

June 24, 2022

Brooke P. Clark
Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attn: Rulemakings and Adjudications Staff

Re: Docket No. NRC-2017-0031, Decommissioning Financial Assurance for Sealed and Unsealed Radioactive Materials

Dear Ms. Clark:

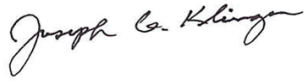
The Low-Level Radioactive Waste Forum's (LLW Forum) Disused Sources Working Group (DSWG) is pleased to provide comments on the US Nuclear Regulatory Commission's (NRC) regarding the Regulatory Basis for the revision to the NRC's rulemaking regarding Decommissioning Financial Assurance for Sealed and Unsealed Radioactive Material. The 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. The DSWG is a working group of LLW Forum members and affiliate organizations that are focused on improving the management and disposition of disused sources.

The DSWG disagrees with the NRC's selection of proposed Alternative 2. While Alternative 2 addresses the immediate need to respond to the petitioner (the Organization of Agreement States), it does not address the fundamental flaws with the NRC's Financial Assurance requirements. The DSWG is in support of Alternative 5, a dual track approach of Alternatives 2 and 4.

The attached comments highlight the DSWG's concerns with the existing NRC financial assurance regulations. We strongly encourage the NRC to pursue a two-track approach: one that will immediately address the concerns of the petitioner and a second that addresses the highlighted concerns with the existing regulations.

Thank you again for the opportunity to provide input to the NRC on this important rulemaking effort. Any questions may be directed to the Forum's Executive Director, Dan Shrum, at dshrum@llwforum.org or 801-580-3201.

Sincerely,

A handwritten signature in black ink, reading "Joseph G. Klinger". The signature is written in a cursive style with a large, stylized "J" and "K".

Joseph G. Klinger
Chairman
Disused Sources Working Group

LOW-LEVEL RADIOACTIVE WASTE FORUM, INC.

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Comments from the Disused Sources Working Group in Response to U.S. Nuclear Regulatory Commission Federal Register Notice re: Decommissioning Financial Assurance for Sealed and Unsealed Radioactive Material [NRC-2017-0031]

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.

The DSWG developed and hereby submits for consideration by NRC the following comments in response to the agency's request for stakeholder feedback on its proposed regulatory basis to support a rulemaking to amend its decommissioning financial assurance regulations for sealed and unsealed radioactive material published in the Federal Register on April 28, 2022.

The DSWG disagrees with the NRC's selection of Alternative 2. While Alternative 2 addresses the immediate need to respond to the petitioner, it does not address the fundamental flaws with the NRC's Financial Assurance requirements. The DSWG is in support of Alternative 5, a dual track approach of Alternatives 2 and 4.

List of Radionuclides Requiring Financial Assurance

The DSWG concurs that 10 CFR 20 Appendix C provides a more comprehensive list of radionuclides than Part 30 Appendix B. Part 20 Appendix C is based on more current international methodologies. (ICRP 26/30 vs. ICRP 2). From a functional perspective, the "new" Part 30 Appendix B should be restructured to present the lower threshold that financial assurance would be required for unsealed and sealed radioactive material. The table should have four columns (at a minimum): radionuclide, radionuclide abbreviation, quantity threshold of unsealed radioactive material requiring financial assurance, and quantity threshold of sealed radioactive material requiring financial assurance. A licensee should be able to look at the table and see the quantity of unsealed and sealed radioactive material that requires financial assurance and not have to perform a mathematical calculation to make that determination (i.e., the licensee should not have to multiply the quantity listed in the appendix for a specific radionuclide by a factor of 10^5 or 10^{12}).

Placing the threshold quantity in the new Part 30 Appendix B would require changing the language in Part 30.35 paragraphs (a)(1), (a)(2) and (d) to remove or adjust the multipliers.

Out of Date Fixed Financial Assurance Amounts

The NRC should eliminate the fixed financial assurance dollar amounts in Part 30.35 (d). The fixed financial assurance amounts were established in 2003 when the original rule was promulgated. The nearly 20-year-old amounts are not reflective of today's decommissioning expenses. Using the US Department of Labor Statistics' Consumer Price Index Inflation Calculator, the fixed financial assurance dollar amount of \$115,000 in 2003 is now equivalent to \$180,900 in 2022. The other fixed financial assurance amounts of \$225,000 and \$1,125,000 in 2003 is now equivalent to \$353,900 and \$1,769,600 respectively. Establishing fixed dollar amounts in regulations without incorporating annual adjustments means the costs are out of date within a year or two of promulgation.

To eliminate the problem of out-of-date fixed financial assurance amounts, the NRC should eliminate all fixed amounts and have licensees in possession of radioactive material requiring financial assurance prepare a decommissioning funding plan. Licensees would evaluate their use of radioactive material, the quantity of radioactive material authorized under their license, and facility conditions to determine the scope of financial liability of future decommissioning. A threshold dollar amount for posting financial assurance can be established that is risk informed based on the risk tolerance of the regulatory program.

The State of Florida has adopted a risk calculation that takes into consideration the half-life of the radionuclide, radionuclide specific risk, activity, the facility size, the usage procedures, and the physical form.¹ Specific numerical risk factors are assigned for each of these categories. These factors are then multiplied together. The product of this calculation is the dollar amount of the financial assurance required. If the product is less than \$30,000 then no financial assurance is required.

If the licensee feels that the result of the risk calculation is not appropriate, the licensee may present evidence (decommissioning funding plan) for an alternative number. Governmental agencies and radioactive material with a half-life less than or equal to 120 days are exempt from the calculation. By statute, only surety bonds are acceptable as the financial assurance instrument.

Threshold Amounts of Radioactive Material Requiring Financial Assurance

With respect to sealed radioactive material, using a factor of 10^{10} times the value listed in Part 20 Appendix C (the "new" Part 30 Appendix B), the threshold quantity of radioactive material is set too high. These values result in only a limited number of International Atomic Energy Agency (IAEA) Category I radioactive sealed sources that would require financial assurance.

¹ Florida Administrative Code 64E-5.217

The IAEA has developed a ranking of radioactive sources according to their relative potential to cause immediate harmful health effects if not safely managed or securely protected.² Individual sealed sources are ranked from highest potential (Category 1) to lowest potential (Category 5).

Category 1 – These sources could lead to the death or permanent injury of individuals who are near the source for a short period of time (e.g., minutes to hours). Examples: radioisotope thermoelectric generators, irradiators, teletherapy machines, and fixed multi-beam teletherapy machines.

Category 2 – These sources could lead to the death or permanent injury of individuals who are near the source for a longer period of time than Category 1 sources. Examples: industrial gamma radiography equipment and high/medium dose-rate brachytherapy devices.

Category 3 – These sources could lead to the permanent injury of individuals who are near the source for a longer period of time than Category 2 sources. Sources in Category 3 could, but are unlikely to, lead to fatalities. Examples: fixed industrial gauges (e.g., level gauges, dredger gauges, conveyor gauges, and spinning pipe gauges) and well logging gauges.

Category 4 – These sources could lead to the temporary injury of individuals who may be near the source for a longer period of time than Category 3 sources. Permanent injuries are unlikely. Examples: low dose-rate brachytherapy sources, thickness gauges, portable gauges, and bone densitometers.

Category 5 – These sources could, but are unlikely to, cause minor temporary injury of individuals. Examples: x-ray fluorescence devices, static eliminators, and electron capture devices.

² The International Atomic Energy Agency (IAEA) Categorization of Radioactive Sources is found in Safety Guide No. RS-G-1.9 and can be found at http://www-pub.iaea.org/MTCD/publications/PDF/Pub1227_web.pdf. For additional information, see <http://www.iaea.org>.

Table 1 below lists the IAEA Category 1, 2, and 3 radioactive sealed sources with half-lives greater than 120 days with the threshold quantities required for posting financial assurance.

Table 1 – IAEA Category 1 2, and 3 Radioactive Sealed Sources with Half-life Greater than 120-days Financial Assurance Threshold Based on a Revised Part 30 Appendix B

Radionuclide	Abbreviation	Half-life	"New" Part 30 App B Value (Ci)	10 ¹⁰ time App B Value (Ci) ^a	10 ¹² time App B Value (Ci) ^b
Americium 241	Am-241	432 y	1.00E-09	10	1,000
Americium/Beryllium	Am-241/Be	432 y	1.00E-09	10	1,000
Californium 252	Cf-252	2.6 y	1.00E-09	10	1,000
Cobalt-60	Co-60	5.3 y	1.00E-06	10,000	1,000,000
Cesium-137	Cs-137	30 y	1.00E-05	100,000	10,000,000
Plutonium-238	Pu-238	88 y	1.00E-09	10	1,000
Plutonium/Beryllium	Pu-239d/Be	88 y	1.00E-09	10	1,000
Stontium-90	Sr-90(Y-90)	29 y	1.00E-07	1,000	100,000
Thulium-170	Tm-170	129 d	1.00E-05	100,000	10,000,000

^a – This value represents the quantity of sealed radioactive material requiring a fixed \$115,000 financial assurance amount.

^b – This value represents the quantity of sealed radioactive material requiring a financial assurance amount based upon a decommissioning funding plan.

Appendix II to the IAEA report titled “Some Practices and Radionuclides of Interest and Their Range of Activities and Categories” lists by category the practices that utilize sealed sources, the radionuclides used and activity ranges (minimum, maximum and typical values). Utilizing a multiplication factor of 10¹⁰ times the “new” Part 30 Appendix B values as the quantity threshold of sealed radioactive material requiring a fixed dollar amount of financial assurance and a multiplication factor of 10¹² requiring financial assurance based on a decommissioning funding plan, only Category 1 sources would require a fixed dollar amount of financial assurance. No Category 1 source would require financial assurance based on a decommissioning funding plan. Financial assurance is not required for Category 2 and below sources. If a licensee has more than one source, then the sum of the fractions rule applies.

A similar situation exists when evaluating whether financial assurance is required for sources required to be reported to the National Source Tracking System.

Table 2³ identifies the two financial assurance threshold for the list of nationally tracked sealed sources and the Category 1 and 2 thresholds.

Table 2 – Sealed Sources Required to be Reported to the National Source Tracking System and Whether Financial Assurance is Required

Nationally Tracked Sealed Sources	10 CFR 30 App. B	Sealed Source Possession Threshold for Financial Assurance		10 CFR 20 Appendix E Thresholds	
		Fixed \$113,000 10 ¹⁰ times App. B limit Ci	Cost Estimate Based 10 ¹² times App. B limit Ci	Cat 1 Ci	Cat 2 Ci
Actinium-227	0.1	1,000	100,000	540	5.4
Americium-241	0.01	100	10,000	1,600	16
Americium-241/Be	0.01	100	10,000	1,600	16
Californium-252	0.01	100	10,000	540	5.4
Cobalt-60	1	10,000	1,000,000	810	8.1
Curium-244	0.01	100	10,000	1,400	14
Cesium-137	10	100,000	10,000,000	2,700	27
Gadolinium-153	10	100,000	10,000,000	27,000	270
Iridium-192	10	100,000	10,000,000	2,200	22
Plutonium-238	0.01	100	10,000	1,600	16
Plutonium-239/Be	0.01	100	10,000	1,600	16
Polonium-210	0.1	1,000	100,000	1,600	16
Promethium-147	10	100,000	10,000,000	1,100,000	11,000
Radium-226	0.01	100	10,000	1,100	11
Selenium-75	10	100,000	10,000,000	5,400	54
Strontium-90	0.1	1,000	100,000	27,000	270
Thorium-228	0.01	100	10,000	540	5.4
Thorium-229	0.01	100	10,000	540	5.4
Thulium-170	10	100,000	10,000,000	540,000	5,400
Ytterbium-169	0.1	1,000	100,000	8,100	81

As shown on the table, no Category 1 sealed sources at the threshold level require a cost estimate based financial assurance. Fourteen Category 1 sealed sources at the threshold level have a fixed dollar \$113,000 financial assurance. Six Category 1 sealed sources at the threshold level require no financial assurance. No Category 2 sealed source at the threshold level require financial assurance. If a licensee has more than one source, the sum of the fractions rule applies.

³ This table was taken from comments submitted by Michael Klebe & Associates, Inc. to the NRC in 2015 in response to a request for comments. The full comments are available at: <http://www.disusedsources.org/wp-content/uploads/2015/11/Byproduct-Material-Financial-Scoping-Michael-Klebe-Associates-Inc..pdf>.

As demonstrated by these tables, utilizing a 10^{10} times the “new” Part 30 Appendix B threshold for requiring financial assurance is too high for most sealed sources. A licensee can possess a Category 2 sealed source that has to be reported to the National Source Tracking System but yet not be subject to FA. If a source is risk significant enough to require reporting to the National Source Tracking System, it is risk significant enough to require FA.

Summary

The DSWG encourages the NRC to pursue Alternative 5, a hybrid combination of Alternatives 2 and 4. The level of effort and cost are obviously greater than pursuing Alternative 2 on its own. However, the fundamental basis for the NRC’s financial assurance regulations is inadequate. The NRC has established fixed dollar amounts of financial assurance for both sealed and unsealed radioactive material that has not been updated in nearly two decades. In addition, the threshold for requiring financial assurance is set too high resulting in risk significant sealed sources not requiring financial assurance. Both Alternatives 2 and 4 can be implemented simultaneously. This will afford a relatively quick relief for the petitioner while the longer-term work on revising the financial assurance methodology to better reflect the decommissioning risk factors.

From: [lori beagles](#)
To: [RulemakingComments Resource](#)
Subject: [External_Sender] NRC-2017-0031 - Decommissioning Financial Assurance for Sealed and Unsealed Radioactive Materials
Date: Friday, June 24, 2022 5:48:31 PM
Attachments: [Docket No. NRC 2017-0031 Decommissioning Financial Assurance for Seal and Unsealed Rad Materials.pdf](#)

Attached are comments from the Disused Sources Working Group (DSWG) submitted by the LLW Forum.

Thank you for the opportunity to comment.