



NUCLEAR ENERGY INSTITUTE

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September 28, 1994

Mr. Dennis M. Crutchfield  
Associate Director  
Advanced Reactors and License Renewal  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Dear Mr. Crutchfield:

This letter provides preliminary responses to several questions and concerns provided in your July 27, 1994, letter on "Application of New Source Term to Operating Reactors." A meeting between NRC staff is scheduled for Thursday, October 6, 1994, to discuss issues related to implementation of a revised source term. We offer the enclosed response as a basis for focused discussion.

Should you have any questions, please contact me at (202) 739-8080 or Kurt Cozens of the NEI staff at (202) 739-8085.

Sincerely,

Alex Marion

KOC/cma  
Enclosure

c: Jim Wilson, NRC/NRR

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**Preliminary Industry Responses to Questions and Concerns  
on  
Application of New Source Term to Operating Reactors**

**QUESTION 1:**

What is the most effective mechanism for pursuing regulatory action? Should industry propose rulemaking consistent with the process outlined in SECY-94-003, -90, and -141?

**QUESTION 1 RESPONSE:**

We believe that the most effective way to develop a coherent and technically defensible approach that licensees can voluntarily implement is for industry to develop a generic guidance document that is endorsed by a regulatory guide. The generic guidance document will provide the necessary technical and programmatic framework for effective implementation of a revised source term at operating power plants in accordance with existing regulatory change processes. This approach is consistent with the processes used by the NRC staff and industry to address the Maintenance, Appendix J, and Graded Quality Assurance issues. In addition, we have concluded that a rulemaking to implement the revised source term, initiated by either the NRC staff or petitioned by industry, is not necessary for operating power plants.

Based on a review of current regulatory requirements, we concluded that the current source term was not imposed on any operating plant by regulation. TID-14844 is referenced in 10 CFR Part 100 as a note and is only provided "For further guidance ...". While the TID is explicitly referenced in 10 CFR 50.34(f), it does not apply to current operating power plants. Paragraph 50.34(f) applies only to the listed applicants with a pending construction or manufacturing permit as of February 16, 1982, none of the listed plants obtained an operating license. No additional explicit references to the TID source term was found in the Code of Federal Regulations. Hence, there is no rule that requires revision to permit the use of the revised source term at operating power plants.

Further review revealed that the TID source term is a basis document for Regulatory Guides (RG) 1.3, 1.4, and 1.89. The use of these RGs and other applications of the TID source term is extensive in operating plants. While the regulatory process to implement the source term varied from plant to plant, the most common means of implementation is through licensing commitments contained in Final Safety Analysis Reports (FSARs) and/or in response to NRC Safety Evaluation Reports (SERs). In some

instances, the TID source term may have been cited in Technical Specifications, License Conditions, or in Orders. Each of these implementation processes has an existing regulatory change process: SERs require evaluation per the 10 CFR 50.59 process; License Conditions and Technical Specification changes will require revision per 10 CFR 50.90; Orders require a revision or cancellation.

The development of a generic guidance document, that is endorsed by a regulatory guide, will provide the foundation for changes to commitments/licensing conditions in accordance with existing regulatory requirements. This approach will reduce the NRC staff review burden, while affording advance process and application concurrence. If industry's recommendation for a generic guidance document endorsed by a regulatory guide is acceptable, it may be beneficial to demonstrating the process with pilot applications.

**QUESTION 2:**

What is the most effective way to address technical issues not covered in NUREG-1465, such as fission product removal mechanisms?

**QUESTION 2 RESPONSE:**

In some applications, NUREG-1465 revised source term may not provide the complete technical bases to implement operational changes. In these applications, consideration of other related technologies, such as fission product removal mechanisms may be required. The proposed guidance document will identify the additional technical bases for implementation of a revised source term of typical applications. For example, the fission product removal mechanisms identified in the Advance Light Water Reactor (ALWR) program and the NUREG reports developed by Sandia National Laboratory may be a good starting point for these evaluations. The generic guidance document will identify the necessary technical issues and assumptions that must be addressed by the licensee.

**QUESTION 3:**

Does implementation require an integrated approach, or can a selective use of portions of NUREG-1465, such as timing be adequately justified? In a selective approach, what aspects of the source term should be emphasized?

**QUESTION 3 RESPONSE:**

We believe that a judicious implementation of a revised source term in a selective manner is technically justifiable and appropriate. Furthermore, we believe that the implementation of the revised source term at operating power plants as an integrated (all or none) approach is unnecessary and inappropriately burdensome.

The generic guidance document will evaluate typical applications and provide technical bases that should be addressed when implementing the revised source term. These evaluations will include consideration of timing, release fractions, fission products, fission product removal mechanisms, etc. The guidance document will also address known dependencies between applications.

**CONCERN I:**

Given the potential burden that the application of new source term may impose on individual licensees, it is reasonable to expect that the industry would want to selectively, implement some, but not all, aspects of the new source term. However, the implementation should lead to a coherent and technically defensible approach. Moreover, the implementation should be coherent and reasonably consistent from plant to plant. Otherwise, implementation will place an unacceptable burden on the NRC review process and inspection program.

**CONCERN I RESPONSE:**

As stated in the Question Response 3, we believe that a selective implementation of the revised source term is appropriate and technically justifiable. We recognize that the potential review burden on the NRC staff could be considerable if industry uses a large variety of bases to justify using the revised source term. To achieve a stable predictable regulatory process, we propose the development of a generic guidance document that provides a framework for reasonable and consistent application.

We do not believe that a single rule change to implement the revised source term is feasible. We believe the implementation of the revised source term can be coherently and consistently implemented with utilization of the generic guidance document. The generic guidance document recommendation effectively utilizes the existing regulatory change processes.

## **CONCERN 2:**

The effect of the new source term on existing safety margins should be evaluated. Because the new source term involves best-estimate methodologies, explicit margins of safety and methods to quantify these margins should be included in any application of the new source term to the design basis of the plant.

## **CONCERN 2 RESPONSE:**

There are two issues that should be examined in response to this: first, what is the safety margin that needs to be evaluated; and second, why does the NRC staff believe that the revised source term is a best-estimate.

### Safety Margins:

It is important to delineate the type of margin being considered. The margin of safety is understood to be the margin above the regulatory limit or acceptance limit reviewed and approved by the NRC staff as part of the licensing basis (i.e., the margin between the assumed or design basis failure point and the acceptance limits as defined in the basis for the Technical Specifications). A different margin associated with the accident analyses that envelopes the uncertainties in design, construction, and operation exists below the regulatory limit. NSAC-125, "Guidelines for 10 CFR 50.59 Safety Evaluations," provides an in-depth discussion of the safety margin term that is consistent with the previous definition. This definition is applicable to Technical Specifications, Licensing Conditions, and Order revisions.

A proposed change that encroaches on the margin beyond the regulatory limit may require prior NRC staff approval. If the Technical Specification Bases do not explicitly address a margin of safety, a regulatory limit may not be readily apparent. In these cases, the licensing basis documentation provides the physical parameters that have been reviewed and approved by the NRC staff as part of the licensing basis. This limit is usually the value of the parameter proposed in the FSAR and modified in the SER and is commonly referred to as the acceptance limit. The NRC staff has recognized that, in some cases, it may be sufficient to only determine the direction of the margin change when evaluating changes, as opposed to a specific value.

Margins that are associated with accident analyses, account for uncertainties, and may be changed without prior NRC staff approval if the specific acceptance condition, criteria, and limits are not adversely affected or invalidated.

As knowledge about particular events is increased and computer modeling and codes become more sophisticated, these uncertainties are reduced. A reevaluation of particular situations may result in a shift of the calculation point, but the consequences of the accident are not affected by this recalculation. Any changes to the calculated values identified in the licensing basis that remain below the acceptance limit is not considered a change to the margin of safety, but only a change to the uncertainty margin or excess margin.

Based on our understanding that regulatory limits cannot be changed without prior NRC staff approval, further discussion is necessary relative to the NRC staff's concern about "explicit margin of safety."

#### Best-Estimate Methodology:

We question the basis for the NRC staff's description of the revised source term as a best-estimate methodology. During the September 9, 1994, NRC staff presentation on NUREG-1465 to the ACRS, it was stated that the revised source term tended to be bounding and was not a mean estimate.

We would like to discuss these concerns at our October 6th meeting to obtain better understanding of staff's concerns. These issues should be clarified and resolved prior to developing the generic guidance document.

#### **CONCERN 3:**

The implementation should not be limited to applications which provide only relief to the industry. The industry program should also include a systematic assessment of those areas in which the new source term would indicate the opportunity for design or operational changes to enhance plant safety. An example of this would be the potential impact of the new chemical form of radioiodine on the containment sump pH controls.

#### **CONCERN 3 RESPONSE:**

In the generic guidance document, a systematic cross check between listed applications of the revised source term will be performed to determine if the applications are mutually exclusive. If the independence of potential applications cannot be demonstrated, linked applications must be implemented as a cohesive unit. As an example, the generic guidance document would state if the independent action of controlling the new chemical form of radioiodine with containment sump pH controls is necessary to permit another specific application.

## PROPOSED AGENDA

MEETING BETWEEN NRC STAFF AND NEI  
ON  
IMPLEMENTATION OF REVISED SOURCE TERM AT OPERATING POWER PLANTS  
AT  
ONE WHITE FLINT

October 6, 1994  
8:00 am to noon

<u>Item</u>	<u>Topic</u>	<u>Responsible Party</u>
1.	Introductions	All
2.	Opening Remarks	Jim Wilson, NRC/NRR Alex Marion, NEI
3.	Overview of NRC July 27, 1994 letter to NEI	Jim Wilson, NRC/NRR
4.	Overview of NEI Preliminary responses to NRC letter	Kurt Cozens, NEI
5.	Discussion of industry's process recommendation: <ul style="list-style-type: none"><li>• Current Regulatory requirements</li><li>• Generic Guidance Document (GGD) form and content</li><li>• How GGD approach satisfies regulatory requirements, plus NRC questions and concerns</li><li>• GGD endorsement methodology</li></ul>	NRC staff NEI
6.	Additional questions posed by industry: <ul style="list-style-type: none"><li>• Will the proposed revisions to 10 CFR Part 50 and 100 direct licensees who are implementing the revised source term to use the new dose criteria?</li><li>• What priority and resources will the NRC staff place on the revised source term effort?</li><li>• What is the status of the remaining fission product removal research at Sandia National Laboratory?</li><li>• What is the purpose of the proposed NRC public workshop?</li></ul>	NRC staff
7.	NRC staff and NEI caucus	NRC staff NEI
8.	Concluding statements and guidance	NRC staff NEI
9.	Adjournment	