

Interoffice Communication

Environment, Safety, Health & Assurance

640 TASF
PH: 515/294-4161

Date: August 19, 2013
To: Shawn Nelson
Terry Herrman
From: Julia Sager, CIH CSP
Industrial Hygiene Manager, ESH&A

Subject: Annual Document Review of Activity 30411.003

Executive Summary

On June 4, 2013, I completed the annual review of documentation required by the Safety Analysis Document (SAD) for Activity 30411.003, *Hydrofluorination of Rare Earth Oxides*. Section 6.2.10.7 of the SAD reads, "Documentation must be provided that ensures this system has been audited for compliance with the requirements of this SAD; particularly the engineering/system design standards outlined in Section 6.1." In response to a concern in the Vital Safety Systems Review of 2001, this review is done annually.

This review included the operations manuals, maintenance logs, and run sheets maintained by the line management of this activity. Trevor Riedemann, Assistant Scientist, provided a completed self-assessment matrix, access to the area, and access to all documents. In addition to this annual document review, the SAD itself was also reviewed and updated by Terry Herrmann. The draft of this update was reviewed.

This year's Review finds the Activity to be compliant with requirements, considering the corrective actions noted below.

Documents Reviewed

The documents reviewed for this investigation included:

- Standing operating procedures
- MPC Self-assessment for Activity 30411.003, Hydrofluorination of Rare Earth Oxides, dated 5/30/13
- Run Data Sheets dated from April 2012 to June 4, 2013
- Cylinder Change Check Lists dated from April 2012 to June 4, 2013
- Calibration Sheets dated from April 2012 to June 4, 2013
- MSDS for hydrogen fluoride
- The signs and placards inside and immediately outside of MD Room 147

Exceptions

The following exceptions were self-reported by MPC line management.

- (1) *The integrity of all welds and connections for highly toxic gas distribution systems must be tested by inboard techniques before the line is used, after any modifications to the line, and at least every two years (corrosive lines annually) if the line has not been altered. (6.1.1.16.1,2)*

The line management self-assessment identified a lapse in the annual weld test/helium leak check on May 15, 2013. In response, MPC moved to a stand-down position, and completed corrective actions as outlined below.

- (2) *A preventive maintenance schedule for the HF monitors and support systems is strictly followed.(6.2.6.1.2). The Standard Operating Procedure (6.0 Maintenance and Inspection Schedule) specifies that the HF sensor receive a "Zero" calibration every 60 days and a "Span" calibration every 90 days as prescribed by the manufacture of the HF sensor. Current practice is to perform both Zero and Span calibrations on a 60 day cycle.*

The document review revealed that there was a single instance lapse on a 60 day calibration cycle, thus resulting in a nearly five-month period between Zero calibrations and a two-month period between Span calibrations of the HF sensor. This was also self-identified by line management, and corrective actions were taken as outlined below.

The following exception was identified in the document review.

- (3) *It shall be verified that the SOP and its support documents (e.g., authorized personnel lists, MSDS, etc.) are current. (6.2.9.1.3)*

The HF MSDS was superseded by a GHS-compliant SDS in March of 2013, but the SOP binder had not been updated.

Modifications

The Safety Analysis Document in effect during the review cycle ending June 24, 2013 specified that the gas cabinet should have a face velocity at all openings of 80-120 fpm face velocity, citing ANSI Z9.5-1992 as follows:

6.1.3.7 Ventilation to all system enclosures shall maintain an average face velocity of 80-120 fpm, with no face velocity measurement more than plus or minus 20% of the average (ANSI Z9.5-1992).

This ANSI Standard has been superseded by ANSI Z9.5-2012. In recognition of an overwhelming body of research that suggests that face velocity is nearly completely unrelated to the capture performance of a hood, the newer standard is less prescriptive in terms of face velocity, but more performance oriented in terms of demonstrating containment. The language in the new ANSI standard with respect to face velocity reads:

6.1.1.5 Face Velocity Tests

Once adequate performance has been established for a particular hood at a given benchmark face velocity using the methods described above, that benchmark face velocity is used as a periodic check for continued performance....

The “methods described above” include airflow visualization tests (smoke testing), Cross-Draft Velocity tests, and exhaust flow measurements.

In recognition of this change in assessment recommendations, and applying the best professional judgment of the industrial hygienist, the following minor modification to the ventilation system assessment requirement listed in 6.1.3.7 was made. The 2013 update to the Safety Analysis Document is expected to incorporate this change.

6.2.9.5.1 Smoke testing (Modified Requirement)

The gas cabinet was found to pass a smoke test, which meets the new standard as well as the intent of the previous one. This modification is more protective than the previous standard.

Corrective Actions

The following Corrective Actions were taken in response to the exceptions described above. All exceptions have been adequately addressed and there are no pending corrective actions required.

Corrective Action to Exception (1)

A helium spectrometer leak-check was performed. A minor leak at a valve fitting was discovered and corrected. No leaks at weld joints were found. This test was conducting using R. Prozorov's spectrometer.

Corrective Action to Exception (2)

During the transition of responsibilities in the MPC, the continuity of preventive maintenance lapsed. This was identified and self-reported during the annual line management review of the process. The previous process of scheduling via Google calendar has been enhanced; pre-event notices or "pop-ups" are pushed to the calendar users, in addition to adding PM items to the group's weekly status meeting to prevent recurrence. However, since a very similar exception was noted in the annual review conducted in 2012, a management meeting was called in order to further discuss and evaluate the conditions that led to the lapse.

Corrective Action to Exception (3)

The GHS-compliant SDS was provided by email to Trevor Riedemann for inclusion in the laboratory documentation, and he confirmed receipt.

Event Categorization

On August 8, 2013, the Event Categorization Team met was held to discuss the matter of continuity of preventive maintenance. Team members attending included:

Mark Murphy	Chief Operations Officer
Tom Wessels	ESH&A Manager
Larry Jones	Activity Supervisor
Mike Vaclav	Facilities Services Group Representative
Shawn Nelson	ESH&A Assistant Manager
Jeff Bartine	Safety Specialist

Julia Sager, Industrial Hygiene Manager, attended as well in order to review her findings with the group.

Larry Jones brought data indicating that the lapse represented missing a single scheduled bimonthly calibration. Discussion indicated that the individual responsible for conducting the preventive maintenance had already been counseled with a memo to file regarding the omission. He also pointed out that the Safety Analysis Document specified a 60-day interval for system zero of the HF Sensors, and a 90-day interval for span calibrations; this makes it more difficult to track the two requirements.

The event was categorized as a failure of initial corrective actions. The event is not reportable as an ORPS, NTS, ISC or CAIRS. It is an Ames Local-ORPS for tracking corrective actions.

Conclusions

Follow-up confirmation of compliance with HF sensor calibration schedule will be conducted by ESH&A. Shawn Nelson will add a reminder checklist item to the ALCATS database.

The current status is that all corrective actions have been taken, and thus this year's Review finds the Activity to be compliant with requirements at this time.