March 28, 2011

Mr. Jack M. Davis
Senior Vice President and Chief Nuclear Officer
Detroit Edison Company
Fermi 2 – 210 NOC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 53 RELATED TO THE SRP SECTION 10.02.03 FOR THE FERMI 3 COMBINED LICENSE APPLICATION

Dear Mr. Davis:

By letter dated September 18, 2008, Detroit Edison Company (Detroit Edison) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U.S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. To support the review schedule, you are requested to respond within 30 days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

If you have any questions or comments concerning this matter, I can be reached at 301-415-8148 or by e-mail at jerry.hale@nrc.gov.

Sincerely,

/RA R. Anand for:/

Jerry Hale, Project Manager
BWR Projects Branch
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 052-033

eRAI Tracking Nos. 5608

Enclosure:
Request for Additional Information

March 28, 2011

Mr. Jack M. Davis
Senior Vice President and Chief Nuclear Officer
Detroit Edison Company
Fermi 2 – 210 NOC
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The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. To support the review schedule, you are requested to respond within 30 days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

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Enclosure:
Request for Additional Information
Distribution:

PUBLIC	NGE 1/2 R/F	SGreen, NRO	MCarpentier, OGC
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OFFICE	NRO/CIB1	NRO/CIB1	OGC	NGE1/PM
NAME	J. Honcharik	M. Norato	M. Carpentier	J. Hale
DATE	3/3/11	3/4/11	3/07/11	2/22/11

***Approval captured electronically in the electronic RAI system.**

OFFICIAL RECORD COPY

Request for Additional Information No. 5608

Fermi Unit 3
Detroit Edison
Docket No. 52-033
SRP Section: 10.02.03 - Turbine Rotor Integrity
Application Section: 10.2.3

QUESTIONS for Component Integrity, Performance, and Testing Branch 2 (ESBWR/ABWR Projects) (CIB2)

10.02.03-1

In a letter dated October 5, 2010, the applicant's response did not fully provide the information requested in RAI 4641, Question 10.02.03-4. Therefore, as requested in RAI 4641, Question 10.02.03-4, provide the operational experience of this turbine material as an integral rotor, which should include how many rotors, units, operating hours, number of defects detected during inspections, rotor failures, etc. to provide a basis of the material to be used. Also, the RAI response stated that "specification B50A373B8 or an equivalent specification with more restrictive chemistry requirements" will be used for the LP rotors. Does the more restrictive chemistry only apply to elements that have deleterious effects on toughness, such as sulfur and phosphorus as stated in NUREG-0800, Section 10.2.3, or does it also apply to the alloying elements? If it applies to the alloying elements, then this equivalent specification should be submitted to the staff for review as outlined in NUREG-0800, Section 10.2.3, Paragraph III.1.

10.02.03-2

In a letter dated October 5, 2010, the applicant's response to RAI 4641, Question 10.02.03-6 stated that a historical Fracture Appearance Transition Temperature (FATT) value was used in the turbine missile analysis. However, ESBWR DCD, Section 10.2.3.1.2 states that the material for the rotors will have a maximum 50% FATT value of +30°F. Therefore, the bounding turbine missile probability analysis (GE-Energy Steam Turbines (GE-ST) report ST-56834/P) should be based on the bounding material properties of the ESBWR DCD (50% FATT value of +30°F) in lieu of historical FATT measurements (50% FATT value of -30°F) currently used in the GE-Energy Steam Turbines (GE-ST) report ST-56834/P. Furthermore, Sections 10.2.3.8 and 10.2.5 of the ESBWR DCD states that the COL applicant will provide the turbine missile probability analysis, and if the actual material properties of the as-built turbine are not available, the bounding material property values should be used. Therefore, since the as-built turbine rotor material properties for Fermi, Unit 3 are not known, GE-Energy Steam Turbines (GE-ST) report ST-56834/P should use the bounding material properties of the ESBWR DCD.

10.02.03-3

In a letter dated October 5, 2010, the applicant's response did not fully provide the information requested in RAI 4641, Question 10.02.03-8, and therefore the following information is requested:

a. Part (b) of the response to RAI 4641, Question 10.02.03-8 does not provide the quantitative information requested about flaw size and detection capability. Rather, it states that volumetric inservice inspection of solid LP rotors is unnecessary. Therefore, as requested in RAI 4641, Question 10.02.03-8, discuss the operating experience of solid rotors, including the effects on material properties and whether current volumetric inspections can detect cracking before they

reach critical size resulting in a turbine missile. Compare the flaw size capability of the volumetric inspections to the average undetected embedded flaw specified in Section 4.2.2.

b. Section 10.2.3.6 of the ESBWR DCD states that volumetric inservice inspection of the rotor will be performed. However, the response to part (b) of the response to RAI 4641, Question 10.02.03-8, states "inservice volumetric inspection of solid nuclear LP rotors is not required to meet the calculations included in the report [GE-Energy Steam Turbines (GE-ST) report ST-56834/P]". Provide an analysis and discussion for a surface flaw that could grow radially inward and cause a rupture of the LP rotor in the locations (other than in the dovetail regions) where an inservice volumetric inspection is not performed. Otherwise, a volumetric inspection of the LP rotor should be included in the turbine inservice inspection program as outlined in NUREG-0800, Section 10.2.3, Paragraph II.5.

10.02.03-4

In a letter dated October 5, 2010, the applicant's response did not fully provide the information requested in RAI 4641, Question 10.02.03-10, and therefore the following information is requested:

a. As requested in RAI 4641, Question 10.02.03-10, provide the tangential stresses at the slot bottoms of axial entry dovetails in Section 4.3 of the GE-Energy Steam Turbines (GE-ST) report ST-56834/P and compare them to the corresponding stresses around the previous shrunk-on-wheel keyways for a similar size turbine to demonstrate that the ESBWR axial entry dovetail slot bottoms feature dramatically lower tangential stresses versus shrunk-on-wheel keyways, and therefore the use of shrunk-on-wheel crack initiation and growth characteristics is considered conservative.

b. Concerning the location of axial entry dovetails, clarify which stages are axial entry dovetails since Sections 10.1.1 and 4.3 of the GE-Energy Steam Turbines (GE-ST) report ST-56834/P identifies different stages that are axial entry dovetails.

c. Provide operating experience with shot-peening of a rotor which demonstrates that compressive stresses are created and increases initiation time for this material and geometry.

10.02.03-5

In a letter dated October 5, 2010, the applicant's response to RAI 4641, Question 10.02.03-11 provided information concerning valve testing. However, the following additional information is requested to clarify the response:

a. The RAI response to RAI 4641, Question 10.02.03-11(c) provides a figure (graph) with no scale for the x and y axis on the graph. Please provide the appropriate numbers for the graph. Also, please clarify and discuss the following statement:

> "The percentage of the updated failure rates that are associated with a valve test frequency of 120 days cannot be determined at this time as there is no data that has been collected with this longer test frequency interval. Assessment of the valve failure data indicates that there are no factors that would prevent the extrapolation of the data to the longer test frequency interval and when assessed against the missile probability analysis the risk resulting from the longer test frequency was considered conservative."

b. The RAI response to RAI 4641, Question 10.02.03-11(d) states that no additional data has been collected. Does this statement mean there was no operating experience for these valves after 1984? If there was valve operating experience, confirm that the operating experience since 1984 is bounded by the operating experience before 1984. In other words, is the operating experience prior to 1984 worse than the operating experience after 1984?