

DETAILS

1. Persons Contacted

AP&L

- *N. S. Carns, Director of Nuclear Operations
- *R. A. Sessoms, Central Operations Manager
- *T. C. Baker, Technical Assistant
- *J. J. Fisicaro, Manager, Licensing
- *H. L. Hollis, Manager, Security
- *J. D. Jacks, Nuclear Safety and Licensing Specialist
- *E. E. Bickel, Superintendent Radiation Protection (RP) and Radwaste
- *R. Carroll, Health Physics (HP) Specialist, Nuclear Oversight
- *J. Dorset, Quality Assurance Supervisor
- *O. W. Cypret, Senior HP Specialist
- D. Snellings, Jr., Corporate Health Physicist

Others

- R. C. Smith, Task Leader, Babcock & Wilcox (B&W)
- R. V. Fite, Engineer, B&W
- E. A. Nickles, Nuclear Field Service Representative, B&W
- R. E. Gillispie, Field Engineer, B&W
- A. L. Stults, Daniels, Maintenance Support Group
- T. R. Rose, Nuclear Support Services

*Denotes those present at the exit meeting on December 14, 1989.

2. Reason for Special Inspection

On December 11, 1989, the licensee notified Region IV that it had identified an apparent violation involving a failure to follow procedures concerning the release of radioactive material from a controlled area and was initiating an investigation of the incident to determine the cause and effects of the apparent violation. The inspector obtained the following details through interviews with the individuals involved. Times given are approximate, unless otherwise stated.

On December 10, 1989, two contract workers (Individuals A and B), contacted an HP technician and asked him to assist them in obtaining seven control rod drive mechanisms flange covers (CRDMFCs) from the contractor's storage box in the licensee's "old radioactive waste building" (ORWB). The components of the CRDMFCs were shipped to ANO on approximately December 1, 1989, as low specific activity (LSA) material from Germany, where they were last used.

Aiding Individuals A and B was a maintenance support worker (Individual C) employed by another contractor. The HP and Individual C signed in on their respective radiation work permits (RWP) and entered the restricted

area surrounding the ORWB at approximately 3:30 p.m. and removed CRDMFCs components from the LSA container. All individuals interviewed stated that the HP technician performed surveys of the components, including taking them to a separate frisking area within the controlled area boundary. The HP technician determined that the components were not radioactively contaminated (less than 1000 disintegration per minute [dpm] per 100 square centimeters [cm²], removable activity) and released the parts to Individuals A and B, who had not entered the controlled area.

Individuals A and B took the parts to their office space located in the maintenance facility, a nonradiological controlled area, and Individual B began to assemble them with the help of Individual D, another contractor employee. Individuals B and D stated that they remained in the office area or nearby and did not enter other controlled areas for the rest of the day. Individual D was attempting to leave the protected area shortly after 7 p.m., when the portal radiation monitor alarmed. He made a second attempt after resetting the monitor. The alarm again sounded. He asked security personnel to contact HP.

HP arrived, performed surveys, and identified contamination on Individual D's jacket cuff. Besides the few hundred counts above background of general contamination, a discrete particle measuring approximately 20 nanocuries was found. A set of clothing normally worn under anti-C coveralls which Individual D had worn earlier, and later placed in his briefcase were also found to be slightly contaminated. The individual was taken for a body count and the results indicated a body burden of 0.3 percent maximum permissible for cobalt-60. The cobalt-60 was identified as external contamination. The individual's termination whole body count performed on December 14, 1989, did not identify any contamination.

When questioned by the licensee, Individual D stated that he had worked in the radiological controlled area earlier in the day, but had successfully passed through a high sensitivity personnel contamination monitor (PCM) afterward. Individual D then told HP of the work he performed on the CRDMFCs in the contractor office. Representatives from HP surveyed the area and found no contamination other than on the CRDMFCs and a small amount on a piece of tape. Individuals working in the area were directed to proceed for whole body counts. Those working on the night shift were counted first. Those on the day shift were directed to go when they arrived the next morning.

Individual B was the only person found with contamination. Contamination was found on his pants which he had also worn the previous day. Once the contamination was identified, HP surveyed his rental car, motel room, and clothing. General contamination was found on the shirt he wore while working on the CRDMFCs and a discrete source was found in the seat of his car and retained for analysis. The analysis determined that the source was approximately 24 nanocuries of cobalt-60.

Even though Individual A had carried most of the components of the CRDMFCs to the office, he was not found to be contaminated. He, like the rest of the day shift, was not surveyed (whole body counted) until the following day, but stated that he wore the same clothes as the previous day.

3. Discussion

During the interview, the HP technician responsible for performing the initial survey and releasing the components of the CRDMFCs on December 10, 1989, stated that on December 11, 1989, he re-surveyed the components plus others still in the storage box and found radioactive contamination ranging to 80,000 dpm per 100 cm². When questioned by the inspector concerning the apparent ease with which he and other HP technicians had found contamination following his initial surveys, he stated that he did not know why he had not discovered the contamination on the previous day, unless he had the disks spread similar to a deck of cards, slightly overlapping, and failed to do a thorough survey. He also conceded that he might not have surveyed as carefully because Individual B had told him (incorrectly) that the components were new and therefore not likely to be contaminated. The licensee stated that the health physicist had always been a competent worker.

The licensee's Procedure 1622.017, "Operation of a Control Point," Revision 5, sets forth in Section 7.6 the requirements for the unconditional release of material from a radiological controlled area. It does not allow the release of material which has removable beta or gamma contamination levels in excess of 1000 dpm/100 cm². The licensee identified to the NRC the apparent violation for failure to follow the requirements of this procedure and initiated corrective action. Because the apparent violation was self-identified and the licensee has taken effective corrective actions, the NRC has elected to use its discretion in accordance with 10 CFR Part 2, Appendix C, Section V.G.1 and not cite the violation.

During the interview, Individual C acknowledged that he had not performed a whole body frisk after completing work under RWP 892249 issued November 27, 1989, which covered work activities associated with minor maintenance, as required. Licensee representatives stated that they had determined that the reason the individual had not performed the frisk was because he had not read the RWP and was unaware that frisking was required. The licensee's Procedure 1000.031, "Radiation Protection Manual," Revision 9, requires in Section 6.7.2.B that all workers review and follow the RWP requirements. RWP 892249, under which Individual C was working, requires that all personnel perform a whole body frisk whenever exiting any radiological controlled area outside controlled access. Technical Specifications 6.10 and 6.11 for ANO Units 1 and 2 require that procedures for personnel radiation safety shall be adhered to for all operations involving personnel radiation safety. The failure to follow

procedures is an apparent violation of Technical Specifications 6.10 and 6.11 (313/8947-02; 368/8947-02).

Individual C had changed clothes in a break room assigned to his employer, before successfully clearing the portal monitors at the secondary guard house. The licensee stated that this area would be surveyed.

The licensee demonstrated to the inspector that a discrete source of the size of that was found in Individual B's rental car could pass through the portal monitors undetected. Currently, the portal monitors are calibrated to detect a source of 200 nanocuries in the centerline of the monitor and will detect smaller sources only if they are positioned sufficiently close to the detectors, as in the case of Individual D. During the interview, Individual B stated that he had gone through a portal monitor before exiting the protected area and there had been no alarm.

The inspector observed other possible ways radioactive contamination could be allowed offsite, by way of the secondary guard station. The inspector first noted that the portal monitors were positioned so that individuals could bypass them and exit through the turnstiles. The inspector determined that bypassing the portal monitors could go undetected by security personnel. The potential for this appeared less likely in the primary guard station because the portal monitors were arranged so that they could not be easily bypassed.

The inspector and a licensee representative also demonstrated that it was possible for an individual to step through the portal monitor too quickly to be surveyed, set off an alarm on the portal monitor (which automatically turns off after the next counting cycle), and still exit without being questioned by security personnel. Individual D stated that after he had repeatedly set off the alarm, he had to call to the security personnel present and ask them to contact HP. He further speculated that he could have left unimpeded. Licensee representatives stated that they were evaluating the repositioning of the portal monitors so that they might be more easily observed. The licensee's actions to ensure that all individuals leaving the protected area pass through the portal monitors and are observed by security personnel is considered an unresolved item (313/8947-02; 368/8947-02).

The inspector reviewed the results of dose calculations performed by the licensee which indicate the dose resulting from 12 hours of exposure to radioactive sources of about 20 nanocuries would be on the order of 0.673 rads to a small area of unshielded skin (0.079 rads if shielded by clothing). Whole body dose would be negligible.

As a result of this incident, the licensee has taken or plans to take the following actions:

- o The licensee has reviewed with the HP technicians the requirements for releasing items from controlled areas.

- The licensee identified a need for clearer delineation of who has authority to release material from various locations.
- The licensee will evaluate ways of tightening controls over restricted areas outside controlled access, such as the ORSB.
- The licensee will evaluate ways to improve observation and control of portal monitors at the secondary guard stations.

4. Conclusions

The discrete source found in an individual's car would not have resulted in any significant exposures. However, the failure to identify the source along with the release of the contaminated CRDMFCs, served to identify portions of the licensee's program which need increased management attention.

5. Exit

The inspector met with the licensee's representatives denoted in paragraph 1 at the conclusion of the inspection on December 14, 1989, and summarized the scope and findings of the inspection as presented in this report. The licensee did not identify as proprietary any of the materials provided to, or reviewed by, the inspector during the inspection.