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BLUE - Hinge on Cabinet Door Causes Acid Spill in the Research Technology Laboratory

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Lesson ID: 2014-LL-PNNL-0038 *(Source: User Submitted)*

Originating Organization or Contracting Company: Pacific Northwest National Laboratory

Date: 12/22/2014 **Contact:** Lessons Learned/Operating Experience Program Manager, Patti Ammonet (509) 375-2275

Classifier: **Reviewer:**

Statement: According to PNNL requirements, bottles of oxidizing agents such as nitric acid must be segregated from other incompatible chemicals in storage and be kept in secondary containers in case of a spill. Avoid placing tall bottles in the vicinity of exposed extended arms of cabinet-door hinges that move across the interior or exterior of the cabinet when the door is opened or closed. An exposed arm means taller bottles placed in the arm's travel path can be hit or jarred and potentially broken. Before entering a laboratory space for a walk-through or inspection, read the hazards awareness summary and comply with the requirements.

Discussion: When bottles of nitric acid were found stored in a cabinet near a bottle of concentrated hydrochloric acid (HCl) during a waste accumulation area assessment in the Research Technology Laboratory (RTL 520), a member of the assessment team rearranged the containers to comply with HDI safety requirements. As he closed the cabinet door, the extended arm of the hinge knocked the bottle of HCl onto the floor, causing it to break and spill. Staff members in adjacent spaces were evacuated to another location within RTL 520 until monitoring indicated it was safe to return. No one was injured.

Analysis: While inspecting a corrosive materials cabinet during a waste accumulation area assessment in RTL 520, a team member noticed several containers of nitric acid stored on the same shelf as a 2-liter bottle of concentrated HCl. Per PNNL requirements for proper chemical storage, he segregated the bottles of nitric acid on one side of the shelf away from the HCl, planning to provide secondary containment for them later to prevent mixing in the event of a spill.

After moving the bottles, the staff member started to close the cabinet door when the arm of the closing mechanism struck the taller bottle of HCl and knocked it out of the cabinet. The bottle shattered, splashing about 5 ml of acid on his pants and shoe, which he quickly washed off. The incident was reported. It served to emphasize the hazards posed by the cabinet's hinge mechanism (see photo above).

Recommended Actions: Because nitric, hydrochloric or other mineral acids can be hazardous if unknowingly mixed together, chemical users need to follow PNNL requirements for handling, storing, labeling and using chemicals.

Safety & Health Representatives, Field Service Representatives, Cognizant Space Managers, Researchers:
* Be aware of closing mechanisms on the interior of storage cabinet doors. Different models of chemical storage cabinets have different hinges/closing mechanisms. Be alert to those with arms that swing out into the interior of the cabinet when opening and closing and make sure bottles that are tall enough to be hit are out of the path of the mechanism. Report chemical spills and other incidents.
* Store incompatible chemicals properly. Store chemicals in systems appropriate for the hazards they pose and segregate incompatible chemicals, providing secondary containment to prevent damage from leaks or spills. Follow all other requirements for appropriate storage facilities, quantities to store, labeling and other particulars.

Savings: N/A

Keywords: SPILL, ACID, ACID SPILL, CORROSIVE, SEGREGATE, INCOMPATIBLE CHEMICALS

Hazard(s): Materials Control, Personal Injury / Exposure - Hazardous Material (General)

ISM Code(s): Feedback and Improvement

Work Function(s): Material - Material Storage

References: N/A

Priority Descriptor: Blue / Information

Attachments:
2014-LL-PNNL-0038.pdf

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