

DISCUSSION AND FINDINGS
BY THE DIVISION OF REACTOR LICENSING
U. S. ATOMIC ENERGY COMMISSION
RELATING TO
CONSIDERATION OF SUSPENSION
PENDING NEPA ENVIRONMENTAL REVIEW
OF THE PROVISIONAL CONSTRUCTION PERMIT FOR THE
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
AEC DOCKET NO. 50-286
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1.0 INTRODUCTION

On September 9, 1971, the Atomic Energy Commission (AEC) published in the Federal Register a revised Appendix D to 10 CFR Part 50, setting forth AEC's implementation of the National Environmental Policy Act of 1969 (NEPA).

Paragraph E(3) of revised Appendix D generally requires a holder of a construction permit issued prior to January 1, 1970, for which an operating license has not been issued, to furnish to the AEC within 40 days of September 9, 1971 a written statement of any reasons, with supporting factual submission, why with reference to the criteria in Paragraph E(2) of revised Appendix D, the permit should not be suspended, in whole or in part, pending completion of the NEPA environmental review specified in Appendix D.

On August 13, 1969, the AEC issued a construction permit to Consolidated Edison of New York, Inc. (Con Ed) for the Indian Point Nuclear Generating Unit No. 3. In accordance with the requirements of Paragraph E(3) of Appendix D, Con Ed filed with the AEC the required statement, dated October 18, 1971.

1.1 Determination

In accordance with the requirements of Section E of Appendix D we have determined that the construction permit for Indian Point Unit

No. 3 should not be suspended pending completion of the NEPA environmental review specified in Appendix D. A formal "determination" to this effect is being forwarded to the Federal Register for publication. In reaching this conclusion we have considered and balanced the criteria in Paragraph E(2) of Appendix D.

1.2 Background

On April 26, 1967, Con Ed filed an application for a construction permit for Indian Point Unit No. 3 with the AEC. An extensive review of the application was made by AEC's regulatory staff and by the Advisory Committee on Reactor Safeguards. On August 13, 1969, the AEC, after public hearings held over a several month period and a favorable recommendation from the Atomic Safety and Licensing Board, issued Construction Permit CPPR-62 for this facility. Numerous other permits with respect to environmental matters have been obtained from other agencies. Among these are permits for: installation of screen-wall, cofferdam, and discharge canal from the Hudson River Valley Commission, New York State Water Resources Commission, and the U. S. Army Corps of Engineers; the outfall structure from the New York State Department of Environmental Conservation; project excavation from the Hudson River Valley Commission and the Village of Buchanan Building Department; and dredging at Lents Cove from the New York State Water Resources Commission, Hudson River Valley Commission, and the U. S. Army Corps of Engineers.

2.0 COMPLETION OF NEPA REVIEW

The time necessary for the completion of the ongoing NEPA review for the Indian Point Unit No. 3 is estimated at 8 months and the criteria set forth in Section E of Appendix D to 10 CFR Part 50 have been evaluated with this approximate time period in mind. That is, the environmental impact of continuing construction at this site, the foreclosure of alternatives of the type that might be required as a result of the full NEPA review, and the cost of delay all have been considered with respect to approximately 8 months of continuing construction activity. Should the actual NEPA review for this case exceed 8 months, such a longer period of time would not significantly add to the environmental impact that construction activities have caused to date but would substantially increase the economic burden if construction were now suspended. A longer review period would also increase the total actual plant expenditures at completion of the NEPA review if the construction permit were not now suspended. We have taken these considerations into account in balancing the factors specified in Section E of Appendix D to 10 CFR Part 50, and have concluded that if a significantly longer time period were required to complete the NEPA review it would not affect our determination that the construction permit for the Indian Point Unit No. 3 plant should not be suspended at this time.

3.0 ENVIRONMENT IMPACT DURING THE PROSPECTIVE REVIEW PERIOD

Since construction of the plant will not be completed during the expected NEPA review period, there will be no environmental impact from radioactive and thermal effluents that would be released, or mechanical damage to marine life at the intake structure, as a result of operation of the plant. Construction to be accomplished during this review period falls basically into three categories: (1) continuation of structural work on containment and adjacent buildings, (2) continuation of work on internal mechanical and electrical systems and (3) landscaping and planting as construction areas are cleared. Percent completion of significant structures are approximated in the following list based on an AEC site visit in early October 1971:

Intake Structure - 98%
Discharge Structure - 98%
Containment Building - 65%
Control Building - 90%
Turbine Hall and Building - 95%
Diesel Generator Building - 30%
Waste Holdup Tank Pit - 80%
Fuel Handling Building - 10%
Primary Auxiliary Building - 80%

All site preparation and excavation work is complete. Foundation work has been completed on all principle structures except the fuel handling building which is nearing completion. The containment building liner has one section of the dome remaining to be installed and then the construction opening closed. The containment building concrete is approximately 25% in place. The control building, primary auxiliary building, and turbine building are completed with only internal erection and fabrication of systems remaining. The diesel generator and waste holdup tank buildings are presently under construction. The foundation and footings have been started for the fuel handling building. Work on the major structures and components of the condenser cooling water system has already been completed. The intake structure and the discharge canal have been constructed; the turbine generator is in place, the condenser has been erected and condenser tubing is nearing completion. The circulating water pumps which were installed have now been removed for recoating. Installation of auxiliary equipment is now in process.

Transmission lines required for Indian Point Unit No. 3 will utilize existing towers currently used by Indian Point Units No. 1 and No. 2. Only five additional towers will be required for Unit No. 3 and these

towers will be located on property already owned by the applicant at the Indian Point site and at the Buchanan substation.

Of the 239 acres comprising the Indian Point site, about two-thirds are currently being used for construction related activities. Following the completion of Indian Point Unit No. 3, the plant area will occupy only 35 acres, approximately 16% of the site. Landscaping and planting have begun in vacated construction areas and will continue as use of other areas for construction is discontinued.

During the next 8 months it is anticipated that the construction of the containment, diesel-generator, waste holdup tank, and fuel handling buildings will be completed; the major mechanical systems (e. g., primary coolant system, engineered safety features, and radwaste systems) will be completed; and the electrical systems including the components in the control room will be nearing completion.

Construction noises are unlikely to disturb the surrounding population since most of the external construction has been completed and the distance to the nearest residential area and the topography of the site make this noise virtually inaudible at these residences.

While some relocation of wildlife has occurred as a result of

construction, approximately one-half of the site peripheral to the construction area remains untouched and thus provides an immediate refuge for the displaced wildlife. This has held to a minimum the actual distance of wildlife relocation and as construction activities are completed and disturbed areas restored wildlife resettlement can be expected.

It is expected that the appearance of the site considering the current advanced state of construction, will change very little during the 8 month period of NEPA review as viewed from the property boundary. In fact, the appearance of the site will become aesthetically more pleasing as the principal structures are completed and final landscaping is completed.

4.0 FORECLOSURE OF ALTERNATIVES DURING THE PERSPECTIVE REVIEW PERIOD

The incremental environmental impact of continued construction of the facility, as discussed above, could be largely redressed by removal of structures and reconstitution of the landscape in the event that the full NEPA review so required; however, reforestation would take decades. Except for the impact of operation, the major adverse environmental impact has already been made. The additional expenditures expected to be made by continuing construction activities during the remainder of the NEPA review period would constitute an increase in investment, but the ongoing construction activities themselves will not result in a substantial increase in this existing environmental impact.

Alternatives that potentially could be affected by continued construction are those related to effluent control measures. These include the environmental impact of routine and accidental radiological releases, thermal effects of releases to the river, and mechanical damage to aquatic life at the intake structure. We have examined each of these areas to determine the alternatives that might be foreclosed as a result of continued construction during the NEPA review period.

Appendix D to 10 CFR Part 50 requires that a cost-benefit analysis of radiological, thermal and other environmental effects be performed by the AEC during the NEPA review and that a conclusion be reached on whether modification or termination of the license is warranted. The radiological effects involve both anticipated low-level releases associated with operation of the plant and with potential releases of radioactivity at somewhat higher levels that could result from an accident.

Routine gaseous and liquid effluent releases will be governed by the limits set forth in 10 CFR Part 20 and the technical specifications to be included in the operating license and Con Ed will be further required to keep radioactive effluents as far below these limits as practicable. This will include meeting numerical guidelines for routine releases comparable to those contained in Proposed Appendix I to the 10 CFR Part 50.

The liquid radwaste treatment system for the plant is designed to be capable of recycling liquid radioactive wastes generated during operation. Blowdown from the steam generators can also be treated. The stated design objectives of the system for liquid effluents are comparable to those of Proposed Appendix I. In addition, construction during the prospective NEPA review period would not preclude any

necessary modifications to piping systems before or after their completion. Modifications requiring additional building space could involve substantial costs but would not be precluded.

The gaseous radwaste treatment system is presently designed to allow a 45 day holdup. The option of inclusion of additional holdup or treatment capability has been preserved by providing space and piping connections.

We conclude that modifications to the liquid and gaseous radwaste system would not be precluded by continued construction. There is reasonable assurance that a plant under construction can be modified to incorporate any radwaste treatment systems found necessary to restrict environmental release of radioactive waste to levels on the order of those specified in Proposed Appendix I, including the addition of building space if required.

The probability of occurrence of accidents and the spectrum of their consequences to be considered from an environmental effects standpoint will be analyzed using best estimates of probabilities and realistic fission product release and transport assumptions rather than the extremely conservative assumptions used in site evaluation and in our safety review for the purpose of comparing calculated doses resulting from hypothetical release of fission products from the fuel,

against the 10 CFR Part 100 siting guidelines. The computed doses that would be received by the population and environment from actual accidents would be significantly less than those presented in our Indian Point Unit No. 3 Safety Evaluation^{1/}. Although the environmental effects of radiological accidents are anticipated to be small, if further reduction in postulated accidental releases is required as a result of the full NEPA review, additional engineered safety systems could be added. For example, space is available for the inclusion of supplemental containment air cleanup systems. Operating parameters also could be adjusted, at some extra dollar cost, to reduce further the environmental impact of postulated accidental releases.

In any event, operation of the plant will be required to be such that the environmental impact of postulated accidental releases will be within Commission guidelines. We conclude that alternatives related to mitigation of accident consequences would not be precluded by the continuation of construction during the prospective review period.

With regard to thermal effects, since the intake structure and discharge canal have already been completed and all that remains to be

^{1/} Safety Evaluation by the Division of Reactor Licensing, U. S. Atomic Energy Commission in the matter of Consolidated Edison Company of New York, Inc., Indian Point Nuclear Generating Unit No. 3, Docket No. 50-286, February 20, 1969, pages 42-45.

accomplished to complete construction of the condenser cooling water system is the installation of the circulating water pumps, continued construction of the system would not further affect any potential alternatives. The incremental additional dollar cost to complete the system is very small when considered against the significant additional dollar cost that would be incurred if a different cooling method were required as a result of the NEPA review. No alternatives would be further foreclosed by continued construction from the standpoint of technical feasibility. With regard to fish protection, since construction of the intake and discharge structures has been already completed, again no alternatives would be further foreclosed.

In summary, no alternatives would be foreclosed by continued construction from the standpoint of technical feasibility.

5.0 EFFECT OF DELAY IN CONSTRUCTION

5.1 Need for Power

The need for electric power to be produced by Indian Point Unit No. 3 is evidenced by the power shortages that have plagued the Con Ed service territory for the last few years.

Since 1969, Con Ed has operated with minimum reserves during each of their peak load seasons and numerous times operating at up to 8% voltage reduction with the discontinuance of service to customers in some cases.^{1/}

Thus far in 1971 Con Ed has added 624 megawatts of additional gas turbine capacity and, after re-rating some of its older units, has a reserve installed on its own system equal to only 9% of the estimated peak load. Con Ed also contracted for 920 megawatts of firm capacity purchases, thus raising the reserve to approximately 17%.^{2/}

This reserve is of the same order of magnitude as those with which Con Ed faced the summers of 1969 and 1970, and again Con Ed has had

^{1/} Consolidated Edison Company of New York, Inc., Statement of Reasons Opposing Suspension of the Indian Point Unit No. 3 Construction Permit Pending NEPA Environmental Review, Oct. 19, 1971, p. 17.

^{2/} Ibid p. 18

to resort to the frequent use of voltage reduction. Through September 30, 1971, Con Ed has reduced voltages on its system on fifteen occasions during the year. Major problems were avoided because forced outages of large units were less than in previous years and there were no prolonged hot spells.^{3/}

For 1972, the estimated peak load and projected installed capacity will provide an anticipated reserve of 21%, assuming that Indian Point Unit No. 2 (nuclear) Bowline Point Unit No. 1 (fossil), and several barge-mounted gas turbines are all on-line as scheduled for summer 1972. It is at this level of anticipated reserve, and greater, that Con Ed has experienced severe difficulties for the past three years.^{4/5/}

The New York State Public Service Commission described the scope of the electricity supply problem in the Con Ed service area in a recent opinion, as follows:

"In the summer of 1971 and, it appears, for a number of summers to come, the New York metropolitan region may be forced to adjust to shortages of electric power

^{3/} Ibid p. 19

^{4/} Loc. cit.

^{5/} Page 3 of attachment to Federal Power Commission letter to James R. Schlesinger, Oct. 15, 1971.

serious enough, at least, to cause inconvenience and, at worst, to weaken the capacity of both the city and its surrounding areas to function."

That statement was written on the assumption that new units planned for service in the period 1972 through 1974 would be available as scheduled. Two such units are the 600 MW fossil-fueled generating units being constructed by Central Hudson Gas and Electric (Roseton Nos. 1 and 2) near Newburgh, New York. The first unit is scheduled for service in the fall of 1972 and the second for the spring of 1973. Con Ed is a joint owner, with a total share of 480 MW.^{6/}

Con Ed anticipates a peak system requirement for 1973 of 8,950 MW. If all the new capacity indicated above should be available, together with firm purchases of 40 MW and additional purchases of 440 MW now being arranged for the summer of 1973, Con Ed anticipated capacity would be 10,685 MW. This leaves a reserve again of less than 20%, essentially the same level of reserve the system has been forced to operate with since the summer of 1969.^{7/}

The estimated peak load for 1974 is 9400 MW. The anticipated installed capacity, assuming that Indian Point Unit No. 3 is on-line, will be 12,370 MW. This includes 400 MW from Con Ed's share of Bowline

^{6/} Consolidated Edison, op. cit., p. 20

^{7/} Ibid, p. 21

Point No. 2, a 600 MW unit scheduled for service in summer 1974 and 800 MW from Con Ed's Astoria No. 6 fossil-fueled generating unit in New York City. This also includes 197 MW of firm purchased capacity for which the Company has negotiated contracts and another 440 MW of firm purchases for which negotiations are now in progress. This would provide a reserve of more than 30% and would represent adequate reserves to prevent a recurrence of the difficulties which have been encountered since 1969 and allow retirement of older, less reliable generating units that contribute heavily to New York City air pollution.^{8/}

5.2 Alternative Sources of Power^{9/}

Construction of other new base load plants is not feasible to meet 1974 requirements. Fossil-fueled plants require an estimated 4 to 6 years to complete and an alternative nuclear power plant would require an even longer time.

Gas turbines that could be installed by 1974, are not long term alternatives for a base load plant such as Indian Point Unit No. 3, however by 1974 Con Ed will have installed on its system over 2300 MW of gas turbines. Approximately 200 MW of this capacity was expressly planned by the Company to serve as emergency start-up and transit

^{8/} Loc. cit.

^{9/} Ibid pp. 27-30.

capacity. The remaining 2100 MW were planned to provide peaking capacities for the early 1970's as compensation for delays already incurred in plants and to replace capacity lost due to equipment deterioration at older plants. Gas turbine capacity beyond that already planned for the system would be required to operate for more hours than would normally be the case for gas turbines intended solely for peaking capacity. There has been little utility operating experience with gas turbines except for peaking service. It is, therefore, difficult to project their expected performance in providing base load capability where they are relied upon for continuous service.

Purchased power as an alternative for Indian Point Unit No. 3 is likewise not feasible for the year 1974. Con Ed already has contracts or commitments for an estimated 197 MW of purchased power for the summer of 1974 and is making arrangements to purchase an additional 440 MW. These purchases have been included in the estimates of installed capacity and reserves that were discussed in the previous section and will be necessary even if Indian Point Unit No. 3 is available. Should Indian Point Unit No. 3 be unavailable, the likelihood of purchasing capacity to replace the 965 MW capacity of that unit appears remote. While Con Ed has indications that power will be

available for purchase during the summer of 1974, the availability of this power is contingent upon the completion of new facilities, nuclear and non-nuclear, scheduled for 1973 or 1974.

Con Ed has in the past made emergency purchases of energy from outside the system. Such purchases and other short duration purchases will probably be available in varying quantities from day to day as load and system conditions of other utilities permit. However, there is no firm assurance that such power would be available when needed to meet emergency load demands.

Some additional power might be available by deferring retirement of older stations. Much of this capacity was installed between forty and fifty-six years ago and was scheduled to be retired prior to 1970 as part of the Company's plans for the 3838 MW of new capacity that is now delayed (Indian Point Units Nos. 2 and 3 and the Cornwall Pumped Storage Project). These plants have become increasingly difficult to maintain and are no longer dependable. They will deteriorate further each additional year that they remain in service, despite continuing maintenance efforts. Accordingly, deferment of retirements would not produce a reliable source of power.

5.3 Economic Cost of Delay

We have examined the Con Ed estimate of costs that might be incurred through suspension of the Indian Point Unit No. 3 construction permit in whole or in part. If the permit were to be suspended in its entirety pending completion of the NEPA review, Con Ed has stated that an increase in costs as a result of a 6-month delay in construction would be \$1.35 million per month.^{10/} The AEC's Division of Construction has independently reviewed these delay costs and has concluded that the estimate by the applicant of the overall increase in costs associated with such a delay in Indian Point Unit No. 3 falls within the general range of what could be expected. These costs include suspension of physical site activities including the layoff and rehiring of the construction workers, field construction standby charges, engineering and home office work, contingencies, taxes, insurance, owners staffing, administration, training and overhead, and interest. The cost of replacement power during this 6-month period is estimated at \$24 million.^{11/} Escalation would increase these costs by \$300,000 per month if the delay were beyond 6 months.

^{10/} Ibid, p.32.

^{11/} Loc. cit.

6.0 DETERMINATION AND BALANCING OF FACTORS

Pursuant to Section E of Appendix D to 10 CFR Part 50, we have taken into consideration the following factors in making a determination regarding the suspension of the construction permit for the Indian Point Unit No. 3 plant pending completion of the NEPA environmental review:

- 6.1 It is not likely that the construction activities to be conducted during the period that the NEPA review is being completed will give rise to an incremental impact on the environment that is substantial and unduly adverse. As discussed in Section 3.0 above, the environmental effects are those associated with construction rather than operation of the plant. The environmental costs of construction, those associated with the change of the site from its former undeveloped state already have been incurred. Continued construction will render this site aesthetically more acceptable. Redress of such environmental impact as might result from further construction could be achieved by removal of above-grade structures and reconstitution of the landscape.
- 6.2 Continued construction during the prospective NEPA review period would not foreclose subsequent adoption of alternatives to currently proposed design features from the standpoint of technical feasibility. As compared to substantial additional dollar costs that might be incurred if major

modifications were required at the end of the NEPA review, the incremental cost of continuing construction is very small. As discussed in Section 4.0 above, flexibility in system performance specifications has been preserved in the area of treatment of radioactive wastes and installation of additional accident mitigating features should improvements in these areas prove necessary as a result of the NEPA review. A change in the type of cooling facility would be more difficult, involving substantial costs, but this would be technically feasible.

- 6.3 The effects of suspension of the construction permit would be substantial. Increased construction and interest cost would result from stoppage and later resumption of construction. As discussed in Section 5.3 above, the cost of construction stoppage alone for 6 months has been estimated at about \$8 million.

It has been estimated that an additional cash outlay of \$24 million would be necessary for the purchase of replacement power and an additional \$300,000 per month if the delay is longer than 6 months. Parts of this expenditure conceivably could influence a later decision whether to require major modification to the plant. However, as discussed previously, major modifications are not likely to be required based on present information. For example, it appears unlikely that the site would have to be abandoned as a result of the NEPA review. We conclude that the large certain cost of delay (at least \$8,000,000)

outweighs the unlikely possibility that expenditures during the period of continued construction will affect substantially a subsequent decision regarding modification of the facility to reduce environmental impact.

After balancing the factors described as to environmental impact of continued construction and the potential for foreclosure of alternatives as a result of further construction against the effect of delay costs, we conclude that the construction permit for the Indian Point Unit No. 3 should not be suspended pending completion of the ongoing NEPA review.

Pending completion of the full NEPA review, Con Ed, the holder of Construction Permit No. CPPR-62, proceeds with construction at its own risk. The discussion and findings herein do not preclude the AEC as a result of its ongoing NEPA environmental review from continuing, modifying, or terminating the construction permit or its appropriate conditioning to protect environmental values.