RAI Volume 2, Chapter 2.1.1.2, First Set, Number 8, Supplemental Question 13:

The response to RAI 2.2.1.1.2-008 committed to update the SAR to state that the cask/canister cooling subsystem is important to safety (ITS). For consistency, the title of the cask cooling subsystems process and instrumentation diagrams in SAR Figures 1.2.5-69 through 1.2.5-72 should be revised to indicate the ITS classification of subsystems. The staff notes that the "bridge" of the remote handling subsystem of the waste package closure system is an ITS component and, therefore, the remote handling subsystem should have an ITS classification. However, the response to RAI 2.2.1.1.2-010 states that the waste package closure system and its subsystems are non-ITS. Please review and verify the contents of the SAR for similar inconsistent application of the ITS classification process, "If a component is ITS, then the subsystem/system containing the component is classified/designated as ITS."

1. SUPPLEMENTAL RESPONSE

In the public call with the NRC staff on October 22, 2009, the DOE acknowledged that the classification of the waste package closure subsystem is not consistent with the practice of classifying a system or subsystem as ITS where any component in the system or subsystem is classified as ITS. The DOE stated that a review of the SAR will be conducted to identify any other similar inconsistencies in classification of systems and subsystems. The basis for classification throughout the SAR will be SAR Table 1.9-1.

The convention used for classification of systems and subsystems as ITS is not intended to classify every component, subcomponent, or piece/part in a system or subsystem as ITS. Only those components, subcomponents, or pieces/parts that support the accomplishment of a safety function identified through the preclosure safety analysis are classified as ITS. The facility subsystems include many other elements that are necessary for normal operations and maintenance that do not provide or support a safety function and are classified as non-ITS.

Chapter 1 of the SAR has been reviewed using the above convention to identify inconsistencies between the text of the design description sections of the SAR, including SAR Tables 1.2.2-10 and 1.2.2-11 for cranes and other mechanical handling equipment, and SAR Table 1.9-1, "Preclosure Safety Classification of SSCs." The safety classification of structures, systems, and components is typically included in the description subsections of the SAR, and specifically addressed in the subsections entitled "Safety Category Classification." SAR Tables 1.2.2-10 and 1.2.2-11 were also reviewed because these tables provide a comprehensive list of cranes and a list of the ITS mechanical handling equipment, including identification of the safety classification.

Several instances were found where the textual description of a subsystem identified the subsystem as non-ITS even though there are components in the subsystem that are ITS. The correct statements of subsystem ITS classification are identified in the following table:

Subsystem	Correct Statement of Classification
Waste package closure subsystem	The waste package closure subsystem is classified as ITS because the bridge of the remote handling system is categorized as ITS. All other components of the waste package closure subsystem are non-ITS.
Dual-purpose canister (DPC) cutting subsystem	The DPC cutting subsystem is classified as ITS because the DPC cutting jib crane and the cask support frame (DPC cutting station) are categorized as ITS. All other components of the DPC cutting subsystem are non-ITS.
Transportation, aging, and disposal (TAD) canister closure subsystem	The TAD canister closure subsystem is classified as ITS because the TAD canister closure jib crane and the cask support frame (TAD canister closure station) are categorized as ITS. All other components of the TAD canister closure subsystem are non-ITS.
Cask cooling subsystem	The cask cooling subsystem is classified as ITS because the relief valves and associated piping that provide overpressure protection to the casks are categorized as ITS. All other components of the cask cooling subsystem are non-ITS.
Fire suppression subsystem	The fire suppression subsystem is classified as ITS because selected preaction valves, sprinkler heads, and system actuation panels associated with double-interlock preaction suppression systems that protect areas where there is a potential for canister breach are categorized as ITS. All other components of the fire suppression subsystem are non-ITS.
Fire detection subsystem	The fire detection subsystem is classified as ITS because the detectors and control boxes associated with the ITS preaction valves are categorized as ITS. All other components of the fire detection subsystem are non-ITS.

During the public call on October 22, 2009, the NRC staff's recommendation to include ITS in the title of SAR figures was discussed. The DOE indicated that the SAR figure titles were based upon the repository nomenclature for the systems and subsystems, and that the ITS components were identified by notations on the figures. It was agreed that the titles of the SAR figures need not be changed.

2. COMMITMENTS TO NRC

The license application will be updated to ensure a consistent statement of system and subsystem safety classification between the SAR text as well as the tables and figures, and SAR Table 1.9-1.

3. DESCRIPTION OF PROPOSED LA CHANGE

The Chapter 1 SAR subsections that describe the structures, systems, and components and specifically state the safety category classification, as well as the corresponding process and instrumentation diagrams, ventilation and instrumentation diagrams, electrical single line diagrams, and logic diagrams will be clarified as necessary to reflect the classification presented in the table above.

RAI Volume 2, Chapter 2.1.1.2, Second Set, Number 9, Supplemental Question 14:

ANSI/ANS 59.52 excludes engine-mounted components except to define interface requirements. Where in the SAR can staff find the standards to be used for the design of engine-mounted components for the emergency diesel generator?

The application of IEEE 387-1995 considers harmonic vibration. Where in the SAR can the staff find the commitment and standards that would be used for addressing the seismic qualification of the emergency diesel generator?

1. RESPONSE

The important to safety (ITS) diesel generators and their support systems include a set of components that interfaces between components supplied by the diesel generator manufacturer and the Emergency Diesel Generator Facility. The functional design described in the SAR and shown on SAR Figures 1.2.8-17 through 1.2.8-24 is consistent with the functional design of safety related diesel generators and support systems at nuclear power plants. The components shown in the central box of SAR Figure 1.2.8-17 are typical engine-mounted components. The functional design of the diesel generator system provides for two physically and electrically separated trains of ITS diesel generators and associated mechanical support systems with sufficient component reliability to supply ITS electrical power when required for the event sequences identified in the preclosure safety analysis.

1.1 CODES AND STANDARDS FOR THE ITS DIESEL GENERATORS AND SUPPORTING SYSTEMS

The principal codes and standards for the ITS diesel generators are identified in SAR Section 1.4.1.2.8, pages 1.4.1-12 through 1.4.1-14, and include:

- Regulatory Guide 1.9, *Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants*
- Regulatory Guide 1.41, *Preoperational Testing of Redundant On-Site Electric Power System to Verify Proper Load Group Assignments*
- NFPA 70, *National Electrical Code*
- NFPA 110, *Standard for Emergency and Standby Power Systems*
- IEEE Std 387-1995, *IEEE Standard Criteria for Diesel-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations*
- IEEE Std 446-1995, *IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications*

The principal codes and standards for the mechanical systems that support the operation of the ITS diesel generators are found in SAR Section 1.2.8.2, pages 1.2.8-12, 1.2.8-14, 1.2.8-17, 1.2.8-19, and 1.2.8-21, and include:

- ASME 2004, *ASME Boiler and Pressure Vessel Code, Section VIII*
- ASME B31.3-2004, *Process Piping*
- NFPA 70, *National Electrical Code*
- NFPA 780, *Standard for the Installation of Lightning Protection Systems*
- ANSI/ANS-59.51-1997, *Fuel Oil Systems for Safety-Related Emergency Diesel Generators*
- ANSI/ANS-59.52-1998, *American National Standard, Lubricating Oil Systems for Safety-Related Emergency Diesel Generators*
- HI 2005, *Pump Standards*
- TEMA 2007, *Standards of the Tubular Exchanger Manufacturers Association*.

These principal codes and standards will be specified to the ITS diesel generator manufacturer through the procurement specification. The ITS diesel generator manufacturer will conform to the requirements contained in these principal codes and standards, identified in the procurement specification, applicable to engine-mounted components. However, the codes and standards applicable to specific engine-mounted components will be those selected by the manufacturer based upon their experience and practice, consistent with the codes and standards cited above.

1.2 SEISMIC QUALIFICATION OF THE ITS DIESEL GENERATORS AND SUPPORTING SYSTEMS

The Equipment Qualification Program for the Yucca Mountain repository structures, systems, and components (SSCs) is described in SAR Section 1.13. The program is applied to active electrical and mechanical SSCs that are categorized as ITS. The purpose of the program is to ensure the ability of ITS SSCs to perform their intended safety functions under the applicable environmental, seismic, and event sequence conditions. The principal standard for the Equipment Qualification Program is IEEE Std 323-2003, *IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations*. As stated in SAR Section 1.13.4, page 1.13-7, the seismic capability of active ITS electrical and active ITS mechanical equipment credited with performing a safety function during and after an event sequence including a seismic event will be demonstrated by appropriate testing and analyses following the guidelines of Regulatory Guide 1.100, *Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants*, and IEEE Std 344-2004, *IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations*, as appropriate for the repository seismic design bases.

With regard to the ITS diesel generators and their support systems, there are no event sequences, including a seismic event, that require the operation of the ITS diesel generators during or after a seismic event. Consequently, there is no seismic ground motion level for which the diesel generators and their support systems must be demonstrated capable of performing their intended safety function. However, the ITS diesel generators and their support systems are designed to perform their intended safety function for the ground motions identified in the International Building Code (ICC 2003) for the location of the repository.

2. COMMITMENTS TO NRC

None.

3. DESCRIPTION OF PROPOSED LA CHANGE

None.

4. REFERENCES

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Regulatory Guide 1.100, Rev. 2. 1988. *Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants*. Washington, D.C.: U.S. Nuclear Regulatory Commission. TIC: 4636.

TEMA (Tubular Exchanger Manufacturers Association). 2007. *Standards of the Tubular Exchanger Manufacturers Association*. 9th Edition. Tarrytown, New York: Tubular Exchanger Manufacturers Association. TIC: 260037.