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May 14, 2009

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-09241

Subject: MHI's Response to US-APWR DCD RAI No. 294-2129 REVISION 1

Reference: 1) "Request for Additional Information 294-2129 Revision 1, SRP Section: 09.03.02 - Process and Post-Accident Sampling Systems, Application Section: 9.3.2" dates March 31, 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. 294-2129 Revision 1."

Enclosed is the response to the RAI 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 the submittals. His contact information is below.

Sincerely,

Y. Ogata

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

Enclosure:

1. Response to Request for Additional Information No. 294-2129 Revision 1

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

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Docket No. 52-021
MHI Ref: UAP-HF-09241

Enclosure 1

UAP-HF-09241
Docket Number 52-021

Response to Request for Additional Information
No. 294-2129 Revision 1

May 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 294-2129 REVISION 1**
SRP Section:	**09.03.02 – Process and Post-Accident Sampling Systems**
APPLICATION SECTION:	**9.3.2**
DATE OF RAI ISSUE:	**3/31/2009**

QUESTION NO. : RAI 09.03.02-1

Background

GDC 14 requires that the RCPB integrity be maintained, and SRP 9.3.2 mentions explicitly that EPRI guidelines "...are used to meet the requirements of the relevant GDC." Concentrations of both SO4 and Li are specified as control parameters by the EPRI guidelines which requires strict adherence to limits (Table 3-3). However, DCD Table 9.3.2-1 does not mention any measurements of SO4 or Li for any RCS location.

Requested Information

How are SO4 and Li inventories measured in the RCS?

ANSWER:

A representative sample will be taken from the RCS hot leg for measurement of the primary coolant concentrations of both SO_4 and Li. The DCD will be revised to add a description as shown in the "Impact on DCD" section below.

Impact on DCD
The following changes will be made to the analysis item of the RCS Hot Leg in Table 9.3.2-1.

"Boron, radioactivity, dissolved oxygen, hydrogen, halogens, pH, ~~and~~ conductivity, acid soluble iron, ~~and~~ SiO_2, **SO_4 and Li**"

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes MHI's response to the NRC's question.

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 294-2129 REVISION 1**
SRP Section:	**09.03.02 – Process and Post-Accident Sampling Systems**
APPLICATION SECTION:	**9.3.2**
DATE OF RAI ISSUE:	**3/31/2009**

QUESTION NO. : RAI 09.03.02-2

Background

SRP 9.3.2 recommends the sampling of chemical mixing tanks (see p. 9.3.2-6), in order to meet the requirements of GDC 13, 14, and 41. However, no mixing tank sample points are listed in the DCD Tables 9.3.2-1 through 9.3.2-6. These tables describe in detail all the sampling points for liquid, gas, and accident sampling systems, and includes both primary and secondary water. However, no mention is made of the chemical mixing tanks as recommended in SRP 9.3.2.

Requested Information

What are your plans for sampling various chemical mixing tanks which prepare and store various solutions for injection into primary and secondary systems (e.g., LiOH, hydrazine, NH3)?

ANSWER:

The chemical mixing tank in the Chemical Volume Control System (CVCS) is used for adding chemicals to the Reactor Control System (RCS). In the secondary system, there is an Ammonia Addition Tank, a Morpholine Addition Tank, a Dimetyleamine Addition Tank and an Oxygen Scavenger Addition Tank as well as a chemical mixing tank.

When the chemical solution is injected from the chemical mixing tank, the solution is metered into the tank and is forwarded with make up water. The concentration of chemical solution in the chemical mixing tank is not required to be measured since it can be determined from the known concentration and volume of chemicals added into the tank.

The concentration and chemical composition of the various chemicals in the chemical mixing tanks in the primary and secondary systems are based on their relevant material safety data sheets (MSDS) and any dilution factor that may apply. Sampling and analysis of these chemicals are not necessary.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes MHI's response to the NRC's question.

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Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 294-2129 REVISION 1**
SRP Section:	**09.03.02 – Process and Post-Accident Sampling Systems**
APPLICATION SECTION:	**9.3.2**
DATE OF RAI ISSUE:	**3/31/2009**

QUESTION NO. : RAI 09.03.02-3

Background

In accordance with GDC 60 and 64, it is required that plants be able to monitor and control effluents both from normal operation and under accident conditions. To meet these requirements, RG 1.21 recommends that sampling include all possible release points (C.2) and include contributions from each phase when more than one phase is involved (C.7). In DCD Table 9.3.2-1, the pressurizer vapor space is mentioned as being sampled by liquid sample. However, such a sampling method is ambiguous and does not seem to meet the recommendations of RG 1.21. The applicant should discuss the equipment and procedures involved.

Requested Information

How is sampling of the pressurizer vapor space performed?

ANSWER:

The primary purpose of sampling the pressurizer vapor space is the determination of the dissolved oxygen concentration of the pressurizer water during the plant startup phase in conjunction with the concentration determination of the pressurizer liquid space. Additionally, the sampling line of the pressurizer vapor space can be used for purging the gas in the pressurizer vapor phase to the Volume Control Tank (VCT).

During normal operation, routine sampling of the pressurizer chemistry is generally not necessary because pressurizer chemical control is achieved by adjusting the Reactor Control System (RCS) bulk water quality which is sampled under normal operating conditions. If a sample of the pressurizer contents is required, sampling of the pressurizer liquid phase is sufficient to obtain the non-condensable gas concentration in the pressurizer water. When the pressurizer vapor phase is sampled, this sample is composed of condensable vapor and non-condensable gas. A sample cooler and a depressurizing device in the process sampling line are designed to condition this fluid for grab sampling. Confirming the concentration of non-condensable gas in the sample from the pressurizer vapor phase provides supplementary information to the results of the pressurizer liquid phase sampling and analysis.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes MHI's response to the NRC's question.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Docket No. 52-021

RAI NO.:	**NO. 294-2129 REVISION 1**
SRP Section:	**09.03.02 – Process and Post-Accident Sampling Systems**
APPLICATION SECTION:	**9.3.2**
DATE OF RAI ISSUE:	**3/31/2009**

QUESTION NO. : RAI 09.03.02-4

Background

In order to meet GDC 60 and 64, plants must be designed to monitor and control effluents both from normal operation and under accident conditions. To meet these requirements, RG 1.21 recommends that samples be representative and that particulates or sediments in a sampled location should be accurately represented in the sample analysis (C.6). Under accident conditions, NUREG-0737 recommends sampling free from plateout, blockage, or distortion of samples [p. II.B.3.1-3, note (11)]. The DCD does not discuss measurement of suspended solids in either gas or liquid lines (except for feedwater). However, it is possible that solids could be present (and might even settle in or plug sample lines) thereby distorting other measured quantities. The measurement of solids is specified by EPRI guidelines to be diagnostic (not required), and recommended to occur weekly. This measurement is especially important for the PGSS, since it also doubles as the PASS gas-sample line, and accident conditions could produce significant quantities of aerosol materials containing fission products.

Requested Information

Are suspended solids measured as part of the gas or liquid samples? What provisions are made to ensure that they do not settle or plate in the lines?

ANSWER:

The RCS hot leg sample in DCD Table 9.3.2-1 does not include thie analysis of suspended solids and will be revised to modify this description as shown in "Impact on DCD" below.

The liquid sampling line diameter and flow rate is selected so that sampling flow in this line is in the turbulent flow region. Therefore this turbulent flow precludes suspended solids from sedimentation and plateout on the sample piping wall.

For the gas sampling system, it is unlikely that significant suspended solids will be contained in the containment atmosphere to be sampled and analyzed during normal operation as gas sampling. Because accident conditions could produce significant quantities of aerosol materials containing fission products after an accident, suspended solids in the containment atmosphere

may be required to be sampled and analyzed by gas sampling. Therefore, to ensure that the solids do not settle out or plateout on the walls, provisions are included in the design of the gas sampling line, according to the guidance of ANSI/HPS N13.1-1999. These design features include using piping material which has corrosion-inhibiting properties and a smooth internal surface such as stainless steel tubing. A piping layout design is utilized such that the straight section of transport tubes, particularly horizontal tubing sections, are kept as short as possible and the tubing bends have a curvature ratio (radius of curvature of the bend divided by the tube diameter) of at least 3.0. A moisture separator connected to the sampling line and the heat tracing in the gas sampling line are included in order to avoid condensation of vapors in the sampling line. Also, purging the piping of suspended solid sedimentation using nitrogen purge gas before sampling will preclude suspended solids from sedimentation and plate out in the sample piping wall.

Impact on DCD

The following changes will be made to the analysis item of the RCS Hot Leg in Table 9.3.2-1.

"Boron, radioactivity, dissolved oxygen, hydrogen, halogens, pH, ~~and~~ conductivity, acid soluble iron, ~~and~~ SiO_2,SO_4 ~~and~~ Li and suspended solids"

The following changes will be made to the analysis item of the RCS Hot Leg and Containment atmosphere gas in Table 9.3.2-2.

RCS Hot Leg
"Boron, Cl, Dissolved gas, radioactivity, gamma spectrum and suspended solids"

Containment Atmosphere Gas
"Radioactivity, gamma spectrum, hydrogen concentration and suspended solids"

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes MHI's response to the NRC's question.

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US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 294-2129 REVISION 1**
SRP Section:	**09.03.02 – Process and Post-Accident Sampling Systems**
APPLICATION SECTION:	**9.3.2**
DATE OF RAI ISSUE:	**3/31/2009**

QUESTION NO. : RAI 09.03.02-5

Background

To satisfy the requirements of GDC 60 and 64, RG 1.21 recommends prompt analysis to minimize decay of radionuclides (C.8). Also, NUREG-0737 recommends prompt sampling under accident conditions [p. II.B.3.1-2, note (1)]. In addition, GDC 14 requires strict chemistry controls to assure the integrity of the RCPB. Some of these controls require immediate action if limits are violated, so it is important to discover such violations promptly. Thus, SRP 9.3.2 recommends a review of operational procedures to verify the capability to promptly obtain samples. The PSS (SRP 9.3.2 refers to the Process Sampling Systems or PSS. In this RAI, PSS is intended to include PGSS, PLSS, and PASS as applicable in the US-APWR design.) has a variety of sampling points and expected conditions, but the DCD makes no mention of processing time at all.

Requested Information

Provide estimates for the time needed to obtain, cool, and prepare samples, and to perform the sample analysis. There are a variety of sample points, and processing may vary for individual points.

ANSWER:

During normal operation, operator emergency action is required when the concentration of chlorine, fluorine or dissolved oxygen in the RCS hot leg exceeds each setpoint. These parameters are measured during normal operation. If the value of any of these parameters exceeds their setpoint, restoring the values of these parameters to below the setpoint, and to normal operating levels is typically within 24 hours.

It is estimated that it will take about 1hour to obtain, cool, and prepare samples. This work includes: (1) transferring to the sample location, (2) preparing the sampling line, (3) purging the sampling line, (4) obtaining sample, and (5) transferring the sample to the hot laboratory. Furthermore, it will take an estimated 4 hours to perform sample analysis even in the longest analysis case. The estimated total of 5 hours for obtaining, cooling and preparing sample and

performing sample analysis permits the operator to take corrective action well in advance of the 24 hour limit.

During and after an accident, it is estimated that it will take about 1hour to obtain, cool, and dilute a post accident liquid sample, once it is deemed safe to take samples. This work includes (1) transferring to the sample location, (2) preparing the sampling line, (3) purging the sampling line, (4) obtaining post accident sample, (5) transferring the sample to the hot laboratory and (6) diluting this sample. Furthermore it will take about 1hour to perform sample analysis even in the longest analysis case. Accordingly, it will take about 2 hour to obtain, cool and prepare sample and perform sample analysis.

According to the description in DCD Section 9.3.2.2.3, the post-accident liquid sample line, "has the capability to take a boron concentration sample measurement 8 hours following an accident." The total time of sampling and analysis will be 2 hour, which is well under the limiting time of within 8 hours of the accident. Also, according to the description in DCD Section 9.3.2.2.3, the combined time allotted for post accident liquid sampling for radioactivity, dissolved gas concentration, pH, and chloride should be 24 hours or less from the time a decision is made to take sample. The total time of sampling and analysis is estimated to be 2 hour and this total time is well below the limiting time of 24 hours. Furthermore, according to our estimated time period, the analysis time will be about 1 hour even in the longest analysis case. This time analysis is in compliance with the requirement in Regulatory Guide 1.21 C8 that "Measurement should be made as soon as practicable after collection to minimize loss of short-lived radionuclide decay".

Also, during and after an accident, it is estimated that it will take about 2 hour to obtain, cool, and dilute a post accident gas sample, once it is deemed safe to take samples. This work includes (1) transferring to the sample location, (2) preparing the sampling line, (3) purging the sampling line, (4) obtaining post accident sample, (5) transferring the sample to the hot laboratory and (6) diluting this sample. Furthermore it will take about 1 hour to perform sample analysis even in the longest analysis case.
According to the description in DCD Section 9.3.2.2.3, the gaseous sample line used for both the PGSS and PASS, "has the capability of taking hydrogen concentration samples and fission product gas concentration measurements 24 hours following an accident," in accordance with the necessary requirements. The 2 hour estimated time period is well below this 24 hour requirement. Furthermore, according to our estimated time period, the analysis time will be about 1 hour even in the longest analysis case. This total time of sampling and analysis will comply with the requirement of Regulatory Guide 1.21 C8.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes MHI's response to the NRC's question.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 294-2129 REVISION 1**
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APPLICATION SECTION:	**9.3.2**
DATE OF RAI ISSUE:	**3/31/2009**

QUESTION NO. : RAI 09.03.02-6

Background

Staff review of DCD Tier 2 (Rev 1), Section 9.3.2 indicates insufficient information is provided in regards to representative sampling from liquid and gaseous process streams and tanks in the design of the process and post-accident sampling systems for compliance with 10 CFR 50, Appendix A, GDC 60, 63, and 64. GDC 60 and 64 require that plants be able to monitor and control effluents both from normal operation and under accident conditions. To meet these requirements, RG 1.21 C.6 recommends that provisions should be made to assure that representative samples are obtained from well-mixed streams or volumes of effluent by the selection of proper sampling equipment, the proper location of sampling points, and development and use of proper sampling procedures. Also, GDC 14 requires representative liquid sampling since accurate sampling is necessary to insure the integrity of the RCPB. The US-APWR Process and Post-Accident Sampling Systems have a variety of sampling points, and DCD Section 9.3.2.1 states that the representative samples for the different subsystems will be obtained. The DCD states that sample lines will be purged prior to sampling, but it does not describe how the sample stream enters the line or what part of the sampled volume this would represent. Thus, the ability to obtain representative samples using the provisions in RG 1.21 C.6 and principles in ANSI/HPS N13.1-1999 cannot be determined based on the information in the DCD. Table 1.9.2-9 of Section 1.9 in the DCD shows conformance with SRP 9.3.2 with no exceptions.

Requested Information

Please address the following items in Section 9.3.2 and revise the DCD to include this information, or justify their exclusion.

1. Describe how collection of representative samples for the applicable gaseous sampling systems is obtained using the principles in ANSI/HPS N13.1-1999.

2. Describe the provisions in RG 1.21 C.6 that are made to assure representative samples are collected for both liquid and gaseous process streams and tanks. Specifically, for liquid systems, describe provisions made to sample in turbulent flow zones of pipes and the bulk volume of tanks.

3. In Table 1.9.1-1 of Section 1.9, update the applicable information in the RG 1.21 "Status" and "Corresponding Chapter/Section/Subsection" columns for Section 9.3.2.

ANSWER:

1. The sample point for containment atmosphere gas sampling is located at upper compartment area in the containment so that the point is not too close to the containment fan and at where containment atmosphere is well mixed. The gas sample is routed to CV atmosphere gas sample equipment outside CV through sample piping. This sample equipment is located outside the containment penetration as close as possible in order to shorten the sample piping length. Furthermore the sampling design features as described in response to Question 09.03.02-4 permits an operator to take the representative samples from containment atmosphere and also complies with the principles of ANSI/HPS N13.1-1999.

2. Liquid tanks are stirred using pumps in recirculation mode, and stir nozzle mixing devices. These features stir the liquid in the tank in order to enable collection of a representative sample. Furthermore the tank sample point is located at the discharging line of the pump to allow the operator to take a well mixed sample of the stirred liquid.

The inner diameter of process and sampling piping is selected to maintain turbulent flow under normal operating flow rate and accordingly this feature prevents suspended solids from sedimentation and plate out.

3. According to above explanation, "Status" and "Corresponding Chapter/Section/Subsection" in DCD Table 1.9.1-1 will be modified to state that Section 9.3.2 conforms to RG 1.21.

Impact on DCD

The following changes will be made to the Tier 2 DCD, Section 9.3.2.2.2, 5th paragraph and Section 9.3.2.2.6, 1st paragraph:

Chapter 9 (Section 9.3.2.2.2 5th paragraph)

The PGSS is designed to collect representative samples for analysis by the plant operating staff from the containment atmosphere during normal operation. The sampling point is located at upper compartment area in the containment so that the point is not too close to the containment fan and at where containment atmosphere is well mixed. The gas sample is routed to CV atmosphere gas sample equipment outside CV through sample piping. This sample equipment is located outside the containment penetration as close as possible in order to shorten the sample piping length. This point also is used as post-accident sample point after an accident.

Chapter 9 (Section 9.3.2.2.6 1th paragraph)

Local grab sampling points, as listed in Table 9.3.2-6, are provided as needed for various processes. Manual grab sample points are provided for the liquid sample points as required by the operator. Quick-disconnect type couplings are used for sample vessel connections to provide a convenient and expeditious way of sampling. Liquid tanks are stirred using pumps in recirculation mode, and stir nozzle mixing devices in order to enable collection of a representative sample. The tank sample point is located at the discharging line of the pump to allow the operator to take a well mixed sample of the stirred liquid. The inner diameter of process and sampling piping is selected to maintain turbulent flow under normal operating flow rate and accordingly this feature prevents suspended solids from sedimentation and plate out.

The following changes will be made to the Tier 2 DCD, Table 1.9.1-1:

Chapter 1 (Section 1.9 Table 1.9.1-1)

Add Section 9.3.2 to "Status" and "Corresponding Chapter/Section/Subsection" in DCD Table 1.9.1-1(sheet 2 of 15) for RG 1.21.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes MHI's response to the NRC's question.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/13 /2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 294-2129 REVISION 1**
SRP Section:	**09.03.02 – Process and Post-Accident Sampling Systems**
APPLICATION SECTION:	**9.3.2**
DATE OF RAI ISSUE:	**3/31/2009**

QUESTION NO. : RAI 09.03.02-7

Background

GDC 60 and 64 require that plants be able to monitor and control effluents both from normal operation and under accident conditions. In order to meet these requirements, RG 1.21 recommends that samples be representative (C.6) and that gas samples containing particulates or condensed phases include them in the analysis (C.7). The DCD states that heat tracing and insulation of gas sample lines are used to eliminate condensation. However, once in a gas sample vessel, dew condensation is collected and routed to holdup tanks, but no mention is made of analysis for possible contaminants or fission products in the condensate. This consideration is especially important because the PGSS also doubles as the PASS gas-sample line.

Requested Information

Regarding the gas sampling system, is the dew condensation in gas sample vessels measured for contaminants including possible radioactive materials?

ANSWER:

The Process Gas Sampling System (PGSS) is used for measuring hydrogen concentration and radioactivity in containment atmosphere. During normal operation, the temperature in containment atmosphere is not anticipated to be high. Accordingly, there will be a minimal amount of dew condensation after cooling by the sample cooler. This amount of condensation is considered to be negligible.

During and after an accident, the containment atmosphere is sampled. The result of the containment atmosphere sample analysis augments the information provided by the containment radiation monitor, the thermometer at the outlet of the reactor vessel, and the hydrogen gas monitor to provide details about the accident condition.

During an accident, the containment atmosphere temperature may increase. However, the atmosphere gas sampling and radioactivity analysis will not be performed until 24 hours after the accident, and after about 22 hours the containment atmosphere temperature is expected have

decreased to close to normal with significant dew condensation not expected. Therefore it is not necessary to analyze the dew condensation in the PGSS.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes MHI's response to the NRC's question.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 294-2129 REVISION 1**
SRP Section:	**09.03.02 – Process and Post-Accident Sampling Systems**
APPLICATION SECTION:	**9.3.2**
DATE OF RAI ISSUE:	**3/31/2009**

QUESTION NO. : RAI 09.03.02-8

Background

GDC 60 and 64 require that plants be able to monitor and control effluents both from normal operation and under accident conditions. To satisfy these requirements, RG 1.21 recommends that measurements should be made at points which would be most representative of releases (C.2). Also, GDC 14 requires representative liquid sampling since accurate sampling is necessary to ensure the integrity of the RCPB. In addition, NUREG-0737 recommends that the sample analysis quantify nuclide inventories [p. II.B.3.1-3, note (9)(a)]. This can only be accomplished if a single sample is known to be representative of an entire volume, or if multiple samples are taken, reflecting how effluent concentrations vary in different locations. In the DCD, PASS measurements are mentioned for the RCS hot leg, RWSP, and containment, and suggests that these terms are singular. The containment is comprised of multiple rooms, the primary system contains many different regions, and the RWST - while a single tank - has multiple entry points and is hardly a well-mixed control volume. Hence, it would seem that one sample point may not be able to provide representative samples for these entire regions.

Requested Information

For the PASS, how many sample points are there in the RCS hot leg, the RWSP, and the containment, and where are they located?

ANSWER:

There are two sample points in the RCS hot leg. One sample point is located in the RCS hot leg of Loop B and another point is located in the RCS hot leg of Loop C.

There are four sample points in the RWSP. One sample point is located in each train downstream of the CS/RHR cooler. However, these sample points are only available while the CS/RHR pumps (located upstream of these sample points) are running.
There is one containment atmosphere sampling point in the containment. This sample point is located at the top of the containment vessel as a representative sample point.

Impact on DCD

The following changes will be made to the each PASS Sample Point Name of the RCS Hot Leg in Table 9.3.2-2 "Post-Accident Sampling System (PASS) Sampling Points":

~~RCS Hot Leg~~ RCS Hot Leg B, RCS Hot Leg C

Refueling Water Storage pit (Obtained from ~~Residual Heat Removal System~~ downstream of A, B, C, D-CS/RHR Hx)

Containment Atmosphere Gas (upper compartment area in the containment)

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes MHI's response to the NRC's question.