PMComanchePekNPEm Resource

From: Monarque, Stephen
Sent: Monday, November 02, 2009 4:59 PM
To: ComanchePeakCOL Resource
Subject: FW: RAI Responses Comanche peak - nonpublic SUNSI review needs to be completed
Attachments: TXNB-09058 RAIs 54 - 59.pdf

From: John.Conly@luminant.com [mailto:John.Conly@luminant.com]
Sent: Monday, October 26, 2009 5:48 PM
To: rjb@nei.org; david.beshear@txu.com; Biggins, James; rbird1@luminant.com; mike.blevins@luminant.com; Dennis.Buschbaum@luminant.com; russell_bywater@mnes-us.com; JCaldwell@luminant.com; Ronald.Carver@luminant.com; cp34update@certrec.com; Ciocco, Jeff; Timothy.Clouser@luminant.com; Collins, Elmo; John.Conly@luminant.com; Carolyn.Cosentino@luminant.com; brock.degeyter@energyfutureholdings.com; nancy.douglas@txu.com; Eric.Evans@luminant.com; Rafael.Flores@luminant.com; sfrantz@morganlewis.com; Goldin, Laura; Hamzehee, Hossein; kazuya_hayashi@mnes-us.com; mutsumi_ishida@mnes-us.com; Johnson, Michael; Kallan, Paul; masahiko_kaneda@mnes-us.com; kak@nei.org; Allan.Koenig@luminant.com; Kramer, John; mlucas3@luminant.com; Fred.Madden@luminant.com; Matthews, David; tmatthews@morganlewis.com; Monarque, Stephen; Ashley.Monts@luminant.com; Bill.Moore@luminant.com; masanori_onozuka@mnes-us.com; ck_paulson@mnes-us.com; Plisco, Loren; Robert.Reible@luminant.com; jeff.simmons@energyfutureholdings.com; Singal, Balwant; nan_sirirat@mnes-us.com; Takacs, Michael; joseph_tapia@mnes-us.com; Tindell, Brian; Bruce.Turner@luminant.com; Vrahoretis, Susan; Ward, William; Matthew.Weeks@luminant.com; Willingham, Michael; Donald.Woodlan@luminant.com; diane_yeager@mnes-us.com
Cc: bill.ward@nrc.gov
Subject: RAI Responses

Luminant has submitted the attached responses to RAI No. 2583 (# 56), 2772 (# 57), 2818 (# 54), 2876 (# 55), 3457 (# 58), and 3602 (# 59). No CD was submitted with the letter. If there are any questions regarding the responses, please contact me or contact Don Woodlan (254-897-6887, Donald.Woodlan@luminant.com).

Thanks,

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

Hearing Identifier: ComanchePeak_COL_NonPublic
Email Number: 1171

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Recipients:
"ComanchePeakCOL Resource" <ComanchePeakCOL.Resource@nrc.gov>
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Luminant

Rafael Flores
Senior Vice President &
Chief Nuclear Officer
rafael.flores@luminant.com

Luminant Power
P O Box 1002
6322 North FM 56
Glen Rose, TX 76043

T 254.897.5590
F 254.897.6652
C 817.559.0403

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Ref. # 10 CFR 52

October 26, 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. 2583, 2772, 2818, 2876, 3457, AND 3602

Dear Sir:

Luminant Generation Company LLC (Luminant) herein submits responses to Requests for Additional Information No. 2583, 2772, 2818, 2876, 3457, and 3602 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.

The commitments made in this letter are specified in a table on page 3.

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

Executed on October 26, 2009.

Sincerely,

Luminant Generation Company LLC

RD Bird for

Rafael Flores

Attachments
1. Response to Request for Additional Information No. 2583 (CP RAI #56)
2. Response to Request for Additional Information No. 2772 (CP RAI #57)
3. Response to Request for Additional Information No. 2818 (CP RAI #54)
4. Response to Request for Additional Information No. 2876 (CP RAI #55)
5. Response to Request for Additional Information No. 3457 (CP RAI #58)
6. Response to Request for Additional Information No. 3602 (CP RAI #59)

Electronic Distribution w/all Attachments

mike.blevins@luminant.com
Rafael.Flores@luminant.com
mlucas3@luminant.com
jeff.simmons@energyfutureholdings.com
Bill.Moore@luminant.com
Brock.Degeyter@energyfutureholdings.com
rbird1@luminant.com
Matthew.Weeks@luminant.com
Allan.Koenig@luminant.com
Timothy.Clouser@luminant.com
Ronald.Carver@luminant.com
David.Volkening@luminant.com
Bruce.Turner@luminant.com
Eric.Evans@luminant.com
Robert.Reible@luminant.com
donald.woodlan@luminant.com
John.Conly@luminant.com
JCaldwell@luminant.com
David.Beshear@txu.com
Ashley.Monts@luminant.com
Fred.Madden@luminant.com
Dennis.Buschbaum@luminant.com
Carolyn.Cosentino@luminant.com

Luminant Records Management –
Portfolio of .pdf files

masahiko_kaneda@mnes-us.com
masanori_onozuka@mnes-us.com
ck_paulson@mnes-us.com
joseph_tapia@mnes-us.com
russell_bywater@mnes-us.com
diane_yeager@mnes-us.com
kazuya_hayashi@mnes-us.com
mutsumi_ishida@mnes-us.com
nan_sirirat@mnes-us.com
rjb@nei.org
kak@nei.org
michael.takacs@nrc.gov
cp34update@certrec.com
michael.johnson@nrc.gov
David.Matthews@nrc.gov
Balwant.Singal@nrc.gov
Hossein.Hamzehee@nrc.gov
Stephen.Monarque@nrc.gov
jeff.ciocco@nrc.gov
michael.willingham@nrc.gov
john.kramer@nrc.gov
Brian.Tindell@nrc.gov
Elmo.Collins@nrc.gov
Loren.Plisco@nrc.com
Laura.Goldin@nrc.gov
James.Biggins@nrc.gov
Susan.Vrahoretis@nrc.gov
sfrantz@morganlewis.com
tmatthews@morganlewis.com

Regulatory Commitments in this Letter

This communication contains the following new or revised commitments which will be completed or incorporated into the CPNPP licensing basis as noted. The Commitment Number is used by Luminant for internal tracking.

Number	Commitment	Due Date/Event
6561	Luminant confirms that alternate methods for verification of valve position indicator operation, and the justification, that are incorporated into the IST program will be made available consistent with the implementation schedule for the IST program to provide for timely review during NRC inspection of the IST program prior to plant operation. Alternate methods for verification of valve position indicator operation, if necessary, will meet the requirements of ASME OM Code ISTC-3700.	Prior to commercial service
6571	Luminant will transition the activities for the NuBuild Project to the Quality Assurance Program Document (QAPD) based on NQA-1, RG 1.8, RG 1.28, and RG 1.33 sometime during the construction of CPNPP Units 3 and 4. The transition will be complete no later than 30 days before fuel load of CPNPP Unit 3.	No later than 30 days prior to Unit 3 fuel load
6581	Site-specific operational procedures for CPNPP Units 3 and 4 will be developed during the transition as they are needed. In particular, [radiological] procedures for radioactive effluents, analytical procedures, instrument calibration and regulated records will be developed before Unit 3 fuel load which will comply with the CPNPP 3 and 4 QAPD, NQA-1, and relevant NRC RGs as discussed in the COLA.	No later than 30 days prior to Unit 3 fuel load
6431	The plan for the CPNPP Units 3 and 4 seismic qualification program will be provided in MUAP-08015, Revision 1, by the end of October 2009. [TXNB-09047 (ML0926670160)]	December 31, 2009 (revised from October 30, 2009)
6591	Luminant commits to submit a schedule to the NRC that supports the planning and conduct of NRC inspections of operational programs, including the IST program, no later than 12 months after issuance of the COL or at the start of construction as defined in 10 CFR 50.10a, whichever is later. This is similar to the approach for the ITAAC schedule required in 10 CFR 52.99(a).	!2 months after COL or at start of construction, whichever is later

Attachment 1

Response to Request for Additional Information No. 2583 (CP RAI #56)

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.: 2583 (CP RAI #56)

SRP SECTION: 14.03.03 - Piping Systems and Components - Inspections, Tests, Analyses, and Acceptance Criteria

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR PROJECTS) (EMB2)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 14.03.03-1

Components ITAAC

The regulatory basis for this question is discussed in NUREG-0800, Standard Review Plan (SRP), Section 14.3.3, which establishes the criteria the NRC staff uses to review combined license (COL) applications.

In the Comanche Peak Nuclear Power Plant, Units 3 and 4 (CPNPP) COL Application Part 10, 'Inspections, Tests, Analyses and Acceptance Criteria and Proposed License Conditions,' Table A.1-1, 'Ultimate Heat Sink System and Essential Service Water System,' Item 2a, the column titled 'Design Commitment' states that ASME Code Section III components are designed and constructed in accordance with the requirements of American Society of Mechanical Engineers (ASME) Code Section III. In the Inspections, Tests, and Analyses (ITA) and Acceptance Criteria (AC) sections, the "as-built" components were discussed. Please provide separate ITAAC for the two remaining activities, Fabrication & Installation and As-built Reconciliation, as follows:

(1) Fabrication and Installation:

(a) For components designated as ASME Code Section III, certified data report(s) can be used to provide assurance that these components are fabricated, installed, and inspected in accordance with ASME Code Section III requirements. Provide an ITAAC demonstrating that an inspection of the components will be conducted.

(b) Provide an AC for this ITAAC that states "Certified ASME Code Data Report(s) (including N-5 Data Reports, where applicable) and inspection reports exist and conclude that the components are fabricated, installed, and inspected in accordance with the requirements of ASME Code Section III."

(2) As-built Reconciliation

(a) In accordance with guidance in SRP 14.3.3, provide as-built ITAAC demonstrating that the components shall be reconciled with the design requirements.

(b) Provide an ITA, as part of this ITAAC, to ensure that a reconciliation analysis of the components using as-designed and as-built information and ASME Code certified Design Report will be performed.

ANSWER:

ITAAC Item 2.a in Table A.1-1 has been revised to separate the "Design Commitment" into 2.a.i and 2.a.ii such that there are two distinct commitments demonstrating that the components

i) are fabricated, installed, and inspected in accordance with ASME Code Section III requirements and

ii) are reconciled with design requirements.

The ITA and AC for items 2.a.i and 2.a.ii have been revised per parts (1) and (2) of the NRC question in order to clarify the ITAAC regarding the design and construction of ASME Code Section III components. This response is consistent with MHI's response to DCD RAI No. 404, Question 14.03.03-20 (ML092160999).

Impact on R-COLA

See attached mark-up Part 10 Draft Revision 1 Table A.1-1 Sheet 1 of 6.

Impact on S-COLA

None.

Impact on DCD

None.

Table A.1-1 (Sheet 1 of 6)

Ultimate Heat Sink System and Essential Service Water System (Portions Outside the Scope of the Certified Design) Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1.a The functional arrangement of the system is as shown on Figure A.1-1.	1.a An inspection of the as-built system will be performed.	1.a The as-built system conform to the functional arrangement as shown on Figure A.1-1.
1.b Each mechanical division of the system (Division A, B, C & D) is physically separated from the other divisions, except for the header portion of the transfer line piping.	1.b Inspections of the as-built system will be performed.	1.b Each mechanical division of the as-built system (Division A, B, C & D) is physically separated from the other divisions of the system by structural and/or fire barriers.
2.a.i The ASME Code Section III components of the UHSS and ESWS (portions outside the scope of the certified design), identified in Table A.1-2, are ~~designed and constructed~~fabricated, installed and inspected in accordance with ASME Code Section III requirements.	2.a.i An inspection of the as-built ASME Code Section III components of the UHSS and ESWS (portions outside the scope of the certified design) will be ~~conducted of the as-built components as documented in ASME design reports~~performed.	2.a.i The ASME Code Section III ~~design~~ data report(s) (certified, when required by ASME Code) and inspection reports (including N-5 Data Reports where applicable) exist and conclude that the as-built ASME Code Section III components of the UHSS and ESWS (portions outside the scope of the certified design) identified in Table A.1-2 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements~~reconciled with the design documents~~.
2.a.ii The ASME Code Section III components of the UHSS and ESWS (portions outside the scope of the certified design), identified in Table A.1-2, are reconciled with the design requirements.	2.a.ii A reconciliation analysis of the components using as-designed and as-built information and ASME Code Section III design report(s) (NCA-3550) will be performed.	2.a.ii The ASME Code Section III design report(s) (certified, when required by ASME Code) exist and conclude that the as-built ASME Code Section III components of the UHSS and ESWS (portions outside the scope of the certified design) identified in Table A.1-2 are reconciled with the design documents. The report documents the results of the reconciliation analysis.

RCOL2_14.
03.03-1

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.: 2583 (CP RAI #56)

SRP SECTION: 14.03.03 - Piping Systems and Components - Inspections, Tests, Analyses, and Acceptance Criteria

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR PROJECTS) (EMB2)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 14.03.03-2

Piping ITAAC

The regulatory basis for this question is discussed in NUREG-0800, Standard Review Plan, Section 14.3.3, which establishes the criteria the NRC staff uses to review combined license (COL) applications.

In the CPNPP COL Application Part 10, Table A.1-1, Item 2b, the Design Commitment states that ASME Code Section III piping is designed and constructed in accordance with the requirements of ASME Code Section III. In the ITA and AC sections, the "as-built" piping was discussed. Provide separate ITAAC for the two remaining activities, Fabrication & Installation and As-built Reconciliation, as follows:

(1) Fabrication and Installation:

(a) For piping designated as ASME Code Section III, certified data report(s) can be used to provide assurance that the piping is fabricated, installed, and inspected in accordance with ASME Code Section III requirements. Provide an ITAAC demonstrating that an inspection of the piping will be conducted.

(b) Provide an AC for this ITAAC that states “Certified ASME Code Data Report(s) (including N-5 Data Reports, where applicable) and inspection reports exist and conclude that the piping is fabricated, installed, and inspected in accordance with ASME Code Section III requirements.”

(2) As-built Reconciliation

(a) In accordance with the guidance in SRP 14.3.3, provide as-built ITAAC demonstrating that the piping shall be reconciled with the design requirements.

(b) Included in this ITAAC can be an ITA to ensure that a reconciliation analysis of the piping using as-designed and as-built information and ASME Code certified Design Reports will be performed.

ANSWER:

ITAAC Item 2.b in Table A.1-1 has been revised to separate the “Design Commitment” into 2.b.i and 2.b.ii such that there are two distinct commitments demonstrating that the piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports

i) is fabricated, installed, and inspected in accordance with ASME Code Section III requirements and

ii) is reconciled with design requirements.

The ITA and AC for items 2.b.i and 2.b.ii has been revised consistent with parts (1) and (2) of the NRC question in order to clarify the ITAAC regarding the design and construction of ASME Code Section III piping and supports. This response is consistent with MHI’s response to DCD RAI No. 404, Question 14.03.03-21 (ML092160999)

<u>Impact on R-COLA</u>

See attached mark-up Part 10 Draft Revision 1 Table A.1-1 Sheet 2 of 6.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

Table A.1-1 (Sheet 2 of 6)

Ultimate Heat Sink System and Essential Service Water System (Portions Outside the Scope of the Certified Design) Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria	
2.b.i The ASME Code Section III piping of the UHSS and ESWS (portions outside the scope of the certified design), identified in FSAR Table 3.2-201, is ~~designed and constructed~~ fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	2.b.i An inspection of the as-built ASME Code piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, will be ~~conducted of the as-built piping as documented in ASME design reports~~performed.	2.b.i The ASME Code Section III ~~design~~ data report(s) (certified, when required by ASME Code) and inspection reports (including N-5 Data Reports where applicable) exist and conclude that the as-built ASME Code Section III piping of the as-built ASME Code piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, identified in FSAR Table 3.2-201 is fabricated, installed, and inspected in accordance with ASME Code Section III ~~reconciled with the design documents~~.	RCOL2_14.03.03-2
2.b.ii The ASME Code Section III piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, identified in Table 3.2-201, is reconciled with the design requirements.	2.b A reconciliation analysis of the piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, using as-designed and as-built information and ASME Code Section III design report(s) (NCA-3550) will be performed.	2.b The ASME Code Section III design report(s) (certified, when required by ASME Code) exist and conclude that the as-built ASME Code Section III piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, identified in Table 3.2-201 is reconciled with the design documents. The report documents the results of the reconciliation analysis.	
3.a Pressure boundary welds in ASME Code Section III components, identified in Table A.1-2, meet ASME Code Section III requirements for non-destructive examination of welds.	3.a Inspections of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	3.a The ASME Code Section III code reports exist and conclude that ~~The~~ the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds.	RCOL2_14.03.03-3

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.: 2583 (CP RAI #56)

SRP SECTION: 14.03.03 - Piping Systems and Components - Inspections, Tests, Analyses, and Acceptance Criteria

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR PROJECTS) (EMB2)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 14.03.03-3

Pressure boundary welds

The regulatory basis for this question is discussed in NUREG-0800, Standard Review Plan, Section 14.3.3, which establishes the criteria the NRC staff uses to review combined license (COL) applications.

For pressure boundary welds of components and piping identified as ASME Code Section III, the applicant provided ITAAC Items 3a and 3b in Part 10, Table A.1-1. The AC stated that the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds. The staff found that the proposed AC cannot be concluded by the ITA. Revise the AC to state “ASME Code report(s) exist and conclude that the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds.”

ANSWER:

Acceptable as-built pressure boundary weld inspections will be documented in an ASME Code report to demonstrate that the ASME Code Section III requirements have been met. The wording in the proposed AC was used to be consistent with another ITAAC that referenced the existence of a code report. The recommended change to ITAAC Items 3.a and 3.b is incorporated in the FSAR markup provided.

This response is consistent with MHI’s response to DCD RAI No. 242, Question 14.03.03-8 (ML091240112).

<u>Impact on R-COLA</u>

See attached mark-up Part 10 Draft Revision 1 Table A.1-1 Sheets 2 and 3 of 6.

Impact on S-COLA

None.

Impact on DCD

None.

Table A.1-1 (Sheet 2 of 6)

Ultimate Heat Sink System and Essential Service Water System (Portions Outside the Scope of the Certified Design) Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria	
2.b.i The ASME Code Section III piping of the UHSS and ESWS (portions outside the scope of the certified design), identified in FSAR Table 3.2-201, is ~~designed and constructed~~ fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	2.b.i An inspection of the as-built ASME Code piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, will be ~~conducted of the as-built piping as documented in ASME design reports~~performed.	2.b.i The ASME Code Section III ~~design~~ data report(s) (certified, when required by ASME Code) and inspection reports (including N-5 Data Reports where applicable) exist and conclude that the as-built ASME Code Section III piping of the as-built ASME Code piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, identified in FSAR Table 3.2-201 is fabricated, installed, and inspected in accordance with ASME Code Section III ~~reconciled with the design documents~~.	RCOL2_14.03.03-2
2.b.ii The ASME Code Section III piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, identified in Table 3.2-201, is reconciled with the design requirements.	2.b A reconciliation analysis of the piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, using as-designed and as-built information and ASME Code Section III design report(s) (NCA-3550) will be performed.	2.b The ASME Code Section III design report(s) (certified, when required by ASME Code) exist and conclude that the as-built ASME Code Section III piping of the UHSS and ESWS (portions outside the scope of the certified design), including supports, identified in Table 3.2-201 is reconciled with the design documents. The report documents the results of the reconciliation analysis.	
3.a Pressure boundary welds in ASME Code Section III components, identified in Table A.1-2, meet ASME Code Section III requirements for non-destructive examination of welds.	3.a Inspections of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	3.a The ASME Code Section III code reports exist and conclude that ~~The~~ the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds.	RCOL2_14.03.03-3

Table A.1-1 (Sheet 3 of 6)

Ultimate Heat Sink System and Essential Service Water System
(Portions Outside the Scope of the Certified Design)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
3.b Pressure boundary welds in ASME Code Section III piping, identified in FSAR Table 3.2-201, meet~~s~~ ASME Code Section III requirements for non-destructive examination of welds.	3.b Inspections of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	3.b The ASME Code Section III code reports exist and conclude that ~~The~~ the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds.
4.a The ASME Code Section III components, identified in Table A.1-2, retain their pressure boundary integrity at their design pressure.	4.a A hydrostatic test will be performed on the as-built components required by the ASME Code Section III to be hydrostatically tested.	4.a The results of the hydrostatic test of the as-built components identified in Table A.1-2 as ASME Code Section III conform to the requirements of the ASME Code Section III.
4.b The ASME Code Section III piping, identified in FSAR Table 3.2-201, retains its pressure boundary integrity at its design pressure.	4.b A hydrostatic test will be performed on the as-built piping required by the ASME Code Section III to be hydrostatically tested.	4.b The results of the hydrostatic test of the as-built piping identified in FSAR Table 3.2-201 as ASME Code Section III conform to the requirements of the ASME Code Section III.
5.a The seismic category I equipment, identified in Table A.1-2, can withstand seismic design basis loads without loss of safety function.	5.a.i Inspections will be performed to verify that the seismic category I as-built equipment identified in Table A.1-2 is installed in the location identified in FSAR Table 3.2-201.	5.a.i The seismic category I as-built equipment identified in Table A.1-2 is installed in the location identified in FSAR Table 3.2-201.
	5.a.ii Type tests and/or analyses of the seismic category I equipment will be performed.	5.a.ii The results of the type tests and/or analyses conclude that the seismic category I equipment can withstand seismic design basis loads without loss of safety function.
	5.a.iii Inspections will be performed on the as-built equipment including anchorage.	5.a.iii The as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions.

RCOL2_14.
03.03-3

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.: 2583 (CP RAI #56)

SRP SECTION: 14.03.03 - Piping Systems and Components - Inspections, Tests, Analyses, and Acceptance Criteria

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR PROJECTS) (EMB2)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 14.03.03-4

The regulatory basis for this question is discussed in NUREG-0800, Standard Review Plan, Section 14.3.3, which establishes the criteria the NRC staff uses to review combined license (COL) applications.

In the CPNPP COL Application FSAR, Table 3.2-201, Seismic Category I piping for the Ultimate Heat Sink Systems and Essential Service Water Systems were identified. In Part 10, Table A.1-1, the applicant provided ITAAC Item 5b for seismic category piping. The Design Commitment used the words “seismic category piping” while “as-built seismic category piping” and “as-built piping” were used in the AC and ITA.

(1) The staff found that the proposed AC cannot be concluded by the ITA. Revise the AC to states “Report(s) exist and conclude that each of the as-built seismic category piping identified in FSAR, Table 3.2-201 meets the seismic category requirements.”

(2) Seismic Category I is the only seismic classification identified in the section. To bring consistency among all the columns in the ITAAC as well as clarify the seismic category of the piping systems, use the phrases “Seismic Category I piping” in the Design Commitment and “as-built Seismic Category I piping” in the AC and ITA.

ANSWER:

Luminant has revised ITAAC #5.b of Table A.1-1 to conform with the following MHI response to DCD RAI 452, Question 14.03.02-12 which was issued on October 1, 2009.

ITAAC for verification of seismic Category I piping will be revised to provide a level of consistency between these ITAAC and the ITAAC for seismic Category I equipment. However, MHI will revise the ITAAC to provide a two-step approach, in place of the three-step approach that is used for ITAAC for seismic Category I equipment. The first step confirms that the piping system is supported by seismic Category I structure(s). The second step requires the existence of reports that conclude the as-built seismic Category I piping, including supports, can withstand combined normal and seismic design basis loads without a loss of safety function. The ITAAC steps that include type tests are applicable to components but are not used for piping. Also, analyses of seismic Category I piping have been consolidated into one ITAAC step that reconciles the as-built piping and support configurations with seismic design basis analyses. MHI considers this approach to be consistent with NRC guidance, such as the following contained in Regulatory Guide 1.206, Subsection C.II.1.2.2, "ITAAC should require an analysis to reconcile the as-built piping design with the design-basis loads, including seismic loads."

Impact on R-COLA

See attached mark-up Part 10 Draft Revision 1 Table A.1-1 Sheet 4 of 6.

Impact on S-COLA

None.

Impact on DCD

None.

Table A.1-1 (Sheet 4 of 6)

Ultimate Heat Sink System and Essential Service Water System
(Portions Outside the Scope of the Certified Design)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
5.b Each of the seismic category piping, including supports, identified in FSAR Table 3.2-201, is designed to withstand combined normal and seismic design basis loads without a loss of its functional capabilitysafety function.	5.b.i Inspections will be performed to verify that the as-built seismic Category I piping, including supports, identified in FSAR Table 3.2-201 are supported by a seismic Category I structure(s).	5.b.i Reports(s) document that each of the as-built seismic Category I piping, including supports, identified in FSAR Table 3.2-201 is supported by a seismic Category I structure(s).
	5.b.ii Inspections will be performed for the existence of a report verifying that on the as-built piping, including supports, identified in FSAR Table 3.2-201 can withstand combined normal and seismic design basis loads without a loss of its safety function.	5.b.ii A report exists and concludes that each of the as-built seismic Category I piping, including supports, identified in FSAR Table 3.2-201 can withstand combined normal and seismic design basis loads without a loss of its safety function. Each of the as-built seismic category piping identified in FSAR Table 3.2-201 meets the seismic category requirements.
6.a The Class 1E components, identified in Table A.1-2, are powered from their respective Class 1E division.	6.a Tests will be performed on the as-built system by providing a simulated test signal in each Class 1E division.	6.a The simulated test signal exists at the as-built Class 1E equipment identified in Table A.1-2 under test in the as-built system
6.b Separation is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	6.b Inspections of the as-built Class 1E divisional cables and raceways will be conducted.	6.b The as-built Class 1E electrical cables with only one division are routed in raceways assigned to the same division. There are no other safety division electrical cables in a raceway assigned to a different division.

RCOL2_14.03.03-4

Attachment 2

Response to Request for Additional Information No. 2772 (CP RAI #57)

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.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-1

Comanche Peak Units 3 and 4 FSAR Section 3.9, “Mechanical Systems and Components,” incorporates by reference this section in the US-APWR design certification document (DCD) with departures and supplemental information. Describe the implementation of the functional design and qualification process specified in the US-APWR DCD for pumps, valves, and dynamic restraints to be used at Comanche Peak Units 3 and 4. As discussed in Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," (June 2007) for equipment that do not have their functional design and qualification process specified in the US-APWR DCD, provide the following information or reference these provisions in the US-APWR DCD: (1) describe the provisions in the design of safety-related pumps, valves, and piping that allow testing of pumps and valves at the maximum flow rates specified in the plant accident analyses; (2) describe the provisions in the functional design and qualification of each safety-related pump and valve that demonstrate the capacity of the pumps and valves to perform their intended functions for a full range of system differential pressures and flows, ambient temperatures, and available voltages (as applicable) from normal operating to design-basis conditions; (3) verify that the qualification program for safety-related valves includes testing and analyses that demonstrate these valves do not experience any leakage, or increase in leakage, from their loading; (4) describe the provisions in the functional design and qualification of dynamic restraints in safety-related systems and access for performing inservice testing (IST) program activities that comply with the requirements in the latest edition and addenda of the American Society of Mechanical Engineers (ASME) OM Code incorporated by reference in 10 CFR 50.55a on the date 12 months before the date for initial fuel load; and (5) give particular attention to flow-induced loading in functional design and qualification to incorporate degraded flow conditions such as those that might be encountered by the presence of debris, impurities, and contaminants in the fluid system (e.g., containment sump pump recirculating water with debris). For example, discuss the application of ASME Standard QME-1-2007, “Qualification of Active Mechanical Equipment used in Nuclear Power Plants,” for the functional design and qualification of pumps, valves, and dynamic restraints in light of its application in MHI Technical Report MUAP-08015, “US-APWR Equipment Environmental Qualification Program,” which is referenced in Section 3.11, “Environmental Qualification of Mechanical and Electrical Equipment,” in the US-APWR DCD. Further, discuss the availability of design and procurement specifications for NRC on-site review to demonstrate the implementation of the US-APWR functional design and qualification process for pumps, valves, and dynamic restraints to be used at Comanche Peak. For example, US-APWR DCD Tier 2, Subsection 3.9.3.4.2.5, “Design

Specifications," specifies that the COL Applicant is to assure snubber functionality in harsh service conditions, including snubber materials (e.g., lubricants, hydraulic fluids, and seals). Clarify the statement in Comanche Peak FSAR Subsection 3.9.3.4.2.5 of the same title (as modified in the Editorial Correction Version dated March 31, 2009) that the "design specification for snubbers installed in harsh service conditions (e.g., high humidity, temperature, radiation levels) is evaluated for the projected life of the snubber to assure that snubber functionality, including snubber materials (e.g., lubricants, hydraulic fluids, seals)."

ANSWER:

FSAR Section 3.9 incorporates Section 3.9 of US-APWR DCD Tier 2 by reference with supplemental information. The second paragraph of DCD Tier 2 Subsection 3.9.6.1 states various provisions for testing pumps, valves, and dynamic restraints that are incorporated into the design of the US-APWR. As noted in DCD Subsection 3.9.6.1, these provisions and requirements are discussed in Section 3.10 of the DCD, which the FSAR also incorporates by reference with supplemental information. MHI Technical Report MUAP-08015(R1) which is scheduled to be to the NRC by the end of 2009 provides the implementation milestones for the equipment qualification process of the US-APWR and for site-specific components through incorporation by reference.

Specifications for pumps, valves, and dynamic restraints will be available over a period of time, but in all cases prior to the equipment being procured. Specifications and supporting design documents will be available for NRC on-site review on a continuous basis shortly after they are approved for use.

The design specification for snubbers installed in harsh service conditions includes snubber materials (e.g., lubricants, hydraulic fluids, seals) that are to be evaluated for environmental qualification. These design specifications are evaluated to establish service and replacement requirements, based on environmental qualifications, to assure snubber functionality for the projected life of the snubber.

Impact on R-COLA

None.

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 Nos. 52-034 and 52-035

RAI NO.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-2

Comanche Peak FSAR Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints," incorporates by reference the provisions in the US-APWR DCD in describing the operational programs for inservice testing (IST) of pumps, valves, and dynamic restraints, and motor-operated valve (MOV) testing at Comanche Peak. US-APWR combined license (COL) Information Item COL 13.4(1) listed in Comanche Peak FSAR Table 1.8-201, "Resolution of Combined License Items for Chapters 1-19," indicates, among other actions, that the COL applicant is to "fully describe" the operational programs as defined in SECY-05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria," dated October 28, 2005. Through a combination of the US-APWR DCD and Comanche Peak FSAR, fully describe the IST and MOV testing operational programs as discussed in Commission Paper SECY-05-0197. See RG 1.206 for guidance regarding the information to be provided in describing the IST programs for pumps, dynamic restraints, and various types of valves. As part of the description of the IST operational program for dynamic restraints, clarify the applicability of ASME Boiler Pressure Vessel (BPV) Code Section XI, and the ASME OM Code, discussed in US-APWR DCD Tier 2, Subsection 3.9.3.4.2.6, "Considerations for Inspection, Testing, Repair, and/or Replacement of Snubbers," for the program for inservice examination and testing of snubbers.

ANSWER:

The IST program for pumps, valves, dynamic restraints, and motor-operated valve (MOV) testing is described through a combination of DCD Revision 2 Subsection 3.9.6 and FSAR Subsections 3.9.6.

FSAR Subsection 3.9.6.4 incorporates by reference the provisions in the US-APWR DCD Subsection 3.9.6.4 that the ASME Code, Section XI and ASME OM Code are applicable to the IST program for dynamic restraints.

<u>Impact on R-COLA</u>

None.

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 Nos. 52-034 and 52-035

RAI NO.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-3

Comanche Peak COL application (COLA) FSAR Section 3.9.6 modifies a statement in US-APWR DCD Tier 2, Section 3.9.6 that the COL Applicant is to administratively control the edition and addenda to be used for the IST program plan for pumps, valves, and dynamic restraints. Comanche Peak COLA FSAR Section 3.9.6 states that the edition and addenda used for the IST program for pumps, valves, and dynamic restraints is administratively controlled as part of the operational program procedures. Comanche Peak COLA FSAR Section 3.9.6 also states that the preservice test program is implemented as described in Section 13.4, “Operational Program Implementation.” Comanche Peak COLA FSAR Section 3.9.6 specifies that the requirements of functional testing for pumps, valves, and dynamic restraints will be in accordance with the IST program plan outlined 12 months prior to fuel load. US-APWR DCD Tier 2, Section 3.9.6 references the ASME OM Code 1995 Edition through the 2003 Addenda for the IST program for plants referencing the US-APWR design. The NRC regulations in 10 CFR 50.55a(f)(4)(i) and (g)(4)(i) require that the IST and ISI programs during the initial 120-month interval comply with the requirements in the latest edition and addenda of the Code incorporated by reference in the regulations on the date 12 months before the date scheduled for initial loading of fuel under a COL under 10 CFR Part 52 (or the optional ASME Code cases listed in the applicable regulatory guides), subject to the limitations and modifications listed in 10 CFR 50.55a of the NRC regulations. Specify the most recent edition and addenda of the ASME OM Code incorporated by reference in 10 CFR 50.55a that will be used as the basis for the IST program description in the COL application to provide support for NRC review of the application for an operating license for Comanche Peak Units 3 and 4. In addition, discuss the planned use of any code cases and their implementation consistent with RG 1.192, “Operation and Maintenance Code Case Acceptability, ASME OM Code,” and any requests for relief from or alternatives to the OM Code, and their justification.

ANSWER:

The ASME Code for Operation and Maintenance of Nuclear Power Plants that will be used as the basis for the IST program description in the COL application is the 1995 Edition through the 2003 Addenda, which is incorporated by reference to DCD Section 3.9. The CPNPP Units 3 and 4 IST program is still under development. When developed, the IST and ISI programs during the initial 120-month interval will comply with the requirements in the latest edition and addenda of the Code incorporated by reference in the regulations on the date 12 months before the date scheduled for initial loading of fuel.

The OM Code Cases listed in Regulatory Guide 1.192 are applied to the IST program as necessary.

The application of any relief or alternatives to the OM Code and their justifications is provided in the response to Question 03.09.06-10 below.

Impact on R-COLA

None.

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 Nos. 52-034 and 52-035

RAI NO.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-4

Comanche Peak COLA FSAR 3.9.6 states that the functional testing for pumps, valves, and dynamic restraints will be in accordance with the “IST program plan” outlined 12 months prior to fuel load. The NRC regulations in 10 CFR 50.55a(f)(4)(i) require that inservice tests to verify operational readiness of pumps and valves, whose function is required for safety, conducted during the initial 120-month interval, must comply with the requirements in the latest edition and addenda of the Code incorporated by reference in the regulations 12 months before the date scheduled for initial loading fuel under a combined license under Part 52, subject to the limitations and modifications listed in the regulations. The NRC regulations in 10 CFR 50.55a(g)(4)(i) provide a similar requirement applicable to dynamic restraints. Other subsections in Comanche Peak COLA FSAR Section 3.9.6 also refer to an IST program plan outlined 12 months prior to fuel load when discussing various IST activities. Clarify the Comanche Peak COLA FSAR to ensure that the IST program (as compared to a program plan) will be available to the NRC staff for review and inspection in a timely manner to allow evaluation of compliance with the NRC regulations applicable to the IST programs from pumps, valves, and dynamic restraints prior to plant operation.

ANSWER:

Luminant commits to submit a schedule to the NRC that supports the planning and conduct of NRC inspections of operational programs, including the IST program, no later than 12 months after issuance of the COL or at the start of construction as defined in 10 CFR 50.10a, whichever is later. This is similar to the approach for the ITAAC schedule required in 10 CFR 52.99(a).

Impact on R-COLA

None.

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 Nos. 52-034 and 52-035

RAI NO.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-5

Comanche Peak COLA FSAR Section 3.9.6 provides plant-specific supplemental information in addition to incorporating by reference the US-APWR DCD for the functional design, qualification, and IST programs for pumps, valves, and dynamic restraints. Confirm that the provisions in the US-APWR DCD for functional design and qualification, and IST and MOV testing operational programs, as supplemented by the information in the Comanche Peak COLA FSAR, will be applied to the specified pumps, valves, and dynamic restraints, or describe plant-specific provisions in these technical areas for the pumps, valves, and dynamic restraints.

ANSWER:

Luminant confirms that the provisions in the US-APWR DCD for functional design and qualification, and IST and MOV testing operational programs, as supplemented by the information in the FSAR, will be applied to the specified pumps, valves, and dynamic restraints.

US-APWR DCD Revision 2 incorporates DCD impacts noted in the responses to US-APWR DCD RAI 288-2274 (MHI Letter UAP-HF-09245). These changes in DCD Revision 2 are also incorporated by reference to the CPNPP Units 3 and 4 FSAR and are applicable to site-specific pumps, valves, and dynamic restraints listed in the FSAR.

Impact on R-COLA

None.

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 Nos. 52-034 and 52-035

RAI NO.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-6

Comanche Peak COLA FSAR Table 3.9-203, "Site-Specific Valve IST Requirements," provides information on testing of valves in addition to those identified in the US-APWR DCD. For the listed plant-specific valves, provide (1) actuator type; (2) Code Class; (3) normal, safety, and fail safe position; (4) containment isolation function; and (5) test parameters and frequency. Also, provide this information for the valves listed in US-APWR DCD Tier 2, Table 3.9-14, "Valve Inservice Test Requirements."

ANSWER:

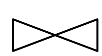
(1) Valve actuator type has been added to FSAR Table 3.9-203.

(2) The applicable ASME Code Class of valves listed in FSAR Table 3.9-203 is provided in Table 3.2-201, Figure 9.2.1-1R, and Figure 9.2.5-201.

(3) FSAR Figure 9.2.1-1R and Figure 9.2.5-201 provide the normal and fail safe position of valves subject to the IST program in the system piping and instrumentation diagram (P&ID). Valve failure position is applied to air operated valves, such as EWS-HCV-2000, 2001, 2002, 2003, and indicated in the system P&ID with following note.

FC (fail closed) FO (fail open)

Normal valve position is indicated in the system P&ID with following notes.

Valves with white color body are normally open 

Valves with black color body are normally closed 

For butterfly valves, the normal position is indicated with one of the following notes:

NO (normally open)

NC (normally closed)

LC (locked closed equal to normally close)

LO (locked open equal to normally open).

FSAR Table 3.9-203 provides the "safe position" in the 4th column (titled Safety-Related Mission).

(4) FSAR Table 3.9-203 provides the containment isolation function in the column titled "Safety Function" for the cases where a valve has a containment isolation function.

(5) FSAR Table 3.9-203 provides test parameters and frequency in the column titled "Inservice Testing Type and Frequency" in accordance with ASME OM Code, Subsection ISTC.

Luminant has forwarded the last sentence in the question regarding DCD Table 3.9-14 to Mitsubishi Heavy Industries, the applicant for the US-APWR Design Certification, for their consideration.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 Table 3.9-203 (Sheets 2 through 6), Pages 3.9-8 through 3.9-12.

Impact on S-COLA

None.

Impact on DCD

None.

CP COL 3.9(12)
~~CP COL 3.9(14)~~

CTS-00829

Table 3.9-203 (Sheet 2 of 6)

Site-Specific Valve IST Requirements

Valve Tag Number	Description	Valve Type	Safety-Related Missions	Safety Functions	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
UHS-VLV-502D	D-UHS Transfer Pump Discharge Check Valve	Check	Transfer Close Transfer Open	Active	BC	Check Exercise / Refueling Outage	3
UHS-MOV-503A	A-UHS Transfer Pump Discharge Valve	Remote MO Butterfly	Maintain Close Transfer Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/~~Cold Shutdown~~Quarterly Operability Test	~~6~~
UHS-MOV-503B	B-UHS Transfer Pump Discharge Valve	Remote MO Butterfly	Maintain Close Transfer Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/~~Cold Shutdown~~Quarterly Operability Test	~~6~~

RCOL2_03.09.06-6
RCOL2_03.09.06-7

Table 3.9-203 (Sheet 3 of 6)

CP COL 3.9(12)

CP COL 3.9(14)

Site-Specific Valve IST Requirements

CTS-00829

Valve Tag Number	Description	Valve Type	Safety-Related Missions	Safety Functions	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
UHS-MOV-503C	C-UHS Transfer Pump Discharge Valve	Remote MO Butterfly	Maintain Close Transfer Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Quarterly Operability Test	6
UHS-MOV-503D	D-UHS Transfer Pump Discharge Valve	Remote MO Butterfly	Maintain Close Transfer Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Quarterly Operability Test	6
UHS-MOV-506A	A-UHS Transfer Line Basin Inlet Valve	Remote MO Butterfly	Maintain Close Transfer Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Quarterly Operability Test	6

RCOL2_03.09.06-6
RCOL2_03.09.06-7

Table 3.9-203 (Sheet 4 of 6)

CP COL 3.9(12)

CP COL 3.9(14)

Site-Specific Valve IST Requirements

CTS-00829

Valve Tag Number	Description	Valve Type	Safety-Related Missions	Safety Functions	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
UHS-MOV-506B	B-UHS Transfer Line Basin Inlet Valve	Remote MO Butterfly	Maintain Close Transfer Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Quarterly Operability Test	6
UHS-MOV-506C	C-UHS Transfer Line Basin Inlet Valve	Remote MO Butterfly	Maintain Close Transfer Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Quarterly Operability Test	6
UHS-MOV-506D	D-UHS Transfer Line Basin Inlet Valve	Remote MO Butterfly	Maintain Close Transfer Close Transfer Open	Active Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold Shutdown Quarterly Operability Test	6

RCOL2_03.09.06-6
RCOL2_03.09.06-7

CP COL 3.9(12)
CP COL 3.9(14)

CTS-00829

Table 3.9-203 (Sheet 5 of 6)
Site-Specific Valve IST Requirements

Valve Tag Number	Description	Valve Type	Safety-Related Missions	Safety Functions	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
ESW-HVCHCV-2000	A-UHS Basin Blowdown Control Valve	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold ShutdownQuarterly Operability Test	6
ESW-HVCHCV-2001	B-UHS Basin Blowdown Control Valve	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold ShutdownQuarterly Operability Test	6
ESW-HVCHCV-2002	C-UHS Basin Blowdown Control Valve	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold ShutdownQuarterly Operability Test	6

RCOL2_03.09.06-6
RCOL2_03.09.06-7

Table 3.9-203 (Sheet 6 of 6)

CP COL 3.9(12)
CP COL 3.9(14)

Site-Specific Valve IST Requirements

CTS-00829

Valve Tag Number	Description	Valve Type	Safety-Related Missions	Safety Functions	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
ESW-HVCHCV-2003	D-UHS Basin Blowdown Control Valve	Remote AO Globe	Maintain Close Transfer Close	Active-to-Fail Remote Position	B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Cold ShutdownQuarterly Operability Test	6

RCOL2_03.09.06-6
RCOL2_03.09.06-7

Notes:

1) Not used.
2) Not used.
3) The check valve exercise test is performed during refueling outage. Valves in the inaccessible primary containment can not be tested during power operation. Test of valves in operating systems may cause impact of power operation. Simultaneous testing of valves in the same system group will be considered.
4) Not used.
5) Not used.
6) Exercising these valves would stop necessary line for operation such as utilities etc. Therefore, exercise testing will be performed at cold shutdown to avoid impact on power operation.Not used. RCOL2_03.09.06-7
7) Not used.
8) Not used.
9) Not used.
10) Not used.
11) Not used.
12) Not used.

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.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-7

Footnote 6 to Comanche Peak COLA FSAR Table 3.9-203 states that exercise testing for the specified valves will be performed at cold shutdown to avoid impact on power operation. Discuss the basis for the deferral of exercise testing without a partial stroke test at a quarterly interval for the specific identified valves.

ANSWER:

The test frequency described in the "Inservice Testing Type and Frequency" column of FSAR Table 3.9-203 (Sheets 2 through 6) has been modified to state "Exercise Full Stroke/Quarterly" for the following valves:

UHS-MOV-503A, 503B, 503C, 503D

UHS-MOV-506A, 506B, 506C, 506D

ESW-HCV-2000, 2001, 2002, 2003

In addition, the following correction has been reflected in the "Valve Tag Number" of related valves:

Change Valve Tag Numbers "ESW-HVC- …" [2000, 2001, 2002, 2003] to "ESW-HCV-…"

Impact on R-COLA

See marked-up FSAR Draft Revision 1 Table 3.9-203 (Sheets 2 through 6), Pages 3.9-8 through 3.9-12 provided in the response to Question 03.09.06-6 above.

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 Nos. 52-034 and 52-035

RAI NO.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-8

Comanche Peak COLA FSAR Subsection 3.9.6.3, "IST Program for Valves," modifies the provision in US-APWR DCD Tier 2, Section 3.9.6 that the COL Applicant is to provide any alternate method of valve position indicator operation and justification for valves in the IST program. Comanche Peak COLA FSAR Subsection 3.9.6.3 states that any alternate method for verification of valve position indicator operation, and its justification, will be described in the IST program plan outlined 12 months prior to fuel load. Confirm that any alternate method for verification of valve position indicator operation, and its justification, will be made available consistent with the implementation schedule for the IST program to provide for timely review during NRC inspection of the IST program prior to plant operation.

ANSWER:

Luminant confirms that alternate methods for verification of valve position indicator operation, and the justification, that are incorporated into the IST program will be made available consistent with the implementation schedule for the IST program to provide for timely review during NRC inspection of the IST program prior to plant operation. Alternate methods for verification of valve position indicator operation, if necessary, will meet the requirements of ASME OM Code ISTC-3700.

<u>Impact on R-COLA</u>

None.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

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.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-9

Comanche Peak COLA FSAR Subsection 3.9.6.3.1, "IST Program for MOVs," modifies the provision in the US-APWR DCD Tier 2, Subsection 3.9.6.3.1 that the COL Applicant is to identify MOVs that require non-intrusive diagnostic testing techniques. Comanche Peak COLA FSAR Subsection 3.9.6.3.1 states that the IST program plan will identify those MOVs that require non-intrusive testing techniques. Discuss plans for non-intrusive testing of safety-related MOVs in fully describing the MOV Testing operational program in support of the NRC review of the COL application for Comanche Peak, Units 3 and 4.

ANSWER:

In the response to US-APWR DCD RAI 288-2274, Question No.03.09.06-13 (ML091480400), MHI agreed to describe how the IST program is consistent with 10 CFR 50.55a, which requires the IST provisions in the ASME OM Code to be supplemented with a program to ensure that MOVs continue to be capable of performing their design-basis safety functions.

DCD Subsection 3.9.6 describes the plan for non-intrusive testing of safety-related MOVs and fully describes the MOV testing operational program, which is incorporated by reference in the CPNPP Units 3 and 4 FSAR.

FSAR Subsection 3.9.6.3.1 incorporates DCD Subsection 3.9.6.3.1, Revision 2 by reference; accordingly, FSAR Subsection 3.9.6.3.1 has been deleted.

<u>Impact on R-COLA</u>

See attached marked-up FSAR Draft Revision 1 Pages 3.9-3 and 3.9-4.

<u>Impact on S-COLA</u>

None.

Impact on DCD

None.

Attachment:

DCD Subsection 3.9.6.3.1, pages 3.9-81 and 3.9-82 as revised in the response to DCD RAI 288-2274, Question No.03.09.06-13.

~~Any alternate method for verification of valve position indicator operation, and its justification, is described in the IST program plan outlined 12 months prior to fuel load.~~ MAP-03-025

~~3.9.6.3.1 IST Program for MOVs~~

DCD-3.9.6-13

~~STD COL 3.9(9)~~ ~~Replace the second sentence of the third paragraph in DCD Subsection 3.9.6.3.1 with the following.~~

~~The IST program plan identifies those motor operated valves (MOVs) that require non-intrusive testing technique.~~

3.9.6.4 IST Program for Dynamic Restraints

STD COL 3.9(6) Replace the second paragraph in DCD Subsection 3.9.6.4 with the following.

The IST program plan for dynamic restraints (snubbers) complies with the requirements in the latest edition and addenda of the Nonmandatory Appendix A of ASME OM Code incorporated by reference in 10 CFR 50.55a (Reference 3.9-29). The IST program plan for dynamic restraints will be provided~~described based on the IST program plan outlined~~ 12 months prior to fuel load. MAP-03-026

3.9.9 Combined License Information

Replace the content of DCD Subsection 3.9.9 with the following.

STD COL 3.9(1) ***3.9(1)*** *Snubber functionality*

This COL item is addressed in Subsection 3.9.3.4.2.5

CP COL 3.9(2) ***3.9(2)*** *Classification of CPNPP Unit 3 reactor internals as prototype*

This COL item is addressed in Subsection 3.9.2.4.1.

3.9(3) *Deleted from the DCD.*

3.9(4) *Deletedfrom the DCD.*

3.9(5) *Deletedfrom the DCD.*

STD COL 3.9(6) ***3.9(6)*** *Program plan for IST of dynamic restraints*

This COL item is addressed in Subsection 3.9.6.4*.*

~~STD COL 3.9(7)~~ ***3.9(7)*** *Deleted from the DCD.~~Alternate method of valve position indicator operation~~* MAP-03-025

~~*This COL item is addressed in* Subsection 3.9.6.3*.*~~

STD COL 3.9(8) ***3.9(8)*** *Administrative control of the edition and addenda used for the IST program plan*

This COL item is addressed in Subsection 3.9.6*.*

~~STD COL 3.9(9)~~ ***3.9(9)*** *~~Non-intrusive diagnostic testing of MOVs~~Deleted from the DCD.* DCD-3.9.6-13

~~*This COL item is addressed in* Subsection 3.9.6.3.1*.*~~

CP COL 3.9(10) ***3.9(10)*** *Site-specific active pumps*

This COL item is addressed in Subsection 3.9.3.3.1*, and* Table 3.9-201*.*

CP COL 3.9(11) ***3.9(11)*** *Site-specific, safety-related pump IST parameters and frequency*

This COL item is addressed in Subsection 3.9.6.2*, and* Table 3.9-202*.*

CP COL 3.9(12) ***3.9(12)*** *Testing and frequency of site-specific valves subject to IST*

This COL item is addressed in Subsection 3.9.6.3*, and* Table 3.9-203*.*

- Category A – safety-related valves with safety-related seat leakage requirements
- Category B – safety-related valves requiring IST, but without safety-related seat leakage requirements
- Category C – safety-related, self-actuated valves (such as check valves and pressure relief valves)
- Category D – safety-related, explosively actuated valves and non-reclosing pressure relief devices

Additionally, valves that are included in the IST Program that have position indication are observed locally during valve exercising to verify proper operation of the position indication. The frequency for this position indication test is in accordance with ASME OM Code. Where local observation is not practicable (such as solenoid valves), other methods are used for verification of valve position indicator operation.

3.9.6.3.1 IST Program for MOVs

IST of ASME Section III Class 1, 2, and 3, and safety-related motor-operated valves (MOVs) is performed in accordance with the ASME OM Code (Reference 3.9-13) and applicable addenda, as required by 10 CFR 50.55a(f) (Reference 3.9-29). The IST program incorporates the guidance of RG 1.192 (Reference 3.9-44) and NUREG-1482 (Reference 3.9-60). Testing is required except where specific relief has been granted by the NRC. In addition to the above, MOVs are inservice tested in accordance with the requirements of Generic Letter 96-05 (Reference 3.9-54) to permit periodic assessment of valve operability at the prescribed frequency. Generic Letter 96-05 supersedes Generic Letter 89-10 (Reference 3.9-55) and its supplements with regard to MOV periodic performance verification.

The MOV testing program requires either in-plant valve operation or prototype valve testing at system flow and pressure, or system differential pressure to verify correct MOV actuator sizing and control settings. This MOV periodic verification program addresses the various requirements, such as, maximum torque and thrust, margins for degraded conditions, degraded voltage, control switch repeatability, load sensitive MOV behavior, etc. The available motor output is determined based on motor capabilities at design basis conditions. These conditions include, rated motor start torque; minimum voltage conditions; elevated ambient temperature conditions; and operator efficiency. The MOV Program utilizes guidance from Generic Letter 96-05 and the Joint Owners Group MOV Periodic Verification study, MPR 2524-A (November 2006) (Reference 3.9-61).

Prior to power operation, a design basis verification test is performed on each active MOV to verify the capability of each valve to meet its safety-related design basis requirements. The test is performed at conditions that are as close to design basis conditions as practicable. The test results are used along with valve preservice tests to develop the initial (periodic verification) testing frequency for each active MOV.

The preservice test program for MOVs is conducted in accordance with the ASME OM Code (Reference 3.9-13), ISTC 3100, under conditions as near as practical to those expected during subsequent IST. The interval between testing to demonstrate continued design basis capability does not exceed five years or three refueling outages, whichever is longer.

In some cases, the valves are tested on a less frequent basis since it is not practicable to exercise the valve during plant operation. If an exception is taken to performing ASME Code test frequency such as full-stroke exercise testing of a valve, then full-stroke testing is performed during cold shutdown condition on a frequency that is not more often than required by the OM Code (Reference 3.9-13). If testing is not practicable during plant shutdown condition, then the full-stroke testing is performed during refueling outage. The inservice operability testing of some MOVs rely on non-intrusive diagnostic techniques to permit periodic assessment of valve operability at design basis conditions.

The IST program is to identify MOVs that require non-intrusive diagnostic testing techniques. The specified frequency of testing using operability of non-intrusive diagnostic techniques is a maximum of once every 10 years. The initial test frequency is the longest of every three refueling cycles or five years, until sufficient data exists to determine a longer test frequency is appropriate, in accordance with GL 96-05 (Reference 3.9-54).

3.9.6.3.2 IST Program for POVs Other Than MOVs

ASME Code, Section III, Class 1, 2 and 3 safety-related POVs (air operated, hydraulic operated, solenoid operated) are subject to operational readiness testing in accordance with the requirements stated in the ASME OM Code. IST of valves assesses operational readiness including actuating, stroke timing, fail safe, and verification of position indicating systems.

POVs other than active MOVs are exercised quarterly in accordance with ASME OM ISTC. Active and passive POVs upon which operability testing is performed are identified in Table 3.9-14.

Additional testing is performed as part of the air-operated valve (AOV) program, which includes the key elements for an AOV Program as identified in the Joint Owners Group Air Operated Valve Program Document, (Reference 3.9-62) and the Comments on Joint Owners' Group Air Operated Program Document (Reference 3.9-63). The AOV program incorporates the attributes for a successful pov long-term periodic verification program, as discussed in RIS 2000-03, Resolution of Generic Safety Issue 158: Performance of Safety-related Power-Operated Valves Under Design Basis Conditions, (Reference 3.9-64), by incorporating lessons learned from previous nuclear power plant operations and research programs as they apply to the periodic testing of air- and other POVs included in the IST program. Key lessons learned that are addressed in the AOV program include:

- Valves are categorized according to their safety significance and risk ranking.
- Setpoints for AOVs are defined based on current vendor information or valve qualification diagnostic testing, such that the valve is capable of performing its design-basis function(s).
- Periodic static testing is performed, at a minimum on high risk (high safety significance) valves, to identify potential degradation, unless those valves are periodically cycled during normal plant operation under conditions that meet or exceed the worst case operating conditions within the licensing basis of the plant

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.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-10

Comanche Peak COLA FSAR Section 3.9.6 does not provide supplemental information for US-APWR DCD Tier 2, Subsection 3.9.6.5, "Relief Request and Authorization to ASME OM Code," which states that Table 3.9-13, "Pump IST," and Table 3.9-14, "Valve Inservice Test Requirements," in the US-APWR DCD Tier 2 identify requests for relief from the ASME OM Code. Provide justification for requests for relief from or alternatives to the ASME OM Code edition and addenda used as the basis for the IST program description in the Comanche Peak COL application following the guidance in RG 1.206, or an application-specific approach in justifying relief or alternative requests.

ANSWER:

The FSAR states that there are no specific relief requests; however such requests may become necessary in the course of developing the IST program.

In the response to US-APWR RAI 288-2274, Question No.03.09.06-47 (MHI Letter UAP-HF-09245) (ML091480400), MHI provided the following paragraph insert to Subsection 3.9.6.5:

> Considerable experience has been used in designing and locating pumps, valves, and dynamic restraints to permit preservice and IST required by ASME OM Code. Deferral of testing to cold shutdown or refueling outages in conformance with the rules of the ASME OM Code (Reference 3.9-13), since during power operation it is not practical, is not considered a relief request. Relief from the testing requirements of the ASME OM Code will be requested when full compliance with requirement of the ASME OM Code is not practical. In such cases, specific information will be provided which identifies the applicable code requirements, justification for the relief request and the testing method to be used as an alternative.

This paragraph is incorporated into Revision 2 of the US-APWR DCD. The CPNPP Units 3 and 4 FSAR incorporates DCD Subsection 3.9.6.5 by reference. Therefore, relief from the testing requirements of the ASME OM Code will be requested as noted in DCD Subsection 3.9.6.5 if full compliance with the requirements of the ASME OM Code is not practical for CPNPP Units 3 and 4.

Impact on R-COLA

None.

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 Nos. 52-034 and 52-035

RAI NO.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-11

Nuclear power plant operating experience has revealed the potential for adverse flow effects from vibration caused by hydrodynamic loads and acoustic resonance on reactor coolant, steam, and feedwater systems. US-APWR DCD Tier 2, Section 3.9.3, “ASME Code Class 1, 2, and 3 Components, Component Supports, and Core Support Structures,” specifies provisions for evaluating the load combinations on safety-related components including fluid effects due to various system operational characteristics. US-APWR DCD Tier 2, Section 14.2, “Initial Plant Test Program,” includes Subsection 14.2.12.1.51, “Steady State Vibration Monitoring of Safety Related and High Energy Piping,” to demonstrate that steady state vibrations of safety-related and high-energy piping are within acceptable limits. Discuss the planned implementation of the program indicated in the US-APWR DCD to address potential adverse flow effects on safety-related components within the IST program in the reactor coolant, steam, and feedwater systems at Comanche Peak Units 3 and 4 from hydraulic loading and acoustic resonance during plant operation.

ANSWER:

The FSAR incorporates by reference the planned implementation of the US-APWR DCD operational program to address potential adverse flow effects on safety-related components within the IST program in the reactor coolant, steam, and feedwater systems. The IST program will be implemented according to the milestone described in Table 13.4-201.

<u>Impact on R-COLA</u>

None.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

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.: 2772 (CP RAI #57)

SRP SECTION: 03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

QUESTIONS FOR Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.09.06-12

Part 10, “ITAAC and Proposed License Conditions,” of the Comanche Peak, Units 3 and 4 COLA states that operational programs are identified in Comanche Peak FSAR Table 13.4-201, “Operational Programs Required by NRC Regulation and Program Implementation,” and that their implementation by the milestones indicated in the table is a potential condition to the license. Part 10 of the Comanche Peak COL application does not specify a license condition for implementation of operational programs. Discuss the plans to develop license conditions for operational program implementation consistent with the guidance in RG 1.206 and Commission paper SECY-05-0197. For example, RG 1.206, Section C.IV.4.3 states that the COL will contain a license condition that requires the licensee to submit to the NRC a schedule, 12 months after issuance of the COL, that supports planning for and conduct of NRC inspections of operational programs. The schedule should be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until either the operational programs in FSAR Table 13.4-201 have been fully implemented or the plant has been placed in commercial service, whichever comes first.

ANSWER:

Section 2.3 of Part 10, “ITAAC and Proposed License Conditions,” has been revised to state in a proposed license condition that Luminant shall implement the programs or portions of programs identified in Table 13.4-201 on or before the associated milestones in Table 13.4-201.

Rather than propose a license condition for the operational program schedule, Luminant commits to submit a schedule to the NRC that supports the planning and conduct of NRC inspections of operational programs no later than 12 months after issuance of the COL or at the start of construction as defined in 10 CFR 50.10a, whichever is later. This is similar to the approach for the ITAAC schedule required in 10 CFR 52.99(a).

FSAR Part 10 Section 2.3 was revised in the Combined License Application Update Tracking Report attached to Luminant letter TXNB-09053, dated October 21, 2009 and the revised pages are attached.

Impact on R-COLA

See attached marked-up FSAR Part 10 Subsection 2.3, pages 4 and 5.

Impact on S-COLA

None.

Impact on DCD

None.

2.3 Operational Programs

Operational Programs are identified in Table 13.4-201 and their implementation by the milestones indicated in the Table is a potential condition to the license. Some of these programs may be adequately controlled by other methods such as the regulations, the technical specifications or a commitment tracking system and will not need to be addressed in a license condition. A proposed license condition is provided in section 3 below based upon the current information in Chapter 13 of the COLA FSAR. CTS-00841

2.4 Environmental Protection Plan

The Environmental Protection Plan (EPP) and its implementation may also be a potential condition to the license. The EPP has typically been an appendix to the operating license and that precedent may be followed for COLs as well. No plant specific environmental items have been identified which are not adequately controlled by regulations, the appropriate permits, etc. and thus an EPP has not been proposed and is not needed. CTS-00841

2.5 Technical Specifications

Implementation of Technical Specifications prior to fuel load could also constitute a potential condition to the license. The Technical Specifications have typically been an appendix to the operating license and that precedent may be followed for COLs as well.

2.6 Others

The current operating licenses have some typical license conditions in areas such as security, fire protection and others. These current license conditions may or may not apply to COLs.

3. Specific Proposed License Conditions

The ~~only~~ license conditions identified thus far during the COL development and review are ~~is~~:

Proposed License Condition	Source	
The plant-specific PTS evaluation of the as-procured reactor vessel material properties will be submitted to the NRC within 12 months following acceptance of the reactor vessel.	Answer to RAI 2353 (CP RAI #8) question 05.03.02-3 as provided in TXNB-09028 dated August 7, 2009.	CTS-00841 RCOL2_05.03.02-3
The licensee shall implement the programs or portions of programs identified in the table below on or before the associated milestones.	COLA FSAR Table 13.4-201 Items 3, 5, 6, 8, 9, 10, 12, 15, 18, and 19.	

Operational Programs to be implemented per License Condition above:

CTS-00841

Program Title	Milestone
Environmental Qualification Program	Prior to Initial Fuel Load
Reactor Vessel Material Surveillance Program	Prior to Initial Criticality
Preservice Testing Program	Prior to Initial Fuel Load
Fire Protection Program	Prior to fuel receipt for elements of the Fire Protection Program necessary to support receipt and storage of fuel on-site. Prior to initial fuel load for elements or the Fire Protection Program necessary to support fuel load and plant operation.
Process and Effluent Monitoring and Sampling Program – Radiological Effluent Technical Specifications/Standard Radiological Effluent Controls	Prior to receipt of radioactive material on-site
Process and Effluent Monitoring and Sampling Program – Offsite Dose Calculation Manual	Prior to receipt of radioactive material on-site
Process and Effluent Monitoring and Sampling Program – Radiological Environmental Monitoring Program	Prior to receipt of radioactive material on-site
Process and Effluent Monitoring and Sampling Program – Process Control Program	Prior to receipt of radioactive material on-site
Radiation Protection Program	Prior to initial receipt of by-product, source, or special nuclear materials (excluding Exempt Qualities as described in 10 CFR 30.18) for those elements of the Radiation Protection (RP) Program necessary to support such receipt Prior to fuel receipt for those elements of the RP Program necessary to support receipt

Attachment 3

Response to Request for Additional Information No. 2818 (CP RAI #54)

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.: 2818 (CP RAI #54)

SRP SECTION: 03.03.01 - Wind Loading

QUESTIONS for Structural Engineering Branch 1 (AP1000/EPR Projects) (SEB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.03.01-1

In order for the NRC staff to determine whether the selected method can be used to determine the design wind loads for the site-specific Seismic Category I reinforced concrete duct banks (solid) and reinforced concrete chases (hollow) that house the yard piping and conduit in accordance with ASCE/SEI 7-05 requirements, additional information about the method is requested to demonstrate compliance with General Design Criterion (GDC)-2 in 10 CFR 50, Appendix A.

Design wind loads for buildings and other structures, including the Main Wind-Force Resisting Systems (MWFRS) and components, may be determined using one of three procedures defined in ASCE/SEI 7-05, Section 6.1.2. The combined license (COL) applicant may select either Method 1 – Simplified Procedure, Method 2 – Analytical Procedure, or Method 3 – Wind Tunnel Procedure described in ASCE/SEI 7-05 to determine design wind loads for the reinforced concrete duct banks and chases.

The COL applicant is requested to identify and describe the wind load design method used to design the site-specific Seismic Category I reinforced concrete duct banks (solid) and reinforced concrete chases (hollow) that house the yard piping and conduit. This information is needed to allow the NRC staff to evaluate the applicability of the design method for converting wind speed to wind loads on these structures. As such, the COL applicant is requested to provide an analysis that explains:

- The portions of the reinforced concrete duct banks (solid) and reinforced concrete chases (hollow) that house the yard piping and conduit that are affected by wind.
- Which method in ASCE/SEI 7-05 (Method 1, 2, or 3) is used by the COL applicant to design the site-specific Seismic Category I reinforced concrete duct banks (solid) and reinforced concrete chases (hollow) that house the yard piping and conduit.
- The rationale and technical basis for characterizing these structures as either open, partially vented, or enclosed based on definitions in ASCE/SEI 7-05, Section 6.2.
- How these structures satisfy the conditions listed in either ASCE/SEI 7-05, Section 6.4.1.1 for Method 1, Section 6.5.1 for Method 2, or Section 6.6.2 for Method 3, as applicable.

ANSWER:

Seismic category I shallow-embedded duct banks and chases are included in FSAR Chapter 3 in the anticipation that such items will be needed, but the application of these designs will be confirmed as detailed electrical, mechanical, and piping commodities design and yard layout progresses. Reinforced concrete duct banks and chases for CPNPP Units 3 and 4 with shallow embedments are buried partially or wholly below grade within structurally engineered and compacted backfill that extends down to the top of the limestone at nominal elevation 782 ft. Duct banks or chases wholly embedded are not subjected to wind loading. Generally, any portion of a duct bank or chase that is not wholly embedded is only marginally exposed and not to an extent that an analysis of wind loading is required. If a portion of a duct bank or chase is significantly exposed at or near the interface of another structure, the wind loading applied to the duct bank or chase is the wind loading calculated for that portion of the interfacing structure. Therefore, in these cases, the wind loads on the duct bank or chase correspond to the ASCE method that is used for the interfacing structure.

Impact on R-COLA

None.

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.: 2818 (CP RAI #54)

SRP SECTION: 03.03.01 - Wind Loading

QUESTIONS for Structural Engineering Branch 1 (AP1000/EPR Projects) (SEB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.03.01-2

In order for the NRC staff to demonstrate compliance with GDC-2 in 10 CFR 50, Appendix A, the COL applicant is requested to provide additional information about the response characteristics of the Ultimate Heat Sink Related Structures (UHSRS) to wind effects. Specifically, staff needs additional information to determine whether Method 2 can be used to determine the design wind loads for the UHSRS in accordance with ASCE/SEI 7-05, Section 6.5 requirements.

Design wind loads for buildings and other structures, including the Main Wind-Force Resisting Systems (MWFRS) and components, may be determined using one of three procedures defined in ASCE/SEI 7-05, Section 6.1.2. The COL applicant selected Method 2 – Analytical Procedure described in ASCE/SEI 7-05, Section 6.5 to determine design wind loads for the UHSRS. According to this procedure, Method 2 can only be used to design the MWFRS for buildings that satisfy the two conditions defined in ASCE/SEI 7-05, Section 6.5.1. Condition 2 for Method 2 states that the building does not have response characteristics making it subject to across wind loading, vortex shedding, instability due to galloping or flutter; and does not have a site location from which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.

The UHSRS consist of the following Seismic Category I reinforced concrete structures.

- Ultimate Heat Sink (UHS) basins
- UHS cooling tower enclosures
- Essential Service Water System (ESWS) pump houses

The layout and configuration of these site-specific structures exposes certain portions of the UHSRS to wind loads that are determined in accordance with Method 2 requirements defined in ASCE/SEI 7-05. Because building design details are required to determine the suitability of Method 2 for analysis of wind loadings, the COL applicant is requested to provide an analysis showing that the UHSRS do not have response characteristics making them subject to across wind loading, vortex shedding, instability due to galloping or flutter; and do not have a site location from which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration. The COL applicant is also requested to provide the rationale and technical basis for characterizing these structures as either open or partially vented based on definitions in ASCE/SEI 7-05, Section 6.2.

ANSWER:

ASCE/SEI 7-05 Commentary, Section C6.5.2, page 284, states:

> The provisions given under Section 6.5.2 apply to the majority of site locations and buildings and structures, but for some locations, these provisions may be inadequate. Examples of site locations and buildings and structures (or portions thereof) that require the use of recognized literature for documentation pertaining to wind effects, or the use of wind tunnel procedure or Section 6.6 include:
>
> 1. Site locations that have channeling effects from up-wind obstructions. Channeling effects can be caused by topographic features (e.g., mountain gorge) or buildings (e.g., a cluster of tall buildings). Wakes can be caused by hills or by buildings or other structures.
>
> 2. Buildings with unusual or irregular geometric shape, including barrel vaults, and other buildings whose shape (in plan or profile) differs significantly from a uniform series of superimposed prisms similar to those indicated in Figs. 6-6 through 6-17. Unusual or irregular geometric shapes include buildings with multiple setbacks, curved facades, irregular plan resulting from significant indentations or projections, openings through the building, or multitower buildings connected by bridges.
>
> 3. Buildings with unusual response characteristics that result in across-wind loading and/or dynamic torsional loads, loads caused by vortex shedding, or loads resulting from instabilities, such as fluttering or galloping. Examples of buildings and structures that may have unusual response characteristics include flexible buildings with natural frequencies normally below 1 Hz, tall slender buildings (building height-to-width ratio exceeds 4), and cylindrical buildings or structures. Note: Vortex shedding occurs when wind blows across a slender prismatic or cylindrical body. Vortices are alternately shed from one side of the body and then the other side, which results in a fluctuation force acting at right angles to the wind direction (across-wind) along the length of the body.
>
> 4. Bridges, cranes, electrical transmission lines, guyed masts, telecommunication towers, and flagpoles.

Figure 1.2-1R shows that the site does not possess any natural features such as ravines or hills near the Ultimate Heat Sink-Related Structures (UHSRS) complex that would promote significant channeling effects or the creation of wakes. Also, the other buildings on the site are not of the heights, plan dimensions, or locations relative to the UHSRS structures that would promote channeling or the creation of wakes or other non-standard wind effects that are beyond the provisions of the Method 2 procedure.

FSAR Table 3KK-2 shows that the minimum natural frequency of the UHSRS is 7.1 Hz for the east-west direction, which is the lowest fundamental frequency in any orthogonal direction for any of the soil conditions considered. This demonstrates that the UHSRS are rigid with respect to wind loading. As shown in Figures 3.8-206 through 3.8-211, the UHSRS complex is comprised of relatively low-rise, nearly rectangular structures that do not include any unusual or irregular geometric shapes and are constructed of reinforced concrete walls, floors, and roofs. Based on the configuration and properties of the UHSRS complex, the complex does not fall within the limitations of Section C6.5.2 of the ASCE/SEI 7-05 Commentary cited above. Therefore, the UHSRS are not considered to have response characteristics that make them subject to unusual wind effects such as across wind loading, vortex shedding, or instability due to galloping or flutter, and Condition 2 of Section 6.5.1 is satisfied.

ASCE/SEI 7-05 Section 6.2 defines an open building as having each wall at least 80 percent open. The UHSRS complex does not meet this requirement so it is not classified as an open building.

ASCE/SEI 7-05 Section 6.2 defines a partially enclosed structure as complying with both of the following conditions:

1. The total area of openings in a wall that receives positive external pressure exceeds the sum of the areas of openings in the balance of the building envelope (walls and roof) by more than 10 percent.

2. The total area of openings in a wall that receive positive external pressure exceeds 4 ft^2 (0.37 m^2) or 1 percent of the area of the wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

Figures 3.8-206 through 3.8-211 show that the UHSRS do not meet Condition 1 of the definition of a partially enclosed building of ASCE/SEI 7-05 Section 6.2. The large circular opening at the top of the structure is of greater area than the combined area of openings on any wall of the UHSRS.

ASCE/SEI 7-05 Section 6.2 defines an enclosed building as a building that does not comply with the requirements for open or partially enclosed buildings. Since the UHSRS do not meet the definitions of open or partially enclosed buildings, the UHSRS are defined as enclosed buildins for the purpose of basic wind loading analysis.

<u>Impact on R-COLA</u>

None.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

Attachment 4

Response to Request for Additional Information No. 2876 (CP RAI #55)

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.: 2876 (CP RAI #55)

SRP SECTION: 03.07.01 - Seismic Design Parameters

QUESTIONS for Structural Engineering Branch 1 (AP1000/EPR Projects) (SEB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.07.01-1

NUREG-0800, Standard Review Plan (SRP) 3.7.1, "Seismic Design Parameters," establishes the criteria the NRC staff will use to evaluate whether an applicant meets the NRC's regulations.

SRP, Section 3.7.1.I.1 provides guidance for developing site-specific ground motion response spectra (GMRS) for sites with soil layers that will be completely excavated to expose competent material. It is stated that GMRS should be specified on an outcrop or a hypothetical outcrop that will exist after excavation and that motions at this hypothetical outcrop should be developed as free-surface motions not as in–column motions. In numerous places throughout Section 3.7 of the Comanche Peak Nuclear Power Plant (CPNPP) Combined license application (COLA), the term “outcrop” is used when describing how ground motions were developed. Define the term “outcrop” as used in the COLA and state whether or not the term has the same meaning, as this term is used throughout COLA Section 3.7 and Appendices 3KK, 3LL, 3MM, and 3NN.

The question is posed because the term can have different meanings depending on the context. In order to evaluate the development GMRS the NRC staff requires clarification.

ANSWER:

As used in Section 3.7 and Appendices 3KK, 3LL, 3MM, and 3NN, the term “outcrop” follows the formulation of the SHAKE family of programs for one-dimensional wave propagation analysis. The wave propagation in layered media results in motion in each layer that can be decomposed into incoming components and reflected components. In SHAKE, the term “outcrop” motion defines the motion of the layer equivalent to two times the incoming component of the motion of that layer. This definition of the term “outcrop” is used consistently throughout the FSAR Chapter 3 and Appendices 3KK, 3LL, 3MM, and 3NN.

Subsection 2.5.2 identifies that the vertical strata of the site subsurface is divided into layers that are distinguished by different physical characteristics. Most prominent of these layers is an approximately 60-ft. thick limestone layer, which is referred to as engineering Layer C. This layer lies about 40 ft.

below the finish grade elevation of 822 ft. at an approximate elevation of 782 ft. The foundation mats for all seismic Category I structures, except seismic Category I duct banks and chases embedded in compacted fill, are founded on this layer. Excavation to layer C will remove the shallower, non-competent layers. As explained in Subsections 2.5.2.5 and 2.5.2.6, the site-specific ground motion response spectra (GMRS) are developed as free-field outcrop motions on the uppermost in-situ competent material. The uppermost in-situ competent layer is the Layer C discussed above.

Theoretically, the “outcrop” motion as defined in Chapter 3 is equal to the hypothetical outcrop surface motion defining the GMRS and foundation input response spectra (FIRS) developed in FSAR Chapter 2 at the top of the in-situ limestone layer at elevation 782’-0” only after the excavation of the overlying non-competent soil and rock layers. Therefore, the “outcrop” motion will be equivalent to the motion defined by GMRS and FIRS only for the case of surface foundations where no soil exists above the top of the in-situ limestone layer at elevation 782’-0”. The presence of in-situ or engineered fill materials above the elevation where GMRS and FIRS are defined will affect the incoming motion at the top of the in-situ competent material. In this case of an embedded foundation, the “outcrop” motion as defined in Chapter 3 will be different from the GMRS and FIRS defined motion that represents the motion at the top of the rock column with the top layers of incompetent in-situ materials removed. However, as discussed in Subsection 3.7.1.1, the nominal site-specific response spectra which are described in Chapter 2 are less than the minimum required response spectra, and are therefore not used for site-specific design and analyses. Instead, the site-specific FIRS are defined as the shape of the certified seismic design response spectra (CSDRS) anchored at 0.1g, in order to comply with the intent of of 10 CFR 50 Appendix S (IV)(a)(1)(i). This is discussed further in the response to Question 03.07.01-5.

Time histories for the CSDRS anchored at 0.1g are developed as discussed in Subsection 3.7.1.1. The site-specific SSI analyses of the seismic Category I facilities - UHSRS (App. 3KK), ESWPT (App. 3LL), PSFSV (App. 3MM), R/B-PCCV-CONTAINMENT INTERNAL STRUCTURE (App. 3NN) – are based on this input motion. These structures are analyzed as both surface-mounted and embedded structures to capture a wide range of site-specific SSI seismic response effects. The analyses of the surface-mounted foundation conditions utilize the outcrop input motion as defined by the CSDRS anchored at 0.1g. The SASSI analyses, which consider embedment effects, use “within-layer” motion as input for the horizontal component of the design earthquake. As further explained in Section 3NN.2, for analysis of embedded foundations, the design input motion is converted to within-layer motion using SHAKE wave propagation analyses that take into account the properties of the backfill above the limestone outcrop surface at elevation 782’-0”. These input horizontal acceleration time histories of the within-layer limestone motion are developed in a manner that captures a wide variation of possible embedment stiffness and damping properties (lower bound, best estimate, upper bound, and high bound profiles as discussed in Appendix 3NN). The properties of the embedment material that are compatible to the strains generated by this input motion are used in conjunction with the input motion.

Impact on R-COLA

None.

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.: 2876 (CP RAI #55)

SRP SECTION: 03.07.01 - Seismic Design Parameters

QUESTIONS for Structural Engineering Branch 1 (AP1000/EPR Projects) (SEB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.07.01-2

NUREG-0800, Standard Review Plan (SRP) 3.7.1, "Seismic Design Parameters," establishes the criteria the NRC staff will use to evaluate whether an applicant meets the NRC's regulations.

In order for the NRC staff to evaluate the suitability of the seismic input, describe in detail how the horizontal and vertical GMRS are developed. At a minimum, the description should include the program used, the output options specified (within versus outcrop motion), the soil column used to generate each spectrum, and the soil properties used to generate each spectrum.

ANSWER:

The program used for the site-response calculations for the GMRS is RVTSITE Version 1.2. This program uses the same equivalent-linear formulation of the soil-column dynamics as the SHAKE program (Schnabel and Seed, 1972; Idriss and Sun, 1992) and uses a random-vibration theory representation of the motions. Further details and references on the methodology are provided below.

For the calculation of the GMRS, the soil column was truncated at elevation 782 ft (top of Layer C), and the GMRS motions were computed as surface motions. Because soil-degradation effects can be neglected and the soil column is treated as linear (Subsection 2.5.4.7.4), this approach is consistent with the recommendations of NEI (NEI, 2009) for embedded structures that are analyzed as surface structures.

Other details of the GMRS calculation, including the development of the site profile, and details of the site amplification calculations and results are described in Subsections 2.5.2.5 and 2.5.2.6. Subsection 3.7.1.1 has been revised in order to clarify that the calculation of the GMRS is fully described in Subsections 2.5.2.5 and 2.5.2.6.

References:

Idriss, I., and Sun, J.I., 1992, Users Manual for SHAKE91.

Schnabel, S. and Seed, H.B., 1972, SHAKE- A Computer Program for Earthquake Response Analysis of Horizontally Layered Sites, Report No. 72-12, Earthquake Engineering Research Center (EERC).

NEI, 2009, Consistent Site-Response/Soil-Structure Interaction Analysis and Evaluation," NEI White Paper, June 12, 2009 (ML091680715).

Impact on R-COLA

See attached marked-up of FSAR Draft Revision 1 page 3.7-2.

Impact on S-COLA

None.

Impact on DCD

None.

CP COL 3.7(22) Replace the last sentence of the ninth paragraph in DCD Subsection 3.7.1.1 with the following.

The CPNPP is not in a high seismic area, is not founded on hard rock, and the site-specific seismic GMRS and FIRS demonstrate that there are no high frequency exceedances of the CSDRS that could create damaging effects.

CP COL 3.7(5) Replace the last two sentences of the sixteenth paragraph in DCD Subsection 3.7.1.1 with the following.

The site-specific horizontal response spectra are obtained from site-specific response analyses performed in accordance with RG 1.208 (Reference 3.7-3) and account for upward propagation of the GMRS. ~~The nominal GMRS and horizontal response spectra~~The calculation of the GMRS and FIRS is outlined in Subsection 2.5.2.5 and 2.5.2.6, respectively. Subsection 2.5.2.5 and 2.5.2.6 document the site response methodology used, the soil properties used, and the methodology for calculating the GMRS. The nominal GMRS and FIRS for 5 percent damping resulting from these site-specific response analyses are shown in Figure 3.7-201. The spectra shown in Figure 3.7-201 represent nominal spectra for the following site-specific conditions: RCOL2_03.07.01-2

FIRS1 = the nominal GMRS, at the top of the stiff limestone (nominal elevation 782') described in Chapter 2. The R/B-prestressed concrete containment vessel (PCCV)-containment internal structure, PS/Bs, UHSRS, PSFSVs, ESWPT, and A/B are founded directly on this limestone layer, have a thin layer of fill concrete placed between the top of limestone and bottom of mat foundation, and/or the fill concrete is analyzed in SASSI (Reference 3.7-17) as part of the seismic structural model.

FIRS2 = the nominal response spectrum for structures located on a layer of fill concrete placed between the top of the limestone at nominal elevation 782' and bottom of the structure's foundation. Note that a comparison of FIRS1 and FIRS2 shows that the presence of several feet of fill concrete does not result in amplification of the ground motion seismic response, and is well below the minimum design earthquake.

FIRS3 = nominal response spectrum corresponding to typical plant grade elevation 822' for shallow-embedment structures founded on native, in-situ, undisturbed materials occurring below plant grade as described in Chapter 2. FIRS3 does not apply currently to any plant structures. FIRS3 represents the free-field ground motion.

FIRS4 = nominal response spectrum corresponding to typical plant grade elevation 822' for shallow-embedment structures founded on engineered and compacted structural backfill that extends down to top of limestone at nominal elevation 782'. FIRS4 is computed using both a 30 percent and a 50 percent coefficient of variation for the engineered fill properties to account for a wide range of potential backfill materials. FIRS4 applies to seismic category I duct banks and chases used for routing yard piping and conduits.

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.: 2876 (CP RAI #55)

SRP SECTION: 03.07.01 - Seismic Design Parameters

QUESTIONS for Structural Engineering Branch 1 (AP1000/EPR Projects) (SEB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.07.01-3

NUREG-0800, Standard Review Plan (SRP) 3.7.1, "Seismic Design Parameters," establishes the criteria the NRC staff will use to evaluate whether an applicant meets the NRC's regulations.

In order for the NRC staff to evaluate the development of the foundation input response spectra (FIRS), describe in detail how the horizontal FIRS (FIRS1, FIRS2, FIRS3, and FIRS4) and vertical FIRS are generated. At a minimum, the description should include the program used, the output options specified (within versus outcrop motion), the soil column configuration used to generate each spectrum, and the soil properties used to generate each spectrum.

ANSWER:

The details of the FIRS calculations are presented in response to Question 03.07.01-2 above. The program used for the site-response calculations for the FIRS is RVTSITE Version 1.2. Details on this software are provided in the response to Question 03.07.01-2.

For the calculation of the FIRS 1, FIRS 2, and FIRS 3 motions, the soil column was truncated at the associated elevations, and the FIRS motions were computed as surface motions. Because soil-degradation effects can be neglected and the soil column is treated as linear (Subsection 2.5.4.7.4), this approach is consistent with the recommendations of NEI (NEI, 2009) for embedded structures that are analyzed as surface structures. The FIRS 4 corresponds to surface conditions and other details of the FIRS calculations, including the development of the site profile and details of the site amplification calculations and results, have been provided in Subsections 2.5.2.5 and 2.5.2.6.

References:

NEI, 2009, Consistent Site-Response/Soil-Structure Interaction Analysis and Evaluation, ”NEI White Paper,” June 12, 2009 (ML091680715).

Impact on R-COLA

None.

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.: 2876 (CP RAI #55)

SRP SECTION: 03.07.01 - Seismic Design Parameters

QUESTIONS for Structural Engineering Branch 1 (AP1000/EPR Projects) (SEB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.07.01-4

NUREG-0800, Standard Review Plan (SRP) 3.7.1, "Seismic Design Parameters," establishes the criteria the NRC staff will use to evaluate whether an applicant meets the NRC's regulations.

In Appendix 3LL of the COLA, the damping ratios of 0.4 that are shown in Table 3LL-2 for the Missile Shield Walls and Mission Shield Roof Slab and in Table 3LL-3 for the Service Tunnel Roof and Service Tunnel Inner Walls are inconsistent with the damping ratio of 0.04 shown in Table 3.7.3-1(b) of the US-APWR design certification document and in Table 2 of Regulatory Guide 1.61, "Damping Values for Seismic Design of Nuclear Power Plants." Explain the discrepancy and provide justification for the higher damping values shown in the two tables.

ANSWER:

The damping ratio of “0.4” shown for the Basin Missile Shield Walls and Basin Missile Shield Roof Slab is a typographical error and has been corrected to “0.04,” which was used for the analysis and design.

Impact on R-COLA

See attached marked-up of FSAR Draft Revision 1 pages 3LL-6 and 3LL-7.

Impact on S-COLA

None.

Impact on DCD

None.

Table 3LL-2

ESWPT Segment 2 FE Model Component Properties

Components	Material	E (ksi)	Poisson's Ratio	Unit Weight (kcf)	Damping Ratio	Width or Height x Thickness (ft) [(2)]	Element type	
Roof	5,000 psi concrete	4,030	0.17	0.21[(1)]	0.04	23 x 2.5	Shell	
Base slab	5,000 psi concrete	4,030	0.17	0.19[(1)]	0.04	34 x 2.5	Shell	
Exterior Walls	5,000 psi concrete	4,030	0.17	0.175[(1)]	0.04	17.17 x 2	Shell	
Interior Walls	5,000 psi concrete	4,030	0.17	0.250[(1)]	0.04	17.17 x 1	Shell	
Basin Missile Shield Walls	5,000 psi concrete	4,030	0.17	0.15	0.04	32 x 2	Shell	RCOL2_03.07.01-4
Basin Missile Shield Roof Slab	5,000 psi concrete	4,030	0.17	0.15	0.04	11.5 x 2 x 95	Shell	RCOL2_03.07.01-4
Pump House Missile Shield Walls	5,000 psi concrete	4,030	0.17	0.1875[(1)]	0.04	26 x 2	Brick	
Pump House Missile Shield Roof Slab	5,000 psi concrete	4,030	0.17	0.1875[(1)]	0.04	10 x 2 x 23	Brick	
Fill Concrete	3,000 psi concrete	3,125	0.17	0.15	0.04	34 x 9.83	Brick	

Notes:

1) The unit weight includes equivalent dead loads due to piping and other supported components, and 25% of applicable live load for dynamic analysis purposes. A pipe load of 150 psf is considered on the tunnel roof slab, 75 psf on the pump house missile shield surfaces, and 50 psf is considered on all other interior surfaces. The applicable floor live load is 200 psf.
2) The width or height of the component is adjusted from actual dimensions to suit the mesh pattern used for the FE model. The adjustments are minor and do not affect the accuracy of the analysis results. Actual component dimensions are shown in Section 3.8 Figure 3.8-202.

Table 3LL-3

ESWPT Segment 3 FE Model Component Properties

Components	Material	E (ksi)	Poisson's Ratio	Unit Weight (kcf)	Damping Ratio	Width or Height x Thickness (ft) (2)	Element type
Roof	5,000 psi concrete	4,030	0.17	0.225(1)	0.04	23 x 2	Shell
Base slab	5,000 psi concrete	4,030	0.17	0.200(1)	0.04	23 x 2	Shell
Exterior Walls	5,000 psi concrete	4,030	0.17	0.175(1)	0.04	16.67 x 2	Shell
Interior Walls	5,000 psi concrete	4,030	0.17	0.250(1)	0.04	16.67 x 1	Shell
Service Tunnel Roof	5,000 psi concrete	4,030	0.17	0.344(1)	0.04	Width varies x 2	Shell
Service Tunnel Outer Walls	5,000 psi concrete	4,030	0.17	0.175(1)	0.04	13.25 x 2	Shell
Service Tunnel Inner Walls	5,000 psi concrete	4,030	0.17	0.217(1)	0.04	13.25 x 1.5	Shell
Fill Concrete	3,000 psi concrete	3,125	0.17	0.15	0.04	23 x 10.08	Brick

RCOL2_03.07.01-4

RCOL2_03.07-01-4

Notes:

1) The unit weight includes equivalent dead loads due to piping and other supported components, and 25% of applicable live load for dynamic analysis purposes. A pipe load of 150 psf is considered on the roof slab and service tunnel roof, and 50 psf is considered on all other interior surfaces. The applicable floor live load is 200 psf for the base slab and service tunnel roof. Also, additional backfill dead load of 187.5 psf due to fill above elevation 822 is considered on the service tunnel roof.

2) The width of the component is adjusted from actual dimensions to suit the mesh pattern used for the FE model. The adjustments are minor and do not affect the accuracy of the analysis results. Actual component dimensions are shown in Section 3.8 Figures 3.8-203 and 3.8-204.

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.: 2876 (CP RAI #55)

SRP SECTION: 03.07.01 - Seismic Design Parameters

QUESTIONS for Structural Engineering Branch 1 (AP1000/EPR Projects) (SEB1)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 03.07.01-5

NUREG-0800, Standard Review Plan (SRP) 3.7.1, "Seismic Design Parameters," establishes the criteria the NRC staff will use to evaluate whether an applicant meets the NRC's regulations.

In appendix 3NN (page 3NN-2) of the CPNPP COLA, it is stated that the minimum design spectra, tied to the shapes of the certified seismic design response spectra (CSDRS) and anchored at 0.1*g*, define the safe-shutdown earthquake (SSE) design motion for the seismic design of category I structures that is specified as outcrop motion at the top of the limestone at nominal elevation of 782 ft.

10 CFR 50 Appendix S, "Earthquake Engineering Criteria for Nuclear Power Plants" requires that the SSE be characterized by free-field ground motion response spectra at the free ground surface and that the horizontal component of the SSE ground motion in the free-field at the foundation level of the structures must be an appropriate response spectrum with a peak ground acceleration (PGA) of at least 0.1g.

Therefore, in accordance with 10 CFR 50 Appendix S, the SSE should be defined at the surface elevation of 822 ft, and it should be demonstrated that the SSE free-field ground motion at the foundation level of 782 ft is represented by an appropriate spectrum with a PGA of at least 0.1*g*.

The applicant should provide a technical bases and justification for defining the SSE at elevation of 782 ft., and demonstrate that placing the SSE at this elevation is in compliance with Appendix S to 10 CFR Part 50.

ANSWER:

The technical basis and justification for the SSE foundation input response spectra (FIRS) at elevation 782 ft is that these spectra fully envelope the SSE free-field ground motion response spectra at the surface elevation 822 ft, and that the SSE input motion at elevation 782 ft is developed in a manner that is consistent with guidance given in ISG-17.

The site-specific FIRS used for site-specific building and structure design have a shape that matches the shape of the US-APWR standard plant CSDRS defined in Subsection 3.7.1.1 of the US-APWR

DCD Tier 2, which is incorporated by reference in the CPNPP Units 3 and 4 FSAR as noted in Section 3.7. The US-APWR standard plant CSDRS characterize the site-independent SSE design ground motion that is defined at a control point located at the bottom of each US-APWR standard plant building basemat. Therefore, the CSDRS are essentially applied as FIRS.

Each of the major seismic category I facilities is founded on a thin layer of concrete fill on top of the limestone layer at elevation 782 ft. This rock outcrop serves as the control point for the seismic analyses of the seismic category I facilities.

Figure 3.7-201 shows a comparison of the actual GMRS and FIRS that were calculated in the site response analysis versus the site-specific FIRS used for site-specific building and structure design and analysis. The site-specific SSE free-field response spectra are shown as FIRS3 in Figure 3.7-201 and have a PGA of approximately 0.05 g. The site-specific FIRS used for site-specific building and structure design have a 0.1 g PGA. The FIRS used for site-specific building and structure design completely envelope the SSE free-field ground motion (FIRS3) at all frequencies of interest. The FIRS used for site-specific building and structure design also envelope the site-specific outcrop GMRS and all other FIRS developed for the site response analysis, as shown in Figure 3.7-201.

As described in Appendix 3NN and the response to Question 03.07.01-1 above, the effects of embedment are also considered in conjunction with the site-specific FIRS in the seismic analysis and the embedment effects are analyzed by considering a wide variation of backfill properties that are strain-compatible with the FIRS used for the design input motion.

Therefore, the site-specific SSE defined at elevation 782 ft and used as the site-specific FIRS is in compliance with 10 CFR Part 50, and is suitable for site-specific design and analysis of buildings and structures.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment 5

Response to Request for Additional Information No. 3457 (CP RAI #58)

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.: 3457 (CP RAI #58)

SRP SECTION: 05.02.05 - Reactor Coolant Pressure Boundary Leakage Detection

QUESTIONS for Balance of Plant Branch 2 (ESBWR/ABWR) (SBPB)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 05.02.05-1

The review of Comanche Peak RCOL application is in parallel with the review of US-APWR design certification (DC), and therefore, is affected by the DCD review. In a letter, dated February 20, 2009 for the response to RAI 165-1967 Question 05.02.05-3 relating to US-APWR DCD Section 5.2.5, "Reactor Coolant Pressure Boundary (RCPB) Leakage Detection," MHI identified leakage detection procedures and alarm set points to be described in DCD Section 13.5.2.1. DCD Section 13.5.2.1, "Operating and Emergency Operating Procedures," states that the procedures are developed by the COL Applicant. Therefore, the NRC staff requests the COL applicant to provide the following information relating to the above RAI.

- Provide procedures to convert the instrument indications of various leakage detection (e.g., containment radioactivity monitors, containment sump level monitor, containment air cooler condensate flow rate monitor) into common leakage rate (gpm).
- Define the alarm setpoints and demonstrate the setpoints are sufficiently low to provide an early warning for operator actions prior to Technical Specification (TS) limits.

ANSWER:

Preparation of a procedure for rapid conversion of the referenced leak detection instruments into a common leak rate and the specific alarm set point values were described in MHI's response to DCD RAI No. 438-3079, Revision 1, Question 05.02.05-7 (ML092600316).

Impact on R-COLA

See attached mark-up FSAR Draft Revision 1 pages 1.8-38, 5.2-2, and 5.2-3.

Impact on S-COLA

None.

Impact on DCD

None.

Table 1.8-201 (Sheet 29 of 68)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	COL Applicant Item	COL Holder Item	Rationale
COL 5.2(7)	Deleted from the DCD.				
COL 5.2(8)	Deleted from the DCD.				
COL 5.2(9)	Deleted from the DCD.				
COL 5.2(10)	Safety and relief valve information; The COL applicant addresses the actual throat area of the pressurizer safety valves and the CS/RHR pump suction relief valves.	5.2.2.4		H	a
CP COL 5.2(14)	Procedures for conversion into common leakage rate; The Combined License Applicant will develop a milestone schedule for preparation and implementation of the procedure.	5.2.5.9		H	b
CP COL 5.2(15)	Procedures for determining the existence of and operator response to prolonged low-level leakage conditions; The Combined License Applicant will develop a milestone schedule for preparation and implementation of the procedure.	5.2.5.9		H	b
COL 5.3(1)	Pressure-Temperature Limit Curves; The COL applicant addresses the use of plant-specific reactor vessel P-T limit curves. Generic P-T limit curves for the US-APWR reactor vessel are shown in Figures 5.3-2 and 5.3-3, which are based on the conditions described in Subsection 5.3.2. However, for a specific US-APWR plant, these limit curves are plotted based on actual material composition requirements and the COL applicant addresses the use of these plant-specific curves.	5.3.2.1 5.3.2.2		H	b
COL 5.3(2)	Reactor Vessel Material Surveillance Program; The COL applicant provides a reactor vessel material surveillance program based on information in Subsection 5.3.1.6.	5.3.1.6		H	b

RCOL2_05.02.05-1
RCOL2_05.02.05-2

5.2.4.1 Inservice Inspection and Testing Program

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.

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.

5.2.4.2 Preservice Inspection and Testing Program

STD COL 5.2(5) Replace the fourth sentence of the first paragraph in DCD Subsection 5.2.4.2 with the following.

The preservice inspection (PSI) program complies with the editions and addenda of American Society of Mechanical Engineers (ASME) Code Section XI incorporated by reference in Code of Federal Regulations, Title 10 (10 CFR) 50.55a(b) as applied to the construction of the component. The implementation milestones for the PSI and preservice testing (PST) program are provided in Table 13.4-201.

STD COL 5.2(14) Add the following Subsection after DCD Subsection 5.2.5.8. RCOL2_05.02.05-1

STD COL 5.2(15)

5.2.5.9 Operating Procedures

RCOL2_05.02.05-2

The operating procedures regarding conversion of the referenced leak detection instruments into a common leak rate and operator actions in response to prolonged leakage are included in system operating procedures in Subsection 13.5.2.1. A milestone schedule for implementation of the procedures is also included in Subsection 13.5.2.1.

5.2.6 Combined License Information

Replace the content of DCD Subsection 5.2.6 with the following.

CP COL 5.2(1) ***5.2(1)*** *ASME Code Cases that are approved in Regulatory Guide 1.84*

This Combined License (COL) item is addressed in Subsection 5.2.1.2.

CP COL 5.2(2) ***5.2(2)*** *ASME Code Cases that are approved in Regulatory Guide 1.147*

This COL item is addressed in Subsection 5.2.1.2.

CP COL 5.2(3) ***5.2(3)*** *ASME Code Cases that are approved in Regulatory Guide 1.192*

This COL item is addressed in Subsection 5.2.1.2.

STD COL 5.2(4) ***5.2(4)*** *Inservice inspection and testing program for the Reactor Coolant Pressure Boundary (RCPB)*

This COL item is addressed in Subsection 5.2.4.1 and Table 13.4-201.

STD COL 5.2(5) ***5.2(5)*** *Preservice inspection and testing program for the RCPB*

This COL item is addressed in Subsection 5.2.4.2 and Table 13.4-201.

5.2(6) *Deleted from the DCD.*

5.2(7) *Deleted from the DCD.*

5.2(8) *Deleted from the DCD.*

5.2(9) *Deleted from the DCD.*

STD COL 5.2(10) ***5.2(10)*** *Safety and relief valve information*

This COL item is addressed in Subsection 5.2.2.4.

STD COL 5.2(14) ***5.2(14)*** *Procedures for conversion into common leakage rate* RCOL2_05.02.05-1

This COL item is addressed in Subsection 5.2.5.9. RCOL2_05.02.05-2

STD COL 5.2(15) ***5.2(15)*** *Procedures for operator response to prolonged low-level leakage*

This COL item is addressed in Subsection 5.2.5.9.

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.: 3457 (CP RAI #58)

SRP SECTION: 05.02.05 - Reactor Coolant Pressure Boundary Leakage Detection

QUESTIONS for Balance of Plant Branch 2 (ESBWR/ABWR) (SBPB)

DATE OF RAI ISSUE: 9/14/2009

QUESTION NO.: 05.02.05-2

In a letter, dated February 20, 2009, MHI responded to RAI 165-1967 Question 05.02.05-4 relating to APWR DCD Section 5.2.5, "Reactor Coolant Pressure Boundary (RCPB) Leakage Detection." In the response, MHI stated that leakage detection procedures for prolonged low-level leakage are to be described in DCD Section 13.5.2.1. DCD Section 13.5.2.1, "Operating and Emergency Operating Procedures," states that the procedures are developed by the COL Applicant. Therefore, the NRC staff requests the COL applicant to provide such information relating to the above RAI.

The operating experience at Davis Besse indicated that prolonged low-level unidentified leakage inside containment could cause material degradation such that it could potentially compromise the integrity of a system leading to the gross rupture of the reactor coolant pressure boundary. The applicant is requested to provide operating procedures that specify operator actions in response to prolonged low level leakage conditions that exist above normal leakage rates and below the TS limits to provide operator sufficient time to take actions before the TS limit is reached. The procedures would include identifying, monitoring, trending, and repairing prolonged low-level leakage. The guidance about developing such procedures for ensuring effective management of leakage, including low-level leakage, is available in Regulatory Guide 1.45, Revision 1 (dated May 2008), "Guidance on Monitoring and Response to Reactor Coolant System Leakage," Regulatory Position C3.

ANSWER:

Preparation of a procedure for operator actions in response to prolonged low level leakage was described in MHI's response to DCD RAI No. 438-3079, Revision 1, Question 05.02.05-10 (ML092600316).

<u>Impact on R-COLA</u>

See marked-up FSAR Draft Revision 1 pages 1.8-38, 5.2-2, and 5.2-3 provided in the response to Question 05.02.05-1 above.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment 6

Response to Request for Additional Information No. 3602 (CP RAI #59)

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.: 3602 (CP RAI #59)

SRP SECTION: 11.05 - Process and Effluent Radiological Monitoring Instrumentation and Sampling Systems

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/15/2009

QUESTION NO.: 11.05-3

The NRC staff's review of Sections 11.5.2.6 and 11.5.2.8 of the COLA, Part 2, FSAR (Rev 0) indicates an inconsistency in regards to implementation of site-specific procedures to satisfy CP COL 11.5(4) and CP COL 11.5(5) under the quality assurance program (QAP) in FSAR Chapter 17. The COL information items address development of procedures for acquiring and evaluating samples of radioactive effluents; equipment inspection, calibration, and maintenance of monitoring and sampling equipment; radioactive waste systems; analytical procedures; and regulated record using the applicable guidance of Regulatory Guide (RG) 1.21, 'Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste,' (October 2008), RG 1.33, 'Quality Assurance Program Requirements,' (February 1978) and RG 4.15, 'Quality Assurance for Radiological Monitoring Programs (Inception Through Normal Operations to License Termination - Effluent Streams and the Environment,' (November 2006) to comply with 10 CFR Parts 20 and 50.

FSAR Sections 11.5.2.6 and 11.5.2.8 indicate site-specific procedures are prepared and implemented under the QAP described in Chapter 17. However, Section 17.5.3 discusses use of an existing NRC approved QAP for CPNPP, Units 1 and 2 (based on ANSI/ASME N45.2-1971) which differs from SRP 17.5 (based on ASME NQA-1-1994, RG 1.8, 'Qualification and Training of Personnel for Nuclear Power Plants,' (May 2000), RG 1.28, 'Quality Assurance Program Requirements (Design and Construction),' (August 1985), and RG 1.33). Please justify use of ANSI/ASME N45.2-1971 (revised in 1977 - inactive standard) and departure from SRP 17.5 on the QAP for CPNPP Units 3 and 4. Revise the COLA to include this information and provide a markup in your response.

ANSWER:

Luminant currently relies on the Comanche Peak Nuclear Power Plant (CPNPP) Units 1 and 2 existing procedures and programs for it's work activities on the NuBuild Project for CPNPP Units 3 and 4. These existing procedures and programs follow an NRC-approved QA program based on ANSI/ASME N45.2-1971.

Luminant will transition the activities for the NuBuild Project to the Quality Assurance Program Document (QAPD) based on NQA-1, RG 1.8, RG 1.28, and RG 1.33 sometime during the construction of CPNPP Units 3 and 4. The transition will be complete no later than 30 days before fuel load of CPNPP Unit 3. A more detailed description of the Units 3 and 4 quality assurance program, including the transition process, is provided in response to RAI No. 2996 (CP RAI #79).

Site-specific operational procedures for CPNPP Units 3 and 4 will be developed during the transition as they are needed. In particular, procedures for radioactive effluents, analytical procedures, instrument calibration and regulated records will be developed before Unit 3 fuel load which will comply with the CPNPP 3 and 4 QAPD, NQA-1, and relevant NRC RGs as discussed in the COLA.

Impact on R-COLA

See changes to Chapter 17 resulting from the response to RAI No. 2996 (CP RAI #79).

Impact on S-COLA

None.

Impact on DCD

None.