREG-0685

Environmental Assessment for Effective Changes to 10 CFR Part 50 and Appendix E to 10 CFR Part 50; Emergency Planning Requirements for Nuclear Power Plants

Manuscript Completed: July 1980
Date Published: August 1980

W. R. Ott

Division of Siting, Health and Safeguards Standards
Office of Standards Development
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

APPENDIX A

REPLACEMENT POWER COSTS OF SHUTTING DOWN OPERATING NUCLEAR POWER PLANTS, 1981

If a nuclear plant is ordered shut down, the power that would have been generated by the plant will be generated by another plant if the capacity is available. A cost estimate was prepared and is shown in the accompanying Table A-1 for replacement power for one month. The list of operating plants for 1981 was taken from the forecast in NUREG-0380, October 19, 1979, excluding Indian Point 1 and TMI 2. It was assumed that each utility would replace the power with coal-fired and oil-fired capacity at the ratio the State where the plant is located currently uses these fuels for steam-electric plants. It was assumed that no replacement hydrogenerating capacity would be available because it would already be fully used. In addition, the availability of hydroelectric capacity is highly weather dependent. Supplies of coal and oil, particularly oil, are highly uncertain for next year. Thus, these fuel mixes may be altered considerably. Similarly, coal supplies could be changed substantially by strikes and severe weather.

Coal and oil costs were based on January 1979 prices from the Department of Energy. Coal costs for 1981 were increased by 15%. Oil costs (residual) were doubled over January 1979 prices. This estimate is conservative since the present price (January 1980) has already exceeded twice the January 1979 price. Neither of these assumptions are likely to be near the prices actually prevailing in 1981. (Oil prices in particular are highly uncertain.) It does seem reasonable however, to assume that oil prices in January 1981 will be no lower than current levels. Also, if oil prices continue rising, past experience indicates that coal prices will follow.

The weighted cost of fuel for each plant was adjusted downward by 6 mills/kWh, which is the approximate savings of nuclear fuel costs by not operating the nuclear plant. No adjustment for non-fuel operating and maintenance costs was made, although average operating and maintenance costs for nuclear plants are lower than those for fossil fuel plants, especially those that would be brought into operation to replace the nuclear capacity.

It was assumed that the nuclear plants operate at an annual average 65 percent capacity factor. This will likely be higher in the early months of 1981 as utilities will be experiencing their winter peak demand for electricity. The average capacity factor will likely be lower in the spring when nuclear plants are typically shut down for refueling. The above patterns will be repeated for the summer and fall.

Given these uncertainties, especially in fuel prices, the monthly replacement costs shown in the Table A-1 should be taken only as indicators. What is clearly shown is that oil-dependent areas are quite vulnerable to substantial cost increases. These are California, the entire Northeast Power Coordinating Council plus New Jersey, Florida, and Arkansas.

TABLE A-1

SHORT-TERM REPLACEMENT POWER COSTS FOR NUCLEAR UTILITIES

Reliability Council / Plant	MWe (DER)*	Ratio of Coal to Oil Use: Coal	Ratio of Coal to Oil Use: Oil	Fuel Cost[1] ¢/10⁶ Btu: Coal	Fuel Cost[1] ¢/10⁶ Btu: Oil	Weighted[2] Ave. Fuel Cost Mills/kWh	Net Fuel Costs[3] Mills/kWh	Replacement Power Costs $ 1x10⁶ Per Mo.[4]
NPCC								
N.Y.-Fitzpatrick	821	1	4	134	218	46.8	40.8	15.9
N.Y.-Ginna	470	1	4	134	218	46.8	40.8	9.1
Conn.-Haddam Neck	575	-	oil	-	245	60.4	54.4	14.9
N.Y.-Indian Point 2	873	1	4	134	218	46.8	40.8	16.9
N.Y.-Indian Point 3	965	1	4	134	218	46.8	40.8	18.7
Maine-Maine Yankee	825	-	oil	-	182	44.8	38.8	15.1
Conn.-Millstone 1	660	-	oil	-	245	60.4	54.4	17.1
Conn.-Millstone 2	870	-	oil	-	245	60.4	54.4	22.5
N.Y.-Nine Mile Point 1	620	1	4	134	218	46.8	40.8	12.0
Mass.-Pilgrim 1	655	-	oil	-	201	49.4	43.4	13.5
Vt.-Vermont Yankee 1	514	-	oil	-	201	49.4	43.4	10.6
Mass.-Yankee-Rowe	175	-	oil	-	201	49.4	43.4	3.5
N.Y.-Shoreham	854	1	4	134	218	46.8	40.8	19.8
SERC								
Ala.-Browns Ferry 1	1065	coal	-	146	-	20.7	14.7	7.5
Ala.-Browns Ferry 2	1065	coal	-	146	-	20.7	14.7	7.5
Ala.-Browns Ferry 3	1065	coal	-	146	-	20.7	14.7	7.5
N.C.-Brunswick 1	821	coal	-	143	-	20.3	14.3	5.6
N.C.-Brunswick 2	821	coal	-	143	-	20.3	14.3	5.6
Fla.-Crystal River 3	825	1	3	132	336	66.7	60.7	23.8
Ala.-Farley 1	829	coal	-	146	-	20.7	14.7	5.9
Ga.-Hatch 1	786	coal	-	132	-	18.7	12.7	4.7
Ga.-Hatch 2	786	coal	-	132	-	18.7	12.7	4.7
Va.-North Anna 1	907	2	3	161	203	39.2	33.9	14.4
S.C.-Oconee 1	887	4	1	147	186	25.8	19.8	8.4
S.C.-Oconee 2	887	4	1	147	186	25.8	19.8	8.4
S.C.-Oconee 3	887	4	1	147	186	25.8	19.8	8.4
S.C.-Robinson 2	700	4	1	147	186	25.8	19.8	6.6
Fla.-St. Lucie 1	802	1	3	132	336	66.7	60.7	23.1
Va.-Surry 1	822	2	3	161	203	39.2	33.2	12.9
Va.-Surry 2	822	2	3	161	203	39.2	33.2	12.9
Fla.-Turkey Point 3	693	1	3	132	336	66.7	60.7	20.0
Fla.-Turkey Point 4	693	1	3	132	336	66.7	60.7	20.0
Ala.-Farley 2	829	coal	-	146	-	20.7	14.7	5.9

FPL allowed to increase fuel charge

By FRED GRIMM
Herald Staff Writer

Florida Power & Light Co. again will be allowed to raise electricity rates, beginning in March. The Public Service Commission Tuesday granted the company its second fuel-adjustment increase within two months' time.

The action translates to an increase of $6.30 — or 12.4 per cent — for the average FPL customer. The average bill for the company's 1.5 million subscribers in South Florida and along the Florida East Coast will be $57.09.

The 4-0 commission vote allows the company to increase its fuel-adjustment charge from 1.32 cents per kilowatt hour to 1.95 cents. That increases each customer's bill by .63 cents for every kilowatt hour used.

Normally, Florida power companies make fuel-cost adjustments in their rates only every six months. But FPL said dramatic, unexpected hikes in the cost of oil had again shattered its original October-to-March projections. A similar increase was tacked on to electric bills in December.

PSC Chairman Joseph Cresse said no one could dispute the rising cost of oil. "The price of oil has gone up 222 per cent in the last two years for reasons I don't understand," he said.

The increase, however, was less than the company had requested. FPL petitioned the Public Service Commission to begin the new fuel-adjustment charges on the upcoming bill for January usage.

The commissioners, however, said it would be unfair to charge customers an increased rate for electricity already consumed. Commissioner Gerald Gunter added that customers would be better able to pay the increase in the March 3 bill, when heating needs are less and bills normally reflect a decrease in electricity consumption.

Assistant Public Counsel Roger Howe, charged with representing the public interest in such matters, said the rate-hike request was not opposed by his office. "We're put in an awkward position," he said. "If we oppose the increase and the company's projections come through, then the consumer has to pay for not only the increased cost but also for the interest on the difference."

Howe said that if the company's latest estimates fall short of the actual fuel costs for the six-month period, FPL must then pay the customers back the overcharge with interest. "It cuts both ways," Howe said.

FPL is scheduled to return to the Public Service Commission again in April with its regularly scheduled April-to-September fuel-adjustment projections.

FPL Tooling Up Its Cutler Plant

By MIKE TONER
Herald Science Writer

Florida Power and Light Co.'s on-again, off-again Cutler power plant, mothballed in 1976 because it was inefficient, will soon be back on again.

Company officials said Wednesday that they plan to reactivate the 31-year-old plant that was once the object of a lawsuit by neighbors who complained that it "incessantly whined, hissed, belched, throbbed, howled, groaned, rumbled and burped" and snorted smoke over the prime residential area around Coral Reef Drive and Ludlam Road.

FPL says this time the power plant should be a better neighbor. The company is spending $2.3 million to refurbish two oil-fired generators, muffle them, and bring them into compliance with today's air pollution standards.

FPL spokesman Tony Bruns said that reactivation of the power plant is necessary to meet the anticipated shortage of electrical reserves that will occur when FPL's Turkey Point nuclear power plant is shut down for a major overhaul, starting in October 1981.

BRUNS SAID the Cutler plant, on Biscayne Bay near the Kings Bay Country Club, is expected to be back in operation by mid-1982.

"A lot of work remains to be done before the plant will be ready," he said. "Work will start as soon as we can gear up for it."

"The major noise problem before was apparently an exhaust stack at the plant. The solution to that problem is currently in the design stage in our engineering department."

The company will also have to modify the plant to meet existing state and federal standards for air pollution — and U.S. Department of Energy regulations that prohibit the use of clean-burning natural gas in new power plants.

In the four years since FPL placed the controversial plant in a state of "cold shutdown," it has been maintained by a skeleton crew of about 20 workers.

Although the company once considered selling the aging generators to some South American country more desperate for electricity, it decided to keep the plant intact for possible use in some unforeseen emergency.

THE "EMERGENCY" the company now sees, is a shortage of adequate generating capacity in South Florida created by the shutdown of its two nuclear reactors at Turkey Point for major repairs.

One or the other of the reactors is expected to be out of service from late 1981 until 1983 for replacement of their steam generators, which have been plagued for years by cracks and corrosion.

The reactivation of the Cutler plant represents a relatively small, but new, addition to the ultimate cost of those repairs — now estimated to cost the company and its customers a total of $136 million.

The overhaul itself is expected to cost an additional $500,000 a day.

'The major noise problem before was apparently an exhaust stack at the plant. The solution to that problem is currently in the design stage in our engineering department.'

— FPL spokesman Tony Bruns

Appendix IX

FLORIDA INTERNATIONAL UNIVERSITY
TAMIAMI CAMPUS • MIAMI, FLORIDA 33199 • (305) 552-2201

COLLEGE OF ARTS & SCIENCES
DEPARTMENT OF BIOLOGICAL SCIENCES

January 30, 1981

Mr. Mark P. Oncavage
12200 S.W. 110 Avenue
Miami, Florida 33176

Dear Mr. Oncavage:

In a letter which was sent to you on June 4, 1979 I expressed my concern for the ultimate fate of liquid wastes generated by Florida Power and Light Company's proposed steam generator repairs. I noted particularly that confusing, ambiguous and conflicting statements were made concerning disposal or possible re-use of the drained reactor coolant.

I have now reviewed the Nuclear Regulatory Commission's Draft Environmental Statement dated December, 1980 and find it not only leaves my questions of one and a half years ago unanswered, but ignores them completely.

I do not consider the fate of nearly 50,000 gallons of highly radioactive waste a trivial matter to either those who will perform the operations of drainage or to organisms who may have to swim in it later on. Will the liquid be stored and re-used? If so, what safety provisions will be made for such storage. Will it be treated and then discharged? If so, some documentation for the decontamination figures should be provided and radiological data concerning plants and animals now living in the cooling canals should be made available. I am disappointed with the completeness of the latest document and hope that succeeding drafts will eventually address themselves to these issues.

Yours sincerely,

Walter Goldberg, Ph.D.
Associate Professor

WG:ms

Appendix X

Exhibit 8

FPL COST BENEFIT ANALYSIS

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

SUMMARY OF COST-BENEFIT ANALYSIS

TITLE OF PROGRAM	ESTIMATED TOTAL COMPANY EXPENDITURES						TOTAL REDUCTIONS				ESTIMATED TOTAL COMPANY BENEFITS (1981-1999)						COST/BENEFIT ANALYSIS		
	Equip. $(000)	Mtnc. $(000) —Operating—	Pers. $(000) —Operating—	Adv. $(000) —Operating—	Total $(000)	PV of Total $(000)	Per Customer 1981-1999 KW	Per Customer 1981-1999 KWH	System 1981-1999 MW	System 1981-1999 GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mntc. $(000) —O&M—	Pers. $(000) —O&M—	Total $(000)	PV of Total $(000)	Net Benefits (Costs) $(000)	Benefit /Cost Ratio	Implementation Dates
Target Area I																			
Water Heater Insulation Program	27		766		793	506	0.04	2,400	6	350	8,771	18,521		2,057	29,349	13,178	12,672	26.0	1982
Reflective Window Film Program	50		18,511		18,561	11,390	0.17	7,000	20	820	29,408	43,281		4,935	77,624	34,785	23,395	3.1	1981
Residential Ceiling Insulation Program	52,541		6,005		58,546	33,186	0.3	11,500	32	1,250	47,721	65,016		8,471	121,208	50,940	17,754	1.5	1981
Appliance Efficiency Program	60		160,881		160,941	94,504	0.3	13,440	607	25,090	903,224	1,320,680		160,502	2,384,406	1,030,563	936,059	10.9	1982
Efficient Home Credit Program	391		40,898		41,289	25,428	0.6	24,000	319	12,780	474,763	673,093		81,781	1,229,637	532,102	506,674	20.9	1981
Comm. & Industrial Energy Analysis Program	21		12,517		12,538	7,578	0.7	43,330	67	4,390	99,185	232,826		26,528	358,539	157,262	149,684	20.8	1981
Street & Outdoor Light Conversion Program	44,731		735		45,466	32,620	0	5,540	0	1,910	0	298,764		0	298,764	115,697	83,077	3.6	1981
Cumulative Subtotal	97,821		240,313		338,134	205,212	N/A	N/A	1,051	46,590	1,563,072	2,652,181		284,274	4,499,527	1,934,527	1,729,315	N/A	

FPL Energy Management Plan
Revised 12/29/80
Docket No. 800662-EG (MC)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

SUMMARY OF COST-BENEFIT ANALYSIS

TITLE OF PROGRAM	ESTIMATED TOTAL COMPANY EXPENDITURES					TOTAL REDUCTIONS				ESTIMATED TOTAL COMPANY BENEFITS (1981-1999)					COST/BENEFIT ANALYSIS		
	Equip. $(000)	Mtnc. $(000) —Operating—	Pers. $(000) —Operating—	Adv. $(000) —Operating—	Total $(000)	PV of Total $(000)	Per Customer 1981-1999 KW	Per Customer 1981-1999 KWH	System 1981-1999 MW	System 1981-1999 GWH	Construction Cost Savings $(000)	Fuel Purchase Savings. $(000)	Mntc. $(000) —O&M—	Pers. $(000) —O&M—	Total $(000)	PV of Total $(000)	Net Benefits (Costs) $(000)	Benefit /Cost Ratio	Implementation Dates
Target Area II																			
Res. Pool Pump Program	5		5,973		5,978	4,249	0.7	3,650	117	642	87,587	35,248		3,330	126,165	62,276	58,027	14.7	1981
Res. Load Control Program	54,137		46,091		100,228	52,063	0.5	0	154	0	238,315	0		0	238,315	110,770	58,707	2.1	1981
Res. & Gen. Svc. T-O-U Rate Program	122,844		29,630		152,474	75,909	0.8	6,920	193	1,370	297,511	67,006		10,913	375,430	163,305	87,396	2.2	1987
Comm. & Industrial T-O-U Rate Program	39,912		11,733		51,645	28,812	2.8	36,660	166	2,120	238,381	109,001		13,033	360,415	172,068	143,256	6.0	1982
Comm. & Industrial Curtailable Rate Program	1		60,363		60,364	35,343	850	0	190	272,437	0	0		0	272,437	138,120	102,777	3.9	1982
Cumulative Subtotal	216,899		153,790		370,689	196,376	N/A	N/A	820	276,570	861,794	211,255		27,276	1,372,762	646,539	450,163	N/A	
Target Area III																			
Capacitor Bank Replacement Program	3,293		0		3,293	2,532	4.0	210,240	3	180	25,542	9,850		771	36,163	18,604	16,072	7.3	1982
Cumulative Subtotal	3,293		0		3,293	2,532	N/A	N/A	3	180	25,542	9,850		771	36,163	18,604	16,072	7.3	
Cumulative Grand																			

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Water Heater Insulation Program

BRIEF DESCRIPTION OF PROGRAM: FPL will sell water heater insulation kits at market price (about $20). FPL will install the kit for free with an on-site Energy Analysis. Kits will be offered as part of Customer-Assisted Energy Analysis services.

PRIMARY PURPOSE OF PROGRAM: Have water heater insulation kits installed on electric resistance water heaters in residential dwellings.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
		——Operating——											——O&M——			
1981	27		95		122	111	0	0	0	0	0	0		0	0	0
1982	0		65		65	54	0.04	240	1	5	0	285		0	285	235
1983	0		70		70	53	0.04	240	2	10	0	650		0	650	488
1984	0		75		75	51	0.04	240	3	15	0	1,110		0	1,110	758
1985	0		80		80	50	0.04	240	3	20	0	1,680		0	1,680	1,043
1986	0		86		86	49	0.04	240	4	25	0	2,400		0	2,400	1,354
1987	0		92		92	47	0.04	240	5	29	7,095	899		162	8,156	4,184
1988	0		98		98	46	0.04	240	6	32	0	1,088		192	1,280	598
1989	0		105		105	45	0.04	240	6	35	1,676	1,295		224	3,195	1,355
1990	0		0		0	0	0.04	240	6	35	0	1,400		242	1,642	634
1991	0		0		0	0	0.04	240	6	35	0	1,540		259	1,799	630
1992	0		0		0	0	0.04	0	6	30	0	1,440		237	1,677	535
1993	0		0		0	0	0.04	0	6	25	0	1,300		210	1,510	438
1994	0		0		0	0	0.04	0	6	20	0	1,140		180	1,320	347
1995	0		0		0	0	0.04	0	6	15	0	930		146	1,076	257
1996	0		0		0	0	0.04	0	6	10	0	680		103	783	171
1997	0		0		0	0	0.04	0	6	6	0	444		67	511	101
1998	0		0		0	0	0.04	0	6	3	0	240		35	275	50
1999	0		0		0	0	0.04	0	6	0	0	0		0	0	0
Cumulative Total	27		766		793	506	0.04	2,400	6	350	8,771	18,521		2,057	29,349	13,178

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 12,672

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 26.0

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Reflective Window Film Program

BRIEF DESCRIPTION OF PROGRAM: FPL will pay labor cost (about $75) for having reflective window film installed in residences when it is cost-effective. FPL will develop a list of approved contractors. FPL will find homes and notify owners through Energy Analyses services.

PRIMARY PURPOSE OF PROGRAM: Have reflective window film installed, where cost-effective, in residential dwellings that utilize some type of electric air conditioning.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
		——Operating——											——O&M——			
1981	50		667		717	652	0.17	700	0	1	0	50		0	50	45
1982	0		1,799		1,799	1,486	0.17	700	2	8	0	456		0	456	377
1983	0		2,128		2,128	1,598	0.17	700	5	20	0	1,300		0	1,300	976
1984	0		2,491		2,491	1,701	0.17	700	8	33	0	2,442		0	2,442	1,668
1985	0		2,441		2,441	1,516	0.17	700	11	45	0	3,780		0	3,780	2,347
1986	0		2,367		2,367	1,335	0.17	700	14	57	0	5,472		0	5,472	3,086
1987	0		2,250		2,250	1,154	0.17	700	16	66	22,704	2,046		370	25,120	12,887
1988	0		2,211		2,211	1,033	0.17	700	18	75	0	2,550		450	3,000	1,401
1989	0		2,157		2,157	915	0.17	700	20	82	6,704	3,034		525	10,263	4,352
1990	0		0		0	0	0.17	700	20	82	0	3,280		566	3,846	1,485
1991	0		0		0	0	0.17	0	20	81	0	3,564		599	4,163	1,457
1992	0		0		0	0	0.17	0	20	74	0	3,552		585	4,137	1,320
1993	0		0		0	0	0.17	0	20	62	0	3,224		521	3,745	1,086
1994	0		0		0	0	0.17	0	20	49	0	2,793		441	3,234	851
1995	0		0		0	0	0.17	0	20	37	0	2,294		359	2,653	634
1996	0		0		0	0	0.17	0	20	25	0	1,700		258	1,958	427
1997	0		0		0	0	0.17	0	20	16	0	1,184		178	1,362	270
1998	0		0		0	0	0.17	0	20	7	0	560		83	643	116
1999	0		0		0	0	0.17	0	20	0	0	0		0	0	0
Cumulative Total	50		18,511		18,561	11,390	0.17	7,000	20	820	29,408	43,281		4,935	77,624	34,785

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 23,395

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 3.1

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Residential Ceiling Insulation Program

BRIEF DESCRIPTION OF PROGRAM: FPL will pay $300 toward the installation cost of ceiling insulation with a rating of R-19 or higher in homes with electric air conditioning and/or heating, provided that the home previously had no ceiling insulation. FPL will develop a list of approved contractors. FPL will find qualifying homes through Energy Analyses services and neighborhood (area) surveys and inspections.

PRIMARY PURPOSE OF PROGRAM: Have ceiling insulation of R-19 installed in residential dwellings that have no ceiling insulation but are equipped with some type of electric air conditioning and/or electric heating.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
	——Operating——												——O&M——			
1981	612		151		763	694	0.3	1,150	0	0	0	0	0	0	0	0
1982	1,978		315		2,293	1,894	0.3	1,150	1	5	0	285	0	0	285	235
1983	2,576		398		2,974	2,234	0.3	1,150	3	13	0	845	0	0	845	635
1984	6,753		864		7,617	5,202	0.3	1,150	7	27	0	1,998	0	0	1,998	1,365
1985	7,730		924		8,654	5,374	0.3	1,150	12	47	0	3,948	0	0	3,948	2,452
1986	7,919		989		8,908	5,024	0.3	1,150	18	68	0	6,528	0	0	6,528	3,682
1987	8,055		735		8,790	4,509	0.3	1,150	23	87	32,637	2,697	487	0	35,821	18,376
1988	8,325		787		9,112	4,255	0.3	1,150	28	106	0	3,604	636	0	4,240	1,980
1989	8,593		842		9,435	4,000	0.3	1,150	32	125	15,084	4,625	800	0	20,509	8,696
1990	0		0		0	0	0.3	1,150	32	125	0	5,000	862	0	5,862	2,263
1991	0		0		0	0	0.3	0	32	125	0	5,500	925	0	6,425	2,249
1992	0		0		0	0	0.3	0	32	120	0	5,760	948	0	6,708	2,140
1993	0		0		0	0	0.3	0	32	112	0	5,824	941	0	6,765	1,962
1994	0		0		0	0	0.3	0	32	98	0	5,358	882	0	6,240	1,641
1995	0		0		0	0	0.3	0	32	78	0	4,836	757	0	5,593	1,337
1996	0		0		0	0	0.3	0	32	57	0	3,876	587	0	4,463	973
1997	0		0		0	0	0.3	0	32	38	0	2,812	422	0	3,234	640
1998	0		0		0	0	0.3	0	32	19	0	1,520	224	0	1,744	314
1999	0		0		0	0	0.3	0	32	0	0	0	0	0	0	0
Cumulative Total	52,541		6,005		58,546	33,186	0.3	11,500	32	1,250	47,721	65,016	8,471		121,208	50,940

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 17,754

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 1.5

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Appliance Efficiency Program

BRIEF DESCRIPTION OF PROGRAM: FPL will give rebates to established customers for replacement purchases of very efficient appliances for cooling, heating, and water heating. FPL will develop a list of specific appliances and rebate amounts. FPL will notify customers through Energy Analyses services. FPL will promote the merits of efficient appliances through mass media and dealer advertising techniques.

PRIMARY PURPOSE OF PROGRAM: Improve the average efficiency of new and replacement appliances used by residential customers by 15 percent.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
		——Operating——											——O&M——			
1981	19		328		347	315	0	0	0	0	0	0		0	0	0
1982	41		15,812		15,853	13,095	0.3	1,344	40	166	0	9,462		0	9,462	7,816
1983	0		16,816		16,816	12,629	0.3	1,344	121	500	0	32,500		0	32,500	24,408
1984	0		17,883		17,883	12,214	0.3	1,344	202	834	0	61,716		0	61,716	42,152
1985	0		19,136		19,136	11,883	0.3	1,344	282	1,169	0	98,196		0	98,196	60,980
1986	0		20,474		20,474	11,547	0.3	1,344	363	1,503	0	144,288		0	144,288	81,378
1987	0		21,908		21,908	11,239	0.3	1,344	444	1,838	630,036	56,978		10,293	697,307	357,718
1988	0		23,441		23,441	10,947	0.3	1,344	525	2,173	0	73,882		13,038	86,920	40,592
1989	0		25,083		25,083	10,635	0.3	1,344	607	2,509	273,188	92,833		16,058	382,079	162,001
1990	0		0		0	0	0.3	1,344	607	2,509	0	100,360		17,312	117,672	45,421
1991	0		0		0	0	0.3	1,344	607	2,509	0	110,396		18,567	128,963	45,137
1992	0		0		0	0	0.3	0	607	2,343	0	112,464		18,510	130,974	41,781
1993	0		0		0	0	0.3	0	607	2,009	0	104,468		16,876	121,344	35,190
1994	0		0		0	0	0.3	0	607	1,675	0	95,475		15,075	110,550	29,075
1995	0		0		0	0	0.3	0	607	1,340	0	83,080		12,998	96,078	22,963
1996	0		0		0	0	0.3	0	607	1,006	0	68,408		10,362	78,410	17,093
1997	0		0		0	0	0.3	0	607	671	0	49,654		7,448	57,102	11,306
1998	0		0		0	0	0.3	0	607	336	0	26,880		3,965	30,845	5,552
1999	0		0		0	0	0.3	0	607	0	0	0		0	0	0
Cumulative Total	60		160,881		160,941	94,504	0.3	13,440	607	25,090	903,224	1,320,680		160,502	2,384,406	1,030,563

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 936,059

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 10.9

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

FPL Energy Management Plan
Revised 12/29/80
Docket No. 800662-EG (MC)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Efficient Home Credit Program

BRIEF DESCRIPTION OF PROGRAM: FPL will propose to the FPSC that, beginning in 1982, customers whose new homes and appliances meet revised Watt-Wise standards (25% more efficient than new state building code) receive and "efficient home credit". FPL will develop cost support data for a charge on all new homes and for the efficient home credit. If adopted, FPL will notify potential purchasers through Energy Information Services and through home builders and developers, appliance dealers and suppliers.

PRIMARY PURPOSE OF PROGRAM: Achieve the use of energy-efficient design and equipment in new homes.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
	——Operating——												——O&M——			
1981	391		3,414		3,805	3,459	0.6	2,400	1	5	0	250		0	250	227
1982	0		3,653		3,653	3,017	0.6	2,400	23	91	0	5,187		0	5,187	4,284
1983	0		3,909		3,909	2,936	0.6	2,400	64	256	0	16,640		0	16,640	12,497
1984	0		4,183		4,183	2,857	0.6	2,400	106	424	0	31,376		0	31,376	21,430
1985	0		4,476		4,476	2,780	0.6	2,400	148	592	0	49,728		0	49,728	30,881
1986	0		4,789		4,789	2,701	0.6	2,400	190	761	0	73,056		0	73,056	41,204
1987	0		5,124		5,124	2,629	0.6	2,400	233	932	330,627	28,892		5,219	364,738	187,111
1988	0		5,483		5,483	2,561	0.6	2,400	276	1,104	0	37,536		6,624	44,160	20,623
1989	0		5,867		5,867	2,488	0.6	2,400	319	1,278	144,136	47,286		8,179	199,601	84,631
1990	0		0		0	0	0.6	2,400	319	1,278	0	51,120		8,818	59,938	23,136
1991	0		0		0	0	0.6	0	319	1,273	0	56,012		9,420	65,432	22,901
1992	0		0		0	0	0.6	0	319	1,187	0	56,976		9,377	66,353	21,167
1993	0		0		0	0	0.6	0	319	1,022	0	53,144		8,585	61,729	17,901
1994	0		0		0	0	0.6	0	319	854	0	48,678		7,686	56,364	14,824
1995	0		0		0	0	0.6	0	319	686	0	42,532		6,654	49,186	11,755
1996	0		0		0	0	0.6	0	319	517	0	35,156		5,325	40,481	8,825
1997	0		0		0	0	0.6	0	319	346	0	25,604		3,841	29,445	5,830
1998	0		0		0	0	0.6	0	319	174	0	13,920		2,053	15,973	2,875
1999	0		0		0	0	0.6	0	319	0	0	0		0	0	0
Cumulative Total	391		40,898		41,289	25,428	0.6	24,000	319	12,780	474,763	673,093		81,781	1,229,637	532,102

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 506,674

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 20.9

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Commercial and Industrial Energy Analysis Program

BRIEF DESCRIPTION OF PROGRAM: FPL representatives, in conjunction with business managers, will make thorough analyses of commercial and industrial customers with usage under 20KW. FPL will also provide consultation and arrange for an engineering consultant to conduct energy analyses of large businesses, local municipalities, and other governmental agencies that are FPL customers. Analyses will also encompass outdoor lighting usage. FPL will notify customers of availability through Energy Information Services (including the South Florida Energy Partnership).

PRIMARY PURPOSE OF PROGRAM: Assist commercial and industrial customers in making their facilities more energy efficient through the installation of certain conservation measures and through the implementation of certain conservation practices.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
	——Operating——												——O&M——			
1981	21		689		710	645	0.7	4,330	3	18	0	900		0	900	818
1982	0		1,153		1,153	952	0.7	4,330	11	70	0	3,990		0	3,990	3,296
1983	0		1,234		1,234	927	0.7	4,330	19	122	0	7,930		0	7,930	5,955
1984	0		1,320		1,320	902	0.7	4,330	27	175	0	12,950		0	12,950	8,845
1985	0		1,412		1,412	877	0.7	4,330	35	228	0	19,152		0	19,152	11,893
1986	0		1,511		1,511	852	0.7	4,330	43	281	0	26,970		0	26,976	15,214
1987	0		1,617		1,617	830	0.7	4,330	51	333	72,369	10,323		1,865	84,557	43,378
1988	0		1,730		1,730	808	0.7	4,330	59	386	0	13,124		2,316	15,440	7,210
1989	0		1,851		1,851	785	0.7	4,330	67	439	26,816	16,243		2,810	45,869	19,448
1990	0		0		0	0	0.7	4,330	67	439	0	17,560		3,029	20,589	7,947
1991	0		0		0	0	0.7	0	67	421	0	18,524		3,115	21,639	7,574
1992	0		0		0	0	0.7	0	67	369	0	17,712		2,915	20,627	6,580
1993	0		0		0	0	0.7	0	67	317	0	16,484		2,663	19,147	5,553
1994	0		0		0	0	0.7	0	67	264	0	15,048		2,376	17,424	4,583
1995	0		0		0	0	0.7	0	67	211	0	13,082		2,047	15,129	3,616
1996	0		0		0	0	0.7	0	67	158	0	10,744		1,627	12,371	2,697
1997	0		0		0	0	0.7	0	67	106	0	7,844		1,177	9,021	1,786
1998	0		0		0	0	0.7	0	67	53	0	4,240		588	4,828	869
1999	0		0		0	0	0.7	0	67	0	0	0		0	0	0
Cumulative Total	21		12,517		12,538	7,578	0.7	43,330	67	4,390	99,185	232,826		26,528	358,539	157,262

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 149,684

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 20.8

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Street and Outdoor Light Conversion Program

BRIEF DESCRIPTION OF PROGRAM: FPL will (a) convert Company-owned incandescent and mercury vapor street lights and outdoor lights to high-pressure sodium vapor; (b) encourage conversion of customer-owned lighting systems to high-pressure sodium vapor; and (c) close the mercury vapor street light and outdoor lighting rate schedules. In addition, a public awareness campaign will be conducted to facilitate the acceptance of this program and encourage customer-induced conversions.

PRIMARY PURPOSE OF PROGRAM: Reduce energy consumption for street lighting and outdoor lighting while maintaining existing illumination levels.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
		Operating											O&M			
1981	3,824		278		4,102	3,729	0	554	0	7	0	350		0	350	318
1982	8,555		103		8658	7,152	0	554	0	38	0	2,166		0	2,166	1,789
1983	9,151		110		9,261	6,955	0	554	0	72	0	4,680		0	4,680	3,515
1984	9,792		118		9,910	6,769	0	554	0	103	0	7,622		0	7,622	5,206
1985	10,477		126		10,603	6,584	0	554	0	141	0	11,844		0	11,844	7,355
1986	660		0		660	372	0	554	0	162	0	15,552		0	15,552	8,771
1987	707		0		707	363	0	554	0	172	0	18,920		0	18,920	9,706
1988	756		0		756	353	0	554	0	181	0	22,444		0	22,444	10,481
1989	809		0		809	343	0	554	0	191	0	27,122		0	27,122	11,500
1990	0		0		0	0	0	554	0	191	0	30,751		0	30,751	11,870
1991	0		0		0	0	0	0	0	184	0	34,040		0	34,040	11,914
1992	0		0		0	0	0	0	0	153	0	32,283		0	32,283	10,298
1993	0		0		0	0	0	0	0	119	0	28,560		0	28,560	8,282
1994	0		0		0	0	0	0	0	88	0	24,112		0	24,112	6,341
1995	0		0		0	0	0	0	0	50	0	15,650		0	15,650	3,740
1996	0		0		0	0	0	0	0	29	0	10,324		0	10,324	2,251
1997	0		0		0	0	0	0	0	19	0	7,714		0	7,714	1,527
1998	0		0		0	0	0	0	0	10	0	4,630		0	4,630	833
1999	0		0		0	0	0	0	0	0	0	0		0	0	0
Cumulative Total	44,731		735		45,466	32,620	0	5,540	0	1,910	0	298,764		0	298,764	115,697

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 83,077

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 3.6

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Residential Pool Pump Program

BRIEF DESCRIPTION OF PROGRAM: FPL will install clips on residential swimming pool pump timers. FPL, in conjunction with pool builders and maintenance organizations, will determine recommended filtering system operating time. FPL will find homes and notify and remind owners through Energy Information Services, coupled with meter reader surveys.

PRIMARY PURPOSE OF PROGRAM: Eliminate the use of residential swimming pool pumps at times of system peak and reduce overall operation of pool pumps when applicable.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
		——Operating——											——O&M——			
1981	5		888		893	812	0.7	365	10	5	0	250		0	250	227
1982	0		950		950	785	0.7	365	31	16	0	912		0	912	753
1983	0		1,017		1,017	764	0.7	365	52	27	0	1,755		0	1,755	1,318
1984	0		1,088		1,088	743	0.7	365	73	38	0	2,812		0	2,812	1,921
1985	0		1,164		1,164	723	0.7	365	94	49	0	4,116		0	4,116	2,556
1986	0		195		195	110	0.7	365	107	56	0	5,376		0	5,376	3,032
1987	0		209		209	107	0.7	365	110	57	80,883	1,767		319	82,969	42,563
1988	0		223		223	104	0.7	365	114	59	0	2,006		354	2,360	1,102
1989	0		239		239	101	0.7	365	117	61	6,704	2,257		390	9,351	3,965
1990	0		0		0	0	0.7	365	117	61	0	2,440		421	2,861	1,104
1991	0		0		0	0	0.7	0	117	56	0	2,464		414	2,878	1,007
1992	0		0		0	0	0.7	0	117	45	0	2,160		356	2,516	802
1993	0		0		0	0	0.7	0	117	34	0	1,768		286	2,054	596
1994	0		0		0	0	0.7	0	117	23	0	1,311		207	1,518	399
1995	0		0		0	0	0.7	0	117	16	0	992		155	1,147	274
1996	0		0		0	0	0.7	0	117	15	0	1,020		154	1,174	256
1997	0		0		0	0	0.7	0	117	13	0	962		144	1,106	219
1998	0		0		0	0	0.7	0	117	11	0	880		130	1,010	182
1999	0		0		0	0	0.7	0	117	0	0	0		0	0	0
Cumulative Total	5		5,973		5,978	4,249	0.7	3,650	117	642	87,587	35,248		3,330	126,165	62,276

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 58,027

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 14.7

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Residential Load Control Program

BRIEF DESCRIPTION OF PROGRAM: FPL will propose to the FPSC that, beginning in 1985, all residential customers who allow their electric central air conditioning, strip heating, and water heating use to be cycled (controlled) will receive a rate incentive. FPL will develop cost support data for the proposal. FPL will provide for the installation of appropriate communication and load control equipment. If adopted, FPL will notify potential customers of the load control offer through Energy Information services.

PRIMARY PURPOSE OF PROGRAM: Reduce the use of home appliances at times of FPL system peak, thereby reducing peak demand.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
		——Operating——											——O&M——			
1981	2		68		70	64	0.5	0	0	0	0	0		0	0	0
1982	2		147		149	123	0.5	0	0	0	0	0		0	0	0
1983	2,909		157		3,066	2,303	0.5	0	0	0	0	0		0	0	0
1984	6,228		207		6,435	4,395	0.5	0	0	0	0	0		0	0	0
1985	7,890		2,264		10,154	6,306	0.5	0	0	0	0	0		0	0	0
1986	9,695		5,188		14,883	8,394	0.5	0	38	0	0	0		0	0	0
1987	10,373		8,694		19,067	9,781	0.5	0	77	0	109,263	0		0	190,263	56,052
1988	11,100		12,665		23,765	11,098	0.5	0	115	0	0	0		0	0	0
1989	5,938		16,701		22,639	9,599	0.5	0	154	0	129,052	0		0	129,052	54,718
1990	0		0		0	0	0.5	0	154	0	0	0		0	0	0
1991	0		0		0	0	0.5	0	154	0	0	0		0	0	0
1992	0		0		0	0	0.5	0	154	0	0	0		0	0	0
1993	0		0		0	0	0.5	0	154	0	0	0		0	0	0
1994	0		0		0	0	0.5	0	154	0	0	0		0	0	0
1995	0		0		0	0	0.5	0	154	0	0	0		0	0	0
1996	0		0		0	0	0.5	0	154	0	0	0		0	0	0
1997	0		0		0	0	0.5	0	154	0	0	0		0	0	0
1998	0		0		0	0	0.5	0	154	0	0	0		0	0	0
1999	0		0		0	0	0.5	0	154	0	0	0		0	0	0
Cumulative Total	54,137		46,091		100,228	52,063	0.5	0	154	0	238,315	0		0	238,315	110,770

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 58,707

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 2.1

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Residential and General Service Time-of-Use Rate Program

BRIEF DESCRIPTION OF PROGRAM: FPL will propose to the FPSC that, beginning in 1987, large residential customers be offered a choice of load control or a mandatory seasonal Time-of-Use (T-O-U) rate. FPL will develop appropriate cost support date for the proposal. FPL will provide for the installation of appropriate metering and communication equipment. If adopted, FPL will notify potential customers of the mandatory seasonal T-O-U rate and the Load Control option through Energy Information services.

PRIMARY PURPOSE OF PROGRAM: Reduce demand of high-use residential and general service customers at times of FPL system peak.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
	——Operating——												——O&M——			
1981	0		0		0	0	0	0	0	0	0	0		0	0	0
1982	0		0		0	0	0	0	0	0	0	0		0	0	0
1983	0		0		0	0	0	0	0	0	0	0		0	0	0
1984	0		0		0	0	0	0	0	0	0	0		0	0	0
1985	8,635		2,898		11,533	7,162	0	0	0	0	0	0		0	0	0
1986	26,899		4,260		31,159	17,574	0	0	0	0	0	0		0	0	0
1987	28,216		5,786		34,002	17,443	0.8	692	101	90	143,319	2,790		504	146,613	75,212
1988	29,744		7,442		37,186	17,366	0.8	692	187	133	0	4,522		798	5,320	2,484
1989	29,350		9,244		38,594	16,364	0.8	692	193	137	154,192	5,069		877	160,138	67,899
1990	0		0		0	0	0.8	692	193	137	0	5,480		945	6,425	2,480
1991	0		0		0	0	0.8	692	193	137	0	6,028		1,014	7,042	2,465
1992	0		0		0	0	0.8	692	193	137	0	6,576		1,082	7,658	2,443
1993	0		0		0	0	0.8	692	193	137	0	7,124		1,151	8,275	2,400
1994	0		0		0	0	0.8	692	193	137	0	7,809		1,233	9,042	2,378
1995	0		0		0	0	0.8	692	193	137	0	8,494		1,329	9,823	2,348
1996	0		0		0	0	0.8	692	193	137	0	9,316		1,411	10,727	2,338
1997	0		0		0	0	0.8	0	193	47	0	3,478		522	4,000	792
1998	0		0		0	0	0.8	0	193	4	0	320		47	367	66
1999	0		0		0	0	0.8	0	193	0	0	0		0	0	0
Cumulative Total	122,844		29,630		152,474	75,909	0.8	6,920	193	1,370	297,511	67,006		10,913	375,430	163,305

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 87,396

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 2.2

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Commercial and Industrial Time-of-Use Rate Program

BRIEF DESCRIPTION OF PROGRAM: FPL will propose to the FPSC that, beginning in 1981, commercial and industrial customers be placed on a phased-in, mandatory seasonal Time-of-Use (T-O-U) rate. FPL will provide for the installation of appropriate metering and communication equipment. FPL will develop appropriate cost support data for the proposal. If adopted, FPL will notify customers of the mandatory seasonal T-O-U rate through Energy Information Services.

PRIMARY PURPOSE OF PROGRAM: Reduce demand of large commercial and industrial customers at times of FPL system peak.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
		——Operating——											——O&M——			
1981	36		160		196	178	0	0	0	0	0	0		0	0	0
1982	495		182		677	559	2.8	3,660	14	20	0	1,140		0	1,140	1,036
1983	20		195		215	161	2.8	3,660	47	62	0	4,030		0	4,030	3,329
1984	21		210		231	158	2.8	3,660	49	65	0	4,810		0	4,810	3,612
1985	7,772		1,389		9,161	5,689	2.8	3,660	51	67	0	5,628		0	5,628	3,495
1986	27,340		2,123		29,463	16,617	2.8	3,660	119	156	0	14,976		0	14,976	8,446
1987	1,315		2,298		3,613	1,853	2.8	3,660	155	200	219,945	6,200		1,120	227,265	116,587
1988	1,407		2,486		3,893	1,818	2.8	3,660	161	206	0	7,004		1,236	8,240	3,848
1989	1,506		2,690		4,196	1,779	2.8	3,660	166	212	18,436	7,844		1,357	27,637	11,718
1990	0		0		0	0	2.8	3,660	166	212	0	8,480		1,463	9,943	3,838
1991	0		0		0	0	2.8	3,660	166	212	0	9,328		1,569	10,897	3,814
1992	0		0		0	0	2.8	0	166	192	0	9,216		1,517	10,733	3,424
1993	0		0		0	0	2.8	0	166	150	0	7,800		1,260	9,060	2,627
1994	0		0		0	0	2.8	0	166	147	0	8,379		1,323	9,702	2,552
1995	0		0		0	0	2.8	0	166	145	0	8,990		1,407	10,397	2,485
1996	0		0		0	0	2.8	0	166	56	0	3,808		577	4,385	956
1997	0		0		0	0	2.8	0	166	12	0	888		133	1,021	202
1998	0		0		0	0	2.8	0	166	6	0	480		71	551	99
1999	0		0		0	0	2.8	0	166	0	0	0		0	0	0
Cumulative Total	39,912		11,733		51,645	28,812	2.8	36,660	166	2,120	238,381	109,001		13,033	360,415	172,068

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 143,256

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 6.0

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Commercial and Industrial Curtailable Rate Program

BRIEF DESCRIPTION OF PROGRAM: FPL will propose to the FPSC that, beginning in 1981, commercial and industrial customers who allow their usage to be curtailed for a specified number of occurrences and hours will receive a rate incentive. This will be a revision to the current rate schedule. FPL will provide for installation of appropriate metering and communication equipment. FPL will develop appropriate cost support data for the proposal. If adopted, FPL will notify potential customers of the offer through Energy Information Services.

PRIMARY PURPOSE OF PROGRAM: Reduce firm demand of large commercial and industrial customers at times of FPL system peak.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
		Operating											O&M			
1981	1		1,544		1,545	1,404	0	0	0	0	0	0		0	0	0
1982	0		5,048		5,048	4,170	850	0	151	0	0	0		0	0	0
1983	0		5,579		5,579	4,190	850	0	156	0	0	0		0	0	0
1984	0		6,159		6,159	4,207	850	0	161	0	0	0		0	0	0
1985	0		6,835		6,835	4,245	850	0	167	0	0	0		0	0	0
1986	0		7,574		7,574	4,272	850	0	173	0	0	0		0	0	0
1987	0		8,384		8,384	4,301	850	0	179	0	254,001	0		0	254,001	130,303
1988	0		9,220		9,220	4,306	850	0	184	0	0	0		0	0	0
1989	0		10,020		10,020	4,248	850	0	190	0	18,436	0		0	18,436	7,817
1990	0		0		0	0	850	0	190	0	0	0		0	0	0
1991	0		0		0	0	850	0	190	0	0	0		0	0	0
1992	0		0		0	0	850	0	190	0	0	0		0	0	0
1993	0		0		0	0	850	0	190	0	0	0		0	0	0
1994	0		0		0	0	850	0	190	0	0	0		0	0	0
1995	0		0		0	0	850	0	190	0	0	0		0	0	0
1996	0		0		0	0	850	0	190	0	0	0		0	0	0
1997	0		0		0	0	850	0	190	0	0	0		0	0	0
1998	0		0		0	0	850	0	190	0	0	0		0	0	0
1999	0		0		0	0	850	0	190	0	0	0		0	0	0
Cumulative Total	1		60,363		60,364	35,343	850	0	190	0	272,437	0		0	272,437	138,120

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 102,777

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 3.9

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)

NAME OF UTILITY - FLORIDA POWER & LIGHT COMPANY

TITLE OF PROGRAM: Capacitor Bank Replacement Program

BRIEF DESCRIPTION OF PROGRAM: FPL will replace all high loss distribution capacitors on the system. Field locations of these older capacitors will be identified during seasonal switching of capacitors.

PRIMARY PURPOSE OF PROGRAM: Reduce system losses in both demand and energy by replacing high loss capacitors.

COST-BENEFIT ANALYSIS

YEAR	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Equip. $(000)	Mtnc. $(000)	Pers. $(000)	Adv. $(000)	Total $(000)	PV of Total $(000)	Per Customer KW	Per Customer KWH	System MW	System GWH	Construction Cost Savings $(000)	Fuel Purchase Savings $(000)	Mtnc. $(000)	Pers. $(000)	Total $(000)	PV of Total $(000)
	——Operating——												——O&M——			
1981	413		0		413	375	0	0	0	1	0	50		0	50	45
1982	883		0		883	729	4.0	21,024	1	5	0	285		0	285	235
1983	944		0		944	709	4.0	21,024	2	10	0	650		0	650	488
1984	1,053		0		1,053	719	4.0	21,024	3	15	0	1,110		0	1,110	758
1985	0		0		0	0	4.0	21,024	3	18	0	1,512		0	1,512	939
1986	0		0		0	0	4.0	21,024	3	18	0	1,728		0	1,728	975
1987	0		0		0	0	4.0	21,024	3	18	25,542	558		101	26,201	13,441
1988	0		0		0	0	4.0	21,024	3	18	0	612		108	720	336
1989	0		0		0	0	4.0	21,024	3	18	0	666		115	781	331
1990	0		0		0	0	4.0	21,024	3	18	0	720		124	844	326
1991	0		0		0	0	4.0	21,024	3	17	0	748		126	874	306
1992	0		0		0	0	4.0	0	3	13	0	624		103	727	232
1993	0		0		0	0	4.0	0	3	8	0	416		67	483	140
1994	0		0		0	0	4.0	0	3	3	0	171		27	198	52
1995	0		0		0	0	4.0	0	3	0	0	0		0	0	0
1996	0		0		0	0	4.0	0	3	0	0	0		0	0	0
1997	0		0		0	0	4.0	0	3	0	0	0		0	0	0
1998	0		0		0	0	4.0	0	3	0	0	0		0	0	0
1999	0		0		0	0	4.0	0	3	0	0	0		0	0	0
Cumulative Total	3,293		0		3,293	2,532	4.0	210,240	3	180	25,542	9,850		771	36,163	18,604

Net Benefits $(000) From Cumulative Totals Col 16 - Col 6: 16,072

Benefit/Cost Ratio From Cumulative Totals Col 16 ÷ Col 6: 7.3

METHOD AND JUSTIFICATION USED TO DETERMINE THE COST EFFECTIVENESS OF THIS PROGRAM: (Attach additional sheets if necessary)