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: **Fire-detection System (Fire-alarm System)**

System Classification: **Safety Significant**

System Safety Function: The automatic fire-alarms systems consist of the heat detectors, smoke detectors, and water flow switches in the RMA, as well as heat detectors in selected glove boxes and hoods. Heat detectors, smoke detectors, and flow switches are used throughout the rest of the building. Details of the Building 332 fire-alarm systems are given in Section 2.7.1.7 of Chapter 2 of the Building 332 SAR.

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.

Answer VSS 1.1 (cont)
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, daily verifications 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
The fire-detection systems have no backlog of tasks associated with preventive maintenance, surveillances, tests, inspections or corrective actions. However, work is currently under way to replace the fire-detection systems with a new PLC (MXL) based fire-detection system. The new system was installed in FY2000 and is scheduled for activation and operational readiness in FY2001. It should be noted that the fire-detection system is being replaced to extend the life of the system to meet the ten to fifteen year facility life expectancy. This replacement will specifically address a growing parts replacement issue for the old system.

The criteria within question VSS 1.2 were met for fire-detection 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.

Building 332 has an effective maintenance program that ensures the operational availability of the fire-detection system. Elements of this program are daily operational inspections conducted by facility operations and quarterly checks and semi-annual calibration of components conducted by qualified Plant Engineering personnel.

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 fire-detection system is operable and available to fulfill its safety function when required.

Components of the fire-detection system have failed to meet test acceptance criteria four times in the past three years. Note that the fire detection system, as a whole, has not been inoperable within the three-year period.

Answer VSS 1.4 (cont)

The fire-detection system has not failed in response to facility operating conditions in the past three years.

The total percentage of time that the four components were not capable of accomplishing their individual safety functions was .029%, (75 hours in three years).

Support systems for the fire-detection system have also been 100% available for the past three years.

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