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Subject: Yellow Alert: Aging Facilities Issues

Identifier: MD L00-115 Date: 05/08/00

**Title: Yellow Alert-Aging Facilities Issues**

**Summary:** Old, unused systems can become fragile and behave in unexpected ways.

**Discussion:** On May 2, 2000, at the Mound Plant in Miamisburg, OH, a Nupro B-4H2 valve failed when an engineer checked to assure it was closed during the conduct of a valve line-up in HH Building, releasing 0.07 curies of tritium into the atmosphere. The system in HH Building was shut down in 1992 and was left idle until 1999 when the D&D effort began on the building. When the valve broke the engineer quickly taped the valve and rigged a suction line to the Tritium Emissions Reduction Facility to capture the escaping tritium.

**Analysis:** The valve was made of brass and had been installed 20-25 years ago. When the valve stem was turned, resistance seemed very low. The valve was immediately inspected and it was found that the valve stem had broken at the bellows-body seal. Closer examination showed that a soft solder (lead-tin) joint had failed. A visual examination of the failure joint revealed that much of the break was oxidized, with only a few bright spots indicating the areas that had broken during the recent effort to turn the valve. The probable cause of the break was a cold solder joint that had degraded over time.

**Resolution:** It should be anticipated that long-idled systems may no longer operate as expected. Valves and other mechanical systems are subject to corrosion and other processes that can weaken them. When these systems are prepared for decontamination and demolition, work planners should look closely at the mechanical systems, evaluate what might occur should they fail, and have established plans of action to address the such failures should the system malfunction.

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