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## 1.0 Use and Application

This document builds on the control functions determined to be essential in HNF-12125, *222-S Laboratory Documented Safety Analysis* (DSA), Chapter 3.0, "Hazard and Accident Analysis," and Chapter 4.0, "Safety Structures, Systems, and Components," for the derivation of Technical Safety Requirements (TSR). This TSR document is prepared and formulated using the requirements and guidelines from Title 10, *Code of Federal Regulations*, Part 830 (10 CFR 830) Subpart B, "Safety Basis Requirements," and DOE G 423.1-1, "*Implementation Guide for Use in Developing Technical Safety Requirements.*" Also, the content of this document follows the direction provided in HNF-8739, *Hanford Safety Analysis and Risk Assessment Handbook* (SARAH), and DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*.

The derivation of TSRs consists of summaries and references to pertinent sections of the DSA in which administrative features are needed to prevent or mitigate the consequences of accidents. Administrative features addressed include ones that (1) provide significant defense-in-depth in accordance with the screening criteria of 10 CFR 830 Subpart B, (2) provide significant worker safety, or (3) maintain consequences of facility operations below Evaluation Guidelines.

### 1.1 Operational Modes

The 222-S Laboratory has only one facility mode, OPERATION, and it entails all aspects of the 222-S Laboratory mission.

## 2.0 Safety Limits (SL)

The hazard and accident analysis did not identify safety-class or safety-significant structures, systems, and components (SSC) for inventory control; therefore no SLs are required for the safe operation of the facility.

## 3.0 Limiting Control Settings (LCS) and Limiting Conditions for Operation (LCO)

The hazard and accident analysis did not identify safety-class or safety-significant SSCs for inventory control; therefore no LCSs or LCOs are required for the safe operation of the facility.

## 4.0 Surveillance Requirements (SR)

As stated in Sections 2.0 and 3.0, there are no SLs, LCSs, or LCOs for inventory control so it is not necessary to address testing, calibration, or inspection requirements to maintain safe operation of the facility within SLs, LCSs, and LCOs.

# 5.0 Administrative Controls (AC)

## 5.1 Purpose

5.1.1 The purpose of the AC section is to state the provisions relating to inventory requirements, contractor organization, and deviations that are necessary to ensure the safe operation of the 222-S Laboratory.

5.1.2 Applicability
These ACs apply during all operations and activities at the facility.

## 5.2 Inventory Requirements

5.2.1 This is a **Specific "Directive Action" AC**

5.2.2 Radioactive Material Inventory/Material at Risk (MAR) Function
Material at Risk limit is the underlying assumption for the accident analysis performed in Chapter 3.0 of the DSA, HNF-12125. The MAR limit, as stated in dose equivalent curies (DE-Ci), protects this assumption and ensures that the consequences determined in the accident scenario are not invalidated thereby placing the facility in formally unanalyzed space.

5.2.3 Control Description
The inventory of radioactive material shall not exceed the dose equivalent curies used to calculate the dose consequences to the collocated worker as a result of the worst-case accident.

5.2.4 Basis
The basis for this control is provided in the accident scenario in the DSA, section 3.4, *Accident Analysis.* This scenario, which produced the highest dose consequences (bounding worst-case accident scenario), assumed a building-wide fire that consumed the entire facility inventory as shown in the DSA, Table 3-1, *Material at Risk and Dose Equivalent Curies*. Therefore, the MAR limit for the facility must be less than the derived radioactive material inventory of 39.11 DE-Ci, which produces the worst-case calculated dose to the collocated worker, to ensure that the bounding consequences are not exceeded as analyzed in the DSA.

## 5.3 Contractor Organization

5.3.1 CH2M HILL Hanford Group, Inc. (contractor) is responsible for the safe operation of the 222-S Laboratory. The contractor organization shall define lines of authority, responsibility, and communication within the operating organization. The position that is responsible for overall safety of operations during back shift or facility closure days shall be designated.

## 5.4 Minimum Shift Complement

5.4.1 The Hazard and Accident Analysis in Chapter 3.0 of the DSA, HNF-12125, did not take credit for personnel actions to mitigate the consequences of the worst-case accident. However, when a radioactive sample is to be received, a minimum of one qualified person is required to maintain radioactive material inventory control.

## 5.5 Technical Safety Requirement Violation

5.5.1 Violation of a 222-S Laboratory TSR occurs as a result of the following circumstance:

- Failure to comply with an AC requirement.

**NOTE**

Failure to comply with an AC statement is a TSR violation when either the AC is directly violated, as would be the case with exceeding the inventory requirement, or the intent of a referenced program is not fulfilled. To qualify as a TSR violation, the failure to meet the intent of the referenced program would need to be significant enough to render the assumptions in the DSA invalid. A noncompliance with a specific procedure that implements an AC program is not necessarily a VIOLATION.

Reporting of all TSR VIOLATIONS or derivations from a TSR will be made in accordance with the provisions of DOE M 231.1-2 CRD, *Occurrence Reporting and Processing of Operations Information*.

## 5.6 Safety Management Programs Supporting Worker Protection

5.6.1 Radiation Protection

A radiation protection program shall be established, implemented, and maintained that is based on 10 CFR 835, “Occupational Radiation Protection.”

5.6.2 Operational Safety Programs

Operational safety programs shall be established, implemented, and maintained that include elements of industrial hygiene, occupational safety, fire protection, procedures, and training.

5.6.3 Emergency Preparedness Program
An emergency preparedness program shall be established, implemented, and maintained that consists of notification, emergency facilities and equipment, protective actions, training and drills, and recovery reentry.

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## 6.0 Design Features

Since none of the features of the 222-S Laboratory design were credited in the hazard and accident analysis, there are no "design features for safety" designated for the 222-S facility.

## 7.0 References

10 CFR 830, Title 10, *Code of Federal Regulations*, Part 830, "Nuclear Safety Management," as amended.

10 CFR 835, Title 10, *Code of Federal Regulations*, Part 835, "Occupational Radiation Protection," as amended.

DOE G 423.1-1, *Implementation Guide for Use in Developing Technical Safety Requirements*, U.S. Department of Energy, Washington, D.C., October 2001.

DOE M 231.1-2 CRD , *Occurrence Reporting and Processing of Operations Information*, U.S. Department of Energy, Washington, D.C., August 2003.

DOE-STD-1186-2004, *Specific Administrative Controls*, U. S. Department of Energy, Washington, D.C., August 2004.

DOE-STD-3009-94, *Preparation Guide for U. S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*, Change Notice 2, U.S. Department of Energy, Washington D.C., April 2002.

HNF-8739, *Hanford Safety Analysis and Risk Assessment Handbook* (SARAH), Fluor Hanford, Richland, Washington.

HNF-12125, *222-S Laboratory Documented Safety Analysis*, CH2M HILL Hanford Group, Inc., Richland, Washington.