

## ArevaEPRDCPEm Resource

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**From:** Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]  
**Sent:** Friday, February 20, 2009 11:33 AM  
**To:** Getachew Tesfaye  
**Cc:** BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); DUNCAN Leslie E (AREVA NP INC)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 182 (1963), FSARCh. 14  
**Attachments:** RAI 182 Response US EPR DC.pdf

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 182 Response US EPR DC.pdf" provides a schedule since a technically correct and complete response to the question is not provided.

The following table indicates the respective pages in the response document, "RAI 182 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 182 — 14.03-10	2	6

A complete answer is not provided for the question. The schedule for a technically correct and complete response to this question is provided below.

Question #	Response Date
RAI 182 — 14.03-10	May 29, 2009

Sincerely,

*Ronda Pederson*

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Licensing Manager, U.S. EPR Design Certification

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**From:** Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]

**Sent:** Wednesday, January 28, 2009 4:24 PM

**To:** ZZ-DL-A-USEPR-DL

**Cc:** Michael Miernicki; Joseph Colaccino; Meena Khanna; ArevaEPRDCPEm Resource

**Subject:** U.S. EPR Design Certification Application RAI No. 182 (1963), FSARCh. 14

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on January 19, 2009, and discussed with your staff on January 28, 2009. Draft RAI Question 14.03-10 was modified as a result of that discussion. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that

cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,  
Getachew Tesfaye  
Sr. Project Manager  
NRO/DNRL/NARP  
(301) 415-3361

**Hearing Identifier:** AREVA\_EPR\_DC\_RAIs  
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**From:** Pederson Ronda M (AREVA NP INC)

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**Options**

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**Response to**

**Request for Additional Information No. 182 (1963), Revision 0**

**01/28/2009**

**U. S. EPR Standard Design Certification**

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 14.03 - Inspections, Tests, Analyses, and Acceptance Criteria**

**Application Section: Tier 1 ITACC Tables**

**QUESTIONS for EPR Projects Branch (NARP)**

**Question 14.03-10:**

The following comments are provided that identify some: inconsistencies, wording interpretation issues, technical adequacy issues, and NRC “inspectability” issues, related to the organization and wording of the EPR ITAAC, documented in Revision 0.

The following examples should be viewed as representative samples of the broader issues. In each case, there are numerous examples and often different variations of the identified concern that could be discussed. Since almost 50% of the EPR ITAAC have varying degrees of such “inspectability” questions associated with them, all of these ITAAC are not presented below; instead relying on the examples presented. This summary is intended to provide a more general discussion of the topical areas of concern.

It should be understood that that it is the responsibility of the applicant to identify all the ITAAC that need such revision. The examples below should not be viewed as a complete “punch list” of all the ITAAC needing review or revision based upon the stated concerns. The generic areas of concern are noted below, supported by some (but not all) examples. These examples were drawn from a review of FSAR Rev. 0. Some of the examples used may have been corrected, or altered in responses to other RAIs that revise the FSAR. Nevertheless, they should be viewed as being illustrative of the type of issue. Some specific comments are also documented:

**A. ITAAC ID and NUMBERING**

NRC Regulatory Issue Summary 2008-05 states in its very first recommendation that, “Applicants should consider using a consistent system to identify and number individual ITAAC within their applications ..... Use of a standard and consistent ITAAC identification system will minimize confusion.”

This recommendation does not appear to have been implemented in Revision 0 of the US EPR ITAAC. While a clearly understood and acceptable alphanumeric system (e.g., 1.a.1) is sometimes used, different sections of the ITAAC use different approaches for ITAAC labeling, including parentheses, bullets and separate paragraphs that do not necessarily align across the “Design Commitment”, “ITA”, “and “AC” columns. Examples of this include Table 2.2.1-5 (Item 3.4b), Table 2.2.2-3 (Item 3.2b), Table 2.2.5-3 (Item 3.3b), and Table 2.5.4-3 (Item 3.2) – all of which address piping ITAAC, but illustrate different ways the alphanumeric system is utilized.

(Also as a minor comment, the “Design Commitment” is sometimes noted as the “Commitment” or the “Commitment Wording”.)

**B. ITAAC INTERPRETATION (Seismic)**

A reader (e.g., reviewer or inspector) is required to interpret how the written AC might meet the ITA in different ways for different systems, even though the Design Commitment might be identical for these systems. Examples of this include Table 2.2.1-5 (Item 3.3), Table 2.2.2-3 (Item 3.3), and Table 2.10.1-2 (Item 3.1). All of these ITAAC require the identified equipment to withstand design basis seismic load without loss of safety function, but use differently organized (and potentially confusingly worded) ITA + AC to establish the inspectable requirements.

### C. REFERENCE ONLY ITAAC

As another example, Table 2.5.2-3 (Items 5.8 & 5.9) appear to use a “reference-only” notation for the divisional color coding and physical separation of the EUPS cables, but inappropriately reference the same cable criteria in the EPPS of Table 2.5.1-3 (Items 5.9 & 5.10). Implementing these EPPS ITAAC alone does not provide adequate assurance that the EUPS cables have also been installed correctly.

[As noted in the RIS, such inconsistent application of an ITAAC ID and wording protocol could lead to interpretations problems and unnecessary confusion.]

### D. I&C LIFE CYCLE

In Table 2.4.1-9 (Item 4.14), the ITAAC for PS hardware and software development identifies the “life cycle” for digital equipment with “bulletized” commitments, ITA requiring both inspections & analysis, and AC indicating alphanumeric criteria which are difficult to align with either the design commitments or the ITA.

### E. DEFINITIONS & TERMINOLOGY

1) In the area of the “Definitions” of Section 1.1 of the EPR FSAR, the terms “as-installed” and “as-built” are defined differently. However, the ITAAC usage of these terms often appears to be not only inconsistent, but also inappropriate to the definition. If “as-built” is equivalent to “as-installed” for systems and structures fabricated onsite, why cannot the term “as-installed” be the operative wording – avoiding the confusing interpretation of these definitions? For Table 2.2.1-5, Item 2.1 requires and inspection of the “as-built” RCS, Item 3.3c requires the inspection of the “as-installed” RCS equipment supports, and Item 3.4b requires inspection of the “as-built” piping. What is the point of such defined differentiation?

Furthermore, for some ITAAC (e.g., Table 2.2.6-3, Item 7.2), the wording is explicit to require that the “as-installed” CVCS valves change positions; while the IRWSTS containment isolation valves of Table 2.2.2-3 (Item 7.2) are appropriately provided closure times, but not noted to be “as-installed”.

2) Another “Definition” concern arises with the term “As-built Reconciliation”. While the definition itself appears appropriate, this term does not appear to be used in the ITAAC themselves. Specifically, for ASME piping systems (e.g., Table 2.2.1-5 for the RCS), there appears to be no ITAAC written to check the “As-built Reconciliation” of the “as-built” piping to assure that the design requirements have been met. [Note that additional ASME ITAAC issues are discussed in a latter comment.]

3) Additional comments relating to Definitions and terminology involve the inappropriate interchange of an “inspection” and a “test”. Examples of this include Items 7.6 & 7.7 of Table 2.2.2-3 where the supply of IRWST water is more appropriately “tested” and not “inspected”.

4) As an example of too liberal an interpretation of terminology, in several ITAAC sections (e.g., Table 2.1.1-7, Items 4.2 & 4.6) the ITA specifies an inspection or

verification of “construction records”. The inspection requirement should be applied to the actual construction of the SSC (as documented in the QA records), but not of the “records” alone.

- 5) Finally, in the use of terminology, care should be taken with regards to the use of terms like “components”, “equipment”, and “piping” depending upon the EPR system. While a reader is likely to logically infer what is meant when these terms are used in reference to a Table or Figure, it is noted the ASME B&PC Code, Section III, NCA-9000 provides a definition of a “component” that includes a “piping system”. Since the EPR Definitions do not define these terms, their inappropriate interchangeability could create unnecessary interpretation problems.

#### F. ASME B&PV SECTION III REQUIREMENTS

RIS 2008-05 identified the need for clear use of ASME references (e.g., design reports vs. data reports) and application of the criteria for proper “construction” (and not just “design”) IAW the ASME B&PV Code, Section III, requirements. This was effectively implemented recently by another applicant by developing six separate ITAAC (three each for ASME components and ASME piping) for each system. These three ITAAC covered (1) the SSC design; (2) the design reconciliation of the as-built SSC; and (3) the fabrication, installation, inspection, & testing IAW the ASME Code. The EPR ITAAC appear to address the ASME Code requirements in an inconsistent and incomplete manner, as follows (using Table 2.2.1-5 for the RCS as a representative example):

- 1) ITAAC 3.1: The ITA lists NDE for the components, but the AC does not identify the need for acceptable NDE results.
- 2) ITAAC 3.4a: The ITAAC identifies analysis of the as-designed piping (e.g., stress reports), but there is no corresponding ITAAC for either the constructed piping (e.g., data reports) or the design reconciliation of the as-built piping (e.g., the design reports referenced by the data reports).
- 3) ITAAC 3.4b: The ITAAC lists pipe welding and hydrostatic testing criteria, but acceptable NDE are not listed in the AC and hydrostatic test results are not specified.
- 4) ITAAC 3.10: The ITAAC indicates ASME “design” of the piping supports, but there are no ITAAC for proper “construction” of the ASME supports. (Additional Question: If ITAAC 3.4a specifies that piping be designed IAW ASME Section III requirements, including seismic loads, does this not also cover adequate design of the piping supports? This then would render ITAAC 3.10 as redundant.)
- 5) ITAAC 3.11: Similar question for “fatigue analysis” of the ASME Components – is this not covered by ITAAC 3.1 relative to the design of the components IAW the ASME Code?
- 6) ITAAC 3.12, 3.13, 3.14, & 3.15: These ITAAC require the existence of “specifications” for ASME components, piping, supports, and core support structures. However, the existence of “specifications” is only a “means to the

correct end”; i.e., that the components, piping, supports, and core support structures are designed, constructed, inspected, and reconciled with the ASME B&PV Code, Section III. If that is what these ITAAC are meant to convey, they should be re-written as such. Otherwise, the mere existence of “specifications” may be meaningless and could be redundant to other ITAAC.

#### G. ITAAC SPECIFICITY & DETAIL

Several EPR ITAAC are written without sufficient specificity or detail that provides meaningful acceptance criteria or attributes that can be assessed and verified by independent inspection. Examples follow:

- 1) Table 2.2.5-3 (Item 2.3) & Table 2.2.7-3 (Item 2.3) require “physical separation” between Divisions, without specifying the amount of required separation. Whereas Table 2.4.1-9 (Item 2.2) & Table 2.4.2.2 (Item 2.2) identify the adequate inspection criteria establishing separation.

[This comment is generic to ITAAC where “separation” and “gaps” are referenced without quantifying the details.]

- 2) Table 2.5.3-2 (Item 2.2) requires a test of the SBODG equipment controls listed in Table 2.5.3-1. However, there is no detail on the function of these controls and how they would be tested acceptably. Table 2.7.6-1 (Item 3.2) indicates that “controls exist in the MCR”, with no specificity as to what controls.
- 3) Table 2.7.1-3 (Items 4.4 thru 4.9) apply generic wording to the AC for using simulated signal to test an interlock function. The test requirements and design conditions are specified in the “Commitment Wording”, which is not part of the ITAAC. [This comment appears applicable to almost all ITAAC listing “interlock” and “bypass” functions.]
- 4) Table 2.5.1-3 (Item 6.4) indicates that the EPSS loads are sequentially energized during a LOOP or LOCA, but does not specify or refer to the details of the correct, expected sequence of the loads.
- 5) In Table 2.2.4-3 (Items 7.2 & 7.4) the ITAAC require “analyses” for the applicable EFWS flowrates, but then specify quantitative design flowrates in the AC, which would appear to align with a “test”, not “analysis”. Similarly, in Table 2.5.4-3 (Items 3.9 & 3.10) the ITA specify “inspections”, which do not comport with the AC requirements of fuel oil needs during EDG operation.
- 6) Table 2.4.5-2 (Item 4.1) provides an ITA requiring the performance of operational tests to verify the order of priority of PACS automatic functions, without specifying in the AC the specific functions or the precise priority order.

#### H. BOUNDING ANALYSIS

Where several EPR ITAAC systems (e.g., IRWSTS in Table 2.2.2-3, Items 3.3 & 6.1) require seismic design and environmental qualification (EQ), the AC are written to indicate installation that conforms with design, when a “bounding” analysis is more



appropriate. In contrast with this apparent inconsistency is the RCS ITAAC of Table 2.2.1-5 (Item 3.3), which appears to correctly identify as-installed equipment that is “seismically bounded by tested or analyzed conditions.”

I. INCOMPLETE ITAAC

- 1) In Table 2.6.1-3 (Item 6.1), the “Commitment Wording” (which is a Tier 1 Design Commitment) specifies that the CRACS maintain ambient conditions and a positive pressure. However, both the ITA & the AC only test for the positive pressure.
- 2) In the FSAR Tier 1 Section 2.4.8 for the Leakage Detection System, there is no statement of whether ITAAC exist for this system.

**Summary**

It is requested that AREVA perform a comprehensive review of all ITACC, and make the appropriate revisions to addresses the concerns identified above.

**Response to Question 14.03-10:**

A response to this question will be provided by May 29, 2009.