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Comments from the Disused Sources Working Group in Response to U.S. Nuclear Regulatory Commission *Federal Register* Notice re Category 3 Source Security and Accountability [NRC-2016-0276]

The Low-Level Radioactive Waste Forum, Inc. (LLW Forum) is a non-profit organization of representatives appointed by Governors and compact commissions that seeks to facilitate state and compact implementation of the Low-Level Radioactive Waste Policy Act of 1980 and its 1985 amendments, as well as to promote the objectives of regional low-level radioactive waste disposal compacts. In September 2011, the LLW Forum formed the Disused Sources Working Group (DSWG) to develop recommendations from the states and compacts for improving the management and disposition of disused sources.

Over a 30-month period, the DSWG invited representatives of key stakeholders to present their perspectives, provide critical input, offer recommendations, and identify important issues associated with the life cycle of sealed sources. In March 2014, the DSWG presented the issues, findings and recommendations in a formal report.[1]

In the summer of 2016, the DSWG met with organizational representatives from the Organization of Agreement States (OAS), the Conference of Radiation Control Program Directors (CRCPD) and the Health Physics Society (HPS) to identify areas of agreement and open a dialogue about the path forward. Following the summer 2016 meeting, all three organizations appointed liaisons to work with the DSWG.

The following comments are provided on behalf of the DSWG in response to NRC-2016-0276, the U.S. Nuclear Regulatory Commission's request for information on Category 3 source security and accountability (82 *Federal Register* 2,399 – January 9, 2017).

For additional information about the DSWG, please contact LLW Forum Executive Director and DSWG Project Director Todd D. Lovinger, Esq at (754) 779-7551 or at LLWForumInc@aol.com or visit the DSWG website at www.disusedsources.org.

[1] *Report of the Disused Sources Working Group: A Study of the Management and Disposition of Sealed Sources from a National Security Perspective,* March 2014. The report is publicly available on the DSWG website at www.disusedsources.org.

General Questions Related to License Verification

1. *Should the current methods for verification of licenses prior to transferring Category 3 quantities of radioactive material listed in 10 CFR 30.41(d)(1)–(5), 10 CFR 40.51(d)(1)–(5), and 10 CFR 70.42(d)(1)–(5) be changed such that only the methods prescribed in 10 CFR 37.71 are allowed?*

   No comment.

2. *Would there be an increase in safety and/or security if the regulations were changed to only allow license verification through the NRC's License Verification System (LVS) or the transferee's license issuing authority for transfers of Category 3 quantities of radioactive material? If so, how much of an increase would there be?*

   No comment.

3. *If the NRC changed the regulations to limit license verification only through the LVS or the transferee's license issuing authority for transfers of Category 3 quantities of radioactive material, should licensees transferring Category 3 quantities to manufacturers and distributors be excepted from the limitation?*

   No comment.

4. *Is there anything else we should consider when evaluating different methods of license verification prior to transferring Category 3 quantities of radioactive material?*

   No comment.

General Questions Related to the NSTS

1. Should Category 3 sources be included in the NSTS? Please provide a rationale for your answer.

Several stakeholders have considered the issue and recommended the strengthening of regulations for higher activity devices and/or tracking of Category 3 sources including the OAS[2] and NRC staff.[3]

[2] OAS Petition for Rulemaking Regarding 10 CFR 31.5 and 31.6; Comment on Draft Proposed Rule 10 CFR Parts 30, 31, 32 and 150. The purpose of this petition is to strengthen the regulation of radioactive materials by requiring an SL for higher-activity devices that are currently available under the GL in 10 CFR 31.5.

[3] In 2008, NRC staff proposed to amend NRC regulations to expand the NSTS to include Category 3 sources including fixed industrial gauges (e.g., level gauges, conveyor gauges, thickness gauges, blast furnace gauges, dredger gauges, and pipe gauges); well-logging devices; medium and low-dose-range brachytherapy devices; and certain radiography devices. Staff also recommended inclusion in the NSTS of

In 2015, the DSWG and CRCPD's E-34 Committee asked state radiation control program directors to complete a survey on the management and disposition of disused sources. The survey included a question as to whether or not all Category 3 sources should in principle be tracked by NRC. 63% of the respondents ranked this item as a high- or medium-priority.[4] In response to a specific question as to whether NRC should expand the NSTS to track Category 3 sources, 58% of respondents marked this item as a high- or medium-priority.[5]

Over the past decade, the U.S. Government Accountability Office (GAO) has undertaken two covert vulnerability-testing efforts that revealed weaknesses in NRC and Agreement State licensing programs.[6] Out of five attempts, GAO was twice able to obtain licenses and then alter them to obtain agreements to purchase devices containing, in aggregate, dangerous quantities of radioactive materials. These may be isolated instances and the DSWG recognizes that NRC and Agreement States have taken significant steps to help ensure that radioactive materials licenses are granted only to legitimate organizations and that licensees can only obtain such materials in quantities allowed by their licenses. Nonetheless, the DSWG believes that the overall fail rate experienced in the GAO vulnerability-testing efforts is cause for the collective attention by all stakeholders and encourages NRC and the Agreement States to continue their joint effort to address the issues identified in the GAO reports and work to achieve improvements in the system, where appropriate.

"sources below the Category 3 threshold, but greater than or equal to a 10^{th} of the Category 3 threshold," base on "…the nature of the sources at 1/10 of Category 3, their potential to aggregate to Category 2, and the costs to the licensed industry and the NRC." 71 Federal Register 19,749 (April 11, 2008). On June 30, 2009, by a 2-2 vote, NRC announced that the Commission "was unable to reach a decision on the staff's recommendation to issue a final rule expanding the number and type of radioactive sources" covered under the NSTS. Press Release 09-121 titled, "NRC Commission Split 2-2 on Expansion of National Radioactive Source Tracking System," NRC, June 30, 2009.

[4] Responses to Question 45, DSWG and CRCPD E-34 Committee Joint Survey of Radiation Control Program Directors, May 2015. Forty-two state radiation control program directors respondend representing 38 individual states.

[5] Responses to Question 48, DSWG and CRCPD E-34 Committee Joint Survey of Radiation Control Program Directors, May 2015.

[6] GAO has completed audits of the security aspects of NRC and Agreement State licensing processes that raised concerns about the relative ease with which lower activity sources can be purchased and potentially aggregated to higher activity levels. See Testimony Before the Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs, U.S. Senate, "Nuclear Security: Actions Taken by NRC to Strengthen Its Licensing Process for Sealed Radioactive Sources Are Not Effective," GAO Report 07-1038T, July 12, 2007; Report to the Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs, U.S. Senate, "Nuclear Security: NRC and DHS Need to Take Additional Steps to Better Track and Detect Radioactive Materials," GAO Report 08-598, June 2008; and, Report to the Committee on Homeland Security, U.S. House of Representatives, "Nuclear Security: NRC Has Enhanced the Controls of Dangerous Radioactive Materials, but Vulnerabilities Remain," GAO Report 16-330, July 2016.

Since Category 3 sources are not currently tracked, regulators face challenges when performing oversight. These challenges, as well as the mobility of some of these sources, may provide an opportunity for loss or theft as determined by a prior NRC-Agreement State Working Group.

The DSWG agrees with the above-identified stakeholder recommendations and generally supports the inclusion of Category 3 sources in the NSTS, but encourages NRC to work with OAS and CRCPD to first address the states' concerns about existing problems and needed improvements to the database. (See below response to Question 5.)

2. *If Category 3 sources are included in the NSTS, should the NRC consider imposing the same reporting requirements currently required for Category 1 and 2 sources (10 CFR 20.2207(f))?*

   The DSWG encourages the NRC to work with the states via CRCPD and OAS to determine the number of existing Category 3 sources.

   The DSWG further recommends that NRC work with CRCPD, OAS and HPS to gather information about the potential burdens and costs of imposing the same reporting requirements for Category 3 sources that are currently required for Category 1 and 2 sources.

   Although the DSWG does not believe that added workload and costs should be used as the primary basis for excluding Category 3 sources in the NSTS, the DSWG encourages the NRC to take these factors into consideration and to work with affected stakeholders to develop a manageable and efficient reporting system to address critical improvements.

3. *Should the NRC consider alternatives to the current NSTS reporting requirements for Category 1 and 2 sources to increase the immediacy of information availability, such as requiring the source transfers to be reported prior to, or on the same day as, the source shipment date?*

   The DSWG supports the consideration of requiring source transfers to be reported prior to, or on the same day as, the source shipment date. Since NRC requires the information to be reported anyway, requiring reporting prior to, or on the same day, as the shipment should not create a significant burden and should improve efficiency and help to eliminate existing vulnerabilities associated with post-transfer tracking.

   In this regard, the DSWG notes that it is standard industry practice to complete waste manifest, export and import authorization and other paperwork *before* radioactive materials and waste are shipped.

4. *Would there be an increase in safety and/or security if the regulations were changed to include Category 3 sources in the NSTS? If so, how much of an increase would there be?*

The DSWG believes that the inclusion of Category 3 sources in the NSTS would provide a corresponding increase in safety and/or security. Although it may be difficult to quantify the amount or degree of increased safety and security, existing vulnerabilities have been identified via the GAO vulnerability-testing efforts and specific instances of excessive aggregation and non-compliance.

For instance, according to presentations at industry meetings, over 10,000 disused sources were collected and indefinitely stored at a waste broker's facility in Texas. Recent inspections by state regulators reportedly deteremined that over 10% of the stored sources were leaking.

In January 2012, the Illinois Emergency Management Agency (IEMA) denied a radioactive waste broker application to renew its license due to continued non-compliance. The company failed to make sufficient progress in decommissioning their facility. In April 2013, IEMA seized their financial assurance instrument, thereafter completing decommissioning activities in the summer of 2014.

In another instance, a waste processor in the State of Washington accumulated legacy radioactive waste, without being required to fund the total cost for end-of-life management of the unsealed and sealed sources. Over time, the volume of legacy waste grew and the company could not adequately fund proper financial assurance for packaging, shipping and disposal. The company continued to request authorization to store more waste in order to generate sufficient funds to cover normal day-to-day expenses. Eventually, the state stopped authorizing acceptance of additional radiative material unless the company started addressing the disposition of the waste material being stored on site. In the end, the company declared bankruptcy and another waste processing company purchased the bankrupt facility, posted adequate financial assurance, and worked with the state to establish a timetable for removal of all legacy waste.

These instances provide support for the increases in safety and security that may be achieved by including Category 3 sources in the NSTS. The DSWG cautions, however, that tracking of Category 3 sources in the NSTS is only one component. In order to meaningfully reduce existing vulnerabilities, NRC and the Agreement States need to impose systems to regularly review the information and use it to address potential concerns – i.e., the continued storage of disused sources that have no potential benefit, the aggregation of risk-significant quantities of radioactive materials and the importance of regulatory compliance by licensees.

5. *Is there anything else we should consider as part of our evaluation of including Category 3 sources in the NSTS?*

   Some states have expressed concern that the National Source Tracking System (NSTS) and Web-Based Licensing (WBL) do not communicate with one another and therefore require duplicative efforts to enter and/or search for the same information in each system.

   State databases may have fields that are different than those in the federal databases and are not interconnected, which again requires duplicative efforts and can therefore be costly and time-consuming to complete.

   Only a handful of states use WBL and there is a significant backlog of states waiting to get authorization to use the system.

   NRC should make it a priority to work with states to address the above issues and should evaluate potential opportunities to expand the use of WBL in an effort to increase regulatory efficiency and consistency.

Specific Questions for Licensees Related to License Verification

1. *It currently takes approximately one month to get credentialed to access the LVS. If you currently do not have online access to LVS, and NRC establishes new requirements for license verification involving Category 3 quantities of radioactive material, would you be inclined to sign up for online access, or would you use alternative methods for license verification such as emailing the NRC Form 748 ''Manual License Verification Report'' to the LVS Help Desk or calling the license-issuing regulatory authority directly?*

   No comment.

2. *Approximately how many transfers involving Category 3 quantities of radioactive material do you do monthly? What percentage involves transfers directly to/from a manufacturer?*

   No comment.

3. *Should license verification be required when transferring to an established manufacturer?*

   No comment.

4. *Do you have online access to LVS? If so, have you experienced any issues with the LVS? Do you have any recommendations on how to improve LVS?*

   No comment.

Specific Questions for Licensees Related to the NSTS

1. *It currently takes approximately one month to get credentialed to access the NSTS. If you currently do not have online access to the NSTS and NRC establishes new requirements for the tracking of Category 3 sources in the NSTS, would you be inclined to sign up for online access or would you use alternative methods for NSTS reporting such as emailing or faxing the NRC Form 748 ''National Source Tracking Transaction Report'' to the NSTS Help Desk?*

   No comment.

2. *Do you have online access to the NSTS? If so, have you experienced any issues with the NSTS? Do you have any recommendations on how to improve the NSTS?*

   No comment.

Specific Questions for Agreement States Related to License Verification

1. *Approximately how many licenses do you authorize for Category 1, 2, and 3 quantities of radioactive material?*

   The DSWG has been working with various stakeholders in an effort to get an accurate and current accounting of Category 3 quantities of radioactive material. The responses indicate that there are significant obstacles to compiling this information including

   - a need for clarity as to what information is being requested—i.e., an accounting of the number of sources, devices or licensees;
   - a lack of availability of data, since Category 3 sources are not currently included in the NSTS and are not tracked by many, if not most, states; and,
   - associated costs and time to gather the information, which often requires physical review of license files manually.

The four states of Connecticut, Illinois, Pennsylvania and Washington recently provided information to the DSWG regarding the number of Category 3 licenses issued in their individual states. (See Appendix 1.) The information indicates that the data varies significantly from state-to-state.

The DSWG is concerned about the lack of an accurate and current accounting of Category 3 quantities of radioactive material, as well as the difficulties and challenges associated with gathering this information due to the lack of state and/or federal tracking databases. Accordingly, the DSWG encourages NRC to work with the states via the OAS and CRCPD to identify issues associated with collection of the information and to work toward implementing a tracking system that that does not impose undue burdens or have unintended consequences.

2. *If license verification through the LVS or the transferee's license issuing authority is required for transfers involving Category 3 quantities of radioactive material, would you encourage the use of LVS among your licensees, or plan for the additional burden imposed by the manual license verification process?*

   No comment.

3. *If license verification through the LVS or the transferee's license issuing authority is required for transfers involving Category 3 quantities of radioactive material, would you consider adopting the Web-Based Licensing System (WBL) to ensure that the most up-to-date licenses are available for license verification using the LVS or voluntarily provide your Category 3 licenses (similar to what some Agreement States do now for Category 1 and 2 licenses) to be included in WBL, or would you do neither and prefer licensees to use the manual license verification process?*

   No comment.

4. *What would the impact in time and resources be on your program to handle the additional regulatory oversight needed for Category 3 licensees if license verification through the LVS or the transferee's license issuing authority was required for transfers involving Category 3 quantities of radioactive material?*

   No comment.

Specific Question for Agreement States Related to the NSTS

1. *The NRC currently administers the annual inventory reconciliation process on behalf of the Agreement States. This process involves providing hard copy inventories to every licensee that possesses nationally tracked sources at the end of the year, processing corrections to inventories, and processing confirmations of completion of the reconciliation into the NSTS. The process involves a significant amount of staff time and resources from November to February. If the Agreement States were to adopt administration of the annual inventory reconciliation process and if Category 3 sources were included in the NSTS, what would the additional regulatory burden be on the Agreement States to perform the annual inventory reconciliation for Category 1, 2, and 3 sources?*

   No comment.

Other Questions

1. *Should physical security requirements for Category 1 and 2 quantities of radioactive material be expanded to include Category 3 quantities?*

   Certain higher activity Category 3 sources present significant risks and challenges, as recognized by the American Federation of Scientists[7] and the GAO.[8] Under the current system, some sources that are considered to be dangerous by the IAEA are not tracked or licensed in a manner to address existing vulnerabilities.[9]

   Additionally, the DSWG is concerned that some licensees are purchasing and using devices just below the Category 2 threshold so as to avoid the increased reporting and security requirements for Category 1 and 2 sources. Due to a lack of financial planning, these sources often end up in long-term storage once they become disused, as noted by the Radiation Source Protection and Security Task Force (RSPSTF).[10]

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[7] Ensuring the Security of Radioactive Sources: National and Global Responsibilities, Charles Ferguson, President of the Federation of American Scientists, 2012.

[8] See Appendix I (Potential Effects of a Radiological Dispersal Device with Category 1, 2 and 3 Quantities of Radioactive Material), Report to the Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs, U.S. Senate, "Nuclear Security: NRC and DHS Need to Take Additional Steps to Better Track and Detect Radioactive Materials," GAO Report 08-598, June 2008.

[9] IAEA Code of Conduct and IAEA Safety Guide #RS-G-1.9 (Categorization of Radioactive Sources) includes a system for categorizing radioactive sources based on their potential to cause harm to people. The system categorizes sources into five categories, Categories 1 through 5, with Category 1 being the greatest risk and Category 5 being the lowest risk. Categories 1, 2, and 3 are all classified as "dangerous" sources.

[10] "The NRC should evaluate requiring licensees to review and document the reasons for storage of risk-significant sources longer than 24 months and the feasibility of establishing a maximum time limit on the long-term storage of risk-significant sources not in use." As recommended in Action 7-1, 2006 Task Force, 2006 Task Force Report. "The NRC incorporated this action into its evaluation for 2006 Recommendation 9-2 in consultation with Federal and State partners. The evaluations will factor into the NRC's decision whether to pursue rulemaking and the public consultation process." 2010 Task Force, 2010 Task Force Report, p. 37, at http://www.nrc.gov/security/byproduct/2010-task-force-report.pdf.

Some of these sources, such as those used in the well logging industry, are mobile and therefore subject to loss or theft. Additionally, the potential for aggregation of these sources into risk significant quantities is a valid concern, as noted by the RSPSTF[11] and National Academies of Sciences (NAS).[12]

The 2015 survey by the DSWG and CRCPD's E-34 Committee asked respondents whether individual Category 3 sources, such as Am/Be sources used in well logging, should be subject to greater security requirements. 74% of the respondents ranked this item as a high- or medium-priority.[13] In response to a survey question at to whether licensees who may possess several Category 3 sources exceeding the Category 2 level should be subject to greater security requirements, 74% of respondents also ranked their responses to this item as a high- or medium-priority.[14]

Based on the inherent risks, mobility and potential for aggregation of certain higher activity Category 3 sources, the DSWG generally supports the expansion of physical security requirements for Category 1 and 2 quantities of radioactive material to include Category 3 quantities. Before implementing new regulatory requirements, however, the DSWG encourages NRC to work with affected stakeholders—including regulators (via OAS and CRCPD), manufacturers, brokers and processors, and licensees (via HPS)—to ensure a smooth transition and minimize any unintended consequences.

2. *Some Category 3 sources are covered under a general license (10 CFR 31.5). Should the NRC consider establishing maximum quantities in general licensed devices, thereby reserving authorization to possess Category 1, 2, and 3 quantities of radioactive material to specific licensees?*

   In order to possess a General License (GL) source, the user has only to file limited registration information with the NRC or Agreement State after obtaining the source. In many instances, there is no significant evaluation by a regulatory agency prior to or during the possession of a GL source.

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[11] The 2010 Radiation Source Protection and Security Task Force Report recognizes that Category 3 sources can be aggregated into a "risk significant quantity." 2010 Task Force, 2010 Task Force Report, p. 9, http://www.nrc.gov/security/byproduct/2010-task-force- report.pdf.

[12] "Sources that fall into Category 3 and lower can be assembled into Category 2 or 1 quantities of radioactive material. Further, it may be the case that some radiation sources near the upper threshold for Category 3 pose more serious risks than other sources that fall near the lower threshold of Category 2 in scenarios other than those used to create the source categorization system." Radiation Source Use and Replacement, National Research Council, National Academies of Sciences (NAS), page 43, note 1, 2008.

[13] Responses to Question 39, DSWG and CRCPD E-34 Committee Joint Survey of Radiation Control Program Directors, May 2015.

[14] Responses to Question 40, DSWG and CRCPD E-34 Committee Joint Survey of Radiation Control Program Directors, May 2015.

In contrast, possession of a Specific License (SL) source requires the user to submit a license application and undergo a facility inspection in advance of obtaining the source. Additional requirements for SL sources include adherence to license conditions, periodic renewals, state approved radiation safety training and procedures, and periodic inspections by the NRC or Agreement State.

In 2008, HPS considered the issue and submitted comments to NRC supporting their position that all Category 3 sources and greater should be subject to an SL.[15] Likewise, in 2010, the OAS petitioned NRC to increase the regulatory control over certain GL sources.[16] When the OAS petition came before the Commission, the additional controls failed upon a tie vote, resulting in a non-decision. However, the NRC did authorize Agreement States to increase controls on GL sources at their own discretion. As a result of this, few states enacted increased controls.

A previous NRC-Agreement State Working Group determined that there is a lack of oversight of GL licensees by the regulators.[17] That working group also found that regulators have not taken an active role in ensuring that GL licensees maintain control over and accountability for GL sources and in ensuring that licensees possess, use, and transfer GL devices in accordance with the regulations. This has led to a loss of control and sometimes to improper disposal or even to orphaned or abandoned sources.[18] Subsequently, NRC and Agreement States implemented registration and annual reporting requirements for GL sources.

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[15] Health Physics Society (HPS) comments on Docket NRC-2008-0272, "Limiting the Quantity of Byproduct Material in a General Licensed Device." Their comments established the HPS position that all Category 3 sources and greater should be subject to a SL.

[16] OAS Petition for Rulemaking (PRM) 31-5 as found at http://www.regulations.gov/#!documentDetail;D=NRC- 2008-0272-0059 and http://www.regulations.gov/#!documentDetail;D=NRC-2008-0272-0001; SECY 10-10-0105, Limiting the Quantity of Byproduct Material in a Generally Licensed Device; Commission Voting Record Decision Item: SECY-10-0105, Final Rule: Limiting the Quantity of Byproduct Material in a Generally Licensed Device (RIN 3150-Al 33), December 2, 2010. In addition to OAS, nine Agreement States also supported this position.

[17] Final Report of the NRC-AS Working Group to evaluate Control and Accountability of Licensed Devices (NUREG- 1551).

[18] In response to an inquiry regarding information about missing nuclear materials over a five year period, the NRC documented 18 instances of Reportable Licensed Lost, Abandoned or Stolen Material (LAS) Events from 1997 to July 7, 2002. Response to Freedom of Information Act (FOIA)/Privacy Act (PA) Request, NRC Form 464 Part I, FOI/PA 2003-0082, December 18, 2002.

The 2015 survey by the DSWG and CRCPD's E-34 Committee asked respondents whether all Category 3 sources should be specifically licensed. Although 76 percent of respondents ranked their responses to this item as a high- or medium-priority,[19] only 16% of the respondents answered in the affirmative as to whether or not their individual state requires that all Category 3 sources be specifically licensed[20] and 24% responded in the affirmative as to whether or not their individual state requires that some or all generally licensed devices be specifically licensed.[21] Of significant note, 57% responded in the affirmative when asked whether NRC will need to adopt rules requiring the specific licensure of Category 3 sources before their individual state can act to do so.[22]

The limited requirements and oversight for a GL source provide a window of opportunity for aggregation or misuse of higher activity Category 3 sources prior to the required reporting to regulatory agencies. Accordingly, the DSWG believes that an SL should be required for Category 3 sources.

The DSWG recognizes that additional regulation may be labor-intensive, costly and pose additional burdens on the NRC and Agreement States. However, due to the estimated small number of Category 3 GL sources in the United States, the DSWG believes that reduction in current vulnerabilities from increased regulation outweighs the anticipated costs. The DSWG encourages NRC to work with the states through OAS and CRCPD to make the transition efficient and reduce unanticipated costs, where appropriate.

[19] Responses to Question 41, DSWG and CRCPD E-34 Committee Joint Survey of Radiation Control Program Directors, May 2015.
[20] Responses to Question 42, DSWG and CRCPD E-34 Committee Joint Survey of Radiation Control Program Directors, May 2015.
[21] Responses to Question 43, DSWG and CRCPD E-34 Committee Joint Survey of Radiation Control Program Directors, May 2015.
[22] Responses to Question 44, DSWG and CRCPD E-34 Committee Joint Survey of Radiation Control Program Directors, May 2015.