



10 CFR 52.79

August 5, 2011  
NRC3-11-0032

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

- References:
- 1) Fermi 3  
Docket No. 52-033
  - 2) Letter from Raj Anand (USNRC) to Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No. 58 Related to the SRP Chapter 12 for the Fermi 3 Combined License Application," dated May 27, 2011
  - 3) Letter from Peter W. Smith (DTE Energy) to USNRC, "Detroit Edison Company Response to NRC Request for Additional Information Letter Nos. 57 and 58, and Supplemental Response to NRC Request for Additional Information Letter No. 4," NRC3-11-0018, dated June 17, 2011

Subject: Detroit Edison Company Supplemental Response to NRC Request for Additional Information Letter No. 58

In Reference 2, the NRC requested additional information to support the review of certain portions of the Fermi 3 Combined License Application (COLA). Responses to those Requests for Additional Information (RAIs) were provided in Reference 3. Attachment 1 of this letter provides a supplemental response to portions of Reference 3.

If you have any questions, or need additional information, please contact me at (313) 235-3341.

I state under penalty of perjury that the foregoing is true and correct. Executed on the 5<sup>th</sup> day of August 2011.

Sincerely,

A handwritten signature in black ink, appearing to read "PWS", with a long horizontal flourish extending to the right.

Peter W. Smith, Director  
Nuclear Development – Licensing and Engineering  
Detroit Edison Company

DD 95  
NRD

Attachment: 1) Supplemental Response to RAI Letter No. 58, RAI Question No. 12.02-7

cc: Adrian Muniz, NRC Fermi 3 Project Manager  
Raj Anand, NRC Fermi 3 Project Manager  
Jerry Hale, NRC Fermi 3 Project Manager  
Michael Eudy, NRC Fermi 3 Project Manager  
Bruce Olson, NRC Fermi 3 Environmental Project Manager (w/o attachments)  
Fermi 2 Resident Inspector (w/o attachments)  
NRC Region III Regional Administrator (w/o attachments)  
NRC Region II Regional Administrator (w/o attachments)  
Supervisor, Electric Operators, Michigan Public Service Commission (w/o attachments)  
Michigan Department of Natural Resources and Environment  
Radiological Protection Section (w/o attachments)

**Attachment 1  
NRC3-11-0032  
(6 pages)**

**Supplemental Response to RAI Letter No. 58  
(eRAI Tracking No. 5634)**

**RAI Question No. 12.02-7**

**NRC RAI 12.02-7**

*In part in response to RAI HH5.4.2-1 regarding the Environmental Report, and in part with respect to Revision 3 of the FSAR to update the application relative to Revision 9 of the ESBWR design control document (DCD), you provided information in FSAR Section 12.2.2.1 related to radioiodine releases that differ from those of the ESBWR DCD (ML102510498). Portions of the submission are not consistent with the methodology and calculations related to Revision 9 of the DCD. As part of the staff's review, it was determined that the asserted concentrations quoted above relate to the description from the DCD before corrections were made to account for condensate flow that bypasses the condensate purification system, that result in higher radionuclide concentrations and releases. Therefore, a number of clarifications are needed relative to the proposed revisions to the FSAR:*

- 1. The discussion in the response refers to NUREG-0016 methodology, as referenced by the DCD, and upon which the staff's review was based, as "overly conservative." The context was related to the potential to exceed the dose guidelines of 10 CFR 50, Appendix I. However, this characterization and the corresponding operational limitations proposed do not provide a quantification of the asserted conservatism. Please provide this information in sufficient detail for the staff to quantify the effect on effluent concentrations and resultant public doses, and occupational doses to in-plant workers.*
- 2. The NUREG-0016 methodology is used for all BWR design applications, and alternative methodology proposals must provide sufficient information for the staff to evaluate the alternative. The proposal does not provide an alternative methodology, instead appearing to assert the conservatism as a justification for not providing an alternative methodology. As part of 10 CFR 50 Appendix I, the staff must evaluate the potential for under-estimation of the calculated public dose. Please provide an alternative methodology, including quantifiable changes to input clarify your quantification and technical basis for this statement, or provide information to support the deviation from the routine source term in Chapter 11.1 of the DCD, and resulting calculations of effluents.*
- 3. The description of the condensate purification system in the ESBWR DCD was changed such that the purification flow went from 100% to 67% of condensate flow. This resulted in increases to the calculated routine source term (and resultant effluent release concentrations and rate, and consequent off-site and in-plant doses) from radionuclides in the steam/condensate systems. Revision 3 of the application proposes to reduce calculated doses by reducing the source term back to the values calculated in the design before the change in the description. This is proposed to be accomplished through operational limitations, by turning off condensate feed to the moisture separator/reheaters (MSR), such that purification flow would be 100% of condensate flow. The proposal, however, does not address the revised power level. As MSR operation provides efficiencies in the thermal cycle that appear to comprise as much as 30% of the usable power output of the reactor, it does not appear to be a reasonable operational consideration. Further, the proposal does not quantify the differences to the routine and accident source terms, from prolonged operation at these reduced power levels. As this is proposed to be an operational limitation controlled through the Offsite Dose Calculation Manual, it is not clear that this proposed limitation would reasonably be considered.*

*Please clarify whether this proposed operational limitation will be stated in the ODCM, or will be proposed as a license condition to satisfy 10 CFR 50 Appendix I.*

- 4. As noted above, the resulting calculated maximally-exposed individual and population doses provided in Revision 3 do not appear to be fully consistent with the revised release concentrations in the ESBWR DCD. Please provide additional information regarding the effect of these changes on the information presented in Tables 12.2-17R, 12.2-18bR, 12.2-201, 12.2-203, and 12.2-204 of the application, including operation at the expected reduced thermal efficiencies consistent with the proposed operational limitation of MSR shutdown, and resolving version differences between the the postulated site-specific source term, the ESBWR DCD source term, the calculated releases and tables of releases, and the estimated doses resulting from those releases.*

### **Supplemental Response**

Detroit Edison provided a response to NRC RAI 12.02-7 (eRAI Tracking No. 5634) within Detroit Edison letter NRC3-11-0018, dated June 17, 2011, (ML11171A297) which included discussion of the Fermi 3 reactor water radionuclide concentration limits. In a conference call with the NRC staff on July 14, 2011, further information related to these limits and ESBWR Condensate Purification System (CPS) capacities were requested. The requested information is provided below.

Reactor water iodine concentration limits are established in FSAR Table 12.2-205 "Fermi 3 Normal Operational Iodine Radioisotopes in Reactor Water (Based on Fermi 3 ODCM)". An operational restriction is imposed in FSAR Section 11.5.4.5 which maintains reactor water iodine concentrations below the limits established.

The ESBWR DCD identifies the necessary system configuration to route all feedwater flow through the CPS (i.e. cascading feedwater lineup). The CPS system and component capacities identified within the ESBWR DCD are based on normal operational flow through CPS at approximately 66% of total feedwater flow (i.e. pumped forward configuration). Limiting CPS components described in the DCD include six condensate filters with one available as standby, and eight demineralizers with one available as standby. The ESBWR DCD does not describe maximum capabilities for the CPS or the Condensate and Feedwater System (C&FS) components (e.g. condensate pumps and piping); therefore, maximum component capabilities will be established during detailed design. To ensure that these capabilities are specified to support 100% feedwater flow, the attached markup provides inserts to FSAR Sections 10.4.6.2.2 and 10.4.7.2.1 to identify that the CPS condensate filters and demineralizers and the C&FS System components can accommodate 100% feedwater flow to support a cascade feedwater configuration.

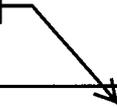
### **Proposed COLA Revision**

FSAR Section 10.4.6.2.2 and 10.4.7.2.1 are to be revised as shown on the attached markups.

**Markup of Detroit Edison COLA**  
(following 2 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

Insert 1 here



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**10.4.6.3 Evaluation**

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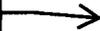
Replace the second sentence in the third paragraph with the following.

**STD COL 10.4-1-A**

A table summarizing the manufacturer's recommended threshold values of key chemistry parameters and associated operator actions is provided as Table 10.4-201.

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Insert 2 here



**10.4.10 COL Information**

**10.4-1-A Leakage (of Circulating Water Into the Condenser)**

**STD COL 10.4-1-A**

This COL Item is addressed in Subsection 10.4.6.3

**Insert 1**

**10.4.6.2.2 Component Description**

Add the following at the end of this section.

**EF3 SUP 10.4-1**

The CPS condensate filters and demineralizers can accommodate 100% feedwater flow to support a cascading feedwater configuration.

**Insert 2**

**10.4.7.2.1 General Description**

Add the following at the end of the second paragraph.

**EF3 SUP 10.4-2**

The C&FS components can accommodate 100% feedwater flow to support a cascading feedwater configuration.