REQUEST FOR ADDITIONAL INFORMATION
Volume 2 – Preclosure
Chapter 2.1.1.6 – Identification of Structures, Systems, and Components Important to Safety, Safety Controls, and Measures to Ensure Availability of the Safety Systems
Set 2 (RAI #1 - #9)

The following questions pertain to DOE's identification of structures, systems, and components important to safety, safety controls, and measures to ensure availability of the safety systems, described in Safety Analysis Report (SAR) Sections 1.2 and 1.9. This information is needed to assess whether or not DOE has demonstrated compliance with 10 CFR 63.21(c)(5), 63.111, and 63.112(e). In addition to the SAR, these questions also refer to other references on the docket.

RAI #1

For procedural safety controls pertaining to the important to safety (ITS) heating, ventilating and air conditioning (HVAC) systems in the Canister Receipt and Closure Facility (CRCF), Wet Handling Facility (WHF), and Emergency Diesel Generator Facility (EDGF):

- Explain how the use of the procedure safety controls (SAR Sections 1.2.4.4.4 and 1.2.5.1.4) in CRCF and WHF, will ensure that the HVAC systems, including the fan coil unit and air cooled condensing unit for the electrical and battery rooms (SAR Figure 1.2.4-104 on page 1.2.4-323 for the CRCF), will be available during waste handling operations. DOE refers to the supply fan as part of the fan coil unit on SAR page 1.2.4-58.

- Explain how the safety function is being met for the ITS HVAC subsystems in the EDGF without a procedural safety control (SAR page 1.2.8-26) during the waste handling operation in CRCF and/or WHF.

DOE identifies one procedural safety control pertaining to the HVAC systems in the CRCF and the WHF specifying that, "… operating procedures will identify the required status of ITS confinement HVAC exhaust fans and the ITS supply and exhaust fans for the ITS electrical and battery rooms … as a condition for commencing waste handling operations…" on SAR pages 1.2.4-64 and 1.2.5-61 for the CRCF and WHF, respectively.

RAI #2

For structures, systems, and components (SSCs) ITS, identify the inspection, testing, and maintenance needed, including the scope and frequency, to ensure availability of safety functions of these SSCs ITS.

In SAR Section 1.9.1.13, DOE has stated that the information about inspection, test, and maintenance programs is provided in SAR Sections 1.2, 1.3, 1.4, 1.5, and 5.6. However, it is not clear whether DOE has provided the information on the type, scope, and frequency of inspection, testing, and maintenance needed for staff to verify compliance with 10 CFR 63.112(e) (13).

RAI #3

Explain the development of cut sets used to demonstrate that the double interlock preaction fire-protection system will satisfy the nuclear safety design bases set forth in SAR Table 1.4.3-2. Specifically,

- Explain why alternate event sequences, such as, false fire detection by one of the interlocked fire/smoke detectors was not included as a cut set to determine overall probability of spurious activation of the system and inadvertent introduction of water.

- Justify a human error screening value of 0.025 in conjunction with the sprinkler head failure probability of 1.6×10^{-6}, to determine the overall spurious activation probability.

The derivation of a failure probability for the double interlock preaction system was based on the failure probability of a sprinkler head and simultaneous failure of a solenoid valve as, described in the reliability and event sequence categorization analyses (e.g., BSC 2008a Section 6.2.2.9.1). It appears that there may be additional cut sets, not considered in the failure probability, that may lead to inadvertent introduction of water. For example, malfunction of a fire-detector may trip a solenoid valve, resulting in water discharge from a damaged sprinkler head.

RAI #4

Provide a technical basis for not considering the failure of the programmable logic controller (PLC) on the transport and emplacement vehicle (TEV), for a scenario in Node Item No. 1.6 for base plate not retracting (Table E-2 of BSC 2008b).

In Table E-2 of BSC 2008b, DOE has considered a scenario, labeled as Node Item 1.6, for TEV operations, in which the base plate does not retract, causing the shield door to remain open. The scenario then assumes that the PLC interlock will preclude TEV movement and potential exposure to workers. DOE, however, has not provided a technical basis for not considering the PLC failure.

RAI #5

Explain why a spurious command to lift or lower an aging over pack (AO) or shielded transfer cask (STC) could lead to the Site Transporter (ST) moving in the wrong direction, as shown in INT-2-ST-COLLISION - Site Transporter Collision fault tree (BSC 2008c Figure B2.4-3)

In BSC 2008c Figure B2.4-3, DOE describes a collision fault tree that contains “ST Moves in Wrong Direction” (INT-6-ST-WRONG-DIR) that may be caused by “Direction Controller Fails” (ISO-ST-CT002_CT-FOH) or “Spurious Command to Lift/Lower AO or STC” (ISO-ST-HC002-HC-SPO). It is not clear how spurious command to lift/lower AO or STC will cause the ST to move in the wrong direction.

RAI #6

Provide the following document, referenced in SAR Table 1.13-1:

BSC 2007. “Preliminary Equipment Qualification Environment Bounding Design Basis Values for YMP ITS Surface and Subsurface Facility SSCs.” 000-30R-MGR0-02900-000-000. Las Vegas, Nevada: Bechtel SAIC Company.

This document is needed to verify the environmental conditions in the equipment qualification program for the surface and subsurface facilities.

RAI #7

Provide information on the functions of ITS controls in the Process & Instrumentation Diagram (P&ID) and Logic Diagrams in SAR section 1.2.4.

In SAR Section 1.2.4, DOE has provided P&IDs and logic diagrams for various equipment. However, the P&IDs do not indicate the functions of ITS controls (e.g., interlocks, sensors, limit switches). For example, SAR Figure 1.2.4-51 shows the P&ID for Canister Transfer Machine. However, it does not identify interlocks that have safety functions, and the interlocks that are provided for redundancy.

RAI #8

Provide a technical basis for the ITS diesel generator capacity, sized to accommodate ITS loads from the handling facilities (SAR Sections 1.2.8 and 1.4.1). This information is needed to verify compliance with 10 CFR 63.112(e) (8).

RAI #9

Provide the estimated time needed for the ITS diesel generators to power the full load in case of loss of off-site power. The information is required for NRC staff to assess the ability of ITS diesel generators to support functions of ITS HVAC systems in CRCF and WHF.

References:

BSC. 2008a. “Canister Receipt and Closure Facility Reliability and Event Sequence Categorization Analysis.” 060–PSA–CR00–00200–000. Rev. 00A. CACN 001. Las Vegas, Nevada: Bechtel SAIC Company, LLC.

BSC. 2008b. “Subsurface Operations Reliability and Event Sequence Categorization Analysis.” 000–PSA–MGR0–00500–000. Rev. 00A. Las Vegas, Nevada: Bechtel SAIC Company, LLC.

BSC. 2008c. “Intra-Site Operations and BOP Reliability and Event Sequence Categorization Analysis.” 000–PSA–MGR0–00900–000. Rev. 00A. Las Vegas, Nevada: Bechtel SAIC Company, LLC.