

UNITED STATES  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
 )  
LICENSEES AUTHORIZED TO )  
POSSESS RADIOACTIVE MATERIAL )  
QUANTITIES OF CONCERN )

EA 05-090

**ORDER IMPOSING PROTECTIVE MEASURES**  
**(EFFECTIVE IMMEDIATELY)**

I

The Licensees identified in Attachment A<sup>1</sup> to this Order hold licenses issued in accordance with the Atomic Energy Act of 1954 by the U.S. Nuclear Regulatory Commission (NRC or Commission) or an Agreement State authorizing them to possess certain quantities of radioactive material of concern. Commission regulations at 10 CFR § 20.1801 or equivalent Agreement State regulations require Licensees to secure, from unauthorized removal or access,

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<sup>1</sup> Attachment A contains sensitive information and will not be released to the public.

licensed materials that are stored in controlled or unrestricted areas. Commission regulations at 10 CFR § 20.1802 or equivalent Agreement States regulations require Licensees to control and maintain constant surveillance of licensed material that is in a controlled or unrestricted area and that is not in storage.

## II

On September 11, 2001, terrorists simultaneously attacked targets in New York, N.Y., and Washington, D.C., utilizing large commercial aircraft as weapons. In response to the attacks and intelligence information subsequently obtained, the Commission issued a number of Safeguards and Threat Advisories to its Licensees in order to strengthen Licensees' capabilities and readiness to respond to a potential attack on a nuclear facility. The Commission has also communicated with other Federal, State and local government agencies and industry representatives to discuss and evaluate the current threat environment in order to assess the adequacy of security measures at licensed facilities. In addition, the Commission has been conducting a review of its safeguards and security programs and requirements.

As a result of its consideration of current safeguards and license requirements, as well as a review of information provided by the intelligence community, the Commission has determined that certain protective measures are required to be implemented by Licensees as prudent measures to address the current threat environment. Therefore, the Commission is imposing the requirements set forth in Attachment B on radioactive materials licensees who possess, or have near term plans to possess, radioactive material quantities of concern. These requirements, which supplement existing regulatory requirements, will provide the Commission with reasonable assurance that the public health and safety and common defense and security

continue to be adequately protected in the current threat environment. These requirements will remain in effect until the Commission determines otherwise.

The Commission recognizes that Licensees may have already initiated many measures set forth in Attachment B to this Order in response to previously issued advisories or on their own. It is also recognized that some measures may not be possible or necessary at some sites, or may need to be tailored to accommodate the Licensees' specific circumstances to achieve the intended objectives and avoid any unforeseen effect on the safe use and storage of the sealed sources.

Although the additional security measures implemented by the Licensees in response to the Safeguards and Threat Advisories have been adequate to provide reasonable assurance of adequate protection of public health and safety, the Commission concludes that the security measures must be embodied in an Order consistent with the established regulatory framework.

This Order requires both Nuclear Regulatory Commission (NRC) and Agreement State licensees to control information that, if released, could reasonably be expected to be useful to potential adversaries in planning an attack and adversely impact the common defense and security of the United States. Licensees must ensure proper handling and protection of their physical protection information related to the security of radioactive materials associated with this Order to avoid unauthorized disclosure in accordance with requirements set forth in Attachment C to this Order. The Commission hereby provides notice that it intends to treat unauthorized disclosure of the licensee's physical protection information as a breach of adequate protection of the public health and safety and the common defense and security of the United States. Whoever willfully violates, attempts to violate, or conspires to violate any provision of an Order issued under Section 161b is subject to punishment including a fine or

imprisonment.

To provide assurance that the Licensees are implementing prudent measures to achieve a consistent level of protection to address the current threat environment, and consistent with the International Atomic Energy Agency (IAEA) Code of Conduct on the Safety and Security of Radioactive Sources (Code of Conduct) concerning Category 1 and 2 sources, all Licensees who hold licenses issued by the U.S. Nuclear Regulatory Commission or an Agreement State authorizing possession of radioactive material quantities of concern, listed for IAEA Category 2 and as listed in Table 1, "Radionuclides of Concern," (Attachment B, Table 1), shall implement the requirements identified in Attachment B to this Order. In addition, pursuant to 10 CFR § 2.202, I find that in light of the common defense and security matters identified above, which warrant the issuance of this Order, the public health, safety and interest require that this Order be effective immediately.

### III

Accordingly, pursuant to Sections 81, 161b, 161i, 161o, 182 and 186 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR § 2.202, 10 CFR Part 30, and 10 CFR Part 32, IT IS HEREBY ORDERED, **EFFECTIVE IMMEDIATELY**, THAT ALL LICENSEES IDENTIFIED IN ATTACHMENT A TO THIS ORDER SHALL COMPLY WITH THE REQUIREMENTS OF THIS ORDER AS FOLLOWS:

- A. 1. The Licensee shall, notwithstanding the provisions of any Commission or Agreement State regulation or license to the contrary, comply with the requirements described in Attachment B to this Order. The Licensee shall immediately start implementation of the requirements in Attachment B to the Order and shall complete implementation by December xx, 2005, or the first day that radionuclides of concern at or above threshold

limits, identified in Table 1, are possessed, which ever is later.

2. The Licensee shall, notwithstanding the provisions of any Commission or Agreement State regulation or license to the contrary, comply with the information protection requirements described in Attachment C to this Order.
- B. 1. The Licensee shall, within **twenty five (25) days** of the date of this Order, notify the Commission, (1) if it is unable to comply with any of the requirements described in Attachment B, (2) if compliance with any of the requirements is unnecessary in its specific circumstances, or (3) if implementation of any of the requirements would cause the Licensee to be in violation of the provisions of any Commission or Agreement State regulation or its license. The notification shall provide the Licensee's justification for seeking relief from or variation of any specific requirement.
2. If the Licensee considers that implementation of any of the requirements described in Attachment B to this Order would adversely impact safe operation of the facility, the Licensee must notify the Commission, in writing, within **twenty five (25) days** of this Order, of the adverse safety impact, the basis for its determination that the requirement has an adverse safety impact, and either a proposal for achieving the same objectives specified in the Attachment B requirement in question, or a schedule for modifying the facility to address the adverse safety condition. If neither approach is appropriate, the Licensee must supplement its response to Condition B.1 of this Order to identify the condition as a requirement with which it cannot comply, with attendant justifications as required in Condition B.1.
- C. 1. The Licensee shall, **within twenty five (25) days** of the date of this Order, submit to the

Commission a schedule for completion of each requirement described in Attachment B.

2. The Licensee shall report to the Commission when they have achieved full compliance with the requirements described in Attachment B.

D. Notwithstanding any provisions of the Commission's or an Agreement State's regulations to the contrary, all measures implemented or actions taken in response to this Order shall be maintained until the Commission determines otherwise.

Licensee responses to Conditions B.1, B.2, C.1, and C.2 above shall be submitted to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555. In addition, Licensee's responses shall be marked as "Withhold From Public disclosure Under 10 CFR 2.390."

The Director, Office of Nuclear Material Safety and Safeguards, may, in writing, relax or rescind any of the above conditions upon demonstration by the Licensee of good cause.

#### IV.

In accordance with 10 CFR § 2.202, the Licensee must, and any other person adversely affected by this Order may, submit an answer to this Order, and may request a hearing on this Order, within **twenty five (25) days** of the date of this Order. Where good cause is shown, consideration will be given to extending the time to request a hearing. A request for extension of time in which to submit an answer or request a hearing must be made in writing to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and include a statement of good cause for the extension. The answer may consent to this Order. Unless the answer consents to this Order, the answer shall, in writing and under oath or affirmation, specifically set forth the matters of fact and law on which the Licensee or other person adversely affected relies and the reasons as to why the Order should not have been issued. Any answer or request for a hearing shall be submitted to the Secretary, Office of the Secretary of the Commission, U.S. Nuclear Regulatory Commission, ATTN: Rulemakings and Adjudications Staff, Washington, DC 20555. Copies also shall be sent

to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, to the Assistant General Counsel for Materials Litigation and Enforcement at the same address, and to the Licensee if the answer or hearing request is by a person other than the Licensee. Because of possible disruptions in delivery of mail to United States Government offices, it is requested that answers and requests for hearing be transmitted to the Secretary of the Commission either by means of facsimile transmission to 301-415-1101 or by e-mail to [hearingdocket@nrc.gov](mailto:hearingdocket@nrc.gov) and also to the Office of the General Counsel either by means of facsimile transmission to 301-415-3725 or by e-mail to [OGCMailCenter@nrc.gov](mailto:OGCMailCenter@nrc.gov). If a person other than the Licensee requests a hearing, that person shall set forth with particularity the manner in which his interest is adversely affected by this Order and shall address the criteria set forth in 10 CFR § 2.714(d).

If a hearing is requested by the Licensee or a person whose interest is adversely affected, the Commission will issue an Order designating the time and place of any hearing. If a hearing is held, the issue to be considered at such hearing shall be whether this Order should be sustained.

Pursuant to 10 CFR § 2.202(c)(2)(i), the Licensee may, in addition to demanding a hearing, at the time the answer is filed or sooner, move the presiding officer to set aside the immediate effectiveness of the Order on the ground that the Order, including the need for immediate effectiveness, is not based on adequate evidence but on mere suspicion, unfounded allegations, or error.

In the absence of any request for hearing, or written approval of an extension of time in which to request a hearing, the provisions specified in Section III above shall be final **twenty five (25) days** from the date of this Order without further order or proceedings. If an

extension of time for requesting a hearing has been approved, the provisions specified in Section III shall be final when the extension expires if a hearing request has not been received. AN ANSWER OR A REQUEST FOR HEARING SHALL NOT STAY THE IMMEDIATE EFFECTIVENESS OF THIS ORDER.

Dated this     day of June 2005

FOR THE NUCLEAR REGULATORY COMMISSION

Jack R. Strosnider, Jr., Director  
Office of Nuclear Material Safety  
and Safeguards

Attachments: A. Service List of Licensees (Not for Public Disclosure)  
B. Protective Measures for Licensees That Possess Sources Containing Radioactive Material Quantities of Concern, including Table 1: Radionuclides of Concern  
C. Proper Handling and Protection of Physical Protection Information Related to the Security of Radioactive Material Quantities of Concern

## **PROTECTIVE MEASURES FOR LICENSEES THAT POSSESS SOURCES CONTAINING RADIOACTIVE MATERIAL QUANTITIES OF CONCERN**

The purpose of the Protective Measures (PMs) is to enhance existing security and control of radioactive material in quantities greater than or equal to values described in Table 1, to reduce the risk of malevolent use of radioactive materials, through access controls to aid prevention, and prompt detection, assessment, and response to mitigate potentially high consequences that would be detrimental to public health and safety and the common defense and security. These PMs are established to delineate licensee responsibility in response to the current threat environment. The following protective measures apply to licensees which, at any given time, possess radioactive sources greater than or equal to the quantities of concern of radioactive material defined in Table 1.

1. Control access at all times to radioactive material quantities of concern and devices containing such radioactive material (devices), and limit access to such radioactive material and devices to only approved individuals who require access to perform their duties.
  - a. The licensee shall allow only trustworthy and reliable individuals, approved in writing by the licensee, to have unescorted access to radioactive material quantities of concern and devices. The licensee shall approve for unescorted access only those individuals with job duties that require access to such radioactive material and devices. Personnel who require access to such radioactive material and devices to perform a job duty, but who are not approved

by the licensee for unescorted access, must be escorted by an approved individual.

- b. For individuals employed by the licensee for three years or less, and for non-licensee personnel, such as physicians, physicists, house-keeping personnel, and security personnel under contract, trustworthiness and reliability shall be determined, at a minimum, by verifying employment history, education, and personal references. The licensee shall also, to the extent possible, obtain independent information to corroborate that provided by the employee (i.e., seeking references not supplied by the individual). For individuals employed by the licensee for longer than three years, trustworthiness and reliability shall be determined, at a minimum, by a review of the employees' employment history with the licensee.
- c. Service providers shall be escorted unless determined to be trustworthy and reliable by an NRC-required background investigation as an employee of a manufacturing or distribution (M&D) licensee. Written verification attesting to or certifying the person's trustworthiness and reliability shall be obtained from the manufacturing/distribution licensee providing the service.
- d. The licensee shall document the basis for concluding that there is reasonable assurance an individual granted unescorted access is trustworthy and reliable, and does not constitute an unreasonable risk for malevolent use of radioactive material quantities of concern. The licensee shall maintain a list of persons approved for access to such radioactive material and devices by the licensee.

2. Each licensee shall have a documented program to monitor and immediately detect, assess, and respond to unauthorized access to radioactive material quantities of concern and devices. Enhanced monitoring shall be provided during periods of source delivery or shipment, where the delivery or shipment exceeds 100 times the Table 1 values.
  - a. The licensee shall respond immediately to any actual or attempted theft, sabotage, or diversion of such radioactive material or of the devices. The response shall include requesting assistance from Local Law Enforcement Agency (LLEA).
  - b. The licensee shall have a pre-arranged plan with LLEA for assistance in response to an actual or attempted theft, sabotage, or diversion of such radioactive material or of the devices which is consistent in scope and timing with realistic potential vulnerability of the sources containing such radioactive material. The pre-arranged plan shall be updated when changes to the facility design or operation affect the potential vulnerability of the sources. Pre-arranged LLEA coordination is not required for temporary job sites.
  - c. The licensee shall have a dependable means to transmit information between, and among, the various components used to detect and identify an unauthorized intrusion, to inform the assessor, and to summon the appropriate responder.
  - d. After initiating appropriate response to any actual or attempted theft, sabotage, or diversion of radioactive material or of the devices, the licensee shall, as promptly as possible, notify the NRC Operations Center at (301) 816-5100 and,

for Agreement State licensees, the appropriate Agreement State regulatory agency.

- e. The licensee shall maintain documentation describing each instance of unauthorized access and any necessary corrective actions to prevent future instances of unauthorized access.
3. a. For domestic highway and rail shipments of licensed radioactive material by a carrier other than the licensee, for quantities that equal or exceed those in Table 1 but are less than 100 times Table 1 quantities, per consignment, the licensee shall:
- 1. Use carriers which:
    - A. Use package tracking systems,
    - B. Implement methods to assure trustworthiness and reliability of drivers,
    - C. Maintain constant control and/or surveillance during transit, and
    - D. Have the capability for immediate communication to summon appropriate response or assistance.

The licensee shall verify and document that the carrier employs the measures listed above.

- 2. Contact the recipient to coordinate the expected arrival time of the shipment;
- 3. Confirm receipt of the shipment; and
- 4. Initiate an investigation to determine the location of the licensed material if the shipment does not arrive on or about the expected arrival time.

When, through the course of the investigation, it is determined the shipment has become lost, stolen, or missing, the licensee shall immediately notify the NRC Operations Center at (301) 816-5100 and its Agreement State regulatory agency, as appropriate. If after 24 hours of investigating, the location of the material still cannot be determined, the radioactive material is deemed missing and the licensee shall immediately notify the NRC Operations Center and its Agreement State regulatory agency, as appropriate.

- b. For domestic highway and rail shipments, prior to shipping licensed radioactive material that exceeds 100 times the quantities in Table 1 per consignment, the licensee shall:
1. Notify the NRC<sup>2</sup>, in writing, at least 90 days prior to the anticipated date of shipment. The NRC will issue the Order to implement the Additional Security Measures (ASMs) for the transportation of Radioactive Material Quantities of Concern (RAM QC). The licensee shall not ship this material until the ASMs for the transportation of RAM QC are implemented or notified otherwise, in writing, by NRC.
  2. Once the licensee has implemented the ASMs for the transportation of RAM QC, the notification requirements of PM 3.b.1 shall not apply to future shipments of licensed radioactive material that exceed 100 times

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<sup>2</sup>Director, Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

the Table 1 quantities. The licensee shall implement the ASMs for the transportation of RAM QC.

- c. If a licensee employs a M&D licensee to take possession of the licensed radioactive material and ship it under its M&D license, the requirements of PM 3.a. and 3.b above shall not apply.

If the licensee is to receive radioactive material greater than or equal to the Table 1 quantities, per consignment, the licensee shall coordinate with the originating licensee to:

1. Establish an expected time of delivery; and
  2. Confirm receipt of transferred radioactive material. If the material is not received at the expected time of delivery, notify the originating licensee and assist in any investigation.
4. For licensees which possess mobile or portable devices containing radioactive material in quantities greater than or equal to Table 1 values, licensees shall:
- a. For portable devices, have two independent physical controls that form tangible barriers to secure the material from unauthorized removal when the device is not under direct control and constant surveillance by the licensee.
  - b. For mobile devices:
    1. that are only moved outside of the facility (e.g., on a trailer), have two independent physical controls that form tangible barriers to secure the material from unauthorized removal when the device is not under direct control and constant surveillance by the licensee.



Table 1: Radionuclides of Concern

Radionuclide	Quantity of Concern <sup>1</sup> (TBq)	Quantity of Concern <sup>2</sup> (Ci )
Am-241	0.6	16
Am-241/Be	0.6	16
Cf-252	0.2	5.4
Cm-244	0.5	14
Co-60	0.3	8.1
Cs-137	1	27
Gd-153	10	270
Ir-192	0.8	22
Pm-147	400	11,000
Pu-238	0.6	16
Pu-239/Be	0.6	16
Se-75	2	54
Sr-90 (Y-90)	10	270
Tm-170	200	5,400
Yb-169	3	81
Combinations of radioactive materials listed above <sup>3</sup>	See Footnote Below <sup>4</sup>	

Use the following method to determine which sources of radioactive material that require protective measures (PMs):

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- Include any single source larger than the quantity of concern in Table 1

<sup>1</sup> The aggregate activity of multiple, collocated sources of the same radionuclide should be included when the total activity exceeds the quantity of concern.

<sup>2</sup> The primary values used for compliance with this Order are TBq. The curie (Ci) values are rounded to one significant figure for informational purposes only.

<sup>3</sup> Radioactive materials are to be considered aggregated or collocated if breaching a common physical security barrier (e.g., a locked door at the entrance to a storage room) would allow access to the radioactive material or devices containing the radioactive material.

<sup>4</sup> If several radionuclides are aggregated, the sum of the ratios of the activity of each source,  $i$  of radionuclide,  $n$ ,  $A_{(i,n)}$ , to the quantity of concern for radionuclide  $n$ ,  $Q_{(n)}$ , listed for that radionuclide exceeds one. [(aggregated source activity for radionuclide A) ÷ (quantity of concern for radionuclide A)] + [(aggregated source activity for radionuclide B) ÷ (quantity of concern for radionuclide B)] + etc.....  $\geq 1$

- Include multiple co-located sources of the same radionuclide when the combined quantity exceeds the quantity of concern
- For combinations of radionuclides, include multiple co-located sources of different radionuclides when the aggregate quantities satisfy the following unity rule: [(amount of radionuclide A) ÷ (quantity of concern of radionuclide A)] + [(amount of radionuclide B) ÷ (quantity of concern of radionuclide B)] + etc.....  $\geq 1$

## Guidance for Aggregation of Sources

NRC supports the use of the IAEA's source categorization methodology as defined in TECDOC-1344, "Categorization of Radioactive Sources," (July 2003) (see [http://www-pub.iaea.org/MTCD/publications/PDF/te\\_1344\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/te_1344_web.pdf)) and as endorsed by the agency's Code of Conduct for the Safety and Security of Radioactive Sources, January 2004 (see <http://www-pub.iaea.org/MTCD/publications/PDF/Code-2004.pdf>). The Code defines a three-tiered source categorization scheme. Category 1 corresponds to the largest source strength (greater than 100 times the quantity of concern values listed in Table 1.) and Category 3, the smallest (equal or exceeding one-tenth the quantity of concern values listed in Table 1.). PMs apply to sources that are greater than the quantity of concern values listed in Table 1, plus aggregations of smaller sources that add up to greater than the quantities in Table 1. Aggregation only applies to sources that are co-located.

Licensees who possess sources in total quantities that exceed the Table 1 quantities are required to implement PMs. Where there are many small (less than the quantity of concern values) co-located sources whose total aggregate activity exceeds the Table 1 values, licensees are to implement PMs.

Some source handling or storage activities may cover several buildings, or several locations within specific buildings. The question then becomes: When are sources considered co-located for purposes of aggregation? For purposes of the PMs, sources are considered co-located if breaching a single security barrier (e.g., a locked door at the entrance to a storage room) would allow access to the sources. Sources behind an outer barrier should be aggregated separately

from those behind an inner barrier (e.g., a locked source safe inside the locked storage room). However, if both barriers are simultaneously open, then all sources within these two barriers are considered to be co-located. This logic should be continued for other barriers within or behind the inner barrier.

The following example illustrates the point: A lockable room has sources stored in it. Inside the lockable room, there are two shielded safes with additional sources in them. Inventories are as follows:

The room has the following sources outside the safes: Cf-252, 0.12 Tbq (0.3 Ci); Po-210, 0.36 TBq (10 Ci), and Pu-238, 0.3 Tbq (8 Ci). Application of the unity rule yields:  $(0.012 \div 0.2) + (0.36 \div 0.6) + (0.3 \div 0.6) = 0.06 + 0.6 + 0.5 = 1.2$ . Therefore, the sources would require PMs. If the sources are distributed and shipped individually, PMs would not apply because they do not exceed the quantities in Table 1.

Shielded safe #1 has a 1.9 Tbq (51 Ci) Cs-137 source and a 0.75 Tbq (20 Ci) Ra-226 source. In this case, both sources would require PMs, because they exceed the quantities in Table 1. The Ra-226 source, although not licensed by NRC, was co-located with an NRC licensed source and therefore would need to be similarly protected.

Shielded safe #2 has two Po-210 sources, each having an activity of 0.2 Tbq (5 Ci). In this case, neither source would require PMs. (total activity = 0.4 Tbq (10 Ci). They do not exceed the threshold quantity 0.6 Tbq (20 Ci).

Because certain barriers may cease to exist during source handling operations (e.g., a storage location may be unlocked during periods of active source usage), licensees should, to the extent practicable, consider two modes of source usage — “operations” (active source usage) and “shutdown” (source storage mode). Whichever mode results in the greatest inventory (considering barrier status) would require PMs for each location.

## **Handling and Protection of Physical Protection Information Related to the Security of Radioactive Material Quantities of Concern**

Licenses shall protect its physical protection information from unauthorized disclosure and control access to its physical protection information to those persons who have established the need to know the information, and are considered to be trustworthy and reliable. The sensitive physical protection information to be protected includes: all information generated by the licensee in response to the protective measures including licensee's security plans and procedures for the physical protection of the radioactive material covered under this Order. A need to know means a determination, by a person having responsibility for protecting the licensee's physical protection Information, that a proposed recipient's access to the licensee's physical protection information is necessary in the performance of official, contractual, or licensee duties of employment.

Licenses shall develop, maintain and implement policies and procedures for controlling access to, and proper handling and protection against unauthorized disclosure of, its physical protection information for radioactive material covered by this Order. The licensee's policies and procedures necessary to ensure compliance must address, at a minimum, the following: (1) the general performance requirement that each person who produces, receives, or acquires the licensee's physical protection Information shall ensure that the licensee's physical protection information is protected against unauthorized disclosure; (2) the protection of information about the physical protection of radioactive material in use, in storage, and while in transit; (3) correspondence containing the licensee's physical protection information; (4) access to the licensee's physical protection information; (5) preparation, marking, reproduction and

destruction of documents; (6) external transmission of documents; (7) use of automatic data processing systems; and (8) removal from the licensee's physical protection Information category.