UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 84 TO FACILITY OPERATING LICENSE NO. NPF-58

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY, ET AL.

PERRY NUCLEAR POWER PLANT, UNIT NO. 1

DOCKET NO. 50-440

1.0 INTRODUCTION

On February 27, 1996, The Cleveland Electric Illuminating Company, the licensee for the Perry Nuclear Power Plant, Unit 1 (PNPP), submitted a license amendment request for NRC review and approval. The license amendment would allow the drywell personnel airlock shield doors to be open for limited time periods during plant startup and shutdown. The opening of these doors during these periods is required in order to perform various activities such as adjustments of equipment, inspection of pipe and valve leaks, etc. at various reactor pressure vessel (RPV) pressures and power levels. During normal plant operation, these doors are closed and their design is based on this condition. With the doors in the open position, their supporting systems under the transitional operating condition are potentially subjected to loadings for which they are not designed. The license amendment involves Updated Safety Analysis Report (USAR) changes which summarize the analyses for such a condition and justify plant operation in this condition for one cycle until the sixth refueling outage.

The March 1, 1996, supplemental letter provided additional information and did not change the original no significant hazards consideration determination published in the Federal Register on March 6, 1996 (61 FR 8982).

2.0 EVALUATION

The dimensions of the two concrete-filled steel shield doors are 12 feet high, 42 inches thick, and 9 feet 9 inches wide and each door weighs about 31 tons. The doors are supported through attachment plates and wheel assemblies on a monorail which in turn is supported through steel brackets and tie rods to steel beams which support a platform where equipment and components important to safety are located. In the closed position, the doors are above a concrete ledge of about 42 inches in width. Therefore, the doors are flush with the concrete ledge and are not subjected to the direct impact of pool swell loads.

According to the information provided by the licensee, the platform and the shield door support systems were designed in accordance with the criteria contained in Standard Review Plan (SRP) Section 3.8.3 taking into consideration all loads and load combinations including any applicable hydrodynamic loads. However, because the doors were assumed to be closed, no hydrodynamic loads on the doors or through the doors to their supporting

system were considered in the design. By using the original design basis criteria and taking the shield doors in open position into consideration, the licensee performed detailed analyses and found that a number of the structural members of the door supporting system are subjected to stresses beyond design basis allowables.

Since the shield doors would be in the open position for a short time and there is an appreciable margin of safety in the design of the shield door supporting structures, the licensee established two Functional Evaluation Criteria, one for the monorail and shield door system and the other for the platform system. The basic differences between the two are: (1) for seismic design, the Newmark Inelastic Response Spectra are used for the monorail and the shield door system and the seismic loads thus obtained are applied to the platform system; for the platform system itself design basis elastic response spectra are applied, (2) load combinations involving earthquakes are combined by square- root-of-sum-of-squares (SRSS) for the monorail and shield door system and the simple summation is used for the platform system. For the load combinations involving Operating Basis Earthquake (OBE), the allowable stress is the yield stress instead of 0.6 yield stress for both systems; for the monorail and shield door system, Safety Relief Valve (SRV) loads are combined with OBE loads and there are no combinations involving both Safe Shutdown Earthquake (SSE) loads and pool swell loads. However, for the platform system the design basis load combinations are used, that is, the SSE and pool swell loads are combined by direct summation, and (3) for computing the required section strength for the monorail and the shield door systems using the plastic section modulus (Z), 90 % of Z is applied; but for the platform system no such modification is used.

On the basis of the Functional Evaluation Criteria as summarized above, the licensee performed an evaluation of the functionality of the platform system, the monorail and the shield door system and concluded that these systems can meet the criteria as established. The platform will continue to provide support to systems, structures and components important to safety.
The potential failure of some of the tie rods in the shield door support system is assumed, but it would not lead to the doors falling.
However, the originally licensed margin of safety is reduced to some extent. The change, having the shield doors in the open position during plant startup and shutdown, is a departure from the licensed operating condition. In the USAR changes, the licensee summarizes its analyses and their results as delineated above. The USAR amendment states that these analyses are only applicable through plant operational cycle 6 and a long-term resolution of the issue is required to be completed prior to restart from the sixth refueling outage.

The licensee's functional evaluation criteria indicate that the difference between these criteria and the original design basis criteria is a reduction in the margin of safety. The reduction is made so that it is less in the platform system than in the monorail and shield door system, since the platform system supports not only the shield doors but also other systems, structures and components important to safety. The reduction of the margin of safety is accomplished by decreasing the effect of load application either by eliminating a dynamic load or combining the dynamic loads by SRSS, and/or by

increasing the allowable stresses. For the platform system, only the allowable stress is increased. For the monorail and the shield door system, the reduction is accomplished both by decreasing the effect of load application as well as increasing the allowable stress. All of these analyses are based on the premise that there are appreciable margins of safety in the original design of these structural systems and the probability of simultaneous occurrences of the SSE and the hydrodynamic loads is very low. This is judgmental and there is some uncertainty in the size of the margins; however, NUREG-0484 Rev. 1, "Methodology for Combining Dynamic Responses," dated May 1980 provides a basis for using the SRSS combination method. The probability of an SSE occurring during the short time that the doors would be open is extremely low. Accordingly, by limiting the reliance on this analysis only for plant start-up and shutdown through the plant operational cycle 6, the effect of the uncertainty associated with the size of the margin is greatly reduced.

On the basis of the above review and evaluation, the staff finds that the license amendment request with respect to the analyses of the drywell personnel airlock shield door in the open position is acceptable during plant start-up and shutdown through operational cycle 6. The licensee is committed to a long-term resolution of the issue which is to be completed prior to the restart from the six refueling outage. An action plan concerning the long-term resolution should be submitted for staff review as soon as practical. It should be noted that the staff has not accepted the use of the Newmark's Inelastic Response Spectra in granting this amendment, and it should not be used in the long-term resolution.

3.0 EXIGENT CIRCUMSTANCES

The need for a license amendment became apparent on February 9, 1996, when the licensee determined that opening the drywell shield doors at power was a condition outside the original design basis of the facility. The licensee met with the staff on February 15, 1996, completed engineering analyses, and submitted the request for license amendment on February 27, 1996. Plant startup from the current refueling outage is scheduled for March 25, 1996. The license amendment is needed prior to that date to avoid delaying plant startup; therefore, the NRC staff finds that exigent circumstances exist in that time does not allow publication of a notice allowing 30 days for prior public comments.

The NRC staff has reviewed the circumstances surrounding the amendment request, and finds that the circumstances could not have been avoided and the licensee made a timely request for amendment. Therefore, the staff finds that the license amendment may be issued in an exigent manner.

4.0 BASIS FOR FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

As required by 10 CFR 50.91(a), the licensee has provided its analysis of the issue of no significant hazards consideration. The NRC staff has reviewed the licensee's analysis against the standards of 10 CFR 50.92(c). The staff's review is presented below.

The amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated because even if the 3/4 inch tie rod, which provides lateral stability, and the left support bracket, a vertical load bearing member, were assumed to be failed, then the drywell shield doors would still remain in an upright position and not fall. Also, structural members of the 620-6 platform were found to be functional such that the various supported systems and components will remain operable or functional as appropriate. In addition, opening the doors during power operation will have no effect on the postulated accident source term, and the shield doors do not provide a barrier against fission products.

The amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated because plant operation is not being changed and structural integrity of the drywell shield doors including supports was considered in the original design.

The amendment does not involve a significant reduction in a margin of safety because the shield doors supporting structure remains functional with margin such that even assuming failure of the 3/4-inch tie rod and the left support bracket, the shield doors will not fall. While there is some reduction in the margin of safety, it will not be significant. In addition, having open shield doors during power operation does not affect the radiological bases as described in the Technical Specifications, and offsite radiation doses to the public are not increased.

Based on this review, the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has determined that the amendment request involves no significant hazards consideration.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Ohio State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or a change to a surveillance requirement. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission made a final no

significant hazards consideration determination with respect to this amendment. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

7.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: March 22, 1996