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TOKYO, JAPAN

March 3, 2009

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffery A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-09067

Subject: MHI's Response to US-APWR DCD RAI No. 190-1764

References: 1) "Request for Additional Information No. 190-1764 Revision 0, SRP Section: 14.03.02 – Structural and Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria, Application Section: DCD, Tier 1 – Section 2.2," dated 2/09/2009.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Response to Request for Additional Information No. 190-1764 Revision 0."

Enclosed are the responses to 7 RAIs contained within Reference 1.

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of this submittal. His contact information is provided below.

Sincerely,

Y. Ogata

Yoshiki Ogata,
General Manager- APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

Enclosures:

1. Response to Request for Additional Information No. 190-1764, Revision 0

CC: J. A. Ciocco
C. K. Paulson

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NRO

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Docket No. 52-021
MHI Ref: UAP-HF-09067

Enclosure 1

UAP-HF-09067
Docket No. 52-021

Response to Request for Additional Information No. 190-1764,
Revision 0

March, 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/3/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 190-1764 REVISION 0**
SRP SECTION:	**14.03.02 – Structural and Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria**
APPLICATION SECTION:	**Tier 1 – Section 2.2**
DATE OF RAI ISSUE:	**02/09/09**

QUESTION NO. 14.03.02-2:

ITAAC Item 1 in Table 2.2-4

The design commitment, ITA, and AC should refer to 'each PS/B' not 'the PS/B'.

The AC should refer to 'as-built structural configurations' not 'as-build design configurations'.

For the AC the reference to 'descriptions' is only applicable to the Table 2.2-2 not the figures. The figures are only horizontal and vertical layouts of the R/B and each PS/B.

ANSWER:

MHI agrees with the identified corrections to Design Commitment, ITA, and AC for ITAAC Item 1 in Table 2.2-4. MHI has also noted, and will correct, other errors of "the PS/B" throughout Table 2.2-4.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 1, Section 2.2, Revision 2, changes to Table 2.2-4:

- Provide corrections to Table 2.2-4 as follows:

Table 2.2-4 Structural and Systems Engineering Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The structural configurations of the R/B and ~~the~~ each PS/B are as ~~shown~~ described in ~~Figures 2.2-1 through 2.2-13 and~~ Table 2.2-2.	1. Inspections of the as-built structural configurations of the R/B and ~~the~~ each PS/B will be performed.	1. The as-built ~~build design~~ structural configurations of the R/B and ~~the~~ each PS/B are reconciled with descriptions in ~~Figures 2.2-1 through 2.2-13 and~~ Table 2.2-2.
2. The ASME Code Section III components and piping retain their pressure boundary integrity at their design pressure.	2. A hydrostatic test and preoperational NDE will be performed in conjunction with Section III of the ASME Code.	2. The results of the hydrostatic test and preoperational NDE of the as-built components and piping conform to the requirements of the ASME Code, Section III.
3. The PCCV retains structural integrity under design pressures of 68 psig.	3. A structural integrity test (SIT) will be performed in accordance with the ASME code, Section III.	3. The result of the structural integrity test (SIT) of the as-built PCCV conforms to the requirements in the ASME Code, Section III.
4. The containment system barrier prevents release of fission products to the atmosphere.	4. A containment integrated leak rate test will be performed in accordance with 10 CFR 50, Appendix J.	4. The containment integrated leak rate test verifies that the leak rate is less than the allowable leakage rate specified in 10 CFR 50, Appendix J.
5. The PCCV is designed based on the structural design-basis loads.	5. An analysis will be performed to verify that the as-built PCCV structural design-basis loads are reconciled.	5. ASME design report exists for the as-built PCCV, and concludes the PCCV is designed based on the structural design-basis loads.
6. The safety-related standard plant buildings other than the PCCV are designed based on the structural design-basis loads.	6. An analysis will be performed to verify that the as-built safety-related standard plant structures, other than the PCCV, structural design-basis loads are reconciled.	6. Design reports exist for the as-built safety-related standard plant buildings other than the PCCV, and conclude the safety-related standard plant buildings are designed in accordance with structural design-basis loads.
7. The ASME Code, Section III, Class 1 piping systems and components are designed to retain their pressure integrity and functional capability under internal design and operating pressures and design-basis loads.	7. Refer to Section 2.3 ITAAC #2	7. Refer to Section 2.3 ITAAC #2

Table 2.2-4 Structural and Systems Engineering Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8. The ASME Code, Section III, Class 2 or 3 piping systems and components are designed to retain their pressure integrity and functional capability under internal design and operating pressures and design-basis loads.	8. Refer to Section 2.3 ITAAC #5	8. Refer to Section 2.3 ITAAC #5
9.a Divisional flood barriers are provided in the R/B and ~~the~~ each PS/B to protect against the internal and external flooding.	9.a An inspection will be performed to verify that the as-built divisional flood barriers exist in the R/B and ~~the~~ each PS/B.	9.a The as-built divisional flood barriers exist at the appropriate locations in the R/B and ~~the~~ each PS/B against the internal and external flooding.
9.b Water-tight doors are provided in the R/B to protect against the internal and external flooding.	9.b An inspection of the as-built water- tight doors will be performed.	9.b The as-built water-tight doors exist at the appropriate locations in the R/B against the internal and external flooding.
10. Penetrations in the divisional walls of the R/B and ~~the~~ each PS/B, except for water-tight doors, are provided appropriately against the internal and external flooding.	10. An inspection of the as-built penetrations will be performed.	10. The as-built penetrations in the divisional walls of the R/B and ~~the~~ each PS/B are installed at an acceptable level above the floor, and are sealed up to the internal and external design flood levels.
11. Safety-related electrical, instrumentation, and control equipment are located to protect against the design flood level.	11. An inspection of the as-built equipment will be performed.	11. The as-built safety-related electrical, instrumentation, and control equipment are located at sufficient height the floor surface against the design flood level.
12. For the R/B and ~~the~~ each PS/B, external wall thicknesses below flood level are provided to protect against water seepage.	12. An inspection of the as-built external wall thickness for the R/B and ~~the~~ each PS/B will be performed.	12. For the R/B and ~~the~~ each PS/B, the as-built external walls below flood level are provided with adequate thickness to protect against water seepage.
13a. Flood barriers of the R/B and ~~the~~ each PS/B are installed up to the finished plant grade level to protect against water seepage.	13a. Inspections of the as-built flood barriers will be performed.	13a. The as-built flood barriers are installed up to the finished plant grade level for the R/B and ~~the~~ each PS/B to protect against water seepage.

Table 2.2-4 Structural and Systems Engineering Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 3 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
13b. Flood doors and flood barrier penetrations of the R/B and ~~the~~ each PS/B are provided with flood protection features.	13b. Inspections of the as-built flood doors and flood barrier penetrations will be performed.	13b. For the R/B and each PS/B, the as-built flood doors and flood barrier penetrations are provided with flood protection features to protect against water seepage.
14. Penetrations in the external walls, including those up to the subgrade level if necessary, of the R/B and each PS/B are provided with flood protection features below flood level.	14. An inspection will be performed to verify that the flood protection features of the as-built penetrations in the external walls of the R/B and ~~the~~ each PS/B exist below flood level.	14. The as-built penetrations in the external walls of the R/B and ~~the~~ each PS/B are provided with flood protection features below flood level.
15. Redundant safe shutdown components and associated electrical divisions outside the containment and the control room complex are separated by 3-hour rated fire barriers to preserve the capability to safely shutdown the plant following a fire. The 3-hour rated fire barriers are placed as required by the FHA.	15. An inspection of the as-built fire barriers will be performed.	15. The 3-hour rated as-built fire barriers are placed as required by the FHA.
16. All penetrations and openings through the fire barriers are protected against fire.	16. An inspection will be performed to verify that the as-built components are provided to protect the penetrations and openings through fire barriers.	16. All as-built penetrations and openings are protected with rated components (i.e. fire doors in door openings, fire dampers in ventilation duct openings, and penetration seals).
17. Safety-related SSCs are designed to withstand the dynamic effects of pipe breaks.	17. Refer to Section 2.3 ITAAC #6	17. Refer to Section 2.3 ITAAC #6
18. The key dimensions of the RV conform with the licensed design and are documented in an as-built report.	18. Refer to Section 2.4.1 ITAAC #5	18. Refer to Section 2.4.1 ITAAC #5

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/3/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 190-1764 REVISION 0**

SRP SECTION: **14.03.02 – Structural Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria**

APPLICATION SECTION: **Tier 1 – Section 2.2**

DATE OF RAI ISSUE: **02/09/09**

QUESTION NO. 14.03.02-3:

ITAAC Item 3 in Table 2.2-4

Why does the AC not state that the results of the SIT conformed to the ASME Code, Section III, and the PCCV retains structural integrity at 115% of the rated design pressure of 68 psig? The test pressure has to be 115% of design pressure, but the design commitment does not state a certain design pressure just design pressures under 68 psig.

ANSWER:

The prepositional word "under" is grammatically linked to the following compound noun "design pressure." It is not intended to be read as a prepositional word linked to the numeric value of the pressure (that is, it is not to be read as "design pressures under 68 psig"). However, to prevent misinterpretation of "under" in the future, it will be changed to a different prepositional word, "with", during the next revision of the DCD.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 1, Section 2.2, Revision 2, changes to be incorporated:

- Change the text under "Design Commitment" for ITAAC Item 3 to:

"3. The PCCV retains structural integrity ~~under~~ with design pressures of 68 psig."

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

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3/3/2009

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Docket No. 52-021

RAI NO.:	**NO. 190-1764 REVISION 0**
SRP SECTION:	**14.03.02 – Structural Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria**
APPLICATION SECTION:	**Tier 1 – Section 2.2**
DATE OF RAI ISSUE:	**02/09/09**

QUESTION NO. 14.03.02-4:

ITAAC Item 5 in Table 2.2-4

Why do the design commitment and AC not state that the PCCV is Seismic Category I and can withstand seismic design basis loads without loss of safety function?

This would be applicable to other similar ITAAC for other buildings like the following:

ITAAC Item 6 in Table 2.2-4

ANSWER:

The acceptance criteria for ITAAC Items 5 and 6 in Table 2.2-4 are to confirm the existence of applicable design reports, and to conclude that the safety-related standard plant buildings are designed in accordance with structural design-basis loads. The requirements for design reports of seismic Category I structures are provided in Appendix C of SRP 3.8.4.

Section IV of Appendix C is an outline of the structural loads to be included. Seismic design basis loads are applicable as environmental loads. Therefore, the ITAAC for safety-related standard plant buildings includes assessment of seismic design basis loads within applicable design limits. No additional ITAAC requirements are necessary to specifically address seismic design basis loads to prevent loss of their safety function.

Impact on DCD

There is no impact on DCD.

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/3/2009

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RAI NO.: **NO. 190-1764 REVISION 0**

SRP SECTION: **14.03.02 – Structural Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria**

APPLICATION SECTION: **Tier 1 – Section 2.2**

DATE OF RAI ISSUE: **02/09/09**

QUESTION NO. 14.03.02-5:

ITAAC Item 9.a in Table 2.2-4

This ITAAC is concerned with the location of divisional flood barriers in the R/B and in each PS/B. Why do the design commitment and AC not refer to the actual locations of the flood barriers based on rooms or refer to a figure or table where the locations of the flood barriers are identified?

This question is also applicable to following ITAAC:

ITAAC Item 9.b in Table 2.2-4 for locations of water-tight doors.

ITAAC Item 10 in Table 2.2-4 for locations of penetrations.

ITAAC Items 13.a and b in Table 2.2-4 for locations of flood barriers.

ANSWER:

Tables and/or figures will be added during a later revision of the DCD which locate flood barriers and water-tight doors as they relate to penetrations in divisional walls within the R/B and each PS/B.

Impact on DCD

Tables and/or figures are to be added during a subsequent DCD revision which locate flood barriers and water-tight doors as they relate to penetrations in divisional walls within the R/B and each PS/B.

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/3/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 190-1764 REVISION 0**
SRP SECTION:	**14.03.02 – Structural Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria**
APPLICATION SECTION:	**Tier 1 – Section 2.2**
DATE OF RAI ISSUE:	**02/09/09**

QUESTION NO. 14.03.02-6:

ITAAC Item 11 in Table 2.2-4

The design commitment and AC are concerned with the electrical and I&C equipment being located so as to be protected against design basis floods. However, their words appear to be incomplete sentences in that they can not be understood. The design commitment should be revised to state something similar to the following: 'Safety related electrical, instrumentation, and control equipment **listed in Table XXXX or in Buildings Y and Z** are located to protect **them from the** design flood.' The AC should state something similar to the following: 'The as-built safety-related electrical, instrumentation, and control equipment **listed in Table XXXX or in Buildings Y and Z** are located at sufficient height **above** the floor surface to protect **them from** the design flood.'

This question is also applicable to following ITAAC:

ITAAC Item 12 in Table 2.2-4 - Why do the design commitment and AC not state how thick the external walls of the R/B and each PS/B are in order to protect against water seepage instead of just stating wall thickness and sufficient wall thickness? There is no measurable quantity stated that can be inspected.

ANSWER:

MHI agrees to add missing words to Design Commitment, ITA, and AC for ITAAC Item 11 in Table 2.2-4.

DCD Tier 2, Subsection 3.4.1.2 states that the external walls below flood level are equal to or greater than two feet thick. To clarify this minimum external wall thickness of the R/B and each PS/B, the numerical value for minimum thickness will be added in the design commitment and AC of ITAAC Item 12 in Table 2.2-4.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 1, Section 2.2, Revision 2, changes to be incorporated:

- Change the text for ITAAC Item 11 and Item 12 to:

11. Safety-related electrical, instrumentation, and control equipment are located in the R/B and each PS/B to protect them from ~~against~~ the design flood ~~level~~.	11. An inspection of the as-built safety-related electrical, instrumentation, and control equipment in the R/B and each PS/B will be performed.	11. The as-built safety-related electrical, instrumentation, and control equipment in the R/B and each PS/B are located at sufficient height above the floor surface to protect them against the design flood ~~level~~.
12. For the R/B and the PS/B, external wall thickness below flood level are ~~provided~~ a minimum two feet thick to protect against water seepage.	12. An inspection of the as-built external wall thickness for the R/B and the PS/B will be performed.	12. For the R/B and the PS/B, the as-built external wall below flood level are ~~provided with adequate thickness~~ a minimum two feet thick to protect against water seepage.

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/3/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 190-1764 REVISION 0**

SRP SECTION: **14.03.02 – Structural Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria**

APPLICATION SECTION: **Tier 1 – Section 2.2**

DATE OF RAI ISSUE: **02/09/09**

QUESTION NO. 14.03.02-7:

ITAAC Items 13.a and 13.b in Table 2.2-4

This question is written on this particular ITAAC, but it applies in general to all ITAAC for this application.

All ITAAC should be numbered consecutively. These two ITAAC do not appear to be a singular ITAAC with individual items a and b, but two ITAAC that are independent of each other. If there is one design commitment and multiple ITA and AC, then that is a singular ITAAC in which the individual ITA and AC may have different designations to identify them.

Typically for this system of identifying each ITAAC by a number, then the individual ITA and AC, if there are more than one of each, could be labeled with some letter designation in order to identify each of them.

Whatever numbering system is utilized, it has to be consistant.

This ITAAC is also applicable to the following ITAAC:

ITAAC Items 9.a and 9.b in Table 2.2-4

ANSWER:

It is agreed to number the ITAAC in DCD Tier 1, Table 2.2-4 consecutively without the use of alpha letter sub-items.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 1, Section 2.2, Revision 2, changes to Table 2.2-4:

- Provide corrections to Table 2.2-4 as follows:

Table 2.2-4 Structural and Systems Engineering Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8. The ASME Code, Section III, Class 2 or 3 piping systems and components are designed to retain their pressure integrity and functional capability under internal design and operating pressures and design-basis loads.	8. Refer to Section 2.3 ITAAC #5	8. Refer to Section 2.3 ITAAC #5
9.~~a~~ Divisional flood barriers are provided in the R/B and the PS/B to protect against the internal and external flooding.	9.~~a~~ An inspection will be performed to verify that the as-built divisional flood barriers exist in the R/B and the PS/B.	9.~~a~~ The as-built divisional flood barriers exist at the appropriate locations in the R/B and the PS/B against the internal and external flooding.
~~9.b~~ 10. Water-tight doors are provided in the R/B to protect against the internal and external flooding.	~~9.b~~ 10. An inspection of the as-built water- tight doors will be performed.	~~9.b~~ 10. The as-built water-tight doors exist at the appropriate locations in the R/B against the internal and external flooding.
~~10~~ 11. Penetrations in the divisional walls of the R/B and the PS/B, except for water-tight doors, are provided appropriately against the internal and external flooding.	~~10~~ 11. An inspection of the as-built penetrations will be performed.	~~10~~ 11. The as-built penetrations in the divisional walls of the R/B and the PS/B are installed at an acceptable level above the floor, and are sealed up to the internal and external design flood levels.
~~11~~ 12. Safety-related electrical, instrumentation, and control equipment are located to protect against the design flood level.	~~11~~ 12. An inspection of the as-built equipment will be performed.	~~11~~ 12.The as-built safety-related electrical, instrumentation, and control equipment are located at sufficient height the floor surface against the design flood level.
~~12~~ 13. For the R/B and the PS/B, external wall thickness below flood level are provided to protect against water seepage.	~~12~~ 13. An inspection of the as-built external wall thickness for the R/B and the PS/B will be performed.	~~12~~ 13. For the R/B and the PS/B, the as-built external wall below flood level are provided with adequate thickness to protect against water seepage.
~~13a~~ 14.Flood barriers of the R/B and the PS/B are installed up to the finished plant grade level to protect against water seepage.	~~13a~~ 14. Inspections of the as-built flood barriers will be performed.	~~13a~~ 14.The as-built flood barriers are installed up to the finished plant grade level for the R/B and the PS/B to protect against water seepage.

Table 2.2-4 Structural and Systems Engineering Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 3 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
~~13b~~ 15. Flood doors and flood barrier penetrations of the R/B and the PS/B are provided with flood protection features.	~~13b~~ 15. Inspections of the as-built flood doors and flood penetrations will be performed.	~~13b~~ 15. For the R/B and PS/B, the as-built flood doors and flood barrier penetrations are provided with flood protection features to protect against water seepage.
~~14~~ 16. Penetrations in the external walls, including those up to the subgrade level if necessary, of the R/B and PS/B are provided with flood protection features below flood level.	~~14~~ 16. An inspection will be performed to verify that the flood protection features of the as-built penetrations in the external walls of the R/B and the PS/B exist below flood level.	~~14~~ 16. The as-built penetrations in the external walls of the R/B and the PS/B are provided with flood protection features below flood level.
~~15~~ 17. Redundant safe shutdown components and associated electrical divisions outside the containment and the control room complex are separated by 3-hour rated fire barriers to preserve the capability to safely shutdown the plant following a fire. The 3-hour rated fire barriers are placed as required by the FHA.	~~15~~ 17. An inspection of the as-built fire barriers will be performed.	~~15~~ 17. The 3-hour rated as-built fire barriers are placed as required by the FHA.
~~16~~ 18. All penetrations and openings through the fire barriers are protected against fire.	~~16~~ 18. An inspection will be performed to verify that the as-built components are provided to protect the penetrations and openings through fire barriers.	~~16~~ 18. All as-built penetrations and openings are protected with rated components (i.e. fire doors in door openings, fire dampers in ventilation duct openings, and penetration seals).
~~17~~ 19. Safety-related SSCs are designed to withstand the dynamic effects of pipe breaks.	~~17~~ 19. Refer to Section 2.3 ITAAC #6	~~17~~ 19. Refer to Section 2.3 ITAAC #6
~~18~~ 20. The key dimensions of the RV conform with the licensed design and are documented in an as-built report.	~~18~~ 20. Refer to Section 2.4.1 ITAAC #5	~~18~~ 20. Refer to Section 2.4.1 ITAAC #5

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/3/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 190-1764 REVISION 0**

SRP SECTION: **14.03.02 – Structural Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria**

APPLICATION SECTION: **Tier 1 – Section 2.2**

DATE OF RAI ISSUE: **02/09/09**

QUESTION NO. 14.03.02-8:

ITAAC Item 14 in Table 2.2-4

The design commitment is more definitive than the AC. The AC establishes the criteria which ensures that the design commitment is met. The AC should be more definitive than the design commitment or the same as it.

For example, the AC could be stated identical to the design commitment.

This question is also applicable to the following ITAAC:

ITAAC Item 15 in Table 2.2-4 - In addition, should the ITA for this ITAAC also include an analysis in addition to the inspection?

ANSWER:

The design commitment of ITAAC Item 14 in Table 2.2-4 is clarified by removing the extraneous phrase. The AC subject of "as-built penetrations" is therefore more definitive than the design commitment.

The fire hazards analysis (FHA) is performed independent of ITAAC, and therefore the intention of ITAAC Item 15 is to verify the placement of 3-hour rated fire barriers consistent with the FHA by as-built inspection. Therefore, no additional analysis is applicable as part of ITA.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 1, Section 2.2, Revision 2, changes to be incorporated:

Change the text for ITAAC Item 14 to:

14. Penetrations in the external walls~~, including those up to the subgrade level if necessary,~~ of the R/B and PS/B are provided with flood protection features below flood level.	14. An inspection will be performed to verify that the flood protection features of the as-built penetrations in the external walls of the R/B and the PS/B exist below flood level.	14. The as-built penetrations in the external walls of the R/B and the PS/B are provided with flood protection features below flood level.

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

This completes MHI's responses to the NRC's questions.

ATTACHMENT 1
to RAI 190-1764

Table 2.2-4 Structural and Systems Engineering Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The structural configurations of the R/B and ~~the~~ each PS/B are as ~~shown~~ described in ~~Figures 2.2-1 through 2.2-13 and~~ Table 2.2-2.	1. Inspections of the as-built structural configurations of the R/B and ~~the~~ each PS/B will be performed.	1. The as-built ~~build design~~ structural configurations of the R/B and ~~the~~ each PS/B are reconciled with descriptions in ~~Figures 2.2-1 through 2.2-13 and~~ Table 2.2-2.
2. The ASME Code Section III components and piping retain their pressure boundary integrity at their design pressure.	2. A hydrostatic test and preoperational NDE will be performed in conjunction with Section III of the ASME Code.	2. The results of the hydrostatic test and preoperational NDE of the as-built components and piping conform to the requirements of the ASME Code, Section III.
3. The PCCV retains structural integrity ~~under~~ with design pressures of 68 psig.	3. A structural integrity test (SIT) will be performed in accordance with the ASME code, Section III.	3. The result of the structural integrity test (SIT) of the as-built PCCV conforms to the requirements in the ASME Code, Section III.
4. The containment system barrier prevents release of fission products to the atmosphere.	4. A containment integrated leak rate test will be performed in accordance with 10 CFR 50, Appendix J.	4. The containment integrated leak rate test verifies that the leak rate is less than the allowable leakage rate specified in 10 CFR 50, Appendix J.
5. The PCCV is designed based on the structural design-basis loads.	5. An analysis will be performed to verify that the as-built PCCV structural design-basis loads are reconciled.	5. ASME design report exists for the as-built PCCV, and concludes the PCCV is designed based on the structural design-basis loads.
6. The safety-related standard plant buildings other than the PCCV are designed based on the structural design-basis loads.	6. An analysis will be performed to verify that the as-built safety-related standard plant structures, other than the PCCV, structural design-basis loads are reconciled.	6. Design reports exist for the as-built safety-related standard plant buildings other than the PCCV, and conclude the safety-related standard plant buildings are designed in accordance with structural design-basis loads.
7. The ASME Code, Section III, Class 1 piping systems and components are designed to retain their pressure integrity and functional capability under internal design and operating pressures and design-basis loads.	7. Refer to Section 2.3 ITAAC #2	7. Refer to Section 2.3 ITAAC #2

ATTACHMENT 1
to RAI 190-1764

Table 2.2-4 Structural and Systems Engineering Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8. The ASME Code, Section III, Class 2 or 3 piping systems and components are designed to retain their pressure integrity and functional capability under internal design and operating pressures and design-basis loads.	8. Refer to Section 2.3 ITAAC ~~#5~~ #3	8. Refer to Section 2.3 ITAAC ~~#5~~ #3
9.~~a~~ Divisional flood barriers are provided in the R/B and ~~the~~ each PS/B to protect against the internal and external flooding.	9.~~a~~ An inspection will be performed to verify that the as-built divisional flood barriers exist in the R/B and ~~the~~ each PS/B.	9.~~a~~ The as-built divisional flood barriers exist at the appropriate locations in the R/B and ~~the~~ each PS/B against the internal and external flooding.
~~9.b~~ 10. Water-tight doors are provided in the R/B to protect against the internal and external flooding.	~~9.b~~ 10. An inspection of the as-built water- tight doors will be performed.	~~9.b~~ 10. The as-built water-tight doors exist at the appropriate locations in the R/B against the internal and external flooding.
~~10~~ 11. Penetrations in the divisional walls of the R/B and ~~the~~ each PS/B, except for water-tight doors, are provided appropriately against the internal and external flooding.	~~10~~ 11. An inspection of the as-built penetrations will be performed.	~~10~~ 11. The as-built penetrations in the divisional walls of the R/B and ~~the~~ each PS/B are installed at an acceptable level above the floor, and are sealed up to the internal and external design flood levels.
~~11~~ 12. Safety-related electrical, instrumentation, and control equipment are located in the R/B and each PS/B to protect them from ~~against~~ the design flood ~~level~~.	~~11~~ 12. An inspection of the as-built safety-related electrical, instrumentation, and control equipment in the R/B and each PS/B will be performed.	~~11~~ 12. The as-built safety-related electrical, instrumentation, and control equipment in the R/B and each PS/B are located at sufficient height above the floor surface to protect them against the design flood ~~level~~.
~~12~~ 13. For the R/B and ~~the~~ each PS/B, external wall thicknesses below flood level are ~~provided~~ a minimum two feet thick to protect against water seepage.	~~12~~ 13. An inspection of the as-built external wall thickness for the R/B and ~~the~~ each PS/B will be performed.	~~12~~ 13. For the R/B and ~~the~~ each PS/B, the as-built external walls below flood level ~~are provided with adequate thickness~~ a minimum two feet thick to protect against water seepage.
~~13a~~ 14.Flood barriers of the R/B and ~~the~~ each PS/B are installed up to the finished plant grade level to protect against water seepage.	~~13a~~ 14. Inspections of the as-built flood barriers will be performed.	~~13a~~ 14.The as-built flood barriers are installed up to the finished plant grade level for the R/B and ~~the~~ each PS/B to protect against water seepage.

ATTACHMENT 1
to RAI 190-1764

Table 2.2-4 Structural and Systems Engineering Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 3 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
~~13b~~ 15. Flood doors and flood barrier penetrations of the R/B and ~~the~~ each PS/B are provided with flood protection features.	~~13b~~ 15. Inspections of the as-built flood doors and flood barrier penetrations will be performed.	~~13b~~ 15. For the R/B and each PS/B, the as-built flood doors and flood barrier penetrations are provided with flood protection features to protect against water seepage.
~~14~~ 16. Penetrations in the external walls~~, including those up to the subgrade level if necessary,~~ of the R/B and each PS/B are provided with flood protection features below flood level.	~~14~~ 16. An inspection will be performed to verify that the flood protection features of the as-built penetrations in the external walls of the R/B and ~~the~~ each PS/B exist below flood level.	~~14~~ 16. The as-built penetrations in the external walls of the R/B and ~~the~~ each PS/B are provided with flood protection features below flood level.
~~15~~ 17. Redundant safe shutdown components and associated electrical divisions outside the containment and the control room complex are separated by 3-hour rated fire barriers to preserve the capability to safely shutdown the plant following a fire. The 3-hour rated fire barriers are placed as required by the FHA.	~~15~~ 17. An inspection of the as-built fire barriers will be performed.	~~15~~ 17. The 3-hour rated as-built fire barriers are placed as required by the FHA.
~~16~~ 18. All penetrations and openings through the fire barriers are protected against fire.	~~16~~ 18. An inspection will be performed to verify that the as-built components are provided to protect the penetrations and openings through fire barriers.	~~16~~ 18. All as-built penetrations and openings are protected with rated components (i.e. fire doors in door openings, fire dampers in ventilation duct openings, and penetration seals).
~~17~~ 19. Safety-related SSCs are designed to withstand the dynamic effects of pipe breaks.	~~17~~ 19. Refer to Section 2.3 ITAAC ~~#6~~ #4	~~17~~ 19. Refer to Section 2.3 ITAAC ~~#6~~ #4
~~18~~ 20. The key dimensions of the RV conform with the licensed design and are documented in an as-built report.	~~18~~ 20. Refer to Section 2.4.1 ITAAC #5	~~18~~ 20. Refer to Section 2.4.1 ITAAC #5