



Physics Division

ESH Bulletin 98-7

ACCESS CONTROL PROBLEMS AT BROOKHAVEN NATIONAL LABORATORY

On June 6, 1998, at the Brookhaven National Laboratory Alternating Gradient Synchrotron, the operations coordinator placed the synchrotron ring in the beam-enabled state while a technician was still inside the ring. The gate watch mistakenly believed that the technician had signed out when he told the operations coordinator that all personnel were out of the ring, and the operations coordinator decided to forego a three-man sweep of the accelerator. The three-man sweep is required before placing the ring in the beam-enabled state. The synchrotron is a proton accelerator, and the ring is a high-radiation area when the proton beam is present. Failure to provide adequate access control to high-radiation areas increases the risk of personnel exposure to ionizing radiation. (ORPS Report CH-BH-BNL-AGS-1998-0003).

Investigators determined that 52 technicians signed in with the gate watch to perform work inside the accelerator ring and signed out before the lunch break. The operations coordinator decided to maintain access control to the ring by placing it in the beam-enabled state while all personnel were having lunch. Before allowing the beam-enabled state to

be entered, the operations coordinator conferred with the gate watch who stated that all technicians had signed out of the ring. However, he did not know that one technician remained inside the ring. When the operations coordinator placed the ring in the beam-enabled state, the technician inside the ring observed that the lights had dimmed. He recognized this as the visual signal that the ring was in the beam-enabled state. The technician used a telephone located inside the ring to alert personnel outside the ring, and they opened the south gate so he could exit. Investigators later determined that the gate watch did not realize that the name he saw on the gate log indicating the technician had exited the ring was written in error by another tech and lined out. Planned corrective actions include retraining the accelerator staff on access procedures and changing the gate log to require two signatures (the technician leaving the ring and the gate watch) for exit.

Accelerator operating procedures require a three-man sweep of the ring before the beam-enabled state can be entered if more than 25 people sign in. The operations coordinator's rationale for placing the ring in the beam-enabled state without performing a three-man sweep was that there was no planned beam injection, and beam injection was disabled with a radiation safety lockout/tagout. The operations coordinator was not the owner of the lockout/tagout.

NFS has reported inadequate access control in previous Weekly Summaries. Following are some examples.

- Weekly Summary 96-48 reported that a security technician at the Lawrence Livermore National Laboratory was hit in the eyes by the reflected beam from an operating class IIIB laser when he entered the room. Investigators determined that a lead experimenter had left the laser on overnight without meeting Laboratory safety requirements. Investigators found the laser power cutoff was not interlocked to the door, there was no alarm, and warning signs were not posted outside the door in violation of access control requirements for the room. (ORPS Report SAN-LLNL-LLNL-1996-0060)
- Weekly Summary 95-45 reported that a facility representative at the Hanford Analytical Laboratory discovered a hot cell that was posted as a high-radiation

area and unlocked. The high-radiation area was not controlled or locked, and unexpected exposure of personnel could have resulted. Corrective actions included revising procedures to improve access control and posting high-radiation areas. (ORPS Report RL--WHC-ANALLAB-1995-0031)

- Weekly Summary 94-22 reported that two journeyman electricians exited the Pulse Intense X-Ray Building at Los Alamos National Laboratory without proper authorization while pulse x-ray operations were being conducted. The electricians were instructed by the firing site leader to remain in the building while pulse x-ray operations were being conducted and stay there until he returned for them following an x-ray shot. Corrective actions included revising standard operating procedures to require positive control of personnel at the site and elsewhere at the facility and excluding non-facility personnel from inside the safety gate before machine operations. (ORPS Report ALO-LA-LANL-FIRNGHELAB-1994-0004)

This event underscores the need for effective access control to areas where hazardous conditions exist and demonstrates the importance of a strong radiological control program for all radiation areas. The operations coordinator failed to follow established access control procedures when he decided to forego the three-man sweep based, in part, on his reliance on a lockout/tagout that he had no control over. Therefore, defense-in-depth was lost.

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