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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
Notification of the Intended Use of Lead Test Assemblies

In accordance with NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR II)," the FirstEnergy Nuclear Operating Company (FENOC) is making a notification to the Nuclear Regulatory Commission (NRC) of the intended use of lead test assemblies (LTA) at the Perry Nuclear Power Plant (PNPP).

A letter dated September 23, 1981 from the NRC to the General Electric Company, referenced in GESTAR II, indicates the notification should include a description of the LTAs, a statement of applicability to GESTAR II, the objectives of the LTA program, and an outline of the measurements to be made on the LTAs. The attachment provides this information.

There are no regulatory commitments contained in this submittal. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager - Fleet Licensing, at (330) 761-6071.

Sincerely,

Mark B. Bezilla

Attachment:
Lead Test Assemblies for Use in Perry Nuclear Power Plant Fuel Cycle 14

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

Description of Lead Test Assemblies

Eight lead test assemblies (LTAs) will be loaded into the Perry Nuclear Power Plant (PNPP) during the spring 2011 refueling outage for use in Fuel Cycle 14 and subsequent fuel cycles. The Global Nuclear Fuel – Americas, LLC (GNF) supplied assemblies contain standard GE14 components and fuel, with the exception of the channel. The channels will be manufactured with a distortion-resistant material composed of 1 percent (%) niobium, 1% tin, and 0.35% iron as the primary alloying metals combined with zirconium, and is known as NSF. Similar niobium alloys are commonly used in pressurized water reactors and Russian fuel rods, but not commercially used in boiling water reactors.

The NSF alloy reduces channel bowing and has a much lower sensitivity to cold-work compared to Zircaloy. The mechanical properties of NSF are similar to the standard Zircaloys, and are considered adequate for reactor service. Corrosion performance of NSF is adequate based on visual examination after six years of operation.

The surface condition of these NSF channels has been modified compared to the previous NSF channels irradiated at PNPP[1]. The NSF channels to be inserted in Fuel Cycle 14 will have a pre-oxidized surface condition similar to the pre-oxidized surface condition that was standard on Zircaloy-4 channels prior to 1990. Since that time, GNF transitioned to a different channel design using an etched surface. NSF channel experience (2002 to present) is with an etched surface condition.

Applicability of NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR II)"

GNF has reviewed the properties of the NSF channels relative to the properties of Zircaloy-2 and Zircaloy-4 in the context of required functions, including safety, of fuel channels as described in GESTAR II and NEDE-21354-P, "BWR Fuel Channel Mechanical Design and Deflection," September 1976. GNF has concluded that the use of NSF as a channel material meets the approved criteria of GESTAR II and may be used in an LTA.

[1] PNPP inserted eight LTAs with NSF channels into the core during the winter 2005 refueling outage (Accession Number ML070940683).

Objectives of LTA Program

The objectives of this program are to expand the experience base on NSF channels and to characterize the corrosion performance. Channel distortion will be monitored to confirm the observations already made regarding resistance to channel bow. Standard analyses will be performed to assure that the safety and licensing bases are maintained.

Outline of Measurements

Corrosion performance will be evaluated visually and potentially with a non-destructive system to measure oxide thickness. Distortion measurements will be made during both the first and second outages after inserting the LTAs, and after discharge; or possibly only during the second outage and after discharge. Depending on the observed performance and the potential for long-term application, coupons (material samples from irradiated channels) may be extracted for hotcell examination.