Assessment of Operational Readiness of the 242-S Confinement Ventilation System

Site: Office of River Protection, Hanford

Facility: Tank Farms

System: 242-S Evaporator Confinement Ventilation System

System Classification: Required for Standby Operation (Safety category not defined)

System Safety Function: To safely maintain the building in "Standby." The 242-S building exhaust system is operated to maintain a negative pressure on the 242-S building process areas (inflow of air from the cleaner areas of the building into the more contaminated areas).

OBJECTIVE:

VSS-1 **This vital safety system is operational and personnel and processes are in place that ensures its continued operational readiness.**

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. (Review Approach items 1, 2, 3 and 7)

Discussion of Results –

The 242-S Facility Shutdown/Standby Plan (SD-WM-SSP-002, Rev. 0) does not classify the building exhaust system as a safety system. The Operational Specification Document (OSD-T-151-00015, Rev. B-12) defines the requirements for the building exhaust system. System design media exists and the configuration is maintained in accordance with procedures. The majority of drawings for the facility are not computerized aided design (CAD) files. System testing is performed as required by the Shutdown/Standby Plan and the OSD. The system is operable to perform its safety function.

As defined in the Interim Control Strategy the ventilation system is credited with preventing the accumulation of flammable or toxic gases in the 242-S building process areas due to steady-state releases during normal operations. The ventilation system keeps a negative pressure on the process areas within the structure and provides HEPA filtration of the building exhaust before its release to the environment. This strategy was developed in response to an Unreviewed Safety Question Evaluation (TF-98-0785, Revision 2) for six miscellaneous facilities, including the 242-S facility.

An authorization basis (AB) amendment has been provided to ORP that will bring the 242-S facilities requirements into the FSAR and will subsequently void the standby/shutdown plan. The AB amendment specifies that the exhaust ventilation system need not be operable, due to further analysis of gas accumulation rates.

The conversion of existing drawings to computerized drawings is needed for this facility and would facilitate the incorporation of outstanding Engineering Change Notices. The existing hand generated drawings are not readily updated when facility changes are completed. This facility's design media, when updated, will provide safer working conditions for the staff.

Necessary and adequate procedures and policies are in place and have been effectively implemented supporting the conclusion that management understands their responsibilities.

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. (Review Approach item 6)

Discussion of Results –

Testing is accomplished at the frequencies established by the preventive maintenance program.

There is one (1) corrective maintenance package on the work schedule for routine maintenance of equipment (tightening of the belts – routine operation). There are zero surveillance tests or preventative maintenance items in the backlog.

One of the major contributors to the system not being available was the failure of the exhaust fan motor (a replacement motor was procured, but the mounting plate and belt/drive issues had to be resolved). Another major contributor to system downtime was the failure of a differential pressure instrument (no longer manufactured and no spare part available). The 242-S building process equipment is shutdown and flammable gas generation is at a minimum, so the shutdown time period had no substantial impact on the accumulation of flammable gases. Radiation surveys of the building are routinely performed and doors to the process area are sealed with tape when the building (process area) exhaust system is non-operational. These surveys found no spread of contamination occurred during the exhaust system shutdown period. In addition, the stack monitoring system has not indicated any release to the environment.

The system is maintained in operational status.

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

Discussion of Results –

The maintenance program is well established and procedures are in place. The operators review the exhaust system performance daily (routines). Configuration management of fieldwork and/or modifications is performed per procedures. The Shift Operations Manager is responsible for maintaining the system in operational status. The facility is an unmanned facility.

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

Discussion of Results –

The system is operable to perform its safety function. Individual component failures are occurring and have the potential for increasing slightly as the system ages (20 shutdowns during the three-year evaluation period). The overall system availability to perform its safety function is currently greater than 86.5% of the period evaluated. The system performs its confinement ventilation (HEPA filters are operable) safety function 100% of the time. The active ventilation system is operable and performs its removal of flammable gas safety function 86.5% of the time. No stack alarms were experienced during the evaluation period, which indicates that the exhaust system didn't allow any radioactive particulate to be released. The stack monitoring system is operable when the exhaust system is operating.

Electricity is the only utility system required by the 242-S building's exhaust ventilation system. In addition, the associated stack monitoring system and differential pressure alarms need electricity to function. Operators monitor the status of the facility's exhaust ventilation system.

CONCLUSIONS:

The 242-S building exhaust ventilation system is performing its safety function. The HEPA filters have not needed to be replaced and are performing the intended safety function.

The availability of the 242-S exhaust system is a minimum of 86.5%. The system is performing its confinement ventilation (HEPA filters are intact) and flammable gas removal functions.

An AB amendment has been provided to ORP that will bring the 242-S facilities requirements into the FSAR and will subsequently void the standby/shutdown plan. The AB amendment specifies that the exhaust ventilation system need not be operable, due to further analysis of gas accumulation rates.

Assessment of Operational Readiness of the
242-S Confinement Ventilation System

Upon approval and implementation of the AB amendment safety systems will need to have the role of each unique piece of equipment defined. These requirements are to be defined within the RPP Safety Equipment List.

The conversion of existing drawings to computerized drawings is needed for this facility and would facilitate the incorporation of outstanding Engineering Change Notices. The existing hand generated drawings are not readily updated when facility changes are completed. This facility's design media, when updated, will provide safer working conditions for the staff.

In addition, boundary drawings are needed to help clarify the safety systems within the facility and the interfaces to supporting structures, systems and components.

DOE employee who reviewed this assessment DOE Review Team Date 2/28/01
(*See below)

Hours required for completing the assessment.

DOE: 40 Hrs.

Contractor: 82 Hrs.

*Harkins, BA
Harp, BJ
Harwood, RG
Marcos, N
Noorani, YG
Sullivan, RS
Trenchard, GD
Wade, KG
Williamson, BI
Wright, T