

# Information Bulletin

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**Title:** Criticality Safety Problems

**Date:** April 6, 2006

**Identifier:** 2006-RL-HNF-0012

**Lessons Learned Summary:** Violating criticality safety rules can lead to inadvertent criticality, which probably cause serious injury or death.

**Discussion of Activities:** This document summarizes several recent problems with full compliance with criticality safety specifications. While some of these issues may seem administrative, they reflect degradation from full compliance with accepted criticality safety requirements.

1. Samples of liquid were drawn from the drain line in the 232-Z scrubber cell without having been analyzed in the applicable criticality prevention specification or authorized in the approved work package for that job.
2. In early summer 2005, the PFP Projects organization initiated a work package to disconnect the water lines to two glove boxes that required periodic inspections because they were connected to fire suppression water. The new glove box configuration would require changes to several existing procedures. The work package was designed to coordinate the release of the procedures with the physical work to disconnect water to the glove boxes. The work package was shelved before any work was started but the changed versions of the procedures that deleted periodic inspections of the glove boxes were released.
3. New requirements for applying measurement uncertainty to fissile mass values for uranium-235 in 3013 containers dictated that the values be recalculated. Recalculation of fissile masses determined that nine 3013 containers exceeded the posted limit by more than 100 grams. In one instance, a single cubicle held more than one container that was calculated to exceed the Criticality Safety Posting limit.
4. During Decontamination and Decommissioning (D&D) of the 26-inch Vacuum system, a section of 6-inch diameter pipe was discovered to contain enough plutonium that, if removed, could exceed both Criticality Safety and Safety Basis accident assumptions. Past experience indicated that a horizontal pipe run would contain a 1/4-inch thick layer of caked powdery plutonium material in the bottom of the pipe but the D&D team discovered a six-foot length of pipe 75 to 90 percent full of highly radioactive hard pumice-like material.

**Analysis:** Events 1 and 2 occurred when work was performed outside the scope of governing documents. Event 3 occurred because new more restrictive requirements were invoked. Event 4 was the result of as-found quantity of fissile material exceeding estimated amounts.

**Recommendations:** Facilities with criticality concerns should ensure that all assigned

personnel have due regard for the necessity of following criticality prevention specifications. Their lives may depend on it.

As with other safety rules, facility personnel must constantly be aware of changing conditions and take corrective action when the situation challenges the limits assumed in the governing documents.

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**References:** PFP Critique CRTm-PFP-2006-005

Occurrence reports:

EM-RL--PHMC-PFP-2005-0027

EM-RL--PHMC-PFP-2006-0002

EM-RL--PHMC-PFP-2005-0013