PMFermiCOLPEm Resource

From: Harvey, Brad
Sent: Wednesday, September 02, 2009 10:45 AM
To: Lemont, Stephen
Cc: Lauron, Carolyn; FermiCOL Resource; Chang, Youngsoo; Fuller, Edward; Lee, Jay; Tonacci, Mark; Hale, Jerry; Hickey, Christine; Frye, Timothy
Subject: FW: Revised Fermi ER DBA 50% X/Q Values
Attachments: RAI Question No. AQ2.7-5.pdf; FERMI 3 ENVIRONMENTAL REVIEW ANNOUNCEMENT # 6: Review of Detroit Edison (DTE) August 25, 2009 RAI Response

Steve:

COL applicants responding to a safety RAI will typically indicate in their RAI response whether or not their response will result in an update to their application (e.g., FSAR). I don't know if this practice is also typical for environmental RAI responses, but Detroit Edison (DE) did not do this in their response to environmental RAI AQ2.7-5.

Subsequently, I have the following environmental-related questions for DE regarding their response to environmental RAI AQ2.7-5:

1. Does the applicant intend to update ER Section 2.7.6.1 and ER Table 7.1-1 to show the new set of EAB and LPZ X/Q values presented in the response to environmental RAI AQ2.7-5?

2. Does the applicant intend to update the design basis accident dose assessment presented in ER Section 7.1 to reflect the new set of EAB and LPZ X/Q values presented in the response to environmental RAI AQ2.7-5?

3. Does the applicant intend to update the long-term (routine release) diffusion estimates (X/Q and D/Q values) presented in ER Section 2.7.6.2 to reflect revised distances to the site boundary and special receptors of interest from a "power block envelope" that encompasses all the routine airborne release pathways to the atmosphere (i.e., the reactor/fuel building, the turbine building, and radwaste building ventilation stacks)? If yes, does the applicant intend to update the gaseous pathway normal operation dose assessment presented in ER Section 5.4.1.2 to reflect the resulting new set of routine release X/Q and D/Q values?

I intend to write a safety RAI that will cover a similar set of questions for the FSAR.

Please let me know if you have any questions.

Brad
415-4118

From: Harvey, Brad
Sent: Tuesday, September 01, 2009 5:32 PM
To: Lee, Jay
Cc: Lauron, Carolyn; Lemont, Stephen; FermiCOL Resource; Chang, Youngsoo
Subject: Revised Fermi ER DBA 50% X/Q Values

Jay:

Please be aware that Detroit Edison has proposed a revised set of 50% EAB and LPZ X/Q values that will impact the design basis accident dose assessment presented in Chapter 7.1 of the Fermi COL ER.

Note that I have reviewed the revised set of X/Q values and found them acceptable.

Please let me know if you have any questions.

Thanks.

Brad
301-415-4118

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From: Harvey, Brad

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Attachment 3
NRC3-09-0013

Response to RAI letter related to ER

RAI Question No. AQ2.7-5

NRC RAI AQ2.7-5

Describe and justify the methodology used to determine distances to the EAB and LPZ.

Supporting Information

The determination of distances to the EAB and outer boundary of the LPZ, as discussed during the site audit, were not made according to the methodologies described in Reg. Guide 1.145.

Response

Per Reg. Guide 1.145, the distances for the EAB and outer LPZ boundary should be the minimum distance from the release point(s) to the EAB and outer LPZ boundary for each of the 16 sectors.

In the Fermi 3 COLA, Revision 0, the EAB and outer LPZ boundary were determined consistent with 10 CFR 100.11, "Determination of Exclusion Area, Low Population Zone, and Population Center Distance." The Fermi 3 distances to the EAB and outer LPZ boundary were determined from the centerline of the Reactor Building. As shown on ER Figure 2.1-4 the EAB boundary is included within the site property boundary, with the closest points in the NW and NNW sectors.

Detroit Edison has recalculated the X/Q values at the EAB and outer LPZ boundaries to account for all possible release source locations. For the purposes of recalculating the X/Q values, effective EAB and outer LPZ boundaries have been determined. These effective boundaries have been determined by drawing a circle that encompasses the postulated design basis accident release locations, with the Reactor Building being the center, and measuring the distance from this new inner circle to the EAB and outer LPZ boundaries. The distance from the inner circle to the EAB and outer LPZ boundary are referred to as the Dose Calculation EAB and Dose Calculation LPZ, respectively. The EAB, new inner circle and resulting Dose Calculation EAB are shown on the enclosed figure. The resulting Dose Calculation EAB distance is shorter than the distance from the Reactor Centerline to the EAB and, thus, the resulting X/Q values are calculated to be higher. The resulting Dose Calculation distances are as follows:

Dose Calculation EAB	740 meters
Dose Calculation LPZ	4670 meters

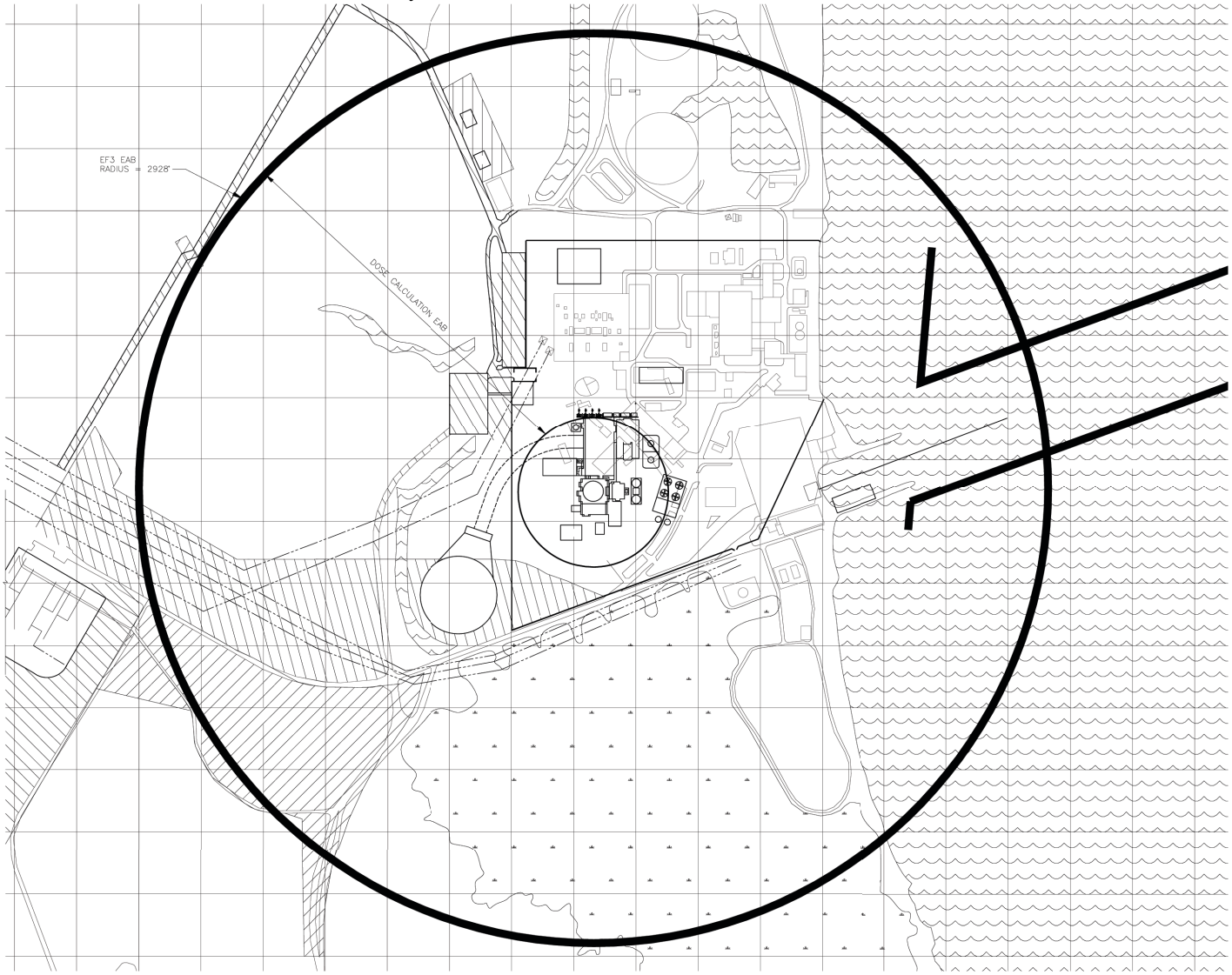
Based on the upper envelope of the ordered 5 percent overall site limit X/Q values as calculated by the PAVAN model, the 50 percentile overall site (i.e., non-direction specific) X/Qs at the Dose Calculation EAB and Dose Calculation LPZ are estimated to be 5.779×10^{-5} sec/m^3 and 4.011×10^{-6} sec/m^3, respectively. These model-predicted X/Q values represent a 0 to 2 hour time interval. The Dose Calculation LPZ X/Q values for intermediate time periods (i.e., 8 hours, 16 hours, 72 hours, and 624 hours) were determined by logarithmic interpolation between the 50 percentile 0 to 2 hour X/Q value at the Dose Calculation LPZ and the corresponding annual

average X/Qs. These results, along with the 50 percentile, 0 to 2 hour and the annual average X/Q values, are summarized below.

Location	**0-2 hours X/Q (sec/m^3)**	**0-8 hours X/Q (sec/m^3)**	**8-24 hours X/Q (sec/m^3)**	**1-4 days X/Q (sec/m^3)**	**4-30 days X/Q (sec/m^3)**	**Annual Average X/Q (sec/m^3)**
Dose Calculation EAB	5.779E-05					4.08E-05
Dose Calculation LPZ	4.011E-06	3.046E-06	2.654E-06	1.969E-06	1.282E-06	7.59E-07

NRC3-09-0013
RAI Question AQ2.7-5

Enclosure 1

Dose Calculation EAB Map
(following 1 page)

Dose Calculation Exclusion Area Boundary