

Criteria, Review, and Approach Document for the Assessment of Operational Readiness of Vital Safety Systems (VSS)

Reviewed by: _____ Date: _____

Site: LLNL

Facility: Plutonium Facility - Building 332

System: Criticality Alarm System

System Classification: Safety Significant

System Safety Function: The safety function of the CAS in Building 332 is to detect accidental criticality events and actuate alarms that initiate an immediate evacuation of personnel in the building.

The safety analysis of an accidental criticality in Building 332 shows that prompt evacuation of the facility can minimize life-threatening radiation exposures to operating personnel that are not in the immediate vicinity of the accident. Proper maintenance and testing of the CAS ensures that a criticality will be reliably detected, and an alarm will sound alerting personnel to respond promptly and appropriately. (See Building 332 SAR, Section 4.4.4.1)

OBJECTIVE

VSS-1

This vital safety system is operational and personnel and processes are in place that ensure its continued operational readiness.

Criteria and Discussion of Results

VSS 1.1 VSS safety functions are defined and understood by responsible line managers, and supporting information/documentation is available and adequate. System testing is adequate to ensure operability. (See Review Approach items 1, 2, 3 and 7.)

Discussion of Results – (List information/documentation that was unavailable or inadequate. Indicate whether the criterion was met.)

Answer VSS 1.1

The VSS safety functions are defined in Chapter 4 of Building 332 SAR.

Line Managers are responsible for understanding the VSS safety functions. System responsible individuals are trained and tested to ensure their understanding of the safety functions.

Building 332 Facility Safety Plans, Facility Operating Procedures, and system drawings are available to provide supporting information and documentation on this VSS.

Building 332 SRPs and ACPs ensure operability of this vital safety system. In addition, inspections are used to ensure the operability of the VSS each working day.

The criteria within question VSS 1.1 were met.

VSS 1.2 The backlog for surveillances, tests, inspections, maintenance, repair, upgrades, or other work on the system is managed and kept to an appropriate minimum. (See Review Approach item 6.)

Discussion of Results – (Provide a discussion indicating whether the criterion was met.)

Answer VSS 1.2

There is no backlog for the criticality alarm system with regard to preventive maintenance, corrective maintenance, surveillances, tests, and inspections nor are there any corrective actions.

The criteria within question VSS 1.2 were met for criticality alarm system surveillances, tests, inspections, maintenance, repair, and the upgrade projects. All elements are managed and work delay is kept to an appropriate minimum.

VSS 1.3 Configuration Management and Maintenance programs effectively ensure operational availability of the system. (See Review Approach items 5, 8 and 9.)

Discussion of Results – (Address the maintenance program, document control, identification of system requirements and their bases, change control/work control, and assessments of the system. Indicate whether responsibility for operational readiness of this system is formally assigned.)

Answer VSS 1.3

Building 332 has a work control/design control process that assures work activities are properly requested, reviewed, and authorized before being performed and such work activities are performed in a formal and deliberate manner with emphasis on safety. In addition, ACP-B332-011, *Unreviewed Safety Questions (USQ) Procedure* provides guidance for evaluating proposed activities for potential Unreviewed Safety Questions.

All procedures within the Plutonium Facility are prepared using QOP-B332-001, *Preparation of Controlled Procedures*, and are reviewed, approved, and revised using QOP-B332-002, *Review, Approval and Revision of Unclassified Controlled Documents – Document Change Control Process*. All controlled procedures within the Building 332 are reviewed every three years.

For the past two years, the Work Control Process has been used to control changes to systems in Building 332. This process, which applies to all facility and program modifications, requires engineering design reviews, requires that "as-built" conditions are confirmed prior to beginning work, ensures the design basis is maintained and also is the mechanism for triggering drawing updates. Prior to 1998, less vigorous configuration management existed in Building 332. The facility is gathering drawings and documentation for an archiving initiative.

Other than daily operational inspections, there are no activities performed on the criticality alarm system that are not captured in a surveillance requirement procedure.

The criteria within question VSS 1.3 were met for configuration management and maintenance programs.

VSS 1.4 The system is operable and available to fulfill its safety function when required. (See Review Approach items 4 and 10.)

Discussion of Results – (Provide a discussion indicating whether the criterion was met.)

Answer VSS 1.4

The criticality alarm system is operable and available to fulfill its safety function when required. In the last three years, the CAS has not failed in response to facility operating conditions. However, In the last three years, some components of the CAS did not perform as expected during normal surveillance testing. On November 26, 1997, a single criticality detector module failed a weekly SRP and it was replaced. On June 15, 1999, two CAS speakers did not perform as expected; they were replaced. On July 12, 2000, two criticality detector modules failed a surveillance test and had to be recalibrated. Of the three failed surveillance's, only one resulted in a violation of a "Limiting Condition of

Answer VSS 1.4 (cont)

Operation” (LCO). The facility was in “maintenance mode” and the repair was completed before the facility was scheduled to come out of maintenance mode. The time that the criticality alarm system was not capable of accomplishing its safety function was 2 hours or <0.01% during the three year period.

The criteria within question VSS 1.4 were met for system operability.