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Subject: Blue Alert- Flammable Gas Generation

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IDENTIFIER KH-00-001.IO DATE January 14, 2000

LESSONS LEARNED- The identification of flammable gas generation hazards in individual areas (tanks/pipes, waste containers, etc.) should indicate the need to consider the cumulative scope of the problem and the benefits of a comprehensive resolution with a central responsibility. Mitigation of the initial finding should consider a complete and systematic approach to resolve the problem wherever it may have the potential to occur. Establish centralized management responsibility (owner and technical infrastructure procedures) to coordinate actions for flammable gas generation and accumulation issues.

DESCRIPTION- The hazard involved with generation of flammable gases from chemical and radio-chemical processes is well known and documented throughout the DOE complex. The generated gas of concern is usually hydrogen. Actinide solution tanks, pipes, waste containers, and other vessels may contain previously unrecognized flammable or explosive concentrations of gases.

ANALYSIS- After the 1989 curtailment of process operations at the Rocky Flats Environmental Technology Site (RFETS), radioactive actinide solutions and other material forms were stranded in systems and containers that were never intended for long-term storage. Commissioned studies identified the concern with accumulation of flammable gases under these conditions and recommendations were followed. However, subsequent sampling revealed unexpected concentrations in some locations, and further mitigative actions were required. Problems may also develop with gas accumulation in waste packaging configurations such as poly bottles, poly bags, and drums, where potentially flammable or explosive concentrations could accumulate without adequate venting. These conditions should be analyzed for the development of adequate controls.

The following problem areas should be considered

- * Drum vent blockages (i.e., corrosion and Tamper Indicating Devices)
- * "Overpack" venting requirements
- * Vent filter flow testing requirements
- * Characterization of gas generating Item Description Codes (i.e., sludges)
- * Sealed containers inside and outside of drums (i.e., produce cans, sealed jars)
- * Inadequate inner package venting (i.e., liners, plastic bags, etc.)

RECOMMENDATIONS- When hazards are identified in seemingly unique areas or processes, they should be reviewed in depth to determine if the same or similar conditions might be possible elsewhere. Contingency planning should be considered where activities or processes might enter unanticipated periods of suspension that create new hazards.

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DOE FUNCTIONAL CATEGORY Fire, Firearms & Explosives
WORK ACTIVITY Material Storage
HAZARD Fire, Firearms & Explosives
REFERENCES NTS-RFO--KHLL-PUFAB-1999-0002

FOLLOW-UP ACTIONS- Information in this report is accurate to the best of our knowledge. As a means of measuring the effectiveness of this report, please notify the contact of any action taken as a result of this report or of any technical inaccuracies you find. Your feedback is appreciated.