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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Limerick Generating Station, Units 1 and 2
Final Environmental Statement-NUREG 0974
Comments on Supplement Dated August 1989

Gentlemen:

As part of its response to the February 28, 1989 decision by the U.S. Court of Appeals for the Third Circuit, the NRC prepared a Supplement to the Final Environmental Statement (FES), NUREG-0974, related to the operation of Limerick Generating Station (LGS), Units 1 and 2. The purpose of this FES Supplement is to present the NRC's evaluation of the alternative of LGS operation with the installation of further severe accident mitigation design features (SAMDAs). This FES Supplement is dated August 1989, and was transmitted to Philadelphia Electric Company (PECo) by letter dated August 16, 1989. The SAMDAs evaluated in the FES Supplement are the following.

1. Dedicated Suppression Pool Cooling

2. Alternate Means of Decay Heat Removal

3. Improved Venting Capability

   A. Anticipated Transients Without Scram (ATWS)-Sized Vent

   B. Decay Heat-Sized Vent with Filter

   C. Decay Heat-Sized Vent without Filter

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4. Core Debris Control

5. Drywell Overpressure/Overtemperature Protection

   A. Drywell Sprays

   B. Drywell Head Flooding

6. Makeup to Reactor Using Low Pressure Diesel-Driven Pump

7. Enhanced Reactor Depressurization Capability

   A. In Conjunction with SAMDA #3B

   B. In Conjunction with SAMDA #4

   C. In Conjunction with SAMDA #5A

   D. In Conjunction with SAMDA #5B

   E. In Conjunction with SAMDA #6

8. Reactor Building Decontamination Factor Improvement

We have reviewed the August, 1989 FES Supplement and agree with its overall finding that there is no clear basis at this time for concluding that modifications to LGS are justified for the purpose of further mitigating severe accident risks, and that the original FES conclusion remains valid. We have found, however, that many of the assumptions used in preparing the August, 1989 FES Supplement appear to be overly conservative and unrealistic, thereby leading to an inaccurate assessment of the potential costs and benefits of the SAMDAs which are evaluated. We consider that all the SAMDAs evaluated can be clearly shown to not be cost beneficial if existing LGS capabilities and Unit 1 operational experience are taken into account. For example, accounting for the existing ability to vent the LGS containments would increase the value of the cost per person-rem cited in the FES Supplement for SAMDAs #2, #3A, #3C, and #6, above the $1,000/person-rem screening criterion. Furthermore, if the existing drywell spray is taken into account in addition to the existing venting capability, SAMDAs #3B, #5A, and #7C would be clearly shown to not be cost beneficial.

We note also that the FES Supplement continues to use accident initiator frequencies which are far too conservative when compared to actual operating experience at LGS Unit 1. Since the commencement of commercial operation in early 1986, Unit 1 has experienced an average of 2.55 turbine trips per year rather than the 8.17 turbine trips per year assumed in the FES Supplement evaluation. By continuing to use the 8.17 value cited in the original FES, the Supplement reflects an unrealistically high overall risk due to this particular initiator.

The evaluations in the FES Supplement include a significant and technically unsupported distinction between high and low pressure Class I accident sequences. We note that such a distinction was not made in the original FES, and this Supplement does not present information concerning the basis for this new distinction. The effectiveness of some of the SAMDAs evaluated in the FES Supplement, particularly SAMDAs #7A through #7F, is strongly affected by the consideration of the distinction between high and low pressure accident sequences and the apparent assumption in the FES Supplement that there is a high likelihood of early containment failure associated with high pressure Class I accident sequences. Until the bases for distinguishing between high and low pressure Class I accident sequences can be reviewed and evaluated, we are unable to assess the validity of this distinction and the corresponding assumption of early containment failure.

We also note that the total person-rem value cited throughout the FES Supplement, particularly in Tables 2, 3, and 5, is in error. Since the total person-rem is overestimated, the benefits cited in the FES Supplement due to SAMDA-reduced doses are also overestimated. FES Supplement Table 2 is based on the original FES which is also in error. The original FES Table H.4 describes the I-T/$\overline{LGT}$ category as used from the LGS Probabilistic Risk Assessment (PRA) radionuclide releases. The original FES Table 5.11c reports for category I-T/$\overline{LGT}$, the fraction of cesium released as 0.1. Table 3.6.5 of the original LGS PRA reported a cesium release fraction of 9.8E-2, but this value was corrected in the September, 1982 Revision 5 of the PRA to 9.8 E-3. The amount of cesium assumed to be released for the I-T/$\overline{LGT}$ category in both the original FES and its Supplement is therefore a factor of 10 too high. Correcting this error would reduce the total person-rem by about 40% for Class I accident sequences.

With regard to ATWS events, the FES Supplement contains statements that there are analyses which predict ATWS power level as high as 30% of full power for some scenarios, while our analysis of the benefit of a containment vent to mitigate an ATWS event assumes a power level of 10% of full power. Our updated PRA shows that over 90% of the ATWS sequences are associated with successful injection of boron into the reactor vessel and reactor vessel depressurization. Core damage is then assumed to result from overfilling the reactor vessel thereby causing reactor power to increase to 10% or less of full power. Furthermore, our PRA shows that boron injection into the reactor vessel is unsuccessful in less than 5% of the ATWS sequences. Thus, the ATWS sequence described in the FES Supplement, which results in 30% of full power should, in fact, have minimal impact on the ATWS vent SAMDA. In a related matter, credit is given in the FES Supplement to the ATWS vent SAMDA for the reduction in the principal source of early fatalities. Our analysis shows that the principal source of early fatalities will be a seismic induced accident sequence, which would not be mitigated by an ATWS vent SAMDA.

In addition to the foregoing, we are providing the following specific comments on a number of SAMDAs evaluated in the FES Supplement.

- SAMDA #2 is identified in Table 4 of the FES Supplement as reducing overpressure challenges for Class III accident sequences. This reference should instead be to Class II accident sequences.

- SAMDA #3A is described in the FES Supplement as passive. Our corresponding SAMDA (i.e., ATWS clean steam vent) uses two normally closed air-operated valves in series to maintain containment isolation.

- SAMDA #3B is incorrectly described on page 9 of the FES Supplement as not effective for containment bypass sequences. We note that Table 4 of the FES Supplement correctly describes the advantages and disadvantages of this SAMDA.

- The FES Supplement discussion of SAMDA #4 does not identify the need to bore an eight foot hole in the Reactor Building basemat in order to install this SAMDA.

- As described in the FES Supplement, SAMDA #5B would be implemented by leaving a blind flange in place in the Heating, Ventilation, and Air Conditioning (HVAC) ducting above the drywell head during normal operation (i.e., this flange is now only installed during refueling operations). The FES Supplement evaluation fails to consider, however, that installation of this flange during normal operation would violate the requirement to maintain this portion of secondary containment at a pressure of negative 1/4 inch water gauge.

If you have any questions, or require additional information please contact us.

G. A. Hunger, Jr.

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Director
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cc: W. T. Russell, Administrator, Region I, USNRC
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