



NUCLEAR ENERGY INSTITUTE

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75 FR 59160

Ellen P. Anderson
SENIOR PROJECT MANAGER
RADIATION SAFETY & ENVIRONMENTAL PROTECTION
NUCLEAR GENERATION DIVISION

January 28, 2011

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Ms. Cindy K. Bladey
Chief, Rules, Announcements and Directives Branch
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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RULES AND DIRECTIVES
BRANCH
USNRC

Subject: Comments on Solicitation for Public Comment on Potential Changes to the Agency's Radiation Protection Regulations (75 FR 59160, Dated September 27, 2010)

Project Number: 689

Dear Ms. Bladey:

On July 7, 2009, the U.S. Nuclear Regulatory Commission (NRC) issued a Federal Register Notice (74 FR 32198) soliciting public comment on the potential changes to the NRC's radiation protection regulations as described in NRC SECY-08-0197 "Options to Revise Radiation Protection Regulations and Guidance With Respect to the 2007 Recommendations of the International Commission on Radiological Protection (ICRP)," dated December 18, 2008.

On March 31, 2010, the Nuclear Energy Institute (NEI)¹ provided comments on behalf of the nuclear energy industry pertaining to the technical options and issues for revisions to 10 CFR 20 and 50. These comments were developed by a nuclear energy industry task force comprised of subject matter experts from 13 utilities, 3 fuel cycle companies, and 1 research and test reactor involved in radiological protection at their respective facilities. They reflect a substantial body of industry technical expertise and lessons-learned with many years of experience.

¹NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

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E-REDS = ADM-03

Template = ADM-013

Add = K. Marjorie Butler
(Krm4)

The four major comments were as follows:

1. Industry agreed with the Commission that the current regulatory framework continues to provide adequate protection. We recognized that current NRC radiation protection regulations contain three generations of science, (ICRP 2, 26, and 60) and that in light of globalization of the nuclear industry there is some value in the alignment of U.S. regulations, implementing guidance and supporting technical codes and standards with contemporary international standards however it should not be the primary consideration.
2. Industry suggested that the Commission not just revise but also reform NRC radiation protection regulations and guidance documents to ultimately reduce regulatory burden, enhance regulatory efficiency, improve flexibility in implementation, and facilitate future updates.
3. Industry encouraged the NRC to continue to promote uniformity across Federal and state radiation protection regulations so that all regulations are based upon a common interpretation and utilization of current science.
4. Industry requested a phased-in implementation period to allow for efficient and effective change management of these changes.

On September 27, 2010, the U.S. Nuclear Regulatory Commission (NRC) issued a Federal Register Notice (75 FR 50150) announcing a series of public meetings to solicit early public input to major issues associated with potential updates to NRC's radiation protection regulations and guidance in light of recommendations presented in the International Commission on Radiological Protection (ICRP) Publication 103 (2007). NEI appreciated the opportunity to participate in these public meetings that we believe were well-executed, candid, and extremely informative.

Although NEI provided verbal responses to the various questions proposed by the NRC during each of these three public meetings, we would like to take this opportunity to formally submit our comments in writing. The nuclear industry makes the following general statements as they pertain to the NRC options detailed in the Federal Register. Specific details for each issue are included in the attached table.

1. The current regulatory framework and industry practices provide adequate protection for occupational workers, the public and the environment.
2. Industry does not believe there is a compelling scientific basis for lowering occupational dose limits.
3. Industry continues to encourage the NRC to promote uniformity across Federal and state radiation protection regulations so that all regulations are based upon a common interpretation and utilization of current science.

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4. Industry recommends that the NRC utilize this opportunity to reform its regulations and guidance documents rather than just updating selected parts and guides.

We request that any evaluations performed by the NRC include a review of scope, cost, and impact for each potential option.

We look forward to continuing dialogue and engagement as a key stakeholder in future workshops, forums, and other meetings to discuss in more detail proposed options and relative issues involving revision of radiation protection regulations.

If you have any questions or desire any additional information concerning these comments, please do not hesitate to contact me at 202-739-8043; exa@nei.org.

Sincerely,

A handwritten signature in cursive script that reads "Ellen P. Anderson".

Ellen P. Anderson

Attachment

**Industry Comments to NRC Staff-Identified Technical Issues and Options Associated
With the Potential Revision to 10 CFR Part 20 Regulations and Guidance**

Issue	Comments
<p>1.0 Effective Dose and Numerical Values</p> <p>1.1. Clarifying Effective Dose Methodology and Assessing Implications for Licensee Compliance with Dose Limits and Changes to Terminology</p> <p><u>NRC Options:</u></p> <p>1.a: No change in the current terminology (terminology remains TEDE).</p> <p>1.b: Change the current regulation to align with the current ICRP Publication 103: Express as Total Effective Dose.</p> <p>1.c: Allow use of either term.</p>	<p>The nuclear industry supports Option 1.b. We believe that agencies of the Federal government should be using the most updated science and terminology. Consistent terminology should be specified within the regulations. Allowing the simultaneous use of both terms (TEDE or TED) could cause confusion within the industry. Therefore, we suggest that NRC revise the current regulations to align with the current ICRP Publication 103: Express as Total Effective Dose.</p>

Issue	Comments
<p>1.0 Effective Dose and Numerical Values - continued</p> <p>1.2. Numerical Values and Weighting Factors</p> <p><u>NRC Options:</u></p> <p>1.2a: No change.</p> <p>1.2b: Change the current regulation to align with the current ICRP Publication 103: Update to new values, models, and radionuclide decay data.</p>	<p>The nuclear industry supports Option 1.2b. We believe that agencies of the Federal government should be using the most updated science and terminology as it pertains to regulations. The industry understands that updated data will not become available at one time but in two separate sets (one in 2011 and one in 2014). In order to provide optimum effectiveness and efficiency, we request that any changes to the radiation protection regulations be delayed until both sets of data become available in 2014.</p> <p>We also suggest that NRC determine which values to use based on a comparison of the EPA (U.S.) and ICRP (international) data in order to make a scientifically-informed decision.</p>
<p>2.0 Occupational Dose Limits</p> <p><u>NRC Options:</u></p> <p>2.a: No change. Allow the dose limit to remain at 5 rem (50 mSv) per year.</p> <p>2.b: Change the current regulation to align with the current ICRP Publication 103: 10 rem (100 mSv) over 5 years, with a maximum of 5 rem (50 mSv) in any one year.</p> <p>2.c: Change the current regulation to align with the approach adopted by some other countries: yearly dose limit of 2 rem (20 mSv).</p>	<p>The nuclear industry supports Option 2.a. We agree with the NRC position, as stated in NRC SECY 08-0197, that there is no compelling scientific basis that justifies lowering the annual occupational dose limit from 5 rem (50 mSv) per year.</p>

Issue	Comments
<p>2.0 Doses to Special Populations</p> <p>3.1. Dose Limits for Embryo/ Fetus of a Declared Pregnant Worker</p> <p><u>NRC Options:</u></p> <p>3.a: No change. Continue with the dose limit of 0.5 rem (5 mSv) during the entire pregnancy.</p> <p>3.b: Change the current regulation to align with the current ICRP Publication 103: 100 mrem (1 mSv) after the declaration of pregnancy.</p> <p>3.c: Change the current regulation to another single value after declaration: For example, 0.05 rem (.5 mSv) after declaration, the provision of the current rule if a dose of 0.5 rem (5 mSv) has already been exceeded at the time of declaration of the pregnancy.</p>	<p>The nuclear industry supports Option 3.a. This option is supported by NRC's own stated position that the current regulatory framework already provides adequate protection of workers, the public and the environment. There is no compelling scientific basis that justifies lowering this dose limit and we suggest that the limit remain 0.5 rem (5 mSV) during the entire pregnancy.</p>

Issue	Comments
<p>3.0 Doses to Special Populations – continued</p> <p>3.2. Dose Limits for Members of the Public, Alternative Provisions for 500 mrem (5 mSv)</p> <p><u>NRC Options:</u></p> <p>3.2a: No change. Continue to allow a dose limit of 0.5 rem (5 mSv) per year, applicable only upon specific approval of a licensee request.</p> <p>3.2b: Change the current regulation to limit the applicability of the provision to situations in which sensitive populations are not receiving the exposure.</p> <p>3.2c: Clarify in guidance that the NRC will require licensees to demonstrate that sensitive populations are not included in any proposals for alternative public dose limits.</p>	<p>The nuclear industry supports Option 3.2-a. Recognizing that this provision of 10 CFR Part 20 has been rarely used and requires prior NRC approval, we suggest that alternate provisions for dose limits for members of the public remain at 0.5 rem (5 mSv) per year.</p>

Issue	Comments
<p>4.0 Incorporation of Dose Constraints</p> <p><u>NRC Options:</u></p> <p>4.a: No change. Do not incorporate the use of constraints into NRC's radiation protection framework.</p> <p>4.b: Change the current regulation to specify that licensees establish and use constraints as part of their radiation protection program and the implementation of the ALARA requirement.</p> <p>4.c: In addition to requiring the establishment and use of constraints, require that the licensee use a numeric value that does not exceed some specified value. One such value for occupational exposure could be the 2 rem (20 mSv) per year level.</p>	<p>The nuclear industry supports Option 4.a. We believe that the current ALARA principles and industry practices adopted in the U.S. sufficiently addresses the intent of the ICRP for dose constraints.</p>

Issue	Comments
<p>1.0 Proposed Revision to the Basis of 10 CFR Part 50, Appendix I Design Objectives</p> <p><u>NRC Options:</u></p> <p>1.a: Leave the basis of 10 CFR Part 50, Appendix I design objectives as is and continue to apply the requirement under existing NRC guidance and industry practices.</p> <p>1.b: Align dose definitions and quantities of 10 CFR Part 50, Appendix I criteria with the ICRP 103 recommendations, in parallel with any changes made to 10 CFR Part 20.</p> <p>1.c: Align dose definitions and quantities of 10 CFR Part 50, Appendix I design objectives with the current framework of 10 CFR Part 20 based on ICRP Publication 26.</p>	<p>The nuclear industry supports Option 1.b. We believe that agencies of the Federal government should be using the most updated science and terminology and therefore suggest that NRC align dose definitions and quantities in 10 CFR Part 50, Appendix I criteria with the ICRP 103 recommendations, in parallel with any changes made to 10 CFR Part 20.</p>

Issue	Comments
<p data-bbox="222 257 968 337">2.0 Voluntary or Required Implementation of Revised 10 CFR Part 50, Appendix I Regulations</p> <p data-bbox="222 376 401 409"><u>NRC Options:</u></p> <p data-bbox="222 449 999 548">2.a: No change. Leave the current requirements and guidance intact for all currently licensed and operating plants under Parts 50 and 52.</p> <p data-bbox="222 588 1016 730">2.b: Make the implementation of new requirements voluntary for all currently licensed and operating plants under Parts 50 and 52 using a separate set of revised 10 CFR Part 50, Appendix I regulations and guidance.</p> <p data-bbox="222 769 1010 911">2.c: Require the implementation of revised 10 CFR Part 50, Appendix I regulations and guidance for all operating plants and applicants over time with a mandated common implementation date.</p>	<p data-bbox="1056 365 1864 571">The nuclear industry supports Option 2.c. We believe that consistency in regulations reduces the possibility of confusion in implementation of regulatory requirements. Consistent methodology should be specified within the regulations. Allowing the simultaneous use of different standards could cause confusion within the industry.</p>

Issue	Comments
<p data-bbox="222 257 989 337">3.0 Approaches and Considerations in Revising 10 CFR Part 50, Appendix Regulations</p> <p data-bbox="222 376 401 409"><u>NRC Options:</u></p> <p data-bbox="222 449 1035 832">3.a: Limited Scope Revision— Besides specific revisions to the regulations, target only those elements of the guidance dealing with dose conversion factors and, if necessary, directly supporting radiological parameters, such as specific adjustments to the basis of dose conversion factors, based on ICRP Publication 103 or ICRP Publications 26 and 30. The balance of the technical guidance and default values of other parameters would remain as stated in current regulatory guides. The revision would identify changes to computer codes using new dose conversion factors based on ICRP Publication 103 or ICRP Publications 26 and 30 recommendations.</p> <p data-bbox="222 872 1035 1224">3.b: Expanded Scope Revision—In addition to the above, the basis of specific parameters used in dose calculations would be evaluated, and an assessment would identify the need to update or retain specific default values. Such parameters, for example, would include human food or animal consumption rates, bio-accumulation factors, shore-line width factors, agricultural productivity rates, usage and time factors for exposed individuals, etc. The revision would also identify changes to computer codes using new dose conversion factors based on ICRP Publication 103 or ICRP Publications 26 and 30 recommendations.</p> <p data-bbox="222 1263 1035 1402">3.c: Full Scope Revision—This approach would consider a full review of the guidance, including a complete update of models addressing liquid and gaseous treatment options and development of radiological effluent source terms, atmospheric and aquatic</p>	<p data-bbox="1056 365 1856 783">The nuclear industry supports Option 3.c. We believe that all radiation protection regulations should not just be revised but reformed. We suggest that NRC perform a full review of the guidance, including a complete update of models addressing liquid and gaseous treatment options and development of radiological effluent source terms, atmospheric and aquatic dispersion, and environmental transport using the current literature and industry standards. The review should assess all aspects of the Full Scope Revision option, including the application of newly developed dose conversion factors based on ICRP Publication 103 or ICRP Publications 26 and 30 recommendations.</p>

dispersion, and environmental transport using the current literature and industry standards. The review would assess model assumptions, parameters (as partly described above), and their default values. The revision would identify changes to computer codes, modeling assumptions and parameters, and apply new dose conversion factors based on ICRP Publication 103 or ICRP Publications 26 and 30 recommendations.

Issue	Comments
<p>4.0 Scope of Revisions to 10 CFR Part 50, Appendix I Regulations</p> <p><i>Provisions:</i> 4.1: Numerical design objectives of 10 CFR Part 50, Appendix I for liquid and gaseous effluents—The revision would retain the current numerical dose criteria, but would redefine doses as effective dose (ED) or TED for consistency with ICRP Publication 103 dosimetry concepts in a revised 10 CFR Part 20, or as TEDE with the current 10 CFR Part 20 (ICRP Publications 26 and 30) if 10 CFR Part 20 were <i>not</i> realigned with ICRP Publication 103. The update would necessitate a revision of dose calculation methods described in Regulatory Guide 1.109 and associated computer codes.</p> <p>4.2: Organ numerical design objectives of 10 CFR Part 50, Appendix I for liquid and gaseous effluents—The revision would assess whether there is still a need to report doses separately for organs since this would not be necessary if ICRP Publication 103 or ICRP Publications 26 and 30 were adopted. The assessment would consider the provisions of Sections II and III of Appendix I to 10 CFR Part 50 on doses associated with radioiodine in situations where releases might be dominated by the presence of noble gases and radioiodine, resulting in potentially significant skin and thyroid doses. The assessment would also consider the need to revise the scope of thyroid dose contributors to include radionuclides present as vapor (tritium) and gases (<i>e.g.</i>, ¹⁴C in inorganic and organic forms) in addition to radioiodine and particulates.</p> <p>4.3: Annual gamma and beta air dose for gaseous effluents—The gamma and beta dose criteria characterize an absorbed dose rate in air, expressed in mrad/year, while the balance of the design</p>	<p><i>NRC Question:</i> Q4-1: Given the above summary descriptions of the provisions of 10 CFR Part 50, Appendix I that might be considered for possible revision, should the NRC evaluate all provisions described above, or focus instead only on those necessary to align 10 CFR Part 50, Appendix I regulations with ICRP Publication 103 if 10 CFR Part 20 were revised, or with ICRP Publication 26 and 30 if 10 CFR Part 20 were <i>not</i> revised?</p> <p><i>Nuclear Industry Response:</i> The nuclear industry suggests that NRC evaluate provisions 4.1 through 4.5 as noted in the Federal Register Notice, not just those necessary to align with ICRP Publication 103, or ICRP Publications 26 and 30. This approach is consistent with the industry's desire to reform regulations.</p>

objectives are expressed in mrem/year for the total body and organs. The revision would assess the need to still report gamma and beta absorbed air dose results based on a review of historical gaseous effluent releases and doses from operating PWR and BWR plants. The revision might consider dropping that requirement altogether, or alternatively, converting the design objective to an ED or TED dose for a receptor assumed to be located at the site boundary.

4.4: Light-Water-Cooled Reactor Provisions of Appendix I to 10 CFR Part 50—The revision would consider whether there is a need to expand current regulatory provisions for design certifications and new reactor applications involving other types of reactor technologies. Such new technologies might include new types of reactor fuels and modular reactor technologies, *e.g.*, high temperature gas-cooled reactors, molten-salt or lead-cooled reactors, and breeder reactors.

4.5: Compliance with Requirements for “Licensed Operation” under 10 CFR Part 20— The revision would consider the need to expand provisions describing compliance requirements for “licensed operation” for sites with two or more licensed entities contributing to and radiation exposures to a single offsite dose receptor under Parts 20.1301(a)(1) and 20.1302(a) and (b). The expanded provisions would identify acceptable methods in the regulation or guidance for apportioning radioactive effluent releases and doses between two or more licensed entities. The discussion would also consider compliance with EPA regulations of 40 CFR Part 190 as implemented under 10 CFR Part 20.1301(e).