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TOKYO, JAPAN

June 26, 2013

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

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-13165

Subject: MHI's Amended Response to US-APWR DCD RAI No. 941-6465 Revision 3 (SRP Section 14.03.04)

References:
1) "Request for Additional Information No. 941-6465 Revision 3, SRP Section: 14.03.04, dated May 21, 2012 (ML121164A806).
2) MHI Letter No. UAP-HF-12237, "MHI's Response to US-APWR DCD RAI No. 941-6465 Revision 3 (SRP Section 14.03.04)", dated September 5, 2012 (ML12254A010).

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Amended Response to Request for Additional Information No. 941-6465 Revision 3." In Reference 2, MHI provided the original response to all of the questions contained in Reference 1.

Enclosed is the amended response to Questions 14.03.04-45, 14.03.04-46, 14.03.04-48, and 14.03.04-52. These responses were revised to reflect staff feedback regarding the specific ITAAC wording and lessons learned from other vendors to ensure appropriate future closure of the ITAAC.

As indicated in the enclosed materials, this document contains information that MHI considers proprietary, and therefore should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) as trade secrets and commercial or financial information which is privileged or confidential. A non-proprietary version of the document is also being submitted with the information identified as proprietary redacted and replaced by the designation "[ ]".

This letter includes a copy of the proprietary version of the response (Enclosure 2), a copy of the non-proprietary version of the response (Enclosure 3), and the Affidavit of Yoshiki Ogata (Enclosure 1) which identifies the reasons MHI respectfully requests that all materials designated as "Proprietary" in Enclosure 2 be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4).

Please contact Mr. Joseph Tapia, General Manager of Licensing Department, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of this submittal. His contact information is provided below.

D081
NRO

Sincerely,

Yoshiki Ogata,
Executive Vice President
Mitsubishi Nuclear Energy Systems, Inc.
On behalf of Mitsubishi Heavy Industries, Ltd.

Enclosure:

1. Affidavit of Yoshiki Ogata

2. Amended Response to Request for Additional Information No. 941-6465 Revision 3 (proprietary version)

3. Amended Response to Request for Additional Information No. 941-6465 Revision 3 (non-proprietary version)

CC: J. A. Ciocco
J. Tapia

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Enclosure 1

Docket No. 52-021
MHI Ref: UAP-HF-13165

MITSUBISHI HEAVY INDUSTRIES, LTD.
AFFIDAVIT

I, Yoshiki Ogata, state as follows:

1. I am Executive Vice President of Mitsubishi Nuclear Energy Systems, Inc., and have been delegated the function of reviewing MITSUBISHI HEAVY INDUSTRIES, LTD's ("MHI") US-APWR documentation to determine whether it contains information that should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) as trade secrets and commercial or financial information which is privileged or confidential.

2. In accordance with my responsibilities, I have reviewed the enclosed document entitled "Amended Response to Request for Additional Information No. 941-6465 Revision 3" dated June 2013 and have determined that portions of the document contain proprietary information that should be withheld from public disclosure. Those pages containing proprietary information are identified with the label "Proprietary" on the top of the page and the proprietary information has been bracketed with an open and closed bracket as shown here "[ ]". The first page of the document indicates that all information identified as "Proprietary" should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4).

3. The information identified as proprietary in the enclosed document has in the past been, and will continue to be, held in confidence by MHI and its disclosure outside the company is limited to regulatory bodies, customers and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and is always subject to suitable measures to protect it from unauthorized use or disclosure.

4. The basis for holding the referenced information confidential is that it includes instrumentation and dimensional details for MHI's advanced accumulator, which has been developed by MHI and not used in the exact form by any of MHI's competitors. This information was developed at significant cost to MHI, since it required the performance of Research and Development and detailed design extending over several years.

5. The referenced information is being furnished to the Nuclear Regulatory Commission ("NRC") in confidence and solely for the purpose of information to the NRC staff.

6. The referenced information is not available in public sources and could not be gathered readily from other publicly available information. Other than through the provisions in paragraph 3 above, MHI knows of no way the information could be lawfully acquired by organizations or individuals outside of MHI.

7. Public disclosure of the referenced information would assist competitors of MHI in their design of new nuclear power plants without incurring the costs or risks associated with the design of the subject systems. Therefore, disclosure of the information contained in the referenced document would have the following negative impacts on the competitive position of MHI in the U.S. nuclear plant market:

A. Loss of competitive advantage due to the costs associated with development of the advanced accumulator. Providing public access to such information permits competitors to duplicate or mimic the advanced accumulator information without incurring the associated costs.

B. Loss of competitive advantage of the US-APWR created by benefits of the advanced accumulator instrumentation or dimensional specifications.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information and belief.

Executed on this 26th day of June, 2013.

Y. Ogata

Yoshiki Ogata,
Executive Vice President
Mitsubishi Nuclear Energy Systems, Inc.

Enclosure 3

UAP-HF-13165
Docket No. 52-021

Amended Response to Request for Additional Information
No. 941-6465 Revision 3

June 2013
(Non-Proprietary)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

6/25/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 941-6465 REVISION 3**

SRP SECTION: **14.03.04 – REACTOR SYSTEMS – INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA**

APPLICATION SECTION: TIER 1 2.4

DATE OF RAI ISSUE: **5/21/2012**

QUESTION NO.: 14.03.04-45

Tier 1 Table 2.4.4-5, ITAAC 1 references Tier 1, Figure 2.4.4-1. This figure is not consistent with the SRP. Not all components specified in the SRP are included (e.g. ASME CL 2 seismic category 1 relief valves and HCV, important alarms and instrumentation, etc...).

ANSWER:

MHI will not revise Tier 1, Figure 2.4.4-1 to incorporate information on ASME Code Section III, Class 2, seismic category I relief valves, HCV or important alarms and instrumentation due to the following reasons:

1. Important alarms and instrumentation

- Table 2.4.4-4, Emergency Core Cooling System Equipment, Alarms, Displays and Control Functions list all the equipment including alarms and instruments for verification of their function, which will be verified by Table 2.4.4-5 ITAAC 8.i and 8.ii, 10.a.i, 10.a.ii, 11.i, 11.ii, 12.i, 12.ii, 12.iii and 12.iv.

  SRP 14.3 Appendix C I.B.v requests "As a minimum, the instruments (pressure, temperature, etc.) required to perform Generic Technical Guidelines (e.g., ERGs, EPGs) (as described in the DCD Tier 2 Chapter 18) should be shown on the figures, **<u>or described in the DD</u>**."

- In addition, instrument connection configurations may change as detailed engineering progresses.

2. HCVs

- Based upon SRP Section 14.3 Appendix C I.B ix [underlined sentence] described below, MHI considers that a HCV should be included in Tier 1 only if it meets both of the following attributes: (1) Operable from the Control Room; and (2) Mispositioning of the valve could affect the system safety function.

SRP 14.3 Appendix C I.B. ix states the following:

Figures for safety-related systems should include most of the valves on the DCD Tier 2 P&ID except for items, such as fill, drain, test tees, and maintenance isolation valves. The scope of valves to be included on the figures are those MOVs, POVs, and check valves with a safety related active function, a complete list of which is contained in the IST plan. Valves remotely operable from the Control Room should be shown if their mispositioning could affect system safety function. Other valves are evaluated for exclusion on a case-by-case basis. Figures for non-safety related systems may have less detail. [Underline added by author]

- The Emergency Core Cooling System (ECCS) has two remote manual control valves (hand control valves, HCV), SIS-HCV-017 and SIS-HCV-089. Neither HCV has an active safety function or receives an ECCS actuation signal as described below:

  SIS-HCV-089 is an Equipment Class 8, non-seismic accumulator makeup flow control valve that may be controlled by operator action from the main control room (MCR), but if the valve is accidentally mispositioned it would not affect the system safety function since other valves in the makeup line (i.e. SIS-AOV-201) would prevent the accumulator from receiving accidental makeup borated water.

  Similarly, SIS-HCV-017 is an Equipment Class 2, seismic Category I nitrogen discharge pressure control valve that that may be controlled by operator action from the MCR, but if the valve is accidentally mispositioned it would not affect any system safety function since other valves (i.e. SIS-MOV-125 A, B, C, D) would prevent the accidental discharge of nitrogen into containment.

3. ASME Code Section III, Class 2, seismic Category I relief valves

- MHI considers that the following screening criteria should be used to exclude relief valves from Tier 1 if they meet all of the following attributes: (1) are not ASME Code Section III, Class 1 components; (2) have no safety function assumed in the accident analysis; (3) are not risk-significant components; (4) are not containment isolation valves; and (5) have no operational capability from the MCR.

- Five (5) ECCS relief valves, SIS-SRV-116 and SIS-SRV-126 A, B, C, and D protect the accumulator nitrogen supply piping and/or the accumulators from overpressurization. All of these valves meet the criteria for exclusion from Tier 1 as described below:

  (1) They are ASME Code Section III Class 2, not Class 1 components.

  (2) These valves do not have a specific active safety function that is assumed in the accident analyses.

  (3) Risk significance of these valves has been determined to be low so neither valve is included in DCD Table 17.4-1, "Risk Significant SSCs".

  (4) They are not containment isolation valves so they are not identified in DCD Tier 2 Figure 6.2.4-1, "Containment Isolation Configuration".

  (5) They are self-actuated mechanical relief valves and have no operational capability from the MCR.

Impact on DCD

There is no impact on the DCD.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical / Topical Reports

There is no impact on the Technical / Topical Reports.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

6/25/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 941-6465 REVISION 3**

SRP SECTION: **14.03.04 – REACTOR SYSTEMS – INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA**

APPLICATION SECTION: **TIER 1 2.4**

DATE OF RAI ISSUE: **5/21/2012**

QUESTION NO.: 14.03.04-46

Tier 1 Table 2.4.4-2 does not contain all required SSC's. See another RAI question shown below in regards to the inconsistency of Figure 2.4.4-1.

> "Tier 1 Table 2.4.4-5, ITAAC 1 references Tier 1, Figure 2.4.4-1. This figure is not consistent with the SRP. Not all components specified in the SRP are included (e.g. ASME CL 2 seismic category 1 relief valves and HCV, important alarms and instrumentation, etc…)."

ANSWER:

MHI will not revise Table 2.4.4-2 Emergency Core Cooling System Equipment Characteristics to incorporate information on ASME CL 2 seismic Category I relief valves and HCV, important alarms and instrumentation, with regard to the question No.14.03.04-46 due to the following reasons:

1. Important alarms and instrumentation

- Table 2.4.4-4, Emergency Core Cooling System Equipment, Alarms, Displays and Control Functions lists all the equipment including alarms and instruments for verification of their function, which will be verified by Table 2.4.4-5 ITAAC 8.i and 8.ii, 10.a.i, 10.a.ii, 11.i, 11.ii, 12.i, 12.ii, 12.iii and 12.iv.

  SRP 14.3 Appendix C.I.B.v requests "As a minimum, the instruments (pressure, temperature, etc.) required to perform Generic Technical Guidelines (e.g., ERGs, EPGs) (as described in the DCD Tier 2 Chapter 18) should be shown on the figures, **<u>or described in the DD</u>**."

2. HCVs

- Same reasons as described in the amended response to RAI 941-6465 Question 14.03.04-45.

3. ASME Code Section III, Class 2, seismic Category I relief valves

- Same reasons as described in the amended response to RAI 941-6465 Question 14.03.04-45.

Impact on DCD

There is no impact on the DCD.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical / Topical Reports

There is no impact on the Technical / Topical Reports.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

6/25/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 941-6465 REVISION 3**

SRP SECTION: **14.03.04 – REACTOR SYSTEMS – INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA**

APPLICATION SECTION: TIER 1 2.4

DATE OF RAI ISSUE: **5/21/2012**

QUESTION NO.: 14.03.04-48

Tier 1 Table 2.4.4-5, ITAAC 7.b.i.a, "An injection test **with low tank pressure** condition for each as-built accumulator will be conducted. The test will be initiated by opening isolation valve(s) in the piping being tested. Each as-built accumulator will be **partially filled with water** and **pressurized with nitrogen.** All valves in these lines will be open during the test. An analysis will be performed to determine the water volume injected." The ITA lacks specificity to ensure a successful test (e.g. low tank pressure, partially filled).

ANSWER:

Tier 1 Table 2.4.4-5 ITAAC 7.b.i.a will be replaced with an ITAAC that requires a dimensional inspection of the flow damper regions of the accumulator that are critical to accumulator performance at vendor shop prior to the preoperational test stage. ITAAC 7.b.iii.a (ITA and AC) will be deleted as these verifications are no longer necessary based on the revision to ITAAC 7.b.i.a.

Along with these Tier 1 revisions, a new table which identifies accumulator dimensions, including the flow damper, which are critical to accumulator performance, will be added to Tier 2 Chapter 6. This table will be based on MUAP-07001-P, Revision 4 Table 3.3-1. In addition, text will be added to Tier 2 Section 6.3.2.1.2 to refer to the topical report table and the associated figure.

Tier 1 Table 2.4.4-5 ITAAC 7.b.i.b will also be revised to specify that the tests of accumulator performance should be performed under both large flow and small flow conditions to verify that the water volume provided by each as-built accumulator and the resistance coefficient of each as-built accumulator system meet the requirements in both large flow and small flow injection modes. The tests will be performed at a lower accumulator pressure than design-basis conditions when the reactor vessel head and the reactor internals are removed during the preoperational test period. The accumulator pressure may be changed to optimize the test conditions. Analyses will be used to correlate the test conditions to actual design-basis conditions.

Impact on DCD

Tier 1 Table 2.4.4-5 ITAAC 7.b.i.a and 7.b.i.b will be revised as shown in Attachment to this amended response. Tier 2 Section 6.3.2.1.2 will be revised and Table 6.3-7 will be added to Tier 2 Chapter 6 as shown in the Attachment.

Attachment 3 to the original response to RAI 941-6465 Revision 3 (ML12254A010) is replaced with the Attachment to this amended response.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical / Topical Reports

The changes described in the Attachment to this amended response will be incorporated into the next revision of MUAP-07001-P, Revision 4, The Advanced Accumulator.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

6/25/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 941-6465 REVISION 3**

SRP SECTION: **14.03.04 – REACTOR SYSTEMS – INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA**

APPLICATION SECTION: **TIER 1 2.4**

DATE OF RAI ISSUE: **5/21/2012**

QUESTION NO.: 14.03.04-52

Tier 1 Table 2.4.4-5, ITAAC 7.b.iii.a – Performance of the ITAAC should be completed by a vendor test measuring the amount of water to fill it. How do you accurately account for the materials/components inside the accumulator?

ANSWER:

Tier 1 Table 2.4.4-5 ITAAC 7.b.iii.a will be deleted and Tier 1 Table 2.4.4-5 ITAAC 7.b.i.a will be replaced with an ITAAC requiring dimensional inspection of each accumulator, including the flow damper, by the vendor to verify critical dimensions are consistent with the design basis of the accumulator. The reason for the changes is to focus on accumulator features that influence critical performance.

Also Tier 1 Table 2.4.4-5 ITAAC 7.b.i.b will be revised to add verification of the water volume provided by the accumulators including total water volume, water volume for the large flow condition and the small flow condition during the accumulator injection tests. The reason for the revision is that the accumulator capacity, especially for the small flow conditions, can only be effectively measured during the preoperational tests.

Along with the Tier 1 revision, a new table which identifies the accumulator, including the flow damper, regions which are critical to accumulator performance, will be added to Tier 2 Chapter 6 based on MUAP-07001-P, Revision 4, Table 3.3-1. In addition, a description will be added to Tier 2 Section 6.3.2.1.2 to refer to the new table.

MUAP-07001-P, Revision 4, Fig. 3.2-1 and Fig. 3.2-2 will be revised at the next occasion to specifically correlate each critical dimension in the figures with the corresponding region identified in Table 3.3-1 of the report and to specify the acceptable manufacturing tolerance for each critical dimension.

Impact on DCD

Tier 1 Table 2.4.4-5 ITAAC 7.b.iii.a will be deleted as shown in Attachment to this amended response. The ITA and AC of Tier 1 Table 2.4.4-5 ITAAC 7.b.i will be revised as shown in the Attachment. Tier 2 Section 6.3.2.1.2 will be revised and Table 6.3-7 will be added to Tier 2 Chapter 6 as shown in the Attachment.

Attachment 7 to the original response to RAI 941-6465 Revision 3 (ML12254A010) is replaced with the Attachment to this amended response.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical / Topical Reports

The changes described in the Attachment to this response will be incorporated into the next revision of MUAP-07001-P, Revision 4, The Advanced Accumulator.

Table 2.4.4-5 Emergency Core Cooling System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 6 of 14)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria	
7.b The ECCS provides RCS makeup, boration, and safety injection during design basis events.	7.b.i.a An injection test with low tank pressure condition for each as-built accumulator will be conducted. The test will be initiated by opening isolation valve(s) in the piping being tested. Each as-built accumulator will be partially filled with water and pressurized with nitrogen. All valves in these lines will be open during the test. An analysis will be performed to determine the water volume injected under design basis conditionsAn inspection of each as-built accumulator will be performed.	7.b.i.a A report exists and concludes that the total water volume injected from each as-built accumulator into the reactor vessel is ≥2126 ft^3 under design basis conditions. The water volume injected from each accumulator into reactor vessel at large flow rate (prior to flow switching to small flow rate) is ≥1326.8 ft^3 under design basis conditions. Each as-built accumulator, including the flow damper, dimensions are consistent with the design basis of the accumulator.	DCD_14.03.04-48, 52 S01 DCD_14.03.04-48 DCD_14.03.04-48
	7.b.i.b Tests and analysies of theeach as-built accumulator system will be performed to calculateverify water volume provided by each as-built accumulator and the resistance coefficients of the as-built accumulator system. These tests will be performed in both large flow and small flow conditions.	7.b.i.b A report exists and concludes that each as-built accumulator provides under design-basis conditions with total water volume of greater than or equal to 2126 ft^3, water volume of greater than or equal to 1326.8 ft^3 for the large flow condition and water volume of greater than or equal to 779.4 ft^3 for the small flow condition; and that the calculated resistance coefficients of theeach as-built accumulator system (based on a cross section area of 0.6827 ft^2) meets the requirements shown in Table 2.4.4-6.	DCD_14.03.04-48, 52 S01 DCD_14.03.04-48, 52 S01

Table 2.4.4-5 Emergency Core Cooling System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 7 of 14)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria	
	7.b.ii The as-built safety injection pump injection test will be performed. Analysis will be performed to convert the test results ~~from the test conditions to the design condition~~into a pump differential head.	7.b.ii A report exists and concludes that each as-built safety injection pump has a pump differential head of no less than 3937 ft and no more than 4527 ft at the minimum flow, ~~and~~ injects no less than 1259 gpm and no more than 1462 gpm of RWSP water into the reactor vessel at atmospheric pressure, and that the minimum flow rate through the as-built SIS minimum flow line is greater than the required pump minimum flow rate.	DCD_14.03.04-51 DCD_06.03-114
	7.b.iii.a ~~Inspections and analyses of each as-built accumulator will be conducted~~Deleted.	7.b.iii.a ~~TheA report exists and concludes that the volume of each as-built accumulator is at least 3,180 ft³.~~ Deleted.	DCD_14.03.04-52 DCD_14.03.04-52 S01 MIC-03-T1-00009
	7.b.iii.b Inspections and analyses of the as-built RWSP will be conducted.	7.b.iii.b ~~The~~A report exists and concludes that the volume of the as-built RWSP is at least ~~81,230~~84,750 ft³.	DCD_14.03.04-53 MIC-03-T1-00006 MIC-03-T1-00009
	7.b.iv Inspection and analysis of the as-built ECC/CS suction strainers will be conducted.	7.b.iv A report exists and concludes that each of the four as-built ECC/CS suction strainers have the following features: • stainless steel materials of construction for corrosion resistance; • a minimum strainer surface area ~~of 3510 square feet~~of 2,754 ft²; • perforated plate with maximum hole diameter of 0.066 inches; • remains submerged under design basis accident conditions; • achieves head loss consistent with design basis NPSH evaluations.	MIC-03-T1-00003 MIC-03-T1-00006 MIC-03-T1-00009

Each 50% capacity SI pump train is connected to a dedicated DVI nozzle for injection into the reactor downcomer region. The DVI nozzles are located at approximately the same vessel elevation as the reactor coolant hot and cold leg penetrations, but slightly below their nozzle centerline.

6.3.2.1.2 Accumulator System

There are four accumulators, one supplying each reactor coolant cold leg. The accumulators are vertically mounted cylindrical tanks located outside each SG/reactor coolant pump cubicle. The accumulators are passive devices. The accumulators are filled with boric acid water and charged with nitrogen. The accumulators discharge into the reactor cold leg when the cold leg pressure falls below the accumulator pressure.

The accumulators incorporate internal passive flow dampers, which function to inject a large flow to refill the reactor vessel in the first stage of injection, and then reduce the flow as the accumulator water level drops. When the water level is above the top of the standpipe, water enters the flow damper through both inlets at the top of the standpipe and at the side of the flow damper, and injects water with a relatively low flow rate. When the water level drops below the top of the standpipe, the water enters the flow damper only through the side inlet, and injects water with a relatively low flow rate. Accumulator, including the flow damper, regions which have dimensions that are critical to the accumulator performance are identified in Table 6.3-7 (refer to Table 3.3-1 and Figures 3.2-1 and 3.3-2 of Ref. 6.3-3) (Ref. 6.3-3). DCD_14.03.04-48, 52 S01

The two series check valves in the supply line to the reactor cold leg are held closed by the pressure differential between the RCS and the accumulator charge pressure (approximately 1,600 pounds per square inch differential [psid]). The accumulator water level, boron concentration, and nitrogen charge pressure can all be remotely adjusted during power operations. The accumulators are non-insulated and assume thermal equilibrium with the containment normal operating temperature (approximately 70 to 120°F).

The accumulators are charged by a flow control valve in a common nitrogen supply line. The failure of the flow control valve is accommodated by a safety valve set at 700 psig and having a (nitrogen) flow capacity of 90,000 ft^3 per hour. Likewise, each accumulator is equipped with a safety valve set at 700 psig and (nitrogen) flow capacity of 90,000 ft^3 per hour, which provides a margin from the normal operating pressure (640 psig), yet precludes overcharging by the associated SI pump.

6.3.2.1.3 Emergency Letdown System

The emergency letdown system provides redundancy to the normal CVCS in achieving cold shutdown boration conditions. Two emergency letdown lines (one each from reactor hot legs A and D) direct reactor coolant to spargers in the RWSP. The SI pumps return more highly borated RWSP water (approximately 4,000 ppm boron) to the reactor vessel through each pump's DVI nozzle.

Table 6.3-7 Accumulator and Flow Damper Regions with Critical Dimension

DCD_14.03.04-48, 52 S01

Accumulator	
Number	Region
1	Inner height
2	Inner diameter
3	Elevation of vortex chamber

Note: each number in this table corresponds to the identification assigned to each dimension in Fig. 3.2-1 of Ref. 6.3-3.

Flow Damper	
Number	Region
1	Standpipe height
2	Height of standpipe inner section
3	Width of standpipe inner section
4	Inner diameter of throat
5	Inner diameter of vortex chamber
6	Height of vortex chamber
7	Width of small flow pipe
8	Width of large flow pipe
9	Facing angle of large flow pipe and small flow pipe
10	Expansion angle of throat

Note: each number in this table corresponds to the identification assigned to each dimension in Fig. 3.3-2 of Ref. 6.3-3.

All the changes will be submitted as part of next revision of the ToR.

Fig. 3.2-1 Outline Drawing of Advanced Accumulator

All the changes will be submitted as part of next revision of the ToR.

Fig. 3.3-2 Outline Drawing of the Flow Damper