

PMFermiCOLNPEm Resource

From: Anand, Raj
Sent: Tuesday, May 24, 2011 10:56 AM
To: latzyn@dteenergy.com
Cc: FermiCOL Resource
Subject: Draft RAls on Chapter 11 and 12.
Attachments: Fermi Section 11&12.doc

Hearing Identifier: Fermi_COL_NonPublic
Email Number: 1145

Mail Envelope Properties (B46615B367D1144982B324704E3BCEED7DDF7FD7BC)

Subject: Draft RAs on Chapter 11 and 12.
Sent Date: 5/24/2011 10:56:01 AM
Received Date: 5/24/2011 10:56:01 AM
From: Anand, Raj

Created By: Raj.Anand@nrc.gov

Recipients:
"FermiCOL Resource" <FermiCOL.Resource@nrc.gov>
Tracking Status: None
"latzyn@dteenergy.com" <latzyn@dteenergy.com>
Tracking Status: None

Post Office: HQCLSTR01.nrc.gov

Files	Size	Date & Time
MESSAGE	3	5/24/2011 10:56:01 AM
Fermi Section 11&12.doc	40442	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

SRP Section 11.4-Question # 20571 Solid Waste management-eRAI 5633

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.

SRP Section 12.04 Radiation Sources-Question # 20572, eRAI 5634

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 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.