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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 71 – Radioactive Waste Management Systems – RAI Numbers 11.5-23 and 11.5-24**

Enclosure 1 contains GE's response to the subject NRC RAIs transmitted via the Reference 1 letter.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

/Kathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

Reference:

1. MFN 06-382, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 71 Related to the ESBWR Design Certification Application*, October 11, 2006

Enclosures:

1. MFN 07-030 – Response to Portion of NRC Request for Additional Information Letter No. 71 – Radioactive Waste Management Systems – RAI Numbers 11.5-23 and 11.5-24

cc:

| | |
|---|---|
| AE Cubbage | USNRC (with enclosures) |
| GB Stramback | GE/San Jose (with enclosures) |
| BE Brown | GE/Wilmington (with enclosures) |
| eDRF | 0066-6197 for RAI 11.5-23 |
| | 0062-5641 for RAI 11.5-24 |

# Enclosure 1

# MFN 07-030

# Response to Portion of NRC Request for Additional Information Letter No. 71 Related to ESBWR Design Certification Application

## Radioactive Waste Management

## RAI Numbers 11.5-23 and 11.5-24

**NRC RAI 11.5-23:**

*A review of DCD Tier 2, Revision 1, Sections 10.4.2, 11.3, 11.5, 12.3.1, and 12.3.2 indicates that there is no discussion addressing plant design features to mitigate radiation exposures and doses to members of the public associated with the production of N-16 and sky-shine out of the turbine building in the context of 10 CFR Parts 20.1302 and 20.1301(e) and 40 CFR 190. Provide:*

*(A) a description of turbine building features (placement of main steam pipes, shielding, construction materials used for the turbine building walls and roof, etc.) that are designed to mitigate radiation fields and sky-shine in plant environs;*

*(B) an estimate of the dose to a postulated member of the public located at or beyond the EAB (800 m) in complying with 10 CFR Parts 20.1302 and 20.1301(e) and 40 CFR 190; and*

*(C) describe how site-specific conditions will be considered in assessing radiation exposures and doses to members of the public, and how such information and operational considerations would be addressed by the COL applicant in the offsite dose calculation manual.*

**GE Response:**

(A) The $N_{16}$ source and sky-shine is discussed in DCD Tier 2, Revision 3, Subsection 12.2.1.3. Necessary biological shielding is provided for equipment in the Turbine Building and is considered in the design of the Turbine Building. Shielded equipment is described in DCD Tier 2, Revision 3, Sections and subsections 10.1, 10.2.4, 10.4.1.1.1, 10.4.1.3 and 10.4.2.3.

(B) The estimated doses of $N_{16}$ source and sky-shine in the Turbine Building were provided in response to RAI 12.3-5 and 12.3-5 S01 (RAI 12.3-5 response is provided in GE letter MFN 06-477, Supplement 1 dated February 6, 2007).

(C) A new paragraph 11.5.7.2 will be added to DCD Tier 2, Revision 4, to require the COL Holder consider site-specific conditions and requirements in assessing radiation exposure and doses to the members of the public in the Offsite Dose Calculation Manual (ODCM) in accordance with the requirements of 10 CFR 20.1301(e) and 10 CFR 20.1302.

**DCD Impact:**

(A) For this item, no DCD changes will be made in response to this RAI.

(B) For this item, no DCD changes will be made in response to this RAI.

(C) A new paragraph will added in the DCD Tier 2, Revision 4 as noted on the attached markup.

**NRC RAI 11.5-24:**

*The DCD does not address acceptance criteria and guidance of SRP Section 9.3.2.II (NUREG-0800) on the process sampling system (PSS) and post-accident sampling system (PASS).*

*A review of DCD Tier 2, Revision 1, Section 11.5 and 9.3.2 indicates that there are no discussions on whether the acceptance criteria and guidance of SRP Section 9.3.2.II Revision 2 July 1981, on the process sampling system and post accident sampling system were considered in the design. The criteria include: General Design Criteria 1, 2, 13, 14, 26, 41, 60, 63,and 64; 10 CFR Part 20.1101(b); and 10 CFR Parts 50.34(f)(2)(viii) and 50.34(2)(xxvi). The guidance includes Regulatory Guides 1.21, 1.26, 1.29, 1.33, 1.56, 1.97, and 8.8; and ANS/HPS 13.1-1999. Accordingly:*

*A) Provide discussions addressing how the applicable requirements of SRP Section 9.3.2.II were met in DCD Tier 2, Sections 11.5.5 and 9.3.2 for gaseous / liquid process and effluent streams;*

*B) Update the text of DCD Tier 2, Sections 11.5.5 and 9.3.2 and Tables 11.5-1 and 9.3-1 to reflect the applicable criteria of SRP Section 9.3.2.II;*

*C) Update the text in DCD Tier 2, Section 11.5.5 by adding internal cross references to DCD Tier 2, Section 9.3.2 and;*

*D) Describe operational considerations that would be addressed by the COL applicant in DCD Tier 2 Sections 11.5.7 and 9.3.2.*

**GE Response:**

The Process Sampling (PSS) design is described in DCD Tier 2 Subsection 9.3.2. A cross reference to DCD Tier 2, Revision 3, Subsection 9.3.2 was made in a new DCD Subsection 11.5.5.9 entitled ""Process and Post-Accident Sampling Programs – Regulatory Compliance" in order to indicate that DCD Subsection 9.3.2 contains information pertaining to the sampling of certain selected streams and processes. The extraction of samples pertaining to the Process and Effluent Radiation Monitoring System (PRM), are primarily taken at the PRM skid or panel associated with each subsystem and therefore, do not have an interconnection with the Process Sampling System (PSS). Please note that the Post Accident Sampling (PASS) function is separate and distinct from Process and Effluent Radiation Monitoring, and under normal circumstances would be described in DCD Sections 1A, 7.4.3.2, 7.5.2.2, 7.9.2.5, 9.3.2, and 16. However, the response to RAI 16.2-68 (GE MFN 06-431 dated November 13, 2006) discusses, and provides justification for, the elimination of the Post Accident Sampling equipment. Post Accident Sampling in the DCD will be limited to information required per the SER accompanying NEDO-32991, Revision 0, "Regulatory Relaxation

For BWR Post Accident Sampling Stations (PASS)," and the associated NRC Safety Evaluation dated June 12, 2001."

Compliance with SRP Section 9.3.2 for the Process and Effluent Radiation Monitoring System is provided in the new DCD Subsection 11.5.5.9 stating, "In addition, where practicable, provisions will be made to include the ability to collect samples at central sample stations in order to reduce leakage, spillage, and radiation exposures to operating personnel. The Process Radiation Monitoring subsystem will be designed to maintain radiation exposures ALARA in accordance with 10 CFR Part 20.1101 (b).

Attached TABLE 1, DCD 9.3.2 Process Sampling System SRP Compliance, provides the applicable Standard Review Plan inspection criteria and how the Process Sampling System (DCD 9.3.2) complies with these requirements.

(A) The new Subsection 11.5.5.9 reflects the criteria mentioned in the response to (A) above, i.e., maintaining radiation exposure ALARA, and reducing leakage and spillage as part of the Process and Effluent Radiation Monitoring system.

(B) The new Subsection 11.5.5.9 mentioned in response (A) above includes a cross reference to DCD Section 9.3.2 and SRP Section 9.3.2 compliance with respect to Chapter 11.5 [see responses to (A) and (B) above.]

(C) Additional statements were added in Revision 3 to the DCD Tier 2 Process Sampling Subsection 9.3.2 documenting that the Process Sampling system design is consistent with the criteria set forth in subsection 9.3.2, "Process and Post-Accident Sampling Systems" of the Standard Review Plan.

(D) There are no known operational considerations for the Process and Effluent Radiation Monitoring subsystems that need to be addressed in Subsections 11.5.7 or 9.3.2.

**DCD Impact:**

A cross reference was made in a new DCD Subsection 11.5.5.9 entitled "**Process and Post-Accident Sampling Programs – Regulatory Compliance**" that indicates that DCD Section 9.3.2 contains information pertaining to the sampling of certain selected streams and processes.

Additional statements were added in DCD Subsection 9.3.2, Process Sampling, to provide justification of the acceptability of the design of the process sampling system based on specific general design criteria and regulatory guides stating that the design of the process sampling system is consistent with the criteria set forth in Section 9.3.2, "Process and Post-Accident Sampling Systems" of the Standard Review Plan. The Process Sampling System is in conformance with the relevant requirements and criteria that are stipulated in the codes and standards identified below:

- 10 CFR 20.20 & 20.1101(b)
- 10 CFR 50, Appendix A, GDC 1, 2, 13, 14, 26, 41, 60, 63, and 64
- 10 CFR 50.34(f)(2)(viii) and 50.34(2)(xxvi)
- Regulatory Guides (RG) 1.21, 1.26, 1.29, 1.33, 1.56, 1.97, and 8.8
- NUREG-0737, Item II.B.3 and
- ANSI/HPS N13.1

The following statement was added in Revision 3 of DCD Tier 2, Subsection 9.3.2.2: "ALARA is considered in station layout and design".

TABLE 1- DCD 9.3.2 Process Sampling System SRP Compliance

| SRP SECTION | SRP Inspection Criteria | DCD COMPLIANCE / RESPONSE Subsection | REMARKS |
|---|---|---|---|
| 9.3.2.II A | *10 CFR Part 20 & 20.1101 (b) ...every reasonable effort to maintain radiation exposure as low as reasonably achievable.* | 9.3.2.2 The following design criteria is delineated to maintain ALARA: Permanently installed sample lines, permanent shielding, designed to minimize purge times, designed to avoid traps and dead legs (e.g.; large radius bends are specified)<br>9.3.2.3 The sampling stations are closed systems and the grab samples taken at the sampling stations have a chemical fume hood to preclude the exposure of operating personnel to contamination hazards. A constant air velocity is maintained through the working face of the hoods to ensure that airborne contamination does not escape to the room under operating conditions. | Table 9.3-1 provides provision to route main steam sample to a separate sample panel due to radiation involved.<br><br>The following statement was added to 9.3.2.2, "ALARA is considered in station layout and design". |
| 9.3.2.II B | *GDC 1 ...design PSS and PASS and components to standards commensurate with importance of safety function.* | 9.3.2.1 The Process Sampling System (PSS) does not perform or ensure any safety-related function. Therefore, this system has no safety-related design basis. The Post Accident Sampling System (PASS) is a subsystem of the Containment Monitoring System and is described in Subsection 7.5.2.<br>9.3.2.2 The seismic design and quality group classifications of sample lines and their components conform to the classification of the system to which they are connected, up to and including the block valve (or valves). Sample lines downstream of the block valves are in conformance with ASME B31.1 Power Piping Code. | The process and post-accident sampling systems will be designed, fabricated, erected and tested to generally accepted and recognized codes and standards that are sufficient to assure a quality system in keeping with the required safety functions.<br><br>The response to RAI 16.2-68 discusses, and provides justification for, the elimination of the Post Accident Sampling equipment as allowed based on the implementation of NEDO-32991, Revision 0, "Regulatory Relaxation For BWR Post Accident Sampling Stations (PASS) and the associated NRC Safety Evaluation dated June 12, 2001. |

| SRP SECTION | SRP Inspection Criteria | DCD COMPLIANCE / RESPONSE Subsection | REMARKS |
|---|---|---|---|
| 9.3.2.II C | *GDC 2... PSS able to withstand effects of natural phenomena.* | 9.3.2.1 The Process Sampling System (PSS) does not perform or ensure any safety-related function. The PSS is designed to function during all plant operational modes under individual system requirements.<br>9.3.2.2 The seismic design and quality group classifications of sample lines and their components conform to the classification of the system to which they are connected, up to and including the block valve (or valves).<br>Table 3.2-1 Note 7 Sample lines from the outer isolation valve or the process root valve through the remainder of the sampling system may be Quality Group D. | The design will enhance plant safety by ensuring the integrity of Seismic Category I systems, such as the reactor coolant pressure boundary, during the design basis seismic event. |
| 9.3.2.II D | *GDC 13... monitor variables that can affect fission process, integrity of reactor core and reactor coolant pressure boundary.* | 9.3.2.1 The Process Sampling System (PSS) collects representative liquid samples for analysis and provides the analytical information required to monitor plant and equipment performance and changes to operating parameters. Alarms are provided for indicating off-normal conditions. The parameters monitored for each process stream are described in Table 9.3-1. | The PSS ensures important information is provided for evaluating whether safety systems and other systems important to safety are performing their intended safety functions i.e., reactivity control fuel cladding integrity, maintaining reactor coolant system integrity, and maintaining containment integrity.<br>I.E.; Table 9.3-1 measures gross activity, corrosion product metals and activity and fission product activity. |
| 9.3.2.II E | *GDC 14... integrity of reactor coolant pressure boundary.* | 9.3.2.1 The Process Sampling System (PSS) collects representative liquid samples for analysis and provides the analytical information required to monitor plant and equipment performance and changes to operating parameters. Alarms are provided for indicating off-normal conditions. The parameters monitored for each process stream are described in Table 9.3-1. | Verification that key chemistry parameters, such as chloride, hydrogen and oxygen concentrations, are within prescribed limits and that impurities are properly controlled provides assurance that the many mechanisms for corrosive attack will be mitigated and will not adversely affect the reactor coolant pressure boundary. Minimizing the potential for corrosive chemical attack increases plant safety by decreasing the probability that the reactor coolant pressure boundary will be compromised due to degradation from corrosive chemical attack.<br>I.E.; Table 9.3-1 measures chloride, dissolved oxygen, conductivity and pH. |

| SRP SECTION | SRP Inspection Criteria | DCD COMPLIANCE / RESPONSE Subsection | REMARKS |
|---|---|---|---|
| 9.3.2.II F | *GDC 26... controlling reliably the rate of reactivity changes.* | 9.3.2.2 Local grab sampling points are located throughout the plant to monitor process streams requiring intermittent sampling. A local grab sampling point is provided for the Standby Liquid Control System. | In BWRs, the sampling systems are used to verify the boron concentration in the standby liquid control system that may be used to maintain the reactor subcritical under cold conditions in the event that the control rod system is inoperable. Sampling and evaluation of boron concentrations used to control the rate of reactivity changes through the injection of borated water into the RCS, enhances plant safety by: 1) meeting the combined reactivity control system redundancy and capability requirements, and 2) not exceeding acceptable fuel design limits. |
| 9.3.2.II G | *GDC 41...reducing the concentration and quality of fission product released to environment following postulated accident.* | The response to RAI 16.2-68 discusses, and provides justification for, the elimination of the Post Accident Sampling equipment as allowed based on the implementation of NEDO-32991, Revision 0, "Regulatory Relaxation For BWR Post Accident Sampling Stations (PASS) and the associated NRC Safety Evaluation dated June 12, 2001<br>7.1.1.6.2 Safety-related containment monitoring system (CMS) instrumentation measures and records radiation levels and the oxygen/hydrogen concentration levels in the primary containment under post-accident conditions. | The ESBWR design does not rely on safety functions of engineered safety features, including the atmospheric cleanup systems and the containment spray system, to mitigate the consequences of postulated accidents by removing from the containment atmosphere radioactive material that may be released in an accident. |
| 9.3.2.II H | *GDC 60 ...capability of PSS to control release of radioactive materials to the environment.* | 7.4.3.2.2 Redundant EQ remote operated isolation valves are provided in the RWCU process sample tap lines.<br>9.3.2.2 All flushing fluids are either returned to appropriate process streams or sent to the radwaste system, except as noted.<br>9.3.2.2 All sampling lines have the process isolation block valves located as close as practical to the process taps. These valves may be closed if sample line rupture occurs downstream of the valves.<br>9.3.2.3 A constant air velocity is maintained through the working face of the hoods to ensure that airborne contamination does not escape to the room under operating conditions. | The process sample system obtains a reactor coolant sample via the RWCU system. These RWCU valves receive a containment isolation signal, which complies with this SRP requirement. These design features provide reasonable assurance that the process sampling system is designed, constructed, installed, and operated on a level commensurate with the need to protect the health and safety of the public and plant operating personnel. |

| SRP SECTION | SRP Inspection Criteria | DCD COMPLIANCE / RESPONSE Subsection | REMARKS |
|---|---|---|---|
| | | 11.5.1.1.1 The main purpose of these radiation monitoring subsystems is to initiate appropriate protective action to limit the potential release of radioactive materials to the environment if predetermined radiation levels are exceeded in major process/effluent streams | |
| 9.3.2.II.I | *GDC 63...detecting conditions that may result in excessive radiation levels in fuel storage and radwaste systems.* | 9.3.2.2 Auxiliary pools, including the Suppression Pool, Gravity-driven Cooling System pools and Isolation Condenser pools, are monitored during the cooling and cleanup modes of FAPCS.<br>11.5.3.2.2 Offgas Post-treatment RMS<br>This subsystem monitors radioactivity for halogens, particulates and noble gas releases during normal and accident conditions in the Offgas piping downstream of the Offgas System charcoal adsorbers and upstream of the Offgas System discharge valve. | The Process Sampling system design ensures that sampling methods are available to monitor the spent fuel pool and the gaseous radwaste storage tank radioactivity levels such that personnel exposures are maintained as low as reasonably achievable.<br><br>The parameters monitored for each process stream are described in Table 9.3-1. |
| 9.3.2.II J | *GDC 64...monitor containment atmosphere & plant environs for radioactivity and release.* | DCD Section 11.5<br>The Process Radiation Monitoring System (PRMS) is provided to allow determination of the content of radioactive material in various gaseous and liquid process and effluent streams. | These design considerations ensure a means is provided to monitor the release of radioactive materials providing the plant operator with the indications needed to initiate actions when necessary to protect the health and safety of plant personnel and the general public. The design objective and criteria are based on the following requirements:<br>• Radiation instrumentation required for safety and protection; and<br>• Radiation instrumentation required for monitoring and plant operation.<br>All radioactive release points/paths within the plant are identified and monitored by this system. |

| SRP SECTION | SRP Inspection Criteria | DCD COMPLIANCE / RESPONSE Subsection | REMARKS |
|---|---|---|---|
| 9.3.2.II.K | *Compliance with NUREG 0737 Sect 11.B.3* | | |
| | 1. ...acceptability to sample normal process & principal components:<br>OffGas<br>Rx Coolant (inlet/out from RWCU)<br>SLC<br>Containment sumps<br>Spent Fuel Pool<br>Drywell Atmosphere<br>Radwaste Storage Tk (inlet & outlet)<br>Condensate Polishing | The parameters monitored for each process stream are described in Table 9.3-1.<br><br>The Reactor Building Sample Station processes samples from the following systems for analysis:<br>Reactor Water Cleanup/Shutdown Cooling System (RWCU/SDC)<br>Control Rod Drive System<br>Fuel and Auxiliary Pool Cooling System (FAPCS)<br>Auxiliary pools, including the Suppression Pool, Gravity-driven Cooling System pools and Isolation Condenser pools, are monitored during the cooling and cleanup modes of FAPCS.<br>A local grab sampling point is provided for the Standby Liquid Control System.<br>Additional grab samples are drawn from selected locations in the Radwaste System<br>The Condensate Polishing Sample Station is located in the Turbine Building. Process samples from the following systems are routed to this panel for monitoring:<br>Condensate and Feedwater System<br>Condensate Purification System.<br><br>Typical process stream sample parameters for the Condensate Polishing Sample Station are outlined in Table 9.3-1. Grab sample facilities are also provided at the Condensate Polishing Sample Station. | DCD Section 11.5 provides design criteria for gaseous process and effluent streams.<br>11.5.1.1.1 Drywell sumps Low Conductivity Waste/High Conductivity Waste (LCW/HCW) discharge RMS<br>11.5.1.1.2 Monitoring Gaseous Process Streams<br>– Offgas Pre-treatment RMS<br>– Offgas Post-treatment RMS<br>11.5.3.2.2 Offgas Post-treatment RMS<br>This subsystem monitors radioactivity for halogens, particulates and noble gas releases during normal and accident conditions in the Offgas piping downstream of the Offgas System charcoal adsorbers and upstream of the Offgas System discharge valve. |
| | 2. The required analysis and frequencies should be given in the plant technical specifications | N/A | The Standard Review Plan (SRP 9.3.2 Process and Post Accident Sampling Systems) requires evaluation of the applicant's technical specifications during the operating license (OL) stage of review rather than during the construction permit (CP) stage. |

| SRP SECTION | SRP Inspection Criteria | DCD COMPLIANCE / RESPONSE Subsection | REMARKS |
|---|---|---|---|
| 9.3.2.II.K | *Compliance with NUREG 0737 Sect 11.B.3* | | |
| | 3. The following guidelines will be used for determining acceptability of the PSS functional design: | | |
| | a. Provisions should be made to assure representative samples from liquid process streams and tanks. | 9.3.2.2 Provisions for Obtaining Representative Samples<br>Where practical, sample connections are located in turbulent flow zones to ensure adequate mixing. Connection is made on the side of horizontal process pipe runs.<br>Sampling lines are sized to maintain turbulent flow and to minimize purge time. Routing is as short and as straight as possible. Large radius bends are used to avoid traps and dead legs.<br>Sampling lines and associated valves and fittings are fabricated from stainless steel.<br>Heat tracing of sampling lines is provided as necessary to prevent crystallization or solidification of contents.<br>Cooling capabilities are provided for temperature control of the samples as required.<br>Sampling equipment is designed with flushing and blowdown capability in order to remove sediment deposits, air and gas pockets. Provisions are made to purge sample lines in the stations. All flushing fluids are either returned to appropriate process streams or sent to the radwaste system, except as noted. | |
| | b. Provisions should be made to assure representative samples from gaseous process streams and tanks in accordance with ANSI N13.1-1969. | DCD Subsection 11.5.3.2.3 discusses conformance with ANSI N13.1-1969. | |

| SRP SECTION | SRP Inspection Criteria | DCD COMPLIANCE / RESPONSE Subsection | REMARKS |
|---|---|---|---|
| 9.3.2.II.K | *Compliance with NUREG 0737 Sect 11.B.3* | | |
| | c. Provisions should be made for purging sample lines and for reducing plate out in sample lines (e.g. heat tracing). | 9.3.2.2 Heat tracing of sampling lines is provided as necessary to prevent crystallization or solidification of contents.<br><br>Sampling equipment is designed with flushing and blowdown capability in order to remove sediment deposits, air and gas pockets. Provisions are made to purge sample lines in the stations. All flushing fluids are either returned to appropriate process streams or sent to the radwaste system, except as noted. | |
| | d. Provisions should be made to purge and drain sample streams back to the system or origin or to an appropriate waste treatment system to keep radiation exposure as low as reasonably achievable. | 9.3.2.2 The sample stations' effluents are returned to an appropriate process stream or to the radwaste drain headers through a common return line. | The Process Sample system is designed to maintain radiation exposures as low as reasonably achievable. |
| | e. Isolation valves should fail in the closed position to control the release of radioactive materials to the environment. | 9.3.2.5 Instrumentation Application<br>PSS instrumentation is provided in each sample station for the following:<br>Provisions are made to stop sample flow upon detection of high-temperature sample flow leaving the sample cooler. | The process sample system obtains a reactor coolant sample via the RWCU system. These RWCU valves receive a containment isolation signal, which complies with this SRP requirement. |
| | f. Passive flow restrictions to limit reactor coolant loss from a rupture of the sample line should be provided to keep radiation exposures to as low as reasonably achievable and to control the release of radioactive materials to the environment. Passive flow restrictors can be replaced with redundant EQ, remotely operated isolation valves. These automatic containment isolation valves should close on containment isolation signals. | 7.4.3.2.2 Redundant EQ remote operated isolation valves are provided in the RWCU process sample tap lines. | The process sample system obtains a reactor coolant sample via the RWCU system. These RWCU valves receive a containment isolation signal, which complies with this SRP requirement. |

| SRP SECTION | SRP Inspection Criteria | DCD COMPLIANCE / RESPONSE Subsection | REMARKS |
|---|---|---|---|
| 9.3.2.II.K | *Compliance with NUREG 0737 Sect 11.B.3* | | |
| | 4. ...the seismic design and quality group classification of sampling lines, components and instruments for PSS and PAS should conform to the classification of the system to which each sampling line and component is connected. | 9.3.2.2 The seismic design and quality group classifications of sample lines and their components conform to the classification of the system to which they are connected, up to and including the block valve (or valves).<br><br>The response to RAI 16.2-68 discusses, and provides justification for, the elimination of the Post Accident Sampling equipment as allowed based on the implementation of NEDO-32991, Revision 0, "Regulatory Relaxation For BWR Post Accident Sampling Stations (PASS) and the associated NRC Safety Evaluation dated June 12, 2001. | As listed previously in this Table, the Process Sampling system design meets the requirements of GDC 1 and GDC 2.<br><br>The process sampling system will be designed, fabricated, erected and tested to generally accepted and recognized codes and standards that are sufficient to assure a quality system in keeping with the required safety functions.<br><br>The design will enhance plant safety by ensuring the integrity of Seismic Category I systems, such as the reactor coolant pressure boundary, during the design basis seismic event. |
| | 5. ...the post-accident sampling system and operational procedures should meet the guidelines of NUREG-0737 and following additional clarifications provided in 5.a, b and c. | The response to RAI 16.2-68 discusses, and provides justification for, the elimination of the Post Accident Sampling equipment as allowed based on the implementation of NEDO-32991, Revision 0, "Regulatory Relaxation For BWR Post Accident Sampling Stations (PASS) and the associated NRC Safety Evaluation dated June 12, 2001. | |

## 11.5.7 COL Information

*11.5.7.1* The derivation of each Subsystem's Lower Limit of Detection is to be determined by the COL Holder based on site specific conditions and operating characteristics of each installed effluent radiation monitoring subsystem.

### *11.5.7.2 Offsite Dose Calculation Manual*

The COL Holder will also develop an ODCM that contains the methodology and parameters used for calculation of offsite doses resulting from gaseous and liquid effluents. The COL Holder will address operational setpoints for the radiation monitors and address programs for monitoring and controlling the release of radioactive material to the environment, which eliminates the potential for unmonitored and uncontrolled release. The ODCM will include planned discharge flow rates.

The COL Holder will consider site-specific conditions and requirements in assessing radiation exposure including N16 source and skyshine doses to the members of the public in the ODCM in accordance with 10 CFR 20.1301 (e) and 10 CFR 20.1302.

### *11.5.7.3 Process and Effluent Monitoring Program*

In addition, the COL Holder is responsible for the site-specific program aspects of the process and effluent monitoring and sampling per ANSI N13.1 (Reference 11.5-13) and Regulatory Guides 1.21 (Reference 11.5-9) and 4.15 (Reference 11.5-10).

### *11.5.7.4 Site Specific Offsite Dose Calculation*

The COL Holder is responsible for addressing 10 CFR 50, Appendix I (Reference 11.5-8) guidelines for maximally exposed offsite individual doses and population doses via liquid and gaseous effluents.

### *11.5.7.5 Instrument Sensitivities*

The COL Holder is responsible for the sensitivities, frequencies and basis for each gaseous and liquid samples.

## 11.5.8 References

11.5-1 ~~10 CFR~~ Title 10 Code of Federal Regulations Part 20.1302, "Compliance with Dose Limits for Individual Members of the Public."

11.5-2 ~~10 CFR~~ Title 10 Code of Federal Regulations Part 50.34a, "Design Objectives for Equipment to Control Releases of Radioactive Material in Effluents-Nuclear Power Plants."

11.5-3 ~~10 CFR~~ Title 10 Code of Federal Regulations Part 50.34(f)(2)(xvii) and 10 CFR 50.34(f)(2)(xxvii).

11.5-4 ~~10 CFR~~ Title 10 Code of Federal Regulations Part 50.36a, "Technical Specifications on Effluents from Nuclear Power Reactors."

11.5-5 ~~10 CFR~~ Title 10 Code of Federal Regulations Part 50, Appendix A, General Design Criterion 60, "Control of Releases of Radioactive Materials to the Environment."