Fermi2LRANPEm Resource

From: Randall D Westmoreland [westmorelandr@dteenergy.com]
Sent: Tuesday, March 31, 2015 5:46 PM
To: Keegan, Elaine
Cc: Kevin P Lynn; Lynne S Goodman; Michael J Koenemann; Jon P Christinidis
Subject: Example Response methodology
Attachments: Draft RAI 2b Method Example for NRC.docx

Importance: High

Elaine,

Attached please find the example of the methodology we plan to use to respond to draft SAMA RAIs 1 and 2, as requested.

Please let us know if you would like to discuss this methodology further. Regards.
Randall Westmoreland
DTE Electric Company
Major Enterprise Projects
Technical Expert
Fermi Office: 734-586-1445
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OUR JOB.

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From: Randall D Westmoreland

Created By: westmorelandr@dteenergy.com

Recipients:
"Kevin P Lynn" <lynnk@dteenergy.com>
Tracking Status: None
"Lynne S Goodman" <goodmanl@dteenergy.com>
Tracking Status: None
"Michael J Koenemann" <koenemannm@dteenergy.com>
Tracking Status: None
"Jon P Christinidis" <christinidisj@dteenergy.com>
Tracking Status: None
"Keegan, Elaine" <Elaine.Keegan@nrc.gov>
Tracking Status: None

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DRAFT RAI 2B
(RAI 2.G.III CLARIFICATION)

PROPOSED METHOD EXAMPLE FOR
ADDRESSING UNDERCOUNTING OF CLASS IIA FREQUENCY

Purpose:

Draft NRC RAI 2b provided to DTE on March 23, 2015 requests accounting for Class IIA release frequency undercounting of 3.14E-09/yr to determine the impact on SAMA adjusted cost benefits as presented in Table 3-6 of DTE RAI responses provided March 5, 2015. In a teleconference on March 27, 2015 between DTE and the NRC reviewers, a method for accounting for the 3.14E-09/yr undercounting was proposed by DTE. The NRC asked to see an example of this methodology applied to a SAMA candidate. This document provides the requested example and further discusses the method.

Proposed Method:

SAMAs 50, 145, 152, 177, and 194 are the SAMAs which have been identified as being close to potentially cost beneficial in previous RAIs. For each of these relevant SAMAs, the general method presented and discussed as summarized in Table 3-2 and Table 3-6 of the March 5, 2015 DTE RAI response is maintained, with the following changes:

1. The 3.14E-09/yr undercount frequency is conservatively added to the H/E release category portion that is classified as Class IIA in Table 3-2 (i.e., 5.32E-08/yr). The addition of all the undercount frequency to the H/E category is judged conservative since it would be expected that this additional frequency would be distributed among various release categories that contain Class II sequences.
2. The general method of Table 3-6 calculates the H/E Class IIA frequency and H/E "Other" frequency that is reduced due to the SAMA candidate in order to calculate the Adjusted Cost Benefit. The fraction of Class IIA frequency reduction for this SAMA candidate is now applied to the new (higher) Class IIA H/E release category frequency developed in Step 1 to develop a new (higher) Class IIA frequency reduction, which translates into a higher Adjusted Cost Benefit. This is based on an assumption that the SAMA Class IIA frequency reduction for the additional 3.14E-09/yr frequency will occur in approximately the same proportion as the other Class IIA frequency in the H/E release category. This is judged a reasonable assumption. The H/E "Other" frequency portion and contribution to the Adjusted Cost Benefit remains the same.
3. The general method of Table 3-6 is used to calculate the new (higher) Adjusted Cost Benefit for comparison to the SAMA Implementation Cost. The higher Adjusted Cost Benefit is due to the increase in the Offsite Benefit portion. The Onsite Benefit portion remains unchanged. Onsite Benefit is calculated based on Level 1 CDF rather than Level 2 Release Category frequency. The 3.14E-9/yr undercounting is due to postulated undercounting of Level 2 frequency not Level 1 CDF.

Example:

An example of this method is provided below. SAMA 050 is used as the example SAMA for this discussion.

1. The additional 3.14E-09/yr frequency is added to the original Class IIA H/E release frequency of 5.32E-08/yr. The new Class IIA H/E frequency is 5.32E-08/yr + 3.14E-09/yr = 5.63E-08/yr, as provided in Table 1. It is noted that the original Class IIA H/E release frequency of 5.32E-08/yr was developed based on the top H/E release sequences presented in Table 2g-2 of the DTE RAI response dated January 9, 2015. The Class IIA contribution was calculated as 17% of the total H/E release category frequency of 3.13E-07/yr, based on the contribution of sequences IIA-063, IIA-024, and IIA-037 as shown in Table 2g-2. Due to this original calculation approach (e.g., using rounded percentages, focus on top sequences), the original Class IIA H/E release frequency value of 5.32E-08/yrpresented in Table 2g-4 is a close approximation to a more detailed calculation.
2. For SAMA 50, the Class IIA frequency reduction for this SAMA is 1.485E-09/yr (previously rounded to 1.49E-09/yr in Table 3-6) based on a detailed cutset summation.This Class IIA frequency reduction for this SAMA maybe compared to the detailed cutset summation for the SAMA Base Case where the Class IIA frequency value is 5.161E-08/yr (slightly different from 5.32E-08/yr value that was calculated in a less detailed manner, as discussed above). The Class IIA frequency reduction portion is therefore calculated as (1.485E-09/yr)/(5.161E-08/yr) = 2.877E-02, or 2.88%, as presented in the third column of Table 2.
3. The 2.88% reduction is applied to the adjusted Class IIA H/E release frequency of 5.63E-08/yr (Table 1), the adjusted Class IIA frequency reduction becomes 2.88% * 5.63E-08/yr = 1.62E-09/yr (Column 4 of Table 2).
4. The Adjusted Cost Benefit is recalculated and results in a higher value based on an increase in the Offsite Benefit portion. For SAMA 50, the Adjusted Cost Benefit is $18,854.
5. An uncertainty factor of 2.5 is applied to this value to account for CDF uncertainty, which results in an Adjusted Cost Benefit with Uncertainty of $47,135. This benefit is less than the $50,000 estimated Implementation Cost, and the SAMA candidate remains non-cost beneficial.

Preparer: Alex Duvall 3/26/2015
Preparer: Gary Hayner 3/31/2015
Reviewer: Grant Teagarden 3/31/2015

Table 1

FERMI 2 SAMA DOSE RISK AND COST RISK WITH SEPARATE CLASS IIA H/E RELEASE CATEGORY

Characteristics of Release Mode			Population Dose	Offsite Economic Cost	Population Dose Risk	Offsite Economic Cost Risk
Release Category		**yr^{-1}**	**Person-rem**	**$**	**Person-rem/yr**	**$/yr**
H/E-BOC		5.93E-08	2.18E+07	3.03E+10	1.29E+00	1.80E+03
H/E	Class IIA	5.63E-08	2.18E+07	3.03E+10	1.23E+00	1.71E+03
	Other	2.60E-07	8.10E+06	2.80E+10	2.11E+00	7.28E+03
H/I		7.20E-08	9.52E+06	5.26E+10	6.86E-01	3.79E+03
H/L		2.46E-10	8.98E+06	1.67E+10	2.21E-03	4.11E+00
M/E		6.17E-08	2.48E+06	8.39E+09	1.53E-01	5.18E+02
M/I		3.71E-08	2.76E+06	6.10E+09	1.03E-01	2.27E+02
L/E		4.36E-08	2.26E+05	2.26E+07	9.85E-03	9.85E-01
L/I		5.46E-08	2.14E+06	8.25E+09	1.17E-01	4.51E+02
LL/E		5.02E-10	1.31E+04	3.81E+05	6.57E-06	1.91E-04
LL/I		7.75E-08	1.29E+05	4.05E+06	1.00E-02	3.14E-01
Cl		7.83E-07	6.46E+01	1.96E+00	5.06E-05	1.54E-06
Totals					5.71E+00	1.58E+04

Table 2

FERMI 2 SAMA CANIDATES WITH POTENTIAL IMPACTS ON CLASS IIA SEQUENCES

SAMA	Description	Class IIA Percent Reduction	Class IIA Frequency Reduction	Additional Offsite Dose Benefit ($)	Additional Offsite Economic Cost Benefit ($)	Base Case Benefit Portion from Offsite	Adjusted Benefit Portion from Offsite	Base Case Benefit Portion from Onsite	Adjusted Cost Benefit ($)	2.5 Uncertainty Factor Applied to Adjusted Cost Benefit ($)	Implementation Cost ($)
50	Change procedures to allow cross connect of motor cooling for RHRSW pumps	2.88%	1.62E-09	5,258	441	11,967	17,667	1,187	18,854	47,134	50,000