· · · * [] [

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

'89 JUL -7 A11:16

COMMISSIONERS:

In the Matter of

Kenneth M. Carr, Chairman Thomas M. Roberts Kenneth C. Rogers James R. Curtiss DOCKI BRANCH

SERVED JUL - 7 1983

PHILADELPHIA ELECTRIC COMPANY

(Limerick Generating Station, Units 1 and 2) Docket Nos. 50-352-0L-2 50-353-0L-2 (Severe Accident Mitigation Design Alternatives)

MEMORANDUM AND ORDER

CLI-89-10

Pending before the Commission is the motion of applicant Philadelphia Electric Company ("PECO") for clarification of the licensing status of the Limerick Generating Station, Unit 2. In its motion, PECO requests that the Commission authorize the NRC staff to grant low power and full power operating licenses for Limerick Unit 2 pending completion of an ongoing adjudicatory proceeding. That proceeding was convened by the Commission in response to a recent decision by the United States Court of Appeals for the Third Circuit ordering the agency to consider, in the context of the National Environmental Policy Act ("NEPA"), certain severe accident mitigation design alternatives ("SAMDAs") for the Limerick facility.

For the reasons stated herein, we find that licensing authorization can be granted for low power operation pending completion of a hearing on the impacts

8907200045 890707 PDR ADOCK 05000352 PDR

1502

of SAMDAs for mitigating severe accidents. Under the circumstances here, the Atomic Safety and Licensing Board's authorization for full power operation of Limerick Unit 2, LBP-85-25, 22 NRC 101, 116 (1985), and the existing final environmental impact statement ("FES") for the Limerick facility, NUREG-0974 (Apr. 1984), without further supplementation, adequately support issuance of a low power license once necessary NRC staff safety findings have been made. Low power operation carries with it a much lower risk than full power of the type of severe accident that the SAMDAs being addressed are intended to mitigate. Moreover, a cost/benefit analysis for low power operation reveals that the benefits far outweigh the minimal environmental costs that may be involved and, in any event, establishes that low power operation will not foreclose the adoption of any of the SAMDAs at issue. Accordingly, the NRC staff, upon making the appropriate findings pursuant to 10 C.F.R. § 50.£7, may issue a low power license.

Finally, because in this instance a determination regarding full power authorization is one properly to be made in the context of the Commission's immediate effectiveness review for Limerick Unit 2, we defer ruling upon that issue until we conduct that review in accordance with 10 C.F.R. § 2.764(f)(2).

I. Background

Applicant's motion comes in the wake of the decision by the United States Court of Appeals for the Third Circuit in <u>Limerick Ecology Action v. NRC</u>, 869 F.2d 719 (3d Cir. 1989) (hereinafter cited as <u>LEA</u>). Im <u>LEA</u>, the Third Circuit held that the agency had erred in dismissing a contention by intervenor Limerick Ecology Action ("LEA") that sought to obtain consideration of SAMDAs for the Limerick Generating Station. The court instead declared that as part of its NEPA responsibilities, the Commission had to give consideration to

SAMDAs for the Limerick Generating Station. The court remanded the matter to the agency for further proceedings.¹

In its motion, PECO asserts that the Commission should declare that authority over the issuance of the operating license for Limerick Unit 2 was not delegated to the Licensing Board as result of the Commission's May 5, 1989, order remanding the issue of SAMDA consideration. According to PECO, the Third Circu *'s decision, by its own terms, had no impact upon the effectiveness of the Licensing Board's initial decision authorizing issuance of an operating license for Limerick Unit 2. Moreover, PECO reads the Commission's May 5 order as a determination that the Licensing Board's authorization for issuance of a full power license for Unit 2 remains valid. As a result, PECO concludes, the Commission should direct the NRC staff to issue an operating license once the staff has made the requisite findings under 10 C.F.R. § 50.57. In addition, the applicant requests that the Commission grant an exemption from any applicable regulatory requirements in 10 C.F.R. Part 50 and Part 51 that would be necessary to permit operation perding the outcome of the ongoing remand adjudication.

In its May 5 order, the Commission indicated that further litigation should be limited to those mitigation alternatives identified by the Atomic Safety and Licensing Appeal Board in ALAB-819, 22 NRC 681, 693-94 (1985), as being supported with the required basis and specificity. LEA thus has the same opportunity to obtain consideration of specific SAMDAs as it would have had if

(Footnote Continued on Next Page)

×

¹Although the agency sought rehearing and rehearing en banc of this decision, that request was denied on April 25, 1989. Thereafter, on May 5, 1989, the Commission entered an order that directed the Chairman of the Atomic Safety and Licensing Board Panel to convene a Licensing Board to conduct further proceedings on the issue of SAMDA consideration, consistent with the court's directive.

Intervenor LEA and the Commonwealth of Pennsylvania ("Commonwealth") oppose PECO's motion. They assert that the effect of the Third Circuit's decision was to nullify the authorization granted by the Licensing Board. Moreover, they assert that the Commission's regulations in Part 51 specifically require that the agency must rectify the inadeouacy in its NEPA statement identified by the Third Circuit prior to providing licensing authorization. They also assert that the grant of an exemption from the requirements of Parts 50 and 51 requested by the applicant would be contrary to law and not in the public interest and thus should be denied.

The NRC staff has asserted that case law governing the issuance of judicial stays in instances when an agency may be in violation of NEPA's requirements as well as Commission precedent would permit the agency to authorize operation of Limerick Unit 2 while the agency brings itself into compliance with NEPA and the Third Circuit's order. The NRC staff also suggests that an exemption from several of the agency's NEPA regulations may be necessary prior to authorizing full power operation of Limerick Unit 2, but that an exemption would be authorized by law and would be in the public interest.

In reviewing the positions of the parties, the Commission notes that they have not made any differentiation between operation at low power (<u>i.e.</u>, less than five percent of rated power) and full power operation. For the reasons stated herein, we have chosen to treat these two modes of operation separately.

⁽Footnote Continued From Previous Page)

its SAMDA contention had been fully litigated before the Licensing Board when it was submitted. If LEA now wishes to have other SAMDAs considered, it can do so by satisfying the requirements governing late filed contentions.

II. Low Power Operation

1

The Commission's rules provide that upon application a low power license nay be authorized by a Licensing Board and issued by the NRC staff prior to the completion of the Board's initial decision on full power authorization, 10 C.F.R. § 50.57(c), and that such low power authorization becomes effective without any "immediate effectiveness" review by the Commission, <u>id</u>. § 2.764(f)(2). However, in the event that full power authorization is issued by a Licensing Board prior to any request for low power authorization, that determination normally will be effective to support low power operation if the applicant requests permission from the NRC staff, without review by the Commission. <u>Id</u>. Essentially, a Licensing Board's grant of full power authorization subsumes any need to seek separate Licensing Board authorization for low power operation.

In the unusual circumstances of this case, however, the question arises whether the Licensing Board's decision of July 22, 1985, authorizing an operating license for Limerick Unit 2 should be deemed effective to authorize issuance of a low power license (one for operational testing at less than five percent of rated power) in light of the Third Circuit's action holding that exclusion of LEA's SAMDA contention was unlawful. For the reasons set forth below, the Commission finds that the existing Licensing Board authorization was and is effective to permit issuance of a low power license by the NRC staff once it concludes that all other requirements of 10 C.F.R. § 50.57 have been met.

Neither the Third Circuit, the Commission, nor the Licensing Board has acted (or has received a request to act) to stay or rescind the authorization granted by the Licensing Board for full power operation of the Limerick

facility. Accordingly, as was explained <u>supra</u>, it continues to be a valid authorization for low power operation. And, under the Commission's rules, that authorization as it relates to low power operation is effective without further Commission action.

Moreover, after careful consideration of the Third Circuit's determination, we have found nothing that leads us to conclude that it compels rescission of the Licensing Board authorization's effectiveness as it relates to low power operation. As we explain below, the Third Circuit's decision regarding SAMDA consideration in no way impinges upon the validity of the existing FES as it relates to low power authorization. There thus is no need to intervene to delay the effectiveness of the existing Licensing Board authorization based upon that FES, at least insofar as it authorizes low power operation.²

LEA and the Commonwealth take the position that the court's finding of a NEPA deficiency has invalidated the agency's prior determinations regarding Limerick to the extent that the Licensing Board's initial decision authorizing full power operation is void and no further action can be undertaken until a NEPA supplement is issued by the NRC staff and found sufficient by the Licensing Board. Nonetheless, as the NRC staff points out, the Third Circuit did not take issue with any of the agency's findings on NEPA environmental issues or Atomic Energy Act safety matters save one: its failure to analyze

²The Third Circuit's decision with regard to the Graterford prisoners likewise does not affect the authorization for low power operation since it dealt only with an off-site emergency planning issue, a matter not relevant to low power operation under the Commission's regulations. 10 C.F.R. Part 50, App. E, § I.

under NEPA the additional matter of the alternative of further mitigation of the consequences of severe accidents through certain facility design changes. Left standing by the court are the NRC staff's assessments in the final FES that the risks of a severe accident itself are small, NUREG-0974, at 6-3; that operation of the Limerick generating station would have a minimal environmental impact for full power operation, <u>id</u>. at 6-4; and that for full power operation, there was an overall favorable balance of the benefits of the plant versus the environmental costs that could result, <u>id</u>. Thus, the basic NEPA framework supporting Limerick facility operation, including low power testing, remains in place.³

In the face of an environmental analysis valid in all respects save one, the issue with regard to low power is whether that deficiency is relevant to low power operation or, stated another way, whether the existing FES will support low power operation without further supplementation. The answer to this question, in turn, depends on the degree to which severe accidents, and the SAMDAs that are intended to mitigate such accidents, are implicated in low power operation.

During low power operation, the arready small risk of a severe accident at a boiling water reactor such as the Limerick facility is reduced still more.

³Previously we have observed that in the usual case NEPA does not require any separate environmental analysis of a proposal to issue a low power operating license. Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), CLI-84-9, 19 NRC 1323, 1326 (1984). As an intermediate step to the full power license that has very small impacts of its own, low power operation for NEPA purposes is subsumed in the environmental evaluation for full power cperation. Id, Essentially, it "presents no environmental impacts different ir kind from those considered in an EIS for full power." Id. See also Chomo v. NRC, 772 F.2d 972, 975 (D.C. Cir. 1985).

See 53 Fed. Reg. 36955, 36955 (Sept. 23, 1988); SECY-84-156. Even for those accident sequences that, if unmitigated, could lead to a radioactive release, such as a large break loss of coolant accident, the probability at low power is lower than at full power by a factor of between 1000 and 100, 100, depending upon the event involved, and the consequences are significantly less severe. SECY-84-156, Enclosure 1. This is so because operators have more time available to restore safety systems or take corrective action, because the fission product inventory during the period of low power operation is much less than during full power operation, and because the required capacity for existing mitigation systems on the facility is much reduced. Id.; 53 Fed. Reg. at 36955, 36956. Thus, this additional substantial reduction in what is already acknowledged to be a small risk of severe accidents establishes that the court's requirement for SAMDA consideration is, in the context of low power operation, directed at an insignificant risk. As a consequence, the mandate to consider SAMDAs has no impact upon the validity of the existing NEPA findings in the FES, which fully support low power operation without further supplementation.

Nonetheless, it might be asserted that if low power operation would increase the environmental cost of SAMDA implementation to a degree sufficient to outweigh the benefit of going ahead promptly with low power testing or would otherwise foreclose subsequent SAMDA installation, in the circumstances of the court's remand that might be reason to postpone low power operation. While it is not apparent that an additional formal cost/benefit analysis is necessary for low power operation in this regard, the Commission nonetheless finds after analyzing the circumstances here that these effects will not occur.

On one side of the balance are 1) the occupational exposures due to activation of materials in the reactor coolant system and contamination of reactor coolant surfaces and 2) the possible slight increase of risk to the public that in principle could arise from operation at low power without mitigation alternatives for the short period, as little as three to four weeks, while testing is underway. On the latter point, the parties have presented nothing that suggests that any slightly increased risk to the public over the limited period of time necessary for low power testing warrants any significant expense to reduce the risk. With respect to the issue of occupational exposure, on the basis of the NRC staff's analysis presented in its response to PECO's notice, it appears that after full power operation has begun the refueling outage installation of the SAMDA with the most occupational exposures would result in an incremental exposure of approximately 1352 person-rem.⁴ However, in the case of low power operation, the radioactive contamination and activation of reactor system components during the relatively short duration of operation would result in occupational exposures that would be reduced by at least seventy-five percent.⁵ This would place the incremental exposure

⁵In its affidavit in support of its response to PECO's motion, the NRC staff states that after low power testing, radioactive dose rates would be

(Footnote Continued on Next Page)

⁴In its affidavit in support of its response to PECO's motion, the NRC staff references the installation time estimates for a direct water-cooled bed rubble core retention device, found on page 3-48 of NUREG/CR-4025; the costs of proceeding with installation of that device after full power operation, found on page 3-49; and a dose rate of 40 millirem per hour found to be typical of the drywell diaphragm floor where much of the work on that core retention device would be performed. From these sources, it appears that approximately 33792 person hours would be required for installation, which at 40 millirem per hour results in a total incremental exposure of 1352 person-rem.

relating to SAMDA installation after low power operation at approximately 338 person-rem,⁶ which is comparable to the occupational exposure incurred as a result of other major work performed during a typical boiling water reactor refueling outage.

On the other side of the balance is the cost of delay of at least three to four weeks for full power operation that must be endured if low power testing has not been started when Limerick Unit 2 is ready for full-power startup. PECO apparently will be ready for full power operation of Unit 2 within the next thirty to sixty days and the adjudicatory proceeding on SAMDAs is reasonably likely to extend well beyond that time frame. On the basis of PECO estimates contained in its motion and supporting documents (which LEA and the Commonwealth do not seriously dispute), the cost of a one-month delay in full power operation while low power testing is ongoing could be in excess of forty million dollars.⁷

(Footnote Continued From Previous Page)

⁶Given the average risk of inducing a fatal maligancy of 10⁻⁴ per rem, International Committee on Radiation Protection, Pub. 26, ¶ 60, this corresponds to a .03 premature cancer death in the work force involved.

⁷This would include almost 12 million dollars in increased fuel costs, approximately 30 million dollars allowance for funds used during construction, and approximately five million dollars for operational, security, and maintenance costs.

expected to be lower. The affidavit also states that after the second refueling outage at Limerick Unit 1, which was over one year after the beginning of full power operation, the drywell diaphragm floor dose rate was about 10 millirem per hour. Given the substantially shorter period of time involved for low power testing and the corresponding smaller amount of fission or activation products that would be produced, this 10 millirem per hour figure, which is one quarter of the full power dose rate adopted by the NRC staff, represents a conservative upper boundary for dose rates to be expected as a result of low power operation.

Added to this is the additional risk of serious delay that may result if low power testing is not authorized and thereby precludes the early detection and correction of facility problems. In addition to providing facility operators with the opportunity to become familiar with the plant's operating characteristics, low power testing also provides an opportunity to identify problems in equipment that cannot otherwise be tested except through plant operation at some, albeit low, power level. This is particularly important because it can lead to the identification of problems that may take weeks or months to correct before full power operation would be allowed. In this instance, that could save millions of additional dollars that will be lost if low power testing, and the opportunity to discover and correct problems, is delayed until the completion of the adjudicatory process.

In summary, whether to postpone low power testing prior to completing NEPA consideration of SAMDAs primarily involves balancing costs of delay, which can be reasonably estimated to be tens of millions of dollars, against potential occupational exposures on the order of 338 person-rem in the event that a decision is made to install any particular SAMDA after the reactor has been contaminated by low power operation. This amount of occupational exposure, spread out over work force of appropriate size to assure that NRC limits on individual exposure in 10 C.F.R. Part 20 are not exceeded, is comparable to exposures routinely incurred in the operation of power reactors. <u>See</u> Limerick FES, NUREG-0974, at 5-42. This does not mean that such an exposure is automatically acceptable, but where, as here, eliminating it is likely to cause

delays costing many millions of dollars, the exposure may reasonably be incurred.⁸

Under these circumstances, the balance favors the prompt issuance of a low power authorization for Limerick Unit 2.⁹ Moreover, it is apparent that the low power operation of the facility will not foreclose the adoption of any of the design alternatives that reasonably may be considered as part of the agency's remand proceeding. As both PECO and NRC staff have indicated in their filings, the operation of Limerick Unit 2 would not make physically impossible the implementation of any of the mitigation design alternatives identified by any of the parties for consideration in the remand proceeding. Also, the utility has agreed that for purposes of evaluating any SAMDAs in the remand proceeding, the cost/benefit ratio should be viewed as of the time of initial licensing without egard to any incremental costs that might be associated with the implementation of a SAMDA after operation has begun. Further, based upon the NRC staff's avalysis of the SAMDA with the potential for the most severe

⁸Using as guidance the numerical value of \$1000 per person-rem of averted radiation exposure per NUREG/CR-3568, entitled "A Handbook for Value-Impact Assessment," would indicate that a \$338,000 expenditure would be justified to avoid 338 person-rem of cumulative exposure. A single day of delay in full power operation of a large nuclear plant like Limerick Unit 2 could cost much more than this.

⁹As we have noted, the impact of incremental occupational exposures is small. Also, while the temporary loss of potential incremental environmental benefits of SAMDAs (incremental decreases in the risk of accidents) cannot in the current state of the art of probabilistic risk assessment be precisely quantified, it is clearly small as well since the entire residual risk of operation even at full power is very small, given the Licensing Board's unchallenged finding that Limerick Unit 2 will provide adequate protection of the public health and safety. Therefore, small differences in either side of the cost/benefit balance for any potential SAMDA would not make any difference in the result.

implementation occupational exposures, described <u>supra</u>, such exposures seemingly would not skew the NEPA balancing analysis in such a manner as to foreclose any reasonable alternatives.¹⁰ Thus, low power operation would not act to foreclose any reasonable SAMDA.¹¹

Accordingly, because any SAMDA supplementation resulting from the court's remand is not relevant to authorization of low power operation, which is already supported by the existing FES and the Licensing Board's authorization of an operating license for Limerick Unit 2, and because any cost/benefit analysis of the particulars of Limerick Unit 2 low power operation favors that licensing action, the Commission by way of clarification concludes that the authorization issued by the Licensing Board remains unaltered and effective with respect to low power testing. Moreover, no exemption from any regulatory requirement is necessary for low power operation. Therefore, upon making the necessary findings under 10 C.F.R. § 50.57, the NRC staff may proceed to issue

¹⁰There is the possibility of operational events during low power operation, such as the leakage of contaminated cooling water into the drywell in amounts in excess of regulatory limits, that could increase somewhat the additional expenses involved in later SAMDA implementation. The Commission concludes that there is an insignificant possibility that these events would increase environmental impacts by an amount great enough to tilt the cost/benefit analysis described above decisively in the opposite direction or to foreclose SAMDA implementation.

¹¹Low power operation generally is considered to encompass four phases: 1) fuel loading and precriticality testing; 2) cold-criticality testing; 3) heatup and testing to one percent of rated power; and 4) testing at one to five percent of rated power. In its June 8, 1989 order, the Commission indicated that the NRC staff was permitted to authorize phase 1 operation. In phase 1, there is no radioactive contamination of the reactor core and so no physical foreclosure of any alternative or any environmental cost by way of incremental risk or subsequent occupational exposures. Such operation thus was entirely appropriate under the existing Licensing Board authorization and the FES.

a license for operation of Limerick Unit 2 at power levels not to exceed five percent of rated power and that no exemption from any regulatory requirement for such low power authorization is necessary.

III. Full Power Authorization

In its motion, PECO also requests that the Commission authorize the NRC staff to issue a full power license for Limerick Unit 2. Previously, the Commission allowed the Licensing Board's authorization for staff issuance of a full power license to become effective only for Limerick Unit 1. CLI-85-15, 22 NRC 184 (1985). PECO's request appears to assume that, pursuant to 10 C.F.R. § 2.764, the Commission has completed its immediate effectiveness review of the Licensing Board's determination regarding Limerick Unit 2. This is not the case, however, so that a determination such as PECO requests, which would have the effect of declaring the Licensing Board's full power authorization "effective," is premature.

Consistent with long-standing Commission practice, the Commission will not complete its effectiveness review for Limerick Unit 2 until shortly before Unit 2 is ready for full power operation. It is our current understanding from the NRC staff that Limerick Unit 2 will not be ready for such an effectiveness review for at least thirty days. Prior to that time, however, the Commission may request that the parties address additional questions relating to the

issues raised in PECO's motion in the context of any effectiveness comments they may provide.

It is so ORDERED.



the Complission 12

SAMUEL J. CHILK Secretary of the Commission

Dated at Rockville, Maryland this 1th day of July, 1989.

 $^{^{12}{\}rm Commissioner}$ Roberts was not present for affirmation of this order. If he had been present, he would have approved it.

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

In the Matter of

1

PHILADELPHIA ELECTRIC COMPANY

Docket No. (s) 50-352/353-0L-2

(Limerick Generatino Station. Units 1 and 2)

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing COMMISSION M&D (CLI-89-10) have been served upon the following persons by U.S. mail. first class, except as otherwise noted and in accordance with the requirements of 10 CFR Sec. 2.712.

Administrative Judge Christine N. Kohl. Chairman Atomic Safety and Licensing Appeal Board U.S. Nuclear Repulatory Commission Washington, DC 20555

Administrative Judge Howard A. Wilber Atomic Safety and Licensing Appeal Board U.S. Nuclear Regulatory Commission Washington, DC 20555

Administrative Judge Frederick J. Shon Atomic Safety and Licensing Board Atomic Salety and Licensing Board U.S. Nuclear Repulatory Commission Washington, DC 20555

Joseph Rutberg, Esquire Joseph Rutberg, Esquire Office of the General Counsel U.S. Nuclear Repulatory Commission Washington, DC 20555

Charles W. Ellipt, Espuire Poswistilo. Elliott & Elliott 1101 Northampton Street, Suite 201 Easton, PA 18042

Administrative Judge Barv J. Edles Atomic Safety and Licensing Appeal Board U.S. Nuclear Repulatory Commission Washinoton, DC 20555

Administrative Judge Morton B. Maroulies. Chairman Atomic Safety and Licensing Board U.S. Nuclear Reculatory Commission Washington, DC 20555

Administrative Judge Jerry Harbour U.S. Nuclear Repulatory Commission Washington, DC 20555

Trov B. Conner, Jr., Esouire Conner & Wetterhahn. P.C. 1747 Pennsvlvania Avenue, N.W. Washington, DC 20006

Edward G. Bauer, Jr., Esouire Vice President and General Counsel Philadelphia Electric Company 2301 Merket Street Philadelphia, PA 19101

Docket No. (\$) 50-352/353-0L-2 COMMISSION NOD (CL1-89-10)

Vincent 5. Bover Vice President-Enor. & Res. Philadelphia Electric Company 2301 Market Street Philadelphia, PA 19101

David Stone Limerick Ecoloov Action. Inc. Robert J. Suparman. Esquire P.O. Box 761 101 North Broad Street. 16th Pottstown, PA 19464

Charles E. Rainey. Jr., Esc. Chief Deputy City Splicitor City of Philadelphie 1 Reading Center, Fifth Floor Philadelphia, FA 19107

David Wersan, Esquire Assistant Consumer Advocate Office of Consumer Advocate 1425 Strawberry Souare Harrisburo, PA 17120

Robert L. Anthony Box 186 Movlan, PA 19065

Senior Resident Inspector U.S. Nuclear Repulatory Commission P.D. Box 596 Pottstown, PA 19464

Dated at Rockville. Md. this 7 day of July 1989

Frank R. Romano Chairman Air and Water Pollution Patrol 61 Forest Avenue Ambler. PA 19002

101 North Broad Street, 16th Floor Philadelphia, FA 19107

Michael B. Hirsch, Espuire Federal Emergency Management Agency 500 C Street. S.W. Washington, DC 20472

> Theodore G. Otto, III, Esquire Chief Counsel Pennsvivania Department of Corrections P.O. Box 598 Camp Hill, PA 17011

Gregory E. Dunlap Deputy General Counsel The Commonwealth of Pennsylvania Office of General Counsel 333 Market Street, 17th Floor Harrisburg, PA 17120

atty Henderson Office/of the Secretery of the Commission