BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION ORIGINAL

In re: Petition for Determination of Need of Hines Unit 2 Power Plant	))))	DOCKET NO. 001064-EI Submitted for filing: August 7, 2000

DIRECT TESTIMONY
OF ERIC G. MAJOR

ON BEHALF OF
FLORIDA POWER CORPORATION

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IN RE: PETITION FOR DETERMINATION OF NEED
BY FLORIDA POWER CORPORATION
FPSC DOCKET NO. _______

DIRECT TESTIMONY OF ERIC G. MAJOR

I. INTRODUCTION AND QUALIFICATIONS.

Q. Please state your name, your employer, and business address.

A. My name is Eric G. Major. I am employed by Florida Power Corporation ("FPC" or the "Company"). My business address is Florida Power Corporation, One Power Plaza, 263 13th Avenue, South, St. Petersburg, Florida 33701-5512.

Q. Please tell us your position with Florida Power Corporation and describe your duties and responsibilities in that position.

A. I am employed by FPC as its Director of Construction and Design Engineering. As FPC's Director of Construction and Design Engineering, I am responsible for the overall management and direction of licensing, engineering, procurement, and construction activities associated with new supply-side, generation projects for the Company. This includes the Hines 2 combined cycle generation plant.

Q. Please tell us about your educational background and experience.

A. I received a Bachelor of Science degree in Civil Engineering from the University of Florida in 1967. In 1971, I received a Masters degree in Engineering Administration from the University of South Florida. I am a Registered Professional Engineer in the

State of Florida, and I have been so registered since 1971. I am also a certified Electrical Contractor, certified General Contractor, and certified Mechanical Contractor in the State of Florida.

My employment history began with FPC in May 1967. I have 12 years of combined engineering/managerial experience in the Energy Delivery area of our Company, 8 years managerial experience in Materials and Contracts, and 13 years of managerial experience in the Energy Supply area of FPC. Since 1990, I have been directing the generation construction activities of FPC during which time FPC has installed a nominal 1,400 MW of generation.

II. PURPOSE AND SUMMARY OF TESTIMONY.

Q. What is the purpose of your testimony in this proceeding?

A. I am testifying on behalf of FPC, in support of its Petition for Determination of Need, by describing the site and unit characteristics for the Hines 2 combined cycle generation plant, including the size, number of units, fuel type and supply modes, the approximate costs, and the projected in-service date.

Q. Are you sponsoring any exhibits to your testimony?

A. Yes. I am sponsoring the following exhibits to my testimony:

EGM-1	**Hines Energy Complex Map.**
EGM-2	**Site Arrangement – Overall Plan.**
EGM-3	**Site Arrangement -- Power Block Area.**

EGM-4	**Typical Combined Cycle Schematic.**
EGM-5	**Installed Cost Estimate for Hines 2 Unit.**
EGM-6	**Project Schedule for Hines 2 Unit.**

Q. Please give us a summary of your testimony.

A. The Company plans to build Hines 2 at the Hines Energy Complex ("HEC"), its existing generation site in Polk County, Florida. That site contains the Hines 1 combined cycle generation unit and its associated facilities. In 1994, the Governor and Cabinet, sitting as the Siting Board, certified the HEC for construction and operation of the Hines 1 unit and for 3,000 megawatts ("MW") of ultimate generation capacity at the site. Hines 2 will account for another 530 MW of nominal capacity located at the site, and it will share many of the existing facilities at the site with Hines 1. The ability to share facilities at the site adds to the cost-effectiveness of the Hines 2 unit. The Company and its ratepayers will capture the cost savings associated with the economies of scale achieved from using the existing facilities for the operation of both the Hines 1 and the Hines 2 units.

Hines 2 is a "sister" unit to Hines 1. It is a state-of-the art, highly efficient combined cycle unit that will operate on natural gas with distillate oil as the backup fuel. Its beneficial heat rate, availability, and responsiveness, among other attributes, provide the Company with a low-cost, highly flexible source of power. Hines 2 therefore enhances the overall operation and efficiency of the Company's system to the direct economic benefit of the Company and its ratepayers.

Apart from the cost savings achieved by placing in operation a state-of-the-art, highly efficient generation unit, the Company and its ratepayers will further benefit from a below market cost for the unit. The projected cost for Hines 2 is approximately $198 million, which is well below the current market cost for equivalent units, because the Company has preserved its previously negotiated, favorable equipment terms.

In sum, Hines 2 allows the Company to meet its reliability needs with the most efficient and sought after technology on the market at a below market cost, giving the Company and its ratepayers substantial economic benefits in terms of technology, efficiency and flexibility in operation, and cost of generating power.

III. DESCRIPTION OF THE HINES 2 SITE.

Q. Please describe the location of the HEC.

A. The HEC is located in southwest Polk County, Florida, approximately 40 miles east of Tampa, 7 miles south of Bartow, and approximately 3.5 miles northwest of Ft. Meade. County Road 640 is on the northern boundary of the HEC, and County Road 555 runs through the site north to south. The location of the HEC is shown in Exhibit ____ (EGM-1).

Q. Please describe the location of Hines 2 at the HEC.

A. Exhibit ___ (EGM-2) is the HEC site plan and shows the development of the entire site. It depicts the relationship of the location of the power block, including Hines 1 and the proposed Hines 2 unit, in relation to the existing cooling ponds and water treatment and wastewater disposal areas for both units. Exhibit ___ (EGM-3) is the power block layout for Hines 2. It depicts the Hines 2 power block in relation to the Hines 1 power block and existing rail lines, state roads, and access roads that will serve both units, and existing dikes and former phosphate mining areas on the HEC site.

Q. Do the Company and its ratepayers benefit from the location of the Hines 2 unit at the HEC?

A. Yes.

Q. What are the benefits to the Company and its ratepayers from locating the Hines 2 unit at the HEC?

A. Location of the Hines 2 unit at the HEC offers the Company and its ratepayers the ability to achieve economies of scale by using existing improvements at the site for operation of the Hines 2 unit. By building Hines 2 at the HEC, the Company will be able to use the existing access road, cooling pond, reclaimed water supply pipeline, water treatment and wastewater disposal facilities, gas lateral, and transmission facilities, among other site improvements, for both the Hines 1 unit and the proposed Hines 2 unit. Because the Company can use the existing site improvements for both units, the Company will not have to design and construct such improvements for the Hines 2 unit. Location of the Hines 2 unit at the HEC will save the Company site development costs the Company otherwise would have incurred. As a result, the

Company and its ratepayers will save additional engineering and construction costs by locating Hines 2 at the HEC.

IV. DESCRIPTION OF THE HINES 2 UNIT.

Q. Please describe the proposed design of the Hines 2 unit.

A. The Hines 2 unit is a state-of-the-art combined cycle unit similar to the Hines 1 unit. It consists of two nominal 170 MW Westinghouse 501 F combustion turbines, two unfired heat recovery steam generators, one nominal 190 MW steam turbine, and a recirculating water cooling system. It is a dual-fuel generation system, meaning that the combustion turbines can be operated on natural gas or distillate oil. For Hines 2, natural gas is the primary fuel, and low sulfur (0.05 percent) distillate oil is the planned backup fuel.

The dual-fueled combustion turbines and steam turbine for the Hines 2 unit are configured in sequential stages, as shown in the typical schematic for a combined cycle unit in Exhibit ___ (EGM-4). The first stage includes the combustion turbines, much like utility peaking units, which generate electrical energy. In the second stage of the process, the hot gas from the combustion turbines is passed through the heat recovery steam generator, where steam is produced and fed into the steam turbine to generate additional electrical energy — hence, the term "combined cycle" generation technology.

Q. Are there advantages to combined cycle technology for the Company?

A. Yes.

Q. What are those advantages?

A. The combined cycle generation technology is very efficient because it generates electrical energy from the input fuel both directly, through the combustion turbines, and indirectly, through the heat recovery steam generator and steam turbine. Further flexibility exists through the use of reheat configurations. By reheating extracted steam, additional improvements in cycle efficiency can be achieved. In all of these ways, combined cycle technology makes the most of the input fuel, achieving increased efficiency in the generation of electrical energy from the available fuel source. For these reasons, the modern combined cycle power plant is one of the most efficient power cycles available today.

Another advantage of the combined cycle design is that it allows for greater flexibility in matching system operating characteristics over time. Because of its technological efficiency, it can readily be called on to meet varying operational load requirements in an economical manner. Thus, the Hines 2 combined cycle unit can function as a baseload or intermediate unit, if required by the Company's system.

In addition to its high efficiency, the Hines 2 unit will have a low environmental impact. Combined cycle units operating on natural gas, like the Hines 2 unit, are one of the cleanest sources of fossil generation. Flue gas is the only byproduct of the combustion process, whether burning natural gas or distillate oil, that leaves the HEC. Both are low sulfur, low ash fuels. Thus, sulfur and particulate emissions are virtually nonexistent. Nitrogen oxides will be controlled by selective catalytic reduction. Airborne emissions therefore will be limited by the use of a relatively clean fuel and the appropriate application of control technologies.

Consumptive water use will be significantly lower than traditional steam turbine cycles, requiring approximately one-third the amount of water used by a steam only cycle. For these reasons, the combined cycle technology of Hines 2 is a relatively benign one in terms of its impact on the environment.

Q. How will fuel be provided and handled for the Hines 2 unit?

A. As noted above, Hines 2 is designed to operate on natural gas as a primary fuel with fuel oil as the backup fuel. Natural gas will be delivered by pipeline to the HEC. The existing gas lateral at the HEC is sufficient to supply the Hines 2 unit. No additional gas lateral is necessary at the HEC.

Additionally, there currently is onsite storage for the distillate oil, providing sufficient storage capabilities to operate Hines 1 and 2 for approximately three (3) days of continuous unit operation at full load on the backup fuel. No additional storage facilities for the backup fuel are necessary for the Hines 2 unit. The distillate oil for the Hines 2 unit will be delivered to the HEC by tanker trucks. The Hines 2 unit will be capable of automatically switching from natural gas to distillate oil firing without shutdown.

Q. How does the Company plan to construct the Hines 2 unit?

A. FPC will maintain direct overall management of the project, including participation in construction management functions, by having a substantial presence onsite during the construction and startup phase. FPC may elect to competitively select equipment suppliers, the architect/engineering ("A/E") firm, and the constructors, or the Company may opt to contract for a design-build turnkey approach. The exact method will be evaluated considering the competitive market while minimizing the Company's risk. In either case, the beneficial option pricing for the power island equipment would still be exercised.

Q. What will it cost the Company to build Hines 2?

A. The total installed cost for the Hines 2 unit is approximately $203.2 million (including transmission costs), in actual dollars, as shown in Exhibit ____, (EGM-5). This cost was developed on the basis of the Polk Combined Cycle Project Specifications (with minimal revisions) and option contracts originally negotiated in 1996. A breakdown of the major cost items for the Hines 2 unit is also included in Exhibit ___, (EGM-5).

The project cost for Hines 2 reflects significant savings compared to the current competitive generation market for equivalent combined cycle technology. The savings were obtained because the Company was able to (i) negotiate and preserve beneficial equipment pricing and other favorable contract terms and conditions (for example, performance guarantees and liquidated damages provisions) from its major equipment supplier(s), thus reducing its capital costs compared to current market costs for the same equipment and (ii) share common site utilities and facilities with the Hines 1 unit, thus reducing or eliminating site development and construction costs and associated facilities costs the Company would have otherwise incurred.

Q. What will it cost the Company to operate the Hines 2 unit?

A. The estimated annual fixed Operating and Maintenance ("O&M") costs are $2.2 million (in 2003) dollars, and the estimated variable O&M is $1.11/MWh (also in 2003 dollars). The O&M cost estimates are based on a unit life of 25 years. For the fixed O&M analysis, it was assumed that fixed costs will remain constant in real dollars over the life of the plant. Fixed O&M costs are those costs that are incurred whether the unit is operating or not. The largest fixed costs for the Hines 2 unit are wages and wage-related overheads for the permanent plant staff. Variable O&M costs are a function of the unit's operation. They include consumables, chemicals, lubricants, water, and maintenance repair parts.

Q. When Hines 2 is constructed and in operation, what will be its operational characteristics?

A. As noted above, Hines 2 will have state-of-the-art combined cycle technology. As a result, it will be a highly efficient unit with an excellent heat rate, operating on average at a net heat rate of 6,975 Btu/kWh. The Hines 2 unit will have an equivalent availability factor of approximately 94 percent, which takes into account a 4 percent forced outage rate and all scheduled maintenance outages. Hines 2 is expected to have a capacity factor range of roughly 55 percent to 65 percent. Upon construction and operation, Hines 2 will be the most efficient unit on the Company's system.

V. PROPOSED SCHEDULE.

Q. What is the in-service date for the Hines 2 unit?

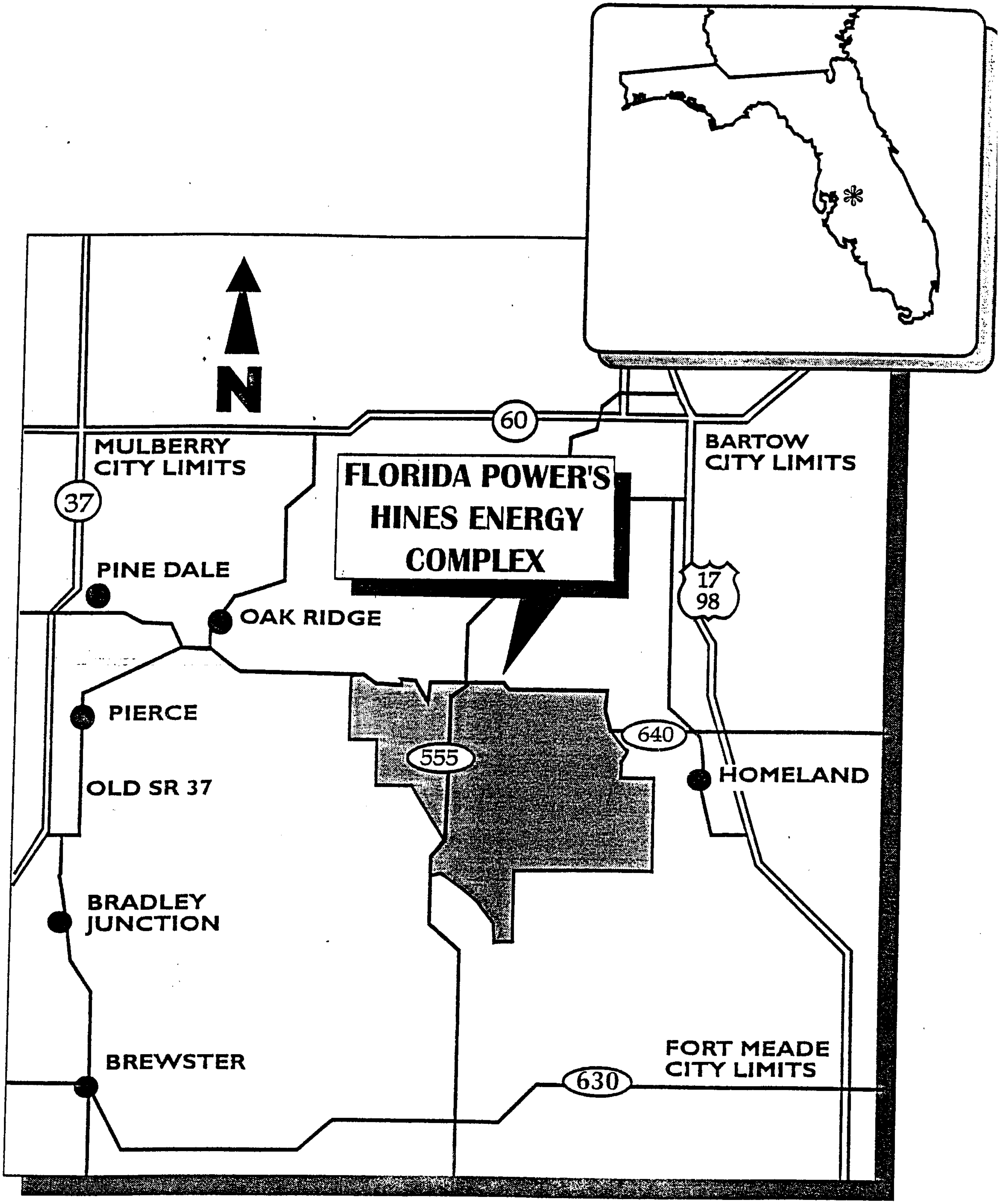
A. Hines 2 is scheduled to come on line by November 30, 2003.

Q. Will the Company meet that in-service date?

A. Yes, barring any unforeseen and significant delays. The proposed schedule for the permitting and construction of the Hines 2 unit is contained in Exhibit ___, (EGM-6). In my opinion, this schedule is reasonable and can be met by the Company.

Q. Does this conclude your direct testimony?

A. Yes.


FLORIDA POWER'S
HINES ENERGY
COMPLEX
N
60
MULBERRY
CITY LIMITS
37
BARTOW
CITY LIMITS
17
98
PINE DALE
OAK RIDGE
PIERCE
640
555
HOMELAND
OLD SR 37
BRADLEY
JUNCTION
BREWSTER
FORT MEADE
CITY LIMITS
630

STATE OF FLORIDA

OFFICE OF COMMISSION CLERK
ANN COLE
COMMISSION CLERK

Public Service Commission

* *

Docket No. : 001064-EI

Docket Title: Petition for Determination of Need for Hines Unit 2 Power Plant by Florida Power Corporation

DN 09526-00: FLORIDA POWER CORPORATION- HINES ENERGY COMPLEX- POWER BLOCK 2- SITE ARRANGEMENT OVERALL PLAN MAP (EGM-2)

[CLK NOTE: MAP PORTION OF TESTIMONY EXHIBIT CAN BE FOUND IN MAPS MICROFILM.]

STATE OF FLORIDA

OFFICE OF COMMISSION CLERK
ANN COLE
COMMISSION CLERK

Public Service Commission

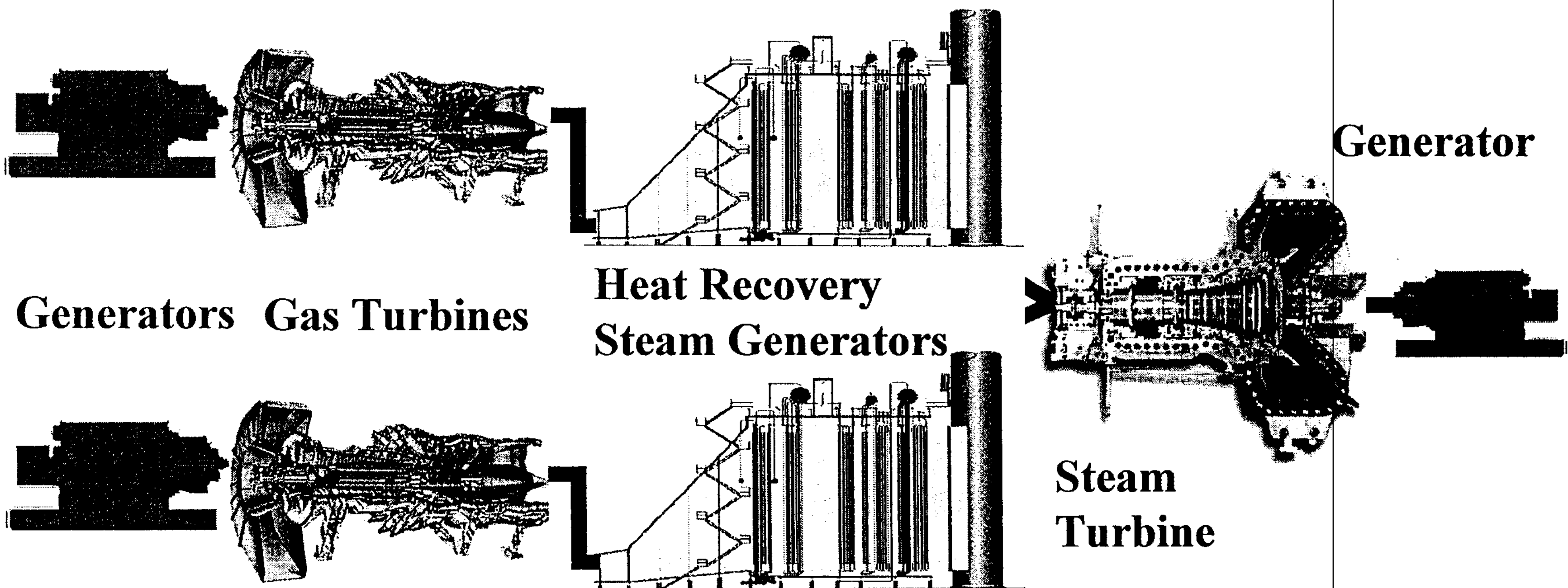
* *

Docket No. : 001064-EI

Docket Title: Petition for Determination of Need for Hines Unit 2 Power Plant by Florida Power Corporation

DN 09526-00: FLORIDA POWER CORPORATION- HINES ENERGY COMPLEX- POWER BLOCK 2- SITE ARRANGEMENT POWER BLOCK AREA MAP (EGM-3)

[CLK NOTE: MAP PORTION OF TESTIMONY EXHIBIT CAN BE FOUND IN MAPS MICROFILM.]



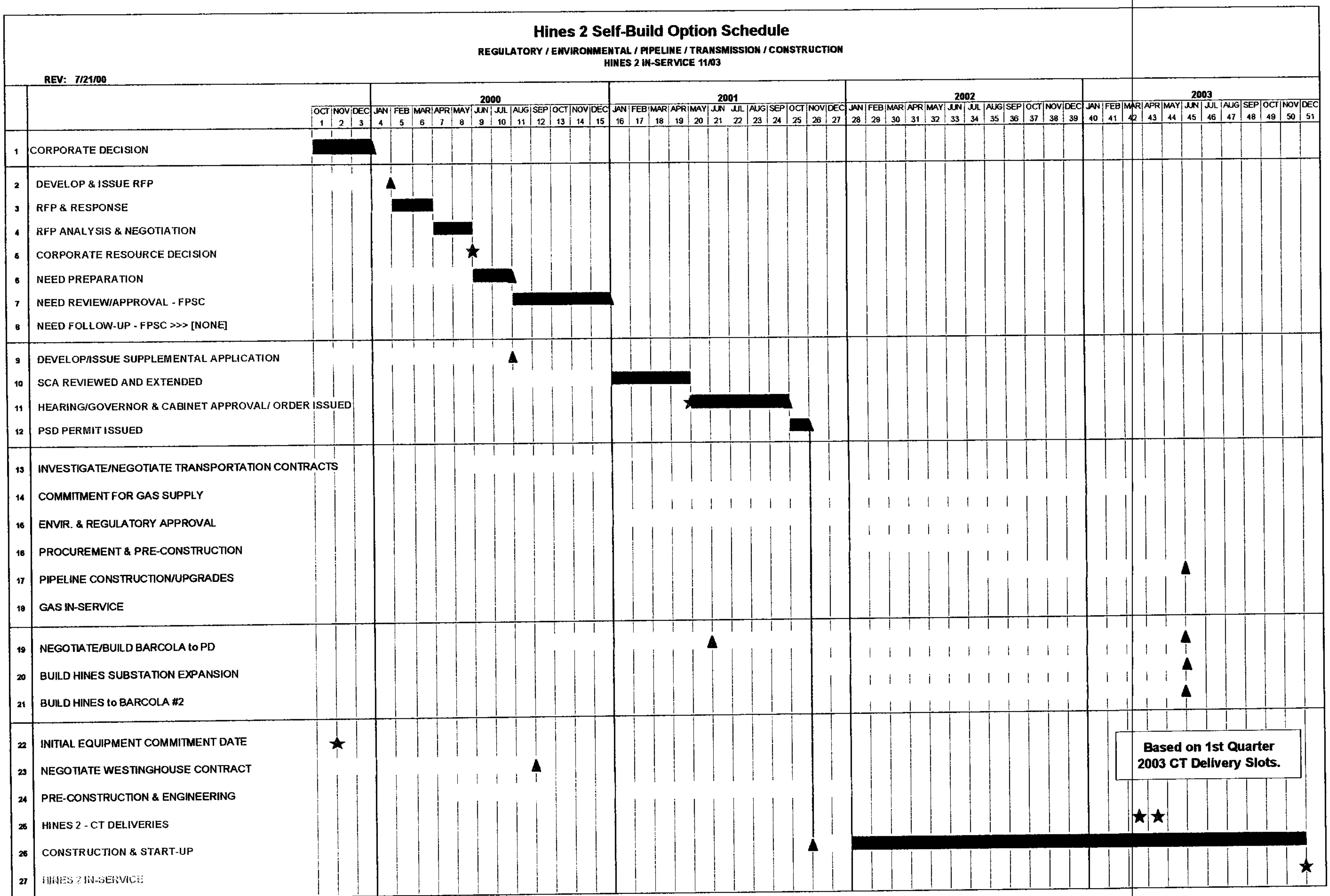
Florida Power CORPORATION

HINES ENERGY COMPLEX

FIGURE 3.2.1-3
TYPICAL COMBINED CYCLE SCHEMATIC
(Two on One)

Cost Estimate Summary
Hines Unit 2

Equipment and Construction Contracts	$	157,262,000
Contingency		3,000,000
FPC Internal Costs		10,482,000
Need Hearing and Site Certification		2,415,000
Engineering Contracts		7,413,000
Interest During Construction (AFUDC)		17,028,000
Total Project Cost - Excluding Transmission		**197,600,000**
Transmission		3,201,000
Transmission Substation		2,405,000
Total Transmission Cost		**5,606,000**
Total Project Cost	**$**	**203,206,000**


Hines 2 Self-Build Option Schedule
REGULATORY / ENVIRONMENTAL / PIPELINE / TRANSMISSION / CONSTRUCTION
HINES 2 IN-SERVICE 11/03
REV: 7/21/00
2000
2001
2002
2003
OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1 CORPORATE DECISION
2 DEVELOP & ISSUE RFP
3 RFP & RESPONSE
4 RFP ANALYSIS & NEGOTIATION
5 CORPORATE RESOURCE DECISION
6 NEED PREPARATION
7 NEED REVIEW/APPROVAL - FPSC
8 NEED FOLLOW-UP - FPSC >>> [NONE]
9 DEVELOP/ISSUE SUPPLEMENTAL APPLICATION
10 SCA REVIEWED AND EXTENDED
11 HEARING/GOVERNOR & CABINET APPROVAL/ ORDER ISSUED
12 PSD PERMIT ISSUED
13 INVESTIGATE/NEGOTIATE TRANSPORTATION CONTRACTS
14 COMMITMENT FOR GAS SUPPLY
15 ENVIR. & REGULATORY APPROVAL
16 PROCUREMENT & PRE-CONSTRUCTION
17 PIPELINE CONSTRUCTION/UPGRADES
18 GAS IN-SERVICE
19 NEGOTIATE/BUILD BARCOLA to PD
20 BUILD HINES SUBSTATION EXPANSION
21 BUILD HINES to BARCOLA #2
22 INITIAL EQUIPMENT COMMITMENT DATE
23 NEGOTIATE WESTINGHOUSE CONTRACT
24 PRE-CONSTRUCTION & ENGINEERING
25 HINES 2 - CT DELIVERIES
26 CONSTRUCTION & START-UP
27 HINES 2 IN-SERVICE
Based on 1st Quarter 2003 CT Delivery Slots.

EGM-6