

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: PETITION FOR DETERMINATION)
OF NEED FOR AN ELECTRICAL POWER)
PLANT IN ST. LUCIE COUNTY BY PANDA)
MIDWAY POWER PARTNERS, L.P.)
_____)

DOCKET NO. 000289-EU

DIRECT TESTIMONY OF
STEVEN W. CRAIN
ON BEHALF OF
PANDA MIDWAY POWER PARTNERS, L.P.

April 24, 2000

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1 **IN RE: PETITION FOR DETERMINATION OF NEED**
2 **FOR AN ELECTRICAL POWER PLANT IN ST. LUCIE COUNTY**
3 **BY PANDA MIDWAY POWER PARTNERS, L.P.**
4 **FPSC DOCKET NO. 000289-EU**

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6
7 **DIRECT TESTIMONY OF STEVEN W. CRAIN, P.E.**
8

9 **Q: Please state your name and business address.**

10 A: My name is Steven W. Crain, and my business address is Panda Midway
11 Power Partners, L.P., 4100 Spring Valley, Suite 1001, Dallas, Texas 75244.

12
13 **Q: By whom are you employed and in what position?**

14 A: I am employed by Panda Energy International, Inc., ("Panda Energy"), as
15 Vice President, Merchant Plant Development.

16
17 **Q: Please describe your duties with Panda Energy International, Inc.**

18 A: My duties and responsibilities for Panda Energy include development and
19 origination of merchant plant development opportunities for Panda Energy
20 throughout the United States and the rest of the world.

21
22 **QUALIFICATIONS AND EXPERIENCE**

23 **Q: Please summarize your educational background.**

24 A: I received a Bachelor of Science Degree in Electrical Engineering from Rice
25 University in 1974. In 1975, I did post-graduate work in electrical power
26 systems at the University of Colorado.

1 **Q: Please summarize your employment history and work experience.**

2 A: I joined Panda Energy in 1996, originally serving as Director for the Asian
3 Sub-Continent for business development. I became Vice President, Business
4 Development, for Panda Energy in February 1997, focusing primarily on
5 international opportunities. In 1998, I was transferred to our newly formed
6 Merchant Plant Department as Vice President, Merchant Plant Development.

7 Immediately prior to joining Panda Energy, in 1995 and 1996, I was a
8 partner/director in Arro Associates, Inc., a corporation formed to develop
9 small cogeneration projects in the Indian Sub-Continent.

10 I served for over 18 years, from 1977 through 1995, in various capacities
11 with generally increasing responsibility for Eagleton Engineering Company,
12 an engineering and construction management firm specializing in oil and gas
13 processing and transportation. From 1992 through 1995, I served as Vice
14 President for Business Development where my duties included development,
15 marketing and promotion of the company's engineering and construction
16 services. I also monitored on-going projects for quality and cost-control
17 purposes. I also was a member of the Board of Directors for Eagleton
18 Engineering Company from 1984 through 1995. I served as the resident
19 Managing Director of the Eagleton Saudi Arabia office in 1991 and 1992.

20 From 1987 through 1991, I served as Vice President of Engineering for
21 Eagleton Engineering Company. In this capacity, I directed multiple Project
22 Managers and provided hands-on management of various individual projects.
23 These projects included a gas sweetening plant for Enron in Iowa, multiple

1 gas/condesate separation and stabilization plants for Union Texas in
2 Pakistan, and new gas interchange system in south Texas that permitted
3 metering and exchange in any direction between five major gas transmission
4 pipelines.

5 From 1981 through 1983, I worked with the Saudi Subsidiary of Eagleton
6 Engineering Company as the Project Manager for various ARAMCO oil and
7 gas projects. Subsequently, in 1983, I became the Managing Director for the
8 Saudi Subsidiary, in which position I continued through 1987.

9 From 1977 through 1981, I was the Lead Project Electrical and Instrument
10 Engineer on various projects including ARAMCO's water flood expansion
11 program and the Louisiana Offshore Oil Port, which utilized four 6,000
12 horsepower electric motor driven crude oil pumps, and included a 230 kV
13 substation.

14 From 1974 to 1977, I was employed as an electrical engineer for Stearns-
15 Roger (now Raytheon) where I was involved in the design of coal-burning
16 power plants. My resume, which I have attached to my testimony as Exhibit
17 SWC-3, provides further information on my background and experience.

18
19 **Q: Are you a registered professional engineer?**

20 **A:** Yes. I am a registered professional engineer in the State of Texas.

21
22 **SUMMARY AND PURPOSE OF TESTIMONY**

23 **Q: What is the purpose of your testimony?**

1 A: I am testifying on behalf of Panda Midway Power Partners, L.P., the applicant
2 for the Florida Public Service Commission's ("the Commission") determination
3 of need for the Panda Midway Power Project. My testimony describes Panda
4 Midway Power Partners, L.P., and Panda Energy, and the relationships
5 between these companies and other affiliates of Panda Energy in the
6 development of the Panda Midway Power Project. My testimony also
7 addresses Panda Midway's assessment of the need for new merchant power
8 plant capacity in the State of Florida. Finally, my testimony addresses the
9 projected capital cost of the Panda Midway Project.

10

11 **Q: Please summarize your testimony.**

12 A: Panda Midway Power Partners, L.P., is petitioning the Commission to grant
13 its determination of need for the Panda Midway Project, a 1,000 MW gas-fired
14 combined cycle power plant to be located in St. Lucie County, Florida. The
15 Project will utilize state-of-the-art technology, with demonstrated reliability and
16 high efficiency. The Project's state-of-the-art technology is environmentally
17 benign and will provide a clean and cost-effective power supply alternative to
18 other electric utilities operating in the State of Florida to meet the growing
19 demands of their retail customers. In contrast to rate-based facilities, Panda
20 Midway will bear all of the capital investment and operating risks associated
21 with the Project, while the purchasing utilities and their ratepayers will bear
22 none. The Project's power will be sold on a merchant basis in Florida's
23 wholesale power market.

1 **Q: What are your responsibilities with respect to the Panda Midway Power**
2 **Project?**

3 A: As Panda Energy's Vice President of Merchant Plant Development, my
4 responsibilities with respect to the Panda Midway Power Project include the
5 general coordination and direction of regulatory and business activities
6 relating to the Project, as well as eventually coordinating the marketing efforts
7 for capacity and energy sales from the Project.

8
9 **Q: Are you sponsoring any exhibits to your testimony?**

10 A: Yes. I am sponsoring the following exhibits.

11 SWC-1. Notice of Filing by Panda Midway Power Partners, L.P., for
12 approval of market-based rate tariff issued by the Federal Energy
13 Regulatory Commission ("FERC") on March 8, 2000.

14 SWC-2. Letter of the FERC confirming Panda Midway Power Partners,
15 L.P.'s status as an Exempt Wholesale Generator under the Public
16 Utility Holding Company Act of 1935.

17 SWC-3. Resume of Steven W. Crain.

18 I am also sponsoring the Petition for Determination of Need filed in this
19 matter on March 6, 2000, and all of the Exhibits contained in Sections I –
20 APPLICANT A-F, II – SITE A-D, and IV – APPENDIX A and B filed in support
21 of the Petition.

22
23
24

1 **PANDA MIDWAY POWER PARTNERS, L.P., AND**
2 **PANDA ENERGY INTERNATIONAL, INC.**
3

4 **Q: Please describe Panda Midway Power Partners, L.P., and its business.**
5

6 A: Panda Midway Power Partners, L.P., ("Panda Midway") is a limited
7 partnership organized and existing under the laws of the State of Delaware
8 and wholly-owned by Panda Energy International, Inc. ("Panda Energy").
9 Panda Energy is an investor-owned corporation organized and existing under
10 the laws of the State of Texas. The Chief Executive Officer of Panda Energy,
11 Mr. Robert W. Carter, owns a 40% interest in the company. The balance of
12 the ownership in Panda Energy is distributed among approximately 300 other
13 investors. Panda Energy wholly-owns Panda Global Holdings, Inc., which, in
14 turn, owns 100% of Panda Merchant Power Holdings, L.L.C., both of which
15 are organized and existing under the laws of the State of Delaware. Panda
16 Merchant Power Holdings, L.L.C., owns 100% of both Panda Midway Power
17 I, L.L.C., and Panda Midway Power II, L.L.C., which are both limited liability
18 corporations organized and existing under the laws of the State of Delaware.
19 Panda Midway Power I, L.L.C., and Panda Midway Power II, L.L.C., own 1%
20 and 99%, respectively, of Panda Midway.

21 Panda Energy is in the business of acquiring and developing merchant
22 power plants. Merchant power plants are power plants that are operated to
23 sell power to other utilities at wholesale at voluntarily negotiated rates, with
24 Panda Energy taking the entire financial and operating risk associated with
25 the plants. Merchant plants are not subject to traditional regulatory treatment

1 wherein the utility is assured the opportunity to recover prudently incurred
2 costs, as well as the opportunity to earn a specified rate of return (currently
3 ranging from 10.75 percent to 13.0 percent in Florida and other jurisdictions)
4 on its equity investment. No retail electric customers, and no utilities, are
5 obligated to purchase the output of a merchant plant, nor to pay for the capital
6 costs of such a merchant plant if it should become uneconomic in the market.
7 The primary purpose of Panda Midway is to own and operate the Panda
8 Midway Power Project, the 1,000 MW (nominal) power plant that we are
9 developing in St. Lucie County, Florida. The Panda Midway Power Project
10 will provide reliable, competitively-priced, environmentally clean power in the
11 Florida wholesale market.

12
13 **Q: What other projects is Panda Energy currently developing?**

14 **A:** Through its various subsidiaries, Panda Energy has been an active player in
15 the domestic merchant power industry. Most recently, Panda Energy has
16 closed on the financing of two merchant facilities in Texas through its Texas
17 Independent Energy ("TIE") joint venture with PSEG Global. The first,
18 Guadalupe Power Partners, L.P., is a 1,000 MW gas-fired facility currently
19 under construction in Guadalupe County, Texas, with commercial operations
20 expected in December, 2000. The second project is the Odessa-Ector Power
21 Partners Project, a 1,000 MW gas-fired facility near Odessa, Texas, that is
22 expected to come on line in the summer of 2001. Panda Energy also
23 developed the Lamar Power Partners Project, a 1,000 MW gas-fired facility in

1 Paris, Texas, in which a majority ownership interest was sold to Florida Power
2 and Light Company Energy ("FPL Energy") prior to financial closing. The last
3 greenfield project currently in development by TIE is the Archer Power
4 Partners Project, a 1,000 MW gas-fired project that will have the first 500 MW
5 phase financed in the second quarter of 2000. Panda Energy also has
6 extensive development activities outside of Texas, with 4,700 MW scheduled
7 to be financed by the end of the year 2000. The Union Power Partners
8 Project is a 2,720 MW gas-fired facility located outside of El Dorado,
9 Arkansas, that is scheduled to reach financial close in the third quarter of
10 2000. The Oneta Project is a 1,000 MW gas-fired facility that will be located
11 near Tulsa, Oklahoma, and is scheduled to reach financial close in July 2000.
12 The final project scheduled for financial close in 2000 is the Gila River
13 Project—a 2,080 MW gas-fired project in Southwest Arizona, with the first
14 1,040 MW phase scheduled for financial close in 2000.

15
16 **Q: Please describe the regulatory status of Panda Midway Power Partners,**
17 **L.P.**

18 A: Because its business is selling wholesale power in interstate commerce,
19 Panda Midway is a "public utility" under the Federal Power Act and is subject
20 to the regulatory jurisdiction of the Federal Energy Regulatory Commission
21 ("FERC"). On March 7, 2000, the FERC issued its letter finding Panda
22 Midway to be an Exempt Wholesale Generator ("EWG") pursuant to the
23 Public Utility Holding Company Act of 1935 ("PUHCA"). See Exhibit SWC-2.

1 On March 3, 2000, pursuant to Rule 205,18 CFR 385.205, Panda Midway
2 applied for the FERC's authorization to sell wholesale power at voluntarily
3 negotiated, market-based rates and for approval of Panda Midway's FERC
4 Electric Rate Schedule No. 1. On March 8, 2000, the FERC issued its Notice
5 of Filing of Panda Midway's request for such authorization and approval. The
6 FERC has scheduled its consideration of Panda Midway's request for
7 authorization and approval of its FERC Electric Rate Schedule No. 1 for the
8 FERC Consent Agenda of April 25, 2000. We anticipate a FERC letter of
9 approval to be issued within a few days following that Consent Agenda. See
10 Exhibit SWC-1.

11
12 **Q: Does Panda Energy or any of its merchant power plant affiliates sell**
13 **electricity at retail in other jurisdictions?**

14 A: No.

15
16 **Q: What experience does Panda Energy and Panda Midway and Panda**
17 **Energy's other affiliates have in operating electrical power plants?**

18 A: Panda Midway has extensive experience, through its employees, in the
19 operation of electrical power plants. Panda Midway has the benefit of Panda
20 Energy's extensive experience in the successful operation of a number of
21 electrical power plants, including Panda Brandywine in Maryland and Panda
22 Rosemary in North Carolina. In addition, Panda Midway's affiliation with
23 Panda Energy gives it access to a panoply of operational services provided

1 by Panda Energy's various affiliates. These include Panda Global Services
2 which provides operations and maintenance services. Panda Power
3 Corporation was formed in 1997 as a licensed power marketer by FERC.
4 Panda Power will provide Panda Midway with power marketing services.
5

6 **Q: Why is Panda Energy interested in building and operating the Panda**
7 **Midway Power Project in Florida?**

8 A: The Energy Policy Act of 1992 opened the nation's wholesale electric
9 marketplace. Panda Energy strongly believes that Florida represents a sound
10 business opportunity for wholesale power plants. With its growing population,
11 growing electric demand, and peninsular geography, Florida needs additional
12 generating capacity in the Peninsula, and will benefit significantly from
13 additional efficient and cost-effective gas-fired power. This need is
14 particularly evidenced by the shortages and interruptions (of interruptible and
15 load management customers) during the hot weather experienced in the
16 summer of 1999. With Panda Energy's expertise and experience in
17 constructing and operating highly efficient power plants, we are confident that
18 we can compete effectively in the Florida wholesale market while providing
19 reliable, cost-effective electric capacity and energy to Florida utilities for
20 resale to their retail customers. We fully recognize that, as a merchant power
21 plant, no utility nor any body of retail electric customers is obligated to buy the
22 Project's output, and that Panda Midway will bear all of the financial and

1 operating risks associated with the construction and operation of the Panda
2 Midway Power Project.

4 OVERVIEW OF THE PANDA MIDWAY POWER PROJECT

5 **Q: Please describe the Panda Midway Power Project.**

6 A: The Panda Midway Power Project is a 1,000 MW gas-fired power plant
7 using advanced combustion turbine technology in combined cycle with a heat
8 recovery steam generator and an electric steam turbine generator. The
9 Project's rated summer capacity is 1,100 MW and its rated winter capacity is
10 1,150 MW. The Project will be constructed by Panda Midway. The Project is
11 scheduled to achieve commercial in-service status in May 2003, and is
12 projected to have a technical and economic life in excess of 30 years. Firm
13 delivered gas supply will be provided for the Project's operations pursuant to
14 a contract between Gulfstream Natural Gas System ("Gulfstream") and Panda
15 Midway having an initial term of 20 years. The Panda Midway Project will be
16 located at one terminus of the Gulfstream system. Additionally, Panda
17 Midway will construct a lateral pipeline to the Florida Gas Transmission
18 ("FGT") system approximately three miles from the proposed site.

19 The Panda Midway Project will be interconnected to the Florida bulk
20 transmission grid at the existing Midway Substation of Florida Power & Light.

21 The Project will satisfy all applicable environmental permitting
22 requirements. Gas-fired combined cycle technology is the most efficient and
23 most environmentally benign electric generation technology currently

1 available and feasible on a commercial basis. Indeed, we expect that the
2 Project's operations will have a net beneficial effect on total emissions from
3 power generation in Florida.

4 Detailed technical information regarding the Panda Leesburg Power
5 Project is presented in the testimony and exhibits of Paul A. Arsuaga, Ph.D.
6 (project economics), Robert Davis (project economics), Frank Gaffney
7 (transmission), Dale M. Nesbitt, Ph.D. (project economics), Jeffrey L. Meling,
8 P.E. (environmental and permitting expert), and Dan White (fuel supply).

10 **PROJECTED OPERATIONS OF THE PANDA MIDWAY POWER PROJECT**

11 **Q: Please give an overview of the projected operations of the Panda**
12 **Midway Power Project.**

13 **A:** The analysis performed for Panda Energy by Paul Arsuaga and Robert Davis
14 of R. W. Beck of the Florida bulk power supply market and of the Project's
15 operating economics yield projections that the Panda Midway Project will
16 operate, economically, at capacity factors ranging from 72 percent in 2004,
17 the first full year of operation, to approximately 76 percent in 2008 and will
18 provide between 6,300 and 6,600 GWh per year of net generation. Altos
19 Management Partners' analysis by Dr. Dale Nesbitt indicates that the Panda
20 Midway Project will operate, economically, at capacity factors ranging from 89
21 percent in 2003 to 71 percent in 2013. We anticipate that the Project will
22 provide approximately 1,100 MW (summer) and 1,150 MW (winter) of
23 capacity for the wholesale power market in Peninsular Florida.

1 **Q: How likely is it that the Project will make sales to utilities outside**
2 **Florida?**

3 A: It is unlikely that any material portion of the Project's output would be sold
4 outside Florida. This is a function of several factors, including relatively low
5 generation costs in the SERC region as compared to those within Peninsular
6 Florida, recent power shortages and projected tight reserves in Peninsular
7 Florida, and limited transmission export capacity from Florida into the SERC
8 region. Our analyses indicate that the market for the Project's power is the
9 wholesale power market within Peninsular Florida. This is why we are
10 seeking the Commission's determination of need that will enable us to build
11 the Panda Midway Project in Peninsular Florida, and why the transmission
12 interconnection facilities are being designed to accommodate deliveries of
13 power from the Project to utilities located south of the Project. Because the
14 wholesale market in Peninsular Florida needs the capacity and energy of the
15 Project, Panda Midway – being a wholesale provider – needs the Project in
16 order to participate in that market and deliver the benefits that our projections
17 say will result from that participation.

18
19 **Q: Does Panda Midway either plan to sell electricity at retail in Florida or**
20 **anticipate making retail power sales in Florida?**

21 A: No. As an Exempt Wholesale Generator, Panda Midway cannot sell
22 electricity at retail. In addition, selling at retail is not a part of either Panda
23 Midway or Panda Energy's development or marketing plans. None of Panda

1 Energy's merchant plant affiliates sells at retail in any jurisdiction. Our
2 primary areas of core expertise include building very efficient power plants
3 and operating them very efficiently. This wholesale operation is our goal for
4 the Panda Midway Power Project.

6 **PROJECT FINANCE, CAPITAL COST, AND VIABILITY**

7 **Q: Please give an overview of the financing plan for the Panda Midway**
8 **Power Project.**

9 A: The Panda Midway Project will be financed through debt instruments issued
10 to the bank markets and institutional investors, along with an equity
11 investment by Panda Energy. The capital structure will be optimized based
12 upon the existing environment in the debt markets, and Panda Energy's
13 corporate consideration, and the Project itself. Panda Energy has earned a
14 reputation in the banking community for developing strong projects with all of
15 the necessary ingredients for a successful financing.

16
17 **Q: What is the projected capital cost of the Panda Midway Power Project?**

18 A: The direct construction cost of the Panda Midway Power Project is expected
19 to be \$386 million, which equates to approximately \$336 per kW based on the
20 Project's 1,000 MW capacity at ISO temperature and humidity conditions.

21 **Q: Please comment on the financial viability of the Panda Midway Power**
22 **Project.**

1 A: With Panda Energy's reputation in the banking community as a successful
2 developer of projects, Panda Energy's operational experience, and technical
3 expertise, there can be no doubt as to the financial viability of the Panda
4 Midway Project. Panda Midway and Panda Energy will have very strong
5 incentives to maintain and operate the Project as efficiently and economically
6 as possible. In simple economic terms, we will expect to operate the Project
7 whenever our potential incremental revenue exceeds our incremental
8 production costs. The gas-fired combined cycle technology that we have
9 selected for the Project is the most efficient and the most economical
10 currently available on a commercial basis. Therefore, it is the technology of
11 choice throughout the U.S. electric industry today. Thus, we consider the
12 Project to be entirely viable. The ultimate proof of this is that we are planning
13 to invest approximately \$386 million in this Project.

14

15 **REQUESTED COMMISSION ACTION**

16 **Q: What action is Panda Midway asking the Commission to take in this**
17 **proceeding?**

18 A: We are petitioning the Commission to issue its order granting an affirmative
19 determination of need for the Panda Midway Power Project. There is a need
20 for additional generating capacity in Florida, and the Project is a viable, clean,
21 reliable, highly available, highly efficient, and cost-effective power plant that
22 will benefit Panda Midway Power Partners, L.P., its wholesale electric
23 customers, and other Peninsular Florida utilities and their customers, without

1 any obligation to purchase the Project's output, without any obligation to pay
2 for the Project's capital cost, and without any of the financial or operating risks
3 associated with power plants.

4

5 **Q: Does this conclude your testimony?**

6 A: Yes, it does

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Panda Midway Power Partners, L.P.

Docket No. ER00-1805-000

NOTICE OF FILING

(March 8, 2000)

Take notice that on March 3, 2000, Panda Midway Power Partners, L.P. (Panda Midway), tendered for filing pursuant to Rule 205, 18 CFR 385.205, a petition for waivers and blanket approvals under various regulations of the Commission and for an order accepting its FERC Electric Rate Schedule No. 1, and for the purpose of permitting Panda Midway to assign transmission capacity and to resell Firm Transmission Rights, to be effective no later than sixty (60) days from the date of its filing.

Panda Midway intends to engage in electric power and energy transactions as a marketer and a broker. In transactions where Panda Midway sells electric energy, it proposes to make such sales on rates, terms, and conditions to be mutually agreed to with the purchasing party. Neither Panda Midway nor any of its affiliates is in the business of transmitting or distributing electric power.

Rate Schedule No. 1 provides for the sale of energy and capacity at agreed prices.

Any person desiring to be heard or to protest such filing should file a motion to intervene or protest with the Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C. 20426, in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214). All such motions and protests should be filed on or before March 24, 2000. Protests will be considered by the Commission to determine the appropriate action to be taken, but will not serve to make protestants parties to the proceedings. Any person wishing to become a party must file a motion to intervene. Copies of this filing are on file with the Commission and are available for public inspection. This filing may also be viewed on the Internet at <http://www.ferc.fed.us/online/rims.htm> (call 202-208-2222 for assistance).

Linwood A. Watson, Jr.
Acting Secretary

FEDERAL ENERGY REGULATORY COMMISSION

WASHINGTON, D. C. 20426

OFFICE OF THE GENERAL COUNSEL

March 7, 2000

Mr. William M. Lamb
Assistant General Counsel
Panda Energy International, Inc.
4100 Spring Valley Road, Ste. 1001
Dallas, Texas 75244

Re: Docket No. EG00-88-000

Dear Mr. Lamb:

On January 28, 2000, you filed an application for determination of exempt wholesale generator status on behalf of Panda Midway Power Partners, L.P., pursuant to section 32 of the Public Utility Holding Company Act of 1935 (PUHCA). Notice of the application was published in the Federal Register, 65 Fed. Reg. 6,597 (2000), with interventions or comments due on or before February 24, 2000. None was filed.

Authority to act on this matter is delegated to the General Counsel. 18 C.F.R. 375.309(g). The General Counsel has further delegated that authority to the Assistant General Counsel for Electric Rates and Corporate Regulation. Based on the information set forth in the application, I find that Panda Midway Power Partners, L.P. is an exempt wholesale generator as defined in section 32 of PUHCA.

A copy of this letter will be sent to the Securities and Exchange Commission.

Sincerely,



Michael A. Bardee
Acting Assistant General Counsel
Electric Rates and Corporate Regulation

Steven W. Crain

**PANDA ENERGY INTERNATIONAL, INC.
Vice President – Merchant Plant Development**

1996 to Present

I initially served as Panda's Director for the Asian Sub-Continent as a follow on to power projects developed in previous company. In 1997, I assumed responsibilities for all of Panda's International Business Development as Vice President – Business Development. Work included projects in Brazil, China, Honduras, Nepal, Turkey and others. With the down turn in 1997 of the international market, I was transferred to Panda's domestic Merchant Plant Development Department as Vice President – Merchant Plant Development. Over the past two years, I have been responsible for front-end development of two 1000 MW projects in Texas, one 1000 MW project in Oklahoma, one 2700 MW project in Arkansas, one 1000 MW project in Pennsylvania, and two 1000 MW projects in Florida.

**ARRO ASSOCIATES, INC.
Partner/Director**

1995 – 1996

Arro was formed to seek out small cogeneration projects in the Indian Sub-Continent. Initial success led to signing of agreements with the Government of Bangladesh for much larger scale projects. Arro then sought a larger partner with the financial and personnel resources to bring these projects to closure. The result of this effort was the signing of a joint development agreement with Panda Energy. As efforts with Panda went forward, I was asked to join Panda as a direct employee.

**EAGLETON ENGINEERING COMPANY
Board of Directors, Vice President, Managing Director (of Saudi Subsidiary)**

1977 – 1995

Over an 18 year period, held various positions of generally increasing responsibility. Company was involved in the oil & gas industry including pipeline, processing plants, compressor stations, etc. An abbreviated reverse chronological summary of my positions and responsibilities is as follows:

1992 – 1995 Vice President for Business Development

Responsible for business development/marketing and promotion of company's engineering and construction services. Responsibilities included customer/client relations on prospective as well as on-going projects; preparation of technical and commercial proposals; contract negotiations. Also monitored on-going projects for quality and cost control purposes.

1991 – 1992 Managing Director – Saudi Subsidiary

Having previously served in this capacity, I was asked to return to Saudi to restore performance, profitability, and cash flow. During this two year period, the subsidiary doubled in value as a result of increased cost efficiencies, personnel reorganization, and improved marketing resulting in the need to expand the staff to over 260. Success resulted in eventual sell-off of the subsidiary to third party Company at a significant profit, in line with the overall parent company strategy.

1987 – 1991 Vice President

Served as Vice President of Engineering. Duties included direction of multiple Project Managers as well as hands-on management of various individual projects. Work included a gas sweetening plant for Enron in Iowa, multiple gas/condensate separation and stabilization plants for Union Texas in Pakistan, and new gas interchange system in south Texas that allowed metering and exchange in any direction between five major gas transmission pipelines.

1981 – 1987 Managing Director – Saudi Subsidiary

Initially served as Project Manager for various ARAMCO oil and gas projects. Was promoted to Managing Director in 1983. Led company through severe downturn in the oil business and emerged as one of the leading in-Kingdom engineering and construction management firms.

1977 – 1981 Lead Project Engineer

Served as Project Electrical and Instrument Engineer on various projects including ARAMCO's water flood expansion program and the Louisiana Offshore Oil Port, which utilized four 6000 horsepower electric motor driven crude oil pumps, and included a 230 kV substation.

STEARNS-ROGER (NOW RAYTHEON) Design Engineer

1974-1977

Served as electrical engineer for design of coal-fired generation plants. Responsibilities were primarily for various control systems and main generator protection and synchronization systems.

ACADEMIC CREDENTIALS AND REGISTRATION

- BSEE, Rice University - 1974
- Post-graduate work in power systems at University of Colorado - 1975
- Registered Professional Engineer – State of Texas

OTHER INFORMATION

- Member of Florida Municipal Electric Association

- Speaker at FMEA – FMPA 1999 Annual Conference on “Merchant Plants – The Future of Power Supply in Florida?”
- Member of Gulf Coast Power Association