NMSS Licensee Newsletter

U.S. Nuclear Regulatory Commission

Office of Nuclear Material Safety and Safeguards

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AVOIDING MISSHIPMENT OF RADIOACTIVE PACKAGES

A Nuclear Regulatory Commission (NRC) licensee recently misshipped a 2.1-curie iridium-192 brachytherapy source. The old source was placed in the shielded source container after the new source was installed in a remote afterloader. The manufacturer's partially completed transportation forms for the old source played a major role in both the misshipment and the successful return of the source to the licensee.

Days after the source exchange, a courier arrived at the licensee's site to pick up a non-radioactive package. The courier was informed that the package would not have transportation papers, and the licensee would not know where it was being shipped. All the courier expected was a heavy box. The courier went to the wrong building and was directed to the medical physicist. The medical physicist saw the partially completed transportation papers with the iridium source and thought the courier was there to get the iridium package. The courier was given the radioactive package.

The source was missing for seven days. Although the partially completed transportation papers contributed to the misshipment, they were also a major factor in recovering the source and protecting the general public. First, they correctly identified the package as a radioactive package, ensuring appropriate handling controls. Second, they provided a paper trail that eventually led the licensee to the source. Although the lack of transportation papers might have prevented the medical physicist from releasing a package, it would not necessarily have prevented the courier from picking up a package.

Licensees should review their own procedures for avoiding misshipments of radioactive packages. These packages should always have sufficient information with them to ensure that they are recognized as radioactive and can be returned to the licensee. Highly visible reminders to check with designated radiation safety personnel before releasing packages may keep employees from releasing packages before they are ready. Attaching a red tag to the package or cover sheet to the transportation papers with this kind of reminder would probably have prevented the misshipment. The important point is for licensees to take special precautions when receiving radioactive material or replacement sources and the accompanying partially completed transportation papers.

PROPOSED MATERIAL CONTROL AND ACCOUNTING (MC&A) REGULATION FOR URANIUM ENRICHMENT FACILITIES

There is a possibility that applications for licenses for construction and operation of new uranium enrichment facilities will be submitted to the Nuclear Regulatory Commission (NRC) soon. There is also a possibility that, over a longer term, legislation will be enacted that would put all or part of the Department of Energy's (DOE's) enrichment facilities under the jurisdiction of NRC regulations. Therefore, it is appropriate that NRC clarify and formalize material control and accounting requirements (MC&A) applicable to enrichment facilities producing low enriched uranium (LEU). In this connection, a proposed rule, to be designated as 10 CFR 74.33, was recently published in the *Federal Register* (Vol. 55, No. 242, Dec. 17, 1990, pp. 51726-51732) for public comment. Existing 10 CFR 74.31 is a performance-based regulation that applies to certain licensees (but not enrichment facilities) authorized to possess and use more than 1 effective kilogram of special nuclear material (SNM) of low strategic significance (currently six LEU fuel fabricators). The proposed new 10 CFR 74.33 is similar to 10 CFR 74.31, but contains additional or modified requirements to protect against and detect unauthorized enrichment activities (e.g., the production of high enriched uranium).

A draft regulatory guide has also been prepared to provide guidance and acceptable methodologies for meeting the proposed performance-based system capabilities. The regulatory guide is also subject to public comment. Single copies of the draft guide may be obtained from the Commission's Public Document Room, 2120 L Street, N.W., Lower Level, Washington, D.C. 20555.

Questions on either the proposed 10 CFR 74.33 regulation or its associated regulatory guide should be directed to Donald R. Joy (301-492-0352) or Phil Ting (301-492-0648), Division of Safeguards and Transportation.

DECEMBER 1990 NMSS LICENSEE NEWSLETTER CONTENTS

SELECTED SIGNIFICANT EVENTS REPORTED TO THE U.S. NUCLEAR REGULATORY COMMISSION

Event 1: Teletherapy Misadministration

Date Reported: February 8, 1990

Licensee: Cleveland Clinic Foundation
Cleveland, OH

A patient received a dose from a cobalt-60 teletherapy treatment, that was 50 percent greater than the physician had prescribed. After the patient had received two treatments of 278 rem each, the physician wrote "Stop prescription" on the first page of the patient's chart. The technologist did not see the order on the first page, but turned to the second page of the chart, where no stop order was listed. The patient received a third treatment of 278 rem.

Event 2: Possible Radiation Overexposure from Misshipped Radiography Source

Date Reported: March 8, 1990

Licensee: Amersham Corporation
Amersham, MA

Amersham Corporation reported that it had received a shipment of 14 source changers, reportedly empty, from a customer in Seoul, Korea. Routine surveys showed a high radiation level. A radiography source was retrieved from the interior, unshielded part of the source changer. The shipment entered the United States in California and was transported to Massachusetts by truck.

Although estimated potential whole-body radiation exposures to two long-distance truck drivers ranged between 27–35 rem, cytology studies did not indicate doses that high. An information notice that provides more details was issued on September 4, 1990 (IN 90-56).

Event 3: Therapy Misadministration

Date Reported: March 16, 1990

Licensee: Riverside Regional Medical Center
Newport News, VA

The wrong patient was administered 296 rem to the brain from a teletherapy machine. The technologist asked for a patient, using the last name only. The individual responding had the same last name and first initial as the correct patient, was the same race and gender, was approximately the same age, had approximately the same treatment area, had approximately the same appointment time, and was scheduled for the same technologist. The technologist did not confirm the identity of the patient by comparing the patient to the photograph on the patient's chart.

Event 4: Therapy Misadministration

Date Reported: March 16, 1990

Licensee: John F. Kennedy Memorial Hospital
Edison, NJ

Comments, and suggestions you may have for information that is not currently being included, that might be helpful to licensees, should be sent to:

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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

A patient receiving an endobronchial iridium-192 treatment received an unintended dose to the face when the ribbon containing the iridium-192 seeds became displaced. The catheter that had contained the ribbon remained in place.

The duty nurse noticed the dislodged source at midnight, but took no action. At 2:00 a.m., the duty nurse taped the unsecured end of the ribbon containing the iridium-192 seeds to the left side of the patient's face, where it remained for about 3 hours. At one point earlier, the patient had tucked the ribbon into her hair.

At about 4:14 a.m., the charge nurse attended the patient, noticed the dislodged source, and called the radiation safety officer, who directed the removal of the source from the patient.

NRC estimated a dose of 1,032 rem to the left side of the face and 282 rem to the eyes. The duty nurse who handled the ribbon received an estimated 17.6 rem to the fingers.

The patient was subsequently discharged, but on March 22, at 1:00 a.m., the patient was readmitted to the hospital complaining of burning of the eyeballs and sensitivity to light. She was released the next day; the diagnosis was keratoconjunctivitis, with the possibility that the condition was radiation-induced conjunctivitis.

Event 5: Therapy Misadministration

Date Reported: March 19, 1990

Licensee: St. Mary's Medical Center
Saginaw, MI

An individual received a dose of 250 rem to the thoracic region of the spine, rather than to the lumbar region of the spine. The patient had received 4,500 rem to the thoracic area of the spine in 1986 and 1987. The prescription for treatment in 1990 was for irradiation of the lumbar portion of the spine.

In preparing for the first treatment, the technologist asked the patient to identify the treatment area. The patient indicated an area of the thoracic spine; the technologist failed to review the patient's chart, examine x-ray film, and obtain verification of the treatment by a second technologist.

Event 6: Radiation Overexposure

Date Reported: April 6, 1990

Licensee: Barnett Industrial X-Ray
Stillwater, OK

A radiographer's assistant received an estimated dose of 5,000-7,000 rem to the skin of his neck. The radiographer and the assistant failed to conduct a radiation survey of the exposure device after either of the two exposures they had completed. The source had not been connected to the drive cable and had remained in the source guide tube.

After the second radiograph had been completed, the assistant radiographer disconnected the source guide tube and draped it around his neck while he was moving the exposure device to another location. As he removed the guide tube from his neck, the sealed source fell to the ground. The assistant's pocket dosimeter was off-scale.

The owner of the firm was notified and directed that the assistant be taken for a medical examination at a local hospital.

The source was retrieved to a shielded position in the exposure device. The radiographer and the assistant received whole-body doses of 17 and 24 rem, as estimated from cytology studies. Although the assistant developed erythema (reddening of the skin) and an open wound on his neck, as of June 1990, the skin tissue had regenerated.

Event 7: Therapy Misadministration

Date Reported: June 5, 1990

Licensee: Mercy Medical Center
St. Joseph, MI

The nuclear medicine department's procedures manual indicated the proper dose for a substernal thyroid scan was 3-5 millicuries of iodine-131, or 100-200 microcuries of iodine-123. The technologist was directed to use iodine-131 for the study, and the technologist administered 4.3 millicuries to a patient.

The procedures manual was wrong. The standard dose for a substernal thyroid scan should have been 50-100 microcuries of iodine-131. The patient received an estimated dose to the thyroid gland of 5,752 rads.

Event 8: Therapy Misadministration

Date Reported: June 19, 1990

Licensee: Tripler Army Medical Center
Honolulu, HI

A nursing mother was given a 4.89-millicurie dose of iodine-131, which resulted in an unintended radiation dose of 30,000 rads to her infant's thyroid gland. The error was detected when the scan indicated an unusually high breast milk uptake.

The physician and nuclear medicine technologist failed to confirm whether the patient was breast-feeding.

Event 9: Therapy Misadministration

Date Reported: June 22, 1990

Licensee: St. Luke's Hospital
Cleveland, OH

A patient received a 178-rem radiation dose to the left side of the head from a cobalt-60 teletherapy unit on June 22, 1990. The patient was scheduled to receive a 200-rem radiation dose to the chest area, the ninth of a total of ten treatments to the chest.

A technologist who had previously treated the patient set up the patient without looking at the treatment documents. After the treatment, the patient asked if her chest was also going to be treated.

Event 10: Therapy Misadministration

Date Reported: November 1, 1989

Licensee: Desert Samaritan Hospital
Phoenix, AZ

A patient who was supposed to receive 100 microcuries of iodine-131 for a diagnostic thyroid scan received 100 millicuries of iodine-131 and was sent home for 24 hours, until imaging was scheduled. When the patient returned, the camera flooded out, indicating a large overdose. The patient was immediately hospitalized and isolated.

The patient's family was contacted and a bioassay performed. Although the thyroid burdens were above the action levels for radiation workers (0.4 microcurie), the level was not considered a serious threat to any family member. The patient's house was surveyed and decontaminated.

The hospital staff did not assay the dose before administering it, did not compare the dose label with the physician's order, and did not maintain adequate records of incoming radiopharmaceuticals. Syncor, the radiopharmacy that dispensed the dose, did not record the telephone order for the iodine-131 legibly, so that the units for microcurie and millicurie could be differentiated, and did not record the type of intended procedure (diagnostic or therapy).

Event 11: Therapy Misadministration

Date Reported: October 1990

Licensee: William Beaumont Hospital
Royal Oak, MI

On October 15, 1990, a patient at William Beaumont Hospital, Royal Oak, Michigan, was administered 320 millicuries of iodine-131 oral solution for a thyroid ablation procedure, rather than 180 millicuries, as intended. As a result of the misadministration, the patient received an estimated whole-body radiation dose of 77 rad. No immediate adverse side effects were observed after the misadministration; however, NRC has contracted with a medical consultant to evaluate if any long-term effects may arise.

The misadministrations occurred when the administering technologist, under the supervision of an authorized user, erroneously administered two vials of iodine-131 solution, instead of one vial, as was intended. Contributing factors to this event included the licensee's storing of iodine-131 stock solution with specific-patient iodine-131 solutions and the administration of the material by an individual other than the person who had assayed and prepared the radiopharmaceutical. In this case, a technologist prepared and assayed the intended dosage (180 millicuries) and placed it along with a stock solution vial of iodine-131 (140 millicuries), also just assayed, in the licensee's fume hood. The technologist was then called away for other duties and requested another technologist to administer the dosage to the patient, informing him that the material had been assayed and was in the fume hood. The technologist did not indicate how many vials were to be administered. Consequently, since both vials were located in the fume hood, along with a dosage record that indicated assay information, the administering technologist assumed that both vials were intended for the patient. He then proceeded to administer both vials. At this hospital, it is not uncommon to administer more than one vial of iodine-131 for thyroid ablation procedures.

As corrective actions to prevent recurrence of similar problems, the licensee modified its procedures for the preparation and dispensation of iodine-131 therapy solutions. The modification includes: (1) provisions for the dual verification of dose assays and/or reassay of doses if the administering technologist is not physically present during the dose assay procedures; (2) physician verification and acknowledgment of dose activity before administrations; and (3) indication on the dose record as to how many vials are to be administered. The licensee also modified its storage procedure to prohibit the storage of stock solutions with specific-patient dose solutions.

RULEMAKINGS PUBLISHED AUGUST 1, 1990–NOVEMBER 30, 1990

FINAL RULES

- "Consideration of Environmental Impacts of Temporary Storage of Spent Fuel after Cessation of Reactor Operation"

  1. Published 9/18/90

  2. Contact: John P. Roberts (301) 492-0608

- "Custody and Long-Term Care of Uranium and Thorium Mill Tailings Disposal Sites"

  1. Published 10/30/90

  2. Contact: Mark Haisfield (301) 492-3877

- "Authorization to Prepare Radiopharmaceutical Reagent Kits and Elute Radiopharmaceutical Generators, Use of Radiopharmaceuticals for Therapy"

1. Published 8/23/90 (final interim rule, effective until 8/23/93)

2. Contact: John Telford (301) 492-3796

REGULATORY GUIDES ISSUED AUGUST 1, 1990–NOVEMBER 30, 1990

Guides in Draft Form

- DG-3005, "Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities"

  1. Issued 9/90

  2. Contact: Charles Ferrell (301) 492-3944

- DG-3003, "Standard Format and Content for a License Application for a High-Level Waste Repository"

  1. Issued 11/90

  2. Contact: Clark Prichard (301) 492-3884

INFORMATION NOTICES PUBLISHED AUGUST 1, 1990–NOVEMBER 30, 1990

A. Unplanned Radiation Exposures to Personnel Extremities, Due to Improper Handling of Potentially Highly Radioactive Sources—IN 90-47, dated July 27, 1990.

This information notice alerts licensees to the hazards of unplanned radiation exposures, especially to the extremities, resulting from improper handling of highly radioactive sources. It summarizes a number of such events, the most recent being the contamination of a radiation-control technician at the Fitzpatrick Nuclear Power Plant on March 8, 1990, when he picked up a contaminated cap to put it back on a vial that had contained Na-24. The licensee calculated that the skin of the worker's left thumb was exposed to approximately 48.4 rem. Repeated instances of such overexposures indicate that radiation workers are often not adequately trained in hazards to extremities, particularly when unfamiliar tasks and objects are involved. Proper training and procedures would make workers more likely to survey or request surveys of suspect or unfamiliar objects.

B. Enforcement Policy for Hot Particle Exposures—IN 90-48, dated August 2, 1990.

This information notice alerts licensees to a Nuclear Regulatory Commission (NRC) policy statement on the use of enforcement discretion in cases involving occupational doses to the skin from exposure to "hot particles" (particles that exceed the limits in 10 CFR 20.101). Because of the principal radiation involved (beta particles), the extremely localized effects, and the lower risk of biological injury due to hot particles, NRC has initiated a rulemaking to establish a different limit for exposure to hot particles. Until the new limit is established by rule, NRC will apply enforcement discretion under the policy statement. In general, the policy statement increases the dose threshold for issuing a notice of violation and decreases the severity levels for violations of the skin dose limits and for failures to report those violations in cases of hot particle exposure.

C. Minimization of Methane Gas in Plant Systems and Radwaste Shipping Containers—IN 90-50, dated August 8, 1990.

This information notice informs licensees of the detection of methane gas in plant radwaste systems and shipments of resins from nuclear power plants, and of preventive measures being taken by licensees to prevent recurrences of these situations. Licensees have found several instances of pressurization resulting from chemical reactions in low-level waste shipping containers storing dewatered synthetic organic materials (such as resins). This creates the potential for exothermic reactions and explosive hazards. The action of bacteria introduced into the radwaste system by plant service water or other means is the apparent source of methane generated in the liners and shipping casks. In one case, the pressure buildup was attributed largely to the introduction of a volatile chemical, Freon-113. Licensees have taken measures to control the generation of methane by cleaning microbiological-contaminated compounds of the radwaste system and have installed engineering controls such as ventilation and fire suppression systems where radwaste is stored. Licensees have also established administrative controls to warn workers of explosive hazards and to prevent the use of any potential source of ignition in the radwaste storage area.

D. Improper Handling of Opthalmic Strontium-90 Beta Radiation Applicators—IN 90-58, dated September 11, 1990.

This information notice informs users of strontium-90 eye applicators of improper handling practices that result in unnecessary radiation exposures to the skin and reminds licensees of the importance of handling devices in accordance with manufacturers' instructions. It describes several cases of improper handling techniques and reviews typical manufacturer's instructions and NRC instructions for safe handling of eye applicators.

E. Errors in the Use of Radioactive Iodine-131—IN 90-59, dated September 17, 1990.

This information notice emphasizes to medical use licensees the potential radiation dose levels resulting from errors in the administration of iodine-131 to humans. It describes several instances of unintended radiation doses to humans resulting from the administration of radioactive iodine and reminds licensees of the need to follow NRC requirements and accepted medical practice.

F. Requirements for Import and Distribution of Neutron-Irradiated Gems—IN 90-62, dated September 25, 1990.

This information notice reminds all importers and distributors of irradiated gemstones and all non-power reactor licensees of NRC requirements, in 10 CFR Parts 30 and 110, that govern the import and distribution of neutron-irradiated gems. NRC requires distributors of such gems to have an NRC distribution license. NRC will take enforcement action against unauthorized importers or distributors. The action may include imposition of monetary penalties or referral to the Department of Justice for potential criminal prosecution or to obtain an injunction by a Federal District Court. NRC will also arrange, in cooperation with the U.S. Customs Service, to check imported shipments of blue topaz, the neutron-irradiated gem most often brought to NRC's attention, to verify that they are authorized.

G. Management Attention to the Establishment and Maintenance of a Nuclear Criticality Safety Program—IN 90-63, dated October 3, 1990.

This information notice alerts addressees to an incident resulting from inadequate management attention to a nuclear criticality safety program and encourages licensees to review their programs in light of this incident, the investigation that followed, and Information Notice 89-24, "Nuclear Criticality Safety," dated March 6, 1989.

H. Pump Explosions Involving Ammonium Nitrate—IN 90-70, dated November 6, 1990.

This information notice informs uranium fuel fabrication and conversion facilities of an explosion potential associated with the pumping of solutions containing ammonium nitrate. The risk could also exist in the pumping of other solutions in which the chemical characteristics of the solute are similar to those of ammonium nitrate. In two incidents described here, pumps, servicing a uranyl nitrate system in one case and associated with an ammonium diurinate system in the other, overheated and boiled off the majority of water in the solution because they were "dead-headed." This concentrated the ammonium nitrate and resulted in a rapid thermal decomposition. Recipients are encouraged to review the information here and consider actions, if appropriate, to preclude possible pump explosion potential.

SIGNIFICANT ENFORCEMENT ACTIONS AGAINST MATERIALS LICENSEES

One way to avoid regulatory problems is to be aware of enforcement problems others have faced. Thus, we have included here a discussion of some representative enforcement actions against materials licensees. These enforcement actions include civil penalties, orders of various types, and notices of violations.

A. Civil Penalties and Orders

1. Veterans Administration Medical Center, Brooklyn, New York
Supplement VI, EA 89-190

A Notice of Violation and Proposed Imposition of Civil Penalties in the amount of $8,750 was issued November 28, 1989, to emphasize the need for the licensee to aggressively monitor and evaluate licensed activities throughout the facility. The action was based on violations involving: (1) failure to follow emergency procedures to remove the patient from the room when a teletherapy treatment timer continued to operate beyond its present time and the source did not return to its shielded position; and (2) 14 violations which in the aggregate demonstrate a lack of management oversight. The licensee responded to the Notice in a letter dated January 3, 1990. After consideration of the licensee's response, the staff concluded the violations occurred as stated. An Order Imposing Civil Penalties was issued April 20, 1990.

2. Veterans Administration Medical Center,
Des Moines, Iowa
Supplement VI, EA 90-014

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $5,000 was issued March 9, 1990, to emphasize the importance of ensuring that, in the future, the licensee will exercise greater management control over all NRC-licensed activities. The action was based on violations involving requirements for: (1) an NRC-authorized radiation safety officer; (2) quarterly physical inventories; (3) contamination surveys; (4) wipe tests; (5) monthly checks on the operation of a xenon-133 collection system; (6) leak tests; (7) dose calibrator linearity tests; (8) yearly radiation safety reviews; (9) calculations regarding concentrations of xenon-133 in designated areas; and (10) records of the transfer of licensed material. The base civil penalty was escalated by 100 percent, because NRC identified the violations.

3. Veterans Administration Medical Center,
New York, New York
Supplement IV, EA 89-165

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $2,500 was issued October 13, 1989, to emphasize the need for the licensee to aggressively monitor and evaluate licensed activities to ensure that these activities are conducted safely and in accordance with the terms of the license. The action was based on violations involving: (1) failure of the Medical Isotopes Committee to approve users of licensed material and to perform the required annual review of the entire radiation safety program; (2) failure to properly secure radioactive material to prevent unauthorized removal; (3) failure to evaluate whole body extremity radiation exposures

of persons handling millicurie amounts of phosphorus-32; (4) failure to perform proper surveys of radioactive material packages before opening; (5) failure to perform dose calibrator constancy checks before assay of patient doses; and (6) storage of food in areas where radioactive materials are stored and used. The licensee responded and paid the civil penalty on November 8, 1989. In the letter, the licensee denied two of the violations and partially acknowledged three other violations. After consideration of the licensee's response, the staff concluded that the violations did occur and that sufficient basis was not provided for retraction of the violations.

4. Veterans Administration Medical Center, Houston, Texas
Supplements IV and VI, EA 90-027

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $7,500 was issued April 11, 1990, to emphasize the importance of establishing and maintaining an effectively managed radiation safety program that includes measures to ensure compliance with NRC requirements. The action was based on violations involving a breakdown of management control over a broad-scope program licensed for medical diagnosis, therapy and research, and a separate program involving the use of a cobalt-60 teletherapy unit.

5. Veterans Administration Medical Center, Newington, Connecticut
Supplement IV, EA 90-035

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $2,500 was issued April 3, 1990, to emphasize the importance of maintaining adequate management attention to licensed activities. The action was based on violations involving failures to: (1) appoint and receive approval of a new Radiation Safety Officer; (2) provide sufficient training to personnel working in the nuclear medicine department; (3) perform certain required surveys or retain records of other surveys; (4) (the Radioisotope Committee) meet as required; and (5) perform required checks of the dose calibrator.

6. American Radiolabeled Chemicals, St. Louis, Missouri
EAs 89-257 and 90-110

An Order Suspending Licenses was issued January 11, 1990. The action was based on inspection findings that included, but were not limited to, the licensee deliberately shipping to Switzerland, on at least six occasions during 1989, packages containing carbon-14 tagged potassium cyanide, bromoacetic acid, or methyl bromide that were improperly labeled on shipping papers, in violation of 10 CFR 71.5. The Order suspended the license until final resolution of the licensee's application for renewal. The licensee made six separate submittals requesting modification of the Order. After each review of the licensee's modified operating procedures, and changes in the radiation safety program and corporate organizational structure, NRC modified the Order to allow a return to limited operation. The Order Suspending Licenses and all other Order modifications were rescinded on September 13, 1990, when a 2-year probationary license was issued.

7. M. Berkowitz and Company, Inc., dba HTP, Sharon, Pennsylvania
Supplements IV and VI, EA 90-115

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $500 was issued July 19, 1990, to emphasize NRC concerns regarding lack of adequate control of licensed material, failure to designate a Radiation Safety Officer, and lack of proper inventories of radioactive sources. The action was based on a number of violations that collectively demonstrate a lack of adequate control of licensed material.

8. Cleveland Clinic Foundation, Cleveland, Ohio
Supplement VI, EA 90-074

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $6,875 was issued June 21, 1990, to emphasize the importance of the failure to promptly report the teletherapy misadministration that occurred on February 8, 1990, and the need to ensure accountability, effective communications, and management control over the licensee's radiation safety program. The action was based on a violation involving the failure to report a therapy misadministration within the required time period. The civil penalty was escalated 175 percent because of the licensee's poor past performance, non-prompt and non-comprehensive corrective actions, and NRC identification of the violation.

9. Consolidated NDE, Inc., Woodbridge, New Jersey
Supplements IV and VI, EAs 90-060 and 90-80

An Order Suspending Operations and Modifying License and a Notice of Violation and Proposed Imposition of Civil Penalty were issued May 2, 1990. The Order requires the licensee to prohibit any individual from using radiography sources until the individual has been retrained and submits a signed statement to the licensee that he or she understands and commits to implement NRC and licensee requirements, requires the use of rope barriers to establish restricted areas, and requires an independent consultant to assess the licensee's radiation protection program. The Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $10,000 was issued to emphasize the unacceptability of violations that individually or collectively cause a substantial potential for exposure in excess of 10 CFR Part 20 limits and the importance of management providing sufficient oversight of radiographic activities to ensure that they are performed safely and in accordance with NRC requirements. The action was based on the

failures to: (1) maintain direct surveillance of a high radiation area; (2) adequately post radiation area and high radiation area signs; (3) adequately perform required surveys of radiographic exposure devices after completing radiographic exposures; (4) lock the source in the shielded position upon completion of radiographic surveys; (5) properly establish a restricted area boundary; and (6) use required dosimetry/badges. The base penalty was escalated 100 percent based on prior notice. The licensee responded July 9, 1990, and after consideration of the licensee's response, an Order Imposing Civil Penalty was issued September 5, 1990.

10. Davis Memorial Hospital, Elkins, West Virginia
Supplements IV and VI, EA 90-101

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $10,000 was issued July 24, 1990, to emphasize the importance of maintaining management oversight and control of licensed activities. The action was based on violations involving failures to: (1) conduct radiation safety committee meetings five separate calendar quarters; (2) perform annual reviews of the entire radiation safety program; (3) train individuals frequenting restricted areas; (4) assay iodine-131 doses before administering to patients; (5) properly determine molybdenum-99 breakthrough contamination; and (6) decontaminate, and limit radiation levels in unrestricted areas. The base civil penalty was escalated 150 percent.

11. Georgetown University, Washington, D.C.
Supplements V and VI, EA 90-103

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $625 was issued July 18, 1990, to emphasize the importance of coordination and control of licensed material. The action was based on the transfer of a 2.1-curie source without proper authorization by the radiation control officer and without proper controls being established. The base civil penalty was mitigated by 25 percent for identification and 50 percent for comprehensive corrective action.

12. Industrial NDT Company, Inc., North Charleston, South Carolina
Supplement VI, EA 90-058

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $6,250 was issued June 8, 1990, to emphasize the need for diligent management oversight of radiographic operations. The action was based on violations involving the failure to secure a radiography source in its shielded positions within the exposure device and the failure to survey the entire circumference of the exposure device, including the source guide tube. The base civil penalty was escalated by 25 percent because of prior notice for similar events.

13. Thomas Jefferson University, Philadelphia, Pennsylvania
Supplements IV and VI, EA 90-013

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $3,125 was issued March 13, 1990, to emphasize the importance of appropriate control and oversight to prevent the improper disposal of radioactive material, and aggressive management oversight of the radiation safety program to ensure that all aspects of the program are carried out in conformance with regulatory requirements and license conditions. The action was based on an incident in which a 53-millicurie cesium-137 brachytherapy source could not be accounted for and was presumed to have been disposed of in the normal trash and taken to a landfill. The base civil penalty was escalated by 25 percent for poor prior performance. The licensee responded in letters received on April 13, 1990. After consideration of the licensee's responses, an Order Imposing a Civil Monetary Penalty was issued July 9, 1990.

14. Petro Data, Inc., Hominy, Oklahoma
IA 90-131

An Order Modifying License (Effective Immediately) was issued August 3, 1990. The action was based on the findings of a recent NRC investigation into the activities of two employees. It was determined that both individuals performed activities involving licensed material without a valid license, and that both individuals provided false information to the NRC investigator. In addition, one of the individuals provided false information to NRC on the placement of licensed material in safe storage.

15. Potomac Valley Hospital, Keyser, West Virginia
Supplements VI and VII, EAs 90-67 and 90-127

A Demand for Information was issued July 2, 1990, and a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $6,250 was issued August 20, 1990, to emphasize the importance of aggressive management involvement in the licensee's licensed program, to ensure that NRC requirements are met and that required records are accurate and complete. The action was based on violations involving failure to hold radiation safety committee meetings and fabrication of NRC-required records to make it appear that the meetings had been held. The base civil penalty was escalated by 25 percent because NRC identified the violation and because there were multiple examples.

16. St. Louis Testing, St. Louis, Missouri
Supplements IV and VI, EA 90-009

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $5,000 was issued March 6, 1990, to emphasize the significance of the cited violations and the need for continued and effective management control over activities authorized

by the license. The action was based on exposure to a radiographer in excess of 3 rem for a calendar quarter, and five other related violations. The licensee responded in letters dated April 4 and 25, 1990. After consideration of the licensee's response, an Order Imposing Civil Monetary Penalty in the amount of $5,000 was issued June 20, 1990.

17. Somat Engineering, Inc., Taylor, Michigan
Supplement IV, EA 90-123

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $125 was issued August 16, 1990, to emphasize the importance of maintaining proper control of licensed material at all times and the unacceptability of willful violations of any nature. The action was based on the willful failure to maintain constant control over a moisture density gauge.

18. Testmaster Inspection Company, Inc., Perrysburgh, Ohio
Supplement VI, EA 90-001

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $3,750 was issued February 13, 1990, to emphasize the need for compliance with radiological safety procedures and for more effective management attention to activities authorized by the license. The action was based on the licensee's failures to: (1) make a survey after each radiographic exposure; (2) retract a source into the exposure device at the end of an exposure, and (3) immediately contact the radiation safety officer after it was determined that the dosimeters worn by the radiographer and the assistant were off-scale and the source in the exposed position. The base civil penalty was mitigated by 25 percent because the licensee identified and reported the violation. An Order Imposing Civil Monetary Penalty in the amount of $3,750 was issued June 20, 1990.

19. U.S. Department of Agriculture, Washington, D.C.
Supplements IV and VI, EA 90-120

A Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $5,000 was issued August 16, 1990, to emphasize the need for licensee management to aggressively monitor and evaluate licensed activities, ensure that activities are conducted safely and in accordance with the terms of the license, and ensure that corrective actions are long-lasting. The action was based on numerous violations that, viewed collectively, demonstrate lack of management oversight. Significant among the violations was the failure to ensure that facilities under the broad license were inspected internally by the radiation safety staff at required frequencies. This was a repeat violation.

B. Severity Level III Violation, No Civil Penalty

1. Riverside Regional Medical Center, Newport News, Virginia
Supplement VI, EA 90-063

A Notice of Violation was issued April 30, 1990, involving a failure to make a positive patient identification, which resulted in a therapeutic misadministration involving a treatment of approximately 300 rad to the wrong patient. A civil penalty was not proposed because the violation was identified promptly by the nursing staff, it was immediately reported to NRC, corrective action was prompt and extensive, and past performance of the licensee was good.

2. Sigma Chemical Company, St. Louis, Missouri
Supplements IV and VI, EA 90-088

A Notice of Violation was issued June 12, 1990, involving failures to: (1) control individual exposures to radioactive material, in that an individual received an absorbed carbon-14 uptake in excess of the limits specified in 10 CFR Part 20; and (2) wear a protective laboratory coat to prevent direct contact with radioactive material. A civil penalty was not proposed because of the licensee's prompt reporting of the event, prompt and extensive corrective actions, and good past performance.

3. Solar Testing Laboratories, Inc., Garfield Heights, Ohio
Supplement VI, EA 90-047

A Notice of Violation was issued April 4, 1990, involving failures to: (1) secure licensed material stored in an unrestricted area; (2) store in a locked facility a moisture/density gauge that was not being used; and (3) lock a moisture/density gauge to prevent the accidental exposure of a sealed source, when the gauge was not under the direct supervision of approved personnel. These violations related directly to the theft of one of the licensee's moisture/density gauges. A civil penalty was not proposed because the licensee identified the loss and promptly reported it to NRC, instituted a significant effort to locate the missing licensed material, and the licensee's past performance was above average.

4. Advanced Medical Systems, Inc., Cleveland, Ohio
Supplement VI, EA 90-051

A Notice of Violation was issued July 26, 1990, after an inspection that identified a number of violations: (1) the emergency electrical generator for the licensee's air-handling and radiological-monitoring equipment was inoperable; (2) bioassays of workers were not performed as required; (3) high-radiation-area access controls were not adequate; (4) an alarming dosimeter used during a hot cell entry had not been calibrated within 6 months before its use; (5) physical inventories of sealed sources and devices had not been conducted; (6) the evaluation of excessive exposure to an individual had not been documented; (7) an external semiannual audit of

facilities and procedures was not conducted as required; (8) the master alarm panel did not properly indicate opening of the basement door, nor was there any warning light over the basement door as required; and (9) the roof area was not conspicuously posted as a radiation area. A civil penalty was not proposed because of the positive steps the licensee has taken to improve its facility over the past few years, especially with regard to decontamination of the facility and ongoing improvements to the hot cell ventilation system, and the positive safety attitude expressed by the licensee's radiation safety officer.

5. Tri-State Associates, Inc., Woodbridge, Virginia
Supplement IV, EA 90-113

A Notice of Violation was issued July 23, 1990, involving the licensee's failure to perform a survey to evaluate radiation hazards incident to radiographic operations. The failure to perform the survey resulted from a serious lapse of attentiveness to operational activity by a licensee radiographer and led to a situation where there was substantial potential for exposure in excess of limits established in 10 CFR Part 20. A civil penalty was not proposed because of the licensee reporting the event to NRC, its corrective actions, and prior performance.

6. University of Cincinnati, Cincinnati, Ohio
Supplement VI, EA 90-040

A Notice of Violation was issued July 2, 1990, for numerous violations involving a serious breakdown in the management of the licensee's radiation safety program. The majority of the violations related to the failure to either perform or to document the results of various required surveys and inventories. A civil penalty was not proposed in order to encourage and support the initiative and effectiveness of senior managers of the University of Cincinnati in fully identifying and correcting the problems in the radiation safety program.

NUCLEAR REGULATORY COMMISSION (NRC) AND ENVIRONMENTAL PROTECTION AGENCY (EPA) TO DEVELOP NATIONAL MIXED WASTE PROFILE

On May 14, 1990, a letter was sent to NRC Chairman Kenneth M. Carr and EPA Administrator William K. Reilly by the Host State Technical Coordinating Committee (TCC), requesting the development of a national profile on the volumes and characteristics of commercially generated low-level radioactive mixed waste. Mixed waste is waste that satisfies the definition of low-level radioactive waste in the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA), and contains hazardous material that is either: (1) listed as a hazardous waste in Subpart D of 40 CFR Part 261; or (2) causes the waste to exhibit any of the hazardous waste characteristics identified in Subpart C of 40 CFR Part 261. As a result of this letter and consultations between NRC, EPA, and the Department of Energy (DOE), a contract was awarded to Oak Ridge National Laboratory (ORNL), to compile a national profile on the volumes, characteristics, and treatability of commercially generated low-level radioactive mixed waste. The information that will be compiled by this profile is needed by States, compact officials, private developers, and Federal agencies to assist in the planning and development of treatment and disposal facilities for low-level radioactive mixed waste.

The project has been divided into three phases. Phase one of the project will consist of an evaluation of existing data on mixed waste volumes and characteristics, to determine if these data are adequate to use as the basis for a national mixed waste profile. Phase one will include a literature search for data on mixed waste, focusing primarily on results from past mixed waste survey reports. A summary of the problems encountered and lessons learned from past surveys will also be included. Phase one will also identify the basis for determining the adequacy of the data, identify the data parameters and information configurations for a mixed waste profile, and propose a method of compiling the existing data, if it is determined that the existing data are adequate to meet the stated objectives of the survey.

Phase two of the project will be implemented if it is determined that the data from previous surveys are not adequate to compile a national mixed waste profile. This phase of the project will begin with the development of a plan for the collection of the data needed to compile the mixed waste profile. This plan will consist of a formal statement of the objective and scope of the plan; a description of the approach and method of data collection; an estimate of the impact on the survey population; a description of the computer database; and a description of the data analysis to be performed. Phase two will also include the development and testing of the tools to be used in the collection of the data. Development of the tools will require a proposal of the data parameters and information configuration to be used to conduct the survey, as well as the testing of the tools on a limited sample population. Phase two of the project will conclude with the actual collection and analysis of the survey data, if needed.

Phase three of the project will consist of the preparation of a national mixed waste profile report. This report, which will be published in NUREG form, will identify mixed waste volumes and characteristics, treatment technologies, and organizations offering these technologies.

Phase one of the project was initiated on September 17, 1990, and the entire project is expected to be completed between September 1991 and March 1992. NRC licensees may be asked to participate in the profile if it is determined that phase two of the plan should be undertaken.

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