DRAFT

Request for Additional Information No. 21, Revision 0

6/13/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 17.04 - Reliability Assurance Program (RAP)
Application Section: Tier 1 Section 3.2 and Tier 2 Section 17.4
SPLA Branch

QUESTIONS

17.04-2

In general, the RAP in principle, applies to both risk-significant active and passive SSCs. The purposes of RAP are to provide reasonable assurance that (SECY-95-132):

a) a reactor is designed, constructed, and operated in a manner that is consistent with the assumptions and risk insights for these risk-significant SSCs,
b) the risk-significant SSCs do not degrade to an unacceptable level during plant operations,
c) the frequencies of transients that challenge SSCs are minimized, and
d) the SSCs function reliably when challenged.

Please provide the basis for not including the risk-significant passive SSCs (e.g., piping, tanks, fire barriers). Include, in your discussion, how the purposes of RAP are met through other programs/requirements (e.g., inspections, monitoring) for the risk-significant passive SSCs.

17.04-3

EPR FSAR Section 17.4 indicates that the risk-significant SSCs are identified by using the PRA Level 1 risk achievement worth (RAW) or Fussell-Vesely (FV) values. It should be noted that, an integrated assessment of internal events and external events would allow the expert panel to determine whether risk significance of the SSCs should be based on significance for individual hazards or from the overall integrated results.

a) Please discuss how risk-significance evaluations considered integrated importance assessments (i.e., risk significance based on an overall assessment that combines the risk hazards). If integrated importance assessments were not considered in the risk significance evaluations, then provide the basis for not considering these integrated importance assessments or not incorporating them in the risk-significance evaluations.

b) Provide the basis for not including PRA Level 2 importance assessment (RAW and FV) in RAP.

17.04-4

Please discuss how the uncertainties were addressed in the risk significance evaluations, i.e., how the sensitivities of importance measures caused by uncertainties in the parameter values were addressed in the risk significance determinations.

17.04-5

EPR FSAR Section 17.4.2.2 provides the threshold criteria of RAW and FV used to identify the risk-significant SSCs, but not the common-cause. Please provide the common cause threshold criteria (as discussed in AREVA's response to RAI #5, Question 17.04-1) in Section 17.4.2.2.

17.04-6

EPR SFAR, Section 17.4.2.2 states that "The selection of risk-significant SSCs uses a combination of probabilistic and deterministic insights such as PRA analytical results, industry experience, regulations, expert panel process, and engineering judgment to identify and prioritize the SSCs."

It is unclear as to whether these deterministic insights are included in the risk-significant SSCs determination process or not. Neither EPR FSAR nor AREVA's response to RAI #5, Question 17.04-1 clearly discusses the inclusion of deterministic insights.

Please indicate the SSCs identified as risk-significant by the deterministic insights and their basis.

17.04-7

It is unclear as to whether an expert panel reviewed the categorization of SSCs determined to be not risk-significant (NRS) from the quantified PRA results, PRA-based seismic margins analysis, and other external events. Note that, the expert panel plays an important role in reviewing the information that lead to these NRS determinations (e.g., assure the basis used in the categorization is technically adequate, review defense-in-depth implications, review safety margin implications, for additional information see Sections 9.2.2 and 9.2.3 of NEI 00-04, Revision 0 as referenced in the AREVA's response to Question 17.04-1). This is particularly important for those safety-related SSCs determined to be NRS.

Please confirm whether an expert panel was used to review the categorization of SSCs that were determined to be NRS based on PRA quantitative results and what SSCs were added due to the expert panel review.

17.04-8

Please provide the process which was developed for selection and qualification of the expert panel members as mentioned in Section17.4.2.3.

17.04-9

Please describe the treatment of EPR PRA undeveloped events in the RAP. Note that, an undeveloped event may represent: multiple failure modes of a single component, a single train of components, multiple components in parallel, and so on.

17.04-10

Section 19.1.5 indicates that the PRA-based seismic margins approach was used to evaluate the risk due to seismic events. According to SECY 93-087, this method identifies potential design-specific seismic vulnerabilities that may be useful in developing the RAP. Please describe how seismic SSCs are addressed in RAP, if not, justify their exclusion.

17.04-11

(Follow-up to Question 17-04-1) The following questions and findings relate to AREVA's response to RAI #5, Question 17-04-1.

a) In general, the response provides the component importance evaluation results, but not the list of risk-significant SSCs. Please provide a comprehensive list of the SSCs designated as risk significant including both probabilistic and deterministic insights. For the identified risk-significant SSCs, describe (i) the process to determine dominant failure modes that considered industry experience, analytical models, and applicable requirements, and (ii) key assumptions and risk insights from probabilistic, deterministic, or other methods.

b) Tables 17.04-1-3 and 17.04-1-6 rank some risk-significant SSCs through the common cause failure (CCF) identification and component descriptions, rather than specific component identification numbers. As a result, it is unclear as to what specific components are in RAP. Please clearly describe the risk-significant SSCs through the use of text descriptions and specific component identification numbers.

c) Explain why the internal flooding and internal fire importance evaluation results are not discussed in the response.

d) Explain why the RAW and FV values shown in Tables 17.04-1-1 through 17.04-1-6 do not match the corresponding RAW and FV values provided in EPR FSAR Chapter 19.

f) In EPR PRA, some initiating event (IE) frequencies were calculated using fault trees, describe how the RAW and FV values of the SSCs modeled in these IE fault trees were calculated and incorporated into the RAP. Otherwise, provide the basis for not including these SSCs in RAP.

g) In the response, first paragraph, Item 2 states that "This reflects the relative increase in CDF/LERF that would exit it…" Please confirm whether this reference is to "LERF" or "LRF."

h) The main control room and remote shutdown panels are not identified as risk-significant in the response. Please provide the basis for considering these SSCs as not risk-significant. Include in your discussion the associated risk importance measures (e.g., RAW and FV values) as applicable, consideration of deterministic methods, and the expert panel's deliberation for not including these components in RAP.

17.04-12

SECY 93-087, Page 14 states that an application for advanced reactor design certification must contain a list of the structures, systems, and components designated as risk significant. Accordingly, please include a list of risk-significant SSCs in EPR FSAR Section 17.4.

17.04-13

EPR FSAR Tier 1 Section 3.2, to be consistent with other sections, the abbreviation of "structures, systems, and components" should be changed to "SSCs."

17.04-14

EPR FSAR Tier 1 Section 3.2 states "The RAP provides reasonable assurance that the reactor design meets the four preceding considerations in the areas of design, procurement, fabrication, construction, and preoperational testing activities and programs." Accordingly, should it be five preceding considerations (design, procurement, fabrication, construction, and preoperational testing) instead of four?

17.04-15

The following questions and findings relate to EPR FSAR Tier 1 Section 3.2, Table 3.2-1.

a) First column should clearly provide the design commitment, i.e., reasonable assurance that the design of risk-significant SSCs is consistent with their assumptions.

b) Second column should provide more details on the inspection/test activities.

c) Third column should describe the acceptance criteria, i.e., designated reliability/HCLPF.