

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: Increment 1 and 3 Room Ventilation Systems

System Classification: Safety Class (Some components of this system are Safety Significant)

System Safety Function: The safety function of the Increments 1 and 3 room ventilation systems is to protect the environment and the public from exposure to radioactive materials. The room ventilation system's direct potentially contaminated room air through the ventilation system's ducting to the associated final two-stage HEPA filter plenums before releasing filtered air to the environment. (See Building 332 SAR, Section 4.3.1.1)

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.

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, Operational Safety Plans, 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 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 of surveillances, tests, inspections, maintenance, or repairs, for the room ventilation systems. Work is under way to replace the fume hood exhaust (FHE) ducting which is part of the room ventilation system. The existing FHE ducting shows evidence of stress corrosion cracking at some weld locations. Seismically qualified cuffs are in place as an interim fix.

It should be noted that one of the Increment 1 supply fans (ACU-4) was replaced to help meet the ten to fifteen year facility life expectancy. The other Increment 1 supply fan (ACU-3) is scheduled for replacement in FY02.

The criteria within question VSS-1.2 were met for Increment 1 and 3 room ventilation systems surveillances, tests, inspections, maintenance, repair, and the upgrade projects. All elements are managed and 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 Increment 1 & 3 room ventilation systems. Elements of this program are daily operational inspections, quarterly maintenance conducted by qualified plant engineering personnel, monthly vibration measurements, and periodic duct inspections.

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 Increment 1 and 3 room ventilation systems are operable and available to fulfill their safety function when required.

Answer VSS 1.4 (cont)

In the past three years, Increment 1 and 3 room ventilation systems have not failed to meet their test acceptance criteria.

In the past three years, the Increment 1 ventilation system has failed to meet the fully redundant operational requirements one (1) time. The failure of both exhaust fans resulted from an incorrect electrical breaker setting and an incorrect operational approach. Both items have been corrected.

Other than this one incident, the Increment 1 ventilation system has not failed in response to facility operating conditions.

Increment 3 has failed to meet the fully redundant operational requirement one (1) time in the past three years. The failure resulted from a fan motor failure.

Increment 1 was not capable of accomplishing its safety function, corridor to atmospheric pressure of $-0.05''$ W.G., for a total of 45 minutes over the past three years.

Increment 3 ventilation system was capable of accomplishing its safety function, corridor to atmospheric pressure of $-0.05''$ W.G., 100% of the time for the past three years.

The criteria within question VSS-1.4 were met for the operability of both systems.