

attempted to duplicate a contact hand dose measurement by affixing a TLD to the end of a telescoping detector and holding the TLD in contact with the cable for three seconds. The vendor I&C technician had originally reported to the HP staff that his estimated hand contact time with the TIP cable had been three seconds.

The licensee determined the contact radiation exposure of the TIP cable by modifying the measured radiation exposure rate with a decay correction factor for Mn-56 and estimated that the exposure rate was 906 R/hr. The licensee then calculated a 1.26 R exposure for a five second exposure period. The licensee then added the technician's 0.377 R exposure information from the whole body TLD and assigned an extremity dose of 1.637 rem.

The licensee experienced difficulty in determining how the contact extremity exposure occurred. During the licensee's initial assessment of the vendor I&C technician's extremity exposure on July 5, 1990, the licensee initially determined that the technician had grabbed the detector cable approximately one foot behind the detector with the left hand. The technician also estimated that his hand was in contact with the cable for three seconds on July 5, 1990. On July 9, 1990, the licensee reported to the inspector that the technician in reviewing the circumstances of the extremity exposure had reported that he grabbed the detector cable approximately seven inches from the detector and that the exposure time may have been up to five seconds. Later in the inspection the inspector interview the vendor I&C technician and the technician reported that in his own review of the event he must have grabbed the cable with his left hand and the detector with his right. That was believed to have been the exposure scenario at the NRC exit meeting on July 10, 1990. However, in a telephone conference between G. Cheatham of CP&L and F. Wright of the NRC on July 20, and July 25, 1990, the licensee reported that the I&C technician had not grabbed the detector with either hand and that he had kept his right hand on the crank lever and grabbed the detector cable approximately seven inches behind the detector with his left hand. The licensee also reported that in reviews of the individuals extremity dose, the licensee learned that there was an additional dose contribution from aluminum 28 that had not been included in initial calculations of the employees extremity dose. The licensee reported that they had determined with the assistance of the TIP vendor the activation radioactivity of the cable and detector from core exposure time and neutron flux. The licensee then calculated the contact personnel exposure to be 6.971 rem, of which 3.711 rem was due to beta particles.

f. Licensee Assessment of the TIP Event

Licensee management had not made its final assessment of the event by the end of the inspection on July 13, 1990. However, licensee management did believe that the cause of the event was a lack of work control by licensee management. The Plant Manager discussed the