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DTE Energy
Detroit Edison

10 CFR 52.79

June 17, 2011
NRC3-11-0018

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

References:
1) Fermi 3
Docket No. 52-033
2) Letter from Jerry Hale (USNRC) to Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No. 57 Related to the SRP Chapter 11 for the Fermi 3 Combined License Application," dated May 27, 2011
3) Letter from Jerry Hale (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
4) Letter from Jerry Hale (USNRC) to Peter W. Smith (Detroit Edison), "Request for Additional Information Letter No.4 Related to the SRP Sections 11.02, 11.04, 11.05 and 12.02 for the Fermi 3 Combined License Application," dated March 9, 2009
5) Letter from Jack M. Davis (DTE Energy) to USNRC, "Detroit Edison Company Response to NRC Request for Additional Information Letter No.4," NRC3-09-0007, dated April 8, 2009
6) Letter from Peter W. Smith (DTE Energy) to USNRC, "Detroit Edison Company Response to NRC FSAR Request for Additional Information Letter No. 4 and ER Request for Additional Information Letter No. 2," NRC3-10-0010, dated February 16, 2010

Subject: 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

In References 2, 3, and 4, the NRC requested additional information to support the review of certain portions of the Fermi 3 Combined License Application (COLA). The responses to the Requests for Additional Information (RAIs) associated with References 2 and 3 are provided as

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Attachments 1 and 2 of this letter. A supplemental response to RAI Letter No. 4 (Reference 4) is provided as Attachment 3. Attachment 3 provides a supplement to the responses submitted for RAI 11.04-2 in References 5 and 6. Information contained in this response will be incorporated into a future COLA submission as described in the attachments.

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 17th day of June 2011.

Sincerely,

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

Attachments:
1) Response to RAI Letter No. 57, RAI Question No. 11.04-4
2) Response to RAI Letter No. 58, RAI Question No. 12.02-7
3) Supplemental Response to RAI Letter No. 4, RAI Question No. 11.04-2

cc: Adrian Muniz, NRC Fermi 3 Project Manager
Jerry Hale, 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 & Environment, Radiological Protection Section (w/o attachments)

Attachment 1
NRC3-11-0018
(4 pages)

Response to RAI Letter No. 57
(eRAI Tracking No. 5633)

RAI Question No. 11.04-4

NRC RAI 11.04-4

FSAR Section 11.4, "Solid Waste Management System [SWMS]," is incorporated by reference from the ESBWR Design Control Document (DCD), Revision 8, with Departure EF3 DEP 11.4-1. In Revision 3 of Section 11.4, Departure EF3 DEP 11.4-1 indicates changes to system component capacities for the SWMS, and includes Figures 11.4-1R and 11.4-2R, and Tables 11.4-1R and 11.4-2R. Figure 11.4-1R includes the revised system process diagram.

The proposed redesigned solid waste management system included the revised system process diagram in Figure 11.4-1R. However, the process diagram shows pumps in series in two places, with no holding tank or other equipment separating the pumps. This is shown for the:

1) *Reactor Water Cleanup System (RWCU)/Fuel and Auxiliary Pools Cooling System (FAPCS) – the top process line, showing the high activity circulation and high activity transfer pumps, and*

2) *Condensate Filter Backwash Drain/Equipment-Floor Drain Subsystem Filter Backwash Drain/Dewatering Fill Head – the lower process line, showing the low activity circulation and low activity transfer pumps. These pumps are shown as tandem units in parallel but the figure does not show if these pumps provide redundancy since they are lacking isolation valves.*

Additionally, the figure appears to be incomplete, in that the detail of the diagram is not sufficient for the NRC staff to fully evaluate whether the system processes are consistent with the regulatory position in Regulatory Guide 1.143 and Branch Technical Position 11-3.

It is not clear from this figure how these pumps are meant to operate, since dual pump units in series may be prone to cavitation. Please provide additional clarifications on the system operation and on the use of these pumps.

Response

FSAR Section 11.4.2.2.1, EF3 DEP 11.4-1 modifies the DCD text in the fourth paragraph and last two sentences of the fifth paragraph with the following.

> "When sufficient bead resins have been collected in the high or low activity resin holdup tanks, they are mixed via the high or low activity circulation pump and sent to the SWMS Processing Subsystem via the high or low activity transfer pump. When sufficient bead resins have been collected in the condensate resin holdup tank, they are mixed via the low activity circulation pump and sent to the LWMS pre-treatment ion-exchanger for reuse or the SWMS Processing Subsystem via the low activity transfer pump."
>
> "The suspended solids are allowed to settle and the residual water is transferred by the respective decant pump to the equipment drain collector tanks or the floor drain collector tanks for further processing. When sufficient sludges have been collected in the tank, the

> sludges are normally mixed by the low activity circulation pump and sent to the SWMS Processing Subsystem by the low activity transfer pump."

The DCD description uses the transfer pump for mixing and transferring bead resins. The FSAR description uses separate pumps for mixing and transferring bead resins. The overall level of detail is consistent between the FSAR and the DCD.

FSAR Departure EF3 DEP 11.4-1 also revises the description of the pumps in FSAR Section 11.4.2.3.1 by replacing the DCD text with the following:

> "Typically three types of pumps are utilized in the SWMS. The decant and concentrated waste pumps are centrifugal pumps. Air operated diaphragm type pumps are utilized in dewatering stations and for circulation pumps; and the transfer pumps are progressing cavity type pumps. All pumps are constructed of materials suitable for the intended service. Pump codes are per the noted requirements of DCD Table 3.2-1 for K20 Solid Waste Management Systems and DCD Table 11.2-1."

As noted above the FSAR uses separate pumps for mixing and transferring bead resins, and Section 11.4.2.3.1 is revised to update the number of pumps and types of pumps used. As noted in FSAR Table 11.4-1R, the low and high activity circulation pumps are diaphragm pumps, and the low and high activity transfer pumps are progressing cavity pump. Both of these pump types are positive displacement pumps. Positive displacement pumps are not prone to cavitation when operated in series. The circulation pumps mix the fluid within the tanks, once the fluid within the tank has been sufficiently mixed; a portion of the discharge from the circulation pumps is transferred to the SWMS Processing Subsystem by the transfer pump.

FSAR Table 11.4-1R lists the Solid Waste Management System (SWMS) equipment descriptions, types, quantities, and capacities. The transfer capacity for the high and low activity transfer pumps is 100 gpm, consistent with DCD Table 11.4-1.

DCD Figure 11.4-1 shows the Solid Waste Management System Process Diagram as a block diagram for the standard design. FSAR Figure 11.4-1R shows the impacts from DEP 11.4-1 to the system process block diagram. DCD Figure 11.4-2 shows the SWMS Collection Subsystem piping arrangement, including valves, for the standard design. FSAR Figure 11.4-2R shows the impacts from DEP 11.4-1 to the piping arrangement and includes valves for pump isolation and system flow configuration. Both FSAR Figure 11.4-2R and DCD Figure 11.4-2, contain the statement "System Design per Requirements of Reg Guide 1.143" under the figure legend.

The description of the changes in FSAR Departure EF3 DEP 11.4-1 are of the same level of detail provided in the ESBWR DCD, and satisfy the regulatory position in Regulatory Guide 1.143 and Branch Technical Position 11-3. DCD Section 11.4.1 indicates that the SWMS is consistent with the regulatory position in Regulatory Guide 1.143 and Branch Technical Position 11-3, and this section has been incorporated by reference in the Fermi 3 FSAR. Also, FSAR Table 1.9-201 indicates the FSAR conforms with Branch Technical Position 11-3 and FSAR Table 1.9-202 indicates the FSAR conforms with Regulatory Guide 1.143.

Proposed COLA Revisions

None

Attachment 2
NRC3-11-0018
(13 pages)

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.*

Response

As part of the response for the requested specific clarifications, the following discussion is provided as background information.

In ESBWR DCD Revision 7, the gaseous release source term in Chapter 12 was increased due to increases in the reactor water source term iodine concentrations. The reactor water source term iodine concentrations were increased to account for the ESBWR "pumped forward" design. Correspondingly, in order to conform to the 10 CFR 50 Appendix I dose limits, the DCD long term dispersion estimates (X/Q and D/Q) were decreased in DCD Table 2.0-1. DCD Table 2.0-1, Note (12), discusses the long term dispersion estimates and COL applicant responsibilities associated with radioactive airborne effluents, stating:

> "Subsection 12.2.2.1 provides a discussion regarding the X/Q and D/Q values in this table. Per Subsection 12.2.2.2, a COL applicant is responsible for ensuring that offsite dose (using site-specific generated X/Q and D/Q values) due to radioactive airborne effluents complies with the regulatory dose limits in Sections II.B and II.C of 10 CFR 50, Appendix I."

Furthermore, as stated in DCD Section 12.2.2.2:

> "The COL Applicant is responsible for ensuring that offsite dose (using site-specific parameters) due to radioactive airborne effluents complies with the regulatory dose limits in Sections II.B and II.C of 10 CFR 50, Appendix I."

Related to the long term atmospheric dispersion estimates in DCD Table 2.0-1 and radioactive airborne effluents, the NRC Safety Evaluation Report (SER) for DCD Chapter 2 (page 2-38) states:

"Other parameters, such as release rates, can also be adjusted to demonstrate compliance with 10 CFR Part 50, Appendix I, dose criteria."

As described in the supplemental response to Environmental Report RAI HH5.4.3-3, Detroit Edison letter NRC3-11-0040, dated September 1, 2010, (ML102510498), preliminary calculations using the gaseous release source term in DCD Rev. 7 Table 12.2-16, indicated that the estimated exposure to the Fermi 3 maximally exposed individual critical organ during a calendar year could exceed 15 mrem. Detroit Edison considered several potential options to ensure that estimated exposures were within the associated regulatory limits. Consistent with Note 12 in DCD Table 2.0-1 and the associated discussion in the NRC SER for DCD Chapter 2 (described above), the release rates were adjusted in order to demonstrate compliance with 10 CFR Part 50, Appendix I dose criteria. Specifically, the release rates for iodine radionuclides were adjusted by placing administrative limits on the reactor water iodine concentrations during normal operation. The limits for the reactor water iodine concentrations are identified in FSAR Table 12.2-205.

The ESBWR source term in the DCD is based on operating the Feedwater System and Extraction Steam Systems in a "pumped forward" configuration in lieu of a cascade configuration. To summarize, the differences between these cascade and the pumped forward operating configurations are as follows:

- In a "cascade" configuration all of the steam is condensed in either the main condenser or "closed" feedwater heaters, and all of the resulting condensate (i.e. reactor coolant) is collected in the main condenser hotwell and treated by the condensate purification system (i.e. filters and demineralizers).

- In the ESBWR "pumped forward" configuration, several flow paths are directed to an "open" (i.e. direct contact) feedwater heater where the steam is condensed and pumped forward through the high-pressure feedwater heaters and into the reactor vessel, thus bypassing the condensate purification system. In the case of the ESBWR, the percentage of primary coolant bypassing the condensate purification system is approximately 34%. The value of 34% can be seen in DCD Figure 10.1-2b as summarized in the following table.

Steam Flow Path	**Flow Rate (x1000 lbm/hr)**	**% of Total Steam Flow**
Total Steam Flow	19,307	
High Pressure FW Heaters to Open Heater #4	4,269	22.1%
MSR Drain to Open Heater #4	1,933	10.0%
LP Turbine Extraction Steam to Open Heater #4	341	1.8%
Sum of Flows to Open Heater #4	6,543	33.9%

Detroit Edison intends to operate Fermi 3 in the pumped forward configuration. Based on operational conditions and reactor water concentrations, actions would be implemented as needed to maintain the reactor water iodine concentrations to values less than those listed in Table 12.2-205. FSAR Section 12.2.2.1 states:

> "In accordance with Subsection 11.5.4.5 and the Fermi 3 ODCM, methods (such as altering the feed water system valve lineup, if necessary, to secure pumped forward feed water heaters) are implemented to ensure that the estimated dose to the MEI is less than 15 mrem to the critical organ. Gaseous effluent release rates will be maintained by limiting the radioiodine concentrations in the reactor water to those prescribed in Table 12.2-205."

One option available for altering system line-ups would be to align the drains that route to Open Feedwater Heater #4 in a pumped forward configuration to the Condenser; i.e., realign to a cascade configuration. As described in the DCD, the MSR Drain (DCD Figure 10.4-7b) and LP Turbine Extraction Steam (DCD Figure 10.4-6a), and the High Pressure Feedwater Heater Drains (DCD Section 10.4.7.2.2.3) can be routed to the condenser in lieu of to Open Heater #4. With these system alignment changes, 100% of the steam flow would pass through the condensate purification system. In this configuration, the MSRs remain in service.

Recognizing the ESBWR operational flexibility of condensate cascade alignment, the limits in Table 12.2-205 were calculated based on this ESBWR functionality. The limits established in Table 12.2-205 were developed assuming that the plant was operating in a cascade configuration; that is 100% of the steam flow is treated by the condensate demineralizers. As described above, this is an operational option for reducing, and maintaining, the reactor water iodine concentration. The values in Table 12.2-205 were developed, consistent with DCD Section 11.1, using the methodology described in ANSI/ANS-18.1-1999. As described in Regulatory Guide 1.112, Regulatory Position C.4, for new reactor applications filed under the provisions of 10 CFR Part 52, an applicant may use the methodology described in ANSI/ANS-18.1-1999. Using the methodology described in ANSI/ANS-18.1-1999 is consistent with the methodology described in DCD, Section 11.1.1, and further described in the GEH response to NRC RAI 11.1-5 (ML080440069). Furthermore, as described in the NRC SER for DCD Chapter 11, using the methodology in ANSI/ANS-18.1-1999 for the ESBWR is an acceptable alternative to the methodology described in NUREG-0016.

The methodology described in DCD Section 11.1, including associated calculational parameters in DCD Table 11.1-3, are based on the plant operating in a pumped forward configuration. To account for the plant operating in a cascade configuration, the following changes are made to the calculational parameters in DCD Table 11.1-3.

Parameter	DCD Table 11.1-3 (Pumped Forward)	Cascade Configuration
Ratio of Condensate Demineralizer Flow Rate to Steam Flow Rate	0.663	1
Fraction of radionuclides in steam treated by condensate demineralizer	0.18	1

The values in Table 12.2-205 were calculated using the methodology described in DCD Section 11.1 and these input values to account for operating in a cascade configuration. The annual airborne releases of iodine in Table 12.2-206 were developed using the reactor water iodine concentrations in Table 12.2-205 and the methodology described in DCD Appendix 12B.

With this background information, the following clarifications are provided in response to the individual requests.

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.*

   The characterization in FSAR Section 12.2.2.1 of the conservative nature of NUREG-0016 is based on experience at operating BWRs. Specifically, the reactor water iodine concentrations at operating BWRs are lower than the values determined using the methodology in NUREG-0016. As this discussion in the FSAR is not relied on in the determination of the source term as described above, the discussion of the conservative nature of NUREG-0016 will be removed from Section 12.2.2.1.

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.*

   As described above the methodology used to develop the normal operating radioiodine limits is based on ANSI/ANS-18.1-1999 consistent with DCD Section 11.1 with changes to input parameters to account for operating in a cascade configuration in lieu of a pumped forward configuration. As described above, the use of the methodology in ANSI/ANS-18.1-1999 is consistent with regulatory guidance and the NRC SER for the DCD. The annual airborne releases of iodine in Table 12.2-206 were developed using the reactor water iodine concentrations in Table 12.2-205 and the methodology described in DCD Appendix 12B. For clarity, a description of the methodology used to develop the normal operating radioiodine limits in Table 12.2-205 and the airborne iodine releases in Table 12.2-206 will be added to FSAR Section 12.2.2.1.

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.*

   As described above, Detroit Edison intends to operate Fermi 3 in a pumped forward configuration provided the normal operating reactor water radioiodine concentrations are less than the values in FSAR Table 12.2-205. Based on reactor water concentrations, the unit could be operated in a cascade configuration; which would reduce the reactor water iodine concentrations to values within those in Table 12.2-205. As described above, when operating in the cascade configuration, all of the steam is routed to the condenser and then treated by the condensate demineralizer. This configuration maintains the MSRs in operation. This configuration will result in a relatively small power reduction due to loss of efficiencies. The design basis reactor water radioiodine concentrations in DCD Table 11.1-4a are not being replaced by site specific values, instead the Fermi 3 FSAR provides conservative operational radioiodine concentration limits compared to the limits for the normal ESBWR operational radioiodine values. As described in Section 12.2.2.1, the radioiodine concentrations in the reactor water will be limited to the values in Table 12.2-205. As discussed in FSAR Section 11.5.4.5, these administrative limits will be stated in the ODCM.

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 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.

As described in the supplemental response to Environmental Report RAI HH5.4.3-3, Detroit Edison letter NRC3-11-0040, dated September 1, 2010, (ML102510498), when using the gaseous release source term in DCD Rev. 7, Table 12.2-16, preliminary calculations indicated that the estimated exposure could exceed 15 mrem to the Fermi 3 maximum exposed individual critical organ during a calendar year. Thus, instead of proceeding with further development of exposure estimates and presenting results that could exceed the established limits, Detroit Edison considered other approaches to ensure that the maximum exposed individual dose limits would not be exceeded. The approach that Detroit Edison decided to use is based on limiting the maximum allowable radioiodine concentration in the reactor water during normal operation. The basis for this approach, implementation and development of the resultant radioiodine source term are described above. As noted above, the MSRs are not removed from service and the resultant power reduction is expected to be relatively small. The information presented in FSAR Tables 12.2-17R, 12.2-18bR, 12.2-201, 12.2-203, and 12.2-204 are based on the gaseous release values presented in Table 12.2-206 that are developed based on the reactor water iodine concentrations in Table 12.2-205.

Proposed COLA Revision

As discussed above, proposed updates to the FSAR are attached.

Markup of Detroit Edison COLA
(following 4 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in a future submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to 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.

11.5 Process Radiation Monitoring System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Add the following paragraph at the end of this section.

STD COL 11.5-3-A Replace text references to DCD Table 11.5-5 with Table 11.5-201.

11.5.4.4 **Setpoints**

Replace the first sentence in this section with the following.

STD COL 11.5-2-A The derivation of setpoints used for offsite dose monitors described in the ODCM. Refer to Subsection 11.5.4.5 for a discussion regarding ODCM development and implementation.

11.5.4.5 **Offsite Dose Calculation Manual**

Replace this section with the following.

STD COL 11.5-2-A The methodology and parameters used for calculation of offsite dose and monitoring are described in the ODCM. NEI 07-09A, Generic FSAR Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description, is incorporated by reference. (Reference 11.5-201) The milestone for development and implementation of the ODCM is addressed in Section 13.4. **[START COM 11.5-001]** The provisions for sampling liquid and gaseous waste streams identified in Table 11.5-201 and DCD Table 11.5-6, and the provisions for batch liquid releases identified in DCD Table 11.5-7, will be included in the ODCM.**[END COM 11.5-001]** Iodine concentrations in the reactor water are maintained less than the values in ~~Table 12.2-206~~ per the ODCM.

Table 12.2-205

11.5.4.6 **Process and Effluent Monitoring Program**

Replace this section with the following.

The same consideration applies to solid and liquid radionuclide sources of exempt quantities or concentrations which are used to calibrate or check the portable and laboratory radiation measurement instruments.

Instrument calibrators are normally used for calibrating gamma dose rate instrumentation. These may be self-contained, heavily shielded, multiple source calibrators. Beta and alpha radiation sources are also available for instrument calibration. Calibration sources are traceable to the National Institute of Standards and Technology, or equivalent.

Radiography sources are surveyed upon entry to the site. Radiation protection personnel maintain copies of the most recent leak test records for owner-controlled sources. Contractor radiography personnel provide copies of the most recent leak test records upon radiation protection personnel request. Radiography is conducted in accordance with approved procedures.

The Condensate Storage Tank (CST) potentially contains radioactive fluids. Estimated conservative radionuclide inventories in the CST are provided in Table 12.2-207. Using conservative assumed parameters for the CST, the exposure rate is less than 5 mrem/hr at 30 cm from the CST and would not be considered a radiation area per 10 CFR 20.1003.

12.2.2.1 **Airborne Releases Offsite**

Replace this section with the following.

EF3 COL 12.2-2-A Airborne sources are calculated using the source terms given in Section 11.1.

The bases for these calculations are shown in Table 12.2-15R.

The ESBWR standard design employs three ventilation stacks (airborne release points). Individual stacks service the ventilation flows from the Reactor/Fuel Buildings (RB/FB), the Turbine Building (TB) and the Radwaste Building (RWB). The offsite airborne release analysis of the ESBWR ventilation stack design employs conservative long term atmospheric dispersion (X/Q) and deposition (D/Q) parameter values for each release location. Fermi site-specific values for these parameters are shown in Table 12.2-15R.

The subject X/Q and D/Q values in Table 12.2-15R are used in the calculation of the gaseous effluent normal operation doses in Table

12.2-18bR. Calculation of site-specific doses is discussed in Subsection 12.2.2.2.

Table 12.2-15R contains values used in calculating the annual airborne release source term. The gaseous source term presented in DCD Table 12.2-16 accounts for the pumped forward design of the ESBWR feed water heaters. In a pumped-forward feed water heater configuration, a significant portion of the steam flow bypasses the condensate demineralizers, increasing the concentration of radionuclides in the reactor water and, when the methodology of NUREG-0016 is applied, increasing the concentration of radionuclides in the gaseous effluents. Gaseous effluents predicted from DCD Table 12.2-16 indicate that the resultant exposure could exceed 15 mrem to the Fermi 3 MEI critical organ during a calendar year. ~~Based upon ANSI 18.1-1999, the gaseous effluent predicted by the NUREG 0016 methodology is overly conservative given the industry's low tolerance for fuel failures and industry wide efforts to reduce radiation exposures ALARA. Additionally, the NUREG-0016 calculated reactor water radioiodine concentrations, upon which the effluent release rates are based, are also overly conservative based upon the measured radioiodine concentrations seen at boiling water reactors, adjusting for power level, reactor water mass, and system flows consistent with DCD Section 11.1.3.~~ In accordance with Subsection 11.5.4.5 and the Fermi 3 ODCM, methods (such as ~~altering the feed water system valve lineup, if necessary, to secure pumped forward feed water heaters~~) are implemented to ensure that the estimated dose to the MEI is less than 15 mrem to the critical organ. Gaseous effluent release rates will be maintained by limiting the radioiodine concentrations in the reactor water to those prescribed in Table 12.2-205.

re-aligning from a pumped forward to a cascade operating configuration where 100% of the radionuclides are treated by the condensate demineralizer

The radioiodine concentrations in the reactor water in Table 12.2-205 are determined using the methodology in DCD Section 11.1 with changes to input values to account for operating in a cascade configuration.

The radioiodine gaseous effluent estimates, consistent with NUREG-0016, are listed in Table 12.2-206. The gaseous source term presented in DCD Table 12.2-16 with the radioiodine source terms in Table 12.2-206 were utilized to calculate estimates for the dose to the MEI and population. The source term for noble gas and other fission products are provided in DCD Table 12.2-16. Design basis noble gas and other fission product concentrations are taken from the tables in DCD Chapter 11. The source term for iodine is provided in Table 12.2-206. The concentration limits of Table 12.2-205 should not present an operational issue and are consistent with the measured concentrations found in

The annual airborne iodine releases in Table 12.2-206 are determined using the methodology in DCD Appendix 12B and the reactor water iodine concentrations in Table 12.2-205.

operating boiling water reactors, adjusting for power level, reactor water mass, and system flows. Operational iodine concentrations are listed in Table 12.2-205. ~~Specific details and information on5 the derivation of the airborne source terms are provided in DCD Appendix 12B.~~

Annual Releases

Based upon the above criteria, the normal operating source terms are given in DCD Table 12.2-16 and Table 12.2-206 and a comparison to 10 CFR 20 criteria is given in Table 12.2-17R. This table also shows the maximum activity concentration for each nuclide at the site boundary from combined operation of Fermi 2 and Fermi 3, and the corresponding concentration limit from 10 CFR 20, Appendix B, Table 2, Column 1.

12.2.2.2 Airborne Dose Evaluation Offsite

Replace this section with the following.

EF3 COL 12.2-2-A

The bases for the calculation of Fermi 3-specific airborne offsite doses are provided in Table 12.2-18aR. The annual gaseous pathway doses are provided in Table 12.2-18bR. The methodology in RG 1.109 was used in determining the annual airborne dose values. The bases include values that are default parameters in RG 1.109 and other values that are Fermi 3 site-specific inputs. As part of the analysis, several sensitivities were performed to account for potentially limiting combinations of atmospheric dispersion, deposition and ingestion pathways. The NNW direction provides the limiting plume dose. The NW direction at the site boundary provides the limiting dose for ground exposure. The NW direction provides the limiting dose for residents and consumption of vegetables. The WNW direction provides the limiting dose due to milk consumption. The NNW direction provides the limiting dose due to meat consumption. The limiting total dose is the sum of these individual applicable pathways. The results of the Fermi 3 gaseous pathway dose analysis are given in Table 12.2-18bR.

Attachment 3
NRC3-11-0018
(17 pages)

Supplemental Response to RAI Letter No. 4
(eRAI Tracking No. 2185)

RAI Question No. 11.04-2

NRC RAI 11.04-2

FSAR Section 11.4.1, STD COL 11.4-4-A states that the proposed plant will not utilize temporary low-level radioactive waste storage facilities to support plant operation. The ESBWR DCD, however, provides the capacity to store the amount of low-level radioactive waste that could be generated in 6 months of operation. Accordingly, the staff requests the applicant to describe the facilities plan for long-term storage of low-level radioactive wastes projected to be generated during operation of Fermi Unit 3, and the operational program addressing the long-term management and storage of such wastes using the guidance of Regulatory Guide 1.206 and Section 11.4 of the Standard Review Plan (NUREG-0800, Rev. 3).

Supplemental Response

Detroit Edison provided a response to NRC RAI 11.04-2 (eRAI Tracking No. 2185) within Detroit Edison letter NRC3-10-0010, dated February 16, 2010, (ML100500278) which contained COLA markups to incorporate Fermi 3 departure DEP 11.4-1, "Long Term Storage of Class B and C Low Level Radioactive Waste," this attachment supplements that response to revise the departure. Departure DEP 11.4-1 identifies an impact to ESBWR DCD Tier 1, Section 2.3.2, "Area Radiation Monitoring System" (ARMS), as incorporated into Fermi 3 COLA Part 10, "Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)," and discussed in Part 7, "Departures Report." The departure will be revised to reestablish consistency with ESBWR DCD Tier 1 Section 2.3.2, "Area Radiation Monitoring System" (ARMS).

Departure DEP 11.4-1 reconfigured the Fermi 3 Radwaste Building (RWB) in order to increase the storage capacity for Class B and C low level waste. This departure includes reconfiguring the arrangement of systems and components within the ESBWR RWB volume. The Structures, Systems, or Components (SSCs) requiring rearrangement are associated with the Liquid Waste Management System (LWMS) and Solid Waste Management System (SWMS). Dose rates within the RWB are maintained below the allowable limits in accordance with the radiological area classification in FSAR Section 12.3.1.3, consistent with the ESBWR DCD.

In reconfiguring the RWB, the rooms and the ARM location descriptions identified in Tier 2 Departure Drawings were renamed with more descriptive designations (e.g. "RW Resin Transfer Pump Room" was now to be called "RW High Activity Transfer Pump Room"). The new room names and location descriptions impacted several DCD Tier 2 tables and drawings, and one Tier 1 table. The Tier 1 table which was impacted (Table 2.3.2-1, ARM Locations) identifies the "functional arrangement (location) of the ARMS equipment" within the RWB, and is utilized in ITAAC 2.3.2-2 Acceptance Criteria as follows, "The as-built ARM system locations conform to Subsection 2.3.2 and Table 2.3.2-1." The functional arrangement of the ARMS has not been impacted by the Fermi 3 departure DEP 11.4-1. The ARM location descriptions associated with Tier 1 Table 2.3.2-1 were updated; however, the functional arrangements of the ARMs remain consistent with DCD Tier 1 information. The ARMS locations identified in DCD Tier 1 Table 2.3.2-1 perform the same functions i.e., the same equipment and processes are to be monitored by the ARMs location descriptions as identified in the DCD and the Fermi 3 DEP 11.4-1.

In the spirit of the Design Centered Working Group approach, as the ESBWR R-COLA, Detroit Edison is providing this supplemental response to RAI 11.04-2 in an effort to minimize non-standard ESBWR adaptations within the Fermi 3 COLA. The attached markups provide a revision to Fermi 3 COLA departure information, DEP 11.4-1, to align the Fermi 3 COLA with ESBWR Tier 1 information. The location descriptions referenced in the DCD Tier 1 Table 2.3.2-1 adequately represent a descriptive identification for the Fermi 3 departure RWB ARMS locations. The functional arrangement of the ARMS have not been changed within the Fermi 3 departure DEP 11.4-1; therefore a Tier 1 departure is not required as long as the room names and ARM locations can be adequately represented as originally identified in the ESBWR DCD Tier 1 information. The attached markups reflect this change.

Proposed COLA Revision

The attached markups include;

- Remove the Tier 1 Section 2.3.2 departure information from Fermi 3 COLA Part 10 (ARMs location descriptions are to remain consistent with the DCD, Fermi 3 DEP 11.4-1 no longer departs from GEH DCD Tier 1 information),
- Remove the Tier 1 impact discussion within Fermi 3 COLA Part 7,
- Revise the ARM location descriptions on figures 12.3-39R, 12.3-40R, and 12.3-41R to match the DCD Tier 1 descriptions. (Note: These figures are located in Fermi 3 COLA Part 9, "Proprietary and Sensitive Unclassified Non-Safeguards Information," and are identified as Security Related Information in accordance with 10 CFR 2.390. As no security related information is to be revised within the attached markups, the details of the figures have been removed. Figure details are available in the Fermi 3 COLA, Part 9. No Proprietary or SUNSI information is contained in this letter.)
- Delete Table 12.3-4R from the Fermi 3 FSAR (ARMs location descriptions are to remain consistent with the DCD, Fermi 3 DEP 11.4-1 no longer departs from this DCD table), and
- FSAR text revisions, as necessary, to reflect these changes.

Markup of Detroit Edison COLA
(following 13 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in a future submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to 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.

Tables

12.3 Radiation Protection

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

EF3 DEP 11.4-1

Insert the following at the begining of this section.

As described in Section 11.4, the Radwaste Building has been configured to accommodate increased storage capacity of Class B and C solid waste. Specifically, the waste storage capacity of the Radwaste Building Class B and C waste has been increased to approximately 10 years.

As part of the configuration changes to the Radwaste Building, the following DCD Tables and Figures are replaced by site specific Tables and Figures.

- ~~Table 12.3-4R replaces DCD Table 12.3-4~~
- Table 12.3-8R replaces DCD Table 12.3-8
- Figure 12.3-19R through Figure 12.3-22R replace DCD Figures 12.3-19 through 12.3-22
- Figure 12.3-39R through Figure 12.3-42R replace DCD Figures 12.3-39 through 12.3-42
- Figure 12.3-61R through Figure 12.3-64R replace DCD Figures 12.3-61 through 12.3-64

Equipment locations were revised to provide an enhanced arrangement. However; tank sizes, tank contents and source terms are the same as those reflected in the DCD. The thicknesses for Radwaste Building walls presented in departure Table 12.3-8R were evaluated against those same walls in DCD Table 12.3-8 and revised if necessary to maintain the same radiation zones as those identified in the DCD. As such, radiation levels and required shielding will remain the same regardless of tank location.

A qualitative evaluation of each wall in the Radwaste Building was performed. The evaluation consisted of comparing the thickness and function of a wall in the departure (FSAR Table 12.3-8R) to the same wall in the DCD. If the value in Table 12.3-8R was equal to or greater than that shown in DCD Table 12.3-8, the value in Table 12.3-8R is more conservative and no further evaluation is required. If the value in Table 12.3-8R is less than that shown in the DCD table, then the function of the

~~**Table 12.3-4R Area Radiation Monitors for Radwaste Building** [EF3 DEP 11.4-1]~~

ARM No.	Description & Location	Figure No.	Monitoring Range1
1	RW Electrical Equipment Room (6170), EL -9350	12.3-39R	H
2	RW Control Room (6270), EL -2350	12.3-40R	H
3	RW High Activity Decant Pump Room (6188), EL -9350	12.3-39R	H
4	RW High Activity Transfer Pump Room (6283), EL-2350	12.3-40R	H
5	RW Trailer Access Area (6383), EL 4650	12.3-41R	H
6[2]	RW Liquid Radioactive Waste Treatment Processing Systems Area (6381), EL 4650	12.3-41R	H
7[2]	RW Wet Solid Radioactive Waste Treatment Processing Area (6394/6395), EL 4650	12.3-41R	H
8[2]	RW Dry Solid Waste Treatment Area (Sorting Room 6393), EL 4650	12.3-41R	H
9[2]	RW Packaged Waste Storage Area (6390/6391/6392), EL 4650	12.3-41R	H

[1] The monitoring ranges corresponding to these alphabetical designations are provided in DCD Table 12.3-7.

[2] ARMs located in accessible areas where abnormal plant evolutions or anticipated operational occurrences can potentially result in dose rate increases of 1mSv/hr (100 mrem/hr) or more.

Delete this table.

Introduction:

A departure is a plant-specific deviation from design information in a standard design certification rule. Departures from the reference ESBWR Design Control Document (DCD) are identified and evaluated consistent with regulatory requirements and guidance. Each departure is examined in accordance with 10 CFR 52 requirements. Although the ESBWR Design Certification Application is currently under review with the NRC, departures are evaluated utilizing the guidance provided in Regulatory Guide 1.206, Section C.IV.3.3.

The following departure is evaluated in this report:

EF3 DEP 11.4-1: Long-term, Temporary Storage of Class B and C Low-Level Radioactive Waste

Departure: EF3 DEP 11.4-1 - Long-Term, Temporary Storage of Class B and C Low-Level Radioactive Waste

Summary of Departure:

The ESBWR DCD identifies that on-site storage space for a six-month volume of packaged waste is provided in the Radwaste Building. The Fermi Unit 3 Radwaste Building is configured to accommodate a minimum of ten years volume of packaged Class B and C waste, while maintaining space for at least three months of packaged Class A waste. This departure is effected by reconfiguring the arrangement of systems and components within the ESBWR RWB volume. The systems structures and components requiring re-arrangement are associated with the Liquid Waste Management System (LWMS) and Solid Waste Management System (SWMS). The existing Radwaste Building Fire Protection and HVAC Systems have sufficient capacity to accommodate the extra volume of Class B and C wastes, and require no modification.

Scope/Extent of Departure:

~~This departure affects Tier 1 information in the ESBWR DCD. This departure is identified in Part 10: ITAAC Section 1.~~

This departure affects Tier 2 information in the ESBWR DCD. This departure is identified in FSAR Sections 1.2.2.10.2, 1.2.2.16.9, 9.4.3.1, 11.4, 11.4.1, 11.4.2.2.1, 11.4.2.2.2, 11.4.2.2.4, 11.4.2.3.1, 12.2, and 12.3; FSAR Tables 9A.5-5R, 11.4-1R, 11.4-2R, 12.2-22R, ~~12.3-4R~~, and 12.3-8R; and FSAR Figures 1.2-21R, 1.2-22R, 1.2-23R, 1.2-24R, 1.2-25R, 9A.2-20R, 9A.2-21R, 9A.2-22R, 9A.2-23R, 9A.2-24R, 11.4-1R, 11.4-2R, 12.3-19R, 12.3-20R, 12.3-21R, 12.3-22R, 12.3-39R, 12.3-40R, 12.3-41R, 12.3-42R, 12.3-61R, 12.3-62R, 12.3-63R, and 12.3-64R.

Departure Justification:

DCD Sections 11.4.1, SWMS Design Basis, and 11.4.2.2.4, Container Storage Subsystem, discuss on-site storage space for low-level radioactive waste. The design accommodates a six month volume of packaged waste storage in the Radwaste Building.

Class A, B, and C low-level radioactive waste is normally promptly disposed of at licensed offsite processing and disposal facilities. In the event that an offsite facility is not available to accept Class B and C waste shipments, the Fermi Unit 3 Radwaste Building waste storage space has been configured to accommodate at least ten years of Class B and C waste generated during plant operation. Shielding analysis results show that the dose rates in surrounding areas, both within the building and externally, are maintained below the allowable limits in accordance with the radiological area classification in FSAR Section 12.3.1.3. Long-term, temporary storage of Class B and C waste HICs, with design lifetimes of 300 years, will not have an adverse effect on the integrity of the waste containers. Periodic inspections will be performed to confirm container integrity during storage.

The increased Class B and C waste storage space is consistent with the regulatory guidance of NUREG-0800, Section 11.4, Appendix 11.4-A. The storage space reserved for Class A waste exceeds that recommended by NUREG-0800, Standard Review Plan, Branch Technical Position 11-3.

Departure Evaluation:

This departure affects ~~Tier 1and~~ Tier 2 information.

~~Tier 1. The Descriptions of the locations of Area Radiation Monitors (ARMs) in the Radwaste Building (RWB) have been modified to logically reflect the RWB layout. The number of ARMs in the RWB remains unchanged, only the room descriptions have been changed. Accordingly it does not:~~

1. ~~Result in a decrease in the level of safety.~~
2. ~~Present a risk to the public health and safety, or present inconsistencies with the common defense and security.~~

Tier 2. This Tier 2 departure does not affect off-site dose rates or the integrity of waste containers in storage. As such, the potential for increased radiation exposure to members of the public is not created. Accordingly, it does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific DCD;
2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the plantspecific DCD;
3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific DCD;
4. Result in more than a minimal increase in the consequences of a malfunction of a SSC important to safety previously evaluated in the plant-specific DCD;
5. Create a possibility for an accident of a different type than any evaluated previously in the plant specific DCD;

Figure 12.3-39R Radwaste Building Area RadiationMonitors El -9350

The configuration of this figure is not to be revised via this markup (see Fermi 3 COLA Part 9, "Proprietary and Sensitive Unclassified Non-Safegaurds Information" for figure details).
Only the Area Radiation Monitor Symbol descriptions are to be revised as shown.

This markup contains no Proprietary or Sensitive Unclassified Non-Safegaurds Information.

ROOM IDENTIFICATION LIST	
ROOM	DESCRIPTION
6100	CORRIDOR
6102	HCW, LCW AND DETERGENT SUMP ROOM
6103	EQUIPMENT DRAIN COLLECTION TANK ROOM A
6104	EQUIPMENT DRAIN COLLECTION TANK ROOM B
6105	EQUIPMENT DRAIN COLLECTION TANK ROOM C
6106	LOW ACTIVITY RESIN HOLDUP TANK ROOM
6107	CONDENSATE RESIN HOLDUP TANK ROOM
6108	HIGH ACTIVITY RESIN HOLDUP TANK ROOM
6109	CONCENTRATED WASTE TANK ROOM
6150	FLOOR DRAIN COLLECTION TANK ROOM A
6160	FLOOR DRAIN COLLECTION TANK ROOM B
6161	LOW ACTIVITY PHASE SEPARATOR ROOM
6170	ELECTRICAL EQUIPMENT ROOM
6171	FLOOR & EQUIPMENT DRAIN SAMPLE TANK ROOM
6172	HIGH ACTIVITY DECANT PUMP VALVE GALLERY
6173	HIGH ACTIVITY RESIN HOLUP TANK VALVE GALLERY
6174	CONDENSATE RESIN HOLDUP TANK VALVE GALLERY
6175	LOW ACTIVITY RESIN HOLDUP TANK VALVE GALLERY
6176	LOW ACTIVITY PHASE SEPARATOR VALVE GALLERY
6177	CONCENTRATED WASTE TANK VALVE GALLERY
6180	FLOOR AND EQUIPMENT DRAIN SAMPLE PUMP AREA
6182	FLOOR DRAIN COLLECTION PUMP ROOM
6183	LOW ACTIVITY CIRCULATION PUMP ROOM
6185	EQUIPMENT DRAIN COLLECTION PUMP ROOM
6186	HIGH ACTIVITY CIRCULATION PUMP ROOM
6187	LOW ACTIVITY DECANT PUMP ROOM
6188	HIGH ACTIVITY DECANT PUMP ROOM
6189	CONCENTRATED WASTE PUMP ROOM
6190	ELEVATOR
6191	STAIRWELL A
6192	STAIRWELL B
6193	STAIRWELL C
6194	STAIRWELL D

AREA RADIATION MONITOR SYMBOL

⊗ N N:MONITOR ASSIGNED NUMBER

1– RW ELECTRICAL ~~EQUIPMENT ROOM~~ Panel Area
~~3– RW HIGH ACTIVITY DECANT PUMP ROOM~~

3 - RW Resin Pump

Figure 12.3-40R Radwaste Building Area RadiationMonitors El -2350

The configuration of this figure is not to be revised via this markup (see Fermi 3 COLA Part 9, "Proprietary and Sensitive Unclassified Non-Safegaurds Information" for figure details).

Only the Area Radiation Monitor Symbol descriptions are to be revised as shown.

This markup contains no Proprietary or Sensitive Unclassified Non-Safegaurds Information.

ROOM IDENTIFICATION LIST	
ROOM	DESCRIPTION
6103	EQUIPMENT DRAIN COLLECTION TANK ROOM A
6104	EQUIPMENT DRAIN COLLECTION TANK ROOM B
6105	EQUIPMENT DRAIN COLLECTION TANK ROOM C
6106	LOW ACTIVITY RESIN HOLDUP TANK ROOM
6107	CONDENSATE RESIN HOLDUP TANK ROOM
6108	HIGH ACTIVITY RESIN HOLDUP TANK ROOM
6109	CONCENTRATED WASTE TANK ROOM
6150	FLOOR DRAIN COLLECTION TANK ROOM A
6160	FLOOR DRAIN COLLECTION TANK ROOM B
6161	LOW ACTIVITY PHASE SEPARATOR ROOM
6171	FLOOR & EQUIPMENT DRAIN SAMPLE TANK ROOM
6190	ELEVATOR
6191	STAIRWELL A
6192	STAIRWELL B
6193	STAIRWELL C
6194	STAIRWELL D
6200	CORRIDOR
6201	CHEMICAL DRAIN COLLECTION TANK ROOM
6202	CHEMICAL DRAIN COLLECTION PUMP ROOM
6251	HIGH ACTIVITY PHASE SEPARATOR ROOM
6270	CONTROL ROOM
6271	HIGH ACTIVITY RESIN HOLDUP TANK VALVE GALLERY
6272	HIGH ACTIVITY PHASE SEPARATOR VALVE GALLERY
6273	CONDENSATE RESIN HOLDUP TANK VALVE GALLERY
6274	LOW ACTIVITY RESIN HOLDUP TANK VALVE GALLERY
6275	LOW ACTIVITY PHASE SEPARATOR VALVE GALLERY
6276	CONCENTRATED WASTE TANK VALVE GALLERY
6277	FLOOR DRAIN COLLECTION & CHEMICAL DRAIN TANKS VALVE GALLERY
6278	EQUIPMENT DRAIN COLLECTION TANK VALVE GALLERY
6281	DETERGENT DRAIN COLLECTION AND SAMPLE PUMP ROOM
6282	DETERGENT DRAIN COLLECTION & SAMPLE TANK ROOM
6283	HIGH ACTIVITY TRANSFER PUMPS ROOM
6284	LOW ACTIVITY TRANSFER PUMPS ROOM
6287	FOYER
6288	TOILET
6289	LOCKER ROOM

AREA RADIATION MONITOR SYMBOL

⊗ N N:MONITOR ASSIGNED NUMBER

2- RW CONTROL ROOM

4- RW ~~HIGH ACTIVITY~~ TRANSFER PUMP ROOM

Resin

Figure 12.3-41R Radwaste Building Area RadiationMonitors El 4650

The configuration of this figure is not to be revised via this markup (see Fermi 3 COLA Part 9, "Proprietary and Sensitive Unclassified Non-Safegaurds Information" for figure details).

Only the Area Radiation Monitor Symbol descriptions are to be revised as shown.

This markup contains no Proprietary or Sensitive Unclassified Non-Safegaurds Information.

ROOM IDENTIFICATION LIST	
ROOM	DESCRIPTION
6190	ELEVATOR
6191	STAIRWELL A
6192	STAIRWELL B
6193	STAIRWELL C
6194	STAIRWELL D
6380	AIR EXHAUST FACILITIES ROOM
6381	PROCESSING SUBSYSTEMS AREA
6382	CORRIDOR
6383	TRAILER ACCESS
6390	CLASS B/C STORAGE AREA
6391	CLASS A STORAGE AREA
6392	DRY ACTIVE WASTE STORAGE AREA
6393	SORTING ROOM
6394	SWMS PROCESSING SUBSYSTEM – DEWATERING SKID A
6395	SWMS PROCESSING SUBSYSTEM – DEWATERING SKID B
6396	CRANE CCTV AND DEWATERING CONTROL ROOM

AREA RADIATION MONITOR SYMBOL

N

N:MONITOR ASSIGNED NUMBER

5– RW TRAILER ACCESS AREA
6– RW LIQUID RADIAOACTIVE WASTE TREATMENT ~~PROCESSING SYSTEMS~~ AREA
7– RW WET SOLID RADIOACTIVE WASTE TREATMENT ~~PROCESSING~~ AREA
8– RW DRY SOLID WASTE TREATMENT AREA ~~(SORTING AREA)~~
9– RW PACKAGED WASTE ~~STORAGE~~ AREA

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Fermi 3 Combined License Application

Part 10: ITAAC

Revision 2
February 2011

TIER 1 INFORMATION

AND

INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

1. TIER 1 INFORMATION

DCD Tier 1 is incorporated by reference ~~with the following exception~~.

~~Replace Section 2.3.2, Design Description with the following -~~

~~The Area Radiation Monitoring System (ARMS) continuously monitors the gamma radiation levels within the various areas of the plant and provides an early warning to operating personnel when high radiation levels are detected so the appropriate action can be taken to minimize occupational exposure.~~

1. ~~The functional arrangement (location) of the ARMS equipment is as listed on Table 2.3.2-1R.~~
2. ~~Each ARM channel listed in Table 2.3.2-1R initiates a MCR alarm and a local audible alarm (if provided) when the radiation level exceeds a preset limit.~~
3. ~~Each ARM channel listed in Table 2.3.2-1R is provided with indication of radiation level.~~

~~Table 2.3.2-1R ARM Locations (Sheet 1 of 3)~~

Area	Description & Location
Reactor Building	RB Refueling Floor Area #1
Reactor Building	RB Refueling Floor Area #2
Reactor Building	RB New Fuel Buffer Pool
Reactor Building	RB New Fuel Buffer Pool
Reactor Building	RB RWCU/SDC Pump
Reactor Building	RB Sump Pumps
Reactor Building*	RB RWCU/SDC Train A Heat Exchanger
Reactor Building*	RB RWCU/SDC Train B Heat Exchanger
Reactor Building	RB Lower Equipment Hatch
Reactor Building	RB Lower Personnel Hatch
Reactor Building	FMCRD HCU Room B
Reactor Building	FMCRD HCU Room D
Reactor Building	RB RWCU/SDC Filter Demineralizer Area
Reactor Building	RB Radiological Control Area Entrance
Reactor Building	RB H2/O2 Monitoring (CMS) Skid
Reactor Building	RB H2/O2 Monitoring (CMS) Skid Panel
Reactor Building	Instrument Rack Area #1
Reactor Building	Instrument Rack Area #2
Reactor Building	Instrument Rack Area #3
Reactor Building	Instrument Rack Area #4
Reactor Building	Instrument Rack Area #5
Reactor Building	Instrument Rack Area #6
Reactor Building	Instrument Rack Area #7
Reactor Building	Instrument Rack Area #8
Reactor Building	RB IFTS Maintenance Room (Multiple)
Reactor Building	Fuel Handling Machine
Reactor Building	RB Remote Shutdown Panel A Area
Reactor Building	RB Remote Shutdown Panel B Area
Fuel Building	FB Spent Fuel Floor
Fuel Building	Fuel Handling Machine
Fuel Building	FB Fuel Transfer Cask Area
Fuel Building	FB FAPCS Heat Exchangers
Fuel Building	FB FAPCS Heat Exchangers
Fuel Building*	FB FAPCS Backwash Transfer Pumps
Fuel Building	FB Sump Pumps
Fuel Building	RB Ground Grade Access Pathway
Fuel Building	FB Wash Down Bay Entry Door
Fuel Building	FB IFTS Fuel Bldg Isolation Valve Room (Inside)
Fuel Building	Fuel Prep Machine

Delete this table.

~~Table 2.3.2-1R ARM Locations (Sheet 2 of 3)~~

Area	Description & Location
Radwaste Building	RW Electrical Equipment Room
Radwaste Building	RW Control Room
Radwaste Building	RW High Activity
Radwaste Building	RW High Activity Transfer Pump Room
Radwaste Building	RW Trailer Access Area
Radwaste Building*	RW Liquid Radioactive Waste Treatment Processing Systems Area
Radwaste Building*	RW Wet Solid Radioactive Waste Treatment Processing Area
Radwaste Building*	RW Dry Solid Waste Treatment Sorting Room Area
Radwaste Building*	RW Packaged Waste Storage Area
Turbine Building*	Main Condenser Vault Area
Turbine Building*	Feedwater Heater Drain Cooler 1 A/B/C Room
Turbine Building	H2 and O2 Analyzer Room B
Turbine Building	Condensate Pumps Room
Turbine Building*	Low Pressure Heater Area
Turbine Building*	Feedwater Heater 4 and Feedwater Storage Tank Room
Turbine Building*	Turbine Bldg Steam Tunnel
Turbine Building*	Condensate Drain Tank and Steam Jet Air Ejector/H2 Recombiner and Cooler Room B
Turbine Building*	Steam Jet Air Ejector/H2 Recombiner and Cooler Room A
Turbine Building*	Feedwater Heater 5B and 6B Room
Turbine Building	Condensate Filter Access Hatch Room
Turbine Building	Corridor/Turbine Building Operating Floor
Turbine Building	Corridor/Turbine Operating Floor
Turbine Building	Crane Travel Area
Turbine Building	Equipment Main Access Area
Turbine Building	RCCWS Pump/Exchanger Room A
Turbine Building*	Offgas Charcoal Adsorber Vessel Vault
Turbine Building	Condensate Pleated Filter Valve/Condensate Filter Transfer Pumps/Condensate Flow Control Valve Station Room
Turbine Building	Condensate Pleated Filter Valve/Condensate Filter Transfer Pumps/Condensate Flow Control Valve Station Room
Turbine Building	Condenser Sampling Pump Room A
Turbine building	Condenser Sampling Pump Room B
Turbine Building	Condensate Deep Bed Demineralizer Valve Room
Turbine Building	H2 and O2 Analyzer Room A
Turbine Building*	Feedwater Heater 5A and 6A Room
Turbine Building*	Feedwater heater 7B Room
Turbine Building*	Feedwater Heater 7A Room
Turbine Building	Turbine Bldg Sampling/Drain Sump C Room
Turbine Building	Corridor/Exhaust Duct Area

Delete this table.

~~Table 2.3.2-1R ARM Locations (Sheet 3 of 3)~~

Area	Description & Location
Turbine Building	RCCWS Pump/Exchanger Room B
Turbine Building*	Main Condenser Vault Area
Control Building	Main Control Room
* ARMs located in accessible areas where abnormal plant evolutions or anticipated operational occurrences can potentially result in dose rate increases of 1mSv/hr (100mRem/hr) or more.	

Delete this table.