

radiation monitoring program revealed a whole body dose of 9.1 mSv (0.910 rem) assigned to the radiographer for the month of June 2000. The reading was within the normal range for this individual, based on licensee records.

The radiographer underwent skin grafting on February 26, 2002. Based on the results of the medical treatment, no long-term adverse health effects are expected.

Cause or Causes—The cause was identified as a failure to conduct a lockout survey of the camera after the source was retracted, the failure to conduct radiation surveys and the failure to utilize an operable alarming rate meter due to a low battery.

Actions Taken To Prevent Recurrence

Licensee—The licensee terminated the radiographer's employment and incorporated the event into the annual refresher training at all 31 Longview Inspection offices.

State Agency—The Department conducted an investigation and concluded that the subsequent injury could have resulted from the overexposure. The Department imposed a suspension of the radiographer's certification for one year.

This event is closed for the purpose of this report.

AS 02-3 Industrial Radiography Occupational Overexposure at McShane Industries in Baltimore, Maryland

Date and Place—September 25, 2001, McShane Industries, Baltimore, Maryland. The NRC was informed of this event in September 2001; however, this event was not documented as an AO in the "Report to Congress on Abnormal Occurrences, Fiscal Year 2001" because of its investigation at that time.

Nature and Probable Consequences—On September 25, 2001, a radiographer employed by Accurate Technologies Incorporated (ATI) of Tinton Falls, New Jersey, was overexposed while conducting industrial radiography in Baltimore, Maryland. (On December 20, 2001, the licensee changed its name to United Evaluation Services Incorporated.) The radiographer was using an Amersham 660A radiography exposure device (camera) when the sealed source containing 2.16 TBq (58.4 Ci) of Ir-192 failed to retract into the shielded position inside the camera following the previous radiographic exposure. The radiographer thought that the source was completely retracted into the shielded position when he relocated the camera, crank, guide tube and its

extension tube in preparation for next exposure. The radiographer did not use a survey meter and was not wearing a pocket dosimeter, a whole body badge, or an alarming rate meter. The radiographer changed the film and identification, then secured the tip of the guide tube on to a different pipe weld for the next exposure. While attempting to unlock the camera for the next exposure, the radiographer noticed that the self-locking device on the camera was not in the locked position. Using the crank, the radiographer retracted the source into the shielded and secured position inside the camera. On September 29, 2001, the radiographer experienced burning and itching sensations in his fingers. On October 1, 2001, the radiographer notified the RSO and visited a physician. The physician reported that, on October 1, 2001, the radiographer had erythema on his fingers and palms. On October 5, 2001, State Inspectors observed radiation burns and blisters on the radiographer's hands. At the request of the State of Maryland, the United States Department of Defense, Armed Forces Radiobiology Research Institute, analyzed a 30 milliliter blood sample obtained from the radiographer, using cytogenetic biological dosimetry techniques, and reported a mean whole body dose estimation of approximately 2,670 mGy (267 rad). The assistant radiographer on site during this incident was not exposed.

Cause or Causes—The root cause of this radiation injury was identified as a failure by the radiographer to follow licensed radiation safety procedures, to comply with Maryland Regulations regarding radiation safety requirements for industrial radiographic operations, and to properly use required radiation detection and measurement devices. Specifically, the radiographer failed to wear an audible alarming rate meter or any type of dosimetry. He also failed to use a radiation survey meter. He inadvertently entered a very high radiation area caused by the Ir-192 sealed source that did not retract into the shielded position inside the camera. Finally, he failed to ensure that the source was secured in the shielded position prior to relocating the equipment from one location to another.

Actions Taken To Prevent Recurrence

Licensee—On October 4, 2001, the licensee agreed to discontinue all licensed activities until the completion of the Departmental Investigation.

State Agency—The licensee was cited for violations of Maryland Regulations for Control of Radiation. Specifically, the licensee was cited for exceeding

occupational exposure limits; failure to conduct radiation surveys; failure to secure the device after the exposure; failure to wear and properly use a pocket dosimeter, alarming rate meter and film badge; failure to notify the Agency of an overexposure; failure to maintain a utilization log; failure to report a bankruptcy to the Agency; failure to notify the Agency before vacating premises; failure to authorize the RSO on the license; and several other associated violations. On October 25, 2001, the Agency issued a Cease and Desist Order to the licensee, prohibiting all industrial radiography activities in Maryland. ATI's Maryland radioactive materials license expired on December 31, 2001, and was terminated. The incident has been referred for escalated enforcement.

This event is closed for the purpose of this report.

AS 02-4 Intra Vascular Brachytherapy Misadministration (IVB) at Rhode Island Hospital, Providence, Rhode Island

Date and Place—January 28, 2002; Rhode Island Hospital, Providence, Rhode Island.

Nature and Probable Consequences—A patient was prescribed a dose of 8 Gy (800 rad) to the coronary artery during a Cordis Checkmate IVB procedure using 10 Ir-192 seeds, 8991 MBq (243 mCi). On January 31, 2002, during a review of dosimetry and physician records, the licensee discovered that the diameter of the artery was used in the treatment plan calculation instead of the radius. This error resulted because the physicians (authorized users) using the CORDIS device were more familiar with the procedures for a NOVOSTE device also in use at this institution. The Novoste device uses the diameter of the artery in the dosimetry calculations whereas the Cordis device uses the radius. The authorized user provided the wrong dimension (diameter instead of radius) which led to an incorrect dose being calculated. As a result the patient received an actual dose of 14.6 Gy (1,460 rad) to the outer coronary artery site instead of the prescribed 8 Gy (800 rad). The licensee indicated that there will probably be no adverse health effect to the patient.

Cause or Causes—As stated, the misadministration occurred due to human error in the use of the diameter of the artery instead of the radius of the vessel as required when using the Cordis system. The physicians' (authorized users) familiarity with the procedures for a Novoste device was a contributing factor.