PMComanchePeakPEm Resource

From: Monarque, Stephen
Sent: Friday, November 06, 2009 3:12 PM
To: ComanchePeakCOL Resource
Subject: FW: Responses to RAIs 85, 86, 87, and 89 from luminant
Attachments: TXNB-09062 RAIs 85-87, 89.pdf

From: John.Conly@luminant.com [mailto:John.Conly@luminant.com]
Sent: Thursday, November 05, 2009 6:06 PM
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Cc: James.Hill2@luminant.com
Subject: Responses to RAIs 85, 86, 87, and 89

Luminant has submitted the attached responses to CP RAIs #85-87 and 89 covering FSAR Sections 5.2, 12.2, and 14.2. If there are any questions regarding these responses, please contact me or contact Don Woodlan (254-897-6887, Donald.Woodlan@luinant.com).

Thanks,

John Conly
COLA Project Manager NuBuild
Luminant Power
(254) 897-5256

Hearing Identifier: ComanchePeak_COL_Public
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Ref. # 10 CFR 52

November 5, 2009

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555
ATTN: David B. Matthews, Director
Division of New Reactor Licensing

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4
DOCKET NUMBERS 52-034 AND 52-035
RESPONSES TO REQUESTS FOR ADDITIONAL INFORMATION
NO. 2969, 3317, 3509, AND 3593

Dear Sir:

Luminant Generation Company LLC (Luminant) herein submits responses to Requests for Additional Information No. 2969, 3317, 3509, and 3593 for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The affected Final Safety Analysis Report pages are included with the responses.

Should you have any questions regarding these responses, please contact Don Woodlan (254-897-6887, Donald.Woodlan@luminant.com) or me.

There are no commitments made in this letter.

I state under penalty of perjury that the foregoing is true and correct.

Executed on November 5, 2009.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

Attachments
1. Response to Request for Additional Information No. 2969 (CP RAI #87)
2. Response to Request for Additional Information No. 3317 (CP RAI #89)
3. Response to Request for Additional Information No. 3509 (CP RAI #85)
4. Response to Request for Additional Information No. 3593 (CP RAI #86)

Electronic Distribution w/all Attachments

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Attachment 1

Response to Request for Additional Information No. 2969 (CP RAI #87)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 2969 (CP RAI #87)

SRP SECTION: 05.02.04 - Reactor Coolant Pressure Boundary Inservice Inspection and Testing

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR PROJECTS) (CIB1)

DATE OF RAI ISSUE: 9/26/2009

QUESTION NO.: 05.02.04-1

In accordance with 10 CFR, Part 50, Appendix A, GDC 32 and NUREG-0800, SRP guidelines, the COL applicant should establish a program to detect and correct potential reactor coolant pressure boundary (RCPB) corrosion caused by boric acid leaks, as described in Generic Letter 88-05, 'Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants, dated March 17, 1988. STD COL 5.2(4) states in part that the boric acid control program consists of visual inspection of component surfaces for evidence of leakage, removal, assessment and inspection follow-up. The statement does not adequately address the scope nor provide a level of detail of the boric acid corrosion control program sufficient to allow the NRC staff to reach a reasonable assurance finding of acceptability of this operational program in accordance with RG 1.206, section C.I.5.2. Please provide more detail in describing the program by addressing the elements recommended in GL 88-05.

ANSWER:

Based on industry operating experience, severe degradation such as wastage of pressure retaining parts caused by boric acid is mostly limited to the carbon steel or low-alloy steel parts of reactor pressure boundary components in PWR plants. As stated in Generic Letter 88-05, operating plant experience shows that mechanical seals and connections such as bolted joints, gasket and flanged connections, valve flange, and seal welds are potential leak locations.

The potential for leakage from the reactor vessel head due to corrosion of reactor vessel head penetration nozzle seal welds is considered to be very low. This is because the US-APWR design uses alloy 690 and its weld metals, which are considered to be highly resistant to Primary Water Stress Corrosion Cracking (PWSCC).

There are boric acid control program and procedure documents for CPNPP Units 1 and 2 (Boric Acid Corrosion Detection and Evaluation, RCS Materials Management Program, Fluid Leak Management

Program) and a similar approach will be applied to CPNPP Units 3 and 4. Additional details have been added to the FSAR Subsection 5.2.4 to address the elements recommended in GL 88-05.

Impact on R-COLA

See the attached marked-up FSAR Draft Revision 1 page 5.2-2.

Impact on S-COLA

None.

Impact on DCD

None.

STD COL 5.2(4) Replace the first sentence of the fourth paragraph in DCD Subsection 5.2.4.1 with the following.

The implementation milestones for the ISI program and the IST program are provided in Table 13.4-201"

Add the following text after the first sentence of the fifth paragraph in DCD Subsection 5.2.4.1.

RCOL2_05.02.04-1

~~The boric acid corrosion control program consists of visual inspection of component surfaces for evidence of leakage, removal of any boric acid residue found, assessment of the corrosion, and inspection follow-up.~~The boric acid corrosion control program (BACCP) for CPNPP Units 3 and 4 includes procedures for determining the principal locations where leakage may cause degradation of the primary pressure boundary by boric acid corrosion. Procedures for controlling leakage include provisions to detect and locate small leaks using on-line leakage monitoring and/or visual inspection. Leakage that is below allowable Technical Specification limits is detected by indication and trending of on-line leakage detection data gathered from containment sump level and flow monitoring, containment air cooler condensate flow rate monitoring, containment airborne particulate radioactivity monitoring, humidity, temperature, and pressure monitoring of the containment atmosphere, and observing gross leakage from changes in the reactor coolant inventory. If a trend indicates reactor coolant leakage, operators are trained to take action to identify possible leak locations.

In addition, the following visual inspections are routinely conducted in order to identify leakage.

- Visual inspection of accessible and observable components during system walkdowns (including walkdowns conducted early in the outage to ensure evidence of RCS leakage, such as boric acid deposits at the leakage sites, is not disturbed prior to engineering evaluation).

- Visual inspections during plant outages (including bare metal inspection of specific components that have higher risk of corrosion)

The BACCP also contains methods for conducting examinations, performing engineering evaluations to establish the impact on the reactor coolant pressure boundary when leakage is located, and establishing corrective actions to prevent recurrences of this type of corrosion.

DCD_05.02.04-8

5.2.4.1.1 Arrangement and Accessibility

Attachment 2

Response to Request for Additional Information No. 3317 (CP RAI #89)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak Units 3 and 4

Luminant Generation Company LLC

Docket No. 52-034 and 52-035

RAI NO.: 3317 (CP RAI #89)

SRP SECTION: 12.02 - Radiation Sources

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/26/2009

QUESTION NO.: 12.02-2

10 CFR 20.1802 requires licensees to secure from unauthorized removal or access, additional materials in controlled or unrestricted areas that are not in storage. NUREG-0800, Standard Review Plan (SRP) Section 12.2 notes that the combined license (COL) applicant is responsible for identifying and quantifying any sources not identified in the referenced design certification document (DCD). 10 CFR 20 Subpart H "Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas" requires licensees to use process or engineering controls to control the concentration of airborne radioactive material. SRP Section 12.3-12.4 provides guidance regarding monitoring for airborne radioactivity, and the protection of plant personnel from airborne contamination.

The US-APWR FSAR Tier 2 Section 12.2.3 COL 12.2(1) notes that the applicant is responsible for identifying any additional sources of radiation that are not identified in FSAR Tier 2 Section 12.2.1. Contrary to this requirement, Comanche Peak FSAR 12.2.1.1.10 does not provide any information regarding the corrosion and fission activity contained within the Evaporation Pond, the methods, models and assumptions employed to determine the residual fission and corrosion product activity in the pond, or how the material will be controlled in accordance with the requirements of 10 CFR 20.1801. Nor does the Comanche Peak FSAR describe the estimated airborne activity concentrations that could result from dispersion of the dried pond sediment due to wind, the resultant exposure to operating plant personnel, or the protective/prevent measures required by 10 CFR 20 Subpart H.

In accordance with the requirements of 10CFR 20.1801 and Subpart H, and the guidance provided in SRP Sections 12.2 and 12.3-12.4, the applicant should revise and update the FSAR to describe:

- The quantity of fission and corrosion product activity in the Evaporation Pond
- The airborne activity exposure to plant personnel due to wind dispersed activity from pond sediment
- The features provided to restrict access to the radioactive material in the pond sediment
- The features provided to provide engineering controls to reduce airborne activity

or describe and justify the specific alternate approaches employed.

ANSWER:

- The estimated fission and corrosion product activity in the evaporation pond water presented in new FSAR Table 12.2-201 are based on the realistic basis source term for the Waste Monitor Tank and the decontamination factors from NUREG-0017.

- Airborne exposure due to potential wind dispersed activity from pond sediment has been addressed in the response to RAI No. 3400 (CP RAI#36) Question No. 11.03-2, submitted via Luminant letter TXNB-09054, dated October 15, 2009, which is repeated here for the reviewer's convenience:

  > The possibility of windblown dust emissions containing plant-derived corrosion and fission products is addressed by design (providing wash water) and by operating procedures. As stated in FSAR Subsection 11.2.3.1, the pond is washed each time the contents are emptied to significantly reduce the potential for accumulation of residual contamination and the bottom of the pond is sloped towards the discharge pit to facilitate complete drainage. Therefore, airborne residual corrosion and fission products that could be spread by wind gusts are minimized and there are no postulated onsite or offsite dose consequences.

- Access to the radioactive material in the pond will be restricted by a fence with a locked gate, surrounding the pond area with posting and labeling, such as the appropriate radioactive placards, in accordance with the Operational Radiation Protection Program. The fence will be placed at a distance from the pond, so that the dose rate at the fence is below the maximum dose rate for Zone 1 (0.25mrem/hr). Additionally, the evaporation pond is located within the Owner Property Boundary and the area is subject to surveillance by random Security patrols.

- The engineering controls to reduce airborne activity include washing the pond and diverting flow only when required. Details on these controls have been added to the FSAR by the response to RAI No. 2747 (CP RAI #29) Question 11.02-3, submitted via Luminant letter TXNB-09048, dated September 24, 2009 (ML092720676). New Subsection 11.2.3.4, provided in FSAR Update Tracking Report Revision 4 submitted on September 2, 2009 (ML092520125), also states:

  > In order to minimize contamination, the pond is rinsed each time the pond content is emptied. The rinse water is also forwarded to Squaw Creek Reservoir, via the discharge box and blended with the CPNPP Units 1 or 2 circulation water flow.

  This practice will minimize the potential for wind-dispersed activity from the pond sediment.

Impact on R-COLA

See the attached marked-up Draft Revision 1 page 12.2-1 and Table 12.2-201 (2 sheets).

Impact on S-COLA

None.

Impact on DCD

None.

12.2 RADIATION SOURCES

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

12.2.1.1.10 Miscellaneous Sources

CP COL 12.2(2) Replace the second and third sentences of the sixth paragraph in DCD Subsection 12.2.1.1.10 with the following.

CPNPP Units 3 and 4 have no additional storage space for radwaste inside the plant structures. An additional storage space for radwaste, to be named the Interim Radwaste Storage Building, is planned for the future construction outside the plant structures. The radiation protection program (see Section 12.5) associated with this additional radwaste storage space is in place to ensure compliance with Title 10, Code of Federal Regulations (CFR) Part 20, 40 CFR 190 and to be consistent with the recommendations of RG 8.8. CTS-00717 DCD_12.02-15

CP COL 12.2(2) Replace the second sentence of the seventh paragraph in DCD Subsection 12.2.1.1.10 with the following.

CPNPP Units 3 and 4 have no additional radwaste facilities for dry active waste.

CP COL 12.2(1) Replace the last paragraph in DCD Subsection 12.2.1.1.10 with the following.

~~Any additional solid, liquid and gaseous radiation sources that are not identified in Subsection 12.2.1, including radiation sources used for instruments calibration or radiography, will be provided when such site specific information would become available in the procurement phase. These sources will be incorporated in the updated FSAR.~~Additionally, the site maintains contained sources of known isotope and activity containing byproduct, source, or special nuclear materials for use as calibration, check, or radiography sources. Example uses for these types of sources include systems security checks; equipment standardization and calibration; process control; gauging and quality assurance testing; teaching; and nuclear reactor operations. RCOL2_12.02-1 CTS-00900

Licensed sources containing byproduct, source, and special nuclear materials that warrant shielding design consideration meet the applicable requirements of 10 CFR Parts 20, 30, 31, 32, 33, 34, 40, 50, and 70. Sources maintained on site are shielded to keep personnel exposure ALARA. Sources brought on-site by

RCOL2_12.02-2

Table 12.2-201 (Sheet 1 of 2)
Estimated Initial Activity into the Evaporation Pond (Based on the Realistic Source Terms of the Waste Monitor Tank)

Nuclide	Activity ($\mu Ci/cm^3$)
Ag-110m	1.3E-08
Ba-140	1.3E-07
Ce-141	1.5E-09
Ce-143	3.1E-08
Ce-144	4.0E-08
Co-58	4.5E-08
Co-60	5.2E-09
Cr-51	3.1E-08
Cs-134	1.9E-08
Cs-136	4.6E-07
Cs-137	2.7E-08
Fe-55	1.2E-08
Fe-59	2.9E-09
H-3	1.8E-01
I-131	2.0E-09
I-132	1.0E-07
I-133	3.1E-08
I-134	1.8E-07
I-135	7.7E-08
La-140	2.7E-07
Mn-54	1.5E-08
Mo-99	6.7E-08

RCOL2_12.02-2

Table 12.2-201 (Sheet 2 of 2)
Estimated Initial Activity into the Evaporation Pond (Based on the Realistic Source Terms of the Waste Monitor Tank)

Nuclide	Activity ($\mu Ci/cm^3$)
Na-24	5.8E-07
Nb-95	2.7E-09
Np-239	2.3E-08
Rb-88	1.9E-04
Ru-103	7.4E-08
Ru-106	8.6E-07
Sr-89	1.4E-09
Sr-90	1.2E-10
Sr-91	1.3E-08
Tc-99m	6.8E-08
Te-129	4.3E-07
Te-129m	1.8E-09
Te-131	1.5E-07
Te-131m	1.7E-08
Te-132	1.7E-08
W-187	2.9E-08
Y-91	5.0E-11
Y-91m	8.6E-09
Y-93	5.6E-08
Zn-65	4.9E-09
Zr-95	3.8E-09

Attachment 3

Response to Request for Additional Information No. 3509 (CP RAI #85)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak Units 3 and 4

Luminant Generation Company LLC

Docket No. 52-034 and 52-035

RAI NO.: 3509 (CP RAI #85)

SRP SECTION: 12.02 - Radiation Sources

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/26/2009

QUESTION NO.: 12.02-1

10 CFR 20.1301, Regulatory Guide (RG) 1.206 C.I.12.2.1, and NUREG-0800 Standard Review Plan (SRP) 12.2 form the regulatory basis for this question. RG 1.206 states that the applicant should describe any required radiation sources containing byproduct, source, and special nuclear material that may warrant shielding considerations, and, for any such sources, should provide a listing by isotope, quantity, form, and use for all of these sources that exceed 3.7 E+9 Bq (100 millicuries). While the response to Comanche Peak COL 12.2(1) noted that additional sources would be identified during the procurement phase, the Comanche Peak FSAR did not identify any radiation sources that required facility shielding, and they did not identify what types and quantities of source material would be required. Facility design must be able to accommodate the activity and types of sources obtained during the procurement phase.

Please revise and update the Comanche Peak FSAR Section 12.2 to:

a. Describe the uses and shielding requirements of any radiation sources containing byproduct, source, and special nuclear material not described in the US-APWR Design Certification Document that may require shielding design considerations.

b. Provide a listing, by isotope, quantity, form, and use, of any of the sources described in your response to a) above that exceed 100 millicuries. For instance, neutron sources for portable instrument calibration, panoramic irradiators for dosimeter or portable instrument calibration.

Otherwise, describe the specific approach to be used as an acceptable alternate approach to address the guidance in RG 1.206.

ANSWER:

Specific details regarding all types of radiation sources containing byproduct, source, and special nuclear material that may be utilized at Comanche Peak Units 3 and 4 are not currently available. However, procurement of many of these types of sources will occur during the construction phase of the

project. Specific details regarding the isotope, quantity, form, any special shielding requirements or shielding design considerations, and use of these sources will be maintained onsite following their procurement. Additionally, the site will utilize written procedures to govern the procurement, receipt, inventory, labeling, leak testing, surveillance, control, transfer, disposal, storage, issuance, and use of these sources in accordance with the Radiation Protection Program and its implementing milestone schedule provided in FSAR Section 13.4 and Table 13.4-201. These procedures will comply with 10 CFR Parts 19 and 20 to assure that occupational doses associated with the control and use of these materials are maintained ALARA. FSAR Subsection 12.2.1.1.10 has been revised to assure that Luminant will be able to track the source type, quantity, form, location, and use such that the facility design will accommodate the activity and types of sources procured and temporarily utilized on site during the construction and operational phase.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 12.2-1 and 12.2-2.

Impact on S-COLA

None.

Impact on DCD

None.

12.2 RADIATION SOURCES

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

12.2.1.1.10 Miscellaneous Sources

CP COL 12.2(2) Replace the second and third sentences of the sixth paragraph in DCD Subsection 12.2.1.1.10 with the following.

CPNPP Units 3 and 4 have no additional storage space for radwaste inside the plant structures. An additional storage space for radwaste, to be named the Interim Radwaste Storage Building, is planned for the future construction outside the plant structures. The radiation protection program (see Section 12.5) associated with this additional radwaste storage space is in place to ensure compliance with Title 10, Code of Federal Regulations (CFR) Part 20, 40 CFR 190 and to be consistent with the recommendations of RG 8.8. CTS-00717 DCD_12.02-15

CP COL 12.2(2) Replace the second sentence of the seventh paragraph in DCD Subsection 12.2.1.1.10 with the following.

CPNPP Units 3 and 4 have no additional radwaste facilities for dry active waste.

CP COL 12.2(1) Replace the last paragraph in DCD Subsection 12.2.1.1.10 with the following.

~~Any additional solid, liquid and gaseous radiation sources that are not identified in Subsection 12.2.1, including radiation sources used for instruments calibration or radiography, will be provided when such site specific information would become available in the procurement phase. These sources will be incorporated in the updated FSAR.~~Additionally, the site maintains contained sources of known isotope and activity containing byproduct, source, or special nuclear materials for use as calibration, check, or radiography sources. Example uses for these types of sources include systems security checks; equipment standardization and calibration; process control; gauging and quality assurance testing; teaching; and nuclear reactor operations. RCOL2_12.02-1 CTS-00900

Licensed sources containing byproduct, source, and special nuclear materials that warrant shielding design consideration meet the applicable requirements of 10 CFR Parts 20, 30, 31, 32, 33, 34, 40, 50, and 70. Sources maintained on site are shielded to keep personnel exposure ALARA. Sources brought on-site by

RCOL2_12.02-1

contractors for activities such as the servicing or calibration of plant instrumentation or the performance of radiography are maintained and used in accordance with the provisions of the licensed utility group or contractor. If these sources must be maintained on site, designated plant personnel approve the storage location and identify appropriate measures for maintaining security and personnel protection.

Specific details regarding the isotope, quantity, form and use of these sources are maintained onsite following their procurement. The following minimum information is maintained:

- Isotopic concentration
- Location on site
- Source strength, form, and geometry (as applicable)
- Description of the use

Written procedures based upon the Radiation Protection Program govern the procurement, receipt, inventory, labeling, leak testing, surveillance, control, transfer, disposal, storage, issuance, and use of these sources. Additionally, these procedures comply with 10 CFR Parts 19 and 20 to assure that occupational doses associated with the control and use of these materials are maintained ALARA.

12.2.3 Combined License Information

Replace the content of DCD Subsection 12.2.3 with the following.

CP COL 12.2(1) ***12.2(1)*** *Additional sources*

This COL item is addressed in Subsection 12.2.1.1.10.

CP COL 12.2(2) ***12.2(2)*** *Additional storage space and radwaste facilities*

This COL item is addressed in Subsection 12.2.1.1.10 and Section 12.5.

Attachment 4

Response to Request for Additional Information No. 3593 (CP RAI #86)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak Units 3 and 4

Luminant Generation Company LLC

Docket No. 52-034 and 52-035

RAI NO.: 3593 (CP RAI #86)

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

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/26/2009

QUESTION NO.: 14.02-9

10 CFR 50.34(f)(2)(xxvii) and NUREG 0737 III.D.3.3 require licensees to provide monitoring of in plant iodine airborne radioactivity. US-APWR FSAR Tier 2 Table 7.5-3 "PAM Variables" notes that portable air sampling instrumentation should have a range of 1.0E-9 uCi/cc to 1.0E-3 uCi/cc for particulates and radio halogens, using portable sampling and on site analysis. This table also notes that portable radiation survey instruments should have ranges of 1E-3 to 1E4 R/h photon, and 1E-3 to 1E4 rads/h beta and low energy photons. However, COL FSAR Section 14.2.12.1.112 "Personnel Monitors and Radiation Survey Instruments Preoperational Tests" does not provide any guidance or acceptance criteria regarding the sensitivity and range of portable and laboratory instruments used for Radiation Protection.

Please revise and update the COL FSAR Section 14.2.12.1.112 to include acceptance criteria demonstrating that the instruments can accurately respond to the required levels of radioactive material, or provide an alternate approach and the associated justification.

ANSWER:

The demonstration that the instruments can accurately respond to the required levels of radioactive material is achieved by correct specification of instrument range and sensitivity, and by the procurement process. Sensitivity is not confirmed during preoperational testing.

FSAR Subsection 14.2.12.1.112 has been revised to specify that calibration be performed in accordance with the radiation protection program in Prerequisite Item B.4, and to include acceptance criteria verifying that (1) the range of portable and laboratory instruments used for radiation protection meet the required instrument ranges specified in Table 7.5-3 and that (2) calibrations have been performed in accordance with the radiation protection program.

Impact on R-COLA

See attached marked-up FSAR draft Revision 1 page 14.2-6.

Impact on S-COLA

None.

Impact on DCD

None.

8. Verify that local offsite fire departments utilize hose threads or adapters capable of connecting with onsite hydrants, hose couplings, and standpipe risers. RCOL2_14.03-1

Add new subsections after DCD Subsection 14.2.12.1.111 as follow.

STD COL 14.2(10) **14.2.12.1.112 Personnel Monitors and Radiation Survey Instruments Preoperational Test**

A. Objective

1. To demonstrate the operation, indication, and alarm functions of radiological personnel monitors and radiation survey instruments.

B. Prerequisites

1. Required construction testing is completed.
2. Test instrumentation is available and calibrated.
3. Required support systems are available.
4. Indicators, power supplies, ~~and~~ sensors, portable and laboratory instruments have been calibrated as required in accordance with ~~vendor instructions~~the radiation protection program described in Section 12.5. RCOL2_14.02-9 RCOL2_14.02-14

C. Test Method

1. Performance of each monitor and survey unit is observed and recorded during individual component tests for each unit during calibration using standard radiation sources, including verification of all alarms, annunciators, and indicators, operation of bypass, interlock, permissive, self-test and loss of power functions, as applicable.

D. Acceptance Criterion

1. Component and, where applicable, integrated testing demonstrates that each monitor or survey unit operates as specified by vendor technical information, and plant procedures implementing the radiation protection program described in Section 12.5, including the following, as applicable: RCOL2_14.02-9 RCOL2_14.02-14
   i. Alarms, annunciators, and indicators.
   ii. Bypass, interlock, permissive, self-test, and loss of power functions.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak Units 3 and 4

Luminant Generation Company LLC

Docket No. 52-034 and 52-035

RAI NO.: 3593 (CP RAI #86)

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

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/26/2009

QUESTION NO.: 14.02-10

10 CFR 50.34.f(2)(xxvi) [NUREG 0737 III.D.1.1] requires leakage control and detection for systems outside containment that might contain highly radioactive fluids, and requires applicants to submit a leakage control program, including an initial test program and a schedule for retesting systems. US-APWR design certification document (DCD) FSAR Tier 2 Chapter 16, Section 5.5.2, notes the requirement for a leakage minimization program for systems outside containment that might contain highly radioactive fluids. Neither COL FSAR Section 14.2.12.1, "Preoperational Tests", nor COL FSAR Table 14A-201 "Conformance Matrix of RG 1.68 Appendix A Guidance versus Added Test Abstracts in the FSAR" discuss testing these systems for leakage, in accordance with NUREG 0737 III.D.1.1.

Please revise and update COL FSAR Section 14.2 to reflect preoperational leak testing indicated by 10 CFR 34.f(2)(xxvi) and NUREG 0737 III.D.1.1 for Highly Radioactive Fluid Systems Outside Containment, or provide an alternate approach and the associated justification.

ANSWER:

The program described in Technical Specifications Section 5.5.2, Primary Coolant Sources Outside Containment, will be initiated during Hot Functional Testing to establish the baseline for the periodic leak testing program.

The US-APWR DCD has been revised to include this activity in Section 14.2.12.1.1, RCS Hot Functional Preoperational Test.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

Changes to the DCD have been provided in Mitsubishi Heavy Industries, Ltd. letter to the NRC, "Transmittal of the Updated Chapter 14 of US-APWR DCD," dated October 28, 2009 (UAP-HF-09499).

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak Units 3 and 4

Luminant Generation Company LLC

Docket No. 52-034 and 52-035

RAI NO.: 3593 (CP RAI #86)

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

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/26/2009

QUESTION NO.: 14.02-11

Regulatory Guide (RG) 1.68 "Initial Test Programs for Water-Cooled Nuclear Power Plants" notes that 10 CFR 50 Appendix B requires a test program to ensure that all structures systems and components (SSCs) will perform satisfactorily in service. RG 1.68 Position 1(c) notes that tests should be provided for those systems that address limiting condition for operations (LCOs) included in Technical Specifications. Radiation monitoring systems are an integral part of the NEI 97-06 "Steam Generator Program Guidelines" program EPRI Technical Report implementing documents, used to demonstrate compliance with the Primary-to-Secondary Leakage specification in DCD FSAR Tier 2 Chapter 16 (Technical Specifications), subsection 3.4.13. DCD FSAR Tier 2 Section 5.4.2.2 Notes the requirement for a Primary-to-Secondary Leakage program in accordance with the criterion of NEI 97-06.

Neither COL FSAR Section 14.2.12.1, "Preoperational Tests", nor COL FSAR Table 14A-201 "Conformance Matrix of RG 1.68 Appendix A Guidance versus Added Test Abstracts in the FSAR" discuss verifying that the systems used to demonstrate compliance with the NEI 97-06 Steam Generator leakage detection criteria, have the required detection sensitivity described in the EPRI implementing documents.

Please revise and update COL FSAR Section 14.2 to demonstrate that the Primary-to-Secondary Leakage monitoring instruments have the required sensitivity, or provide an alternate approach and the associated justification.

ANSWER:

The Primary-to-Secondary Leakage monitoring instruments are identified in DCD Subsection 5.2.5.3, and verification that the instrument sensitivities meet the specification is confirmed during the procurement process. Verification that calibration of these instruments has been performed is included in DCD Subsection 14.2.12.1.78 as a test prerequisite.

US-APWR DCD Subsection 14.2.12.1.78, Item B.3 of Prerequisites has been revised to include this activity.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

Changes to the DCD have been provided in Mitsubishi Heavy Industries, Ltd. letter to the NRC, "Transmittal of the Updated Chapter 14, Subsection 14.2.12.1.78 of US-APWR DCD," dated November 4, 2009 (UAP-HF-09510).

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak Units 3 and 4

Luminant Generation Company LLC

Docket No. 52-034 and 52-035

RAI NO.: 3593 (CP RAI #86)

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

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/26/2009

QUESTION NO.: 14.02-12

10 CFR 20.1501 requires surveys for monitoring and control of personnel radiation exposure. RG 1.206 C.I.12.5(1)(c) requires that the applicant have adequate types of instruments. RG 1.206 C.I.12.5.2.1 notes that the applicant should have laboratory equipment to support radiation surveys in the plant. In COL FSAR Section 14.2.12.1.112 "Personnel Monitors and Radiation Survey Instruments Preoperational Tests", STD COL 14.2(10) addresses pre-operational tests. The NRC staff notes that RG 1.68 (Appendix A, Section 1.k (Preoperational Testing-Radiation Protection Systems)) includes "laboratory equipment used to analyze or measure radiation levels and radioactivity concentrations" as one of the system types that should receive pre-operational testing to demonstrate proper operation. While US-APWR DCD FSAR Tier 2 Section 14.2.12.1.84 addresses the performance of laboratory equipment associated with Post Accident Sample Analysis, neither the DCD or the COL FSAR address testing of radiation protection laboratory equipment, such as Whole Body Counters, and radiation protection air sample counting instruments.

Please revise and update the COL FSAR to include a site-specific pre-operational test for laboratory equipment in FSAR Section 14.2.12.1, or justify the absence of such testing.

ANSWER:

The scope of FSAR Subsection 14.2.12.1.112, "to demonstrate the operation, indication, and alarm functions of radiological personnel monitors and radiation survey instruments," verifies functionality of monitors and instruments that are or can be deployed in the plant, consistent with RG 1.68 Appendix A, item 1.k.(2). FSAR Subsection 14.2.12.1.112 has been revised to include laboratory equipment consistent with RG 1.68 Appendix A, item 1.k(3).

Impact on R-COLA

See marked-up FSAR draft Revision 1 page 14.2-6 attached to the response to Question 14.02-9.

Impact on S-COLA

None.

Impact on DCD

None.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak Units 3 and 4

Luminant Generation Company LLC

Docket No. 52-034 and 52-035

RAI NO.: 3593 (CP RAI #86)

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

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/26/2009

QUESTION NO.: 14.02-13

RG 1.68 “Initial Test Programs for Water-Cooled Nuclear Power Plants” notes that 10 CFR 50 Appendix B requires a test program to ensure that all SSCs will perform satisfactorily in service. RG 1.206 C.I.14.2.3 notes that the COL Applicant should also describe the types and sources of design performance requirements used to develop the testing procedures. COL FSAR Section 14.2.12.1.112 “Personnel Monitors and Radiation Survey Instruments Preoperational Tests” notes that the tests are to verify the operability of the radiation monitoring system, including alarms, where applicable. However, the test criteria do not discuss the radiation system sensitivity, as it relates to establishing statistically valid and functionally useful alarms (high confidence of activity present on an alarm, along with a low [e.g. 1/10,000] false alarm rate), under expected field conditions.

Please revise and update the COL FSAR Section 14.2.12.1.112 to reflect verification that the alarm provisions of the instrument are functionally viable, or provide an alternate method of verifying instrument functionality and the associated justification.

ANSWER:

The determination of whether alarms are statistically valid and functionally useful (high confidence of activity present on an alarm, along with a low [e.g. 1/10,000] false alarm rate) is based on alarm setpoint selection and instrument sensitivity specifications. These parameters are selected based on design requirements. Instrument sensitivity is specified by design and confirmed during the procurement process. Instrument setpoints are determined during design and adjusted to plant conditions by the operational radiation protection program described in COLA FSAR Section 12.5. The preoperational test program would not be used to perform analyses to determine the correct selection of alarm setpoints or instrument sensitivity specifications.

FSAR Subsection 14.2.12.1.112 has been revised to specify that calibration be performed in accordance with the radiation protection program.

Impact on R-COLA

See marked-up FSAR draft Revision 1 page 14.2-6 attached to the response to Question 14.02-9.

Impact on S-COLA

None.

Impact on DCD

None.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak Units 3 and 4

Luminant Generation Company LLC

Docket No. 52-034 and 52-035

RAI NO.: 3593 (CP RAI #86)

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

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/26/2009

QUESTION NO.: 14.02-14

10 CFR 20.1501(b) requires that instruments used for radiation measurements be periodically calibrated. NUREG-1736 "Consolidated Guidance: 10 CFR Part 20 – Standards for Protection Against Radiation" notes that this is normally done by adjusting an instrument response to reflect the value from a known standard. NUREG-0800 Standard Review Plan (SRP) 14.2 "Initial Plant Test Program - Design Certification and New License Applicants", requires that each licensee perform, or permit the Commission to perform, tests of radiation detection and monitoring instruments. NRC Information Notice No. 93-30: "NRC Requirements for Evaluation of Wipe Test Results; Calibration of Count Rate Survey Instruments" notes that the licensee must demonstrate that the instrument is calibrated to make measurements and sufficiently sensitive to meet the applicable regulatory requirements in 10 CFR Parts 20. Calibration information can be found in the instrument manufacturer's guidance, however, the licensee, not the instrument manufacturer, is responsible for demonstrating that the instrument and method used are sensitive enough to meet NRC regulatory requirements. The applicant is relying on NEI 07-03 to describe the radiation protection program elements described in SRP Section 12.5. While NEI 07-03A discusses radiation protection instrument calibration, NEI 07-03A does not specifically address the process to be used to ensure that calibration of portable and laboratory instruments is performed using national or international standards guidance. Extensive guidance is available in the national and international community regarding the selection and calibration of radiation protection instrumentation including standards organizations, such as ANSI, IEEE, IEC and NCRP. None of these standards or standards organization are referenced as the basis for portable and laboratory radiation protection instrument calibration. However, in COL FSAR Section 14.2.12.1.112 "Personnel Monitors and Radiation Survey Instruments Preoperational Test", step (B)(4), the applicant notes that instruments will have been calibrated as required in accordance with vendor instructions. As vendor calibration procedures may optimize instrument function and response to conditions that are not representative of the power plant environment, the licensee is required to determine the appropriate standards to be used as the basis for instrument calibration.

Please update and revise COL FSAR Section 14.2.12.1.112 to reflect the use of consensus standards, in addition to vendor recommendations, as part of the method of calibration of portable and laboratory radiation protection instrumentation, or describe an alternate approach and the associated justification.

ANSWER:

Selection of specific consensus standards and their application to the calibration of radiation detection and monitoring instruments is necessary to implement the radiation protection program through development of plant methods, procedures and processes. However, since the instruments involved and the analytical methods used are subject to continual improvements and upgrades, they should be specified at a time much closer to actual plant operations. The test program relies upon the radiation protection program to specify the proper methods for radiation protection instrument calibration. The radiation protection program described in COLA FSAR Section 12.5 references NEI 07-03A which in turn references the appropriate consensus standards.

Luminant agrees that calibration procedures for radiation protection instruments are based upon both the consensus standards identified in the radiation protection program and the vendor instructions. Subsection 14.2.12.1.112 has been revised to include reference to the radiation protection program for calibration requirements.

Impact on R-COLA

See marked-up FSAR draft Revision 1 page 14.2-6 attached to the response to Question 14.02-9.

Impact on S-COLA

None.

Impact on DCD

None.