NMSS Licensee Newsletter

U.S. Nuclear Regulatory Commission

Office of Nuclear Material Safety and Safeguards

NUREG/BR-0117
No. 01-4
December 2001 - January 2002

NMSS Licensee Newsletter (December 2001 - January 2002)

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NRC ACTIVITIES IN RESPONSE TO SEPTEMBER 11, 2001, EVENTS

In light of the terrorist attacks that occurred September 11, 2001, the U.S. Nuclear Regulatory Commission (NRC) has taken action to enhance security for nuclear power plants, nuclear fuel facilities, and other licensed facilities and activities. Safety and security are inseparable topics that remain the top priorities of NRC, licensees, and other government agencies.

NRC's response to the terrorist attacks took three forms:

1. Although there were no attacks on, or specific, credible threats against, NRC-licensed facilities, NRC took immediate actions to monitor and assess events and threats, to ensure that NRC and licensees took appropriate security measures, and to issue safeguards advisories to licensees.

2. NRC has taken continuing actions, including updating and supplementing advisories to licensees; coordinating closely with military, intelligence, law enforcement, and State agencies; informing Congress and the public of Agency actions; and reviewing licensee actions.

3. NRC has initiated short-term and long-term actions to thoroughly review safeguards programs, including their underlying assumptions.

NRC's safeguards program is based on the definition of the threat against which different licensees must defend. The extent of the threat and the requirements for protection depend on the type of facility and the risk of theft or sabotage of the nuclear or radioactive material involved. Generally,

requirements are higher for nuclear power plants and nuclear fuel cycle facilities than for most other types of facilities.

Licensees use material control and accounting measures to keep track of nuclear material in process, storage, or transport. Facilities with quantities and types of nuclear material that could pose a substantial public risk have physical security plans that consider the robust design of major facilities and use the principle of defense-in-depth, or multiple measures, to control access to facilities.

Normal security measures for large nuclear facilities include well-armed civilian guard forces, physical barriers; detection systems; access controls; alarm stations; and detailed response strategies. NRC inspects security measures routinely and periodically undertakes various exercises. Key licensee employees are subject to clearance requirements, including background investigations, and must meet requirements for fitness for duty. Licensees must be prepared to implement protective strategies when faced with an armed attack. NRC is reconsidering all these elements of the safeguards program as part of its comprehensive examination of the necessary level of protection for licensed facilities and activities.

NRC took a number of immediate actions after the attacks of September 11, 2001. Immediately after the second plane crash, NRC activated its Operations Center at Headquarters, and the Incident Response Centers in the regions. The Agency has operated the Emergency Operations Center around the clock. Teams consisting of top officials and specialists were assigned to these centers. NRC issued safeguards advisories to power reactors and certain fuel cycle facilities, recommending that they go to the highest level of security, which they did. All facilities have remained at the highest security level, Security Level 3, because of the threat of retaliatory attacks by terrorists. The licensees were advised to maintain heightened security. Specific actions taken by the licensees include increased patrols; additional security posts; limited access of personnel and vehicles to facility sites; and increased coordination with local law enforcement and military authorities. Subsequently, NRC issued safeguards advisories to other facilities and to Agreement States, which regulate many nuclear facilities. The Agency continues to monitor the situation, in close coordination with other Federal and State agencies.

NRC has been working closely with the Federal Bureau of Investigation, Office of Homeland Security, Federal Emergency Management Agency, Department of Energy, Federal Aviation Administration, the military, and others. NRC temporarily assigned staff to the FBI's Strategic Information and Operations Center and the Consequence Management Team of the Office of Homeland Security. Lastly, the Agency has continued communicating with nuclear regulators around the world, including Canadians and Mexicans, as well as the International Atomic Energy Agency and the Nuclear Energy Agency.

The terrorist attacks have also prompted NRC's review of the sensitivity of information contained in documents and information received and issued by the Agency. The Agency has removed, from public availability, documents and information that might be of help to an attacker or saboteur, and has temporarily shut down its public website, to determine what information should not be available. A redesigned website has since been partially restored and will be fully restored when all the information has been reviewed for its potential security sensitivity, and the new information can be posted. NRC has also communicated with the public by issuing press releases, briefing interested parties, and responding to inquiries.

In the long term, NRC is considering the implications of the September 11 attacks for NRC's responsibilities for security of nuclear facilities and material, as part of a National examination of security measures. In addition to the elements of NRC's safeguards program discussed above, the comprehensive review will include questions of coordination with other Government agencies, particularly the new Office of Homeland Security; the respective responsibilities of the Federal Government and the private sector for defense of nuclear facilities; the threat of additional attacks against the U.S.; consistency in the level of protection against terrorist attacks throughout the critical infrastructure; and emergency preparedness by NRC, licensees, States, and localities.

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NRC MEASURES TO INCREASE SECURITY AND CONTROL OF LICENSED MATERIAL

The way the U.S. Nuclear Regulatory Commission (NRC) looks at control and security of licensed material, as required by 10 CFR 20.1801 and 20.1802, changed dramatically after September 11, 2001. Before the terrorist attacks, NRC was principally concerned about accidental exposure to material. Industry history has shown the danger from lost sources, as evident from events in Thailand, Brazil, and other real events. After September 11, the danger of Radiological Dispersion Devices, aka "Dirty Bombs," became more apparent. Numerous news organizations, including *The Washington Post*, on December 4, 2001, have reported that documents captured from the Al Qaeda organization and other leads indicated the organization's interest in developing such a weapon, which would use conventional explosives to spread radioactive material. Now NRC is looking at control and security of licensed material as a means to prevent theft and malevolent use of that material, in addition to loss and accidental exposure.

After the September 11 attacks, NRC implemented both immediate and interim actions intended to increase the security and control over radioactive materials possessed by NRC and Agreement State licensees. Immediate actions included staffing the NRC Headquarters operations center on a 24-hr basis, right after the attacks, and recommending that licensees with security plans go to a heightened security level.

NRC is currently conducting a "top-to-bottom" review of security requirements, which will consider all aspects of security for radioactive sources. This review is expected to result in additional, long- term recommendations for increasing security and control to protect radioactive materials from a terrorist threat or other malevolent uses. NRC is also coordinating with the U.S. Department of Energy (DOE) to accelerate the DOE program to retrieve unused greater than Class C waste radioactive sources (primarily americium-241 and plutonium) that are awaiting disposal.

Interim measures since September 11 have also included the issuance of several safeguards advisories to materials licensees. The advisories have been used to communicate to licensees the need for prudent and prompt actions to strengthen security measures and awareness, in light of the potential for a terrorist threat; to strongly encourage licensees to establish and maintain a high level of alertness to security-related matters; to increase attention to unusual activities; and to conscientiously use security controls such as locks, and stricter access controls for their sources. The following advisories were issued to materials licensees:

- September 25, 2001: A Safeguards Advisory was issued to Large Materials Licensees and Agreement States. That advisory was issued to ensure that large materials licensees and Agreement States were aware of the threat of terrorist attacks.
- October 16, 2001: A second Safeguards Advisory was issued to an expanded list of materials licensees, providing more specific and formal recommendations for enhancing security of licensed materials.

  The advisory also urged licensees to promptly contact local law enforcement agencies, the local Federal Bureau of Investigation, NRC, and applicable Agreement State agencies, when relevant suspicious or unusual situations arise. This Safeguards Advisory was followed up with telephone inspections, by NRC and Agreement States, with their licensees, to verify that the licensees received the advisory and to determine if appropriate measures had been taken in light of the threat.
- October 26, 2001: A third advisory urged all manufacturers and distributors to be even more careful to confirm the identity and authorization of recipients, before transferring large amounts of radioactive material.
- November 8, 2001: This advisory urged materials licensees that prepare or receive radioactive material shipments, other than irradiated fuel shipments that meet the Department of Transportation definition of a Highway Route Controlled Quantity, to take additional security precautions.
- December 13, 2001: This was an update to the November 8, 2001 advisory, providing further guidance on additional security precautions.

As earlier stated, in response to the terrorist attack of September 11, NRC is doing a "top-to- bottom" review of security requirements. Although the long-term review is underway, interim measures are being considered, using some of the lessons learned in developing the recommendations of the Safeguards Advisories.

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NRC PARTICIPATION IN THE FBI STRATEGIC INFORMATION OPERATIONS CENTER

Since September 11, the U.S. Nuclear Regulatory Commission (NRC) has assigned staff to the Federal Bureau of Investigation (FBI) Strategic Information Operations Center (SIOC). SIOC is located in the FBI Headquarters building in downtown Washington, DC. It covers about 3700 square meters (40,000 square feet) of windowless office space in the central part of the building. Some of the other agencies that provide staff are the Department of Defense; Bureau of Alcohol, Tobacco and Firearms; Federal Aviation Administration; and many more that have responsibilities to protect the public health and safety. NRC staff was assigned to the Consequence Management Group.

At any given time, there are approximately 500 Federal agents and attorneys working to review incoming information, referred to as "leads," to the appropriate agency, or to assign FBI agents to work the lead.

At first the SIOC was manned 24 hours a day, 7 days a week. Leads came in frequently, and the primary focus was on aviation. Eventually those leads dropped off as the investigation became more involved with the anthrax threat. As the situation became more stable, the hours were reduced to 12-hour days, from 8:00 am to 8:00 pm. Now, because leads have become scarce, NRC no longer has staff present in the SIOC, but has someone on call around the clock at the NRC Operations Center. Work at SIOC involved receiving information from the FBI or other agencies and forwarding that information to the NRC Operations Center. This information also flowed in the other direction, as information was received by our regional offices or by Headquarters and then forwarded to the FBI, for investigation. Most leads were provided by well-meaning citizens who wanted to help. Many calls related to information that was weeks or even months old and, before September 11th, did not seem important to the caller. After the attack, many people thought that some past activities or discussions now seemed suspicious.

On most occasions, what appeared to be a substantial and suspicious bit of information turned out to be quite innocent.

NRC on-site support at the SIOC was necessary for establishing an efficient flow of information between NRC and other Federal agencies. In the fight against terrorism, the efficient flow of information is critical. The cooperation among agencies, as evidenced at the SIOC, has helped make the response to potential threats more effective and timely.

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NRC THREAT ASSESSMENT PROGRAM

The U.S. Nuclear Regulatory Commission (NRC) has a well-established threat assessment program, to support safeguards policy decisions, as well as to evaluate current threat information, to determine the need for both NRC and licensee response. Although the program is maintained by the Office of Nuclear Material Safety and Safeguards (NMSS), it serves as an Agency asset, and team members, who are intelligence analysts with counterterrorism backgrounds, evaluate intelligence and law enforcement information daily. The threat team has established liaison contacts throughout the intelligence and law enforcement communities, to assure receipt of information in a timely manner. As part of the NRC response to September 11, the threat team provided around-the-clock intelligence support to NRC's Safeguards Team and Executive Team, which assess conditions and decide on Agency action during an incident. This support has been scaled back, along with the rest of the Agency response; however, the threat team continues to be on call on a 24-hour basis.

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REVIEW OF LOST, STOLEN, OR ABANDONED RADIOACTIVE SOURCE DATA REPORTED TO NMED

This article presents the result of a review of data, reported to the U.S. Nuclear Regulatory Commission (NRC),[1] involving the reportable[2] loss of control of radioactive material (lost, stolen, or abandoned radioactive material) for the period January 1, 1997 - December 31, 2001. A total of 1742 sources was reported lost during this period. This equates to an average of about 348 sources lost annually. There are approximately 2 million radioactive sources licensed by NRC and its Agreement States. Therefore, the reported loss rate is less than two-tenths of 1 percent of the source inventory, annually. Based on information reported to the Nuclear Materials Events Database (NMED), approximately 45 percent of sources lost or stolen were recovered. However, this may underestimate the recovery rate, because information on the final disposition of sources is not always reported to NMED.

There is no evidence from reported event data that any of the lost, stolen, or abandoned radioactive material was stolen or otherwise diverted for use in a terrorist act.

About 24 percent (435 out of 1742) of the sources were stolen. Most of the reported thefts (over 80 percent) involved stolen portable moisture/density gauges used in highway construction. Most of the lost moisture/density gauges were stolen from vehicles where the gauges were temporarily stored, along with other construction tools and equipment. The gauges typically contain two separate sources; therefore, the loss of a single gauge accounts for two sources. The primary reason for the theft of portable/moisture density gauges appeared to be the attraction of expensive portable equipment. The reported thefts do show a regional bias.

About 45 percent of the stolen gauges occurred in four States: Arizona, California, Florida, and Texas. The reason more gauges are stolen in these States is not known. It could be because there are more gauge users in these States. The gauges are used in highway and other paving construction projects, and the States listed have long construction seasons.

The majority of lost sources reported to NMED were sources lost as a result of improper inventory control by source owners. This accounts for about 60 percent (1103 out of 1742) of the lost sources. Found sources account for about 12 percent (204 out of 1742) of the lost sources. Most (about 98 percent) were found at scrap metal recycling facilities or landfills. A source found in a scrap recycling facility or landfill is counted as a lost source, since the source is out of the control of the owner. In some cases, the same source may have been reported lost by the owner. An attempt is made to match any source found, with a source previously reported lost, so as not to double-count the loss.

Table 1, below, shows the typical devices, with associated isotopes and activities, that are reported lost, stolen, or abandoned.

With the exception of fixed gauges (Cs-137) which account for approximately 13 percent of the lost sources, and self-luminous devices (H-3), the activities of other sources reported lost were less than 1.85 megabecquerels (MBq) (50 mCi). The activities of sources lost in fixed gauges were as high as 74 gigabecquerels (GBq) (2 Ci).

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[1]NRC maintains a database, the Nuclear Materials Events Database (NMED), on incidents and accidents (events) involving the use of radioactive material licensed under the Atomic Energy Act (AEA). NMED contains records of events reported to NRC by NRC licensees, Agreement States, and non-licensees, from 1990 to the present.

[2]The criteria for reporting lost sources are based on activity levels specified in Title 10, Part 20, of the *Code of Federal Regulations* (CFR) - 10 CFR 20.2201.

Table 1. Type devices, isotopes, and activities for about 75 percent of lost devices

Class of device	Typical radioisotopes	Typical activity range
Portable gauge	Cs-137, Am-241/Beryllium	Cs-137: 0.3 GBq (8 mCi) Am-241: 1.48 GBq (40 mCi)
Fixed gauge	Cs-137	0.74 GBq - 74 GBq (20 mCi - 2 Ci)
Brachytherapy seed	Ir-192, Cs-137	0.3 GBq to 1.48 GBq (8 - 40 mCi)
Radiopharmaceutical	I-125, I-131, Tc-99m	3.7 MBq - 740 MBq (100 μCi - 20 mCi)
Self-luminous device	H-3	7 GBq - 2 TBq (190 mCi- 58 Ci)
Ionization device	Po-210	0.37 GBq - 1.48 GBq (10 mCi - 40 mCi)
Chemical agent detector/monitor	Am-241, Ni- 63	Am-241: 9.25 MBq (250 μCi) Ni-63: 0.56 GBq (15 mCi)
Gas Chromatography unit	Ni-63	Gas Chromatography unit
Calibration source	Am-241, Cs-137, Gd-153, Pu-239, Co-60	Calibration source

Note: Definitions for Table:
Cs-137 - cesium-137; Am-241 - Americium-241; GBq - gigabecquerels; mCi - millicuries; IR-192 - iridium-192; I-125 - iodine-125; I-131- iodine-131; Tc-99m - technetium-99 molybdenum; MBq - megabecquerels; μCi - microcurie; H-3 - tritium; TBq - terabecquerels; Po - 210 - polonium-210; Ni-63 - Nickel-63; Gd-153 - gadolinium-153; Pu-239 - plutonium-239; Co-60 - cobalt-60.

In addition to the devices described in Table 1, one irradiator [15.5-GBq (420 Ci) Cs- 137] source and 22 radiography exposure devices with Ir-192 sources ranging in activity from 0.59 terabecquerels (TBq) (16 Ci) to 3.1 TBq (84 Ci) were also reported lost during the period January 1, 1997 - December 31, 2001. The reported disposition of these sources is as follows:

- The irradiator source was licensed before 1980 and could not be accounted for by the licensee during an NRC inspection in July 2000. The source had not been in use for an extended period of time. It was identified as being unaccounted for during an NRC review of former licensees. The licensee believes that the source was shipped to an authorized recipient, although there is not documentation to support that belief.
- About 36 percent (8 out of 22) of the radiography exposure devices were stolen. Half of the devices were stolen while secured in vehicles, and the other half were stolen while locked in sheds. Six of the eight devices were reported recovered. The remainder of the devices were lost either through unsecured devices' falling off licensees' trucks transporting the device; falling overboard off barges; being left unattended; or being part of misdirected shipments by common carrier. All devices, except one that fell overboard, were recovered.

During the period for which data were reviewed for this article, there were no reports of personnel exposures exceeding regulatory limits because of loss of control of radioactive material. However, three of the loss-of-control of material events did result in facility contamination. The most severe event occurred in July 2001 at a steel recycling facility. Investigators suspected that the contamination was from a sealed source belonging to a fixed gauge that was melted. Estimates placed the source activity at no more than 3.7 GBq (100 mCi). The facility was shut down for more than 24 days for decontamination. The estimated cost is 4 million dollars for the cleanup contractor: 4 to 5 million dollars lost in production and business; and a balance of the cost in transportation and disposal. The total cost of cleanup is estimated at 10 to 12 million dollars.

The second event, which occurred in 1999, involved contamination at a landfill with Thorium-232 inadvertently received from a general licensee. The clean-up cost was estimated to be between 300,000 and 400,000 dollars. The third event involved a private individual who found a 0.74-TBq (20-Ci) H-3 exit sign and broke open one or more of the tubes in the sign while eating sunflower seeds. The individual and his house were contaminated. The highest uptake was calculated to be 0.92 kilobecquerels/liter (24.8 microcuries/liter). The committed effective dose equivalent calculated for the highest uptake was 0.86 millisieverts (86 millirem).

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USE OF NUREG-1556, "CONSOLIDATED GUIDANCE ABOUT MATERIALS LICENSES," BY LICENSEES, APPLICANTS, AND AGREEMENT STATE REGULATORS

The United States Nuclear Regulatory Commission (NRC) has produced a series of technical reports (NUREG-1556 series, "Consolidated Guidance about Materials Licenses") providing program-specific guidance. The series contains 20 volumes intended to facilitate the processes of license application, NRC review of applications, renewal of licenses, and NRC inspection of licensees. This series of NUREGs also provides a comprehensive source of reference information about materials regulations for those involved in various aspects of licensed materials utilization. The NUREGs are reviewed and, if necessary, revised every 3 years.

All 20 NUREGs, with the exception of Volume 9, "Program-Specific Guidance About Medical Use Licenses," have been published in final form. Volume 9 will be issued for a 60-day public comment period and finalized after comments have been considered. Development of the NUREG-1556 series supports NRC's performance goals of maintaining safety, improving public confidence, and increasing efficiency, effectiveness, and realism, as well as reducing unnecessary regulatory burden.

NRC strongly encourages current licensees, applicants for licenses, and Agreement State regulators to use the NUREG-1556 guidance documents in preparing new and renewal applications. We believe that use of these documents will make the NRC staff's review of these applications and inspections more effective and efficient. It is particularly important that licensees and applicants use these documents, because they supersede much of the guidance previously used for licensing. NRC's report, "Phase II- Byproduct Materials Review," August 2001, specifically recommended that NRC take a pro-active posture by encouraging licensees to use the NUREG-1556 documents as a means of improving the process for materials licensing. Future license renewal letters will strongly request that licensees use the NUREG-1556 documents in preparing applications.

The NUREGs are available electronically by visiting NRC's Home Page (http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/). For your convenience, a list of these NUREGs follows:

Vol. No.	Volume Title	Final Published
1, Rev. 1	"Program-Specific Guidance about Portable Gauge Licenses"	11/01
2	"Program-Specific Guidance about Radiography Licenses"	08/98
3	"Applications for Sealed Source and Device Evaluation and Registration"	07/98
4	"Program-Specific Guidance about Fixed Gauge Licenses"	10/98
5	"Program-Specific Guidance about Self-Shielded Irradiators"	10/98
6	"Program-Specific Guidance about 10 CFR Part 36 Irradiators"	01/99
7	"Program-Specific Guidance about Academic, Research and Development, and Other Licenses of Limited Scope"	12/99
8	"Program-Specific Guidance about Exempt Distribution Licenses"	09/98
9	"Program-Specific Guidance about Medical Use Licenses"	Draft
10	"Program-Specific Guidance about Master Material Licenses"	12/00

Vol. No.	Volume Title	Final Published
1, Rev. 11	"Program-Specific Guidance about Licenses of Broad Scope"	04/99
12	"Program-Specific Guidance about Possession Licenses for Manufacturing and Distribution"	12/00
13	"Program-Specific Guidance about Commercial Radiopharmacy Licenses"	09/99
14	"Program-Specific Guidance about Well Logging, Tracer, and Field Flood Study Licenses"	06/00
15	"Guidance about Changes of Control and about Bankruptcy Involving Byproduct, Source, or Special Nuclear Materials Licenses"	11/00
16	"Program-Specific Guidance about Licenses Authorizing Distribution to General Licensees"	12/00
17	"Program-Specific Guidance about Licenses for Special Nuclear Material of Less Than Critical Mass"	11/00
18	"Program-Specific Guidance about Service Provider Licenses"	11/00
19	"Guidance for Agreement State Licensees Proposing to Work in NRC Jurisdiction (Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters) and Guidance for NRC Licensees Proposing to Work in Agreement State Jurisdiction (Reciprocity)"	12/00
20	"Guidance about Administrative Licensing Procedures"	12/00

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SIGNIFICANT ENFORCEMENT ACTIONS

Detailed information about these enforcement actions can be accessed via the U. S. Nuclear Regulatory Commission's (NRC's) homepage (http://www.nrc.gov/OE/). Click on "Enforcement Actions." Cases are listed alphabetically. To access the complete enforcement action, click on the highlighted text after the name of the case.

Medical

Jameson Memorial Hospital (EA 01-103)

On September 25, 2001, a letter was issued documenting NRC's decision to exercise enforcement discretion in accordance with Section VII.B.6 of the Enforcement Policy for a Severity Level III violation involving the failure to maintain the whole-body dose, to a physician, below 50 millisieverts (5 rem). The licensee replied, in a letter dated March 22, 2001, that it had used a different dose evaluation methodology and that it had concluded that the dose was within the regulatory limit. Although this methodology was not specifically approved for use by the licensee, NRC concluded that discretion was warranted because the licensee's dose evaluation methodology is accepted by the State of Pennsylvania and is similar to other accepted methodologies. NRC is currently evaluating the use of alternative dose evaluation methodologies and is developing its regulatory and technical positions on this issue.

University of Medicine and Dentistry of New Jersey (EA 01-186)

On September 25, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $3000 was issued for a Severity Level III problem. The problem included two violations, the first involving the failure to control and maintain constant surveillance of material in controlled or unrestricted areas; and the second, the failure to make surveys (i.e., evaluations of the radiological conditions and potential hazards incident to the use, transfer, release, disposal, or presence of radioactive material or other sources of radiation). Although the normal civil penalty assessment process would have fully mitigated the civil penalty, a base civil penalty was proposed in accordance with Section VII.A.1.g of the Enforcement Policy, to emphasize the significance of the loss of licensed material in this case.

El Senorial PSI Nuclear Medical Laboratory (EA 01-145)

On September 28, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $2750 was issued for a Severity Level III violation. The violation was based on the failure to issue film or thermoluminescent dosimeter whole-body monitors to all individuals who were occupationally exposed to ionizing photon radiation on a regular basis.

Washington Hospital Center (EA 01-184)

On October 2, 2001, a letter was issued documenting NRC's decision to exercise enforcement discretion, in accordance with Section VII.B.6 of the Enforcement Policy, for a Severity Level III violation involving the failure to maintain the whole-body dose to a physician below 50 millisieverts (5 rem). The licensee replied, in a letter dated June 13, 2001, that it had used a different dose evaluation methodology, and that it had concluded that the dose was within the regulatory limit. Although NRC had not specifically allowed the licensee to use this methodology, NRC concluded that discretion was warranted, because the licensee's dose evaluation methodology is accepted by the District of Columbia and is similar to other accepted methodologies. NRC is currently evaluating the use of alternative dose-evaluation methodologies and is developing its regulatory and technical positions on this issue.

Halifax Regional Hospital (EA 01-260)

On October 24, 2001, a letter was issued documenting NRC's decision to exercise enforcement discretion, in accordance with Section VII.B.6 of the Enforcement Policy, for a Severity Level III violation involving the failure to maintain the whole-body dose to a physician below 50 millisieverts (5 rem). The licensee informed NRC that it had used a different dose evaluation methodology, and that it had concluded that the dose was within the regulatory limit. Although NRC had not specifically allowed the licensee to use this methodology, NRC concluded that discretion was warranted because the licensee's dose-evaluation

methodology is accepted by the State of Virginia and is similar to other accepted methodologies. NRC is currently evaluating the use of alternative dose-evaluation methodologies and is developing its regulatory and technical positions on this issue.

Glendive Medical Center (EA 01-180)

On November 1, 2001, a Notice of Violation was issued for a Severity Level III violation involving the failure to secure from unauthorized removal, or limit access to, licensed material [37 gigabecquerels (1-curie) molybdenum-99/technetium-99m generator] in an unrestricted area ,and failure to control and maintain constant surveillance of licensed material. Although a civil penalty would normally be proposed by the civil penalty assessment process, NRC exercised discretion in accordance with Section VII.B.6 and did not propose a penalty, because it concluded the incident was an isolated occurrence caused by personnel error.

Gauges

Construction Engineering Labs, Inc. (EA 01-181)

On September 27, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $3000 was issued for a Severity Level III problem involving willfulness. The problem consisted of two violations involving the failure to secure and maintain constant surveillance over a gauge and failure to assure that gauges were routinely secured in vehicles, according to procedures.

Design Fuels Corporation (EA 01-245)

On October 9, 2001, a Notice of Violation was issued for a Severity Level III violation involving the improper transfer of a gauge regulated by NRC under a general license. Although a base civil penalty was warranted under the Enforcement Policy's assessment process, a penalty was not proposed because the case exceeded the 5-year statute of limitations.

LTV Steel Company, Inc. (EA 01-244)

On October 9, 2001, a Notice of Violation was issued for a Severity Level III violation involving the transfer of a gauge, without reporting the transfer to NRC, and without providing the transferee with a copy of 10 CFR Part 31, per the regulations.

Palmerton & Parrish, Inc. (EA 01-218)

On November 1, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $3000 was issued for a Severity Level III problem involving: (1) failure to maintain control of radioactive material that is in an unrestricted area and that is not in storage; (2) failure to transport a portable moisture/density gauge in the required container; (3) failure to block and brace the gauge during transportation; and (4) failure to lock the gauge during transportation. Although the civil penalty would have been fully mitigated, based on the normal civil penalty assessment process, a base civil penalty was assessed, in accordance with Section VII.A.1.g of the Enforcement Policy, to reflect the significance of maintaining the control of licensed material.

Redondo Construction Corporation (EA 01-240)

On November 6, 2001, a Notice of Violation was issued for a Severity Level III violation involving the unauthorized transfer of byproduct material (cesium-137 and americium-241) contained in three portable gauges.

Mathy Construction Company (EA 01-214)

On November 6, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $3000 was issued for a Severity Level III problem involving the failure to secure and limit access to a portable moisture/density gauge and the failure to lock the gauge or transport case while the gauge was being transported. Although the civil penalty would have been fully mitigated based on the normal civil penalty assessment process, a base civil penalty was assessed in accordance with Section VII.A.1.g of the Enforcement Policy, to reflect the significance of maintaining control of licensed material.

SCI Engineering, Inc. (EA 01-237)

On November 15, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the

amount of $3000 was issued for a Severity Level III violation involving the failure to secure from unauthorized removal, or limit access to, byproduct material (cesium-137 and americium-241) contained in two portable moisture/density gauges, and the failure to control and maintain constant surveillance of this licensed material. Although the civil penalty would have been fully mitigated, based on the normal civil penalty assessment process, a base civil penalty was assessed, in accordance with Section VII.A.1.g of the Enforcement Policy, to reflect the significance of maintaining control of licensed material.

Centennial Engineering and Research, Inc. (EA 01-219)

On December 3, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $3000 was issued for a Severity Level III problem involving the willful failure to: (1) submit an amendment request to reflect the designation of a new radiation safety officer; and (2) confine possession of byproduct material to the location authorized by the license.

Radiography

Allied Inspection Services, Inc. (EA 01-213)

On September 17, 2001, a Notice of Violation was issued for a Severity Level III violation involving a radiographer's failure to wear a direct reading dosimeter and a personal dosimeter at all times during radiographic operations.

Cooperheat-MQS Inspection, Inc. (EA 01-166)

On September 18, 2001, a Notice of Violation was issued for a Severity Level III violation involving multiple failures to use certified radiographers while performing radiography operations.

X-Ray Inspection, Inc. (EA 01-215)

On September 27, 2001, a Notice of Violation was issued for a Severity Level III violation involving the failure to have two qualified individuals present during radiography conducted at a temporary jobsite.

Nondestructive and Visual Inspection, Inc. (EA 01-216)

On September 28, 2001, a Notice of Violation was issued for a Severity Level III violation involving the failure of Nondestructive and Visual Inspection, Inc., a licensee of the State of Louisiana, to file NRC Form 241, "Report of Proposed Activities in Non-Agreement State," before conducting radiographic operations using curie quantities of iridium-192 on off-shore platforms in waters off of the Gulf of Mexico in areas of Federal jurisdiction.

Conam Inspection (EA 01-225)

On November 9, 2001, a Notice of Violation was issued for a Severity Level III violation involving the performance of radiography at a location other than a permanent radiographic installation, with only one qualified individual present.

Other

Southeast Missouri State University (EA 00-201)

On September 13, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $11,000 was issued for a Severity Level I problem involving the failures to: (1) control activities to limit doses in accordance with requirements; (2) make necessary surveys to determine radiological hazards; and (3) possess only material authorized on the University's license. Although a base civil penalty would be warranted, based on the normal civil penalty assessment process, NRC exercised enforcement discretion, in accordance with Section VII.A.1 of the Enforcement Policy, and increased the penalty by 100 percent, based on the licensee's particularly poor performance. Additionally, a Notice of Violation (see EA 01-151) was also issued for a Severity Level III violation involving the failure to secure from unauthorized removal, or limit access to, a strontium-90 sealed source with a nominal activity of 740 megabecquerels (20 millicuries), and failure to control and maintain constant surveillance of this licensed material.

Nuclear Fuel Services (EA 01-098)

On September 24, 2001, a Notice of Violation was issued for a Severity Level III violation involving the failure to maintain a criticality alarm system for storage of approximately 20 kilograms (about 43 pounds) of highly enriched uranium.

Earthline Technologies (EA 99-290)
(Previously RMI Environmental Services)

On September 24, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $17,600 was issued for a Severity Level II violation. The violation was based on the licensee discriminating against a radiation protection technician for engaging in protected activities. In addition, a Notice of Violation for a Severity Level III violation was also issued in conjunction with this case (see EA 01-037). The violation involved the failure to secure from unauthorized removal, or limit access to, licensed material in an unrestricted area, and failure to control and maintain constant surveillance of licensed material.

Burlington Performance Wear (EA 01-266)

On November 6, 2001, NRC exercised enforcement discretion, in accordance with the Interim Enforcement Policy for Generally Licensed Devices Containing Byproduct Material, and refrained from issuing enforcement action for a violation involving the loss of a generally licensed spectrochemical analyzer. Discretion was warranted because the licensee's actions were not willful, it identified and reported the loss, and it took appropriate corrective actions to prevent recurrence.

(Contact: Sally Merchant, OE, 301-415-2747;
e-mail: slm2@nrc.gov)

SIGNIFICANT EVENTS

The U.S. Nuclear Regulatory Commission (NRC) is providing summaries of these events to inform licensees of conditions they may encounter and of actions that may be taken to deal with them.

Event 1: Overexposure of a consultant employee from intake of americium-241 at Southeast Missouri State University, Cape Girardeau, Missouri

Date and Place: June 13, 2000; Southeast Missouri State University; Cape Girardeau, Missouri.

Nature and Probable Consequences: The licensee reported that a consultant identified americium-241 (Am-241) radioactive contamination throughout storage areas in one of the campus basements. The consultant attempted to perform "spot" decontamination, re-surveyed the areas he had decontaminated, and again found removable contamination as high as 540,000 counts per minute. The licensee shut down the ventilation system and established control of contaminated areas by posting and locking access to the basement. The consultant communicated to the licensee that the decontamination efforts had not been effective, and that further decontamination efforts were beyond his ability. The licensee suspected that the contamination came from an empty vial that was labeled as containing 0.19 gigabecquerels (5 millicuries) of Am-241. NRC inspectors identified several areas of both fixed and removable contamination in the basement and on the second floor of the building. Extensive surveys of homes, automobiles, etc., did not identify off-site contamination or contaminated janitorial supplies. The licensee and a new contractor initiated an exposure evaluation involving multiple bioassay samples and lung, knee cap, skull, and liver in-vivo measurements. The final dose estimate to the individual who attempted to perform decontamination was 15 centisieverts (cSv) (rem) committed effective dose equivalent and 263 cSv (rem) committed dose equivalent to the bone surface. The licensee concluded that the interior of its storage safe likely became contaminated with Am-241 as material was routinely retrieved from and returned to the safe over the course of several years (1970 through 1979). It is possible that the contamination was the result of a spill that occurred in 1997 when the safe was dropped. After decontamination efforts, NRC determined that no detectable radioactivity remained and the building met NRC criteria for unrestricted use. The licensee stated that the most significant root cause for the event is a significant degradation of its radiation safety program in the past several years.

Actions Taken to Prevent Recurrence

Licensee: The licensee appointed a new Radiation Safety Officer (RSO) and assistant RSO to its program. A Radiation Safety Committee was chartered with the charge of providing oversight of the licensee's Radiation Safety Program. The licensee developed and implemented new Radiation Safety Program policies and procedures with the assistance of a contractor.

NRC: On September 13, 2001, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $11,000 was issued for a Severity Level I problem involving the failures to: (1) control activities to limit doses in accordance with requirements; (2) make necessary surveys to determine radiological hazards; and (3) possess only material authorized on the University's license. Also, a Notice of Violation was issued for a Severity Level III violation involving the failure to secure, from unauthorized removal, or limit access to, a strontium-90 sealed source with a nominal activity of 740 megabecquerels (20 mCi), and failure to control and maintain constant surveillance of this licensed material.

Event 2: Gamma Stereotactic Radiosurgery (Gamma Knife) Medical Event at Saint Luke's Medical Center in Milwaukee, Wisconsin.

Date and Place: July 10, 2001; Saint Luke's Medical Center; Milwaukee, Wisconsin.

Nature and Probable Consequences: The licensee reported a medical event involving a patient who received a cobalt-60 gamma knife treatment to the wrong site. Two patients were prepared for treatment, but the wrong treatment plan was used for the first patient. Four of eight shots were administered to the wrong site before it was discovered that the wrong package was being used. The patient received approximately 1300 centigray (rad) to the 50 percent isodose line, over a short period of time, to a small area of the brain. The consequences of the exposure are not known at this time and are being investigated. The patient's progress will be followed for some time. The patient subsequently received the correct treatment. The attending physician and the patient were notified on July 7, 2001.

Actions Taken to Prevent Recurrence

Licensee: Corrective actions taken included a more prominent display of the patient's name on the treatment forms, triple verification of each treatment coordinate, and physician sign-off that both the patient's name, and the patient himself/herself, are correct.

NRC: NRC contracted a medical consultant to review this event.

(Contact: Roberto Torres, NMSS, 301-415-8112, e-mail: rjt@nrc.gov)

SELECTED *FEDERAL REGISTER* NOTICES

(September 1, 2001 - November 30, 2001)

NOTE: U.S. Nuclear Regulatory Commission (NRC) contacts may be reached by mail at the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

FINAL RULES

"Interim Storage for Greater Than Class C Waste," 66 FR 51823, October 10, 2001.
Contact: Mark Haisfield, NMSS, 301-415-6196; e-mail: mfh@nrc.gov.

"List of Approved Spent Fuel Storage Casks: NAC-UMS Revision," 66 FR 52486, October 16, 2001
Contact: Jayne M. McCausland, NMSS, 301-415-6219; email: jmm2@nrc.gov.

"List of Approved Spent Fuel Storage Casks: Westinghouse MC-10 Termination; Confirmation of Effective Date," 66 FR 55559, November 11, 2001.
Contact: Merri Horn, NMSS, 301-415-8126; e-mail: mlh1@nrc.gov.

"Disposal of High-Level Radioactive Wastes in a Proposed Geologic Repository at Yucca Mountain, NV," 66 FR 55732, November 2, 2001.
Contacts: Timothy McCartin, NMSS, 301415-7285; e-mail: tjm3@nrc.gov;

Janet Kotra, NMSS, 301-415-6674;
e-mail: jpk@nrc.gov;
Clark Prichard, NMSS, 301415-6203;
e-mail: cwp@nrc.gov.

"List of Approved Spent Fuel Storage Casks: Fuel Solutions Cask System Revision," 66 FR 56982, November 14, 2001.
Contact: Merri Horn, NMSS, 301-415-8126; e-mail: mlh1@nrc.gov.

"List of Approved Spent Fuel Storage Casks: NAC-MPC Revision; Confirmation of Effective Date," 66 FR 58056, November 20, 2001.
Contact: Jayne M. McCausland, NMSS, 301-415-6219; e-mail: jmm2@nrc.gov.

"List of Approved Spent Fuel Storage Casks: Standardized NUHOMS-24P, -52B, and -61BT Revision," 66 FR 59531, November 29, 2001.
Contact: Merri Horn, NMSS, 301-415-8126; e-mail: mlh1@nrc.gov.

PROPOSED RULES

"Debt Collection Procedures," 66 FR 50860, October 5, 2001.
Contact: Leah Tremper, OCFO, 301-415-7347; e-mail: lpt@nrc.gov.

"List of Approved Spent Fuel Storage Casks: NAC-UMS Revision," 66 FR 52554, October 16, 2001
Contact: Jayne M. McCausland, NMSS, 301-415-6219; email: jmm2@nrc.gov.

"Availability of Official Records," 66 FR 52721, October 17, 2001.
Contact: Catherine M. Holzle, OGC, 301-415-1560; email: cmh@nrc.gov.

"List of Approved Spent Fuel Storage Casks: Fuel Solutions Cask System Revision," 66 FR 57002, November 14, 2001.

Contact: Merri Horn, NMSS, 301-415-8126; e-mail: mlh1@nrc.gov.

OTHER NOTICES

"Notice of Availability of NUREG-1748, Draft Environmental Review Guidance for Licensing," 66 FR 52951, October 18, 2001.
Contacts: Matt Blevins, NMSS, 301-415-7684;
e-mail: mxb6@nrc.gov;
Melanie Wong, NMSS, 301-415-6262;
e-mail: mcw@nrc.gov.

"Final Decision Related to the US Department of Energy's General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories and Its Yucca Mountain Site Suitability Guidelines," 66 FR 54303, October 26, 2001.
Contacts: Michael P. Lee, NMSS, 301-415-6677;
e-mail: mpl@nrc.gov;
C. William Reamer, NMSS,
301-415-6537; e-mail: cbr@nrc.gov.

"National Mining Association; Receipt of Petition for Rulemaking (PRM-170-5)," 66 FR 55604, November 2, 2001.
Contact: Michael T. Lesar, ADM, 301-415-7163: or Toll-Free: 1-800-368-5642; e-mail: mtl@nrc.gov.

(General Contact: Paul Goldberg, NMSS, 301-415-7842; e-mail: pfg@nrc.gov)

GENERIC COMMUNICATION ISSUED

(September 1, 2001 - November 30, 2001)

Note that this is only a summary of a U.S. Nuclear Regulatory Commission (NRC) generic communication. If this document appears relevant to your needs, and you have not received it, please call one of the technical contacts listed below. The Internet address for the NRC library of generic communications is -- www.nrc.gov/NRC/GENACT/GC/index.html. Please note that this address is case-sensitive and must be entered exactly as shown.

Information Notice (IN)

IN 2001-08, Supplement 2, "Update on Radiation Therapy Overexposures in Panama," was issued on November 20, 2001. This notice was issued to all medical licensees to provide additional

information related to the radiation therapy overexposures that recently occurred in Panama.

Contacts: Robert Ayres, NMSS, 301-415-5746; e-mail: rxa1@nrc.gov; Donna-Beth Howe, NMSS, 301-415-7848; e-mail: dbh@nrc.gov; Roberto J. Torres, NMSS, 301-415-8112; e-mail: rjt@nrc.gov.

(General Contact: Mark A. Sitek, NMSS, 301-415-5799; e-mail: mas3@nrc.gov)

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