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NUCLEAR ENERGY INSTITUTE

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November 3, 2015

Ms. Cindy K. Bladey
Chief, Rules, Announcement, and Directives Branch
Division of Administrative Services
Office of Administration
Mail Stop: OWFN-12-H08
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Comments on Draft NUREG-1530, Revision 1, "Reassessment of NRC's Dollar Per Person-Rem Conversion Factor Policy," *Federal Register* Notice (80FR53585); Docket ID NRC-2015-0063

Project Code: 689

Dear Ms. Bladey:

The Nuclear Energy Institute (NEI)¹, on behalf of the industry, provides the attached comments for U.S. Nuclear Regulatory Commission (NRC) consideration. In a September 4, 2015, *Federal Register* Notice (80FR53585), the NRC requested public comments on draft NUREG-1530, Revision 1, "Reassessment of NRC's Dollar Per Person-Rem Conversion Factor Policy." Draft Revision 1 proposes a new value for the conversion factor of \$5,100 per person-rem and recommends the staff reevaluate the conversion factor every five years and update guidance and regulations as needed.

Updating guidance and regulations after every five-year reevaluation of the dollar per person-rem conversion factor could be enormously burdensome to both the NRC and to its regulated entities. Draft Revision 1 does not provide evidence to support the need for a five-year reevaluation frequency nor any indication the staff has considered the burdens that would impose.

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

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Ms. Cindy K. Bladey
November 3, 2015
Page 2

The only hint of a rationale is provided in the discussion of rounding the new dollar per person-rem value to two significant figures (instead of one significant figure at present). The document says such precision is necessary "...to allow for a more frequent adjustment..." The irony is that the overall calculation of costs and benefits in which the conversion factor is applied is usually less precise. Hence, the precision that draft Revision 1 says is necessary to allow for frequent adjustments (adding burden) makes no difference in the final result, and, in our view, offers no benefit to public health and safety.

In the discussion of updating the dollar per person-rem conversion factor, draft NUREG-1530, Revision 1, does not indicate that future updates of the conversion factor would necessarily include public involvement. We urge the NRC to ensure that any such future updates provide opportunity for meaningful public involvement. In that spirit, we appreciate the opportunity the NRC has provided for review and comment on the present draft Revision 1 of NUREG-1530.

If you have any questions on the attached detailed comments, please contact me.

Sincerely,



James E. Slider

Attachment

c: Mr. Timothy J. McGinty, NRR/DSS, NRC
Ms. Alysia G. Bone, NRR/DPR/PRMB/PRAT, NRC
Mr. Richard F. (Fred) Schofer, NRR/DPR/PRMB/PRAT, NRC

Industry Comments on Draft NUREG-1530, Rev. 1

Comment Number/ Page/ Section	Comment
1. Page 22, lines 23 and 28 Section 5, Nominal Risk Coefficient	<p>RE: [line 23] <i>“Thus, by not accounting for cancer morbidity, the NRC may underestimate the benefits of a proposed action (e.g., medical costs averted, value of lost production, etc.) by as much as another 20 percent.”</i> [line 28] <i>“The NRC staff prefers to achieve greater alignment with ICRP Publication 103 and adopt the nominal risk coefficient of 5.7×10^{-4} per rem with the understanding this coefficient may underestimate the U.S. population risk by as much as 30 percent.”</i> [Underlining added]</p> <p>Underestimation: The significance of the potential overestimation of benefits or underestimation of risk and the net effect of these potential uncertainties is not explained. It should be.</p>
2. Page 22, lines 32-33 Section 5, Nominal Risk Coefficient	<p>RE: <i>“However, the final dollar per person-rem calculated using either the EPA or ICRP is not practically different.”</i></p> <p>EPA vs. ICRP: The statement that there is not a practical difference between the use of the ICRP risk coefficient and the EPA value is not supported by evidence. In the interest of full disclosure, the staff should consider providing some indication of the sensitivity of the final figure to this difference. For example, if the EPA values were used, the best estimate value would be more similar to the high estimate, and the low and high estimates similarly increased.</p>
3. Page 23, lines 2-3 Section 5, Nominal Risk Coefficient	<p>RE: <i>“For simplicity, the NRC staff does not recommend low and high nominal risk coefficient factors for use in sensitivity analyses.”</i> [Emphasis added]</p> <p>Simplicity: Simplicity alone is insufficient justification for not including the range of risk coefficient factors in sensitivity analyses. If the NRC has a stronger justification, it should be provided. Otherwise, the NRC should reexamine the proposed high and low values of the dollar per person-rem conversion factor to ensure they adequately bound uncertainties in the nominal risk coefficient.</p>

Industry Comments on Draft NUREG-1530, Rev. 1

Comment Number/ Page/ Section	Comment
4. Page 25, line 28 Section 6, Dollar Per Person-Rem Conversion Factor	<p>RE: <i>"The NRC acknowledges that there may be unique circumstances where other dollar conversion factors may warrant consideration."</i></p> <p>Unique Circumstances: This sentence could be interpreted to mean that NRC will choose whatever value of dollar per person-rem it wishes in any particular case. The paragraph is not clear on how the analyst should select other values based on "unique circumstances". The document should provide additional guidance to ensure the consideration of unique circumstances does not become an excuse for using arbitrary values. If the NRC uses a different value of the dollar per person-rem conversion factor in a specific application, the staff should clearly document the basis for the use of that different value.</p>
5. Page 25, lines 28-38 Section 6, Dollar Per Person-Rem Conversion Factor	<p>RE: <i>"The NRC acknowledges that there may be unique circumstances where other dollar conversion factors may warrant consideration. For example, doses to a population whose age distribution is not representative of the general population could be subject to a different risk coefficient because health risks are directly related to the age distribution of the affected population. Further, recognizing the uncertainties inherent in establishing a representative conversion factor, alternative values to capture the uncertainties may be warranted. Thus, it would be reasonable to expect an analyst to include alternative valuations in regulatory analyses in order to show the decision maker the sensitivities of the proposed action to relevant considerations. However, the base case computations in a regulatory analysis will use the recommended best estimate dollar conversion factor of \$5,100 per person-rem, and apply the low and high estimates in illustrating sensitivity and in bounding the range and direction of the impacts."</i></p> <p>Alternates: By suggesting that alternative risk coefficients might be important to consider, this section again begs the question about including alternate risk coefficients in the sensitivity analysis.</p>
6. Page 26, line 12 Section 6.1, Number of Significant Figures	<p>RE: <i>"In the future to allow for a more frequent adjustment for maintaining alignment with economic changes, the NRC staff should round this number to two significant figures."</i></p> <p>Significant Figures: In our view, "maintaining alignment with economic changes" is weak justification for rounding to two significant figures. If the "economic changes" contemplated are Inflation and Real Income Growth (two factors presented</p>

Industry Comments on Draft NUREG-1530, Rev. 1

Comment Number/ Page/ Section	Comment
	<p>in the NRC's formula), they have been low for most of the past decade. With present socio-economic trends (e.g., globalization, recession or paltry real economic growth, historically low workforce participation rates, historic levels of governmental debt and deficits), they appear likely to remain low for the next decade as well. Thus "maintaining alignment" is unlikely to be a significant concern.</p> <p>In addition, because of the imprecision of the overall process in which the dollar per person-rem conversion factor is used, two-digit precision in the dollar per person-rem conversion factor may be nothing but window dressing. For example, it is very difficult (i.e., effortful) to estimate costs of compliance with a proposed requirement to two significant figures. Estimates to an order of magnitude and single digit precision are typical early in the formulation of proposed new requirements. To achieve greater precision, the cost estimator must have a proposed regulatory requirement that is specific enough to enable: (a) an exact compliance solution to be defined, (b) a precise scope of work to be determined to provide that compliance solution, and (c) the timing of the work schedule to be gauged against plant outage schedules and work scopes. Thus, in a realistic assessment of the costs of compliance against the potential person-rem saved, the precision of the final answer would be controlled by the lower precision of the cost estimate. The precision of the final answer would not be improved by maintaining two-digit precision in the dose conversion factor. In other words, the supposed benefit of maintaining two-digit precision in the conversion factor is illusory when considered in context with its use.</p> <p>On page 29, at lines 30-33, the NRC itself appears to acknowledge the irrelevance of two-digit precision in the cost-benefit calculation, in the following sentence: "...in recognition of the uncertainties inherent in [the dollar per person-rem value], NRC staff and decisionmakers [sic] would typically rely more heavily on other considerations when the break-even cost-beneficial determination was close (e.g., <u>within a factor of five</u>)." [Emphasis added]</p> <p>We recommend single-digit precision in the conversion factor as sufficient and practical.</p>

Industry Comments on Draft NUREG-1530, Rev. 1

Comment Number/ Page/ Section	Comment
<p>7. Page 28, lines 5-7 Section 7.2, Updating Nominal Risk Coefficient</p>	<p>RE: <i>"The NRC staff should periodically update the nominal risk coefficient used in the dollar per person-rem conversion factor when the ICRP provides new recommendations for its conversion factor."</i></p> <p>Congruence with ICRP: The text sounds as if the staff's intent is to require an update be timely made following receipt of a new ICRP recommendation for the value of nominal risk coefficient.</p> <p>Certainly, the NRC staff should stay informed of changes in ICRP recommendations. It may also make sense for the NRC to consider evaluating the effect of a new ICRP recommendation on the NRC's dollar per person-rem calculation. However, it does not follow that the NRC necessarily <u>must adopt</u> the latest ICRP recommendation as its own within a specific timeframe, or revise the NRC's dollar per person-rem value every time the ICRP value changes. The critical question is what effect the ICRP change has on public health and safety. Slavish congruence with international recommendations that yields little or no benefit to public health and safety is no virtue, particularly if achieving it would require the allocation of NRC and industry resources that could be used to greater benefit in other areas.</p> <p>Public Involvement: The text is unclear whether the NRC will seek public involvement in future updates to the nominal risk coefficient used in the dollar per per-rem conversion factor.</p> <p>We strongly urge the NRC to solicit public input if and when future updates are considered. The draft NUREG-1530, Rev. 1 and whatever NRC administrative procedures are used to implement this requirement should be revised to reflect this imperative.</p>
<p>8. Page 28, lines 14-16 Section 7.3, Re-baselining Dollar per Person-Rem Conversion Factor</p>	<p>RE: <i>"Therefore, the NRC staff should reevaluate its baseline values for VSL (to account for <u>structural changes in the economy</u>) and nominal risk coefficient approximately every five years, and update guidance and regulations as needed."</i> [Emphasis added]</p> <p>Structural Changes: It is not clear what "structural changes in the economy" the staff thinks might affect VSL and, more specifically, what structural changes are relevant to nuclear safety regulations. If there are specific economic factors in the basis for VSL that the NRC believes it needs to reevaluate every five years, those factors and the criteria on which the NRC will reevaluate them ought to be stated clearly in NUREG-1530. At the same time, if those factors are so dynamic and have such a profound effect on VSL, the NRC should consider</p>

Industry Comments on Draft NUREG-1530, Rev. 1

Comment Number/ Page/ Section	Comment
	<p>choosing a different value for VSL or determining a different basis for updating its chosen value of VSL that is less influenced by factors so dynamic that they are likely to change significantly within the proposed reevaluation period.</p>
<p>9. Page 28, lines 14-16 Section 7.3, Re-baselining Dollar per Person-Rem Conversion Factor</p>	<p>RE: <i>"Therefore, the NRC staff should <u>reevaluate its baseline values for VSL (to account for structural changes in the economy) and nominal risk coefficient approximately every five years, and update guidance and regulations as needed.</u>"</i> [Emphasis added]</p> <p>Five-Year Reevaluation: The document offers no evidence to support the recommendation to reevaluate the baseline value for VSL and the nominal risk coefficient every five years. For example, the document does not mention how many of the NRC's past regulatory analyses would reach different conclusions if the dollar per person-rem conversion factor changed by as much as NRC expects the factor to change in its proposed five-year updates. The document is silent on how such a requirement would be captured in the NRC's administrative controls. The document is silent on the impacts the reevaluation would impose on NRC and industry resources, and on the potential benefits to public health and safety the NRC expects to accrue from reevaluating the conversion factor on the proposed five-year interval.</p>
<p>10. Page 28, lines 14-16 Section 7.3, Re-baselining Dollar per Person-Rem Conversion Factor</p>	<p>RE: <i>"Therefore, the NRC staff should reevaluate its baseline values for VSL (to account for structural changes in the economy) and nominal risk coefficient approximately every five years, and <u>update guidance and regulations as needed.</u>"</i> [Emphasis added.]</p> <p>Updating Regulations: Updating guidance and regulations after every five-year reevaluation of the conversion factor could be enormously burdensome to NRC and the entities subject to NRC regulations. In addition, such updates of guidance and regulations could take years due to public notice and comment requirements. Given the resources, stakes, and timescales involved, it would be imprudent to undertake an update of guidance and regulations on the proposed five-year frequency of reevaluating the dollar per person-rem conversion factor. With the nuclear industry's long planning horizons, cementing into place an additional factor to drive change in guidance and regulations as often as every five years would add even greater uncertainty to the regulatory environment. We recommend that any reevaluation be triggered by the magnitude of the change in the conversion factor, rather than the passage of time or the publication of a</p>

Industry Comments on Draft NUREG-1530, Rev. 1

Comment Number/ Page/ Section	Comment
	<p>new ICRP recommendation. As the staff itself mentions on page 29, lines 13-15, current experience indicates "...increases of <u>at least an order of magnitude</u> would be necessary to justify any reassessment of [past] decisions." [Emphasis added]</p>
<p>11. Page 29, lines 19-22 Section 8, Implications of Revised Conversion Factor Policy</p>	<p>RE: <i>"Second, for all other regulatory applications where \$2,000 per person-rem has been used by the NRC, the NRC is not proposing that previous decisions be reviewed or updated based on this revised conversion factor policy."</i></p> <p>Actions in Progress: It is unclear how NUREG-1530, Rev. 1, would apply to licensing actions already in progress which are based on the NUREG-1530, Revision 0. If Revision 1 is published prior to a final licensing decision is made (e.g., publishing a Final Supplemental Environmental Impact Statement being issued in a license renewal scenario), the analysis made using terms of NUREG-1530, Rev. 0, should not be redone. The cited statement in NUREG-1530, Revision 1, should be modified to state clearly that existing licensing actions will not be reevaluated.</p>
<p>12. Page 31, lines 16-24 Section 9, Process to Incorporate the Revised Dollar Per Person-Rem Value as NRC Policy</p>	<p>RE: <i>"With respect to implementation, the NRC staff, licensees, and applicants <u>may begin using</u> the revised conversion factor in all regulatory applications discussed in Section 3 of this report, except for regulatory applications discussed in Section 3.1, "Routine Liquid and Gaseous Effluent Releases from Nuclear Power Plants." [Emphasis added]</i></p> <p>Implementation: The term "may begin using" is unclear. The question is when the new value becomes <u>mandatory</u>. The NRC should choose a specific date for implementation of NUREG-1530, Rev. 1. That date should be far enough in the future that: (1) the NRC can complete its update of the full suite of guidance documents for regulatory analysis; (2) any potential slippage in completing the guidance documents would not conflict with the NUREG-1530, Rev. 1, implementation date; and (3) implementation would be unlikely to have a significant effect on licensee plans already in progress. The NRC should communicate the implementation date through an appropriate official channel, e.g., an Information Notice supported by a Commission vote on a SECY. On the above basis, we would recommend January 1, 2020, as allowing time for slippage in completing the guidance update plus some lag to allow industry to complete applications that may be planned for submittal in the next few years.</p>

Industry Comments on Draft NUREG-1530, Rev. 1

Comment Number/ Page/ Section	Comment
<p>13. Page B-1, line 27 Appendix B, "Adjusting the Cancer Risk Coefficient for High-Rate Exposure Scenarios – The Dose and Dose-Rate Effectiveness Factor"</p>	<p>RE: <i>"Organizations such as the National Academies' Biological Effects of Ionizing Radiation Committee VII and the U.S. Environmental Protection Agency (EPA) also developed risk coefficients that use a different judged DDREF of 1.5 in their derivations (NAS, 2006 and EPA, 2011b). Thus any high dose-dose rate corrections to a coefficient should be based on the DDREF developed by that particular organization."</i></p> <p>Uncertainty in DDREF: It would be appropriate to insert before the last sentence an acknowledgment of the continued uncertainty about the shape of the dose response curve and the value of DDREF. We suggest something like the following: "It should be noted that considerable debate continues regarding the shape of the dose-risk response curve for low doses, and thus the value of a DDREF to be applied."</p>
<p>14. Page B-1 Appendix B, "Adjusting the Cancer Risk Coefficient for High-Rate Exposure Scenarios – The Dose and Dose-Rate Effectiveness Factor"</p>	<p>General Concern: Appendix B does not mention guidance contained in ICRP Publication 103 about aggregation and uncertainty in estimating population radiation exposures. Paragraph 221 of ICRP 103 cautions:</p> <p><i>"When exposures occur over large populations, large geographical areas, or long time periods, the total collective effective dose is not a useful tool for making decisions because it may aggregate information inappropriately and could be misleading for selecting protective actions. To overcome the limitations associated with collective effective dose, each relevant exposure situation must be carefully analysed to identify the individual characteristics and exposure parameters that best describe the exposure distributions among the concerned population for the particular circumstance. Such an analysis – by asking when, where and by whom exposures are received – results in the identification of various population groups with homogeneous characteristics for which collective effective doses can be calculated within the optimization process...In practical optimization assessments, collective doses may often be truncated..."</i></p> <p>This means that the determination of offsite radiation exposures in a regulatory analysis should reflect the identification of appropriate population groups for which collective effective doses can be calculated and, depending on uncertainty and other characteristics, truncated. This does not appear to be addressed in the revision of NUREG-1530.</p>