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Report to Congress on Abnormal Occurrences

January – March 1995

U.S. Nuclear Regulatory Commission

Office for Analysis and Evaluation of Operational Data

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ABSTRACT

Section 208 of the Energy Reorganization Act of 1974 identifies an abnormal occurrence (AO) as an unscheduled incident or event that the Nuclear Regulatory Commission determines to be significant from the standpoint of public health or safety and requires a quarterly report of such occurrences to be made to Congress. This report provides a description of those incidents and events that have been determined to be AOs

during the period of January 1 through March 31, 1995.

This report addresses one AO at an NRC-licensed facility which involved a medical brachytherapy misadministration. The report also contains updates of one AO previously reported by an NRC licensee and three AOs previously reported by the Agreement States. No "Other Events of Interest" items are being reported.

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PREFACE

Introduction

The Nuclear Regulatory Commission (NRC) reports to Congress each quarter, under provisions of Section 208 of the Energy Reorganization Act of 1974, any abnormal occurrences (AOs) involving facilities and activities regulated by NRC. An AO is defined in Section 208 as an unscheduled incident or event that the Commission determines to be significant from the standpoint of public health or safety.

NRC identifies an AO for the purpose of this report using the criteria in Appendix A. The criteria were initially promulgated in an NRC policy statement that was published in the *Federal Register* on February 24, 1977 (Vol. 42, No. 37, pages 10950-10952).

This policy statement was published before medical licensees were required to report misadministrations to NRC and few of the examples in the policy statement were applicable to medical misadministrations. Therefore, in 1984, NRC adopted additional guidance for AO reporting of medical misadministrations. These guidelines augment the NRC policy statement examples and are summarized in Table A-1 in Appendix A.

On January 27, 1992, new medical misadministration requirements became effective. As directed by the Commission, the staff is currently developing a new policy statement for reporting incidents and events to Congress. The policy statement will be published for public comment in the *Federal Register* prior to final Commission approval for use in developing future AO reports.

In order to provide wide dissemination of information to the public, a *Federal Register* notice is issued on NRC licensee AOs. Copies of the notice are distributed to the NRC Public Document Room and all Local Public Document Rooms. At a minimum, each notice must contain the date and place of the occurrence and a

description of its nature and probable consequences.

NRC has determined that, of the incidents and events reviewed for this reporting period, only those that are described in this report meet the criteria for reporting as AOs. This report covers the period from January 1 through March 31, 1995. Information reported on each AO includes date and place, nature and probable consequences, cause or causes, and actions taken to prevent recurrence.

Appendix B contains updated information on previously reported AOs.

Appendix C contains information on incidents that can be perceived as significant but do not involve a major reduction in the level of protection provided for public health and safety. These events are not reportable as AOs but are provided as "Other Events of Interest."

The Regulatory System

The system of licensing and regulation by which NRC carries out its responsibilities is implemented through the rules and regulations in Title 10 of the *Code of Federal Regulations*. This includes public participation as an element. To accomplish its objectives, NRC regularly conducts licensing proceedings, inspection and enforcement activities, evaluation of operating experience, and confirmatory research, while maintaining programs for establishing standards and issuing technical reviews and studies.

In licensing and regulating nuclear power plants and the uses of byproduct nuclear materials, NRC follows the philosophy that the health and safety of the public are best ensured by establishing multiple levels of protection. These levels can be achieved and maintained through regulations specifying requirements that will ensure the safe use of nuclear materials. The regulations include design and quality assurance criteria appropriate for the various activities licensed by NRC. An inspection and enforcement program helps ensure compliance with the regulations.

Reportable Occurrences

Operating experience is an essential input to the regulatory process for assuring that licensed activities are conducted safely. Licensees are required to report certain incidents or events to NRC. This reporting helps to identify deficiencies and to ensure that corrective actions are taken to prevent recurrence.

For nuclear power plants, dedicated groups have been formed, both by NRC and the nuclear power industry, for the detailed review of operating experience to help identify safety concerns early; to improve dissemination of such information; and to feedback the experience into licensing, regulations, and operations. In addition, NRC and the nuclear power industry have ongoing efforts to improve the operational data systems, which include not only the type and quality of reports required to be submitted, but also the methods used to analyze data. In order to more effectively collect, collate, store, retrieve, and evaluate operational data, the information is maintained in computer-based data files.

Three primary sources of operational data are Licensee Event Reports (LERs) submitted pursuant to 10 CFR 50.73, immediate notifications submitted pursuant to 10 CFR 50.72, and medical misadministration reports submitted pursuant to 10 CFR 35.33.

Except for records exempt from public disclosure by statute and/or regulation, information concerning reportable occurrences at facilities licensed or otherwise regulated by NRC is routinely disseminated by NRC to the nuclear industry, the public, and other interested groups as these events occur.

Dissemination includes special notifications to licensees and other affected or interested groups, and public announcements. In addition, information on reportable events is routinely sent to the NRC's Local Public Document Rooms throughout the United States and to the NRC Public Document Room in Washington, D.C. Congress is routinely kept informed of reportable events occurring in licensed facilities.

Agreement States

Section 274 of the Atomic Energy Act, as amended, authorizes the Commission to enter into agreements with States whereby the Commission relinquishes and the States assume regulatory authority over byproduct, source, and special nuclear materials (in quantities not capable of sustaining a chain reaction). As part of the cooperative effort between the Agreement States and the Commission with respect to the control of radiation hazards associated with the use of such material, the Agreement States, through compatible regulations, require the reporting of incidents and events, involving nuclear material, by the regulated community.

Information on such reportable occurrences for Agreement State licensed activities is publicly available at the State level. In support of NRC's effort to identify and report abnormal occurrences, the Agreement States voluntarily provide information to NRC on events that occurred in their State that meet the AO criteria as defined in Appendix A. For the purpose of developing a nationwide database, Agreement States are encouraged to provide information to NRC on reportable events.

In early 1977, the Commission determined that AOs happening at Agreement State licensed facilities should be included in the quarterly reports to Congress. The AO criteria included in Appendix A are applied uniformly to incidents and events that occur at NRC and Agreement State licensed facilities. Procedures have been developed and implemented, and AOs reported by the Agreement States to NRC are included in the quarterly reports to Congress.

Foreign Information

NRC participates in an exchange of information with various foreign governments that have nuclear facilities. This foreign information is reviewed and considered in the NRC's assessment of operating experience and in its research and regulatory activities. Reference to foreign information may occasionally be made in these quarterly AO reports to Congress; however, only domestic AOs are reported.

Reopening of Closed Abnormal Occurrences

NRC reopens previously closed AOs if significant new information becomes available. Similarly, previously reported "Other Events of Interest" are

updated if significant new information becomes available.

REPORT TO CONGRESS ON ABNORMAL OCCURRENCES JANUARY-MARCH, 1995

NUCLEAR POWER PLANTS

NRC has reviewed all incident and event reports received from licensees for operating nuclear power plants in the United States (U.S.) through the first quarter of 1995. Using the criteria and

guidelines in Appendix A of this report, none of the occurrences reviewed for this reporting period were determined to be significant enough to be reported as an AO.

FUEL CYCLE FACILITIES (Other than Nuclear Power Plants)

NRC has reviewed all incident and event reports received from licensees for the milling, processing, and fabrication of nuclear fuel in the U.S. through the first quarter of 1995. Using the criteria and

guidelines in Appendix A of this report, none of the occurrences reviewed for this reporting period were determined to be significant enough to be reported as an AO.

OTHER NRC LICENSEES (Industrial Radiographers, Medical Institutions, Industrial Users, etc.)

There are approximately 22,000 active material licenses for the use of byproduct materials in industrial, medical, and academic applications in the U.S. Twenty-nine States, known as Agreement States, have entered into agreements with NRC to assume regulatory authority for approximately 15,000 of these licensees within their States. NRC is responsible for regulating approximately 7000 licensees located in the remaining 21 States, the District of Columbia, and all U.S. territories. NRC has reviewed all incident and event reports received from NRC licensees through the first quarter of 1995. Using the criteria and guidelines in Appendix A of this report, the following occurrence was determined to be significant enough to be reported as an AO.

95-1 Medical Brachytherapy Misadministration at Welborn Memorial Baptist Hospital in Evansville, Indiana

The following information pertaining to the event is also being reported in the Federal Register. Appendix A (see Event Type 5 in Table A-1) of this report notes that a therapeutic dose that is greater than 1.5 times the prescribed dose can be considered an abnormal occurrence.

Date and Place—November 18, 1994; Welborn Memorial Baptist Hospital, Inc.; Evansville, Indiana. **Nature and Probable Consequences**—On November 18, 1994, a 73-year-old female patient was prescribed to receive a brachytherapy treatment dose of 600 centigray (cGy) (600 rad) at the vaginal cavity using a GammaMed Ili high dose rate afterloading unit. However, because of a treatment error the patient received a 1250 cGy (1250 rad) dose instead of the prescribed dose.

The licensee identified the misadministration during a quality management review on November 21, 1994. The licensee reported the event to the NRC on November 22, 1994, and followed up with a written report on December 6, 1994. The referring physician was notified. The patient was notified on November 23, 1994, by the licensee's Radiation Safety Officer and was provided with a written report of the incident.

An NRC medical consultant was retained to evaluate the medical consequences of the misadministration. The medical consultant expressed concern that long term effects such as fibrosis or loss of blood supply may occur as a result of the 1250 cGy (1250 rad) treatment. The medical consultant also suggested that this case be considered for the U.S. Department of Energy (DOE), Office of Epidemiology and Health Surveillance long term medical study program. Information regarding the DOE program and a

copy of the NRC medical consultant's report were provided to the referring physician.

Cause or Causes—NRC concluded that the cause of the misadministration was twofold: (1) the technologist failed to activate a button that automatically corrects for treatment time based on source decay, failed to notice a display indicating the treatment time correction that would have been entered automatically, reentered the treatment time instead, and failed to notice the error; and (2) the treatment software did not stop the technologist from proceeding after the initial error was made as it was supposed to because an integrated circuit containing the software code failed to operate.

Action Taken To Prevent Recurrence

Licensee—In order to prevent recurrence of the incident as of November 25, 1994, the licensee revised its internal "Policy and Procedure for all HDRs" to require both individuals operating the unit to verify the displayed time factor and compare it to the factor supplied by the

manufacturer. Prior to this misadministration, the device operators were required to verify only operator entered data. Also, the unit was evaluated by the licensee's medical physicist and a GammaMed service representative. As a result of the evaluation, the printed circuit board (card) with the read-only-memory integrated circuits containing the defective software program was replaced with a card having the correct software program.

NRC—NRC conducted a safety inspection on November 30 and December 1, 1994 (Ref. 1). An interoffice review of the event was conducted through December 8, 1994, to review the circumstances of the misadministration. No violations of NRC requirements were identified. As a result of the incident, NRC contacted the manufacturer of the GammaMed Ili and sent a letter to all GammaMed Ili users to inform them of this potential problem and tell them how to test their software to prevent similar events.

This item is considered closed for the purpose of this report.

AGREEMENT STATE LICENSEES

The 29 Agreement States have approximately 15,000 active material licenses for the use of byproduct materials in industrial, medical, and academic applications. Procedures have been developed for Agreement States to screen incidents and events using the same criteria and

guidelines as NRC, and to voluntarily report those occurrences that have been determined to be significant enough to be considered as AOs. Using the criteria and guidelines in Appendix A of this report, no occurrences were determined to be significant enough to be reported as an AO.

REFERENCES

1. Letter from B.J. Holt, Chief, Nuclear Materials Inspection Section 1, Division of Radiation Safety and Safeguards, to Marjorie Soyugenc, President, Welborn Cancer Center/Welborn Memorial Baptist Hospital, Inc., forwarding Inspection Report No. 030-33236/94002, Docket No. 030- 33236,

License No. 13-01674-02, dated January 12, 1995.*

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*A copy is available for inspection, or copying for a fee, in the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC.

APPENDIX A

ABNORMAL OCCURRENCE CRITERIA¹

The following criteria used to determine an abnormal occurrence (AO) were set forth in an NRC policy statement published in the *Federal Register* on February 24, 1977, (Vol. 42, No. 37, pages 10950-10952).

An event will be considered an AO if it involves a major reduction in the degree of protection of the public health or safety. Such an event would involve a moderate or more severe impact on the public health or safety and could include but need not be limited to:

1. Moderate exposure to, or release of, radioactive material licensed by or otherwise regulated by the Commission;
2. Major degradation of essential safety-related equipment; or
3. Major deficiencies in design, construction, use of, or management controls for licensed facilities or material.

Examples of the types of events that are evaluated in detail using these criteria are:

For All Licensees

1. Exposure of the whole body of any individual to 25 rem or more of radiation; exposure of the skin of the whole body of any individual to 150 rem or more of radiation; or exposure of the feet, ankles, hands or forearms of any individual to 375 rem or more of radiation [10 CFR 20.403(a)(1)], or equivalent exposures from internal sources.
2. An exposure to an individual in an unrestricted area such that the whole body dose received exceeds 0.5 rem in one calendar year [10 CFR 20.105(a)].
3. The release of radioactive material to an unrestricted area in concentrations which, if

averaged over a period of 24 hours, exceed 500 times the regulatory limit of Appendix B, Table II, 10 CFR Part 20 [CFR 20.403(b)(2)].

4. Radiation or contamination levels in excess of design values on packages, or loss of confinement of radioactive material such as (a) a radiation dose rate of 1000 mrem per hour three feet from the surface of a package containing the radioactive material, or (b) release of radioactive material from a package in amounts greater than the regulatory limit.
5. Any loss of licensed material in such quantities and under such circumstances that substantial hazard may result to persons in unrestricted areas.
6. A substantiated case of actual or attempted theft or diversion of licensed material or sabotage of a facility.
7. Any substantiated loss of special nuclear material or any substantiated inventory discrepancy that is judged to be significant relative to normally expected performance and that is judged to be caused by theft or diversion or by substantial breakdown of the accountability system.
8. Any substantial breakdown of physical security or material control (i.e., access control, containment, or accountability systems) that significantly weakened the protection against theft, diversion, or sabotage.
9. An accidental criticality [10 CFR 70.52(a)].
10. A major deficiency in design, construction, or operation having safety implications requiring immediate remedial action.
11. Serious deficiency in management or procedural controls in major areas.
12. Series of events (where individual events are not of major importance), recurring incidents, and incidents with implications for similar facilities (generic incidents) that create major safety concern.

¹On January 1, 1994, changes to Title 10 of the *Code of Federal Regulations* Part 20 were promulgated. At the Commission's directive, the staff is currently developing a policy statement revising criteria for various types of AOs. The changes pertinent to the 10 CFR 20 revision will also be included in that draft policy statement. Upon Commission's approval, the appropriate changes to this Appendix will be published.

For Commercial Nuclear Power Plants

1. Exceeding a safety limit of license Technical Specifications [10 CFR 50.36(c)].
2. Major degradation of fuel integrity, primary coolant pressure boundary, or primary containment boundary.
3. Loss of plant capability to perform essential safety functions such that a potential release of radioactivity in excess of 10 CFR Part 100 guidelines could result from a postulated transient or accident (e.g., loss of emergency core cooling system, loss of control rod system).
4. Discovery of a major condition not specifically considered in the Safety Analysis Report (SAR) or Technical Specifications that requires immediate remedial action.
5. Personnel error or procedural deficiencies that result in loss of plant capability to perform essential safety functions such that a potential release of radioactivity in excess of 10 CFR Part 100 guidelines could result from a postulated transient or accident (e.g., loss of emergency core cooling system, loss of control rod system).

For Fuel Cycle Licensees

1. A safety limit of license Technical Specifications is exceeded and a plant shutdown is required [10 CFR 50.36(c)].
2. A major condition not specifically considered in the safety analysis report or Technical Specifications that requires immediate remedial action.
3. An event that seriously compromised the ability of a confinement system to perform its designated function.

Medical Misadministrations

As discussed in the Preface to this report, the NRC policy statement on AOs was published before licensees were required to report medical misadministrations to the NRC. Therefore, during 1984, NRC developed guidelines for selecting such events for AO reporting. These guidelines, which are summarized in Table A-1, augment the NRC policy statement.

As noted in the Preface, revised guidelines are currently being developed because new medical misadministration definitions became effective on January 27, 1992.

**Table A-1 NRC Guidelines for Selecting Medical Misadministration Events
for Abnormal Occurrence (AO) Reporting**

Event Type	AO Reporting Threshold	
	Diagnostic Exposure	Therapeutic Exposure
(1) Administering a radiopharmaceutical or radiation from a sealed source other than the one intended.	If the improper administration results in any part of the body receiving unscheduled radiation, an AO report should be proposed if: (a) the actual dose to the wrong body part is greater than five times the upper limit of the normal range of exposures prescribed for diagnostic procedures involving that body part, or (b) there are clinical indications of any adverse health effects to the wrong body part. If the parts of the body receiving radiation improperly would have received radiation anyway, had the proper administration been used, an AO report should be proposed if: (a) the actual dose is greater than five times that intended to the above described body parts, or, (b) the above described body parts show signs of adverse health effects greater than expected had the proper administration been used.	If the improper administration results in any part of the body receiving unscheduled radiation, an AO report should be proposed for any such event. If the parts of the body receiving radiation improperly would have received radiation anyway, had the proper administration been used, an AO report should be proposed if: (a) the actual dose is greater than 1.5 times that intended to the above described body parts, or, (b) the actual dose is less than 0.5 times that intended to the above described body parts, or, (c) the above described body parts show signs of adverse health effects greater than expected had the proper administration been used, or (d) the event (regardless of any health effects) affects two or more patients at the same facility.
(2) Administering a radiopharmaceutical or radiation to the wrong patient. or	An AO report should be proposed if: (a) the actual dose to the wrong patient exceeds five times the prescribed dose for the intended patient, or (b) the event results in any adverse health effects.	An AO report should be proposed for any such event.
(3) Administering a radiopharmaceutical or radiation by a	Same guidelines as for Event Type 1.	Same guidelines as for Event Type 1.

Table A-1 (Continued)

Event Type	AO Reporting Threshold	
	Diagnostic Exposure	Therapeutic Exposure
route of administration other than that intended by the prescribing physician.		
(4) Administering a diagnostic dose of a radiopharmaceutical differing from the prescribed dose by more than 50 percent.	An AO report should be proposed if: (a) the actual dose is greater than five times the prescribed dose, or, (b) the event results in adverse health effects worse than expected for the normal range of exposures prescribed for the diagnostic procedure.	Not applicable.
(5) Administering a therapeutic dose of a radiopharmaceutical differing from the prescribed dose by more than 10 percent; or administering a therapeutic radiation dose from a sealed source such that errors in the source calibration, time of exposure, and treatment geometry result in a calculated total treatment dose from the final prescribed total treatment dose by more than 10 percent.	Not applicable.	An AO report should be proposed if: (a) the actual dose is greater than 1.5 times the prescribed dose, or, (b) the actual dose is less than 0.5 times the prescribed dose, or (c) the event results in adverse health effects worse than would be expected for the normal range of exposures prescribed for the therapeutic procedure, or, (d) the event (regardless of any health effects) affects two or more patients at the same facility.
(6) Recurring or series of events (regardless of the number of patients or facilities involved).	For either diagnostic or therapeutic exposures, an AO report should be proposed for recurring events or a series of events (in which each individual misadministration is not of major importance) that create a significant public health or safety concern.	
(7) Generic events.	For either diagnostic or therapeutic exposures, an AO report should be proposed for misadministrations with generic implications that create a significant public health or safety concern.	

APPENDIX B

UPDATE OF PREVIOUSLY REPORTED ABNORMAL OCCURRENCES

During January through March 1995, NRC licensees, Agreement States, Agreement State licensees, and other involved parties, such as reactor vendors and architect-engineering firms, continued with the implementation of actions necessary to prevent recurrence of previously reported abnormal occurrences (AO). The AOs

discussed below contain a summary of information presented in previous reports and any subsequent updated information provided during the reporting period. Those updated events which still require additional information will be discussed in future reports.

OTHER NRC LICENSEES

92-18 Loss of Iridium-192 Source and Medical Therapy Misadministration at Oncology Services Corporation in Indiana, Pennsylvania

This abnormal occurrence (AO) was originally reported in NUREG-0090, Vol. 15, No. 4, "Report to Congress on Abnormal Occurrences, October-December 1992," under the title "Loss of Iridium-192 Source and Medical Therapy Misadministration at Indiana Regional Cancer Center in Indiana, Pennsylvania."

The AO criteria used were:

- (1) Event Type 5, in Table A-1—A therapeutic dose that is greater than 1.5 times the prescribed dose; and
- (2) For All Licensees, No. 2—An exposure to an individual in an unrestricted area such that the whole body dose received exceeds 0.5 rem in one calendar year.

At that time, it was reported on November 16, 1992, Oncology Services Corporation had lost a 159,000 gigabecquerel (4.3 curie) sealed iridium-192 source from a high dose rate (HDR) remote afterloader brachytherapy unit at its Indiana Regional Cancer Center in Indiana, Pennsylvania. The source had: (1) broken off of the HDR unit while in service; (2) subsequently killed a patient with a 1,600,000 centigray (1,600,000 rad) absorbed dose, after remaining on the patient's body for almost 4 days; and (3)

caused 94 other people to receive radiation ranging from 400 microsievert to 220 millisievert (40 millirem to 22 rem). The source was eventually mixed by accident with medical biohazard waste and was subsequently found and recovered at the site of a company that had been contracted to dispose of biological waste material.

The AO report is updated as follows:

The licensee submitted information in letters dated August 31, 1994, and October 4, 1994, in response to the NRC's Notice of Violation and Proposed Imposition of Civil Penalties dated May 31, 1994. After consideration of the licensee's responses, NRC concluded that an adequate basis was not provided for withdrawal of any of the violations or for mitigation of the civil penalties. An "Order Imposing Civil Penalties—\$280,000" (Order) was issued on April 24, 1995 (Ref 1). The licensee has 30 days to pay the civil penalties. The licensee may also within 30 days of the date of the Order request a hearing on the Order.

Concurrent with the enforcement process, the licensee requested the termination of its license on December 13, 1993, with the license to be replaced by individual licenses issued to the facilities named as locations of use on the Oncology Services Corporation (OSC) license. The OSC license was terminated on August 24, 1994, concurrent with new licenses being issued to the facilities which were previously listed as locations of use on the OSC license.

This event will be updated when additional information becomes available.

AGREEMENT STATE LICENSEES

AS 88-5 Medical Teletherapy Misadministration at Sacred Heart Hospital in Cumberland, Maryland

This AO was originally reported in NUREG-0090, Vol. 11, No. 4, "Report to Congress on Abnormal Occurrences, October-December 1988."

The AO criterion used was a moderate or more severe impact on public health or safety, as stated in the second paragraph of the General Criteria.

At the time it was reported that on September 2, 1988, an 81-year-old patient received a therapeutic dose of 1400 centigray (1400 rad) to a part of the body not scheduled to receive radiation. The event was reported as an AO because it involved a moderate or more severe impact on public health or safety.

The AO report is updated as follows:

NRC is continuing to work with the State of Maryland to obtain more information regarding this incident.

This event will be updated when additional information becomes available.

AS 88-6 Multiple Medical Teletherapy Misadministrations at Sacred Heart Hospital in Cumberland, Maryland

This AO was originally reported in NUREG-0090, Vol. 11, No. 4, "Report to Congress on Abnormal Occurrences, October-December 1988."

The AO criterion used was a moderate or more severe impact on public health or safety, as stated in the second paragraph of the General Criteria.

At the time it was reported that over a 13-month period 33 patients undergoing brain cancer treatments had received therapeutic radiation exposures from a cobalt-60 teletherapy machine that exceeded the prescribed dose by at least 10 percent in each case. The event was reported as

an AO because it involved a moderate or more severe impact on public health or safety.

The AO report is updated as follows:

NRC is continuing to work with the State of Maryland to obtain more information regarding these incidents.

This event will be updated when additional information becomes available.

AS 93-9 Medical Teletherapy Misadministration by "Unspecified Licensee" in New York, New York

This abnormal occurrence (AO) was originally reported in NUREG-0090, Vol. 16, No. 3, "Report to Congress on Abnormal Occurrences, July-September 1993," under the title "Medical Teletherapy Misadministration by 'Unspecified Licensee' in New York, New York."

The AO criterion used was administering a therapeutic dose to a part of the body not scheduled to receive radiation.

At that time, it was reported that on July 11, 1992, cobalt-60 teletherapy treatments of 200 centigray (cGy) (200 rad) each were to be administered to the right axilla (armpit) of a patient.

The AO report is updated and closed out as follows:

A 65-year-old patient undergoing a cobalt-60 teletherapy treatment was prescribed to receive a dose of 3600 cGy (3600 rad) to the right axilla in 18 fractions of 200 cGy (200 rad) per fraction and two fields (anterior and posterior) per fraction at a rate of 5 fractions per week. This course was to be followed by a booster dose of 400 cGy (400 rad) 2 days following the end of the fractionated-dose course of treatment.

During the course of simulation, the attending radiation oncologist was called from the room for an emergency case. During simulation the technologist accidentally photographed the wrong side of the patient, namely the left axilla instead of the right axilla as prescribed. The attending radiation oncologist subsequently reviewed the simulation films, which were incorrectly marked

as "right side," and approved them without recognizing the error. The port films taken at the initial patient set-up prior to therapy were correctly marked "left side," but were not recognized as the wrong treatment site by the attending oncologist.

The patient was treated for five fractions of 200 cGy (200 rad) each for one week by three different technologists, and received a total dose of 1000 cGy (1000 rad) before the error was discovered. Upon discovery, the treatment was discontinued, the patient was correctly resimulated, and the treatment was administered as prescribed. Both the patient and the patient's referring physician were informed of the event and the patient was told that there would be no adverse effects. The patient verbally indicated that he understood. The patient was followed clinically by the licensee and there have been no adverse effects to date. A medical consultant was not involved.

The underlying causes of the event are as follows: (1) while the attending radiation oncologist was absent, the simulation technologist did not follow the initial prescription which was correct, and incorrectly set up the patient for treatment; (2) the attending radiation oncologist approved the

incorrectly marked films without recognizing the error; (3) the patient was incorrectly set up for the initial treatment based on erroneous simulator films; (4) the portal films taken at the time of set up were marked correctly, but the simulation error remained undetected by the personnel involved; and (5) an independent verification of the correct treatment site was not performed by the three different technologists who treated the patient although they entered the treatment site as "right axilla" in the treatment chart.

To prevent recurrence, the licensee took the following corrective actions: (1) the internal procedures were amended to require the presence of the attending radiation oncologist throughout the simulation procedure, and to require unambiguous marking of the simulator films; (2) the senior technologist was required to independently verify the correct patient, set-up, dose, and treatment parameters before initiating treatment; and (3) the personnel involved were reprimanded and counseled.

The City of New York concurred with the licensee's evaluation of the event and corrective actions.

This event is closed for the purpose of this report.

APPENDIX C

OTHER EVENTS OF INTEREST

"Other Events of Interest" are reported because they can be perceived as being significant but have been determined not to involve a major reduction in the level of protection provided for public health or safety; therefore they are not

reportable as abnormal occurrences.

During the period from January 1 through March 31, 1995, no "Other Events of Interest" items were reported.

REFERENCES FOR APPENDICES

1. Letter from Hugh L. Thompson, Jr., Deputy Executive Director for Nuclear Materials Safety, Safeguards and Operations Support, to Douglas R. Colkitt, M.D., President, Oncology Services Corporation forwarding Order Imposing Civil Penalties - \$280,000,

Docket No. 030-31765, License No. 37-28540-01 dated April 24, 1995.*

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*A copy is available for inspection, or copying for a fee, in the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC.

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11. ABSTRACT (200 words or less)

Section 208 of the Energy Reorganization Act of 1974 identifies an abnormal occurrence (AO) as an unscheduled incident or event that the Nuclear Regulatory Commission determines to be significant from the standpoint of public health or safety and requires a quarterly report of such occurrences to be made to Congress. This report provides a description of those incidents and events that have been determined to be AOs during the period of January 1 through March 31, 1995.

This report addresses one AO at an NRC-licensed facility which involved a medical brachytherapy misadministration. The report also contains updates of one AO previously reported by an NRC licensee and three AOs previously reported by the Agreement States. No "Other Events of Interest" items are being reported.

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