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The Bataan Nuclear Power Plant: Three Episodes of Decision Making

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The controversial construction of the first Philippine Nuclear Power Plant (PNPP-1) in Bataan is subjected to a close examination in the area of decision making. The entire decision making process is analyzed in three parts or episodes. The first begins with the blueprint stage of the PNPP-1 where the rational model of Etzioni is applied. The temporary suspension of the PNPP-1 construction constitutes the second episode. This is an attempt to apply Lindblom's incrementalist model with the subsequent decision by President Marcos to resume the construction of PNPP-1 as a reversion to the application of the rational model. Under President Aquino's administration, the third episode junking the PNPP-1 makes use of a combination of the two models—incrementalism and mixed scanning with Simon's satisficing model-which proves to be more effective in making policy decisions.

This paper analyzes three important episodes in the construction of the Bataan Nuclear Power Plant officially known as the Philippine Nuclear Power Plant 1 (PNPP-1) to illustrate the decision making process that took place within the executive branch of the Philippine government. Two of these decision making episodes took place during the deposed regime while the third happened during the first year of the present government. The first part of this paper discusses the events, describes and explains certain decisions made under each episode while the second part attempts to determine what type of decision making model has been applied.

Episode I: The Blueprint Stage of the PNPP-1

At the time President Marcos and his technocrats were preparing the blueprints of the PNPP-1 at Morong, Bataan between 1964 and 1973, twenty-five countries of the world were already operating a total of 294 units of nuclear power reactors and five other countries, like the Philippines, had in the pipeline their plans to establish their very first nuclear plant to meet the long-term need for a large-scale source of energy other than oil.

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These five other countries are Cuba with one unit designed to generate 408 megawatts (MW), Poland with one unit of 440 MW capacity, Romania with two units for a total generating capacity of 1320 MW, and South Africa with two units for a total of 1842 MW.[1] The Philippines, the sixth country, originally envisioned to put up eleven nuclear plants which was later scaled down to six, then to two, then one due to the country's financial difficulties. The number of nuclear power reactors in operation and under construction as of 1982 is shown in Table 1.

In the Philippines, two studies on the economic feasibility of putting up a nuclear power plant in Luzon were made between 1964 and 1973. In 1968, the Atomic Energy Regulatory and Liability Act instituted procedures for licensing and regulating the construction and operation of nuclear power plants. Under Republic Act 31655, the National Power Corporation (NPC) was authorized to establish and operate nuclear plants in 1972. A year later, a presidential order was signed for the establishment of the first nuclear power plant in Bataan to be operated by the NPC.[2] Also in 1973, when some economists/technocrats of Marcos considered nuclear power as the only viable alternative source of energy, the decision to go nuclear was made amid the energy crisis and unabated increases in the cost of fossil fuels.[3]

Thus, the main justification given by Marcos "expert" planners in going nuclear was economic in nature. For one thing, the plant would lessen our dependence on imported oil. The experts further pointed out that when the plant would start commercial operation in 1985, it would supply 16% of the total energy requirements of Luzon and 5% of the country's energy requirements. About 215 million dollars would be saved in terms of displaced imported oil.[4]

According to a 1981 study of the Ministry of Energy, the cost per kilowatt-hour of nuclear energy was 37 centavos and that of oil was 53 centavos. The same study showed a lower cost per kilowatt-hour of coal, geothermal energy, and wood, as follows: P0.32, P0.28, and P0.24 respectively.[5]

Before construction actually started in 1977, a contract with Westinghouse to design, supply and manufacture a nuclear plant was signed in 1976. There were other companies that offered better financing and construction arrangements such as French and German companies but Westinghouse was able to corner the contract because of the reported involvement of the Herdis Management and Investment Corporation owned by Herminio Disini whose "credentials" as a fellow 'Ilokano' and golf crony to Marcos was reinforced by ritual kinship to Imelda Marcos, whose first cousin, Inday Escolin, he married.[6]

Table 1. Nuclear Power Reactors in Operation and Under Construction at the End of 1982*

	In operation		*Under construction*	
	Number of units	*Total MW (e)**	*Number of units*	*Total MW (e)**
Argentina	1	335	2	1,291
● Belgium	5	3,463	2	2,012
Brazil	1	626	2	2,490
● Bulgaria	4	1,632	1	1,000
● Canada	13	6,686	10	6,772
"China, Republic of"	4	3,110	2	1,814
Cuba			1	408
● Czechoslovakia	2	762	6	2,520
● Finland	4	2,160		
France	32	23,355	27	30,200
● German Democratic Republic	5	1,694	8	3,276
● Germany, Federal Republic of	15	9,831	9	9,411
● Hungary	1	408	3	1,224
India	4	809	3	1,320
● Italy	3	1,232	3	1,999
● Japan	25	16,589	10	9,233
Korea, Republic of	2	1,193	7	6,227
● Mexico			2	1,308
● Netherlands	2	501		
Pakistan	1	125		
● Philippines			1	620
● Poland			1	440
● Romania			2	1,320
South Africa			2	1,842
Spain	4	1,973	11	10,156
● Sweden	10	7,330	2	2,110
● Switzerland	4	1,940	1	942
Union of Soviet Socialist Republics	40	17,876	23	23,420
United Kingdom	31	6,470	10	6,292
United States of America	80	62,376	61	67,213
● Yugoslavia	2	632		
World Total	294	173,108	215	196,860

Construction in Austria and Iran has been interrupted and plants in these countries are not included.

* MW(e) = megawatt electrical; 1 megawatt = 1,000,000 watts

● Non-nuclear weapon States party to the Treaty on Non-Proliferation of Nuclear Weapons, where the safeguards agreement were in force as of November 1982.

Source: International Atomic Energy Agency Bulletin, Vol. 25, No. 1 (March 1983); reproduced in Taaroja, *et al.*

The Bataan Nuclear Power Plant which was then estimated during its blueprint stage to cost $1.2 billion and was envisioned to produce 620 megawatts of electric power (1 megawatt equals 1,000,000 watts). To build it, the Philippines planned to secure a loan from the World Export-Import Bank (EXIMBANK), which it did and for which the Filipinos have to pay P660,000 daily interest. This EXIMBANK loan of $277,200,000.00 qualified the Philippines to join the top five recipients of EXIMBANK loans for nuclear power plants as shown in Table 2. The actual cost of the PNPP-1 was however raised to $1.9 billion due to additional safety features and construction delay.

Table 2. Top Five Recipients of EXIMBANK Loans for Nuclear Power Plants in Thousand US Dollars (Inception through September 20, 1982)

Country	*Total Loans*	*Plant*	*Company*
South Korea	1,951,185	6	Westinghouse, Bechtel
Spain	991,570	15	Westinghouse, G.E. Singer, AEC
Taiwan	595,229	6	Westinghouse, G.E.
Japan	497,151	11	Westinghouse, G.E.
Philippines	277,200	1	Westinghouse, G.E.
TOTAL	5,371,192	50	

Source: US EXIMBANK, Authorization for Nuclear Power Plants and Training Center, Summary by country, in *Multinational Monitor*, February 1983.

In 1974, the government's original plan was to set up two 500 megawatt reactors instead of the 620 megawatt reactor which was actually constructed. General Electric (GE) proposed to build a 600 megawatt plant for $700 million only. However, this proposal was ignored in favor of a Westinghouse proposal to build two plants for $500 million, a lower bid, but without any specifications or costs justifications, as in the GE proposal.

By March 1975, Westinghouse formally presented a proposal for $1.2 billion, not $500 million. The US EXIMBANK, which has sunk loans into the plant, proposed not only $1.2 billion, but $1.6 billion for just one plant.[7]

According to the blueprints of the PNPP-1, the operating principle is essentially the same as in other electric power plants, except that, in this case,

nuclear reactions produce the heat needed. The nuclear reactions are a series of nuclear fissions where several nuclei of Uranium-235 are split, releasing radiation and tremendous heat. These reactions take place within the fuel rods containing natural uranium with about 3% Uranium-235 enrichment.[8]

The Bataan Nuclear Power Plant is a pressurized water reactor type (see figure 1). Water under high pressure circulates through the reactor core to absorb the heat generated by the nuclear reactions. When the heated water (primary coolant) passes through the steam generator, the secondary coolant boils and steam is generated. The steam drives the turbine which runs the electric generator. The steam passing through the turbine gives up its heat to the tertiary coolant, which is water from the sea. The steam changes to water and goes back to the steam generator. During normal operations of the plant, about 720,000 liters of seawater per minute is pumped in as tertiary coolant. This water circulates, absorbs the heat from the steam and goes back to the sea.[9]

The reactor is inside a 12.7 cm. thick carbon steel vessel (see figure 2). The vessel is surrounded by a thick concrete wall. The vessel and wall are further housed in a 2.5 cm. thick carbon steel shell. Finally, the shell is enclosed by a steel-reinforced concrete wall about 1 meter thick. The concrete floor is about 6 meters thick.[10]

To ensure that the least number of people is affected in case of a nuclear accident, the Philippine Atomic Energy Commission (PAEC) required a minimum distance of one kilometer between the plant site and a low population area. The plant is 2.2 km. away from the nearest barrio of Gantuan which had only 221 residents in 1981. The nearest population center is Olongapo which is 22 km. from the site. According to the International Atomic Energy Agency,[11] the PNPP-1 is the only nuclear plant located 9 kilometers away from a volcano, namely, Mt. Natib. The location of the country's first nuclear power plant just described is shown in figure 3.

Episode II: Temporary Suspension and Resumption of the Construction of the PNPP-1

Opposition to the Bataan Nuclear Power Plant started to mount in 1978 when doubts were cast about the capability of the current nuclear technology, the economics of the nuclear power plant, and the integrity of the political machinery that safeguards the health and safety of the public.

On February 13, 1978, Daniel F. Ford, executive director of the Union of Concerned Scientists (UCS) wrote President Marcos and told him that:

Figure 1. Typical Diagram of a Pressurized Water Reactor Plant like the Bataan Nuclear Power Plant

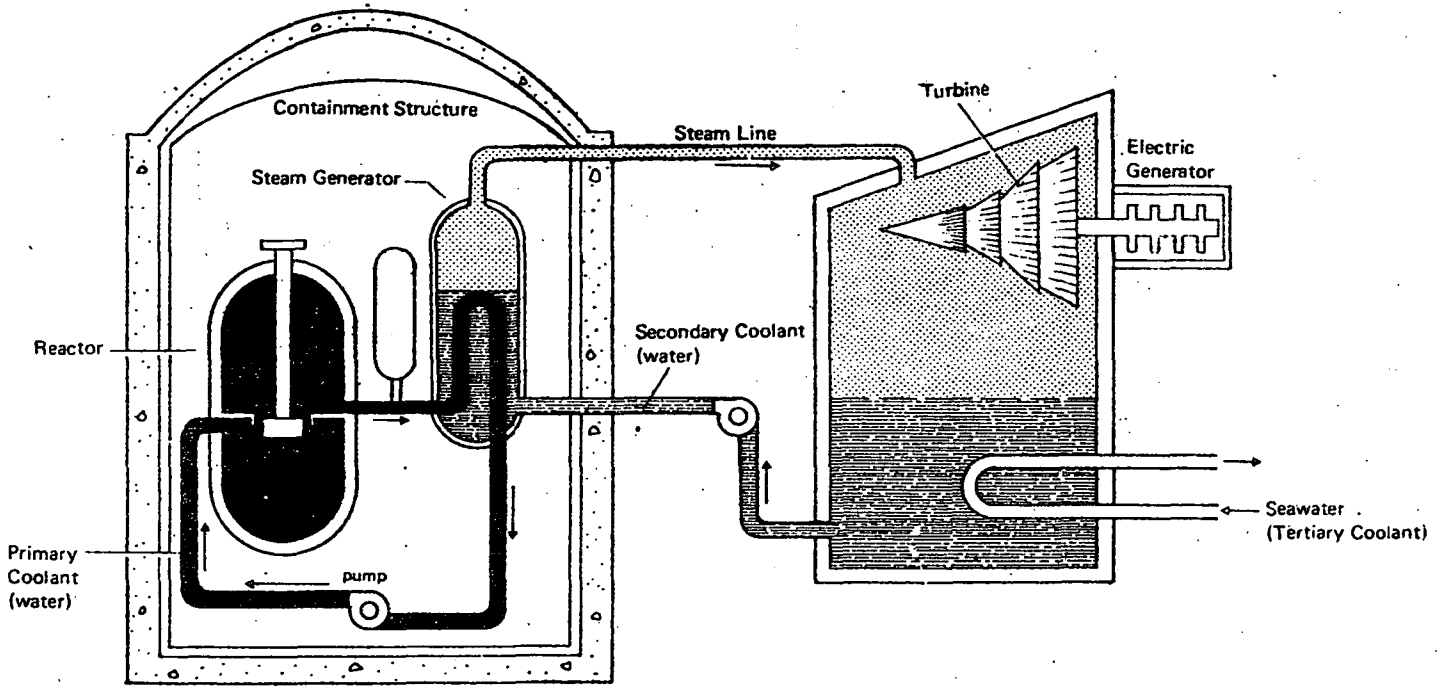


Figure 2. Protective Barriers of the Bataan Nuclear Reactor

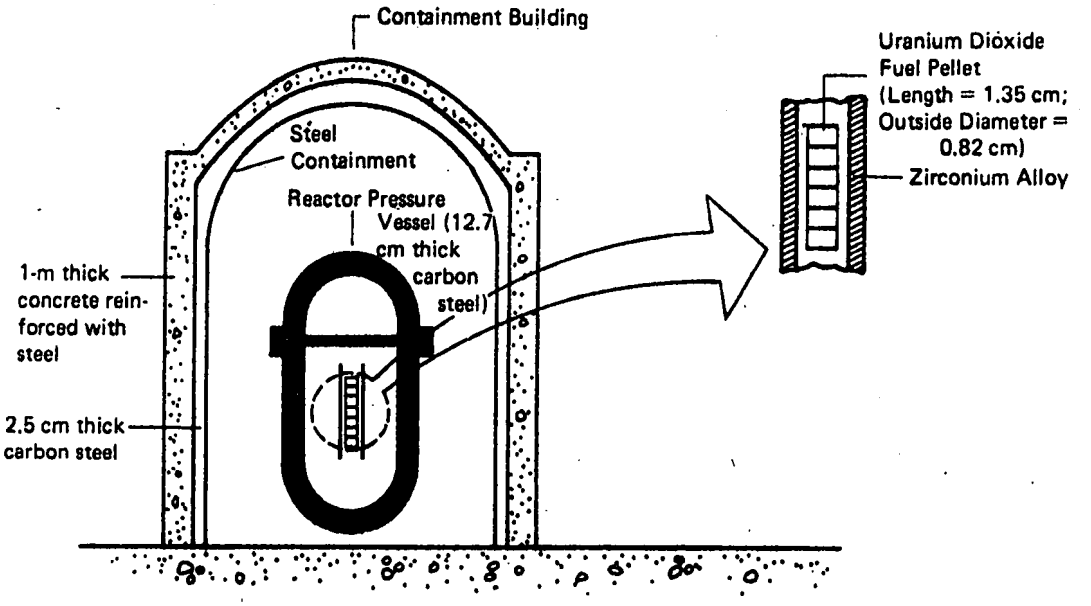
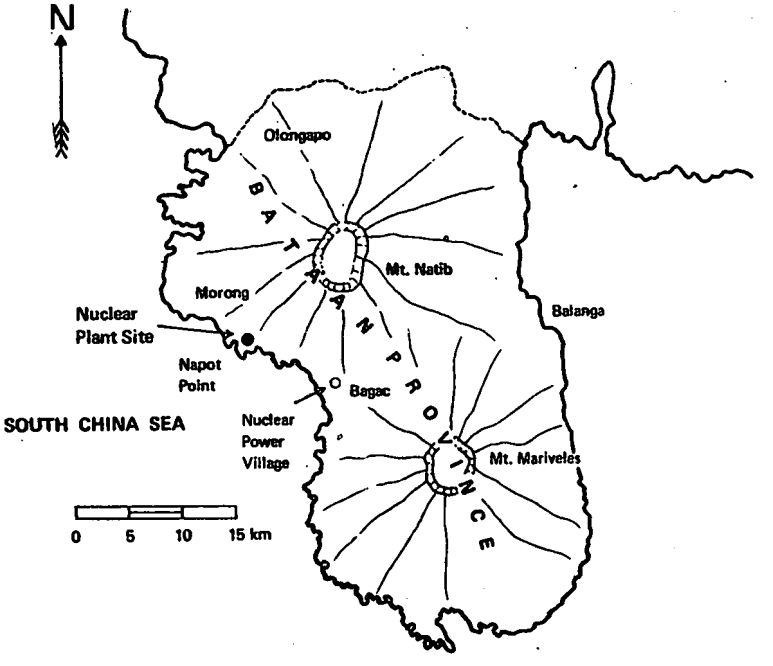


Figure 3. Location of the Bataan Nuclear Power Plant



1) The Westinghouse reactor designed for the Bataan project was riddled with some 200 structural and safety defects.

2) Of the 34 Westinghouse-constructed power plants, the Connecticut Yankee plant (supposed to be the most reliable) closed shop because of safety problems, and Westinghouse's plant in Surrey, Virginia, was considered one of the most dangerous in the USA.

3) A $150-million suit has been slapped against Westinghouse for alleged faulty equipment and services.

4) The Westinghouse design failed to meet the standard of the US Nuclear Regulatory Commission (NRC) against earthquakes, specifically because Bataan lies on an earthquake fault and is very near an active volcano.

5) The total cost of the project, once finished in 1984 would reach $1.9 billion, a price far higher than any equivalent nuclear project in the world.

6) There was no need to invest that much ($644 million borrowed from the EXIMBANK) because of easily available cheaper and safer alternative sources of power such as solar-based technologies. Besides, nuclear power was estimated to contribute a measly 3 percent of the country's needs by 1985.

7) A serious nuclear plant accident has the potential of killing 45,000 people; injuring tens of thousands more; damaging property worth $10.5 billion or about P79 billion and transforming an area equivalent to one-third of the Philippines into a permanent disaster zone.[13]

On March 28, 1979, the Three Mile Island (TMI) nuclear incident occurred in Harrisburg, Pennsylvania, USA. The TMI incident was traced primarily to operator error, malfunction and ambiguity of certain components. This alarmed scientists in many parts of the world.

In the Philippines, foremost oppositor to the PNPP-1 was former Senator Lorenzo M. Tañada who wrote the President asking him to immediately suspend the building of the plant on March 15, 1979. The following day, March 16, President Marcos, responding to Tañada's letter, ordered the creation of a commission to inquire on the safety of all nuclear plants in the country. The commission was headed by then Assemblyman Ricardo C. Puno with retired Court of Appeals Justice Conrado M. Vasquez and Jose G. Bautista as members. This body was known as the Puno Commission.

On June 17, 1979, President Marcos ordered a temporary stop to the work in the construction site at Bataan, a decision which drew wide public attention.

The Puno Commission conducted a series of hearings from June 23 to September 14, 1979. Concerned groups that presented witnesses, position papers and exhibits, included the following: *Samahang Pisika ng Pilipinas,* National Society for Seismology and Earthquake of the Philippines, Inte-

grated Bar of the Philippines Bataan Chapter, government agencies, such as the Ministry of Health, Bureau of Mines, Weather Bureau, PAEC, NPC, and firms involved such as Westinghouse and its consultation group, EBASCO.

One month after the last hearing, the Puno Commission submitted its 30-page report to the President stating its findings on nine major issues raised by President Marcos in LOI 876. Among the Commission's findings and recommendations were:[13]

> 1) The Bataan nuclear reactor plant has been found with inadequate safeguards and could be a potential hazard to the health and safety of the public .... The frequency of accidents in nuclear plant, not excluding those designed by Westinghouse, are ominous signals that safety is not assured and therefore additional safeguards are imperative.
>
> 2) The PAEC, NPC and Ministry of Health each prepared emergency plans for coping with radiation emergencies. The plan would involve all government-related agencies including the barrio captains.
>
> 3) No definite standards, maximum or minimum, have been shown to prevent nuclear contamination because of the possibility that exposure might be received under a variety of conditions and circumstances; hence it is imperative to lay down recommendations for action level that would be generally acceptable.
>
> 4) There is no record of the history of earthquakes at Napot point ... since 1900, only one earthquake had been instrumentally determined to have its epicenter in Bataan peninsula and it was of a magnitude estimated to be between 4 and 4.4 on the Richter scale.
>
> 5) There is as yet no stable rock formation in any of our islands which could serve as permanent burial site for nuclear waste. The interagency committee created under Administrative Order No. 389 has not yet chosen the site or exact location in the Philippines where the nuclear waste may be stored. The dangers in the handling and frequent transfer of low, medium and high level toxic wastes and a very high degree of competence and care must be exercised by the operator.
>
> 6) Westinghouse officials, notwithstanding the request of the President in his letter dated April 11, 1979, have not made any clarification on doubts that arose about the safety of the plant since the TMI incident on March 28, 1979. It was only on June 22, 1979 that Westinghouse sent its panel of experts to see the President, long after the President had created a commission on the safety of nuclear reactor plant. This obviously demonstrates unwarranted delay and lack of concern over the safety of the plant.

While the Puno Commission was still conducting hearings, sometime in July 1979, Senator Tañada went to the United States to conduct his own research and to invite Robert Pollard, Nuclear Safety Engineer, UCS, to come to the Philippines to give testimony to the Puno Commission. Since he could only come in late September and the hearings were to end September 11, 1979, Pollard just prepared a detailed affidavit which became part of the records of the Puno Commission's inquiry. The nuclear safety expert, however, was in

the Philippines on March 1981 and delivered a speech on the weakness or dangers of the Bataan nuclear plant at the Rotary Club of Manila.[14]

The Puno Commission signed and submitted its report on September 15, 1980. Ten months after, Marcos surprised the Filipino people, particularly the oppositors, with a new and unexpected decision: the resumption of construction of the temporarily suspended Bataan Nuclear Power Plant. The contract with Westinghouse was renegotiated supposedly incorporating 102 regulatory guides or safety requirements.

In the light of Marcos' fresh order to resume construction in Bataan, Pollard in his talk before the Rotary Club of Manila in March 1981, charged that "the information given to President Marcos in August 1980, upon which he based his decision to resume construction, was innacurate and incomplete."[15] The inaccurate information was fed to the President by Zoilo Bartolome of the PAEC on August 15, 1980.

The other facts given by Pollard[16] include the following:

1) Westinghouse has been given the final authority to decide on how safety requirements should be met. This makes it even more likely that necessary safety features will not be included in the Bataan plant.

2) There has been no detailed independent review of the Bataan Plant designed by technical experts.

3) Even without an accident, the Bataan Plant is likely to pose serious economic problems for the Philippines.

4) Safe disposal of radioactive waste is not assured.

5) The Bataan Nuclear Power Plant will not be safe; it will not be inexpensive.

6) The Bataan Plant could not be licensed in the United States because it lacks important safety features.

7) Many of the major reasons why the Puno Commission recommended a halt in the construction remains as valid as they were in 1979.

Episode III: Junking of the PNPP-1

The President's order to resume construction in Bataan despite the Puno Commission's sound recommendation to halt construction drew more opposition and more controversies from the public. Based on revised schedules and targets, the Marcos regime was determined to start commercial operation of the plant by 1986, the project construction having been almost 100 percent completed. Were it not for his sudden defeat during the 1986 snap election

and his subsequent exile to Hawaii, the former dictator would have ordered commercial operations of the PNPP-1 inspite of mounting opposition here and abroad.

Exactly three days after the flight of Marcos to Hawaii following the dramatic overthrow of his regime on February 25, 1986, President Corazon Aquino signed her first executive order creating the Presidential Commission on Good Government (PCGG), headed by Senator Salonga, the main task of which was to try to recover the wealth believed to have been illegally acquired by Marcos, his family, and his cronies.[17]

More details about the Westinghouse deal have come out since Marcos' ouster in February 1986. Some of the "Marcos Papers" contained details on Westinghouse "commissions" being funnelled into overseas investments. With the help of a banker and a lawyer who used to work with Disini on the project and who have become informant to the Aquino government's investigation of the anomalous deal, it was determined that Marcos received most of the $80 million payment for awarding a lucrative contract to build the first nuclear power plant in the Philippines.[18]

Further investigation into the project revealed that Disini received payments through various channels including acquiring Asia Industries as a Westinghouse distributor in the Philippines. Payments were then made to Asia Industries as "commission" for Disini's services. Disini also set up another dummy company, Power Contractors, which was named the chief contractor for building the reactor. Moreover, an insurance company, also owned by Disini, underwrote a $688 million policy on the nuclear plant, said to be the biggest on record in the Philippines.[19]

The largest chunk of the commissions was coursed through a complex network involving the Swiss subsidiary of Westinghouse, which in turn assigned the entire contract to another subsidiary established solely to handle the Philippine project. All this contracting and subcontracting manipulations were intended to give an appearance of legality to an otherwise illicit operations.[20] A special fund was then established in Switzerland to disburse the money to Disini, Marcos and one or two Disini employees.

It is, therefore, very clear that the original price of the Westinghouse reactor project was inflated so as to cover the enormous kickbacks masquerading as legal "commissions" to Disini and his patron.[21]

There were even entries in the Marcos Papers which showed that about $9.8 million from the Westinghouse commissions was used to finance part of the "international operations" of the deposed regime.[22]

On April 26, 1986, history's worst nuclear accident occured at Chernobyl power plant, one of the 40 operating nuclear power reactors of the Union of Soviet Socialist Republics (USSR). Thirty-one people were killed when an explosion and fire struck the power station's No. 4 reactor, triggering a massive leak of radiation. Soviet officials blamed this most recent accident on human error, saying the reactor blast was due to an unauthorized experiment during which safety regulations were flouted.[23]

The Chernobyl incident, though tragic to the victims, was a blessing in disguise to Filipinos especially to cause-oriented groups that have persistently picketed President Aquino's cabinet meeting at Malacañang, demanding the dismantling of the Bataan nuclear power plant. Indeed, if such a serious accident could happen in a scientifically or technologically advanced country like the Soviet Union, how much more in a Third World nation like the Philippines? Truly, the tragedy at Chernobyl was a strong argument against the scheduled commercial operation of the Bataan plant, confirming the views, fears and dangers brought out by Pollard, Tañada and other oppositors.

In the wake of the Chernobyl nuclear accidents, President Aquino immediately convened her Cabinet and decided, on the eve of April 30, 1986, to "mothball" the controversial $2.1 billion PNPP-1 at Bataan.[24]

During this April 30 cabinet meeting, the President decided to form a presidential committee to study the ultimate fate of the plant and to look into whether to negotiate, arbitrate or litigate the issues.[25] Appointed members of the committee were: Rene Saguisag as chairman; Sedfrey Ordoñez, Alberto Romulo, Tito Guingona and Gabriel Singson as members.

During these critical moments of decisionmaking, then Finance Minister Ongpin and Central Bank Governor Fernandez favored the commercial operations of the Bataan nuclear power plant from the standpoint of recovering the huge foreign loan contracted for the expensive construction. From a purely financial standpoint, they argued that "either the mothballing or the dismantling of the nuclear plant would only pose further strain on the government's empty coffers,"[26] pointing out that "the government incurs additional interest charges of $350,000 a day or $100 million a year in the meantime the plant's start-up operation is delayed."[27] The decision to mothball the PNPP-1 will require P308 million outlay plus ₱22 million annually on top of the $2.2 billion already invested in the plant's construction.[28]

Two options on what to do with the mothballed plant were considered by the Aquino government:

Option I: Dismantle the plant and sell it at a discount.
Option II: Convert the plant to a coal thermal plant.

The first option looked unattractive to the decision makers because "it would be difficult to dismantle the plant and there might be no buyers." The second option was also considered not feasible because it would require additional cost of $1 billion to $1.5 billion and 6 to 7 years to complete. Former NPC President Gabriel Itchon explained that "the plant was designed to use saturated steam while conventional coal thermal plants need superheated steam."[29]

Even before the Aquino government decided to mothball the Bataan nuclear power plant, the decisions of the Supreme Court on this controversial issue appeared to have been very supportive of the fundamental actions and directions taken by the newly-installed regime. For instance, amid heightened demonstrations against the projected near commercial operation of the first nuclear reactor by various oppositors, the Supreme Court stopped PAEC from issuing an operating permit for the controversial nuclear plant in Morong, Bataan on February 12, 1986.[30] The high court did not only stop the PAEC from issuing an operating permit to NPC but also ordered the PAEC to reopen the hearing on the nuclear plant in order to allow the Nuclear Free Philippines Coalition and other oppositors to present additional evidence.[31]

The two major issues raised by the oppositors to the high court were "the competence of the PAEC Commissioners to pass judgment on the safety of the nuclear plant," and "the validity of the application filed by the NPC for the conversion of its construction permit for the plant."[32]

In explaining the Supreme Court's decision, Justice Efren Plana, said:

> At any rate, even if it is to be assumed that there are some doubts regarding the conclusion that there has been a prejudgement of the safety of the PNPP-1, the doubts should be resolved in favor of a course of action that will assure an unquestionable objective inquiry, considering the circumstances thereof and the number of people vitally interested therein.[33]

After the Saguisag Committee completed its inquiries here and in the United States, President Aquino convened her cabinet on June 30, 1986 to hear the Presidential Committee's report and make vital decisions thereafter.

Even before Saguisag and Salonga left for the United States on May 14, 1986, the Presidential Committee had already recommended to "abandon" the controversial project and repudiate the foreign loans used to finance it.[34] The Presidential Spokesman contended:

> In the wake of the recent Chernobyl tragedy, it seems impossible now to operate the plant. We believe we have a legally tenable, intellectually respectable and psychologically satisfying position for prudently disengaging from the loans we have incurred here.[35]

Also during the Cabinet meeting on May 14, 1986, the departure date of Saguisag for America, the final verdict on the most expensive nuclear power plant in the world had already been made: to junk the controversial Bataan plant, although the government was still considering options to recover part of the cost.[36]

During the June 30 Cabinet meeting, Saguisag revealed irregularities in the controversial projects and made legal proposals on how to negotiate, arbitrate and/or litigate on the plant. Contents of the Saguisag report were not, however, publicly revealed because "there are confidential stuff that can be used against us when we go to liquidation or negotiation."[37]

Then Budget Minister and Presidential Committee Member Romulo also said: "we believe there was no contract because Marcos and his cohorts did not represent the Filipino people when they made the deal."[38] Finally, tagging the Westinghouse as the "main culprit" in the $2.1 billion nuclear plant deal, the cabinet reaffirmed its earlier decision to scrap the controversial project.[39] On May 30, 1986, Westinghouse sent a letter to the new government demanding payment for the monthly interest rate for the project's suspension.

When the Cabinet met in July 1986 to discuss the matter, the Aquino government decided not to pay its $200,000 monthly interest liability for suspending the controversial nuclear plant in Bataan as well as P10 million salary of its foreign consultants, starting the third quarter of that year.[40] Spokesman Saguisag quickly clarified: "Anyway, the project has not been merely suspended, it has been effectively scrapped."[41]

On January 29, 1987, the new president of the National Power Corporation, C. D. del Rosario, reported that at the end of the fourth quarter of 1986, the position of the Presidential Committee (known as the Saguisag Committee) on the Bataan Nuclear Power Plant has remained in full force and effect, that is: The implementation of any provisions of the nuclear plant contract should stop and that the government would not permit any act that would pre-empt or prejudice its its options whether to negotiate, arbitrate and/or litigate the issues with respect to the nuclear plant contract.[12]

Conclusion

The three episodes on the controversial Bataan Nuclear Power Plant described and properly documented in the preceding paragraphs provide inter-

esting explorations in decision making. Although not a single episode perfectly fits into any of the decision models presented by Etzioni, Lindblom, and Simon, the basic features of a particular approach may be approximately exhibited.

Etzioni[43] describes the "rationalistic" model as a high-order fundamental policymaking process aimed at setting basic directions which tends to posit a high degree of control over the decision making situation on the part of the decision maker. In this approach, an actor or decision maker becomes aware of a problem, posits a goal, carefully weighs alternative means, and chooses among them according to his estimates of their respective merit, with reference to the state of affairs he prefers. According to one of Etzioni's recent articles (1986), rational models seem to be more suitable for totalitarianism or high-power approaches.[44]

The decision to go nuclear through the construction of PNPP- 1 in Morong, Bataan described in Episode I was basically rational. The blueprints or plans of the first Philippine nuclear reactor were conceived during the initial years of Martial Law, a regime characterized by extreme unitary or centralization of decision making powers. That President Marcos was fully aware of the energy crisis and the unabated increases in the cost of fossil fuels as well as the need to search for alternative sources of energy so that we could lessen our dependence on imported oil are, to a certain extent, credible. Highly quantitative feasibility studies conducted by Marcos' technocrats in the evaluation of alternative sources of energy appeared to have contributed to the rationality of the planning and/or decision making process. Ideally, the rational-comprehensive model requires the weighing of all alternatives and the final choice of the option that maximizes the benefits. Such a choice is called a "rational decision."

While evaluating all existing options as intendedly rational, this strict requirement, at the same time, spells out the unrealistic nature of the approach. It is not always possible to assess and assign weights to all existing options in the world for man does not always possess all the necessary skills or capability to do so. No doubt, Marcos and his technocratic advisers did not always make the best fundamental decisions. This model's assumption that facts and values are separate does not always hold true in practice for, more often than not, value conflict rather than agreement exists. And usually, the values of the totalitarian decision making prevail.

Lindblom offers a less demanding model of decision making which he called the "incrementalist" approach and described as the "science of muddling through" requiring the following primary features:[45]

1. Rather than attempting a comprehensive survey and evaluation of all alternatives, the decision making focuses only on those policies which differ incrementally from existing policies.

2. Only a relatively small number of policy alternatives are considered.

3. For each policy alternative, only restricted number of "important" consequences are evaluated.

4. The problem confronting the decision maker is continually redefined: Incrementalism allows for countless ends-means and means-ends adjustments which, in effect, make the problem more manageable.

5. Thus, there is no one decision or "right" solution but a never-ending series of attacks on the issues at hand through serial analyses and evaluation.

6. As such, incremental decision making is described as remedial, geared more to the alleviation of present, concrete social imperfections than to the promotion of future social goals.

In the second episode, it is clear that there was an attempt on the part of President Marcos to apply the incrementalist model when he ordered the suspension of construction work in Bataan and created the Puno Commission in response to popular demand. Nevertheless, he reverted to rationalism when he high-handedly decided to resume construction work without benefit of consultation and despite the recommendation of the Puno Commission to halt construction. Marcos' obviously wrong high-order decision to resume construction of the Bataan nuclear power reactor inspite of people's opposition was based on inaccurate information from one of his officials. Indeed, as Boulding puts it, "we do stagger through history like a drunk putting one disjointed incremental foot after another."[46]

Perhaps in the mind of President Marcos, it would be a big mistake not to resume construction of the controversial Bataan Nuclear Power Plant considering the huge amount of money that has been sunk into the project and the fat commissions he and Disini would cease receiving from Westinghouse.

According to Etzioni, the incrementalist model seems to be "more suitable to highly pluralistic, special-interest dominated polities."[47] This model cannot,

therefore, work under a dictatorship or totalitarianism such as the Marcos regime where the second episode took place. At this juncture, one may logically ask: how can Lindblom's incrementalist model, which is characterized by pluralist processes, apply in Episode II which took place under martial law? One relevant explanation is provided by Aberbach and Rockman who argue that the process of organizational decision making looks fairly similar everywhere but the main variation lies in the "norms of the leading actors."[48] Under the second episode, the sole leading "actor" in the decision making process was Ferdinand E. Marcos and one has to understand his norms and personal characteristics in order to see how seemingly pluralistic approaches could work under a regime of authoritarianism. The ex-dictator who, during an interview with *Playboy* magazine in Hawaii, claimed that he and the former First Lady has some supernatural powers, was characterized as a "power- mad individual who would do anything to remain in power."[49]

Thus, just as he held referenda and elections in order to demonstrate to the world that he had popular support and people's participation, so did he attempt to lend his ears to secondary "actors" by creating the Puno Commission to hear all sides and make appropriate recommendations during the suspension periods in order to create the semblance of a pluralist process.

Incrementalism or the "mixed scanning" model or a combination of the two pervaded the decision making process in the third and final episode. Mixed scanning, according to Etzioni, is more suitable to systems that combine a balanced commitment to the collectivity with pluralism.[50] The mixed scanning model combines high-order, fundamental policymaking processes which set basic directions and incremental ones which prepare for fundamental decisions and work them out after they have been reached. In other words, mixed scanning is a combination of rationalism and incrementalism.

When the Aquino government finally decided to junk the controversial nuclear power plant in Bataan, it did so only after consulting with different interest groups here and abroad and after the Supreme Court had made vital decisions on legal cases involving the project. The Presidential Committee headed by Saguisag had to conduct hearings not only in the Philippines but also in the United States in order to enhance the rationality of a high-order, fundamental decision it would make. What was happening around the world such as the tragedy in the Chernobyl nuclear power reactor was also given due course. These and all other steps taken by the Aquino government were made possible because of the new regime's popularity and democratic institutions.

During the 1950s when more empirical evidence about how decisions were actually made began to accumulate, Simon dropped the notion of optimal

rational choice altogether because in practice he recognized that complete information was unobtainable, people were not exclusively rational beings, and both the objectives and the consequences in public policy were not susceptible to quantitative measurements or even approximate evaluations. Thus, he opted for "bounded" rationality and a "satisficing" model of decision making, i.e., people accepted what was good enough or satisfying to them and did not search for all possible alternatives.[51]

Simon's satisficing model was followed by the Aquino Cabinet when it decided to abandon the Bataan Nuclear Power Plant and, subsequently, not to pay the monthly loan interests to the EXIMBANK as well as consultancy fees. At the moment, these twin decisions were the most satisfying in view of the TMI and Chernobyl incidents and the anomalous deals discovered on the clinching of the contract by Westinghouse.

In making effective policy decisions, it is generally better to use a combination of two or more decision making models than to stick to only one approach regardless of the contigencies.

Endnotes

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