whole body scans; and (3) failure to provide proper instruction to the nuclear medicine staff. The licensee paid the civil penalty.

94–18 Multiple Teletherapy Misadministrations at Sinai Hospital in Detroit, Michigan

The following information pertaining to this event is also being reported concurrently in the **Federal Register**. Appendix A of this report notes that a therapeutic dose that results in any part of the body receiving unscheduled radiation can be considered an abnormal occurrence.

Date and Place—July 28 and August 3, 1994; Sinai Hospital; Detroit, Michigan.

Nature and Probable Consequences— On July 28, 1994, and August 3, 1994, misadministrations occurred on two separate patients when the licensee's therapists failed to verify correct teletherapy machine parameters prior to treatment.

Beginning on July 19, 1994, a patient was to received 4500 centigray (cGy) (4500 rad) in a series of 25 treatments to the left neck area. The first seven treatments were completed without incident. However, on the eighth treatment on July 28, one faction was set up using the wrong treatment angle. This resulted in a radiation dose of 90 cGy (90 rad) being received by the right shoulder and neck area instead of the left neck area.

Beginning July 5, 1994, another patient was to receive 5000 cGy (5000 rad) in a series of 25 treatments to the right shoulder area. The first 20 treatments were completed without incident. However, on the 21st treatment on August 3, the teletherapy unit was positioned using the wrong treatment angle. This resulted in a radiation dose of 100 cGy (100 rad) being received by the right lung area instead of the right shoulder area.

An NRC medical consultant reviewed both cases and concluded that no significant adverse side effects or tissue injury are expected.

Cause or Causes—The cause of both misadministrations was human errors by several of the licensee's therapists. The therapists failed to verify the collimator angle, the wedge setting, and the treatment site before administering the teletherapy dose to the patients.

Action Taken To Prevent Recurrence

Licensee—The corrective actions taken included: (1) Suspending all teletherapy treatments pending an internal investigation, and identification of appropriate corrective actions prior to re-start of the teletherapy treatments; (2) developing procedures which require independent verification of proper treatment parameters during patient setup; and (3) installing a record-and-verify system on the teletherapy unit to ensure that all major treatment parameters are checked prior to a treatment.

NRC—NRC Region III conducted an inspection July 29 through August 12, 1994, to review the circumstances surrounding the two misadministrations (Ref. 4). NRC also retained a medical consultant to review the case. An Enforcement Conference was held on September 8, 1994, to discuss the inspection findings and actions taken by the licensee. On September 21, 1994, NRC Region III issued a Notice of Violation with a Severity Level III (Severity Levels I through V range from the most significant to the least significant) violation with no civil penalty assessed. The licensee's corrective and preventive actions will be reviewed during the next NRC inspection of the licensed program.

Ås required by 10 CFR 35.33(a), the licensee, for each misadministration, notified the referring physician and patient after the discovery of the incident and submitted a written report to the patient, including a statement that the report submitted to NRC Region III will be made available upon request.

94–19 Brachytherapy Misadministration Involving the Use of a Strontium-90 Eye Applicator at the University of Massachusetts Medical Center in Worcester, Massachusetts

The following information pertaining to this event is also being reported concurrently in the **Federal Register**. Appendix A (see Event Type 5 in Table A–1) of this report notes that a therapeutic dose that results in an actual dose less than 0.5 times the prescribed dose can be considered an abnormal occurrence. In addition, Criterion No. 11 under "For All Licensees" in Appendix A notes that a serious deficiency in management or procedural controls in major areas can be considered an abnormal occurrence.

Date and Place—July 29, 1994; University of Massachusetts Medical Center; Worcester, Massachusetts.

Nature and Probable Consequences— NRC Region I was notified on August 1, 1994, by the licensee of a brachytherapy misadministration involving the use of a strontium-90 (Sr-90) eye applicator. On July 29, 1994, a physician performed an ophthalmic treatment on a patient using a Sr-90 eye applicator without first removing the stainless steel mask from the source. Because of this oversight, the licensee estimated that the treatment site received 107 centigray

(cGy) (107 rad) of radiation, rather than the 1250 to 2000 cGy (1250 to 2000 rad) that was intended. In addition, whereas the beta radiation from the eye applicator source only affects the surface of the eye, the bremsstrahlung radiation resulting from the interaction of the beta particles on the stainless steel mask is more penetrating. The patient returned on August 2, 1994, for the completion of the therapy to bring the total dose delivered within the originally prescribed range. The licensee expects that the clinical outcome of the misadministration will be inconsequential for the patient.

Cause or Causes—According to the licensee a combination of factors led to the misadministration: (1) Infrequent use of the ophthalmic applicator and the fact that its appearance with the mask is similar to its appearance with the mask removed; (2) the event occurred on a Friday afternoon and the stress of the week's work affected the alertness of the individuals involved; and (3) the most experienced physicists were not available, and a relatively inexperienced physicist prepared the source and was unaware that the source was equipped with a stainless steel mask.

Actions Taken to Prevent Recurrence

Licensee—The licensee is reviewing the feasibility of modifying the mask in some manner to make it more easily distinguished from the unmasked source. In addition, the licensee has employed two new radiation oncology physicians and a new chief physicist.

NRC-NRC conducted a special inspection on August 3, 1994. The inspector determined that the physician was assisted by a dosimetrist who had not previously been directly involved with the procedure. When the physician requested that the dosimetrist provide him with the eye applicator source in order to perform the treatment, the dosimetrist handed him the source with the stainless steel mask in place. The dosimetrist stated that she was unaware that the source was equipped with a mask and that the mask needed to be removed. The physician and other licensee staff stated that it is the assistant's responsibility, in this case the dosimetrist's responsibility, to remove the stainless steel mask from the source before handing the eye applicator to the physician. The treatment was administered by the physician with the mask in place. While cleaning the eye applicator later that same day, the licensee determined that the treatment had been performed with the mask in place. The licensee stated that the patient and the patient's physician were notified that there had been an