From:	Balkin, Ethan R.
To:	RulemakingComments Resource
Cc:	Gillo, Jehanne; Brooks, Kenneth; codyms@ornl.gov
Subject:	[External_Sender] Comments to NRC on Proposed Rulemaking: Rb-82 Generators, Emerging Technologies, and Other Medical Use of Byproduct Material.
Date:	Thursday, October 26, 2023 11:56:16 AM
Attachments:	image001.png DOE IP Responses to NRCs Rb-82 and EMT Rulemaking RFI.xlsx

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To Whom It May Concern:
As a Federal stakeholder who may be impacted by this rulemaking activity the DOE Isotope Program appreciates the opportunity to comment on Regulations.gov Docket ID NRC-2018-0297. All comments are organized in the attached Excel file. Should further elaboration or clarification on any comment be desired, we are happy to engage in a "Fed to Fed" dialogue at a mutually convenient time.

Best regards,
-Ethan

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he/him/his

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II. Discussion	IP Comments:
The NRC is requesting comment on a regulatory basis to support a rulemaking that would amend part 35 of title 10 of the *Code of Federal Regulations* (10 CFR), "Medical use of byproduct material," to add requirements for calibration and dosage measurement for strontium-82/rubidium-82 generators (hereafter referred to as Rb-82 generators) and establish performance-based requirements for existing and future emerging medical technologies (EMTs). The NRC is also considering additional changes to its medical use regulations to accommodate developments in the medical field related to new radiopharmaceuticals and EMTs. Additionally, the NRC is evaluating the current training and experience requirements required for authorized users (AUs) of EMTs to fulfill their radiation safety-related duties and supervisory roles.	**Please enter your comments in this column, corresponding to the questions that are highlighted in the first column.**
A regulatory basis is a precursor to a proposed rule and describes the NRC's planned approach for revising the regulations. This regulatory basis (1) includes a discussion of the background of the regulatory issues, (2) explains the proposed areas of change to the regulations and how those changes could resolve the issues, (3) provides the technical and policy information used to support the regulatory basis, and (4) identifies different alternatives to address the regulatory issues and evaluates the cost and benefits of rulemaking and the alternatives. The regulatory basis also explains the limitations on the scope and quality of the regulatory basis, such as known uncertainties in the data or methods of analysis, and the mitigation measures that address these limitations.	

III. Specific Requests for Comment	
The NRC considers a regulatory basis to be a pre-rulemaking document. If the NRC decides to pursue rulemaking, the NRC will publish a proposed rule that will seek public comment. Currently, the NRC is seeking advice and recommendations from the public on the regulatory basis.	
The regulatory basis, titled “Rubidium-82 Generators, Emerging Technologies, and Other Medical Use of Byproduct Material—Regulatory Basis,” can be obtained at ADAMS Accession No. ML23122A356. The regulatory basis evaluates the existing regulatory framework for Rb-82 generators, including the use of enforcement discretion when licensees who use Rb-82 generators cannot meet existing requirements for calibration, and dosage determination and what type of regulatory changes would need to be considered to permit such action. In addition, the regulatory basis evaluates what regulatory changes are needed to establish risk-informed, performance-based requirements for existing and future emerging medical technologies.	
The NRC will consider any comments received on the regulatory basis in the development of the proposed rule and will respond to the comments in the proposed rule. The regulatory basis describes all of the regulatory changes being considered, and the NRC is requesting comment regarding some of these potential changes. Please indicate the topic and item number with your response or comment:	
Request for Comment Regarding Averted Costs to Licensees	

Section 8 of the regulatory basis document discusses potential rulemaking costs and other impacts to the NRC (section 8.3), Agreement States (section 8.4), and licensees (section 8.5). The analyses are based on the NRC's preliminary assessment and estimates, and the NRC will conduct a more detailed cost and impact evaluation in the draft regulatory analysis that will accompany the proposed rule. To assist the NRC in conducting this detailed analysis, please provide comments on whether licensees would realize averted costs from a more streamlined licensing of existing and future EMTs. Explain why or why not.	
Request for Comment on Topics in Appendix A of the Regulatory Basis	
The specific areas for comment that follow are from appendix A of the regulatory basis, and the numbering scheme matches the numbering in appendix A.	
Generator Systems (See Regulatory Basis Section A.1)	
The NRC is considering regulatory changes to address calibration and dose determination requirements for rubidium-82 generators. In addition, the NRC is also considering regulatory changes to address generators currently licensed under 10 CFR part 35, subpart K and novel generator systems.	

Question A.1.1: Please provide comments on the need for radiation safety officers to have specific training for all generator systems licensed under 10 CFR part 35, subpart D, “Unsealed Byproduct Material—Written Directive Not Required.” If general awareness on radionuclide generators, including their functions and risks, is sufficient, explain why.	Specific training can ensure the following: 1) Safety and compliance to this CFR and other relevant regulations; 2) Ensure that RSO's are equipped to maintain adequate records and reporting; 3) Staying current on regulatory updates/changes. General awareness may be sufficient, provided there is adequate risk assessment to confirm low-risk application, simplicity of use, etc.
The NRC is considering amending the requirement in § 35.63, “Determination of dosages of unsealed byproduct material for medical use,” to clarify that, for the incremental administration of rubidium-82, dose measurements do not have to be complete before administration when the dose is measured continuously during the infusion of Rb-82 from a generator to the patient.	
Question A.1.2: Please provide comments on whether and how the NRC should allow the completion of dosage measurement after the beginning of an incremental administration for radionuclides other than Rb-82. How would such an allowance be bounded? What considerations should go into the expansion of this flexibility?	The estimated patient dose should account for radioactive material that is (or anticipated to be) eliminated by the body as waste prior to its decay. That is long-lived components that are known to be eliminated by the body (NRC will define the time range) will not contribute to the patient’s dose.
Question A.1.3: The NRC has found that AUs authorized under § 35.290, “Training for imaging and localization studies,” have sufficient understanding of radionuclide generators, and the NRC is considering revising § 35.27, Supervision,” to require device-specific training requirements for supervised individuals. Please provide comments with a rationale on whether § 35.290 AUs should also be required to have device-specific training for all radionuclide generators for which they supervise the use.	Device-specific training would be necessary in ensuring safety, regulatory compliance, and optimal care. Unique device functionality and processes of each generator does require training in order to ensure risk mitigation and safety.

Intravascular Brachytherapy Systems (See Regulatory Basis Section A.2)	
The NRC is considering revisions to 10 CFR part 35, subpart F, “Manual Brachytherapy,” to incorporate regulatory requirements for intravascular brachytherapy (IVB).	
Question A.2.1: The NRC is considering adding a new section under subpart F to address the specific training and experience (T&E) requirements to be an AU for IVB and other uses under § 35.401 (liquid brachytherapy, diffusion brachytherapy, and eye applicators). Please provide comments on the sufficiency of the T&E for AUs as outlined in the current EMT licensing guidance documents for IVB, liquid brachytherapy, and eye applicators. Specifically, the NRC is seeking comments on the knowledge topics encompassing the safety-related characteristics of these EMTs required for AUs to fulfill their radiation safety-related duties and supervision roles; the methods on how knowledge topics should be acquired; and consideration for continuing education, vendor training for new medical uses, and training on NRC regulatory requirements.	No comment.
Liquid Brachytherapy Sources and Devices (See Regulatory Basis Section A.3)	
The NRC is considering changes to 10 CFR part 35, subpart F, “Manual Brachytherapy” and other pertinent sections to incorporate regulatory requirements for liquid brachytherapy.	

Question A.3.1: The NRC has found that the hazards of liquid brachytherapy are similar to those of microsources and microspheres. Please provide comments with a rationale on whether the current definition of manual brachytherapy in § 35.2, "Definitions," should be revised to include liquid brachytherapy and exclude microsources or if liquid brachytherapy should be included in the newly proposed subpart I for microsources.	No comment.
Question A.3.2: The NRC is proposing to add a new § 35.71, "Contamination control," that would require licensees to develop, implement, and maintain procedures addressing contamination control and spill response for the uses authorized on the license. The NRC is seeking input on whether this requirement is needed or if the requirements in 10 CFR part 20, "Standards for Protection against Radiation," are sufficient for contamination control. Please provide comments on this proposed requirement and indicate if it should apply to all medical licensees or to a certain subset and why.	10 CFR part 20 is sufficient for contamination control as it provides a comprehensive framework. This would also ensure consistency with regulatory requirements and any necessary enforcement by preventing the potential for licensees to inadvertently misinterpret either regulation and/or consider certain regulatory requirements as superseding one another. The NRC should consider a risk/benefit analysis to confirm if additional regulations would add measurable value for licensees without incurring a resource and/or excessive cost burden.
Question A.3.3: The NRC is considering amending § 35.2 to define the term "source leakage" as it relates to liquid brachytherapy. For example, a possible leakage rate could be any leakage from a liquid brachytherapy source that results in a dose exceeding 0.5 Sievert (50 rem) dose equivalent to any individual organ other than the treatment site. Please comment on whether this limit is appropriate and explain why or why not. What types of limits for liquid brachytherapy device leakage should the NRC consider (*e.g.,* activity-based, dose-based, external to the patient)?	A leakage rate of 0.5 Sievert is stringent and may not be practical. Leakage rates are not always clinically significant or harmful, especially if it does not exceed the dose limits within a specified treatment plan. Further, regulatory limits should weigh risk/benefit to ensure that the most effective medical treatment may be delivered. Over-regulation of leakage rates may deter the use of otherwise effective treatments.
Gamma Stereotactic Radiosurgery and Photon Emitting Teletherapy Units (See Regulatory Basis Section A.6)	

Since the NRC established requirements for gamma stereotactic radiosurgery units in 2002, the design and engineering elements have evolved and the components and operation of newer GSR units are significantly different from the units that the NRC currently regulates under 10 CFR part 35, subpart H, “Photon Emitting Remote Afterloader Units, Teletherapy Units, and Gamma Stereotactic Radiosurgery Units.”	
Question A.6.1: Please provide comments on the need for model-specific training for radiation safety officers for certain 10 CFR part 35, subpart H devices. If model-specific training is needed, how should the NRC determine which devices would require such training?	We do not agree that model-specific training is needed. RSOs are required to maintain a comprehensive understanding of safety principles. Regulation on specific devices will undermine their ability to adapt to new and emerging technologies; thus, limiting their ability to adapt to new and emerging challenges. This could also create resource and cost challenges resulting in licensees being unable to adapt to new technology and innovation.
Question A.6.2: Current NRC requirements in 10 CFR part 35, subpart H, are focused on components critical to patient and facility safety for the use of these devices. The proposed changes to subpart H focus on elements and objectives rather than specific components. Examples of elements include source output, source collimation, source position, source attenuation, patient safety, and facility safety. Please provide comments on other elements that should be considered.	1) Specify design and maintenance of any radiation shielding; 2) Patient follow-up and monitoring post-treatment to assess any potential long/short-term effects; 3) Documentation requirements and document retention; and 4) Consider any international standards for potential aligment of specifications.

Question A.6.3: Please provide comments on what types of objective tests the NRC should require for full calibration measures for 10 CFR part 35, subpart H devices. What functional elements should be considered for safety?	1) Traceability of documentation for previous calibrations; 2) Confirmation of functionality for any component that actuatues critical function of the device; 3) Dose Rate Accuracy; 4) Clearly defined, periodic recalibration requirements; and, 5) Alarm management
Question A.6.4: Please provide comments on what types of objective tests the NRC should require for periodic spot-checks for 10 CFR part 35, subpart H devices. Additionally, what functional elements should be considered critical to safety?	Effective application of requirements implemented under Question A.6.3 should eliminate the need for periodic spot-checks.
Microsource Manual Brachytherapy (See Regulatory Basis Section A.7)	
The use of microspheres for permanent implant manual brachytherapy has grown significantly over the past 20 years, and the NRC has accrued valuable operating experience. To incorporate the use of new and existing microspheres and microparticles for manual brachytherapy, the NRC is considering creating a new subpart within 10 CFR part 35 in the currently “reserved” subpart I of 10 CFR part 35.	

Question A.7.1: The NRC is considering defining a “microsource” in § 35.2 as microparticles and microspheres. What types of radiation (such as alpha, beta, gamma) should fit into the definition of “microsource”? Please include comments and a rationale for whether (1) microspheres should be limited to specific types of radiation or certain energies; (2) microsources should be limited to sealed sources with a Sealed Source and Device (SS&D) registry; (3) unsealed microsources should be required to have a SS&D registry; and (4) any additional changes are needed in the current regulations for microsource brachytherapy that would increase flexibility for future microsource brachytherapy.	No comment.
Question A.7.2: The NRC is considering defining “physiological equilibrium” in § 35.2 to include stasis or other states of equilibrium. Please provide comments on what should be included in a definition of physiological equilibrium or identify other considerations for physiological stop points.	No comment.
Question A.7.3: As the complexity of the medical use of byproduct material increases, use of teams in medical care is becoming more common. Please provide comments on the fundamental elements of a successful team-approach program.	No comment.
Section 35.40, “Written directives,” would be amended to clarify that requirements for manual brachytherapy uses under 10 CFR part 35, subpart F, are in § 35.40(b)(6). The NRC is considering listing the subpart I requirements for written directives for microsource manual brachytherapy uses under a new item in § 35.40(b).	No comment.

Question A.7.4: For microsource manual brachytherapy, please provide comments and a rationale for whether the before-implant written directive should specify the dose or activity.	No comment.
Question A.7.5: For microsource manual brachytherapy, please provide comments and a rationale for whether the after-implant written directive should specify the activity administered or the dose delivered to the treatment site.	No comment.
Question A.7.6: As required by § 35.41 for determining whether a medical event has occurred (as defined in § 35.3045), please comment on whether and why the NRC should require calculating and documenting the activity administered or the activity or dose specifically delivered to the treatment site. By what deadline (*e.g.,* number of hours or days) should this determination be made?	No comment.
Question A.7.7: For microsource manual brachytherapy, please comment on whether the NRC should require post-treatment imaging to confirm that the treatment was delivered in accordance with the written directive. Why or why not? What other mechanisms are available to confirm that the treatment was delivered in accordance with the written directive?	No comment.
Question A.7.8: Please identify any tasks that would require an authorized medical physicist for the use of microsphere manual brachytherapy and identify whether and how the NRC should revise the training and experience requirements for authorized medical physicists in § 35.51, “Training for an authorized medical physicist.”	No comment.

Question A.7.9: Please comment on what types of use should be permitted for microsource manual brachytherapy, including whether the use should be limited to that approved in the sealed source and device registry. Please comment on why unsealed microsources without a unique delivery system should or should not be allowed.	No comment.
Question A.7.10: Please comment on why any new requirements for microsource manual brachytherapy should or should not be limited to permanent implants.	No comment.
Question A.7.11: The NRC is considering establishing minimum safety procedures for microsources and requiring instructions to assure adequate protection of public health and safety. These changes are based on current EMT licensing guidance for yttrium-90 (Y–90) microspheres and expected new uses of microsources. Please identify and comment on other items that should be included in a new requirement for safety procedures and instructions for microsource manual brachytherapy.	No comment.
Question A.7.12: The NRC is considering establishing minimum safety precautions (controls) to assure adequate protection of public health and safety. These considerations are based on current EMT licensing guidance for Y–90 microspheres and expected new uses of microsources. Please identify and comment on other items that should be included in a new requirement for safety precautions (controls) for microsource manual brachytherapy.	No comment.

Question A.7.13: The NRC is seeking input on the need for continued conditional approval for AUs of Y–90 microspheres. The current licensing guidance for Y–90 microspheres states that an AU should successfully complete training in the operation of the delivery system, safety procedures, and clinical use for the specific type of Y–90 microsphere for which authorization is sought. The guidance specifies that clinical use training to support unsupervised use should include at least three hands-on patient cases for each type of Y–90 microsphere requested, conducted in the physical presence of an AU who is authorized for the type of Y–90 microsphere for which the individual is seeking authorization. The guidance allows conditional approval of an AU before completing these three hands-on patient cases if a proposed AU cannot complete patient cases before authorization. This conditional approval was originally added to the guidance because there were limited Y–90 microsphere licensees and AUs to train future AUs. As the use of Y–90 microspheres has increased significantly, please comment on the continued need for conditional approval for Y–90 microsphere AUs. Indicate why the NRC should or should not continue to allow this pathway for all microspheres and microsources AUs.	No comment.

Question A.7.14: The NRC is seeking input on the 80 hours of classroom and laboratory training for interventional radiologists pursuing AU status for Y–90 microsphere and other microsource uses. The NRC in the current EMT licensing guidance for Y–90 microspheres includes a pathway for interventional radiologists to become AUs for Y–90 microspheres use. This pathway requires the interventional radiologist to demonstrate that they have 80 hours of classroom and laboratory training in specific topics and specific work experience important to radiation safety, in addition to demonstrating they have sufficient clinical interventional radiology and diagnostic radiology experience. Please comment on why 80 hours is or is not an appropriate amount of time to ensure these topics are adequately covered. Who should supervise the work experience to ensure the future AUs have adequate radiation safety knowledge and why?	No comment.

Question A.7.15: The NRC is seeking input on classroom and laboratory training topics for physicians seeking AU status for all microspheres or other types of microsources. The NRC, in the current EMT licensing guidance for Y–90 microspheres, provides a pathway for interventional radiologists and physicians that meet the training and experience requirements in §§ 35.390 and 35.490 to become AUs for Y–90 microspheres use. This pathway does not require any classroom and laboratory training or specific work experience for these physicians besides demonstration of successfully completed training in the operation of the delivery system, safety procedures, and clinical use (including hands-on patient cases) for the type of Y–90 microsphere for which authorization is sought. Please identify and comment on any additional classroom and laboratory training topics or specific work experience that should be required for these physicians to become AUs for all microspheres or other types of microsources in subpart I. What additional training and work experience should be considered, if any, and why?	No comment.
Question A.7.16: The NRC is seeking input on the pathways for physicians to become AUs for use of microspheres and other types of microsources. The NRC in the current EMT licensing guidance for Y–90 microspheres provides pathways for interventional radiologists and physicians that meet the training and experience requirements in §§ 35.390 and 35.490 to become AUs for Y–90 microsphere use. Please comment on whether and why the NRC should or should not provide additional pathways for other types of physicians to become AUs for use of microspheres or other types of microsources.	No comment.

Question A.7.17: In most circumstances, are AUs the individuals administering Y–90 microspheres? Is it appropriate for other individuals to administer microsources under the supervision of an AU? Why or why not?	No comment.
Other Part 35 Changes: Novel Radionuclide Generators (See Regulatory Basis Section A.8)	
Question A.8.1: Industry is evaluating various novel radionuclide generators. Some novel radionuclide generators may be utilized to compound therapeutic dosages of unsealed byproduct material. The NRC is considering a requirement for licensees to perform breakthrough testing on novel radionuclide generators and report instances when breakthrough exceeds a defined limit. Since breakthrough limits for some novel radionuclide generators have not been established by the United States Pharmacopeia, please explain why it would or would not be sufficient for licensees to develop, implement, and maintain procedures for breakthrough testing and reporting for novel radionuclide generators.	No comment.
Other Part 35 Changes: Training and Experience (See Regulatory Basis Section A.8)	
Question A.8.2: Please comment on the type of T&E that should be required for AUs utilizing novel radionuclide generators and the type of T&E for authorized nuclear pharmacists utilizing novel radionuclide generators.	No comment.

Question A.8.3: Please comment on why the current structure for authorized medical physicist involvement in 10 CFR part 35, subpart F, “Manual Brachytherapy,” is or is not sufficient. If not sufficient, what specific tasks or skills should be performed by an authorized medical physicist for manual brachytherapy?	No comment.
Question A.8.4: Due to the increased number and complexity of EMTs, please comment on why the NRC should or should not require continuing education for AUs. If continuing education should be required, what should it entail, at what frequency should it be acquired, and how should knowledge topics be acquired?	No comment.
Question A.8.5: Please comment on the need for AUs for § 35.200 to have device-specific training on radionuclide generators. If device-specific training is needed, what topics should the training include? Please explain why the training should or should not be specific to the radionuclide generators for which the AUs are supervising the use.	No comment.

Question A.8.6: Please comment and provide a rationale for whether physicians authorized for full use under § 35.300 need additional T&E to fulfill their radiation safety-related duties and supervision roles because of expected emerging therapeutic radiopharmaceuticals. Please comment on why additional training is or is not needed on regulatory requirements for emerging therapeutic radiopharmaceuticals. If needed, what topics should the T&E include? What specific training should these AUs be required to have (*e.g.,* vendor training on clinical use and safety procedures) prior to first-time use, if any? Why should they be required or not required to have continuing education?	No comment.
Question A.8.7: Please comment on why the current AU T&E requirements for use of sealed sources and medical devices for diagnosis in § 35.590 (*i.e.,* 8 hours of classroom and laboratory training in basic radionuclide handling techniques specifically applicable to the use of the device authorized under § 35.500, as well as device-specific training in the use of the device) are or are not appropriate for emerging sealed sources and medical devices containing sealed sources. If AUs for § 35.500 need additional training and work experience on emerging sealed sources and medical devices containing sealed sources for diagnosis, what topics should be covered?	No comment.
Other Part 35 Changes: Security and Controls	
Question A.8.8: Please comment on any specific changes that are needed to secure consoles, keys, and passwords for remote afterloader units, teletherapy units, and gamma stereotactic radiosurgery units because of changes in technology.	1) Multi-Factor Authentication; 2) Routine password changes; 3) Role-Based Access Control; 4) Data Integrity, Traceability, audit trail, and routine/redundat back-ups.

Question A.8.9: Please comment on the types of doors or entry controls that would be acceptable to maintain security of licensed material while not interfering with patient care. For example, why should a physical door be required, or why other entry controls such as lasers acceptable?	This should be determined based on the risk assessment conducted by the facility/licensee to ensure there is adequate securtiy while maintaining patient safety. The assessment should consider safety, security (including negligence and attempthed theft), and adequate operation to ensure safe evacuation in the event of an emergency.
IV. Cumulative Effects of Regulation	
The NRC is following its Cumulative Effects of Regulation (CER) process by engaging with external stakeholders throughout this regulatory basis and related regulatory activities. Opportunity for public comment is provided to the public at this regulatory basis stage.	
1. In light of any current or projected CER challenges, how should NRC provide sufficient time to implement the new proposed requirements, including changes to programs and procedures?	Elements to ensure sufficient time should include: 1) Advance public notice; 2) phased implementation and/or a well defined transition period for more stringent requirements; 3) Monitor new implementation - keep the industry feedback loop open for a period of time, post-implementation to ensure the NRC may hear any new or previously unrealized challenges.
2. If CER challenges currently exist or are expected, what should be done to address them? For example, if more time is required for implementation of the new requirements, what period of time is sufficient?	This should be considered on a case-by-case basis and depended on the level of change/impact to the broader industry, as well as ensuring continuous collaboration and communication with all industry stakeholders.

3. What other (NRC or other agency) regulatory actions (*e.g.,* orders, generic communications, license amendment requests inspection findings of a generic nature) influence the implementation of the proposed rule's requirements?	No comment.
4. What are the unintended consequences, and how should they be addressed?	The introduction of additional regulatory requirements, without a clear understanding and communication of the benefits/increased safety, will create undue burden on entities that are required to comply. This includes resource burdens that can prevent organizations from taking advantage of new technology. Further, it can create an environment that may replace efforts in innovation to efforts in compliance.
5. Please comment on the NRC's cost and benefit estimates in the regulatory basis.	No comment.