

November 13, 2007

MEMORANDUM TO: Chairman Klein  
Commissioner Jaczko  
Commissioner Lyons

FROM: Luis A. Reyes */RA/*  
Executive Director for Operations

SUBJECT: ESTIMATE OF THE NUMBER OF GENERALLY LICENSED  
DEVICES WHICH ARE IAEA CATEGORY 3

In response to the Staff Requirements Memorandum M070904, "Briefing on Radioactive Materials Security and Licensing," dated September 12, 2007, staff has estimated the number of high-activity generally licensed devices. Specifically, staff provides data on devices that are Category 3 as defined by the Code of Conduct on the Safety and Security of Radioactive Sources or Category 3.5 (a factor of 10 below the Category 3 lower threshold and a factor of 10 above Category 4 lower threshold). In related Commission correspondence, questions about category 2.6 sources have been raised. Staff determined that presenting both categories for comparison would be the most efficient method of providing the data to the Commission.

There are no generally licensed devices that are either Category 1 or 2. As shown in the enclosed Table, staff estimates that there are about 200 Category 3 devices and about 2,600 Category 3.5 devices in the U.S. Nuclear Regulatory Commission (NRC) and Agreement States.

To obtain this value, staff performed an analysis of data in the General License Tracking System (GLTS) and additional data collected from Agreement States. The Agreement States supplied data on generally licensed devices as part of the annual update of interim inventory data (discussed later). Staff had already determined that the States have collected this information as part of the annual registration requirement in 10 CFR 31.5.

The data shown in the NRC portion of the Table were drawn from the GLTS and includes only devices listed as 'current' (actively possessed) in that system. However, through the registration process, staff is aware that many devices were never reported returned to the manufacturer or otherwise properly disposed of as required by 10 CFR 31.5. Some devices remain in a 'current' status because staff has been unable to confirm an alternate status. Therefore, the NRC data may be somewhat conservative on the number of active devices in NRC jurisdiction with Category 3 or 3.5 quantities.

CONTACT: William R. Ward, FSME/DMSSA  
(301) 415-7038

In addition, device activities in GLTS are the activities at initial distribution. Since these devices were initially distributed over a 30 to 40 year period, staff decay-corrected the activity using the period from the last verifiable transfer to the present. The last transfer may not be the initial transfer, so the calculated activity would be higher than it would be if the period from the initial transfer date to the present was used. The net effect is that the "binning" of devices by Category may be shifted towards the higher activity Categories. That is, some devices binned as Category 3 may have already decayed to Category 3.5 and some devices binned as Category 3.5 may have already decayed to Category 4.

On August 28, 2006, as part of the annual update process for the interim inventory of radioactive sources, a letter was sent to all Agreement State Radiation Control Program Directors (RCPDs). The letter (RCPD-06-031) notified the Agreement State agencies of the lowering of the inventory threshold from Category 2 to Category 3.5 and requested the agencies to update the list of specific licensees to be contacted, including licensees to be added because of the lower threshold. The letter also requested the States to send data on generally licensed devices that contained at least a Category 3.5 quantity of material. Not all States were able to provide full information, and those who were able to were responsible for 71% (12,282/17,298) of the specific licenses in the Agreement States as listed in the NRC 2005/2006 Information Digest. The estimate for Agreement State totals as shown in the Table was obtained by dividing the reported data by a factor of 0.71. Thus, the extrapolation represents a national estimate of all Agreement States.

Devices containing Po-210 were included, but after correcting for decay, no devices contained material at or above the Category 3.5 threshold of 162 mCi. The typical maximum initial distribution activity for Po-210 devices is 200 mCi. Generally licensed device distribution is reported quarterly with a month allowed for the report (see 10 CFR 32.52). By the time a 200 mCi Po-210 device is reported, it usually has decayed below the 162 mCi threshold for Category 3.5. Similarly, Pm-147 data was also included, but there were no reports approaching the 108-curie threshold for Category 3.5.

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### Estimates of Generally Licensed Devices

Isotope	Category 3	Category 3.5	Total Devices	Typical Purpose
<b>NRC</b>				
Am-241	53	765	818	Fixed gauges (2-5 Ci for Cat 3; 200/300/500/1000 mCi for Cat 3.5)
Cm-244	0	3	3	X-ray fluorescence devices
Co-60	2	19	21	Fixed gauges (100-500 mCi except 2-3 Ci gauges)
Cs-137	20	558	578	Fixed gauges (3-5 Ci for Cat 3; 0.3–3 Ci for Cat 3.5)
Pu-238	0	5	5	X-ray fluorescence devices (300 mCi)
Ra-226	41	0	41	Fixed gauges (2.5–3.3 Ci) only one model reported, production was discontinued in 1991
Sr-90	0	2	2	Fixed gauges (3 Ci)
<b>NRC Total</b>	<b>116</b>	<b>1,352</b>	<b>1,468</b>	See text for a discussion of why this total is somewhat conservative
<b>Agreement States</b>				
Am-241	33	547	580	Fixed/Thickness gauges (2-5 Ci for Cat 3; 200/300/500/1000 mCi for Cat 3.5)
Am-241/Be	0	6	6	Density/moisture/level interface gauges (production ended in 2001)
Cm-244	2	6	8	X-ray fluorescence devices
Co-60	0	27	27	Fixed gauges (100-500 mCi)
Cs-137	31	305	336	Fixed gauges (3-5 Ci for Cat 3; 0.3–2.4 Ci for Cat 3.5)
Sub-total	66	891	957	Sub-total as reported by 29 of 35 State agencies representing 71% of all specific licenses
Estimated State Total	93	1,255	1,348	Total obtained by dividing above sub-total by 0.71 to obtain an estimate for all 35 State agencies
<b>Combined NRC/ Agreement State Totals</b>	<b>209</b>	<b>2,607</b>	<b>2,816</b>	<b>This is the estimated national total</b>

Enclosure