Advisory Committee on the Medical Use of Isotopes (ACMUI)

Comments on the Nuclear Regulatory Commission (NRC)
Draft NUREG-1556, Volume 9, Rev. 3
Consolidated Guidance about Materials Licenses
Program-Specific Guidance about Medical Use Licenses

Report Date: October 09, 2015

Subcommittee Members: F. Costello; S. Langhorst (Chair); S. Mattmuller; C. Palestro; J. Suh; and P. Zanzonico

Charge: To provide comments on the non-rulemaking update[1] draft NUREG-1556, Volume 9, Rev. 3, "Consolidated Guidance about Materials Licenses: Program-Specific Guidance about Medical Use Licenses," with particular attention to how changes might impact medical licensees and to make recommendation for ACMUI action.

Recommendations

1. This updated draft of NUREG-1556, Volume 9, Rev. 3 will be made available for public comment on the NRC NUREG-1556 website[2]. Due to the extensive reorganization of this revision and the complication of this draft being a separate but parallel update of the document, the Committee recommends that the comment period be extended to a minimum of 90 days.

2. Further specific discussions by the medical and regulatory communities and other stakeholders on the application of NRC safety culture traits are needed before specific safety culture examples are given or safety culture items are included in a model medical licensee audit program. The Committee recommends removing the medical use example in Section 3.2 and the safety culture audit item listed in Appendix L.

[1] The NRC has split updating of NUREG-1556 Volume 9 into two separate but parallel tasks. The first task to update guidance for NUREG-1556 Volume 9 occurred contingent with the current 10 CFR 35 rulemaking. Request for comment on the first task was published in July 2014 (79 FR 42224, July 21, 2014). The final update of this rulemaking-related guidance is being completed as part of the final rulemaking for 10 CFR 35. The second task to update guidance for NUREG-1556 Volume 9 is the draft being reviewed for this ACMUI report which contains no updates from the first task. Instead, the draft reviewed in this report contains only updates of remaining portions of the guidance document not impacted by the 10 CFR 35 rulemaking, except as noted later in this report for patient release guidance. As such, the AMCUI recommendations provided in this report do not include 10 CFR 35 rulemaking nor certain patient release portions of the guidance document.
[2] http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/.

3. The Committee recommends that identification of locations for medical use of byproduct materials be limited to specific addresses (e.g., street and building) rather than using global positioning system coordinates.

4. The Committee recommends that the description of information required by the NRC to be included in a license application or amendment pertaining to a consultant Radiation Safety Officer be accompanied by the criteria used by the NRC to judge the acceptability of a candidate's qualifications.

5. The Committee recommends a footnote be added in Section 8.9.3 to clarify that the term "dose" continues to be used by many medical licensees to refer to the activity of unsealed byproduct material.

6. The Committee recommends that the "CardioGen-82 Highlights of Prescribing Information" document be removed from the reference list in Section 8.9.3 because the document does not address the equipment used to measure the Rb-82 dosage. The Committee also recommends that the paragraph discussing the Rb-82 generator be moved to the end of the "Discussion" segment.

7. The Committee recommends adding reference to RIS 2013-12, to EMG 2013-003, and to the "CardioGen-82 Highlights of Prescribing Information" document in Section 8.10.20 after the paragraph discussing Sr-82 and Sr-85 concentrations so that licensees are reminded of the circumstances regarding the NRC's use of enforcement discretion not to issue a violation regarding use of Rb-82 generator systems. The Committee also recommends that a footnote be added to the Appendix L medical audit section on generator use which references this important issue on the use of Rb-82 generator systems in Section 8.10.20.

8. The Committee commends the effort by the NRC to minimize duplicate guidance documents by removing the Rev 2 Appendix AA on licensee use of a consortium and instead directing licensees to the primary reference document. The Committee recommends that the NRC take similar action by removing the Rev 2 Appendix U on patient release and instead reference Regulatory Guide 8.39.

9. The Committee recommends that the NRC not include guidance on patient release that completely reverses the NRC final rule statements that the dose limit of 5 mSv (0.5 rem) is anything other than a per-release limit.

10. The Committee recommends adding reference to NCRP Report No. 173 in Appendix L for conducting self-assessment of radiation safety programs.

General Comments on Draft NUREG-1556, Volume 9, Rev. 3

Sections have been revised to conform to Items 5-11 listed on the NRC Form 313 "Application for Materials License". Although the ACMUI finds the reorganization of the guidance document to be an overall improvement, it is challenging to identify the changes that have been made. Review of this draft document is also complicated by the NRC's decision to split the update of NUREG-1556 Volume 9 into two separate but parallel tasks. The Committee therefore recommends that the comment period be extended to a minimum of 90 days.

Specific Comments on Draft NUREG-1556, Volume 9, Rev. 3

Safety Culture

The Section 3.2 on Safety Culture is new. The NRC issued its final safety culture policy statement[3] since the last revision of this guidance document. The NRC's positive safety culture traits are listed in Table 3.1. The policy statement ends with the following statements regarding implementation and inspection of a licensee's safety culture.

> "There may be traits not included in this Statement of Policy that are also important in a positive safety culture. It should be noted that these traits were not developed to be used for inspection purposes.
>
> It is the Commission's expectation that all individuals and organizations, performing or overseeing regulated activities involving nuclear materials, should take the necessary steps to promote a positive safety culture by fostering these traits as they apply to their organizational environments. The Commission recognizes the diversity of these organizations and acknowledges that some organizations have already spent significant time and resources in the development of a positive safety culture. The Commission will take this into consideration as the regulated community addresses the Statement of Policy."

Appendix L of the draft guidance document provides a model medical licensee audit. Item 5 under "Radiation Safety Program" states:

> "Is a positive safety culture program in place? Are the traits identified in NRC's Safety Culture Policy Statement addressed [NUREG/BR-0500]?"

The Committee recommends that this item be deleted from the model audit because it contradicts the NRC's statement that "these safety culture traits were not developed to be used for inspection purposes."

[3] NRC Final Safety Culture Policy Statement (76 FR 34773, June 14, 2011).

The Committee agrees that maintenance of a positive safety culture is important for medical licensees. The NRC's development of its safety culture policy has focused primarily on nuclear power and non-medical uses of byproduct material. The Committee believes that the application of the NRC's safety culture policy to medical use of byproduct material should be addressed in a dialogue between the medical and regulatory communities if the NRC plans to develop specific safety culture guidance or examples specific to medical licensees. The special circumstances of purposely exposing patients to radiation, the measure of the benefits of this exposure, patient safety programs developed by medical licensees, and the impact of NRC regulations on patient safety and accessibility to medical care all need to be fully explored in order to properly define and apply the meaning of NRC safety culture traits to the medical use of byproduct material. The Committee therefore recommends Section 3.2 "Safety Culture" be modified to remove the specific medical use example as follows:

> "The NRC, as the regulatory agency with an independent oversight role, reviews the performance of individuals and organizations to determine compliance with requirements and commitments through its existing inspection and assessment processes. However, the NRC's safety culture policy statement and traits are not incorporated into the regulations. Many of the safety culture traits may be inherent to an organization's existing radiation safety practices and programs. ~~For instance, time-outs before a therapeutic procedure provide an opportunity for the medical team to double-check treatment parameters and the WD to reduce the likelihood of a medical event. The use of time-outs may correspond with the safety culture training specified in Table 3.1 as "Work Processes" (the process of planning and controlling work activities is implemented so that safety is maintained). However, licensees should be aware that this is just an example, and should consider reviewing their radiation safety programs in order to develop and implement a safety culture commensurate with the nature and complexity of their organizations and functions.~~"

Global Positioning System (GPS) Coordinate

Section 8.3 encourages the applicant "to provide global positioning system coordinates, as appropriate." The Committee recommends that specific facility addresses be used, rather than GPS coordinates, to specify the locations of byproduct material use for a medical licensee. GPS coordinates are not as descriptive and certainly not as familiar, as street or building addresses, especially in the setting of a large medical facility.

Outside Consultant or Contractor Appointed as RSO

Section 8.7.1 requires that an applicant provide new specific information when an outside consultant or contractor is appointed as the Radiation Safety Officer (consultant-RSO). This information includes: identification of other licenses the consultant-RSO covers; the minimum time (hours per week) the consultant-RSO will be onsite; appointment of in-house point of contact during consultant-RSO's absence; overall availability of the consultant-RSO to respond to radiation safety program and regulatory questions or operational issues; and maximum amount

of time needed for the consultant-RSO to arrive at the facility. The Committee recommends that the description of information the NRC requires an applicant to provide in a license application or amendment regarding a consultant-RSO be accompanied by the NRC criteria used to judge the acceptability of a consultant-RSO.

Dose Calibrator and Other Equipment Used to Measure Dosages of Unsealed Byproduct Material

Section 8.9.3 provides guidance on measuring dosages of unsealed byproduct material. The term, "dosage", was introduced in the 2002 revision[4] of 10 CFR 35 with the new definitions of prescribed dosage, therapeutic dosage, and unit dosage to signify the activity of unsealed byproduct material. This regulatory terminology change was made in an effort to replace the previous term, "dose", which also refers to the amount of energy absorbed per unit mass. However, this regulatory definition has not been universally applied as is evident by the primary equipment used to measure dosage still being identified as a "dose calibrator". The Committee recommends the addition of the following footnote at the end of the "Criteria" section recognizing that the term "dose" continues to be used by medical licensees to refer to the activity of unsealed byproduct material:

> "… and check of instruments (e.g., dose[FN] calibrators) used to measure patient dosages.
>
> [FN] The term, 'dose', continues to be used by many medical licensees to refer to the activity of unsealed byproduct material."

Rubidium-82 Generator Systems

Following the 2011 recall of Rb-82 generators by the manufacturer, NRC initiated a detailed examination of its current regulations with respect to the operation of the generator, the infusion cart, the radiation detector used to measure the Rb-82 dosage, and the Sr-82/Sr-85 concentration determination process[5]. The NRC determined that licensees using the generators could not meet the current NRC regulatory requirements in: (1) 10 CFR 35.60 to calibrate the instrument used to measure the activity of the dosage administered to each patient or human research subject in accordance with nationally recognized standards or calibration instructions provided by the manufacturer, and (2) 10 CFR 35.63 to determine the activity of each dosage administered before medical use. The NRC issued an enforcement guidance memorandum[6] which provides three criteria that, if met, will permit NRC to use enforcement discretion and not

[4] 79 FR 20250, "Medical Use of Byproduct Material – Final Rule," April 24, 2002.
[5] RIS 2013-012, "Notice Of Issuance Of Enforcement Guidance Memorandum – Interim Guidance For Dispositioning Violations Involving 10 CFR 35.60 And 10 CFR 35.63 For The Calibration Of Instrumentation To Measure The Activity Of Rubidium-82 And The Determination Of Rubidium-82 Patient Dosages," August 23, 2013.
[6] EGM 2013-003, "Enforcement Guidance Memorandum - Interim Guidance for Dispositioning Violations Involving 10 CFR 35.60 and 10 CFR 35.63 for the Calibration of Instrumentation to Measure the Activity of Rubidium-82 and the Determination of Rubidium-82 Patient Dosages," April 18, 2013.

cite violations for failure to comply with the requirements for Rb-82 generator systems in 10 CFR 35.60 and 10 CFR 35.63. This action taken by the NRC was crucial to allow licensees to reinitiate use of Rb-82 generators for cardiac PET exams, and it is important to remind licensees of these special circumstances surrounding the medical use of a Rb-82 generator.

The "Discussion" section of Section 8.9.3 lists further guidance for the measurement of dosages from Rb-82/Sr-82 generators. The Committee agrees that RIS 2013-12 and EGM-13-003 are important guidance documents for this list as these documents address the circumstances regarding the NRC's use of enforcement discretion not to issue a violation regarding use of Rb-82 generator systems. However, the Committee recommends that the "CardioGen-82 Highlights of Prescribing Information" document be removed from this list because this document does not address issues regarding the equipment used to measure the Rb-82 dosage. The Committee also recommends moving this paragraph to the end of the "Discussion" segment of this section.

Section 8.10.20 includes guidance on recording and maintaining documentation of each dosage to reflect proper use and accountability. The Committee recommends adding reference to RIS 2013-12, to EMG 2013-003, and to the "CardioGen-82 Highlights of Prescribing Information" document in Section 8.10.20 after the paragraph discussing Sr-82 and Sr-85 concentrations so that licensees are reminded of the circumstances regarding the NRC's use of enforcement discretion not to issue a violation regarding use of Rb-82 generator systems. This reference can read as follows:

> "Licensees who use rubidium-82 (Rb-82)/strontium-82 (Sr-82) generators should also refer to the following for further guidance on documentation and recordkeeping:
>
> - Regulatory Issues Summary 2013-012, 'Notice of Issuance of Enforcement Guidance Memorandum—Interim Guidance for Dispositioning Violations Involving 10 CFR 35.60 and 10 CFR 35.63 for the Calibration of Instrumentation to Measure the Activity of Rubidium-82 and the Determination of Rubidium-82 Patient Dosages,' August 23, 2013
>
> - Enforcement Guidance Memorandum 2013-003, 'Interim Guidance for Dispositioning Violations Involving 10 CFR 35.60 and 10 CFR 35.63 for the Calibration of Instrumentation to Measure the Activity of Rubidium-82 and the Determination of Rubidium-82 Patient Dosages,' April 18, 2013
>
> - CardioGen-82 Highlights of Prescribing Information, label approved on 02/08/2012 for NDA No. 019414."

The Committee also recommends that a footnote be added to the Appendix L medical audit section on generator use which references this important issue on the use of Rb-82 generator systems in Section 8.10.20. This footnote can read as follows under segment for "Dose or Dosage Measuring Equipment":

> "3. Licensee uses generators?[FN]

[FN] See Section 8.10.20 for additional information regarding Rb-82 generators."

Guidance Regarding Licensees Use of a Consortium

The Committee notes that the Rev. 2 Appendix AA "Production and Noncommercial Distribution by the Medical Facility of PET Radioactive Drugs to Consortium Members under Authorization of 10 CFR 30.32(j)" was removed. Instead in Section 8.5.1, licensees are encouraged to review NUREG-1556, Volumes 13 and 21 for use of a consortium for noncommercial distribution of PET radionuclides. The Committee commends the NRC on its effort to minimize duplication of guidance documents. By referencing a primary guidance document rather than duplicating that same guidance in a second location, maintenance of the primary document is easier and the possibility that these multiple documents diverge into inconsistent guidance is eliminated.

Guidance Regarding Patient Release

The Committee recommends that the NRC remove the Rev. 2 Appendix U "Model Procedures for Release of Patients or Human Research Subjects Administered Radioactive Materials" and instead refer licensees to Regulatory Guide 8.39 "Release of Patients Administered Radioactive Materials". Again, the removal of this duplicate model procedure will make maintenance of patient release guidance easier and minimize chance of confusing licensees and patients with potential differences that may arise in separate guidance documents. The Committee supports and considers it most appropriate to maintain the primary guidance for patient release in Regulatory Guide 8.39. Use of the NUREG-1556 series of guidance volumes largely resides with individuals responsible for licensing and managing radiation safety programs. Guidance for patient release is of more universal interest not only to licensees, but also to the general medical community, patients, patient families, and the public. In the Committee's opinion, the stand-alone primary guidance document, Regulatory Guide 8.39, is the most appropriate type of guidance document for this subject to support the NRC's commitment to conducting its regulatory responsibilities in an open and transparent manner.

With the recommended removal of Appendix U, the information contained in the introductory sections, "Model Procedures for Release of Patients or Human Research Subjects Administered Radioactive Materials" and "Special Considerations and Guidance for Release of Patients Following I-131 Therapy" can be included in Section 8.10.18 "Item 10: Release of Patients of Human Research Subjects" in the main document. However, the following sentence at the beginning of Appendix U "Special Considerations and Guidance for Release of Patients Following I-131 Therapy" is misleading and should be deleted.

> "Although the regulations are not explicit, licensees should consider implementing the 5 mSv (0.5 rem) as an annual limit for multiple administrations during a calendar year."

The Committee again reemphasizes[7] that 5 mSv (0.5 rem) was set as the basis for patient release established by the NRC in its final rulemaking[8] for each patient release, as explicitly stated in these two sentences:

> "The NRC is establishing a dose limit of 5 millisieverts (0.5 rem) total effective dose equivalent to an individual from exposure to the released patient for each patient release." [Page 4122, Column 3, beginning of first full paragraph]
>
> and
>
> "Each patient release is to be treated as a separate event, and licensee knowledge of previous administrations is unnecessary." [Page 4130, Column 3, end of first full paragraph]

These explicit statements by the NRC in the patient release final rulemaking conflict with the guidance encouraging licensees to consider 5 mSv (0.5 rem) as an annual limit. The Committee is concerned that introducing this inconsistency could cause patient anxiety and licensee confusion about how to maintain compliance with patient release criteria, both of which could result in the procedure being delayed, replaced by a less effective medical procedure, or even cancelled. The NRC recently stated[9] its intention to pursue rulemaking on this topic. **Until that rulemaking process is completed, the Committee feels it is inappropriate for NRC guidance on patient release to completely reverse the NRC final rule statements that the dose limit of 5 mSv (0.5 rem) is anything other than a per-release limit.**

The Committee did not review and comment on the body of Appendix U because update of that guidance is being conducted by another separate task to update patient release guidance[10].

NCRP Reference

The Committee recommends including NCRP Report No. 173, "Investigation of Radiological Incidents" (2012), as a reference by adding the following paragraph before the "Annual Radiation Protection Medical Licensee Audit" in Appendix L:

> "NCRP Report No. 173 states the two general objectives of a self-assessment process are to: (1) self-identify and correct deficiencies or weaknesses in the radiation protection program; and (2) improve the performance of the radiation protection program by ensuring that its design, development, and implementation are effective and efficient."

---

[7] ACMUI "Patient Release Report", December 13, 2010 – See section "Annual Dose Limits versus Per-Release Dose Limits (http://pbadupws.nrc.gov/docs/ML1034/ML103481099.pdf)

[8] 62 FR 4120: "Criteria for the Release of Individuals Administered Radioactive Material - Final Rule", NRC Docket No. RIN 3150-AE41, January 29, 1997.

[9] NRC RIS 2008-07, "Dose Limits for Patient Release Under 10 CFR 35.75", March 27, 2008.

[10] The Commission has directed the NRC Staff to revise Regulatory Guide 8.3 as part of the Patient Release Project (COMAMM-14-001/COMWDM-14-001 "Background and Proposed Direction to NRC Staff to Verify Assumptions Made Concerning Patient Release Guidance," March 10, 2014).