



August 29, 2011

AET 11-0044

ATTN: Document Control Desk
Ms. Catherine Haney, Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

American Centrifuge Lead Cascade Facility
Docket Number 70-7003; Materials License Number SNM-7003
NRC Event Report # 47014

Dear Ms. Haney:

Pursuant to 10 Code of Federal Regulations (CFR) 70.50(c)(2) and Section 1.2.5 of the License Application for the American Centrifuge Lead Cascade Facility (Lead Cascade), Enclosure 1 provides the required 60-day written event report pertaining to safety equipment failure. It was determined on July 1, 2011 that the X-3001 Lead Cascade battery room Hydrogen Monitoring system became de-energized and no redundant equipment was available to perform the required safety function. The Hydrogen Monitoring system is credited as an Item Relied On for Safety (IROFS) for the Lead Cascade. Enclosure 2 contains a list of commitments made in the report.

Should you require additional information regarding this event, please contact Terry Sensus at (740) 897-2412.

Sincerely,

Daniel W. Rogers
General Manager, American Centrifuge Plant Operations

Enclosures: As Stated

cc: J. Calle – NRC RII
J. Downs – NRC HQ
D. Hartland – NRC RII
O. Siurano – NRC HQ
B. Smith – NRC HQ

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Enclosure 1 to AET 11-0044

60-day Written Event Report For NRC Event # 47014

**Information contained within
does not contain
Export Controlled Information**

Reviewer: G. Peed

Date: 08/26/2011

NRC Event #47014

Description of Event

At approximately 0950 on June 11, 2011, the X-3001 Lead Cascade battery room Hydrogen Monitoring system (Manufacturer: RKI Instruments; Model #: 73-1021RK-01) became de-energized and no redundant equipment was available to perform the required safety function. This equipment met the defined IROFS Failure Criteria and the associated Compensatory Measures were not taken. The failure of the Hydrogen Monitoring system with no redundant equipment available to perform the required safety function was determined to be reportable to the NRC in accordance with 10 CFR 70.50(b)(2) at 1451 on July 1, 2011, after a review of an initial engineering report on the impact of a June 11, 2011 loss of power.

Also during the June 11, 2011 loss of power, the X-3001 Lead Cascade battery room Forced Air Ventilation became deenergized. The battery room Forced Air Ventilation is credited as an IROFS for the Lead Cascade. Per IROFS Surveillance 012 (IS-012), this is not reportable under 10 CFR 70.50(b)(2) because it did not meet the defined IROFS Failure Criteria. Failure of this IROFS is defined as a loss of ventilation capability and the battery room hydrogen concentration level exceeding 4 percent hydrogen in air. Calculations show that under worst case conditions (equalizing battery charge at 105°F) it would take 96 hours of hydrogen accumulation to reach the Lower Flammability Limit of 4%. During the loss of power, the battery room ventilation was unavailable for only a few hours (less than 9 hours) and the initial hydrogen concentration was less than 1 percent prior to the event.

Probable Cause of the Event

The root cause of the event's reportability was the fact that the failure criteria for the IROFS surveillance for the Hydrogen Monitoring System, IS-039, related to ISA 7.3.3.6, Battery Room Hydrogen Monitoring, was not written adequately. The surveillance did not account for a momentary loss of power or loss of monitoring for any reason or any period of time. Had the surveillance incorporated all of the technical basis for the Hydrogen Monitoring system, unavailability of the hydrogen monitors could have been tolerated for a period of time before the system needed to be restored or other compensatory actions needed to be taken. For example, IS-039 for the Hydrogen Monitoring System stated that an IROFS failure would result if the Hydrogen Monitoring System failed to function (no hydrogen monitors are functioning), therefore, a loss of power would be an immediate IROFS failure. From design basis calculations, the time required for hydrogen to generate to different concentrations in the battery room volume is shown in the following table:

| Battery String | Equalize Charge H ₂ Generation | |
|------------------------------|---|----------|
| | 95°F | 105°F |
| H ₂ Concentration | | |
| 1% | 36 hours | 24 hours |
| 2% | 72 hours | 48 hours |
| 4% | 144 hours | 96 hours |

Consequently, the IROFS surveillance did not take into consideration these design analysis calculations and, therefore, was written especially conservative.

Corrective Actions

Actions Completed

1. On August 3, 2011, the Technical Services Organization revised IS-039 to address the engineering evaluation for the battery system and hydrogen accumulation to address the fact that there are times that the hydrogen monitor will not be supplied power.

Actions In Progress

1. By September 30, 2011, the Technical Services Organization will develop a Lessons Learned document and share with the personnel responsible for developing, reviewing, and approving IROFS surveillances. This required reading will assure that future surveillances are developed to adequately take into account the operation, maintenance, and technical basis for the surveillance as well as contingent equipment and processes available. The Technical Services Organization will also review the IROFS surveillance development procedure and evaluate any changes due to this Lessons Learned.
2. By October 31, 2011, the Technical Services Organization will review the technical basis for all other IROFS surveillances against the lessons learned generated to determine if there are any other surveillances that need to be revised.

Extent of Exposure of Individuals to Radiation or to Radioactive Materials

There was no release of radioactive material nor any personnel exposures associated with this event.

Lessons Learned from the Event

Surveillances should be developed to adequately take into account the operation, maintenance, and technical basis for the surveillance as well as contingent equipment and processes available.

Enclosure 2 to AET 11-0044

List of Commitments

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**Reviewer: G. Peed
Date: 08/26/2011**

NRC Event Report # 47014

List of Commitments

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