# GULF POWER COMPANY

# TEN YEAR SITE PLAN

For Electrical Generating Facilities

And

Associated Transmission Lines

Submitted to the
State of Florida
Department of Community Affairs
Division of Local Resource Management
Bureau of Land and Water Management
Power Plant Siting Program

April 1, 1980

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# CHAPTER I

## DESCRIPTION OF EXISTING FACILITIES

FCG Form 1A

UTILITY Gulf Power Company

EXISTING GENERATING FACILITIES

| (1) Plant | (2) Unit No. | (3) Location | (4) Type | (5) Fuel Pri | (6) Fuel Alt | (7) Com'l In-Service Mo/Yr | (8) Exptd Retrmnt Mo/Yr | (9) Gen Max Nameplate KW | (10) Net Capability Summer MW | (11) Net Capability Winter MW |
|---|---|---|---|---|---|---|---|---|---|---|
| Crist | | Pensacola 25/1N/30W | | | | | | 1,229,000 | 1041.6 | 1041.6 |
| | 1 | | F | NG | HO | 1/45 | 1990 | 28,125 | 21.6 | 21.6 |
| | 2 | | F | NG | HO | 6/49 | 1990 | 28,125 | 20.3 | 20.3 |
| | 3 | | F | NG | HO | 9/52 | 1990 | 37,500 | 37.5 | 37.5 |
| | 4 | | F | C | NG | 7/59 | 1996 | 93,750 | 77.6 | 77.6 |
| | 5 | | F | C | NG | 6/61 | 1996 | 93,750 | 81.9 | 81.9 |
| | 6 | | F | C | NG | 5/70 | 2005 | 369,750 | 318.9 | 318.9 |
| | 7 | | F | C | no | 8/73 | 2008 | 578,000 | 483.8 | 483.8 |
| Lansing Smith | | Panama City 36/2S/15W | | | | | | 381,850 | 377.8 | 381.3 |
| | 1 | | F | C | no | 6/65 | 2002 | 149,600 | 159.5 | 159.5 |
| | 2 | | F | C | no | 6/67 | 2004 | 190,400 | 187.0 | 187.0 |
| | A | | CT | LO | no | 5/71 | 1991 | 41,850 | 31.3 | 34.8 |
| Scholz | | Sneads 12/3N/7W | | | | | | 98,000 | 95.7 | 95.7 |
| | 1 | | F | C | no | 3/53 | 1990 | 49,000 | 48.0 | 48.0 |
| | 2 | | F | C | no | 10/53 | 1990 | 49,000 | 47.7 | 47.7 |
| Total System As of December 31, 1979: | | | | | | | | | 1515.1 | 1518.6 |

UTILITY Gulf Power Company

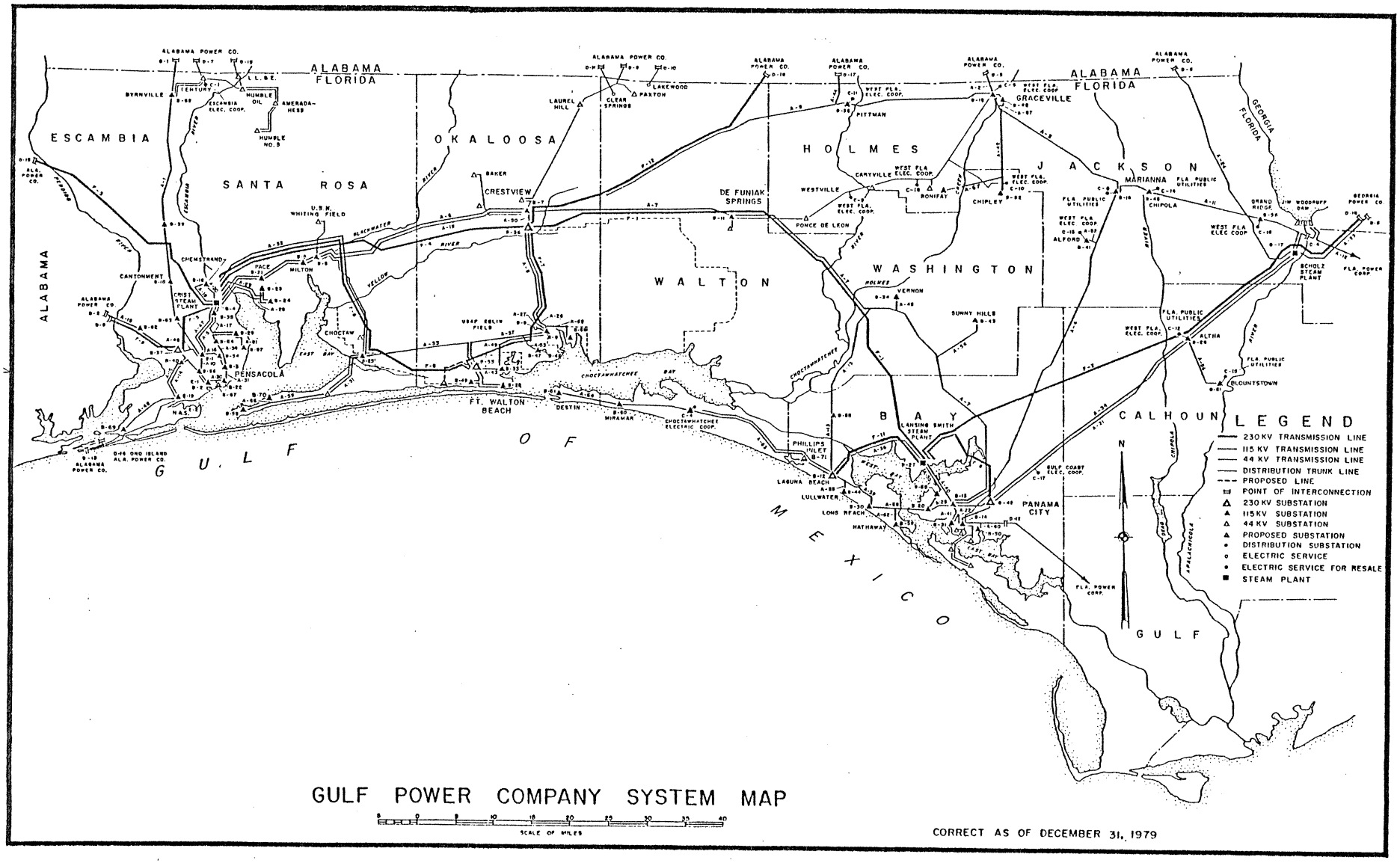
EXISTING GENERATING FACILITIES
LAND USE AND INVESTMENT

| (1) | (2) Land Area | (3) | (4) | (5) Plant Capital Investment (in $1,000) | (6) | (7) |
|---|---|---|---|---|---|---|
| Plant Name | Total Acres | In Use Acres | Land | Site Improvements | Buildings & Equipment | Total |
| STEAM TOTAL | | | 384 | 44,056 | 251,961 | 296,401 |
| Crist | 676.00 | 200 | 135 | 29,247 | 177,036 | 206,418 |
| Lansing Smith | 841.40 | 270 | 204 | 10,719 | 57,388 | 68,311 |
| Scholz | 293.15 | 168 | 45 | 4,090 | 17,537 | 21,672 |
| COMBUSTION TURBINES - TOTAL | | | | 104 | 3,771 | 3,875 |
| Lansing Smith CT | | | | 104 | 3,771 | 3,875 |

UTILITY Gulf Power Company

EXISTING GENERATING FACILITIES
ENVIRONMENTAL CONSIDERATIONS FOR STEAM GENERATING UNITS

| (1) Plant Name | (2) Unit | (3) Flue Gas Cleaning Particulate | (4) Flue Gas Cleaning SOx | (5) Flue Gas Cleaning NOx | (6) Cooling Type |
|---|---|---|---|---|---|
| Crist | 1 | no | no | no | WCTM |
| | 2 | no | no | no | WCTM |
| | 3 | no | no | no | WCTM |
| | 4 | EP | no | no | WCTM |
| | 5 | EP | no | no | WCTM |
| | 6 | EP | no | no | WCTM |
| | 7 | EP | no | no | WCTM |
| Lansing Smith | 1 | EP | no | no | OTS |
| | 2 | EP | no | no | OTS |
| Scholz | 1 | EP | no | no | OTF |
| | 2 | EP | no | no | OTF |




# GULF POWER COMPANY SYSTEM MAP

CORRECT AS OF DECEMBER 31, 1979

# CHAPTER II

## FORECAST OF ELECTRIC POWER DEMAND

UTILITY Gulf Power Company

HISTORY AND FORECAST OF ENERGY USE

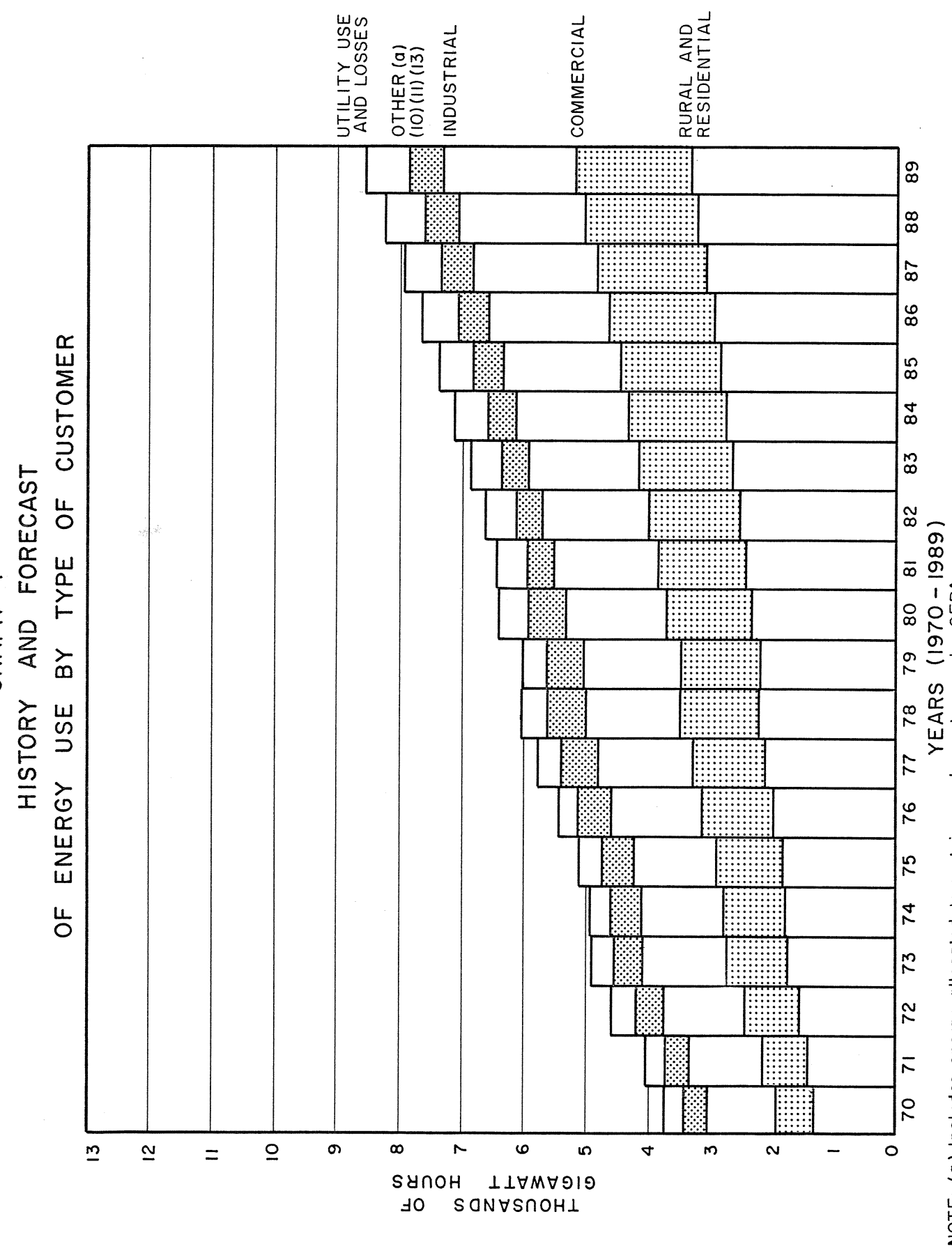
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|
| | Rural & Residential | | | Commercial | | Industrial | |
| Year | GWH | Average No. of Customers | Average KWH Consumption Per Customer | GWH | Average No. of Customers | GWH | Average No. of Customers |
| 1970 | 1,306 | 121,972 | 10,707 | 679 | 16,418 | 1,068 | 134 |
| 1971 | 1,425 | 127,233 | 11,200 | 752 | 17,212 | 1,164 | 141 |
| 1972 | 1,602 | 135,437 | 11,828 | 860 | 18,088 | 1,308 | 149 |
| 1973 | 1,800 | 142,434 | 12,637 | 946 | 18,938 | 1,382 | 159 |
| 1974 | 1,835 | 150,257 | 12,212 | 969 | 19,589 | 1,325 | 159 |
| 1975 | 1,889 | 154,170 | 12,253 | 1,041 | 19,769 | 1,340 | 160 |
| 1976 | 2,046 | 158,492 | 12,913 | 1,128 | 20,364 | 1,435 | 154 |
| 1977 | 2,156 | 163,121 | 13,220 | 1,207 | 20,964 | 1,494 | 156 |
| 1978 | 2,243 | 168,156 | 13,342 | 1,254 | 21,567 | 1,530 | 160 |
| 1979 | 2,225 | 172,906 | 12,868 | 1,269 | 21,949 | 1,552 | 164 |
| 1980 | 2,354 | 178,280 | 13,204 | 1,359 | 22,618 | 1,619 | 173 |
| 1981 | 2,447 | 183,604 | 13,328 | 1,407 | 23,205 | 1,672 | 177 |
| 1982 | 2,547 | 189,110 | 13,468 | 1,456 | 23,806 | 1,726 | 179 |
| 1983 | 2,651 | 194,805 | 13,608 | 1,508 | 24,428 | 1,779 | 181 |
| 1984 | 2,756 | 200,702 | 13,732 | 1,561 | 25,075 | 1,832 | 184 |
| 1985 | 2,865 | 208,988 | 13,709 | 1,616 | 25,853 | 1,887 | 191 |
| 1986 | 2,979 | 215,258 | 13,839 | 1,673 | 26,629 | 1,943 | 195 |
| 1987 | 3,097 | 221,716 | 13,968 | 1,732 | 27,428 | 2,001 | 200 |
| 1988 | 3,220 | 228,367 | 14,100 | 1,793 | 28,251 | 2,060 | 204 |
| 1989 | 3,348 | 235,218 | 14,234 | 1,856 | 29,099 | 2,121 | 209 |

UTILITY Gulf Power Company

HISTORY AND FORECAST OF ENERGY USE

| (9) Year | (10) Street & Highway Lighting GWH | (11) Other Sales to Ultimate Consumers GWH | (12) Total Sales to Ultimate Consumers GWH | (13) Sales For Resale GWH | (14) Utility Use & Losses GWH | (15) Net Energy For Load GWH |
|---|---|---|---|---|---|---|
| 1970 | 13 | 0 | 3,066 | 350 | 348 | 3,764 |
| 1971 | 13 | 0 | 3,354 | 384 | 334 | 4,072 |
| 1972 | 12 | 0 | 3,782 | 428 | 394 | 4,604 |
| 1973 | 9 | 0 | 4,137 | 448 | 393 | 4,978 |
| 1974 | 13 | 0 | 4,142 | 470 | 371 | 4,983 |
| 1975 | 13 | 0 | 4,283 | 505 | 360 | 5,148 |
| 1976 | 13 | 0 | 4,622 | 519 | 334 | 5,475 |
| 1977 | 14 | 0 | 4,871 | 551 | 401 | 5,823 |
| 1978 | 14 | 0 | 5,041 | 569 | 434 | 6,044 |
| 1979 | 14 | 0 | 5,060 | 558 | 412 | 6,030 |
| 1980 | 14 | 0 | 5,346 | 590 | 474 | 6,410 |
| 1981 | 14 | 0 | 5,540 | 416 | 477 | 6,433 |
| 1982 | 15 | 0 | 5,744 | 396 | 494 | 6,634 |
| 1983 | 16 | 0 | 5,954 | 415 | 511 | 6,880 |
| 1984 | 16 | 0 | 6,165 | 434 | 532 | 7,131 |
| 1985 | 16 | 0 | 6,384 | 453 | 561 | 7,398 |
| 1986 | 17 | 0 | 6,612 | 473 | 586 | 7,671 |
| 1987 | 17 | 0 | 6,847 | 494 | 613 | 7,954 |
| 1988 | 18 | 0 | 7,091 | 516 | 658 | 8,265 |
| 1989 | 19 | 0 | 7,344 | 539 | 670 | 8,553 |

Note: Columns (13) and (15) include energy allocated to certain resale customers by Southeastern Power Administration (SEPA).



UTILITY Gulf Power Company



ENERGY SOURCES AND FUEL REQUIREMENTS

| | ENERGY SOURCES | | Actual 1978 | Actual 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|---|
| (1) | PURCHASE & INTERCHANGE | GWH | (126) | (603) | 274 | (416) | (529) | (690) |
| (2) | NUCLEAR | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (3) | COAL | GWH | 5378 | 6000 | 5639 | 6428 | 6792 | 7195 |
| (4) | RESIDUAL-TOTAL- | GWH | 53 | 2 | 1 | 4 | 10 | 8 |
| (5) | Steam | GWH | 53 | 2 | 1 | 4 | 10 | 8 |
| (6) | CC | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (7) | CT | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (8) | DISTILLATE-TOTAL- | GWH | 22 | 3 | 14 | 14 | 14 | 14 |
| (9) | CT | GWH | 22 | 3 | 14 | 14 | 14 | 14 |
| (10) | Diesel | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (11) | NATURAL GAS-TOTAL- | GWH | 717 | 628 | 482 | 403 | 347 | 353 |
| (12) | Steam | GWH | 717 | 628 | 482 | 403 | 347 | 353 |
| (13) | CC | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (14) | CT | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (15) | Diesel | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (16) | OTHER | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (17) | NET ENERGY FOR LOAD (a) | GWH | 6044 | 6030 | 6410 | 6433 | 6634 | 6880 |
| | FUEL REQUIREMENTS | | | | | | | |
| (18) | NUCLEAR | $BTUx10^{12}$ | NONE | NONE | NONE | NONE | NONE | NONE |
| (19) | COAL | 1000 TON | 2613 | 2771 | 2685 | 3060 | 3236 | 3429 |
| (20) | RESIDUAL-TOTAL- | 1000 BBL | 134 | 4 | 2 | 10 | 24 | 20 |
| (21) | Steam | 1000 BBL | 134 | 4 | 2 | 10 | 24 | 20 |
| (22) | CC | 1000 BBL | NONE | NONE | NONE | NONE | NONE | NONE |
| (23) | CT | 1000 BBL | NONE | NONE | NONE | NONE | NONE | NONE |
| (24) | DISTILLATE-TOTAL- | 1000 BBL | 53 | 7 | 35 | 35 | 35 | 35 |
| (25) | CT | 1000 BBL | 53 | 7 | 35 | 35 | 35 | 35 |
| (26) | Diesel | 1000 BBL | NONE | NONE | NONE | NONE | NONE | NONE |
| (27) | NATURAL GAS-TOTAL- | 1000 MCF | 9141 | 7273 | 7213 | 6240 | 5434 | 5532 |
| (28) | Steam | 1000 MCF | 9141 | 7273 | 7213 | 6240 | 5434 | 5532 |
| (29) | CC | 1000 MCF | NONE | NONE | NONE | NONE | NONE | NONE |
| (30) | CT | 1000 MCF | NONE | NONE | NONE | NONE | NONE | NONE |
| (31) | Diesel | 1000 MCF | NONE | NONE | NONE | NONE | NONE | NONE |
| (32) | OTHER | $BTUx10^{6}$ | NONE | NONE | NONE | NONE | NONE | NONE |
| (33) | ANNUAL AVG. FOSSIL NET H.R. | BTU/KWH | 11493 | 10982 | 11603 | 11516 | 11470 | 11456 |

NOTE: (a) Includes energy allocated to certain resale customers by Southeastern Power Administration (SEPA).

UTILITY Gulf Power Company



ENERGY SOURCES AND FUEL REQUIREMENTS

| | ENERGY SOURCES | | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 |
|---|---|---|---|---|---|---|---|---|
| (1) | PURCHASES & INTERCHANGE | GWH | (539) | (168) | (358) | (704) | (385) | (1151) |
| (2) | NUCLEAR | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (3) | COAL | GWH | 7337 | 7408 | 7869 | 8500 | 8494 | 9539 |
| (4) | RESIDUAL-TOTAL- | GWH | 12 | 89 | 91 | 89 | 87 | 96 |
| (5) | Steam | GWH | 12 | 89 | 91 | 89 | 87 | 96 |
| (6) | CC | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (7) | CT | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (8) | DISTILLATE-TOTAL- | GWH | 14 | 14 | 14 | 14 | 14 | 14 |
| (9) | CT | GWH | 14 | 14 | 14 | 14 | 14 | 14 |
| (10) | Diesel | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (11) | NATURAL GAS-TOTAL- | GWH | 307 | 55 | 55 | 55 | 55 | 55 |
| (12) | Steam | GWH | 307 | 55 | 55 | 55 | 55 | 55 |
| (13) | CC | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (14) | CT | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (15) | Diesel | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (16) | OTHER | GWH | NONE | NONE | NONE | NONE | NONE | NONE |
| (17) | NET ENERGY FOR LOAD (a) | GWH | 7131 | 7398 | 7671 | 7954 | 8265 | 8553 |
| | FUEL REQUIREMENTS | | | | | | | |
| (18) | NUCLEAR | $BTUx10^{12}$ | NONE | NONE | NONE | NONE | NONE | NONE |
| (19) | COAL | 1000 TON | 3494 | 3452 | 3672 | 3937 | 3935 | 4386 |
| (20) | RESIDUAL-TOTAL- | 1000 BBL | 31 | 230 | 235 | 230 | 225 | 248 |
| (21) | Steam | 1000 BBL | 31 | 230 | 235 | 230 | 225 | 248 |
| (22) | CC | 1000 BBL | NONE | NONE | NONE | NONE | NONE | NONE |
| (23) | CT | 1000 BBL | NONE | NONE | NONE | NONE | NONE | NONE |
| (24) | DISTILLATE-TOTAL- | 1000 BBL | 35 | 35 | 35 | 35 | 35 | 35 |
| (25) | CT | 1000 BBL | 35 | 35 | 35 | 35 | 35 | 35 |
| (26) | Diesel | 1000 BBL | NONE | NONE | NONE | NONE | NONE | NONE |
| (27) | NATURAL-GAS-TOTAL- | 1000 MCF | 4783 | 857 | 857 | 857 | 857 | 857 |
| (28) | Steam | 1000 MCF | 4783 | 857 | 857 | 857 | 857 | 857 |
| (29) | CC | 1000 MCF | NONE | NONE | NONE | NONE | NONE | NONE |
| (30) | CT | 1000 MCF | NONE | NONE | NONE | NONE | NONE | NONE |
| (31) | Diesel | 1000 MCF | NONE | NONE | NONE | NONE | NONE | NONE |
| (32) | OTHER | $BTUx10^{6}$ | NONE | NONE | NONE | NONE | NONE | NONE |
| (33) | ANNUAL AVG. FOSSIL NET H. R. | BTUxKWH | 11426 | 11120 | 11073 | 10983 | 10973 | 10889 |

NOTE: (a) Includes energy allocated to certain resale customers by Southeastern Power Administration (SEPA).

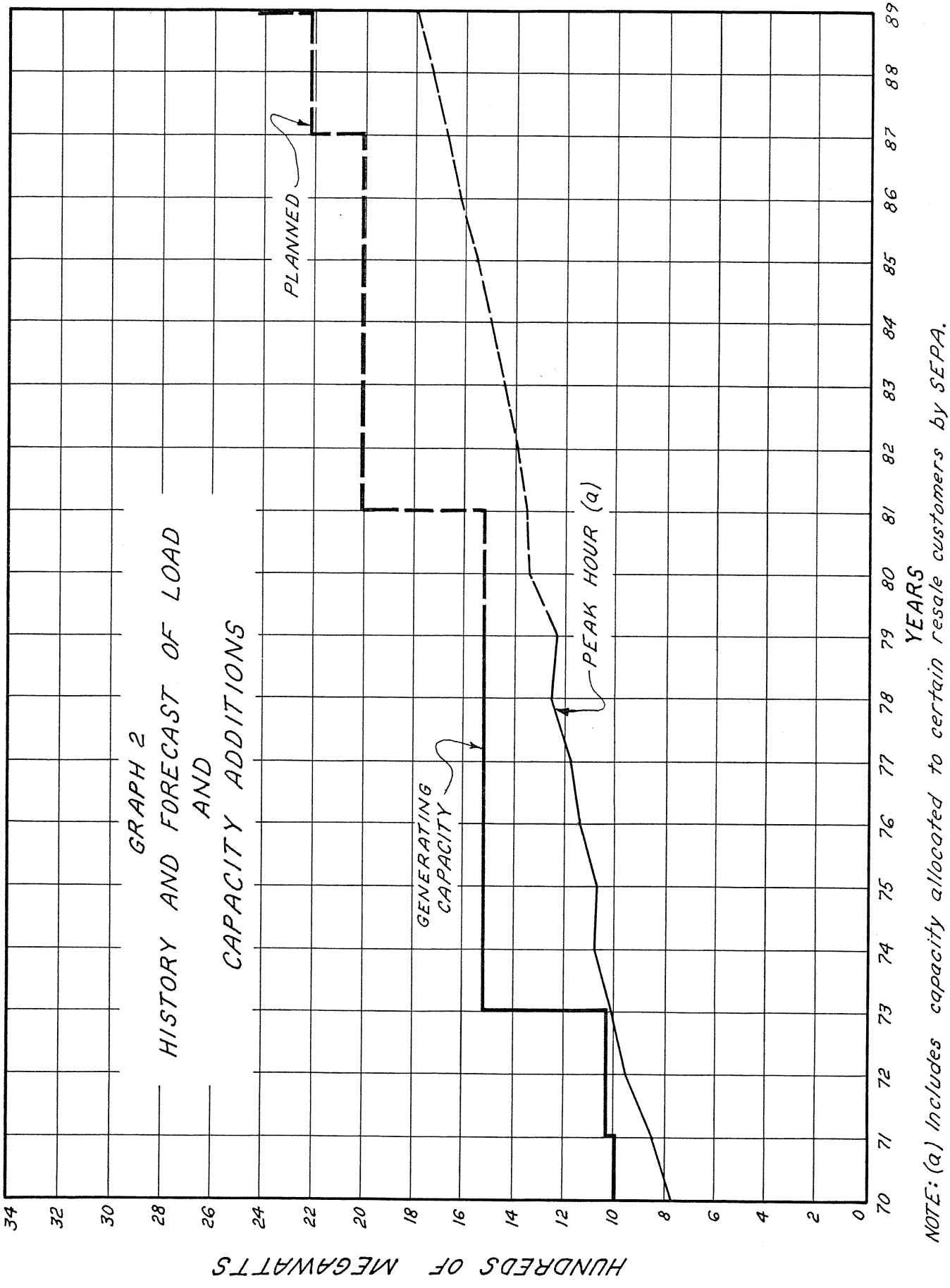
FCG Form 4

UTILITY Gulf Power Company

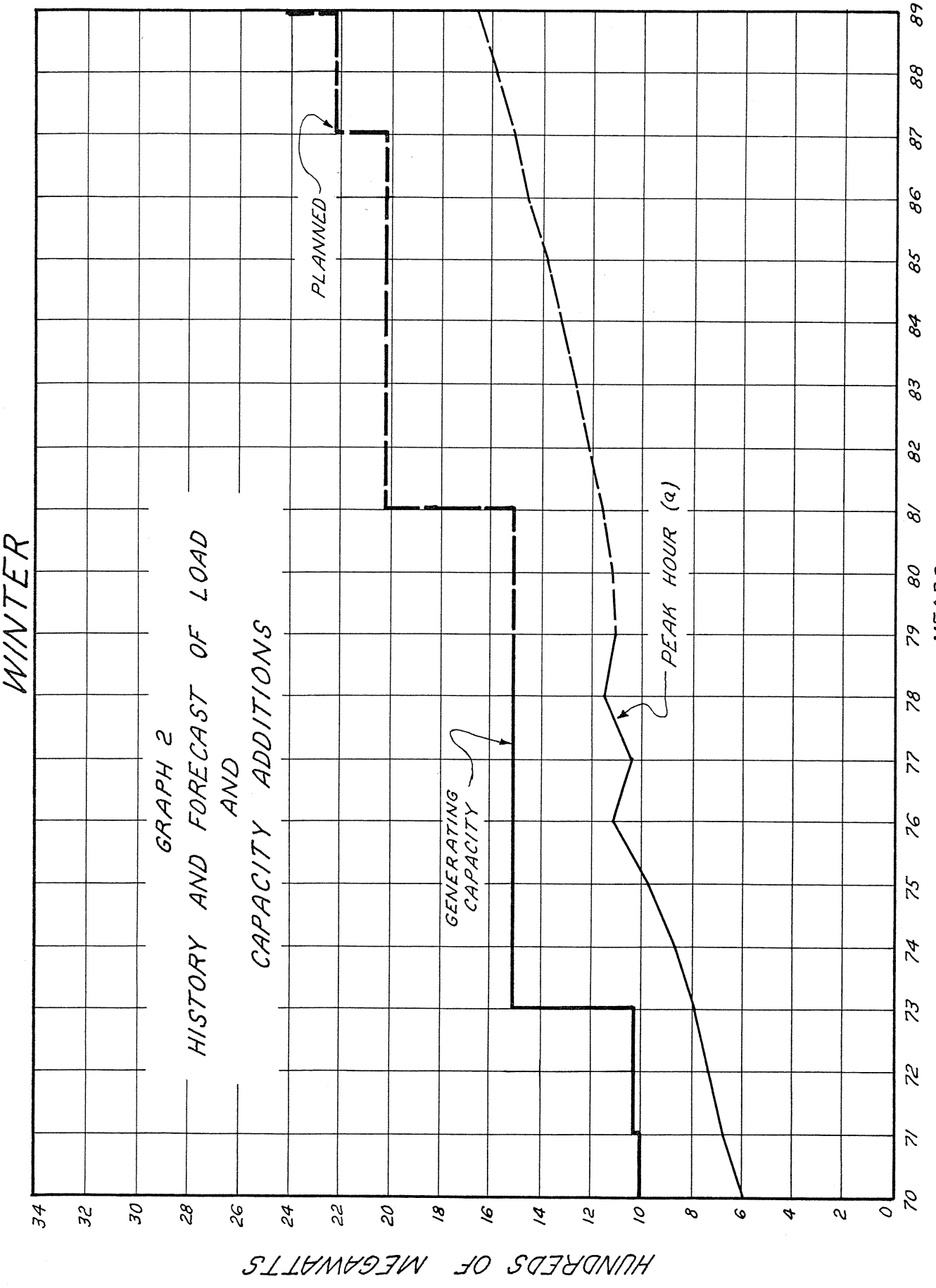
HISTORY AND FORECAST OF SEASONAL PEAK DEMAND AND ANNUAL NET ENERGY FOR LOAD

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|
| | Summer Peak Demand Net MW | | | | | Winter Peak Demand Net MW | |
| Year | Interruptible | Total | Net Energy For Load - GWH | Load Factor % | Year | Interruptible | Total |
| 1970 | | 774 | 3,764 | 55.49 | 1970-71 | | 600 |
| 1971 | | 842 | 4,072 | 55.24 | 1971-72 | | 648 |
| 1972 | | 956 | 4,604 | 54.81 | 1972-73 | | 764 |
| 1973 | | 1,014 | 4,978 | 56.02 | 1973-74 | | 790 |
| 1974 | | 1,081 | 4,983 | 52.60 | 1974-75 | | 826 |
| 1975 | | 1,078 | 5,148 | 54.52 | 1975-76 | | 976 |
| 1976 | | 1,140 | 5,475 | 54.65 | 1976-77 | | 1,121 |
| 1977 | | 1,180 | 5,823 | 56.33 | 1977-78 | | 1,072 |
| 1978 | | 1,257 | 6,044 | 54.89 | 1978-79 | | 1,154 |
| 1979 | | 1,232 | 6,030 | 55.87 | 1979-80 | | 1,111 |
| 1980 | NONE | 1,350 | 6,410 | 54.05 | 1980-81 | NONE | 1,118 |
| 1981 | | 1,354 | 6,433 | 54.24 | 1981-82 | | 1,161 |
| 1982 | | 1,397 | 6,634 | 54.21 | 1982-83 | | 1,214 |
| 1983 | | 1,449 | 6,880 | 54.20 | 1983-84 | | 1,269 |
| 1984 | | 1,502 | 7,131 | 54.05 | 1984-85 | | 1,327 |
| 1985 | | 1,557 | 7,398 | 54.25 | 1985-86 | | 1,388 |
| 1986 | | 1,614 | 7,671 | 54.28 | 1986-87 | | 1,451 |
| 1987 | | 1,674 | 7,954 | 54.28 | 1987-88 | | 1,517 |
| 1988 | | 1,735 | 8,265 | 54.31 | 1988-89 | | 1,586 |
| 1989 | | 1,799 | 8,553 | 54.33 | 1989-90 | | 1,658 |

Note: Includes capacity and energy allocated to certain resale customers by Southeastern Power Administration (SEPA)




NOTE: (a) Includes capacity allocated to certain resale customers by SEPA.




NOTE: (a) Includes capacity allocated to certain resale customers by SEPA.

FCG Form 5

UTILITY Gulf Power Company

PREVIOUS YEAR ACTUAL AND TWO-YEAR FORECAST OF PEAK DEMAND
AND NET ENERGY FOR LOAD BY MONTH

| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|
| | ACTUAL | | FORECAST | | | |
| | 1979 | | 1980 | | 1981 | |
| MONTH | PEAK DEMAND MW | NEL GWH | PEAK DEMAND MW | NEL GWH | PEAK DEMAND MW | NEL GWH |
| JAN | 1,154 | 559 | 1,111 | 543 | 1,118 | 547 |
| FEB | 1,115 | 466 | 1,038 | 453 | 1,046 | 457 |
| MAR | 791 | 422 | 853 | 435 | 858 | 437 |
| APR | 760 | 402 | 799 | 423 | 802 | 425 |
| MAY | 967 | 480 | 1,107 | 530 | 1,110 | 531 |
| JUN | 1,202 | 576 | 1,265 | 637 | 1,263 | 635 |
| JUL | 1,232 | 624 | 1,274 | 674 | 1,274 | 675 |
| AUG | 1,216 | 636 | 1,350 | 663 | 1,354 | 663 |
| SEP | 1,159 | 525 | 1,195 | 589 | 1,195 | 589 |
| OCT | 964 | 440 | 1,055 | 490 | 1,062 | 492 |
| NOV | 973 | 419 | 910 | 443 | 916 | 446 |
| DEC | 1,033 | 481 | 1,077 | 530 | 1,088 | 536 |
| TOTAL | | 6,030 | | 6,410 | | 6,433 |

Note: Includes Capacity and Energy Allocated to Certain Resale Customers by Southeastern Power Administration (SEPA)

# FORECASTING DOCUMENTATION

## I. General

Gulf uses two basic methods in its current peak hour demand forecasts, an in house micro method and an econometric model.

Since the micro method is dependent on customer and kilowatt hour forecasts, we begin with an explanation of these forecasts and then move on to the econometric forecast of energy and demand.

II. Customer and Kilowatt Hour Forecasts (Micro Method)

Customer and kilowatt hour forecasts begin with the gathering of information to determine the growth in all classes for the forecasting period.

For the industrial class, approximately 90% of the energy is consumed by the 34 largest customers. Local office personnel contact each of the 34 industries and discuss their power needs and employment projections for the forecast period. Our forecast data for energy is based on the long term planning of these 34 largest industrial customers with the remaining 10% projected using a time trend. No additional industrial load is included in our forecast until an industry makes a definite commitment to locate in our service area.

For the commercial class, information is obtained on new construction and expansion projects by contacting architects, engineers, developers, and community planning groups. These large block loads are planned well in advance and account for approximately two thirds of the customer and energy growth in the commercial sector. The remaining growth comes from small businesses which can be projected by its historical relationship with residential growth.

The forecasts for the street light and wholesale classes are the sum of the projections we received from the individual communities and wholesale customers. These projections are checked for reasonableness by comparing them to long term trends, contract capacities, and known changes which will occur.

The residential customer forecast begins with all the job information obtained from the survey of the industrial and commercial sectors and the projections for growth in employment obtained from State Employment Agencies and other sources. After this job information is assembled at the local level and adjusted for the number of persons and wage earners per household, it is combined into our service area residential customer forecast. This is tested for reasonableness by comparing it to other forecasts for our ten-county area, such as Kiplinger, University of Florida, and our own econometric forecast.

The kilowatt hour forecast methodology deals with the average residential customer as if Gulf had only one customer and utilizes the appliance saturation survey information and our load management programs to predict what will happen to that customer's KWH consumption assuming his willingness to purchase power remains at the last known level. This process begins by separating ten-year KWH/customer history into its weather sensitive and non-weather sensitive components.

This is done by using past appliance saturations and typical appliance usage to arrive at the non-weather sensitive component, which we assume remains relatively constant for each month within a given year. The weather sensitive component is left when the non-weather sensitive portion is subtracted from each month's KWH/customer.

The non-weather sensitive quantity is checked by comparing it with the average KWH/residential customer for the month of April, which is normally the least weather sensitive month for our system, and found to be extremely close for each of the ten Aprils in the history. After separating the two KWH/customer components and testing the primary component for validity, we are ready to project each component.

In order to project the weather sensitive component, there are some factors that vary from year to year that must be eliminated.

Just as customer growth can be eliminated from KWH growth by dividing KWH by the number of customers, we also eliminate the factors of weather and billing cycle length, resulting in a monthly factor with the dimensions of KWH/CUST/$^{O}$HR/DAY.

For a weather sensitive component, this leaves only two variables: (1) load growth (for heating and air conditioning), and (2) level of customer usage.

With the customer usage variable held constant at the last known level, all that remains is to forecast the growth of the heating or cooling load.

This is done by determining from our saturation surveys and load reporting system the accumulated connected heating and cooling loads and then projecting, based on load management programs, future heating/cooling load to be added, taking into consideration the following:

1. Decrease in heating and cooling requirements caused by:

   A. Smaller dwelling size

      (1) Increased apartment, townhouses, and condominiums.

      (2) Smaller single family residences.

   B. More insulation

      (1) Good ¢ents Home Program

      (2) Insulation Surveys of Existing Homes

   C. Improved equipment efficiency average from present 6.8 EER to 7.5 EER by 1985.

   D. Customer Conservation and Changes in temperature levels maintained.

After the heating and cooling loads to be added in future years have been obtained, the annual growth factors for heating growth are applied to the monthly KWH/CUST/$^{O}$HR/DAY factor. When this monthly factor is multiplied by the average $^{O}$HRs and the number of billing days for that month, the result is a weather normalized, weather sensitive KWH/customer component of consumption.

A similar projection is made for the non-weather sensitive component by making projections for the future saturation limits. Using the typical appliance consumptions that were validated based on our customer historic usage and the number of days in the appropriate monthly billing period, the resulting figure is a future projection of the non-weather sensitive, or base load KWH/customer component.

The combined KWH/customer components for each month of the year are multiplied by the total number of residential customers for each month and the result is the annual distribution of KWH sales for the residential class based on normalized weather.

III. Peak Hour Demand Forecasts (Micro Method)

In addition to the econometric method for forecasting peak hour demand which we will discuss later, Gulf also utilizes a micro method which analyzes changes in numbers of customers and average use per customer, then converts KWH to demand through the use of class load factors.

This method begins with KWH projections by customer class which we discussed earlier. The next step is to utilize actual load data gathered from a random sampling of customers to determine annual class load factors.

Exhibit #MD-1 shows actual annual class load factors obtained from data gathered in 1976. These factors are applied to the KWH forecast to compute the five day average demand. The calculation for this is shown on Exhibit #MD-1 and equals 487.2 MW for the residential class in 1980. The five day average demand for each class is summed to equal 1120.9 MW, and then multiplied by a diversity factor that converts five day average demand to an unadjusted peak hour demand. This diversity factor, indicated on Exhibit #MD-2, is computed by dividing the actual 1976 system peak hour demand by the five day average demand for 1976 to account for system peak hour losses and diversity between five day average demand and peak hour demand.

Gulf's current demand forecast assumes the individual class load factors will remain essentially constant throughout the forecast period. The small changes in system annual load

factor shown in the projections result from differences in growth rates between the classes, and from a moderate band width added to the computed demands to account for the effect of minor temperature variations which occur at rather frequent intervals during the summer and winter peak months.

The last calculation needed to get forecast peak hour demand is to multiply the unadjusted peak hour demand by the weather factor. For 1980, this results in a peak hour demand of 1350 MW, which is shown on Exhibit #MD-3.

## SAMPLE CALCULATIONS FOR YEAR 1980

### 5-Day Average Demand

| CUSTOMER CLASS | ANNUAL CLASS(1) LOAD FACTORS | PROJECTED BILL KWH SALES FOR 1980 (Millions) | 5-DAY AVERAGE DEMAND (MW) |
|---|---|---|---|
| Residential | .549 | 2342.9 | 487.2 |
| Commercial | .570 | 1353.0 | 271.0 |
| Industrial | .734 | 1618.8 | 251.8 |
| FPU | .555 | 227.7 | 46.8 |
| REA(2) | .575 | 323.1 | 64.1 |
| TOTAL | | | 1120.9 |

$$\text{Residential 5-Day Average Demand} = \frac{\text{Projected Billed KWH Sales for Year}}{\text{Annual Class Load Factor} \times \text{Hours in Year}}$$

$$\text{Residential 5-Day Average Demand} = \frac{2342.9}{.549 \times 8.76} = 487.2 \text{ MW}$$

(1) Annual class load factors from 1976 cost of service study.
(2) REA does not include SEPA allocation of 12 MW.

# DIVERSITY FACTOR

Historical Data

| Customer Class | 5-Day Average Demands (MW) 1976 |
|---|---|
| Residential | 419.7 |
| Commercial | 224.0 |
| Industrial | 224.3 |
| Florida Public Utilities | 37.8 |
| REA | 67.3 |
| TOTAL | 973.1 |
| Actual System Peak Demand | 1140.3 |

$$\text{Diversity Factor} = \frac{\text{Actual System Peak Hour Demand}}{\text{5-Day Average Demand}}$$

$$\text{Diversity Factor} = \frac{1140.3}{973.1}$$

$$\text{Diversity Factor} = 1.17$$

## PEAK HOUR DEMAND (1980)

Peak Hour Demand = Sum of 5-Day Average Demands x Diversity Factor x Weather Factor

Sum of 5-Day Average Demands = 1120.9 MW

Diversity Factor = 1.17

Weather Factor = 1.02

1979 Peak Hour Demand = 1121 x 1.17 x 1.02 = 1338 MW + SEPA = 1350MW

## IV. Econometric Model

### (a) Concepts

An econometric model is one that relates a dependent variable, such as KWH sales, to socio-economic variables without regard for the reasonableness of the relationship. Our model, termed an "econometric-end use model", combines the best of two methods. Econometric techniques are used to develop end-use equations, with emphasis on assuring that these relationships are both meaningful and reasonable.

The econometric models were developed by Data Resources, Inc. (referred to as DRI) with Gulf Power Company providing data input and interpretive assistance. Of major importance is the National Economic Forecast, which begins the forecasting sequence through input to the service area economic model.

DRI's model of the U.S. economy is a computer based system of over 900 quarterly equations that describe the interactions of the measurable facets of the national economy, and is updated annually (Exhibit #E-1). This model is utilized by DRI to produce their short and long term forecast of the U. S. economy, by DRI's clients to test the impact of their own assumptions on the national economic outlook, and by DRI's clients as input into their own forecasting systems.

Exhibit #E-2 shows a block diagram which represents Gulf's econometric forecasting system. The system

begins a national forecast which drives the service area economic model to produce input into the energy model, which in turn produces energy forecasts by customer class. The energy forecasts by class are used in the peak demand model to produce the peak demand forecast. An electric energy price projection and a projection of losses from supply to sales is input to these models.

The major link between Gulf's service area economic model and the national economy is the employment sector. Factors such as tax rates, environmental regulations, transportation facilities, wage rates, etc., that influence an industry's decision to locate or expand in our service area as opposed to elsewhere are used to capture employment opportunities. Other segments of the economy, such as population, income, prices, etc., interact with the employment sector to produce a consistent economic scenario.

Some of the variables forecast in the service area economic model are shown in Exhibit #E-3.

(b) Energy and Customers

Variables forecast within the energy model are classified by residential, commercial, industrial, wholesale, and street lights.

The residential portion of the energy model contains sub-models to forecast customers, appliance saturation, and usage per customer (Exhibit #E-4).

Customers are forecast as a function of population 21 years of age and older (the household forming age group) and a two year weighted average of real per capita income. Income here is used to measure the capability to form a household (Exhibit #E-5).

Usage per customer (Exhibit #E-6) is a function of the stock of appliances owned by the average customer, the price of electricity, weather, and income. The price of electricity influences the use of the appliances the customer owns (Exhibit #E-7).

The commercial portion of the energy model is a function of commercial employment, price of electricity, and weather. Here commercial employment tracks the growth of commercial activity while price measures the incentives for conservation (Exhibit #E-8).

The industrial portion is divided into four sub-models:

Chemicals
Paper
Other Manufacturing
Non-Manufacturing

Each of these sub-models is a function of local production, price of electricity, pollution control equipment, and the availability of natural gas (Exhibit #E-9).

The wholesale portion is a function of the sales of commercial and residential energy, since the REA Cooperatives do not have any large industrial loads.

(c) Peak Hour Demand

Three steps are required to develop this model. First, historical peaks are normalized for weather. Second, the normalized peaks are separated into the components of demand associated with each class of customer. Finally, equations are developed for each customer class.

The historical weather normalized peaks are determined by developing for each year an equation for hourly demand as a function of weather variation. Then, typical peak day weather conditions are used to compute the normalized peak.

These normalized peaks are separated into residential/commercial, industrial, and wholesale components.

Exhibits #E-10, #E-11, and #E-12 show the actual equations developed for each of the customer classes.

With the exception of the residential/commercial class, the demand contribution is a function of energy sales to that class only. Residential/commercial includes a factor to account for the change in appliance mix, and thus a change in load factor.

The equation for the industrial class indicates a slightly deteriorating load factor, while the wholesale equation indicates a slightly improving load factor.

Using these equations, the actual peaks are weather normalized and the forecasted peaks computed

as a sum of the class components.

Local service area input data to the econometric model is continually refined and improved to enhance the accuracy of projections.

## DESCRIPTION OF THE DRI MACRO MODEL OF THE U.S. ECONOMY

WHAT?

- SYSTEM OF 900 QUARTERLY EQUATIONS DESCRIBING THE INTERACTIONS OF THE U.S. ECONOMY.
- COMPUTER BASED
- CURRENT, UPDATED ANNUALLY.

USES?

- BY DRI TO DEVELOP SHORT-TERM (TO 1980) AND LONG-TERM (TO 1990) FORECASTS OF THE U.S. ECONOMY.
- BY DRI'S CLIENTS TO TEST AND EVALUATE THEIR OWN SET OF ASSUMPTIONS ON THE MACRO ECONOMIC OUTLOOK.
- BY DRI'S CLIENTS AS INPUTS INTO THEIR OWN FORECASTING SYSTEMS.

WHO?

- MANAGED BY A STAFF OF 25 FULL-TIME PROFESSIONALS
- DIRECTION OF OTTO ECKSTEIN, PRESIDENT

Exhibit #E-2

# FUNCTIONAL BLOCK DIAGRAM
## GULF ECONOMETRIC LOAD FORECASTING SYSTEM

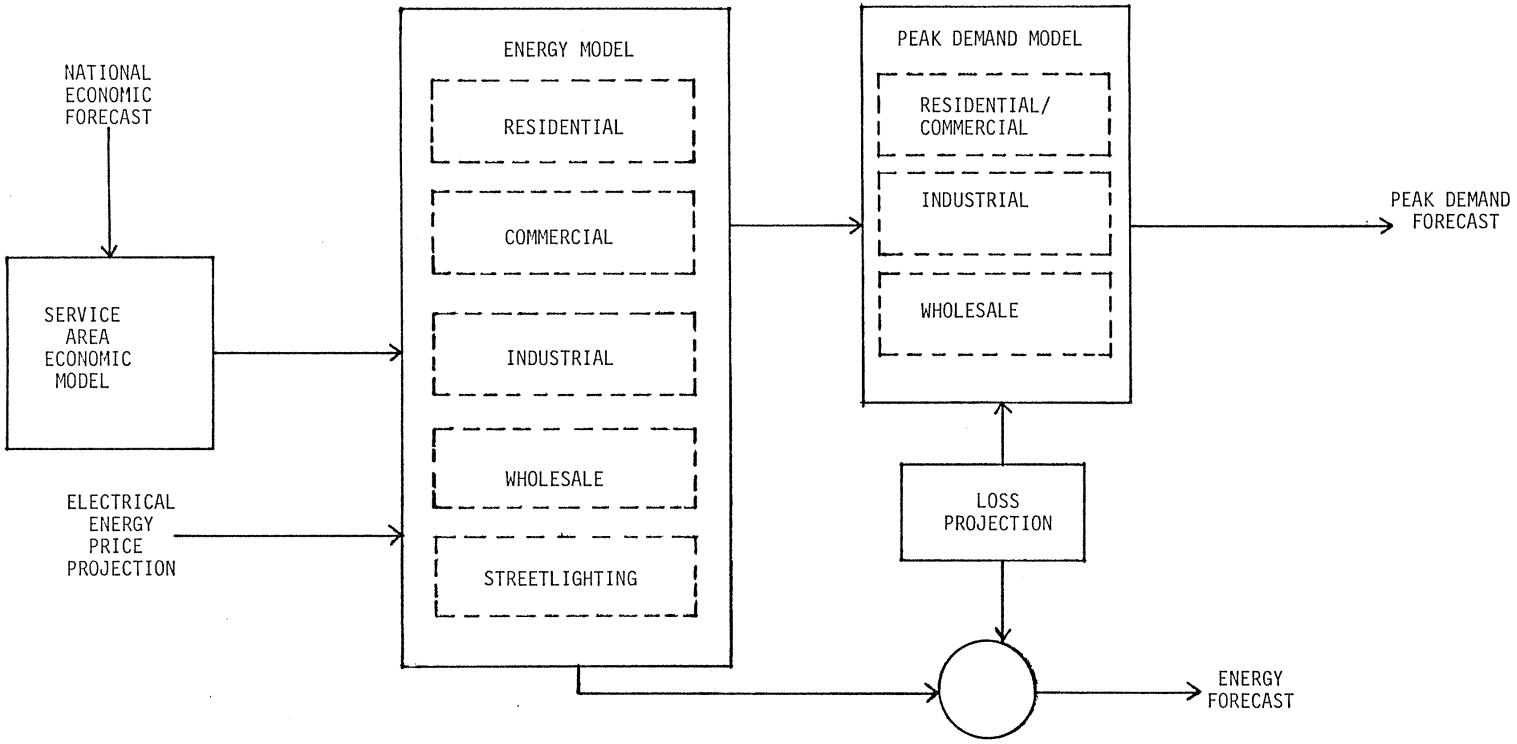


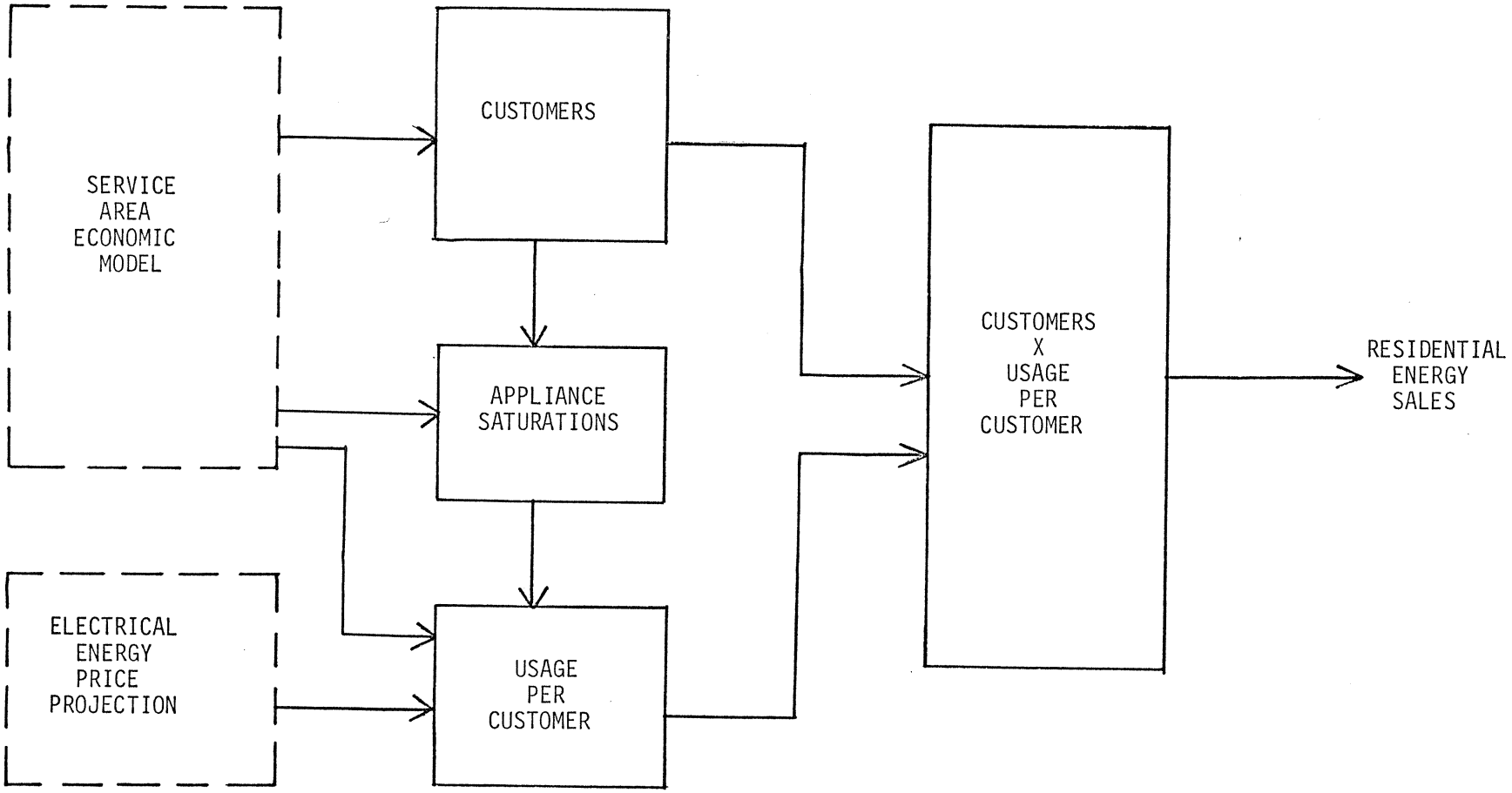
Exhibit #E-3

SERVICE AREA ECONOMIC MODEL

| FORECASTED VARIABLES | GEOGRAPHICAL AREA COVERED | SOURCE OF DATA |
|---|---|---|
| I. INCOME, WAGES AND PRICES | | |
| • PERSONAL INCOME | 10 COUNTY AREA | BUREAU OF ECONOMIC ANALYSIS |
| • AVERAGE HOURLY EARNINGS - MANUFACTURING WORKERS | PENSACOLA SMSA | BUREAU OF LABOR STATISTICS |
| • CONSUMER PRICE INDEX - ATLANTA | ATLANTA SMSA | BUREAU OF LABOR STATISTICS |
| II. POPULATION | | |
| • TOTAL POPULATION | 10 COUNTY AREA | BUREAU OF ECONOMIC ANALYSIS |
| • POPULATION-AGES 21 & OVER | 10 COUNTY AREA | DERIVED USING FLORIDA AGE BREAKDOWN AND 10 COUNTY POPULATION TOTAL |
| III. EMPLOYMENT | | |
| • MANUFACTURING | | |
| • PAPER & ALLIED PRODUCTS | PENSACOLA SMSA | BUREAU OF LABOR STATISTICS |
| • CHEMICAL PRODUCTS | PENSACOLA SMSA | BUREAU OF LABOR STATISTICS |
| • OTHER MANUFACTURING | 10 COUNTY AREA | FLORIDA DEPARTMENT OF COMMERCE |
| • NONMANUFACTURING | 10 COUNTY AREA | FLORIDA DEPARTMENT OF COMMERCE |

Exhibit #E-4

RESIDENTIAL ENERGY MODEL



## RESIDENTIAL CUSTOMERS

$$CUST^{*} = f(POP, \overline{Y})$$

INPUTS FROM SERVICE AREA ECONOMIC MODEL:

POP = POPULATION 21 YEARS AND OLDER.

$\overline{Y}$ = TWO YEAR WEIGHTED AVERAGE OF REAL PER CAPITA INCOME

## USAGE PER CUSTOMER

$$KWH/CUST = f(APPL, PRICE, WEATHER, Y/\overline{Y})$$

WHERE:

APPL = WEIGHTED STOCK OF APPLIANCES (APPLIANCE SATURATION MODEL)

PRICE = PRICE OF ELECTRICAL ENERGY (FINANCIAL MODEL)

WEATHER = ASSUMED NORMAL FOR FORECASTS

Y = REAL PER CAPITA INCOME (SERVICE AREA ECONOMIC MODEL)

$\overline{Y}$ = TWO YEAR WEIGHTED AVERAGE OF REAL PER CAPITA INCOME (SERVICE AREA ECONOMIC MODEL)

APPLIANCE MODELS

- RANGES ( ELECTRIC AND TOTAL)
- WATER HEATERS ( ELECTRIC AND TOTAL)
- CLOTHES DRYERS (ELECTRIC AND TOTAL)
- DISHWASHERS
- CLOTHES WASHERS
- FREEZERS
- REFRIGERATORS (TOTAL AND FROSTFREE)
- RESISTANCE HEAT
- HEAT PUMPS
- CENTRAL AIR CONDITIONING
- WINDOW UNIT AIR CONDITIONING

## COMMERCIAL ENERGY MODEL

$$KWH_{COM} = f(E_{NM}, PRICE, WEATHER)$$

WHERE:

$E_{NM}$ = NONMANUFACTURING EMPLOYMENT EXCLUDING GOVERNMENT (SERVICE AREA ECONOMIC MODEL)

PRICE = PRICE OF ELECTRICAL ENERGY (FINANCIAL MODEL)

WEATHER = ASSUMED NORMAL FOR FORECASTS

## INDUSTRIAL MODEL SPECIFICATION

- AREA INDUSTRIAL PRODUCTION:

$$\text{FRB INDEX} * \frac{\text{AREA EMPLOYMENT}}{\text{U.S. EMPLOYMENT}}$$

- POLLUTION CONTROL EQUIPMENT
- PRICE OF ELECTRICITY
- AVAILABILITY OF NATURAL GAS

## RESIDENTIAL/COMMERCIAL DEMAND MODEL

$$MW_{RES/COM} = 467.9 + 0.95 \left(\frac{MWH_R}{LF_R * 8760} + \frac{MWH_C}{LF_C * 8760}\right) - 0.094 \left(\frac{APPL_{MWH}}{APPL_{MW}}\right)$$

WHERE:

$MW_{RES/COM}$ = PEAK DEMAND CONTRIBUTION OF RESIDENTIAL PLUS COMMERCIAL

$MWH_R$ = ANNUAL RESIDENTIAL ENERGY SALES

$MWH_C$ = ANNUAL COMMERCIAL ENERGY SALES

$LF_R$ = RESIDENTIAL LOAD FACTOR

$LF_C$ = COMMERCIAL LOAD FACTOR

$APPL_{MWH}$ = ANNUAL MWH OF APPLIANCE STOCK

$APPL_{MW}$ = SUMMER MW OF APPLIANCE STOCK

## INDUSTRIAL DEMAND MODEL

$$MW_{IND} = 0.0001\ (MWH_{IND})^{1.03}$$

(RESULTS IN SLIGHTLY DECREASING LOAD FACTOR)

WHERE:

$MW_{IND}$ = PEAK DEMAND CONTRIBUTION OF INDUSTRIAL

$MWH_{IND}$ = ANNUAL INDUSTRIAL ENERGY SALES

## WHOLESALE DEMAND MODEL

$$MW_{WS} = 0.0003\ (MWH_{WS})^{0.97}$$

(RESULTS IN SLIGHTLY INCREASING LOAD FACTOR)

WHERE:

$MW_{WS}$ = PEAK DEMAND CONTRIBUTION OF WHOLESALE.

$MWH_{WS}$ = ANNUAL WHOLESALE ENERGY SALES.

# CHAPTER III

# FORECAST OF FACILITIES REQUIREMENTS

UTILITY Gulf Power Company

PLANNED AND PROSPECTIVE GENERATING FACILITY ADDITIONS AND CHANGES

| (1) Plant Name | (2) Unit No. | (3) Location | (4) Type | (5) (6) Fuel Pri | Fuel Alt | (7) Const Start Mo/Yr | (8) Com'l In-Service Mo/Yr | (9) Gen Max Nameplate KW | (10) Net Capability Summer MW | (11) Net Capability Winter MW |
|---|---|---|---|---|---|---|---|---|---|---|
| V. J. Daniel (1) | | Jackson Co. Mississippi | | | | | | | 505 (1) | 505 (1) |
| | | | | | | | 5/81 | | 505 | 505 |
| Robert W. Scherer (2)(3) | | Monroe Co. Georgia | | | | | | | 404 (2) | 404 (2) |
| | | | | | | | 2/87 | | 202 | 202 |
| | | | | | | | 2/89 | | 202 (3) | 202 (3) |
| | | Total additions to system as of December 31, 1979 | | | | | | | 907.0 | 907.0 |

(1) Gulf to acquire 50% of the total plant capacity in May, 1981.

(2) Gulf to acquire 202 MW, of the total plant capacity in 1987.

(3) Gulf to acquire an additional 202 MW of the total plant capacity in 1989.

UTILITY Gulf Power Company

FCG Form 7A

FORECAST OF CAPACITY, DEMAND, AND SCHEDULED MAINTENANCE
AT TIME OF SUMMER PEAK (a)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| Year | Total Installed Capacity MW | Firm Capacity Import MW | Total Available Capacity MW | Peak Demand MW (b) | Margin Before Maintenance MW | Margin Before Maintenance % of PK. | Scheduled Maintenance MW | Margin After Maintenance MW | Margin After Maintenance % of PK. |
| 1980 | 1515 | 40 | 1555 | 1350 | 205 | 15.2 | | 205 | 15.2 |
| 1981 | 2020 | 34 | 2054 | 1354 | 700 | 51.7 | | 700 | 51.7 |
| 1982 | 2020 | 34 | 2054 | 1397 | 657 | 47.0 | | 657 | 47.0 |
| 1983 | 2020 | 47 | 2067 | 1449 | 618 | 42.7 | | 618 | 42.7 |
| 1984 | 2020 | 47 | 2067 | 1502 | 565 | 37.6 | | 565 | 37.6 |
| 1985 | 2020 | 47 | 2067 | 1557 | 510 | 32.8 | | 510 | 32.8 |
| 1986 | 2020 | 47 | 2067 | 1614 | 453 | 28.1 | NONE | 453 | 28.1 |
| 1987 | 2222 | 47 | 2269 | 1674 | 595 | 35.5 | | 595 | 35.5 |
| 1988 | 2222 | 47 | 2269 | 1735 | 534 | 30.8 | | 534 | 30.8 |
| 1989 | 2424 | 47 | 2471 | 1799 | 672 | 37.4 | | 672 | 37.4 |

NOTE: a. Capacity additions and changes must be made by May 31 to be considered in effect at the time of the Summer Peak. All values are Summer Net MW.

b. Includes capacity allocated to certain resale customers by Southeastern Power Administration (SEPA).

UTILITY Gulf Power Company

FCG Form 7B

FORECAST OF CAPACITY, DEMAND, AND SCHEDULED MAINTENANCE
AT TIME OF WINTER PEAK (a)

| Year | Total Installed Capacity MW | Firm Capacity Import MW | Total Available Capacity MW | Peak Demand MW (b) | Margin Before Maintenance MW | Margin Before Maintenance % of PK. | Scheduled Maintenance MW | Margin After Maintenance MW | Margin After Maintenance % of PK. |
|---|---|---|---|---|---|---|---|---|---|
| 1980-81 | 1519 | 16 | 1535 | 1118 | 417 | 37.3 | 20 | 397 | 35.5 |
| 1981-82 | 2024 | 16 | 2040 | 1161 | 879 | 75.7 | | | |
| 1982-83 | 2024 | 16 | 2040 | 1214 | 826 | 68.0 | | | |
| 1983-84 | 2024 | 29 | 2053 | 1269 | 784 | 61.8 | | | |
| 1984-85 | 2024 | 29 | 2053 | 1327 | 726 | 54.7 | | | |
| 1985-86 | 2024 | 29 | 2053 | 1388 | 665 | 47.9 | | | |
| 1986-87 | 2024 | 29 | 2053 | 1451 | 602 | 41.5 | | | |
| 1987-88 | 2226 | 29 | 2255 | 1517 | 738 | 48.6 | | | |
| 1988-89 | 2226 | 29 | 2255 | 1586 | 669 | 42.2 | | | |
| 1989-90 | 2428 | 29 | 2457 | 1658 | 799 | 48.2 | | | |

NOT AVAILABLE

NOTE: a. Capacity additions and changes must be made by November 30 to be considered in effect at the time of the Winter peak. All values are Winter Net MW.

b. Includes capacity allocated to certain resale customers by Southeastern Power Administration (SEPA).

DOCUMENTATION OF FACILITY CHANGES

Availability of Purchased Power

Gulf Power Company coordinates its planning and operation with the other operating companies of the Southern electric system: Alabama Power Company, Georgia Power Company, and Mississippi Power Company. In any year an individual operating company may have a temporary surplus or deficit in generating capacity, depending on the relationship of its planned generating capacity to its load and reserve responsibility. Each company buys or sells its temporary deficit or surplus capacity from or to the pool. This is done through the mechanism of an Inter-company Interchange Contract among the companies which is reviewed and updated annually.

# CHAPTER IV

# SITE DESCRIPTION

# AND

# IMPACT ANALYSIS

UTILITY Gulf Power Company

STATUS REPORT
SPECIFICATIONS OF PROPOSED GENERATING FACILITIES

| | | |
|---|---|---|
| (1) | Plant Name & Unit | V. J. Daniel Electric Generating Unit 1 |
| (2) | Status | This facility is not located in the state of Florida. |
| (3) | Anticipated Construction Timing | |
| (4) | Capacity | Summer 507.7 MW(1)<br>Winter 507.7 MW |
| (5) | Type | |
| (6) | Primary and Alternate Fuel | |
| (7) | Air Pollution Control Strategy | |
| (8) | Cooling Method | |
| (9) | Total Site Area | |
| (10) | Anticipated Capital Investment | |
| (11) | Certification Status | |
| (12) | Status With Federal Agencies | |

(1) Gulf to acquire 50% of total plant capacity in May, 1981.

UTILITY Gulf Power Company

STATUS REPORT
SPECIFICATIONS OF PROPOSED GENERATING FACILITIES

| | | |
|---|---|---|
| (1) | Plant Name & Unit | V. J. Daniel Electric Generating Unit 2 |
| (2) | Status | This facility is not located in the state of Florida |
| (3) | Anticipated Construction Timing | |
| (4) | Capacity | Summer 503 MW[1]<br>Winter 503 MW |
| (5) | Type | |
| (6) | Primary and Alternate Fuel | |
| (7) | Air Pollution Control Strategy | |
| (8) | Cooling Method | |
| (9) | Total Site Area | |
| (10) | Anticipated Capital Investment | |
| (11) | Certification Status | |
| (12) | Status With Federal Agencies | |

[1] Gulf to acquire 50% of total plant capacity in May, 1981.

UTILITY Gulf Power Company

STATUS REPORT
SPECIFICATIONS OF PROPOSED GENERATING FACILITIES

| | | |
|---|---|---|
| (1) | Plant Name & Unit | Robert W. Scherer Electric Generating Center |
| (2) | Status | This facility is not located in the State of Florida. |
| (3) | Anticipated Construction Timing | |
| (4) | Capacity | (1)<br>Summer 404 MW<br>Winter 404 MW |
| (5) | Type | |
| (6) | Primary and Alternate Fuel | |
| (7) | Air Pollution Control Strategy | |
| (8) | Cooling Method | |
| (9) | Total Site Area | |
| (10) | Anticipated Capital Investment | |
| (11) | Certification Status | |
| (12) | Status With Federal Agencies | |

[1]Gulf to acquire 202 MW of Unit 3 in February, 1987, and 202 MW of Unit 4 in February, 1989, for a total of 404 MW.

UTILITY Gulf Power Company

STATUS REPORT AND SPECIFICATIONS OF PROPOSED
DIRECTLY-ASSOCIATED TRANSMISSION LINES

(1) Point of Origin and Termination

No new directly-associated transmission lines in Florida are required.

(2) Number of Lines

(3) Right-Of-Way

(4) Line Length

(5) Voltage

(6) Anticipated Construction Timing

(7) Anticipated Capital Investment

(8) Substations

(9) Participation