

Date: Tue, 07 Apr 1998 09:16:35 -0500
From: Meredith Brown <racer@lanl.gov>
Subject: Red Alert: Injury in Air Handling Unit

Title: **Personal Injury in Air Handling Unit**

Identifiers: 1998-CH-AMES-0001
Date: April 2, 1998

Lesson Learned: The following Lesson Learned is issued to provide preliminary information on the protection of workers performing work in close proximity to mechanical power transmission apparatus.

The safeguarding of HVAC equipment by use of an enclosed location does not necessarily prevent exposure to the unguarded motion hazards found within that enclosed location. Access into these areas should be restricted to trained personnel who are aware of the hazards present, that are provided with appropriate tools and safety equipment, and who perform tasks in accordance with established entry procedures. Alternatively, ensure that all motion hazards are fully safeguarded. See American Society of Mechanical Engineers (ASME) B15.1, "Safety Standard for Mechanical Power Transmission Apparatus" for additional information.

29 CFR 1910.219(c)(4)(i) permits a shaft end to project not more than one-half the diameter of the shaft unless guarded by a non-rotating cap or sleeve. However, 29 CFR 1910.219 is based on the 1953 edition of ASME B15.1. The most current (1996) edition of ASME B15.1 no longer makes reference to this practice. This practice has not existed in ASME B15.1 since 1972. Sole reliance on the requirements of Subpart O, "Machinery and Machine Guarding," of the OSHA General Industry Standards should be avoided. The American National Standards Institute (ANSI) B11 machine tool safety standard series, and ASME B15.1, provide supplemental information that represents current industry practices for protecting employees from mechanical equipment hazards.

The referenced ANSI and ASME standards can be ordered through <http://www.ansi.org>.

Discussion of Activities: Two employees went to the basement of an administration building to evaluate a duct smoke detector that had initiated a fire alarm earlier in the day. The detector was located inside the supply fan room of the air handling unit. The fan was turned off by the employees at the control panel located outside the supply fan room, but both entered before the fan had come to a complete stop. One of the employee's came in contact with the exposed end of the still-rotating 3 inch diameter shaft. The exposed shaft end projects 1-7/8 inches. The force of the rotating fan entangled the employee clothes. Severe injuries resulted to both of the employee's arms due to constriction of the clothing, and to the head and neck due to contact with stationary equipment. The injured employee was airlifted by helicopter to a regional hospital where he is listed in critical condition.

Analysis: A Type B Accident Investigation Board was appointed on March 30, 1998 by the Chicago Operations Office Manager in accordance with DOE O 225.1A, "Accident

Investigations." The Board has been on-site conducting the investigation since March 30, 1998. Final determinations on the accident are pending completion of the investigation.

A preliminary finding identified during the investigation is that even though electrical power is disconnected (and locked out) to the motor for an air handling unit, pressure differences within the HVAC system can cause the fan to rotate at significant speed.

Recommended Actions: The contracting officer directed the installation of appropriate safeguards to the motion hazards found in the supply fan room where the accident occurred. In addition, the contracting officer requested that all remaining mechanical power transmission apparatus be evaluated to identify other existing motion hazards.

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Authorized Derivative Classifier: Not Applicable

Originator: Justin T. Zamirowski, Chicago Operations Office, Safety and Technical Services Deputy Director, (630) 252-2248

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Priority Descriptor: RED/URGENT

Functional Category: Worker Process Keywords: Machine Guarding, Injury

References: Occurrence Report, CH-AMES-AMES-1998-0002 Meredith Brown ESH Lessons Learned Program Manager 505 667 0604