

## ArevaEPRDCPEm Resource

---

**From:** DUNCAN Leslie E (AREVA NP INC) [Leslie.Duncan@areva.com]  
**Sent:** Monday, January 18, 2010 1:17 PM  
**To:** Tesfaye, Getachew  
**Cc:** DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 330, FSAR Ch. 14  
**Attachments:** RAI 330 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 330 Response US EPR DC.pdf," provides technically correct and complete responses to 2 of the 3 questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 330 Question 14.02-144.

The following table indicates the respective pages in the response document, "RAI 330 Response US EPR DC.pdf" that contain AREVA NP's responses to the subject questions.

Question #	Start Page	End Page
RAI 330 — 14.02-143	2	2
RAI 330 — 14.02-144	3	3
RAI 330 — 14.03.09-15	4	4

A complete answer is not provided for 1 of the 3 questions. The schedule for a technically correct and complete response to this question is provided below.

Question #	Response Date
RAI 330 — 14.02-143	March 18, 2010

Sincerely,

Les Duncan  
Licensing Engineer  
**AREVA NP Inc.**  
An AREVA and Siemens Company  
Tel: (434) 832-2849  
[Leslie.Duncan@areva.com](mailto:Leslie.Duncan@areva.com)

---

**From:** Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]  
**Sent:** Saturday, December 05, 2009 6:24 AM  
**To:** ZZ-DL-A-USEPR-DL  
**Cc:** Tomon, John; duBouchet, Andy; Peralta, Juan; Marble, Julie; Junge, Michael; Miernicki, Michael; Steckel, James; Colaccino, Joseph; ArevaEPRDCPEm Resource  
**Subject:** U.S. EPR Design Certification Application RAI No. 330 (3948, 3972),FSAR Ch. 14

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on November 18, 2009, and discussed with your staff on December 2, 2009. No changes were made to the draft RAI 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, excluding the time

period of **December 25, 2009 thru January 3, 2010, to account for the holiday season** as discussed with AREVA NP Inc. For any RAIs that cannot be answered **within 40 days**, it is expected that a date for receipt of this information will be provided to the staff within the 40-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  
**Email Number:** 1089

**Mail Envelope Properties** (F322AA625A7A7443A9C390B0567503A1017FA42E)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 330, FSAR Ch. 14  
**Sent Date:** 1/18/2010 1:17:18 PM  
**Received Date:** 1/18/2010 1:17:21 PM  
**From:** DUNCAN Leslie E (AREVA NP INC)

**Created By:** Leslie.Duncan@areva.com

**Recipients:**

"DELANO Karen V (AREVA NP INC)" <Karen.Delano@areva.com>

Tracking Status: None

"BENNETT Kathy A (OFR) (AREVA NP INC)" <Kathy.Bennett@areva.com>

Tracking Status: None

"Tesfaye, Getachew" <Getachew.Tesfaye@nrc.gov>

Tracking Status: None

**Post Office:** AUSLYNCMX01.adom.ad.corp

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	2502	1/18/2010 1:17:21 PM
RAI 330 Response US EPR DC.pdf		96197

**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**

**Response to**

**Request for Additional Information No. 330 (3948, 3972), Revision 0**

**12/05/2009**

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

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 14.02 - Initial Plant Test Program - Design Certification and New  
License Applicants**

**SRP Section: 14.03.09 - Human Factors Engineering - Inspections, Tests,  
Analyses, and Acceptance Criteria**

**Application Section: FSAR Chapter 14**

**QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)**

**QUESTIONS for Operating Licensing and Human Performance Branch  
(AP1000/EPR Projects) (COLP)**

**Question 14.02-143:**

The NRC staff requests that the applicant include the integrated test ITAAC from section 3.3.2 and Table 3.3-1 of the U.S. EPR FSAR in the appropriate system based design ITAAC of Tier 1 chapter 2. Additionally, the staff request that the applicant remove section 3.3.2 and Table 3.3-1 of Tier 1 after the inclusion of the integrated test ITAAC into appropriate sections of Tier 1 chapter 2.

**Response to Question 14.02-143:**

A response to this question will be provided by March 18, 2010.

**Question 14.02-144:**

The NRC staff requests that the applicant revise U.S. EPR FSAR Section 14.2.12.11.19, "Radiation Monitoring System (Test #143)," as follows:

- a. Revise test method item 3.5 to state: Using radioactive calibration check sources initiate automatic initiation signals and record control actuations.
- b. Table 7.3-1, ESF Actuation Variables, lists three radiation monitors as providing input to the protection system: the containment high range monitors, the MCR air intake duct monitors, and the main steam line activity monitors. However, Test #143 only provides acceptance criteria for the MCR air intake monitors. The staff requests that the applicant revise the acceptance criteria item 5.1 of test abstract #143 to state: "The radiation monitoring system generates high radiation signals for the main steam lines, containment, and MCR air intake ducts as input to the protection system."

The staff requests that the applicant revise the acceptance criteria item 5.2 to include: "The airborne and area radiation monitors function as described in FSAR Sections 7.1.1.5.5, 7.3.1, and 12.3.4 as well as in Section 3.3.1, "Protection System (PS)," of FSAR Section 16, "Technical Specifications." The airborne and area radiation monitors are listed in Table 11.5-1 and Table 12.3-3, respectively."

**Response to Question 14.02-144:**

- a) U.S. EPR FSAR Tier 2, Section 14.2, Test #143, Step 3.5 will be revised to provide clear guidance for generating a test input for the radiation monitor.
- b) U.S. EPR FSAR Tier 2, Section 14.2, Test #143, Step 5.2, Step 5.3, and Step 5.4 will be revised to verify that the radiation monitor generates a protection signal from the main control room (MCR) air intake duct activity, containment high range activity, and a steam line activity signal.

U.S. EPR FSAR Tier 2, Section 14.2, Test #143, Step 5.2 was revised as requested in the Response to RAI 260, Question 14.02-106.

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Section 14.2, Test #143 will be revised as described in the response and indicated on the enclosed markup.

**Question 14.03.09-15:**

NUREG-0800 Section 14.3.9 (II) states that applicants must submit a description of a minimum inventory of displays, controls, and alarms necessary to accomplish the Generic Technical Guidelines (e.g., EPGs, ERGs) and critical operator actions identified through PRA analysis.

Staff do not have documents supporting Section 14.3.9 on file. NRC staff requests that the minimum inventory materials in support of Section 14.3.9 be submitted. Materials supporting Chapter 14 end with Section 14.3.8.

**Response to Question 14.03.09-15:**

The minimum inventory of alarms, displays, and controls is described in U.S. EPR FSAR Tier 2, Section 18.7.4.4. The preliminary list of minimum inventory of alarms, displays, and controls is provided in U.S. EPR FSAR Tier 2, Table 18.7-1.

As described in U.S. EPR FSAR Tier 2, Section 18.7.4.4, the methodology for selecting the final minimum inventory is described in the U.S. EPR Human System Interface Design Implementation Plan. ITAAC for selecting the final minimum inventory is provided in U.S. EPR FSAR Tier 1, Section 3.4, Item 8.0 and Table 3.4-1, Item 8.0.

**FSAR Impact:**

The U.S. EPR FSAR will not be changed as a result of this question.

# U.S. EPR Final Safety Analysis Report Markups



- 5.4 Verify that safety-related components meet electrical independence and redundancy requirements.
- 5.5 The excore instrumentation system functions as described in Section 7.1.1.5.3.

**14.2.12.11.19 Radiation Monitoring System (Test #143)**

1.0 OBJECTIVE

- 1.1 To verify the functional performance of the airborne radiation monitoring system.
- 1.2 To verify the functional performance of the area radiation monitoring system.

2.0 PREREQUISITES

- 2.1 Construction activities on the safety-related radiation monitoring system have been completed with all radiation monitors positioned per Table 12.3-3.
- 2.2 Radiation monitoring system instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.
- 2.3 Support systems required for operation of the radiation monitoring system are completed and functional.
- 2.4 Test instrumentation is available and calibrated.
- 2.5 Calibration check source is available, as required.
- 2.6 Verify that factory acceptance testing has been completed.
- 2.7 Verify proper operation of alarm setpoints, operation, control, and indication functions.

3.0 TEST METHOD

- 3.1 Verify the operation of the radiation monitor using a check source and external test equipment, as applicable.
- 3.2 Check the self-testing feature of the radiation monitor, as applicable.
- 3.3 Compare local and remote indications.
- 3.4 Verify as-designed local and remote alarm actuations, as applicable.

3.5 Initiate a high radiation signal to the MCR air intake, main steam line, and containment high range radiation monitors to verify that control actuations meet design requirements. The source of initiation of the signal, listed in order of preference, should be one of the following:~~Simulate automatic initiation signals and record control actuations:~~

14.02-144 →

- 3.5.1 Internal check source (verify that check source strength is capable of generating desired control actuations).

14.02-144 →

- 3.5.2 Radiation calibration check source (verify that check source does not generate a personnel hazard during the test).
- 3.5.3 Simulated high radiation signal at the radiation detector.

- 3.6 Verify that the radiation monitoring system operates over the design range using actual or simulated signals.
- 3.7 Verify that the radiation monitoring system responds as designed to actual or simulated limiting malfunctions or failures.
- 3.8 Verify that the radiation monitoring system response meets the accident analysis assumptions, such as time response, accuracy, and control stability.
- 3.9 Verify redundancy and electrical independence of the radiation monitoring system design.

4.0 DATA REQUIRED

- 4.1 Radiation monitor response to a check source, as applicable.
- 4.2 Technical data associated with the source.
- 4.3 Local and remote responses to test signals, as applicable.
- 4.4 Signals levels necessary to cause alarm actuation.

5.0 ACCEPTANCE CRITERIA

14.02-144 →

- 5.1 The radiation monitoring system (MCR air intake duct activity) generates a Main Control Room air intake activity measurement signal as input to the protection system
- 5.2 The radiation monitoring system (containment high range activity) generates a containment isolation signal as an input to the protection system, as designed.
- 5.3 The radiation monitoring system (main steam line activity) generates a steam generator isolation signal as an input to the protection system, as designed.
- 5.4 The airborne and area radiation monitors function as described in Sections 7.1.1.5.5~~Sections 7.1.1~~, 7.3.1, 7.5.1, and 12.3.4. The airborne and area radiation monitors are listed in Table 11.5-1 and Table 12.3-3, respectively.

**14.2.12.11.20 Process and Effluent Radiological Monitoring System (Test #144)**

1.0 OBJECTIVE

- 1.1 To verify that the process and effluent radiological monitoring system can detect and record specific radiation levels, and to verify alarms and interlocks.