

**Nuclear Energy Institute (NEI) Response to
NRC Request for Additional Information (RAI) Regarding
Nuclear Energy Institute Topical Report NEI 07-03, Revision 0,
"Generic FSAR Template Guidance for Radiation Protection Program Description,"**

1. The "Operational Radiation Protection Program" sections of Draft Guide-1145 (Regulatory Guide (RG) 1.206) and the Standard Review Plan SRP (NUREG-0800), refer to several guidance documents which provide guidelines for an acceptable operational radiation protection program. In general, most of this guidance is explicitly called out in NEI 07-03. However, the staff has noted the following omissions in NEI 07-03:
 - a. Regulatory Guide 8.25 "Air Sampling in the Workplace,"
 - b. NUREG/CR-0041, "Manual of Respiratory Protection Against Airborne Radioactive Materials,"
 - c. Memorandum from Larry W. Camper to David B. Matthews and Elmo E. Collins, "List of Decommissioning Lessons Learned in Support of the Development of Standard Review Plan for New Reactor Licensing," October 10, 2006 (Agencywide Document Access and Management System (ADAMS) Accession No. ML062620355).

Please incorporate the above guidance documents into the appropriate section of NEI 07-03 or provide justification as to why these references should not be included in NEI 07-03.

NEI Response:

NEI has not incorporated the above guidance documents into NEI 07-03 as references. Our justification for not doing so is as follows (for each of the three cited documents):

- a. The Introduction in Regulatory Guide 8.25, "Air Sampling in the Workplace," states:

"this guide does not apply to activities conducted under 10 CFR Part 50 at reactor facilities. Although the provisions of 10 CFR Part 20 apply equally to nuclear reactors and to other facilities, the air sampling programs of reactor licensees are well established, and the NRC is satisfied that the quality of air sampling at nuclear reactors is adequate. Therefore, no further guidance on air sampling is needed at this time for reactor licensees."

This conclusion by the NRC staff in the regulatory guide was developed in response to extensive comments made by the nuclear energy industry on a draft version of the regulatory guide that was published for public comment. The industry comments described the scope of air sampling programs employed at nuclear power plants and highlighted the industry's exceptional performance in regard to protecting workers against significant intakes of airborne radioactive material. This level of performance is attributable to the extensive protective measures built into nuclear power plant design and operating procedures to control airborne radioactive material and minimize the potential for intakes, as well as reflecting the high quality of commensurate air sampling programs.

NEI 07-03 contains a description of air sampling programs and operational measures to monitor and control airborne radioactive material and prevent intakes at new nuclear power plants that is reflective of the "well-established" programs being

employed at currently operating plants. In addition to NEI 07-03, Chapter 12 of an FSAR supporting a Construction and Operating License (COL) application contains details of plant and system designs, either by reference to a certified design or as described in the FSAR, that serve to limit airborne radioactive material in occupied areas and minimize the potential for intakes.

The descriptive information provided in the COL application, including NEI 07-03, is commensurate with the level of detail provided in support of previous power reactor operating license (OL) applications and provides reasonable assurance that the air sampling programs at new nuclear power plants are adequate, as has been concluded by the NRC staff in Regulatory Guide 8.25 in regard to currently operating plants.

Therefore, we have not included a commitment to Regulatory Guide 8.25 in NEI 07-03.

- b. Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection," states in the Introduction that the guide "describes a respiratory protection program that is acceptable to the NRC staff." Further, the Discussion in the guide notes that "[m]ore detailed advice and technical information can be found in NUREG-0041, 'Manual of Respiratory Protection Against Airborne Radioactive Materials.'" In fact, the Regulatory Position in the Regulatory Guide is largely based on the detailed advice and technical information contained in NUREG-0041, but the Regulatory Guide is adequate as a "stand-alone" document to serve as guidance to licensees, as well to provide appropriate acceptance criteria to the staff for conducting a review of a respiratory protection program described in a COL FSAR. The information in the NUREG itself is useful in providing technical details supporting the regulatory guide, but is not necessary to serving as specific criteria for evaluating a respiratory protection program as described in a COL FSAR.

The information in NEI 07-03 regarding the respiratory protection program includes a commitment that the program conforms with the guidance in Regulatory Guide 8.15, as well as a detailed description of required program elements that is derived from the regulatory guide. The level of descriptive detail about the respiratory protection program, in addition to a specific commitment to Regulatory Guide 8.15, is sufficient to support a finding of reasonable assurance that the respiratory protection program complies with NRC requirements and serves to adequately protect worker health and safety.

Therefore, we have not included a commitment to NUREG-0041 in NEI 07-03.

- c. The memorandum cited in this item of the RAI conveys some decommissioning lessons learned in support of the development of the SRP in regard to the requirements contained in 10 CFR Part 20.1406. Subsequent to issuance of the memorandum, the NRC has determined that a regulatory guide will be developed to establish a regulatory position on demonstrating compliance with the respective regulation. The regulatory guide was published for public comment in July 2007 and, when finalized, will be factored into the SRP. The information provided in the memorandum may be incorporated into the final version of the regulatory guide in total, in part, or not at all.

In our view, the memorandum, in itself, does not constitute an approved regulatory position, even though it is listed as a reference in the SRP. Even from an informational perspective, the memorandum cannot be considered as complete or final in regard to what is necessary or adequate to demonstrate compliance with 20.1406 because the information in the publicly available draft of the proposed regulatory guide indicates that the regulatory perspective on this matter has already evolved well beyond that provided in the memorandum.

NEI 07-03 contains a commitment to 20.1406 and descriptive details about how the operational radiation protection program facilitates minimization of contamination that reflects industry's experience and lessons-learned from decommissioning, as well as the information provided in the memorandum, that is adequate to support a finding of reasonable assurance of compliance with NRC regulations and adequate protection of health and safety given the present state of the development of NRC regulatory position on this matter. To commit to the memorandum at this point seems to us to be premature and inappropriate because it will lack finality. At the time of issuance of an approved regulatory guide on 20.1406, we will consider how to update to NEI-07 to reflect an appropriate commitment to the regulatory guide.

Therefore, we have not included a commitment to the memorandum in NEI 07-03.

2. The SRP references the following standards in Section 12.5, "Operational Radiation Protection Program":

- ANSI/ANS 3.1-1993 R99, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants."
- ANSI/HPS N13.6, "Practice for Occupational Radiation Exposure Records Systems."
- ANSI/HPS N13.11-2001, "Personnel Dosimetry Performance-Criteria for Testing."
- ANSI/HPS N13.14-1994, "Internal Dosimetry Programs for Tritium Exposure-Minimum Requirements."
- ANSI/HPS N13.30-1996, "Performance Criteria for Radiobioassay."
- ANSI/HPS N13.42-1997, "Internal Dosimetry for Mixed Fission Activation Products."
- ANSI IEEE 309-1991, "Test Procedure for Geiger-Mueller Counters."
- ANSI N42.20-2003, "Performance Criteria for Active Personnel Radiation Monitors."
- ANSI N42.28-2002, "American National Standard for Calibration of Germanium Detectors for In Situ Gamma Ray Measurements."
- ANSI N42.17A-1989, "Performance Specifications for Health Physics Instrumentation-Portable Instrumentation for Use in Normal Environmental Conditions."
- ANSI N323A-1997, "American National Standard Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments."

Please incorporate the above listed ANSI standards into NEI 07-03 as references, or provide justification as to why these standards have been omitted from NEI 07-03.

NEI Response:

The RAI lists 11 American National Standards Institute (ANSI) standards that are included as references in Section 12.5 of NUREG-0800, "Standard Review Plan (SRP)," and recommends that the standards be incorporated into NEI 07-03, or that a justification be provided as to why the standards were omitted from NEI 07-03.

Some ANSI standards are endorsed in NRC regulatory guides, most often with a description of exceptions and clarifications, as a part of the Regulatory Position describing methods that are acceptable to NRC staff for demonstrating compliance with NRC regulations. ANSI standards, in themselves, are not regulatory documents, nor do they serve as *de facto* regulatory guidance on methods acceptable to NRC staff for demonstrating compliance with NRC regulations, except as stipulated and endorsed in an NRC regulatory guide or other appropriate regulatory document. As a general matter, references identified in the SRP should be consistent with references identified in the underlying regulatory guides.

Moreover, it is not clear if the staff intends that SRP references to these ANSI standards indicate NRC endorsement of them. In our view, including an ANSI standard in a list of references in the SRP does not constitute endorsement of the respective ANSI standard as part of an approved regulatory position of NRC staff, nor should it be implied that such a listing, in itself, of an ANSI standard means that the standard is necessary or sufficient to accept, review, or reach a finding of reasonable assurance of compliance with NRC regulations in regard to a COL application. In fact, reference in a COL application to an ANSI standard that has not been properly endorsed by the NRC would only be appropriate where the applicant is proposing to use the standard as an alternative to existing guidance or to address an area where no guidance currently exists.

NEI 07-03 contains commitments to all of the NRC regulations and respective regulatory guides that are applicable to operational radiation protection programs at nuclear power plants. Where such regulatory guidance already contains an endorsement of an ANSI standard listed in the RAI, the commitment implicitly includes the respective ANSI standard as it is endorsed in the guide, and no additional commitment directly to the ANSI standard is necessary, nor is it appropriate, unless all of the exceptions and clarifications included in the regulatory guide are either reiterated in the application or taken exception to, with an appropriate justification. Several of the ANSI standards listed in the RAI are endorsed in NRC regulatory guides and therefore the commitment to the regulatory guides satisfies the recommendation in the RAI.

The remaining ANSI standards are not endorsed in regulatory guides, and it must be assumed that the NRC has not yet established a regulatory position in regard to each of these standards. A wholesale commitment to these standards in the COL application would be inappropriate and inefficient, in that the NRC would need to evaluate, and, in effect, develop a regulatory position on each of the standards. Any exceptions or clarifications developed by the staff in regard to the standards would need to be subsequently incorporated into NEI 07-03.

NEI has provided in NEI 07-03, in addition to commitments to all of the regulations and regulatory guides applicable to operational radiation protection programs at

nuclear power plants, detailed descriptions of required program elements sufficient to support a finding of reasonable assurance of compliance with NRC regulations and adequate protection of worker and public health and safety.

Because of the ambiguous regulatory approval status of the identified ANSI standards, and for the other reasons discussed above, we have not included in NEI 07-03 commitments directly to the 11 ANSI standards listed in the RAI.

3. (12.5) NEI 07-03 does not reference 10 CFR 20, Subpart B entitled "Radiation Protection Programs." In order to include this reference, consider adding the following phrase preceding the second paragraph in 12.5 (prior to the words "The purpose of"), "In accordance with 10 CFR 20, Subpart B,..."

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

4. (12.5) In the description of Milestone 2 ("Prior to receiving reactor fuel under this license"), reference is made to providing radiation monitoring in accordance with 10 CFR 50.68. Compliance with 10 CFR 50.68 requires the establishment and implementation of plant procedures relating to criticality accident requirements in addition to the use of radiation monitoring equipment. Modify item 2 under the milestone section of 12.5 to add the words, "plant procedures on criticality accident requirements will be established, implemented, and maintained and" prior to the words "radiation monitoring."

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

5. (12.5) In the section describing the four different milestones, no specific mention is made of when the position of radiation protection manager (RPM) should be filled. It can be inferred from the text that this position should be filled prior to initial loading of fuel in the reactor (milestone 3). The description of milestone 3 should be modified to specifically state that the RPM position will be filled during this milestone stage.

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

6. (12.5.1) In the list of management commitments listed, the establishment of an as low as is reasonably achievable (ALARA) Committee is listed as an option (item 8). The establishment of an ALARA Committee (or similarly named committee with similar functions) is an important part of an effective radiation protection program and should not be listed as an optional management commitment. Please reflect this committee as part of the main list of management commitments.

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

7. (12.5.2.1) The same comment (see #6 above) applies to listing the establishment of an ALARA Committee as an optional responsibility of the Plant Manager. RG 8.8 states that the RPM should have direct recourse to responsible management and making the ALARA Committee one of the responsibilities of the Plant Manager would be one way to establish such a link between the RPM and Plant Manager.

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

8. (12.5.2.3) The same comment (see #6 above) applies to participating as a member of the plant ALARA Committee as an optional responsibility of the Radiation Protection Manager. RG 8.8 states that the RPM should have direct recourse to responsible management and making the ALARA Committee one of the responsibilities of the RPM would be one way to establish such a link between the RPM and Plant Manager.

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

9. (12.5.3) For all Regulatory Guides referenced in NEI 07-03, please specify the revision number.

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

10. (12.5.3.2) In the list of "Personnel Monitoring Instrumentation and Equipment" there is no mention of remote and local reading alarm dosimeters (which may be coupled with direct or electronic surveillance equipment) for monitoring workers in high-dose/high-dose-rate environments. Please include "remote and local reading alarm dosimeters (which may be coupled with direct or electronic surveillance equipment, as necessary)" in the list as an example of Personnel Monitoring Instrumentation or provide justification as to why these dosimeters should not be listed.

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

11. (12.5.3.2) The nominal range shown for the neutron survey instruments listed under "Portable Monitoring Instrumentation and Equipment" is 0 - 5 rem/hr. Compared to the nominal ranges given for the other portable instrumentation, the upper range of 5 rem/hr seems low. Please justify why this is an appropriate nominal range for a neutron survey instrument.

NEI Response:

NEI proposes to maintain the nominal range of 0 – 5 rem/hr. A review of previously submitted license applications, as well as discussions with existing operational nuclear power plant licensees, indicates that the typical range maintained for portable neutron survey instrumentation is not in excess of 0 – 5 rem/hr. Under expected operating conditions, including anticipated abnormal occurrences, scattered neutron radiation fields well below 5 rem/hour may be encountered during access into a reactor containment when the reactor is critical. Higher neutron radiation fields may exist directly over the reactor cavity when the reactor is at power, but this area is not accessed by personnel under such conditions. Therefore, it is not necessary to maintain portable neutron radiation survey instrumentation with a nominal range greater than 0 – 5 rem/hr. In addition, it would be unnecessarily difficult and costly to attempt to maintain the capability, either onsite or through contracted services, for periodic calibration and testing of portable neutron radiation survey instrumentation with a nominal range greater than 0 – 5 rem/hr because of the limited availability of properly certified neutron radiation sources that provide neutron radiation fields at levels greater than 5 rem/hr. Such a regulatory burden is not justified by industry experience or anticipated operating conditions.

12. (12.5.4.4) The third paragraph in this section makes reference to 10 CFR 20.1903. Should this reference be 10 CFR 20.1602, which describes the additional administrative controls for restricting access to Very High Radiation Areas?

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

13. (12.5.4.7) The first paragraph in this section states that the requirements of 10 CFR 20.1301 will be met. Please indicate in the text that the requirements of 10 CFR 20.1302 will also be met, as they relate to controlling the maximum dose rate in unrestricted areas.

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

14. (12.5.4.7) The first paragraph states that the requirements of 10 CFR 20.1201 will be complied with. However, no mention is made of 10 CFR 20.1202, 20.1203 or 20.1204. Please reflect the commitment to meet the requirements of 20.1201, 20.1202, 20.1203, and 20.1204, as they relate to demonstrating compliance with internal and external dose limits, in this section.

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

15. (12.5.4.8) In the sixth paragraph of this section, please change the following sentence "Practical measures are implemented to prevent the spread of contamination, including, for example:" to "Practical measures are implemented to prevent the spread of contamination, including:..."

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

16. (12.5.4.10) In the list of regulations for this section no mention is made of 10 CFR 20.2201 "Reports of theft or loss of licensed material." Please indicate if procedures will be in compliance with this regulation by adding 20.2201 to the existing list.

NEI Response:

NEI has incorporated the recommended change into NEI 07-03.

Editorial Changes

NEI Response:

NEI has incorporated all of the editorial changes listed in the RIA into NEI 07-03.

Consider the following editorial changes as shown in **Bold**:

- E1. (12.5) In the paragraph describing the purpose of the radiation protection program, please correct as follows: "...as low as **is** reasonably achievable (ALARA)."
- E2. (12.5) In the paragraph describing Milestone 3, please change the first sentence to read, "Prior to initial loading of fuel in the reactor, the **radiation protection** program...."
- E3. (12.5.1) Please change item number 7 of this section so that it reads as follows: "Establish a direct reporting chain of the Radiation Protection Manager to the Plant Manager that is **at the same reporting level as, but** independent of, the reporting chains for Operations and Maintenance."
- E4. (12.5.2.3) Please modify item number 3 in this section as follows: "Provide radiation protection input to facility design, **including plant modifications**, and work planning;..."
- E5. (12.5.2.4) Please change the first sentence of the second paragraph as follows: "The qualifications and experience of RPTs are consistent with the guidance **contained in** Regulatory Guide 1.8."
- E6. (12.5.2.4) Please modify the third paragraph in this section as follows: "...trained and qualified staff in Radiation Protection (**as described in section 12.5.2.5**) other than RPTs..."
- E7. (12.5.3.1) In the section titled "Storage and Issue Area for Contaminated Tools and Equipment" please change the last sentence in that paragraph to: "Clean and contaminated tools and equipment **are** segregated to avoid cross-contamination."
- E8. (12.5.3.1) In the section titled "Facility for Dosimetry Processing and Bioassay" please change the first sentence to: "A facility or facilities are provided to support processing of dosimetry and **performance** of bioassay..."

- E9. (12.5.3.1) In the section titled: "Laundry Facility" please make the following change to the second sentence: "...applicable limits in 10 CFR Parts 20 and 50 and as low as **is** reasonably achievable..."
- E10. (12.5.4.2) In the section titled: "Refueling" please change the last sentence to the following: "...the normal radiation level on the refueling bridge **during these operations** is expected to be less than 5 rem/h."
- E11. (12.5.4.2) In the section titled: "Inservice Inspection" please change the first sentence in the following way: "...previous radiation and contamination surveys, **and/or** previous RWPs appropriate to the particular job to be performed."
- E12. (12.5.4.2) In the section titled "Radwaste Handling" please modify the last sentence in the paragraph in the following way: "The radwaste system is described in **FSAR Chapter 11.**"
- E13. (12.5.4.2) Please reword the first two sentences of the section titled "Normal Operation" in the following way: "The plant was designed so that significant radiation sources are minimized, shielded, and/or **located** in cubicles. **Instrument readouts for** instrumentation required for normal operation, **for the most part, can be** read remotely **from** the control room or **from** other low radiation areas."
- E14. (12.5.4.2) The last sentence of the first paragraph under the section titled "Routine Maintenance" should be changed as follows: "This serves to minimize the time spent in the radiation area **and thereby minimize personnel dose.**"
- E15. (12.5.4.2) The first sentence of the second paragraph of the "Routine Maintenance" section should be modified to "In addition, the **preventive** maintenance procedure..." The word "usual" should be deleted.
- E16. (12.5.4.2) The second sentence of the second paragraph of the "Routine Maintenance" section should be modified to "...shielding is specified, if appropriate, and additional specific instructions..."
- E17. (12.5.4.2) The first sentence of the third paragraph of the "Routine Maintenance" section should be modified as follows: "Extension tools are used when practical **to minimize dose when personnel are working on radioactive components/equipment.**"
- E18. (12.5.4.2) The second to last sentence of the third paragraph of the "Routine Maintenance" section should be changed as follows: "...accomplished as safely and quickly as possible, and what the acceptance criteria **for completing the job** are."
- E19. (12.5.4.4) The second sentence of the third paragraph should be modified as follows: "...restricting access to each Very High radiation Area as required by 10 CFR 20.**1602.**"
- E20. (12.5.4.7) Please change the second paragraph of this section as follows:

"To the extent practical, procedures and engineered controls based on sound radiation protection principles are used to keep occupational doses and doses to members of the public as low as **is**

reasonably achievable (ALARA). A description of facility design features and engineered controls intended to maintain occupational exposures **ALARA** is included in **FSAR** Sections 12.3-12.4. A description of systems and facility design features intended to maintain public exposures ALARA is included in **FSAR** Chapter 11."

- E21. (12.5.4.7) Please change the second sentence in the paragraph marked by the number 3 in the following way: "The briefings are intended to assure that personnel understand..."
- E22. (12.5.4.8) Please change the fourth and fifth bullets in this section in the following way: "Containments, caches and enclosures are used during maintenance, repairs, and testing, when practical, to contain spills and releases;" and "Engineering controls, such as portable ventilation or filtration units to reduce concentrations of radioactivity in air or fluids, are used where practical;..."
- E23. (12.5.4.8) Please change the seventh bullet in this section to read as follows: "...necessitate disposal as radioactive waste **is** minimized."