Center for Development Policy

April 28, 1981

James R. Shea, Director
Office of International Programs
U.S. Nuclear Regulatory
Commission
Washington, D. C. 20555

Dear Jim Shea:

I enclose various reports, clippings, and letters on the Philippine reactor that I thought may be of interest to you.

The fight goes on!

Sincerely,

Virginia B. Foote

Virginia B. Foote

VBF/hms

Enclosures: Congressional letters
Bob Pollard speech & clips
Petition for rehearing of Philippine case

418 10th St SE Washington, DC 20003
~~225 4th Street, N.E.~~ Washington, D.C. 20002 (202) 547-6406

ADDRESS OF
ROBERT D. POLLARD, NUCLEAR SAFETY ENGINEER
UNION OF CONCERNED SCIENTISTS
ON THE
BATAAN NUCLEAR POWER PLANT
******

ROTARY CLUB OF MANILA
March 19, 1981

President Balatbat,
distinguished members of
the Rotary Club, ladies
and gentlemen:

I am honored and pleased to have the opportunity to address the Rotary Club of Manila. My last visit to the Philippines was in 1964 and the circumstances were much different. I rode a crippled nuclear-powered submarine into Subic Bay and spent much of my time in Subic repairing it. I did not have a chance to see very much of your beautiful country. However, at least that time, we Americans took our nuclear reactor back home with us.

I will be speaking today about the nuclear power plant now under construction in Bataan. You may be wondering why I have come around the world to share my concerns with you about this first Filipino nuclear power reactor. As an American, I feel some responsibility to you since it was my government which has promoted and financed the introduction of nuclear power in the Philippines. Also my organization, the Union of Concerned Scientists, has played an active role in the controversy which has emerged over the Bataan reactor here and in the United States.

In 1978, long before the Puno Commission was created and long before the Three Mile Island accident, my colleague, Daniel Ford, and I both wrote to President Marcos regarding the serious safety defects in the Westinghouse-designed Bataan reactor. In July 1979, I first met with Senator Tañada in Washington. He asked me to come to the Philippines to give testimony to the Puno Commission. The Commission apparently was in a hurry to finish its job and would not wait for my appearance until September, which was the earliest I could travel to the Philippines. I did, however, prepare a detailed affidavit which became part of the record of the Puno Commission's inquiry.

In February 1981, I met again with Senator Tañada in Washington. The Senator asked me to review the sparse materials provided to him by the Philippine Minister of Energy concerning the safety features which were to be added to the Bataan reactor as a result of the renegotiation between Westinghouse and the National Power Corporation. Senator Tañada asked me to answer this question -- "Are these additional safety features adequate to protect health and safety of the public?"

Just a week ago in Washington, I obtained more detailed information on the safety-related changes in the design of the Bataan reactor. This information, which is freely available to public in the United States, is precisely the same information that Senator Tañada

was denied access to by the Minister of Energy on grounds that the new contract between Westinghouse and the NPC was confidential.

Since arriving in the Philippines, my colleague, Attorney Jacob Scherr and I have had an opportunity to visit the site of the Bataan reactor and to meet with officials of the National Power Corporation and the Philippine Atomic Energy Commission, including Mr. Josue D. Polintan, Manager, Nuclear Power Department, NPC; Mr. Jose C. Torres, Manager, Technical Services, Nuclear Power Department, NPC; and Mr. Zoilo M. Bartolome, Commissioner, PAEC. I would like to thank the NPC for sharing with us more information about the plant and for the kind hospitality they have extended to us.

Before addressing the safety of the Bataan reactor, I would like to make some general remarks about the hazards of nuclear power. The most important factor that must be emphasized is that nuclear power is an inherently dangerous technology. Its use demands an unprecedented level of perfection in the choice of the site, the design of the plant, and the construction and operation of the plant itself. The price of a mistake is too high. Although a nuclear explosion is not possible, the consequences of an accident which releases even a fraction of the radioactive materials in the reactor are not significantly smaller. The many studies performed by the U.S. government predict that a nuclear accident

would result in the death of 3,300 people due to radiation within a few weeks or months, the death of 45,000 more due to cancer in the following 10 to 40 years, and almost a quarter of a million cancer cases in the same period that are not fatal if proper medical treatment is available.*/ These casualty figures are based upon the assumption that all people within five miles of the reactor and all people downwind for 25 miles are evacuated within a few hours. If this is not accomplished, the casualties would be even higher. About 3000 square miles of land would require decontamination to make it habitable. All the buildings in this area would have to be sandblasted to remove radioactive contamination. All streets would have to repaved. All surface soil and vegetation would have to be scrapped away and buried in some remote unpopulated location. There is no credible technical dispute about these consequences. Rather, the dispute centers on how often such an accident will occur. Another more honest way of stating the question is -- Is it ever acceptable to kill tens of thousands of people and make some part of the world uninhabitable? That is the fundamental question involved in the decision

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*- U. S. NRC, Reactor Safety Study, WASH-1400, October 1975.

to design and build a nuclear power plant.

Even Dr. Edward Teller, a prominent proponent of nuclear power, admits that "a single major mishap in a nuclear reactor could cause extreme damage ... because of the radioactive contamination." In 1969, he said, "So far, we have been extremely lucky ..." Since then, we have had many instances of what the nuclear industry refers to as -- incidents, transients, events, excursions, and learning experiences. Some have been very close calls which proved that no design can provide foolproof protection against mistakes which human beings make.

The consequences of the 1974 fire in the Browns Ferry plant in Alabama stemmed from an inadequate design, but human error also contributed to the accident. The usual practice of using a lighted candle to check for air leaks started the fire. The telephone number posted for reporting fires to the main control room was incorrect. The fire-fighting system could not be turned on manually because a metal plate installed over the switch to protect it during plant construction had not been removed. The fire hose used by the plant had a different size thread than that used by the local fire department and this handicapped fire fighting efforts. The fire disabled all the safety systems and the plant came within an hour of suffering a major catastrophe.

In the summer of 1976, an operator error resulted

in draining water from the reactor cooling system in the Zion plant, a Westinghouse reactor near Chicago. The same operator error simultaneously disabled all the instrumentation provided to detect the loss of water. A senior technical advisor in the U. S. Nuclear Regulatory Commission (U.S.NRC), Dr. Stephen Hanauer, recommended a reevaluation of all plants to eliminate this type of deficiency. Although the loss of water was stopped in time at Zion, he said that next time some similar unforeseen event may result in an accident. That reevaluation is still going on. It has become one of the unresolved safety issues affecting Westinghouse plants.

Finally, two years ago, the Three Mile Island (TMI) plant suffered the worst accident in the history of commercial reactors in the United States. Although the accident was complex, it started from routine maintenance which shut off the normal water flow to the steam generators. One valve on the reactor cooling system stuck open; two other valves were shut which should have been open. The reactor operators, misled by their training and instruments, took precisely the wrong actions. Prior to the TMI accident, the U.S.NRC had called such accidents "incredible". It was believed that the probability of such an accident was so low that protection against it was not needed.

Despite this history of frequent accidents, which

the Puno Commission said "is an ominous sign that safety is not assured", the construction of the Bataan plant is continuing. Based on the many studies of the TMI accident and the safety improvements now known to be needed, my detailed knowledge of Westinghouse plants in the U.S., and all the information I now have about the Bataan plant, I have reached the following conclusions:

1. <u>The Bataan plant could not be licensed in the United States because it lacks some important safety features.</u>

In a letter last November to Senator Tañada, the Minister of Energy said that the NPC was required to comply with a total of 146 nuclear safety requirements of U.S. NRC. But that figure was exaggerated by the listing of 102 U.S. nuclear regulatory guides that should have been incorporated into the original construction permit which was issued by the PAEC on April 4, 1979, just one week after the Three Mile Island accident in Pennsylvania. However, some of these 102 requirements obviously were not included in the original Westinghouse-NPC contract because they had to be added to the new contract. Of the remaining 44 requirements, only twenty (20) are mentioned in the new contract. In one instance, some of the requirements concerning steam generator corrosion are discussed only for the purpose of saying they will not be met. Of those requirements resulting from the TMI accident, less than half are being incorporated in the new contract. For one requirement, the new price

of $1.9 billion for the Bataan plant covers only the studies necessary to determine the extent of the changes that are needed. Actually, making these changes so this plant could be licensed in the U.S. will require further increases in the price of the plant above $1.9 billion.

2. Many of the major reasons why the Puno Commission recommended a halt in the construction remain as valid today as they were in 1979.

The Puno Commission said that the Bataan plant design was an old design plagued with unresolved safety issues like other Westinghouse designs. However, the renegotiated contract contains no provisions that would lead to the resolution of even a single unresolved safety issue. The Puno Commission said that the Bataan nuclear plant design needs fundamental changes and additional safeguards. Yet, the renegotiated contract describes no fundamental design changes and few additional safeguards.

3. The information provided to President Marcos in August 1980, upon which he based his decision to resume construction, was inaccurate and incomplete.

On August 15, 1980, PAEC Commissioner Bartolome wrote President Marcos that a total of 102 U.S. NRC regulatory guides "were required of NPC by PAEC before

PAEC issued a construction permit for PNPP-1." This is not accurate. Five of these old regulatory guides are discussed in the renegotiated contract. The subjects are: instrumentation needed to assess plant conditions during and following an accident; periodic testing of the emergency diesel generators; periodic testing of the emergency power and plant protection systems; fire protection; and qualification testing of vital electrical equipment to demonstrate that it can operate in the hostile environment caused by an accident. In one instance, the renegotiated contract actually provides that the regulatory guide requirements necessary for adequate fire protection will not be met if these would delay construction of the plant. Furthermore, the fire protection requirements discussed in the new contract are known to be inadequate. Therefore, in the U. S., both plants under construction and in operation are being forced to add new fire protection features beyond those specified in the regulatory guide.

Commissioner Bartolome did not tell President Marcos that more than half of the TMI lessons learned requirements have not been added to the Bataan plant design. All of these TMI requirements are vitally important to safety. In the U. S., all plants under construction have been forced to incorporate all of these design requirements. For some reasons, this apparently is not being done for the Bataan plant.

It is also of great concern to me that some of

the information provided by PAEC to the Puno Commission, upon which the Commission concluded that the plant would be "reasonably safe", is simply wrong. The PAEC's description of the arrangement and operation of the valves used to protect the reactor against rupture from high pressures is alarming. It demonstrates an almost total lack of knowledge of this important aspect of plant design. The PAEC describes as "normally open" exactly the same valve which is in fact normally closed but stuck open during the TMI accident. PAEC also describes these important valves as being "connected in series" with other valves, when in reality, the valves are, and must be, connected in parallel. This aspect of the design is relatively simple to understand and, therefore, PAEC's confusion is very disturbing. It does not give me assurance that other, more complex aspects of the design are fully understood.

4. <u>Westinghouse has been given the final authority to decide how U.S.NRC safety requirements should be met</u>.

The Puno Commission found that Westinghouse had demonstrated a "lack of immediate concern over the safety of the plant." It then recommended that, if the project continues, "Westinghouse should ... manifest and demonstrate that it shares the genuine concern of the government to safeguard the welfare of (the Philippine) people ...."

I have found no indication in the documents I have read that Westinghouse has changed its priorities. Westinghouse does not provide all the safety features it is required to provide in the U. S. Furthermore, the renegotiated contract contains a provision which permits Westinghouse alone to interpret all requirements issued after October 1, 1973. In the event of disputes concerning the proper design necessary to meet a requirement, Westinghouse has the final word unless the Philippine government is willing to pay "the then prevailing commercial rates", as the contract phrases it, to have its interpretation of a safe plant built.

The renegotiated contract also provides for a bonus payment to Westinghouse if the plant is completed in less than 50 months from September 1980. This provision, together with the provision giving Westinghouse the final word on the safety design, makes it even more likely that necessary safety features will not be included in the Bataan plant.

5. <u>There has been no detailed, independent review of the Bataan plant design by technical experts of the U.S. NRC</u>.

Many organizations and individuals in the United States, including the Union of Concerned Scientists, Natural Resources Defense Council, Center for Development Policy, Center for Law and Social Policy, and Congressman

Clarence Long, have argued that the U. S. Government should not permit the export of nuclear reactors which have not undergone safety review in the United States. Yet the U. S. Government has so far specifically refused to review the design of the Bataan plant or to consider the severe hazards to the health and safety of the Filipino people. In granting the export license last May, the U.S. NRC ruled that assuring the safety of the design of the Bataan plant was the Philippines' problem.

6. Even without an accident which harms the health and safety of the Filipino people, the Bataan plant is likely to pose serious economic problems for the Philippines.

An accident at the Bataan reactor plant of the same magnitude as the one two years ago at Three Mile Island would deal a severe blow to the Philippine economy. The latest estimate of the cost of cleaning up TMI is over $1 billion. It is not known when, or even if, the plant can be put into operation again. At present, none of the highly radioactive waste have been removed from the island. The most optimistic date for completion of the clean up is 1988, seven years from now, and the owner of the Three Mile Island nuclear plant is already on the brink of bankruptcy.

Let us assume, for the sake of argument, that the Philippines will be lucky. Assume that, despite a lack

of experience in nuclear plant operation and regulation and a plant design without the safety features required in the United States, no accident happens in the Bataan plant. I still believe that the project is not a wise investment. Westinghouse plants in the United States are now breaking down with alarming regularity. The main steam turbines, which drive the electrical generator, are developing cracks after only a few years operation. Westinghouse and the electric companies are now engaged in developing complex inspection methods to detect the cracks and measure their size. Calculations are then being done to determine whether the turbine can be safely operated with the cracks present. Unfortunately, these inspections and calculations are not foolproof. Within the last year, two Westinghouse turbines have come apart. In the Yankee Rowe Plant, repairs took over eight months. In the other case, the Indian Point 3 Plant is still shutdown after two months with no reliable estimate of when the plant can restart.

Another problem plaguing Westinghouse reactors in the U. S. is corrosion of the steam generators. The steam generators are large components which serve to transfer heat from the reactor to produce the steam for the electric turbines. There are thousands of small tubes in the steam generators which are supposed to prevent seepage of the radioactive reactor cooling water into the steam. The problem is that the tubes are corroding and leaking. The result is that Westinghouse

plants that are only six or seven years old have had to shutdown for extensive repairs or replacements of the steam generators! These repairs take nine months to a year to complete, expose workers to unusually high radiation doses, and cost close to the original cost of the entire plant.

The point is that even without a major accident, there is good reason to expect that the Bataan plant will not be a reliable source of electricity and will require frequent and expensive repairs. In fact, repair and modification of existing nuclear power plants in the U.S. is rapidly becoming the major portion of the nuclear industry's business in the United States.

The Bataan nuclear plant has already become one of the most expensive nuclear reactors in the world. The original Westinghouse proposal in 1974 quoted a price of $500 million for two plants at the Bataan site. In seven years, the cost for the one plant now under construction has multiplied more than seven times to $1.9 billion!

Assuming no further increase in price of the plant, I have calculated that the cost of electricity from the Bataan reactor will be approximately $.09/Kw-hour. This figure does not include the expenses of radioactive waste disposal and decommissioning of the plant. It assumes that the Bataan plant will operate at 70% of its capacity, while the average Westinghouse reactor in the U.S. only operates at 63% of capacity. In

contrast, the cost of electricity from a coal-fired plant ($.05/Kw-hr.) would be 45% less than that for the Bataan reactor. Even an oil-fired plant would be less expensive ($.07/Kw-hr.), at current oil prices of $30 per barrel.

The Bataan reactor was supposed to help make the Philippines less dependent on foreign sources of energy, by reducing consumption of imported oil. In fact, the Bataan reactor would make the Philippines more dependent. The Bataan reactor would trap the Philippines in almost total reliance upon Westinghouse and the U.S. for uranium fuel, maintenance, spare parts, and perhaps disposal of radioactive wastes. Are you prepared to further increase your energy dependence upon a foreign nation? Would it not be wiser to invest this same money in developing your own energy resources in the Philippines, such as oil, coal, geothermal, hydropower, and solar?

The cost of nuclear power has soared so high that it may be cheaper for the Philippines to abandon the Bataan reactor, rather than completing its construction. A well-regarded energy economist has computed that it is less expensive in the United States to forego further work on a nuclear plant which is 30% - 40% constructed and to replace it with a coal-fired facility. This is true even if none of the costs of a partially-constructed nuclear plant are not recovered by selling off the components.

Let me turn now to the questions of radioactive waste disposal and decommissioning.

Each year for 30 years, the Bataan reactor would produce around 30 tons of highly radioactive spent fuel. The safe disposal of this radioactive waste is by no means assured. According to a paper presented by PAEC in 1977, since the Philippines is in a volcanic belt and has no stable salt rock formations, the long-term storage and disposal of nuclear wastes from the Bataan reactor will depend on the establishment of an international burial site. Yet the prospects of any country agreeing to become the world's nuclear garbage dump remain very slim! The Puno Commission took note of the fact that no progress has been made in finding a final repository for the wastes that would be generated.

Assuming that a safe solution to the radioactive waste dilemma is found, you can be assured that it will be extremely expensive. The Japanese are now paying the French $750 for the reprocessing of each kilogram of their spent fuel and the temporary storage of the remaining high level liquid radioactive wastes. If the Bataan reactor were operative today, it would cost the Philippines some $20 million each year for a similar arrangement. However, it is important to keep in mind that the French will be shipping the wastes back to Japan in ten years for final disposal.

Many people hold the mistaken belief that a

nuclear plant, once construction is completed, can remain in operation indefinitely. The fact is that the Bataan plant, like all nuclear power plants, is designed to operate for only 30 or so years.

Over time, radioactive contamination will build up in the plant. The radiation levels can reach such high levels that it will not be safe to allow workers to perform the necessary maintenance and testing. In addition, the reactor vessel is bombarded by intense radiation and the steel will become so brittle that the plant cannot be operated safely. At the end of its life, the plant must be decontaminated and dismantled or entombed. To this date, no large nuclear plant has been decommissioned in the United States.

In sum, the Bataan Nuclear Power Plant will NOT be safe; it will NOT be reliable; and it will NOT be inexpensive. At best, the Bataan reactor will be a very costly way to increase your energy dependence upon foreign countries. At worst, it may result in a catastrophe that could render an important portion of your nation uninhabitable.

The Philippines can still turn its back on nuclear power. The American people also have been misled about the hazards and economics of nuclear power, but you now have the benefits of the painful lessons we are learning in the United States. Your own error so far will not be without cost, but the cost of going forward with the Bataan reactor would surely be much greater.

The question facing you transcends political considerations. It is a matter of the health, safety, and well-being of the present and future generations of Filipinos. It is a question that, I believe, must be faced squarely now, for with each day that construction continues, the options become fewer and more expensive. I recommend that you seriously consider abandoning the Bataan nuclear power plant. Based upon my analysis, I have concluded that this is the correct course of action. In any event, the Philippines should enlist a panel of independent scientists and experts to assist you in making a decision that is in the best interests of all the Filipino people.

Thank you.

/m-

San Francisco, CA
February 17, 1981

Mr. Lindsay Mattison
Center For Development Policy
#225, 4th St. N.E.
Washington D.C. 20002

Dear Mr. Mattison:

Senator Raul Manglapus came to San Francisco yesterday for a final conference with me before I leave for Manila next Thursday, February 19.

He brought with him the good news that once more you are going to help us, by shouldering the transportation expenses of Bob Pollard who has agreed to address a public forum in Manila sometime on the third week of March. He will discuss among other things, the safety of the Bataan Reactor, and more specifically the additional safeguards which Westinghouse had agreed to incorporate to the reactor at an additional cost of $700 million. (UCS paid for trip -- lucky for us!)

I believe it will be a great service to our people to bring home to them the grave dangers that they will face with the construction of a nuclear reactor which has not been tested by the NRC or by anyone with enough nuclear experience and expertise, and on a site whose seismic and safety problems have not been fully resolved, and when until now our Government has not found a safe place for the final disposal of the radioactive waste.

I believe too that this project could make even our Government see the need for exercising extreme care and prudence in this matter, by hiring an independent team of nuclear scientists to examine not only the safety of the nuclear reactor and its additional safeguards, but also the safety of the site before continuing the construction of the plant. Everything of course would depend upon the soundness, clarity and force of the position paper to be presented.

Hoping for your continued interest and cooperation in our struggle, I remain

Gratefully yours,

LORENZO M. TANADA

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Center for Development Policy

April 2, 1981

Dear Member of Congress:

On March 20, 1981 the Export-Import Bank submitted to Congress the statement of a proposed financial guarantee to the National Power Corporation of the Philippines for $104,000,000. This guarantee is to finance the total U.S. cost of $122,600,000 which is part of an $800,000,000 cost overrun for the Philippine nuclear power plant, PNPP-1.

This cost overrun and the safety of the nuclear project continue to be of great concern to the Center for Development Policy (CDP), the Union of Concerned Scientists (UCS) and the Natural Resources Defense Council (NRDC). We urge that Ex-Im be required to supply Congress with a full explanation of this guarantee prior to a funal decision.

As you know, the Philippine reactor has been plagued with safety problems. In June 1979 President Marcos suspended construction and ordered the establishment of a special commission to review the safety of the site and the design of the plant. The commission found the design outdated and unsafe. The Ex-Im submission to Congress is misleading in that it implies all safety related requests made by the Commission have been satisifed. In fact, this is not the case.

The Philippine Atomic Energy Commission has adopted U.S. NRC standards and the public expects this reactor to meet these standards. Yet, this reactor <u>still</u> could not be built in the U.S. as it does not include all post-1973 requirements and less than half of the requirements resulting from TMI have not been addressed. Incredibly, the cost of this 620 megawatt reactor has soared from $1.1 billion to $1.9 billion, making PNPP-1 one of the most expensive reactors in the world. If the necessary safety features were included, the total price would increase further.

The safety of PNPP-1 continues to be a matter of controversy and concern in the Philippines, as the enclosed clippings indicate. Surely the Filipinos deserve a product that

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meets U.S. standards and surely they will continue to demand it. Will Ex-Im Bank grant further loan guarantees if the plant is up-graded again? We feel strongly that the Ex-Im Bank should inform Congress now if it intends to lend or guarantee on further modifications. Additionally, did Ex-Im determine that $122 million is a reasonable price for the safety modifications added thus far? Has the plant become so expensive that it is no longer economical?

Finally, Ex-Im Bank has justified its nuclear lending program as necessary to compete with subsidized credit available in several foreign countries, notibly France and West Germany. The contract for PNPP-1 was won by Westinghouse Corporation with a $644 million loan and guarantee package from Ex-Im Bank in 1976. Is there now foreign competition for the design modifications for PNPP-1 which justify Ex-Im Bank increased exposure on this project?

It is the hope of CDP, UCS and NRDC that you can give this matter your immediate attention as Congress only has 25 days to act once Ex-Im notification is submitted.

We hope to talk to you further.

Sincerely,

Virginia B. Foote

Virginia B. Foote
Center for Development Policy

VBF/hms

Enclosures

Center for Development Policy

April 10, 1981

Senator William Proxmire
5241 Dirksen Office Building
Washington, D.C.

Dear Senator Proxmire:

On March 20, 1981 the Export-Import Bank submitted to Congress the statement of a proposed financial guarantee to the National Power Corporation of the Philippines for $104,000,000. This guarantee is to finance the total U.S. cost of $122,600,000 which is part of an $800,000,000 cost overrun for the Philippine nuclear power plant, PNPP-1. The cost overrun brings the cost of PNPP-1 up to $1.9 billion, making it one of the most expensive reactors in the world!

This cost overrun and the safety of the nuclear project continue to be of great concern to the Center for Development Policy. We urge that Ex-Im be required to supply Congress with a full explanation of this guarantee prior to a final decision and answer the following questions.

1. On August 5, 1980, the Export-Import Bank denied South Korea cost overrun financing for a nuclear power plant of $11,547,660 in loans and $10,264,586 in guarantees. The reason given by Ex-Im Bank was that South Korea should honor its commitment to provide all funds necessary to complete and operate the Kori-2 nuclear power plant in the event of a cost overrun, as stated in the original loan contract between Ex-Im and South Korea authorized in 1975. Why then seven months later did Ex-Im approve another guarantee of $104,000,000 for the Philippine nuclear power plant (PNPP-1)? Was there not a clause in the original 1976 Ex-Im/Philippines contract stating that the Philippines would provide all necessary funds to complete and operate the project, <u>not</u> Ex-Im Bank? If not, why not?

2. Ex-Im Bank has justified nuclear lending program as essential for competing with subsidized credit available in several foreign countries, notibly France and West Germany. The contract for PNPP-1 was won by the Westinghouse Corporation with a $644 million loan/guarantee package in 1976. Is there now foreign competition for the design modifications for PNPP-1 which justify Ex-Im Bank increased exposure on this project?

3. Did Ex-Im Bank determine that $122 million is a reasonable price for the safety modifications added thus far?

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4. Did Ex-Im determine that with these additional design modifications PNPP-1 would meet current USNuclear Regulatory Commission (NRC) standards, thereby satisfying the concerns of the Philippine safety commission?

5. It has been widely circulated in the Filipino press that PNPP-1 still does not meet post-1973 U.S. standards, and includes less than half the post-Three Mile Island requirements. Was Ex-Im Bank led to believe all safety questions had been resolved? Will Ex-Im Bank be asked to finance further design modifications on this already very expensive plant? What will be the cost of bringing PNPP-1 up to current U.S. standards?

6. Considering the average Westinghouse reactor operates at only 63% of capacity, it has been estimated that the cost per kilowatt hour of the 620 megawatt PNPP-1 will be $ .09. In comparison, a newly built oil-fired plant fueled at current oil prices of $30 per barrel would generate electricity at $ .07 per kilowatt hour. Do these estimates agree with Ex-Im estimates? Did Ex-Im conduct a feasibility study to determine if PNPP-1 was still cost effective?

7. Why has the cost of PNPP-1 soared from $1.1 billion to $1.9 billion, making PNPP-1 one of the most expensive reactors in the world? Does this cost increase reflect additional safety features designed to protect the reactor against the well documented volcanic and seismic activity of the area? For example, does the reactor now comply with the request of the Philippine Atomic Energy Commission and the International Atomic Energy Agency that the plant be able to withstand 22 feet of volcanic ash?

Thank you for your time and consideration of these important issues and questions.

Sincerely,

Virginia B. Foote
Associate Director

VBF/hms

EXPORT-IMPORT BANK OF THE UNITED STATES
WASHINGTON, D.C. 20571

APR 21 1981

CABLE ADDRESS "EXIMBANK"
TELEX 89-461

Dear Mr. Chairman:

Thank you for giving us the opportunity to comment on certain issues relating to the Philippine nuclear power plant case raised in a letter from the Center for Development Policy dated April 2, 1981 and attached materials.

The Philippine nuclear power plant was originally designed in accordance with U.S. Nuclear Regulatory Commission (NRC) guidelines in effect as of a "cut-off" date of late 1973, or shortly before the period when Westinghouse and the National Power Corporation (NPC) entered into negotiations which culminated in the award of the supply contract to Westinghouse. We might point out that nearly half of U.S. domestic nuclear plants now in operation were commissioned before post-1973 regulatory guidelines went into effect, and the construction contract of any plant (foreign or domestic) is based, of necessity, on some design cut-off date.

are they not retrofitted?

The Philippine Dune Commission in November 1979 found the Napot Point plant site to be within acceptable standards of safety but noted that unresolved plant safety issues persisted. In light of post-1973 NRC guidelines including post-Three Mile Island recommended safety revisions, the NPC and Westinghouse subsequently examined all of these and NPC in turn submitted a plan to the Philippine Atomic Energy Commission and the Government of the Philippines to upgrade the plant in accordance with those guidelines and revisions judged feasible and relevant. The plan was approved and the Government of the Philippines on September 26, 1980, lifted its order suspending plant construction.

The extent to which NRC guidelines should be incorporated into the Westinghouse contract, even using U.S. standards as a guide, was essentially a matter to be decided by the parties to the contract and the Government of the Philippines. To assume that all changes which would be required for a new plant yet to be constructed would, or could, be incorporated into a plant which is nearly 80%

NPC says plant is only 18-20% completed

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completed is unrealistic. It is our understanding that the project was previously already in compliance with several of the updated regulatory guidelines, and that others were not and are not relevant to Westinghouse responsibilities. In any case, those regulatory guidelines which were judged by the Philippine Atomic Energy Commission as being feasible to implement at this 80% point in the construction progress, as well as those relevant to this project, are being followed, through amendments to the Westinghouse contract.

In accordance with the procedures established by Executive Order 12114 entitled "Environmental Effects of Major Federal Actions, "a Concise Environmental Review of this nuclear project was prepared under the direction of the U.S. Department of State. This document was taken into account by the State Department which then recommended to the NRC that the requested export license be granted. On May 6, 1980, the NRC issued the license (also taking into account the Concise Environmental Review), and its decision was upheld by the U.S. Court of Appeals of the District of Columbia on March 30, 1981.

Eximbank believes that all feasible, practical and legally required steps have been taken to upgrade the design of the Philippine nuclear plant, and that the cost of the U.S. items for these improvements is reasonable. The Bank does not believe that we should attempt to substitute our judgment on plant design for the judgment of those having primary responsibility for such matters.

Eximbank does not now foresee any further changes in plant construction and hence no need for further financing of costs beyond those outlined in our letter of March 20, 1981, but it is not possible now to tell if any further plant changes may be mandated in the future. Pro forma balance sheets, submitted by the NPC, project profitable operations during the period of repayment of debt to Eximbank, and Eximbank believes the project remains feasible and viable. Despite the increased costs of this project, its need as an integral and major part of the power supply system makes its completion a matter of primary concern to the Government of the Philippines which gives it full support.

Eximbank does not justify its current actions in relation to the additional costs of this project on the basis of foreign competition which would not be anticipated at this late stage in project development. Rather Eximbank is responding to strong representations by the Government of the Philippines that if Eximbank refuses to participate to the extent it now proposes in guaranteeing the financing of a portion of the additional costs, the balance of additional financing required would not become available and the project might not be completed. Given the investment already made in the Philippine nuclear project, and the strong desire of the Philippine Government to complete the project, Eximbank firmly believes the additional requested financing support is a necessity.

Sincerely yours,

Donald E. Stingel
Director

The Honorable
Stephen L. Neal
Chairman
Subcommittee on International Trade,
Investment and Monetary Policy
Committee on Banking, Finance and Urban Affairs
U.S. House of Representatives
Washington, D.C. 20515

Times Journal (Manila)
March 20, 1981; P. 9

Safety of nuke plant doubted

AN American nuclear engineer yesterday opposed the construction of the nuclear power plant in Morong, Bataan, which a world-renowned US physicist has pronounced safe.

Robert Poland of the Union of Concerned Scientists whose members go around the world giving lectures against nuclear technology, spoke before the Manila Rotary Club.

Pollard claimed that the Bataan plant, which is now under construction after additional safeguards were demanded by the government from its contractor, Westinghouse, still lacked enough safety features.

He also said that the plant would prove an expensive means of generating electricity.

Pollard resigned from the US Nuclear Regulatory Commission in 1979, apparently because of differences with his colleagues on the use of nuclear technology.

Pollard's observations and the stand taken by his group have been disputed by internationally-known US physicist Edward Teller who linked the crusaders against nuclear technology to those who tell "fairy tales just for the purpose of freightening children."

Construction of the Bataan plant was resumed late last year after Westinghouse agreed to the government's demand for 90 additional safety devices and measures.

Once completed, the plant will generate 620 megawatts of electricity which is more than one fourth of Luzon's present peak load of 2,000 megawatts.

Teller, who was in Manila last January to preside over an international conference on energy, disputed the statements of those questioning the safety of nuclear power plants.

He said there are about 200 big nuclear energy-generating reactors in the free world today working in the past 10 years without any single person being hurt.

"This is a safety record which is quite unprecedented," he said. PNA

Evening Post (Manila)
Sat., March 21, 1981
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Nuclear plant accident not remote

An accident at the Bataan nuclear power plant in Morong, once its construction is completed and it goes into full operation, which would jeopardize thousands of people and render a big part of the country uninhabitable, is not a remote possibility.

This warning was aired yesterday by Dr. Robert Pollard, a nuclear engineer identified with the US-based Union of Concerned Scientists, in a press conference held at the Manila Overseas Press Club (MOPC).

"No matter how good the design of your nuclear plant is, and in spite of the best efforts of the designers, there could very well be an accident that would jeopardize thousands of people and render part of your nation uninhabitable," Dr. Pollard said.

UNSAFE

The other day, Pollard spoke before the Rotary Club of Manila where he also described the Bataan reactor as "dangerously unsafe and very expensive."

The American nuclear scientist said that there are many features that were not added to the proposed Bataan nuclear plant which the US Nuclear Regulatory Commission (NRC) has required of all nuclear plants in the US. These include the following:

1. There must be a modification to the emergency electric power supplies in the plant.

Almost all the safety systems in nuclear power plants, Pollard said, require electricity to operate, "and it could be that you don't have electricity available from the transmission network from the grid," so the plant must have on-site emergency generators.

2. There must be a testing of the valves which protect the system against high pressure.

TESTING

This testing is strictly required in the US and it has been shown that some of Westinghouse's valves were not properly designed and could not open and close properly under all conditions of an accident, Pollard pointed out.

Another major problem not discussed in the renegotiated National Power Corporation (NPC)-Westinghouse contract, according to him, is: "How do you protect yourselves against a hydrogen explosion in the Bataan plant?"

"This is one of the major areas being studied now in the US because prior to the Three-Mile Island accident, we required protection against only a very small amount of hydrogen being produced," Pollard said.

Answering questions from newsmen, Pollard said there are other requirements that deal with administrative matters.

SUPERVISORS

These, he said, are the technical qualifications of the supervisors of the plant; the training required for the plant operators; the ability to bring to the plant experts following an accident who could help bring the plant under control, and others.

"It may be that these administrative requirements are being handled by the NPC and, therefore, that might be the reason they are not discussed in the contract," Pollard said.

On the information that the site of the Bataan nuclear plant has not experienced any high-intensity earthquake, Pollard said, "Just because in 200 years you have not had an earthquake in the area, does not mean that it can not happen."

Bulletin Today (Manila)
Saturday, March 21, 1981, P. A1 & 9

RP nuke plant very expensive, says US expert

An American nuclear safety expert questioned yesterday the increase by $700 million in the construction cost of the Bataan nuclear plant, saying this made it one of the most expensive in the world.

At the same time, nuclear safety engineer Richard D. Pollard disclosed no adequate safety measures have been written into the renegotiated contract for the disposal of used Uranium 235 which he said has a radioactive lifespan of up to 250,000 years.

Pollard spoke for the second consecutive day against what he called "unsafe, unreliable and expensive" Bataan project in what began to appear as a crusade of the Union of Concerned Scientists against the proliferation of nuclear plants around the world.

Former Sen. Lorenzo Tañada, who has sat by Pollard during his two public appearances here so far, said he would furnish President Marcos and the other officials with what he described as "these vital revelations and statements" to enable them to arrive at a new decision on the project.

Fielding questions in a press conference at the Manila Overseas Press club, Pollard said the cost of the projects has leaped from an original Westinghouse proposal in 1974 of $500 million for two plants, to ₱1.9 billion, or a seven-fold hike in only seven years, for only one plant.

Lately, he said he has learned that the cost jumped anew to $2.5 billion, on the builders' claim this would cover the cost of additional safety measures.

Pollard said that even allowing for runaway inflation, other cost overruns and safety modifications, "it is unimaginable that the plant would cost this much."

The American nuclear authority said this rendered the reactor project uneconomical in the face of other cheaper alternative power sources abundant on the islands.

Pollard said he did not find in the new contract adequate provisions for the burial of nuclear waste which he warned caused cancer and other incurable and yet unknown diseases.

MANILA (PNA) — One of the world's most eminent scientists has lauded the Philippines for its decision to resume construction of a nuclear power plant in Bataan in these time of soaring oil prices.

Dr. Eduard Teller, a Hungarian-American who helped develop both the atomic and hydrogen bombs described the decision as wise and said nuclear energy today is "economical, cheap, practically everlasting.

Teller was in Manila recently to address the International Conference on Energy and Environment. He is a member of a scientific group called the Scientists and Engineers for a Secure Energy.

Teller, whose credentials are detailed in the Who's Who in Science, dispute the argument of another group, the Union of Concerned Ssientists whose members go around the world giving lectures to propagate their opposition to nuclear technology.

In his address before the International Conference on Energy in Manila, Teller said "among the source of energy, the best one which I have to mention is nuclear energy."

"Nuclear energy has been developed and it is the safest of all sources of electricity. It is today clearly the least expensive, safest and cleanest," he said.

Over the past 10 years, he said 200 big power-generating nuclear plants have been built in the Free World and "the remarkable thing is that in 10 years, the 200 nuclear power plan did not hurt a single individual."

Referring to the Three-Mile island accident in the United States, Teller, who was the chairman of the world's first reactor safeguard committee years ago, said the accident would not have occurred if the reactor operators had acted properly by calling in a couple of nuclear engineers.

"Reactors are absolutely safe for people because reactors are so constructed that there are a great number of safety installations that prevent damage to people," he said. "If any one of these stops to function, the reactor stops to function."

Business Day (Manila)
Friday, March 20, 1981
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Expert doubts safety of Bataan nuke plant

A US nuclear safety engineer has claimed that the Philippine Nuclear Power Plant project, now under construction in Morong, Bataan, is still unsafe, and more than half of the requirements for nuclear plants imposed by the US Nuclear Regulatory Commission are missing. Many of the major reasons for the suspension of construction on the plant in 1979 — and a renegotiation of contract between Westinghouse, PNPP-1 contractor, and the Philippine government to include added safety design features — still remain, according to Roberto D. Pollard. The National Power Corp. responded with a restated commitment to making the plant safe in all possible aspects. The NPC invited Pollard to have a "dispassionate discussion" with its engineers on the Philippine nuclear plant project.

Expert doubts safety of Bataan nuke plant

Contrary to the report of the Philippine Atomic Energy Commission to President Marcos, the redesigned Philippine Nuclear Power Plant project currently under construction in Morong, Bataan is still not safe, Robert D. Pollard, US nuclear safety engineer, said yesterday.

Pollard, who has been in the country for several weeks, said during a meeting of the Rotary Club of Manila that he based his findings on researches he had made on the PNPP-1 project both here and abroad.

According to Pollard, of the 44 requirements that the US Nuclear Regulatory Commission had imposed on the standard nuclear plant design of Westinghouse International Projects Co. (PNPP-1's contractor), provisions for only 20 are contained in the renegotiated contract between Westinghouse and the Philippine government. Furthermore, of the requirements imposed since the Three Mile Island accident, only half are to be included in the redesigned Bataan nuclear plant.

The PAEC, in its recommendation for the resumption of construction of the plant, had said in its report that the redesigned plant already had all the necessary safety features.

On the basis of Pollard's findings, former Senator Lorenzo Tañada, long one of the plant's oppositors, yesterday urged President Marcos to again review PNPP-1's safety aspects, and recommended the immediate suspension of construction work in the area.

WITNESS. Pollard had been one of the witnesses Tañada was to call to give testimony during the nuclear safety hearings held in 1979 by the Commission on Nuclear Reactor Plants. However, the hearings ended in August 1979 and Pollard's schedule permitted him to come to the Philippines only in September.

The commission, headed by Justice Minister Ricardo Puno, concluded after the hearings that the Bataan nuclear plant's design was not safe. It therefore recommended to President Marcos that Westinghouse, in renegotiating its contract, "provide reasonable assurance of the safety of the nuclear plant."

However, Pollard noted, the Bataan plant still lacks some important safety features, and many of the major reasons for its suspension still remain.

He added that the renegotiated contract contains a provision which permits Westinghouse alone to interpret all requirements on safety design issued after Oct. 1, 1973 (the date the original contract was signed).

FINAL WORD. If disputes arise, Pollard said, Westinghouse will have the final word as stipulated in the contract, unless the Philippine government is willing to pay prevailing commercial rates to have its interpretation of a safe plant built.

The renegotiated contract also includes a provision for a bonus payment to Westinghouse if the plant is completed in less than 50 months from Sept. 1980. This provision, plus the "final word" agreement, will likely mean that the necessary features will not be included in the plant design, Pollard commented.

NPC restates commitment to ensure plant's safety

The National Power Corp. yesterday restated its commitment to making the nuclear power plant project in Bataan safe for the whole country.

In a statement issued for NPC president Gabriel Y. Itchon, senior vice-president for engineering Jose Jovellanos, Sr. said the present nuclear plant design and safety features have been "confirmed by objective and dispassionate evaluation of a host of Filipino and foreign nuclear experts."

"Time and money have not been considered as restraints" in making the plant safe, it was noted, considering the present high $1.9 billion cost of the project.

NPC had approved extensive on-site investigations, studies and analyses to determine the safety of the nuclear plant site. Through the Philippine Atomic Energy Commission and the International Atomic Energy Authority, the safety of the plant itself has also been studied meticulously, Jovellanos said.

As a result of the Three Mile Island incident, the NPC did not scrimp on the costs of having the design and structure of the plant reassessed, he continued. Also, engineering graduates have been extensively trained to take over the job of running the plant when it goes into operation.

Jovellanos extended an invitation to US nuclear safety engineer Robert D. Pollard, who claimed that the plant was still unsafe, to sit down with NPC engineers and government nuclear experts, and "have a dispassionate discussion" on his observations.

Pollard had visited the Bataan nuclear project a few days ago, according to Jovellanos, for about 20 to 30 minutes.