

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: Hydrogen Gas Control System

System Classification: Safety Significant

System Safety Function: The safety function of the hydrogen gas control system is to protect facility workers from the effects of a hydrogen explosion by preventing the explosion. (See Section 4.4.6.1 of 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.

Line Managers are responsible for understanding the VSS safety functions. System responsible individuals are trained on the completion of a checklist that ensures the safety system is capable of performing its safety function prior to each run.

Answer VSS 1.1 (cont)

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

In the Integrated Chemical Operation Procedure (ICOP) is a checklist that is performed prior to each run. The checklist verifies that the system is functioning properly and is available to perform its safety function. In addition, daily room checks verify the room hydrogen gas concentration meter is powered up and on the correct scale.

Administrative Control Procedure (ACP-B332-021) provides guidelines for obtaining facility approval prior to conducting hydrogen experiments.

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 surveillances, tests, inspections, maintenance, repair, or upgrades for the hydrogen control system.

The criteria within question VSS 1.2 were met for hydrogen gas control system surveillances, tests, inspections, maintenance, repair, and 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*

Answer VSS 1.3 (cont)

(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.

After software changes to the HYDOX control system, a validation and verification (V&V) of the safety software is performed. This V&V is documented and filed in the HYDOX Q/A file. Also, daily room checks are utilized to ensure the hydrogen concentration meter is powered up and on the correct scale and the hydrogen concentration in the room is less than 4% by volume.

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 hydrogen control system is operable and available to fulfill its safety function when required. In the past three years, the hydrogen control system has not failed its test acceptance criteria; nor has it failed in response to facility operating conditions.

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