

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
OFFICE OF FEDERAL AND STATE MATERIALS AND  
ENVIRONMENTAL MANAGEMENT PROGRAMS  
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS  
WASHINGTON, DC 20555

September 7, 2007

**NRC REGULATORY ISSUE SUMMARY 2007-18  
DATA FOR UPDATING THE INTERIM  
INVENTORY OF RADIOACTIVE SOURCES**

**ADDRESSEES**

All U.S. Nuclear Regulatory Commission (NRC) Part 40, Part 50, Part 70, Part 72, and Part 76 licensees and certificate holders who are authorized to possess sources of radioactive material at the Category "3.5" (as defined below) activity or higher.

**INTENT**

NRC is issuing this regulatory issue summary (RIS) to inform addressees of a forthcoming survey of data for input into the interim inventory of radioactive sources. The submission of this information will be voluntary. No specific action or response to this RIS is required.

**BACKGROUND**

The events of September 11, 2001, heightened the Nation's concerns about the possible use of radioactive material for malevolent acts. In June 2002, the Secretary of Energy and the NRC Chairman met to address these concerns, and agreed to convene an Interagency Working Group on Radiological Dispersal Devices (hereafter, WG). In May 2003, the WG issued its report. The report is available on the Internet at: <https://homer.ornl.gov/nrc/nrc-doerddrpt.pdf>. The WG report included a list of radionuclides and thresholds above which tracking of the sources was recommended. A similar study, undertaken by the International Atomic Energy Agency (IAEA), created a list of radionuclides and thresholds much the same as the Department of Energy (DOE)/NRC list. In July 2003, the IAEA published their source categorization scheme. That scheme is incorporated in the IAEA *Code of Conduct for the Safety and Security of Radioactive Sources* (January 2004). The Code of Conduct is available at: <https://homer.ornl.gov/nrc/codeofconductenglish.pdf>. In August 2005, the IAEA re-issued their scheme as the safety standard, RS-G-1.9, *Categorization of Radioactive Sources*.

NRC has adopted the IAEA source categorization scheme and established the Category 2 threshold for certain radionuclides as the level for implementation of several new actions (see Enclosure 1 for the list of nuclides and their Category 2 thresholds) in support of international cooperation on source tracking. On December 28, 2005, new import/export regulations concerning radioactive sources at or above the IAEA Category 2 thresholds became effective. On November 8, 2006, NRC published the final rule for a new National Source Tracking System (NSTS) to track radioactive sources at or above the IAEA Category 2 thresholds.

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The NSTS is expected to be implemented in the summer of 2008 with the exact date published in the *Federal Register* at least three months in advance. In 2005, NRC and Agreement States issued Orders or other legally binding requirements that established new security measures for licensees authorized to possess Category 2, or greater, quantities of material.

## **SUMMARY OF ISSUE**

Until the NSTS is implemented, the Commission directed that NRC and the Agreement States maintain an interim inventory of sources at, or above, the IAEA Category 2 threshold. This inventory has been updated annually by querying all licensees authorized to possess these sources. The first round of requests was issued between November 2003, and October 2004, and the response provided a "snapshot" of sources possessed at the time of the query response. The first round included aggregated amounts (individual sources below the threshold, but which summed to a total above a threshold) and asked about source import/export and disposition plans. The next two rounds, performed in Fiscal Year (FY) 2005 and FY 2006, were similar, but did not include aggregation, nor did it ask about plans for import/export or source disposition.

On June 9, 2006, the Commission directed the commencement of an information collection on sources at or above an activity that is much lower than the previous thresholds (SECY-06-0094). Specifically, NRC and the Agreement States were directed to collect data on sources at, or above, a threshold identified as Category "3.5." The IAEA defines Category 3 as one-tenth of Category 2. The IAEA defines Category 4 as one-hundredth of Category 3. The Commission has defined Category "3.5" as one-tenth of Category 3, or one-hundredth of Category 2.

As a result, NRC and the Agreement States have updated the inventory with lists of licensees authorized to possess radionuclides on the IAEA list in sources or quantities that are at or above the new Category "3.5" threshold. All licensees on the updated list will be contacted by letter or electronic mail to request information on sources at or above the Category 3.5 threshold. If licensees previously acknowledged possessing sources, they will be provided their previous data and asked to update it. If the licensees do not possess any sources at or above the Category 3.5 threshold, they will be asked to state this in their responses. As before, the responses will be for the instant in time, "snapshot," of when the licensees respond. The data will be available to NRC and the Agreement States and some data may be shared with other Federal agencies, including DOE and the Department of Homeland Security, to assist with their roles in source security.

The reasons for maintaining the inventory are:

- To maintain an inventory of the sources at or above the Category 2 threshold and feed these data to the NSTS in 2008;
- To maintain or establish contact with the licensees that will participate in the system;
- To provide specific information on the number, types, general uses, and geographic locations of sources in use;
- To plan for the possible expansion of the NSTS, to include Category 3 sources; and
- To evaluate the effect of limiting generally licensed devices to a maximum activity of Category "3.5".

## **SURVEY INFORMATION - VOLUNTARY RESPONSE REQUESTED**

All addressees are requested to voluntarily submit a response to the survey when they receive it. Responses should be submitted within 30 days of the receipt of the survey. As discussed below, each licensee will be contacted separately and instructed on how to participate in the survey. The survey will be available on an NRC independent contractor's secure website until Fall 2008 for viewing, downloading, and responding.

NRC-licensed addressees that choose to participate in the survey may do so by using the Internet to respond directly or to download the survey form to complete and mail or fax their response to the address or phone numbers provided in the instructions.

The method of Agreement State licensed addressees' participation in the survey will be determined by each Agreement State. Some Agreement States have chosen to allow the NRC contractor to contact their licensees and participation will be similar to the participation by NRC-licensed addressees as discussed above. Some Agreement States have chosen to contact their own licensees and will obtain the survey data from the licensees and provide it to NRC.

Enclosure 2 provides information on the new Category "3.5" threshold values for the radionuclides of interest and the types of information being requested. As before, Oak Ridge National Laboratory will collect the inventory information for NRC. Username and passwords to access the secure website and instructions on how to provide the data will be mailed separately. If you provided any data in a previous response, those data are displayed when you log in to the Internet site, using the provided user name and password. You are requested to follow the instructions and update any prior data. If you do not possess any sources at or above the applicable threshold, please follow the instructions to positively indicate this. Data collection is through a secure Internet web site.

Although the Category "3.5" threshold could include devices that are usually generally licensed under current regulations, you do not need to include any of these devices in this survey unless they are included on your specific license. NRC will obtain data on devices being operated under a general license directly from the Agreement States or the General License Tracking System.

## **BACKFIT DISCUSSION**

This RIS requires no action or written response. Any action on the part of addressees to respond to the survey in accordance with the guidance contained in this RIS is strictly voluntary and, therefore, is not a backfit under 10 CFR 50.109, 70.76, and 76.76. Consequently, the staff did not perform a backfit analysis.

## **FEDERAL REGISTER NOTIFICATION**

A notice of opportunity for public comment on this RIS was not published in the *Federal Register* because the RIS is informational and involves the voluntary submission of information on the part of addressees.

## CONGRESSIONAL REVIEW ACT

This RIS is not a rule as designated by the Congressional Review Act (5 U.S.C §§ 801-886) and, therefore, is not subject to the Act.

## PAPERWORK REDUCTION ACT STATEMENT

This RIS contains information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget, approval numbers 3150-0011 and 3150-0029.

## PUBLIC PROTECTION NOTIFICATION

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

## CONTACT

This RIS requires no specific action nor written response. Please direct any questions about this matter to the technical contacts listed below.

### */RA by TQuay for/*

Michael Case, Director  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

### */RA/*

Janet Schlueter, Director  
Division of Materials Safety and State Agreements  
Office of Federal and State Materials  
and Environmental Management Programs

Technical Contacts: William R. Ward, FSME  
301-415-7038  
E-mail: [wrw1@nrc.gov](mailto:wrw1@nrc.gov)

Nima Ashkeboussi, FSME  
301-415-7637  
E-mail: [naa@nrc.gov](mailto:naa@nrc.gov)

### Enclosures:

1. Table 1 - International Atomic Energy Agency (IAEA) Category 2 Thresholds
2. Table 2 - Category "3.5" Thresholds
3. "List of Recently Issued Generic Communications"

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OFFICE	SSSB:FSME	Tech Editor	BC:SSSB:FSME	D:FCSS:NMSS	D:SFST:NMSS	D:DORL:NRO
NAME	WWard	EKraus by fax	THarris	RPierson	EWBrach	CHaney
DATE	9/ 13 /06	8/ 15 /06	9/ 13 /06	7 / 10 /07	7 / 31 /07	7/ 24 /07
OFFICE	IHPB:DIRS:NRR	OE	OGC - NLO	OGC - CRA	PMDA:NRR	OIS
NAME	RPedersen	CCarpenter	FCameron	DReddick	PCraver	MJanney
DATE	7 / 25 /07	6/ 22 /07	7/11/07	6/ 27 /07	7/ 25/07	7/17/07
OFFICE	MSEAB:FSME	LA:PGCB:NRR	PGCB:NRR	BC:PGCG:NRR	D:MSSA:FSME	D:DPR:NRR
NAME	AMcIntosh	CHawes	AMarkley	MMurphy	JSchlueter	TQuay for MCase
DATE	9/13/06	8/02/07	08/03/07	08/28/07	08/31/07	09/07/07

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**Table 1**  
**International Atomic Energy Agency (IAEA)**  
**Category 2 Thresholds**

Radionuclide	Category 2 threshold <sup>1</sup>	
	(TBq)	(Ci)
Actinium-227, Californium-252, Thorium-228, Thorium-229	0.2 TeraBecquerel	5.4 Curies
Cobalt-60	0.3 TeraBecquerel	8.1 Curies
Radium-226	0.4 TeraBecquerel	11 Curies
Curium-244	0.5 TeraBecquerel	14 Curies
Americium-241, Americium-241/Be, Plutonium-236, Plutonium-238, Plutonium-239, Plutonium-239/Be, Plutonium-240, Polonium-210	0.6 TeraBecquerel	16 Curies
Iridium-192	0.8 TeraBecquerel	22 Curies
Cesium-137	1 TeraBecquerel	27 Curies
Selenium-75	2 TeraBecquerels	54 Curies
Ytterbium-169	3 TeraBecquerels	81 Curies
Gadolinium-153, Strontium-90 (Yttrium-90)	10 TeraBecquerels	270 Curies
Thulium-170	200 TeraBecquerels	5,400 Curies
Promethium-147	400 TeraBecquerels	11,000 Curies

Use the following method to determine which sources to report to the inventory:

- Convert Curies (Ci) to Terabecquerels (TBq) as follows:  $n \text{ (TBq)} = N \text{ (Ci)} \times 0.037 \text{ TBq/Ci}$ .
- Include any single source equal to or larger than the quantity of concern listed above.

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<sup>1</sup> The TBq values in Table 1 are the same as the IAEA Category 2 values and are the regulatory standards. Curie values provided here and in the IAEA Code of Conduct are rounded and not exact.

**Table 2**  
**Category “3.5” Thresholds**

**[Radionuclides of Concern with Category “3.5” Threshold in GBq/TBq and Curies]  
 [for use in the Fiscal Year (FY) 2007 Interim Inventory]**

<b>Radionuclide</b>	<b>Quantity of Concern<sup>2</sup></b>	<b>Exact equivalent in Curies<sup>3</sup></b>
Actinium-227, Californium-252, Thorium-228, Thorium-229	2 GigaBecquerels	0.054 Curies
Cobalt-60	3 GigaBecquerels	0.081 Curies
Radium-226	4 GigaBecquerels	0.108 Curies
Curium-244	5 GigaBecquerels	0.135 Curies
Americium-241, Americium-241/Be, Plutonium-236, Plutonium-238, Plutonium-239, Plutonium-239/Be, Plutonium-240, Polonium-210	6 GigaBecquerels	0.162 Curies
Iridium-192	8 GigaBecquerels	0.216 Curies
Cesium-137	10 GigaBecquerels	0.270 Curies
Selenium-75	20 GigaBecquerels	0.541 Curies
Ytterbium-169	30 GigaBecquerels	0.811 Curies
Gadolinium-153, Strontium-90 (Yttrium-90)	0.10 TeraBecquerel	2.703 Curies
Thulium-170	2 TeraBecquerels	54.054 Curies
Promethium-147	4 TeraBecquerels	108.11 Curies

Use the following method to determine which sources to report to the inventory:

- Convert Curies (Ci) to Terabecquerels (TBq) as follows:  $n \text{ (TBq)} = N \text{ (Ci)} \times 0.037 \text{ TBq/Ci}$ .
- Convert TBq to Ci as follows:  $N \text{ (Ci)} = n \text{ (TBq)} / 0.037 \text{ TBq/Ci}$ .
- Convert Ci to Gigabecquerels (GBq) as follows:  $n \text{ (GBq)} = N \text{ (Ci)} \times 37 \text{ GBq/Ci}$ .
- Convert GBq to Ci as follows:  $N \text{ (Ci)} = n \text{ (GBq)} / 37 \text{ GBq/Ci}$ .
- Include any single, specifically licensed source equal to, or larger than, the quantity of concern in Table 2.

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<sup>2</sup> The IAEA Code of Conduct uses Becquerel-based values. The Category 4 values are defined as 1/100th of the Category 3 value. The Commission has determined it needs data to a level in between Category 3 and 4. It has chosen Category “3.5” to be one-tenth of Category 3 or 10 times Category 4. The Becquerel-based values in Table 2 are the IAEA Category 3 values divided by 10 and are the standards for the FY 2007 inventory.

<sup>3</sup> In the Code of Conduct, when the IAEA converted the Becquerel values to Curie values, they were rounded to one significant digit after conversion. This is the proper method to convert. However, for simplicity in determining whether a given quantity exceeds the applicable threshold standard, the Curie values listed here are the exact values determined by using the formulas above, rounded to three significant digits, and not less than one-thousand of a Curie (or to the nearest milliCurie).

**Recently Issued NMSS Generic Communications**

Date	GC No.	Subject	Addressees
02/02/07	IN-07-03	Reportable Medical Events Involving Patients Receiving Dosages of Sodium Iodide Iodine-131 less than the Prescribed Dosage Because of Capsules Remaining in Vials after Administration	All U.S. Nuclear Regulatory Commission medical use licensees and NRC Master Materials Licensees. All Agreement State Radiation Control Program Directors and State Liaison Officers.
02/28/07	IN-07-08	Potential Vulnerabilities of Time-reliant Computer-based Systems Due to Change in Daylight Saving Time Dates	All U. S. Nuclear Regulatory Commission licensees and all Agreement State Radiation Control Program Directors and State Liaison Officers.
03/15/07	IN-07-10	Yttrium-90 Theraspheres® and Sirspheres® Impurities	All U.S. Nuclear Regulatory Commission (NRC) Medical Licensees and NRC Master Materials Licensees. All Agreement State Radiation Control Program Directors and State Liaison Officers.
04/04/07	IN-07-13	Use of As-Found Conditions to Evaluate Criticality-related Process Upsets at Fuel Cycle Facilities	All licensees authorized to possess a critical mass of special nuclear material.
05/02/07	IN-07-16	Common Violations of the Increased Controls Requirements and Related Guidance Documents	All licensees who are implementing the U.S. Nuclear Regulatory Commission (NRC) Order Imposing Increased Controls (EA-05-090), issued November 14, 2005 and December 22, 2005.
05/21/07	IN-07-19	Fire Protection Equipment Recalls and Counterfeit Notices	All holders of operating licenses for nuclear power reactors and fuel cycle facilities; except those licensees for reactors that have permanently ceased operations and who have certified that fuel has been permanently removed from the reactor vessel; and except those licensees for decommissioned fuel cycle facilities.
03/01/07	RIS-07-03	Ionizing Radiation Warning Symbol	All U.S. Nuclear Regulatory Commission licensees and certificate holders. All Radiation Control Program Directors and State Liaison Officers
03/09/07	RIS-07-04	Personally Identifiable Information Submitted to the U.S. Nuclear Regulatory Commission	All holders of operating licenses for nuclear power reactors and holders of and applicants for certificates for reactor designs. All licensees, certificate holders, applicants, and other entities subject to regulation by the U.S. Nuclear Regulatory Commission (NRC) of the use of source, byproduct, and special nuclear material
03/20/07	RIS-07-05	Status and Plans for Implementation of NRC Regulatory Authority for Certain Naturally-occurring and Accelerator-produced Radioactive Material	All NRC materials licensees, Radiation Control Program Directors, State Liaison Officers, and NRC's Advisory Committee on the Medical Uses of Isotopes



Date	GC No.	Subject	Addressees
04/05/07	RIS-07-07	Clarification of Increased Controls for Licensees That Possess Collocated Radioactive Material During Transportation Activities	All U.S. Nuclear Regulatory Commission (NRC) licensees issued NRC's Order Imposing Increased Controls and all Radiation Control Program Directors and State Liaison Officers
05/04/07	RIS-07-09	Examples of Recurring Requests for Additional Information (RAIs) for 10 CFR Part 71 and 72 Applications	All holders of, and applicants for, a: (1) 10 CFR Part 71 certificate of compliance (CoC) for a radioactive material transportation package; (2) 10 CFR Part 72 CoC for a spent fuel storage cask; and (3) 10 CFR Part 72 specific license for an independent spent fuel storage installation (ISFSI).
05/15/07	RIS-07-10	Subscriptions To New List Server For Automatic Notifications Of Medical-Related Generic Communications, <i>Federal Register</i> Notices And Newsletters	All U.S. Nuclear Regulatory Commission (NRC) medical-use licensees and NRC Master Materials licensees. All Radiation Control Program Directors and State Liaison Officers.

Note: A full listing of generic communications may be viewed at the NRC public website at the following address:  
<http://www.nrc.gov/Electronic Reading Room/Document Collections/Generic Communications>.