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# THE PHILIPPINE NUCLEAR POWER PROJECT ITS PAST, PRESENT AND FUTURE\*

by

Jose U. Jovellanos\*\*

## INTRODUCTION

Shortly after losing the case in a New Jersey Court alleging that Westinghouse Electric Corporation bribed the Marcos Government to get the contract for the 620 MW Philippine Nuclear Power Project (PNPP) located in Napot Point, Bataan, the Philippine Government announced it would appeal the case to a higher court.

However, early last month (October 1993), the Philippine Government announced that it was seriously considering acceptance of a compromise offer from Westinghouse to settle both the court case and the pending arbitration case in Geneva, Switzerland. In addition, Westinghouse sought the revocation of National Power Board Resolution No. 93-274 banning Westinghouse from getting any business in National Power Corporation (NAPOCOR) projects.

The Westinghouse offer consists of supplying two (2) 100 MW gas turbines valued at \$49.5 million for delivery of one unit in December, 1993 and the other in February, 1994.

It was reported that the total loan for the PNPP to date is \$2.6 billion of which \$1.1 billion is still outstanding with daily interest at \$300,000.00. The Philippine Government had already spent P 1,209 billion (\$53 million) for litigation and arbitration costs during the period January 1988 to June 1993.

## A. HISTORICAL BACKGROUND

A.1. Philippine interest in the peaceful uses of nuclear energy started when the Philippine Government under President Maguayay signed a

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\*\*Chairman and President, Engineering and Development Corporation of the Philippines; Engineering Consultant since 1955.

bilateral agreement with the United States on July 27, 1955 under President Eisenhower's "Atom for Peace Program."

- A.2. On October 26, 1956, eighty-two (82) member nations of the UN (including the Philippines) met in Geneva and established the International Atomic Energy Agency (IAEA) whose main objectives are the application of atomic energy for peaceful purposes, including the production of electric power.
- A.3. On June 13, 1958, Congress enacted RA 3067 known as the "Philippine Science Act of 1958" creating the Philippine Atomic Energy Commission (PAEC) to conduct or cause the research and development of, among others, processes, materials and devices used in the production of atomic energy.
- A.4. The Philippine Senate ratified the IAEA Statute and the membership of the Philippines in the agency became effective on September 2, 1958.
- A.5. Manila Electric Company (MERALCO), electric franchise holder of Manila and environs (then a wholly-owned subsidiary of a U.S. electric utility) commissioned in the late 1950's their consultants, Gilbert Associates, to undertake a preliminary feasibility study of a nuclear power plant for their system. The conclusion was that it was not yet timely to undertake a nuclear power project.
- A.6. In January, 1960, the Philippine Government requested IAEA assistance to survey the prospects for nuclear power in the country over the next decade. The report of the IAEA Mission submitted in August 1961 concluded that nuclear energy could play an economic role in the future power system of the country to supplement conventional energy resources.
- A.7. Upon request of the Philippine Government under President Macapagal, the UN funded in 1963 a feasibility study executed by the IAEA for a nuclear power plant to serve Luzon. The study which was completed in 1965 recommended that the Philippines should seriously consider using nuclear power plants in the Luzon Grid by the early 1970's and that legislation for the regulation of nuclear power and third party liability for nuclear damage be enacted.

- A.8. In response to the IAEA recommendation, RA 5207, otherwise known as the "Atomic Energy Regulatory and Liability Act," was enacted on June 15, 1968 empowering PAEC to issue license for the construction, possession and operation of any atomic energy facility, including nuclear power plants.
- A.9. The enactment of RA 5207 provided the legal basis for the construction and operation of the PNPP project. Various agreements later signed with the U.S. and IAEA provided the safeguards against use of nuclear equipment, devices and materials for military purposes.

## B. BASES OF DECISION TO PROCEED WITH PNPP

- B.1. Following the change of ownership from American to Filipino shareholders led by the late Eugenio Lopez, bids were invited by Meralco in 1967 for a 300 to 500 MW nuclear power plant for completion in 1975. Their analysis and evaluation of the bids received showed that such a plant cannot be supported by its market until the late 1970's or early 1980's.
- B.2. RA 6395 was enacted on September 10, 1971 revising NPC's charter and authorizing it to construct, operate and maintain power plants using nuclear, geothermal and energy from other sources. This legislation provided the impetus for NPC's active consideration of a nuclear power plant. With the assistance of the UNDP, a second feasibility study was started in 1972 by PAEC, NPC and MERALCO.
- B.3. Following the imposition of Martial Law, Presidential Decree 40 (PD 40) was issued on November 7, 1972 providing for the total electrification of the country and the setting up of power grids. NPC was entrusted with putting up additional power generating capacities and transmission lines required by the program. The members of the National Power Board then were:

M.D. Barretto	-	Chairman
R.R. Ravanzo	-	General Manager and Ex-Officio Vice-Chairman
A. Melchor	-	Director
I. Abancio	-	Director
R.G. Santos	-	Director

- B.4. In early 1973, a technical and economic feasibility study was jointly undertaken by Electrowatt Engineering Services of Zurich and Sargent & Lundy Engineers of Chicago. They reported the economic advantages of a nuclear power plant compared to a conventional plant using imported oil and recommended that a government body be immediately entrusted with setting up the requisite organization for implementing the project. Thus NPC started to set up the initial organization for site surveys; licensing and safety procedures; and staff recruitment and training.
- B.5. The oil crisis in late 1973 which saw the price of crude oil increase from \$2.55 per bbl. in April 1973 to \$10.70 posed very serious problems to the Philippines. The country then depended on 95% of its energy requirements on imported oil. The question not only became whether the country can afford to pay the price but more critical was where to get the crude oil since the foreign oil companies can no longer guarantee supply to their local refineries. This accelerated interest in the construction of a nuclear power plant for Luzon as "the only immediately implementable project for meaningfully reducing dependence on imported oil."
- B.6. Accordingly, in early 1974 NPC undertook initial discussions with General Electric Company (GE), manufacturers of Boiling Water Reactors (BWR) and Westinghouse, manufacturers of Pressurized Water Reactors (PWR). The choice went to PWR on the basis of the evident preference then of electric utilities for this type as shown by the table below.

Year Contracted	No. of Reactors		MWe.	
	BWR	PWR	BWR	PWR
1971	4	24	4,384	21,621
1972	15	21	16,832	22,551
1973	11	33	11,096	36,392
1974	9	39	10,144	38,792
1975	1	8	1,150	7,999
1976	1	25	940	26,378
TOTAL	41	150	44,545	153,733

- B.7. On June 7, 1974, President Marcos issued authority to then NPC General Manager R.R. Ravanzo to sign for and in behalf of the Republic of the

Philippines, the letter of commitment with Westinghouse Electric Corporation to:

"negotiate for and formulate a signed and effective contract between the two parties for the supply, installation, construction and startup of two 620-megawatt nuclear power plants."

The National Power Board at its meeting on June 14, 1974 took note of the President's authorization and adopted Resolution No. 74-221 similarly authorizing R.K. Ravanzo on behalf of NPC. The members of the National Power Board then were:

M.D. Barretto	-	Chairman
R.K. Ravanzo	-	General Manager and Ex-Officio Vice-Chairman
A. Melchor	-	Director
I. Abancio	-	Director
R.G. Santos	-	Director
P.G. Dumol	-	Director

- B.8. Actual negotiations between NPC and Westinghouse were preceded by various exchanges of correspondence and project presentations between Westinghouse and Philippine Government agencies including NPC. A Westinghouse letter to President Marcos dated February 22, 1974 originally indicated and defined their interest in the development of nuclear power in the Philippines.
- B.9. In the letter of commitment issued to Westinghouse dated June 17, 1974, Ravanzo envisioned that the Government will own the Nuclear Steam Supply system (NSSS) of the plant and NPC to own the conventional portion. NPC shall, however, be the Administrator-Lessee of the Government portion.
- B.10. Negotiations with Westinghouse were conducted over a 22-month period from June, 1974 to the signing of the contract on February 11, 1976. However, Ravanzo was retired as NPC General Manager on November 18, 1975 and it was his successor, C.D. del Rosario, who continued and completed the

negotiations. The members of the National Power Board then were:

M.D. Barretto	-	Chairman
C.E. del Rosario	-	General Manager and Ex-Officio Vice-Chairman
A. Melchor	-	Director
A.L. Jurnie	-	Director
P.G. Dumol	-	Director
I. Abancio	-	Director
R.G. Santos	-	Director

B.11. On May 24, 1976, PD 953 was issued increasing the authorized capital of NPC to P2.0 billion; the foreign debt ceiling to US \$4.0 billion; and the local debt ceiling to P12.0 billion in order to accommodate the financial requirements of the nuclear project.

B.12. The contract with Westinghouse became effective in September, 1976 for a plant completion and acceptance in July, 1983. Following the resignation of M.D. Barretto as Chairman of the National Power Board, Minister V. T. Paterno of Industry was appointed in his place on September 8, 1976. Minister Paterno served as Chairman until October 6, 1977 when he was replaced by Minister G. Z. Velasco following the creation of the Ministry of Energy under PD 1306 in which both the PNOC and NPC became attached agencies. The Minister of Energy became Ex-Officio Chairman of NPC under said decree.

### C. IMPLEMENTATION OF PNPP

C.1. Implementation of PNPP was divided into the Westinghouse scope which is covered by the contract and the NPC scope which included the transmission system needed to interconnect PNPP into the Luzon Grid for the delivery of its output; plant site investigation and acquisition; procurement of uranium fuel; engineering and consultancy services; and insurance.

C.2. The Westinghouse contract was made "turnkey" in view of the absence of NPC in-house capability for this type of project, being the first of its kind to be undertaken by NPC. The project is complex and the single-point responsibility was deemed most appropriate and expeditious.

- C.3. Although the negotiations with Westinghouse originally envisioned two units, it was finally decided that due to financing constraints, the contract was limited to one unit.
- C.4. During the later part of 1975 prior to the award and signing of the contract with Westinghouse, then Secretary of Industry V.T. Paterno raised two policy issues:
- a) That the capital costs are so high and therefore may be less economical than oil-based thermal power, and
  - b) That the national economy may not be able to afford the high capital costs resource-wise and that users of the power output of the project (industries and others) may be squeezed out of the capital markets.
- C.5. In a memorandum to the President dated December 10, 1975, Acting NPC General Manager del Rosario submitted the results of joint study by NPC and the Nuclear Finance Team of the issues raised with the following conclusions:
- 1) The nuclear power project is substantially more economical than the oil alternative inspite of capital cost inflation. Moreover the project generates foreign exchange savings of about \$150 million per year and reduces the economy's vulnerability to economic and political disruptive forces;
  - 2) The nuclear power project as scheduled, can not be deferred without seriously impeding normal economic growth. Alternative power programs studied to meet 1982 and 1985 load requirements are not feasible because they assume a timetable of development for indigenous resources particularly for geothermal, that is unrealistic and therefore not feasible; and
  - 3) The drain on capital resources generated by the nuclear power projects is not as large as it has been presented. It is only the \$250 million bank loan which is really competing with the capital supply available to other development projects. The balance is financed from financial sources which would not be available anyway to the country, if



the project is not implemented. This smaller amount can be afforded by the economy particularly since this is an absolute necessity for sustaining economic activity.

Apparently, the above conclusions were accepted by all concerned so that construction of PNPP proceeded.

- C.6. The NEC load forecast for the Luzon Grid used in justifying PNPP and presented in the November 1974 project financial brochure assumed very optimistic rate of load growth compared to the actual experience. For example, the forecast peak demand for 1983 (the year the first unit of PNPP was targeted for commissioning) was 3000 MW against an actual of only 2400 MW. Even on the basis of the optimistic forecast of 3000 MW, a new generating unit of 450 MW (15% of 3000 MW) should have been the biggest one to be considered for the Luzon Grid system rather than the 620 MW capacity of PNPP. If this criterion were applied, then the consideration of a coal-fired power plant instead of PNPP could have been a more prudent approach to the oil problem. It was fortunate that development of the Tiwi and Mak-Ban Geothermal areas had been accelerated so that a total of 660 MW had been installed by end 1984 and made up for the delay of PNPP.
- C.7. Upon the assumption of Minister Velasco as Chairman of the National Power Board on October 6, 1977, a thorough review was made of the Westinghouse contract, including the subcontracts for the civil works under Power Contractors, Inc. (PCI) and for the electro-mechanical erection under Ecco-Asia and later MIESCOR. However, no major changes could be made since Westinghouse and its subcontractors stood very firm on the provisions of their contracts as originally approved by all parties concerned.
- C.8. Following the Three-Mile-Island incident, President Marcos ordered the suspension of the construction in June 1979 and initiated public hearings on the safety aspects of the project. The suspension was lifted in September 1980 and construction was resumed. Earlier in March 1980, the USNRC granted the export license for PNPP's nuclear components. However, opposition to the project by local anti-nuclear groups continued.

- C.9. NPC submitted to PAEC the Final Safety Analysis Report (FAR) in July 1982 and later requested for an Operating License in June 1984. In June to August 1985, PAEC conducted public hearings. After the hearings ended, the oppositionists petitioned the Supreme Court to restrain PAEC from rendering decision. The Supreme Court issued a writ of injunction to PAEC and held public hearings. On February 11, 1988, the Supreme Court ordered PAEC to reopen the hearings after its membership is reconstituted.
- C.10. Although the Supreme Court Resolution became executory, action was overtaken by the EDSA Revolution and PAEC was not "reconstituted" under the Aquino regime. Instead on January 30, 1987 President Aquino issued Executive Order No. 128 organizing the Philippine Nuclear Research Institute (PNRI) under the Department of Science and Technology (DOST) which in effect abolished the Philippine Atomic Energy Commission (PAEC) created under Republic Act No. 5207.
- C.11. PNPP was later "mothballed" and its administration later transferred to the Presidential Committee on the Philippine Nuclear Power Plant with NARCATOR personnel in-charge of the physical plant.

#### D. COURT LITIGATION/INTERNATIONAL ARBITRATION

- D.1. Earlier this year a court in New Jersey dismissed the Philippine multi-million dollar damage claim against Westinghouse. So far the litigation had cost the Philippine Government \$48.0 million of which \$38.0 million was spent during the Aquino regime and \$10 million under the Administration through June, 1992.
- D.2. Should the Philippine Government decide to file an appeal, it will mean additional litigation expenses with no assurance of reversing the New Jersey Court decision, according to Philippine Government legal experts.
- D.3. On the other hand the International Arbitration case in Geneva, Switzerland had already cost the Philippine Government \$5.0 million. Should it proceed, no one has as yet estimated the additional costs to the Philippine Government.
- D.4. Informed sources indicate that should the Philippine Government win the arbitration case in Geneva, the award will most probably not exceed

\$40 million. However, it may take years to get a decision in Geneva and it may not be in favor of the Philippine Government either. The pretrial hearing is scheduled on November 21, 1973.

#### E. THE WESTINGHOUSE COMPROMISE PROPOSAL.

- E.1. The Westinghouse proposal covers the supply of two brand new Model 501D gas turbines each rated at 100 MW using oil or natural gas and valued at \$19.5 million.
- E.2. Westinghouse also proposed the revocation of National Power Board Resolution No. 196473 banning Westinghouse from getting any contract in NABOVIA power projects.
- E.3. The initial reaction of President Marcos was "approval in principle" and directed Energy Secretary Felton Lazaro and the Presidential Committee to negotiate with Westinghouse.
- E.4. Reaction from Congressional leaders is varied, some taking the view that any compromise agreement is subject to Congressional approval.
- E.5. Details of the Westinghouse compromise agreement are undergoing legal scrutiny.
- E.6. Burns and Roe, engineering consultants of Westinghouse, which is not included in the Westinghouse compromise proposal is reported to have offered to the Philippine Government to drop its \$Fr 40,000 retention claim and \$950,045 claim under the Arbitration case. There is no indication that the Burns and Roe proposal will be considered by the Philippine Government.

#### F. PROS AND CONS OF COMPROMISE SETTLEMENT

- F.1. A final settlement will end the litigation and arbitration proceedings once and for all and give the Philippine Government complete freedom to decide on the future of PNPP.
- F.2. The Philippine Government will be able to figure out its "losses" and "costs" resulting from the project as well as analyze and pinpoint responsibilities for decisions made or not made.

- F.3. Hopefully, a final study can be undertaken to end all studies made on what to do with PHEP.
- F.4. Would it be better to accept \$49.5 million cash settlement instead of the gas turbines?
- F.5. One business columnist asks "What guarantee do we have that Westinghouse did not again bribe the Ramos officials and cronies to accept the settlement?"

#### G. THE FUTURE OF PNPP NUCLEAR POWER

- G.1. At the Roundtable Discussion during the World Energy Conference (WEC) in 1989 in Munich, West Germany, it was observed that "in the foreseeable future nuclear power will not provide an answer to the energy supply in most developing countries." The reason is that the unit sizes available on the market are larger than can be accommodated in the grid of most of these countries. The 620 MW PNPP is 20% of the current peak demand of the Luzon Grid of 3100 MW compared to the rule of thumb of 10% or 310 MW. Accordingly, if PNPP is operated as a nuclear power plant, it would appear too big for the present system.
- G.2. Converting PNPP into combined cycle with gas turbines could bring the plant capacity to 1200 to 1400 MW which would even be worse for the Luzon Grid under the constraints mentioned in G.1. above.
- G.3. Accordingly, it would seem that the majority of developing countries including the Philippines will remain totally dependent on oil, gas and coal with all their economic and political constraints for some years to come. Fortunately, we have sizable indigenous resources of hydro and geothermal which should first be tapped in order to minimize imported energy through PHILIPPINES 2000.