

Lew W. Myers  
Vice President

216-280-5915  
Fax: 216-280-8029

September 3, 1998  
PY-CEI/NRR-2298

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Perry Nuclear Power Plant  
Docket No. 50-440  
License Amendment Request Pursuant to 10CFR50.90: Revision of the Division 3 Diesel  
Generator Fuel Oil Level Requirements

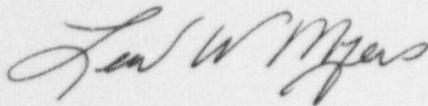
Ladies and Gentlemen:

Nuclear Regulatory Commission review and approval of a license amendment for the  
Perry Nuclear Power Plant (PNPP) is requested pursuant to 10CFR50.90. The proposed  
license amendment request increases the present Division 3 Diesel Generator fuel oil  
level requirements to account for (1) a rounding error in the calculation, and (2) the  
unusable volume due to vortex formation at the eductor suction nozzles located in the  
fuel oil storage tank.

Attachment 1 provides the Summary, a Description of the Proposed Technical  
Specification Change, a Safety Analysis, and an Environmental Consideration.  
Attachment 2 provides the Significant Hazards Consideration. Attachment 3 provides the  
annotated Technical Specification pages reflecting the proposed change.

If you have questions or require additional information, please contact Mr. Henry L.  
Hegrat, Manager - Regulatory Affairs, at (440) 280-5606.

Very truly yours,



Attachments

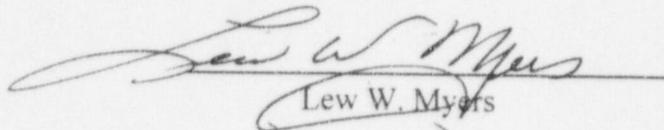
cc: NRC Project Manager  
NRC Resident Inspector  
NRC Region III  
State of Ohio

9809150048 980903  
PDR ADOCK 05000440  
P PDR

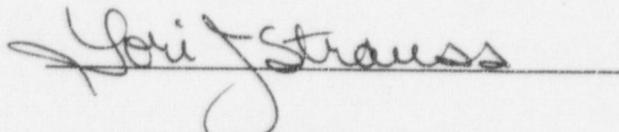
11  
ADD 1

INTR. BOND

I, Lew W. Myers, being duly sworn state that (1) I am Vice President - Nuclear, of the Centerior Service Company, (2) I am duly authorized to execute and file this certification on behalf of The Cleveland Electric Illuminating Company and Toledo Edison Company, and as the duly authorized agent for Duquesne Light Company, Ohio Edison Company, and Pennsylvania Power Company, and (3) the statements set forth herein are true and correct to the best of my knowledge, information and belief.

  
Lew W. Myers

Sworn to and subscribed before me, the 3rd day of September, 1998.



LORI J. STRAUSS  
Notary Public, State of Ohio  
My Commission Expires 3/24/2003

## SUMMARY

This proposed change request involves a revision to the Perry Nuclear Power Plant (PNPP) Technical Specifications (TS), Limiting Condition for Operation (LCO) 3.8.3, Action A and Surveillance Requirement (SR) 3.8.3.1. Specifically, this change revises the Division 3 Diesel Generator (DG) 7-day fuel oil supply requirement from 36,100 gallons to 36,700 gallons and the 6-day fuel oil supply requirement from 31,500 gallons to 32,000 gallons.

These requirements are being revised due to a discrepancy identified in the associated Mechanical Design Calculation (Reference 1). The calculation was revised (1) to correct a rounding error, and (2) to consider vortex formation near the eductor suction nozzle located near the bottom of the fuel oil storage tank. The revised calculation and associated TS requirement revision ensures a sufficient fuel oil volume to maintain submergence of the eductor suction nozzle so that vortex formation would not occur during the required 7-day DG operation. In addition, the revised calculation and associated TS requirement revision continues to maintain a minimum fuel oil inventory based upon the DG operating continuously for 7 days at rated capacity. This is consistent with Section 5.4 of ANS-59.51/ANSI N195-1976 (Reference 2).

## DESCRIPTION OF THE PROPOSED TECHNICAL SPECIFICATION CHANGE

This proposed change revises the present Division 3 DG fuel oil level supply requirements to account for an unusable volume due to vortex formation of the eductor suction nozzles located near the bottom of the fuel oil storage tank. Specifically, Condition A of Limiting Condition for Operation (LCO) 3.8.3, "Diesel Fuel Oil, Lube Oil, and Starting Air" and Surveillance Requirement (SR) 3.8.3.1 were modified to revise the fuel oil level limits.

Condition A was revised to denote:

"2. For Div 3, < 36,700 gal and  $\geq$  32,000 gal."

SR 3.8.3.1 was revised to denote:

"b.  $\geq$  36,700 gal of fuel for Div 3 DG."

The annotated pages for the proposed change to Condition A and SR 3.8.3.1 are provided in Attachment 3. No TS Bases changes are necessary to support this proposed change.

## SAFETY ANALYSIS

The Division 3 DG is provided with a storage tank having a fuel oil capacity of 39,375 gallons. The DG fuel oil tank is designed to provide the capacity of fuel oil necessary to operate the DG for a period of 7 days while supplying maximum post loss-of-coolant accident load demand. The 7-day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location.

The DG fuel oil tank inventory requirements are provided in SR 3.8.3.1 and Action A of LCO 3.8.3. SR 3.8.3.1 provides verification of the 7-day supply requirement. The current TS 7-day supply requirement is  $\geq 36,100$  gallons. Action A of LCO 3.8.3 provides the designated Conditions which restricts the fuel oil level reduction between a 7-day supply and a 6-day supply requirement. The current TS restriction for Division 3 is  $< 36,100$  gallons and  $\geq 31,500$  gallons.

During an NRC inspection conducted from February 23 through March 5, 1998, a discrepancy was identified between Mechanical Design Calculation R45-09 Revision 4 (Reference 1) and TS LCO 3.8.3 for the Division 3 DG fuel oil storage tank 7-day supply requirement. The discrepancy involved a rounding error in the calculation. The calculated 7-day supply requirement of 36,140 gallons (Reference 1) had been non-conservatively rounded down to 36,100 gallons and used as a limit to support the 7-day supply requirement specified in LCO 3.8.3.

During the ensuing investigation and resolution of the discrepancy, PNPP discovered that the calculation did not consider vortex formation near the eductor suction nozzle located near the bottom of the fuel oil storage tank. Vortex formation occurs as the level in the tank drains down to near the top of the suction nozzle producing a swirling effect of the liquid. Due to this swirling effect, air begins to be introduced into the suction piping impairing the fuel transfer system capability. This condition would occur before the fuel level reached the top of the suction nozzle piping, thereby reducing the usable volume of the fuel oil. At the current TS limit, the potential exists that vortex formation could occur and the DG would exhaust its fuel supply after 6 days and 21.5 hours instead of the TS requirement of 7 days.

To overcome the effects of vortex formation, an additional depth of fuel oil is required to be maintained. The subsequent calculation determined that the required 7-day supply requirement should be 36,700 gallons, replacing the current TS value of 36,100 gallons. In addition, the required 6-day supply requirement should be 32,000 gallons, replacing the current TS value of 31,500 gallons. The revised calculation and associated TS requirement revision ensures a sufficient fuel oil volume to maintain submergence of the eductor suction nozzle so that vortex formation does not occur. In addition, the revised calculation and associated TS requirement revision continues to maintain a minimum fuel oil inventory based upon the DG operating continuously for 7 days at rated capacity. This is consistent with Section 5.4 of ANS-59.51/ANSI N195-1976 (Reference 2).

Similar concerns were investigated on the Division 1 and Division 2 DGs. However, the proposed change request only addresses the Division 3 DG since the Division 1 and Division 2 DG TS limits had sufficient margins in the calculations.

### **REFERENCES**

1. Mechanical Design Calculation, R45-9, Revision 4.
2. ANS-59.51/ANSI N195-1976, "Fuel Oil Systems for Standby Diesel-Generators."

### **ENVIRONMENTAL CONSIDERATION**

The proposed Technical Specification change request was evaluated against the criteria of 10CFR51.22 for environmental considerations. The proposed change does not significantly increase individual or cumulative occupational radiation exposures, does not significantly change the types or significantly increase the amount of effluents that may be released off-site and, as discussed in Attachment 2, does not involve a significant hazards consideration. Based on the foregoing, it has been concluded that the proposed Technical Specification change meets the criteria given in 10CFR51.22(c)(9) for categorical exclusion from the requirement for an Environmental Impact Statement.

### **COMMITMENTS WITHIN THIS LETTER**

There are no regulatory commitments contained in this letter. Any actions discussed in this document represents intended or planned actions, are described for the NRC's information, and are not regulatory commitments. Please notify the Manager - Regulatory Affairs at the Perry Nuclear Power Plant of any questions regarding this document or any associated regulatory commitments.

### SIGNIFICANT HAZARDS CONSIDERATION

The standards used to arrive at a determination that a request for amendment involves no significant hazards considerations are included in the Commission's Regulation, 10CFR50.92, which states that the operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

The proposed amendment has been reviewed with respect to these three factors and it has been determined that the proposed change does not involve a significant hazard because:

- (1) The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed change revises the Division 3 Diesel Generator (DG) 7-day fuel oil supply requirement and the 6-day fuel oil supply requirement due to a rounding error in the calculation and due to the consideration of vortex formation near the eductor suction nozzle located near the bottom of the fuel oil storage tank. The proposed change ensures a sufficient DG fuel oil volume to maintain submergence of the eductor suction nozzle so that a vortex formation does not occur. Eliminating the concerns of a vortex formation will provide assurance that the DG fuel oil system will perform its intended function. Analyzed events are initiated by the failure of plant structures, systems, or components. The DGs are not considered as initiators of any analyzed event. The proposed change does not have a detrimental impact on the integrity of any plant structure, system, or component that initiates an analyzed event. The proposed change will not alter the operation of, or otherwise increase its failure probability of any plant equipment that initiates an analyzed event. As such, the probability of occurrence for a previously analyzed accident is not significantly increased.

The consequences of a previously analyzed event are dependent on the initial conditions assumed for the analysis, the availability and successful functioning of the equipment assumed to operate in response to the analyzed event, and the setpoints at which these actions are initiated. The proposed change ensures a sufficient DG fuel oil volume to maintain submergence of the eductor suction nozzle so that a vortex formation does not occur. The proposed change continues to ensure that the DG fuel oil system will adequately support the design basis performance and mitigative function of the DG. The proposed change does not affect the performance of any credited equipment. As a result, no analyses assumptions are violated and there are no adverse effects on the factors that contribute to offsite or onsite dose as the result of an accident. The proposed change does not affect setpoints that initiate protective or mitigative actions. The proposed change ensures that plant structures, systems, or components are maintained consistent with the safety analysis and licensing bases. Based on this evaluation, there is no significant increase in the consequences of a previously analyzed event.

Therefore, this change will not involve a significant increase in the probability or consequences of any accident previously evaluated.

- (2) The proposed change would not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed change revises the Division 3 DG 7-day fuel oil supply requirement and the 6-day fuel oil supply requirement due to a rounding error in the calculation and due to the consideration of vortex formation near the eductor suction nozzle located near the bottom of the fuel oil storage tank. The proposed change ensures a sufficient DG fuel oil volume to maintain submergence of the eductor suction nozzle so that a vortex formation does not occur. Eliminating the concerns of a vortex formation will provide assurance that the DG fuel oil system will perform its intended function. The proposed change does not involve a physical change to the DG fuel oil system or tank, nor does it change the operating characteristics or the safety function of the DG. The proposed change does not involve a physical alteration of the plant. No new or different equipment is being installed and no installed equipment, which might initiate a new or different kind of accident, is being operated in a different manner. The proposed change does not impact core reactivity or the manipulation of fuel bundles. The DG performs a mitigative function. There is no alteration to the parameters within which the plant is normally operated or in the setpoints that initiate protective or mitigative actions. As a result no new failure modes are being introduced. There are no changes in the methods governing normal plant operation, nor are the methods utilized to respond to plant transients altered.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

- (3) The proposed change will not involve a significant reduction in the margin of safety.

The margin of safety is established through the design of the plant structures, systems, and components, the parameters within which the plant is operated, and the establishment of the setpoints for the actuation of equipment relied upon to respond to an event. The proposed change revises the Division 3 DG 7-day fuel oil supply requirement and the 6-day fuel oil supply requirement due to a rounding error in the calculation and due to the consideration of vortex formation near the eductor suction nozzle located near the bottom of the fuel oil storage tank. The margin of safety is being maintained by the proposed change from the margin of safety established by the original design. The proposed change ensures a sufficient DG fuel oil volume to maintain submergence of the eductor suction nozzle so that a vortex formation does not occur. Eliminating the concerns of a vortex formation will provide assurance that the DG fuel oil system will perform its intended function. The proposed change does not significantly impact the condition or performance of structures, systems, and components relied upon for accident mitigation. The proposed change, in fact, provides assurance of the DG's ability to perform its intended function as previously evaluated. The proposed change does not significantly impact any safety analysis assumptions or results.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above considerations, it is concluded that a significant hazard would not be introduced as a result of this proposed change. Also, since NRC approval of this change must be obtained prior to implementation, no unreviewed safety question can exist.