

**From:** Richard Emch  
**To:** acox@entergy.com; mhamer@entergy.com; Rick Buckley  
**Date:** 09/27/2006 3:24:52 PM  
**Subject:** Fwd: Request for Clarification on VY RAI Responses

Rick, Mike, and Allen,

Attached is a set of follow-up questions on the SAMA analyses. After you have looked at them, call me right away at 301-526-8716 to set-up a conference call. We will need a fast response to these questions to maintain the schedule.

Rich

>>> Robert Palla 9/27/2006 9:36 AM >>>

Rich/Jessie - attached is the list of items where we will need more discussion/information re: the VY SAMA RAI responses. This list covers both RAI responses (Part 1 and 2). Bob

**CC:** Jessie Muir; Robert Palla; Samuel Hernandez-Quinones

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**REQUEST FOR CLARIFICATION  
ENERGY RESPONSES TO VERMONT YANKEE SAMA RAIs**

RAI 1.a

The response to this RAI indicates that the contribution to Functional Classes IBE and IED from LOOP-initiated events is  $2.27E-06$  per year. This is 81% of the total CDF due to LOOP. This is essentially the SBO frequency, since these functional classes involve loss of both essential buses. Briefly explain why the percentage of LOOPS that result in SBO is so high.

RAI 1.b

1. The response to this RAI indicates that the BWROG F&O pertaining to data analysis and initiating event frequencies were resolved in the VY02R0 update. Clarify in which version the resolution of the other F&Os was incorporated.
2. In regards to the CDF decreases from  $8.73E-06$  to  $4.91E-06$  from model VY02R8 to model VY04R0, clarify if most of this decrease can be attributed to any of the seven (in addition to those associated with the EPU) changes identified in the response to this RAI.

RAI 1.d

This response indicates that the flooding analysis was reviewed in the 2002 BWROG Peer Review. The ER (p. E.1-37) states that the peer review was performed in 2000. Clarify.

RAI 5.e

In ER Table E.1-3, SAMA 47 is indicated as covering as many as 17 "risk significant terms" involving internal flooding initiators. However, based on the RAI response this SAMA seems to cover only 1 of 17 such terms. Provide justification that there are no cost-beneficial SAMAs for the other flood initiators.

RAI 5.f

1. The response for item 12 indicates the CDF contribution from events with a SW line break in a diesel generator room is approximately  $1E-07$ . This corresponds to about 2% of the total CDF. Also, the RRW values for the two diesel room SW flooding events appear to be 1.0073 and 1.0053. This is above the RRW cutoff used to identify potential SAMAs in the ER. Provide additional justification as to why additional SAMAs would not be cost-beneficial for these events.
2. The response for item 14 indicates that floods in the reactor building basement (torus room) are not a significant contributor to risk. However, it appears that several of the "risk significant terms" in ER Table E.1-3 could be impacted by this SAMA (i.e., enhancements for aligning alternate cooling during a major flood). Identify the risk significant terms impacted by this SAMA, and the associated, combined CDF from these contributors. Justify why this or other potential SAMAs were not further evaluated.

#### RAI 5.g

1. To support the assertion made in the third and fourth paragraphs of the response (that SAMA candidates to respond to internal risk contributors are also applicable to the significant fire scenarios), please cite the specific internal event candidate SAMAs that would also be applicable to fire risk, indicating the specific fire risk contributor (fire area or sequence) affected.
2. Confirm whether the items listed in Table RAI.5-2 are credited in the fire PRA. If so, justify why additional SAMAs were not further evaluated, given the relatively large residual level of fire risk.

#### RAI 5.h

The response to this RAI indicates that valve improvements would decrease the likelihood of containment bypass scenarios and of MSIV closure during testing. It is not clear how either of these impacts would reduce the risk from "transients with power conversion system available" since the MSIVs must be open for these sequences. Clarify.

#### RAI 5.i

Even though SAMA 59 is intended for medium LOCAs, the proposed hardware improvement would presumably have an impact not only for medium LOCAs, but also for small LOCAs and possibly transients (with loss of makeup). The benefit of this SAMA should thus include these impacts. Address these impacts, and provide a revised benefit estimate, as appropriate.

#### RAI 5.k

1. In the response to this RAI, it is stated that a passive design would require closure of two isolation check valves. Explain the location and function of these check valves.
2. The response states that passive venting still requires operator action to control venting so that adequate NPSH is maintained. Either this must be done or alternate injection from sources outside containment must be utilized. Clarify whether alternate injection sources have been accounted for in the assessment. Also, the response to RAI 6.h, which considers SAMA 63, states that controlled venting is not included in the model. Clarify this discrepancy.
3. The response mentions that the cost of adding redundant components includes providing an alternate power source for valve V16-19-86. Explain this requirement.
4. Cost estimates are provided for three alternative vent system modifications, but only one benefit estimate is provided. Provide the estimated benefits for each of the vent system modifications considered.

#### RAI 6.a

1. For SAMAs 9 and 23, it appears that flooding internal to the drywell was evaluated. It would appear that flooding (or sprays) on the outside might serve the same purpose and avoid the necessity for the relocation of the drywell vent. Discuss.

2. For SAMA 52, explain why minor modifications to the existing CRD system or modifications to the emergency procedures to enhance CRD flow rates would not be viable low-cost alternatives to the SAMA that was evaluated.
3. For SAMAs 10 and 24, it would appear that use of existing fire water sprays or relatively simple modifications to the sprays might be effective in mitigating releases. Discuss.

#### RAI 6b

Most of the refined cost estimates for SAMA candidates 35, 49, 50, 51, 52, 53, 54, 55 and 60 have increased significantly when accounting for the single-unit site (from the greater than \$2 million cost estimate that was used in the ER). One would expect this consideration to decrease cost estimates. Provide a further explanation of the methods and specific assumptions used to derive these cost estimates that would justify the increase in cost estimates from those reported in the ER.

#### RAI 6.e

The fourth sentence of the response appears incomplete.

#### RAI 6.g

The response to this RAI appears to describe SAMA 59 as a means of reducing the frequency of medium LOCAs due to overpressurization of the RCS rather than reducing the consequences of medium LOCAs. This is not consistent with the description and the basis for conclusions for this SAMA in Table E.2-1 or the corresponding operator action in Table E.1-3 (p. E.1-8). Describe this event/sequence more clearly and provide an analysis of the benefit consistent with this sequence.

#### RAI 6.h

The appropriateness of a factor of 3 reduction in operator failure to vent for SAMA 63 is not clear. The benefit of the controlled venting occurs for sequences involving successful venting and these sequences are not significantly affected by reducing the operator error to vent. Provide further support for the evaluation.

#### RAI 7.a

This response describes a SAMA that includes a portable generator to prolong the life of the 125 Vdc batteries. This same function appears to be provided by the recent revision to the PSA, which credits the use of the John Deere diesel generator as an alternate power supply for the station battery chargers. Clarify.

#### RAI 7.c

The SAMA proposed by this RAI was to provide DC power directly to affected loads using a portable generator upon loss of a DC bus. This is somewhat different from that suggested by RAI 7.a. Discuss this alternative.

## **Additional Information Needed as a Result of Revisions to PSA and SAMA Analyses**

- I. Confirm that a procedure is in place for the use of the John Deere diesel generator to supply power to the station battery chargers.
- II. Describe the technical reviews conducted on the revisions made to VY04R1 to produce VY05R0.
- III. Explain the reasons for the more significant increases or decreases in CDF contributions for the major initiators in the current PSA update identified in Revised Table E.1-2. Specifically, address the internal flooding and loss of AC buses 3 and 4 changes.
- IV. The estimated benefit for the candidate SAMAs, as well as many of their cost estimates, were changed in the Revised Table E.2-1. Provide the following in regards to these changes.
  - a. The RAI response states on p. 30 that more refined cost estimates were used for SAMA candidates 2, 3, 16, 28, 32, 33 and 41 to account for the new estimated benefit values. Provide details of the modifications considered in the cost estimate and the method by which the costs were calculated for each of these SAMAs.
  - b. Explain why the refined cost estimates are significantly greater than the original cost estimates for SAMA 2 (greater by a factor of 2), SAMAs 28, 33 and 41 (greater by a factor of 3), and SAMAs 3 and 32 (greater by a factor of 5).
  - c. Justify the change in cost estimate for SAMA 16, which was originally determined using a Peach Bottom estimate of greater than \$2 million and was refined in the VYNPS RAI response to be greater than \$2.1 million. This does not appear to be a refined cost (when compared to the others). Provide the refined cost estimate.
  - d. Revised Table E.2-1 provides estimated benefits (at 7% with uncertainty) for SAMAs 3, 24, 31, 32, 34, 36, 63, and 66 that could now be considered roughly equivalent to their estimated costs. Given the small difference between the cost and benefit values, provide more detailed cost estimates for these SAMA candidates, or rationale as to why these SAMAs should not be further evaluated for possible implementation.
  - e. Describe Entergy's plans with regard to SAMAs 47, which was cost-beneficial in the ER but are not cost-beneficial in the revised assessment. Also, SAMA 66 is indicated to be potentially cost-beneficial on page 30, but not cost effective on page 39. Clarify.