



FirstEnergy Nuclear Operating Company

Perry Nuclear Power Plant  
10 Center Road  
Perry, Ohio 44081

Vito A. Kaminskas  
Vice President

440-280-5382  
Fax: 440-280-8029

January 23, 2012  
L-12-016

10 CFR 50.59(d)(2)

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT:  
Perry Nuclear Power Plant  
Docket No. 50-440, License No. NPF-58  
Report of Facility Changes, Tests and Experiments

The FirstEnergy Nuclear Operating Company (FENOC) hereby submits the Report of Facility Changes, Tests and Experiments for the Perry Nuclear Power Plant. The attached report covers the period from the last submittal dated September 8, 2009 to the present.

There are no regulatory commitments contained in this submittal. If there are any questions or if additional information is required, please contact Mr. Phil H. Lashley, Supervisor – Fleet Licensing, at (330) 315-6808.

Sincerely,

Vito A. Kaminskas

Attachment:  
Perry Nuclear Power Plant Report of Facility Changes, Tests and Experiments for the Period September 8, 2009 to the Present

cc: NRC Region III Administrator  
NRC Resident Inspector  
NRR Project Manager

Attachment  
L-12-016

Perry Nuclear Power Plant  
Report of Facility Changes, Tests and Experiments for the Period  
September 8, 2009 to the Present  
Page 1 of 2

Title

Changes to the Structural Design Criteria for the Fuel Handling Building Crane and the Polar Crane

Activity Description

This evaluation addresses the note added to Updated Safety Analysis Report (USAR) Table 3.9-6, "Safety Related Crane Load Combinations and Stress Limits," indicating the "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings," dated 1978, found in the American Institute of Steel Construction (AISC) 8th Edition is used as the basis for the material stress allowable for American Society for Testing and Materials (ASTM) A325 and A490 bolts in the seismic qualification of the fuel handling building (FHB) crane and the reactor building polar crane. This change is based on the design allowable stresses used for A325 and A490 bolts in seismic qualification calculation SQ-0194 (Harnischfeger Report CN-25990) for the FHB crane and equipment qualification reports 4549-32-133 and 4549-32-134 (Harnischfeger Report CN-25588-9, also filed as Attachments 4 and 5 to Calculation 3:36.012) for the polar crane.

The change to USAR Table 3.9-6 resolves an issue related to a seismic qualification calculation performed in 1977 for the FHB crane, which used an allowable stress limit for ASTM A325 and A490 bolts based on an updated 1976 AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts." This is in conflict with USAR Table 3.9-6, "Safety Related Crane Load Combinations and Stress Limits," which specifies the use of the 1969 AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings" (AISC 7th Edition) for seismic design of the crane, including these bolts. The change addresses the same issue for the polar crane equipment qualification report, except the "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings," dated 1978 (AISC 8th Edition), was used for the shear and tension stress allowables for A325 and A490 bolts.

Summary of Evaluation

The USAR described design functions are assessed for potential impact due to the increase in the shear and tension stress allowables for ASTM A325 and A490 bolts used in the seismic qualification analysis of the FHB and polar cranes. The USAR design functions that required evaluation were: the capability to withstand a seismic event without dropping a full rated load, the movement of casked fuel in the FHB, the movement of the reactor head, the movement of reactor vessel internals, and the lifting of other loads over or near spent fuel. The following design requirements associated with these cranes must be met: missile hazard considerations, heavy load lifts per

NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," and natural phenomena and dynamic loadings. Also, the potential to initiate a USAR Chapter 15 accident must be evaluated, including: a radioactive release from a subsystem or component via a fuel handling accident outside containment, a cask drop from a crane, and a fuel handling accident inside containment.

This evaluation concluded the FHB and polar cranes seismic qualification analyses that use the increased stress allowable values for ASTM A325 and A490 bolting found in the "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings," dated 1978 (AISC 8th Edition), are acceptable. While the safety factor of joints using ASTM A325 and A490 bolts has decreased, this is considered an acceptable reduction in excess margin as the stress allowable remains within a safety factor of 2.0 as discussed in the "Guide to Design Criteria for Bolted and Riveted Joints," by Fisher and Struik. Therefore, the FHB crane and the polar cranes remain capable of performing all USAR described design functions since the design of the high strength bolted connections on the FHB crane and the polar crane meet the material stress allowables in an accepted industry standard, the "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings," dated 1978 (AISC 8th Edition). The FHB and polar cranes remain capable of withstanding a seismic event without any loss of design or safety function as a result of this USAR change. The polar crane also remains capable of withstanding hydrodynamic loading concurrent with a seismic event.

The evaluation concluded the seismic qualification analysis of the FHB and polar cranes that uses the increased stress allowable values for ASTM A325 and A490 bolting found in the "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings," dated 1978 (AISC 8th Edition), is not a change to an analysis methodology. The seismic design of the cranes meet the applicable requirements of the AISC 8th Edition using the same methodology used in the existing analyses. The AISC 8th Edition prescribes requirements for the same methodology (elastic or plastic design) used in the 7th Edition, and the AISC 8th Edition does not invalidate or alter the methodology used in the 7th Edition nor does the 8th Edition introduce a new methodology other than those of the AISC 7th Edition. As such, there is no change in methodology used for seismic qualification of the cranes.

This means the use of the AISC 7th or 8th Edition, in its entirety, does not change the calculated stresses found in the FHB and polar crane seismic qualification. Based on the guidance in Nuclear Energy Institute (NEI) 96-07, if the revised analytical results are not changed when compared to the original analytical results, the change in an element of a methodology is acceptable. Since the methodology and the elements of the methodology between these two AISC Editions have not changed or are acceptable under 10 CFR 50.59, and this change is limited to an acceptable change to the high strength bolting material stress allowable, this USAR change is not a departure from a method of evaluation described in the USAR. Therefore, the "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, 1978," may be added to USAR Table 3.9-6, and this change may be implemented without the completion of a license amendment.