

**NRC Request for Additional Information: TOPICAL REPORT 09-10, REVISION 1,
"GUIDELINES FOR EFFECTIVE PREVENTION AND MANAGEMENT
OF SYSTEM GAS ACCUMULATION"**

NRC RAI, Question 1

The first question in the NRC request for additional information is quoted below. Bold font has been added to emphasize the main question that the industry addresses in its response.

"The objective of the TR process is, in part, to add value by improving the efficiency of other licensing processes, for example, the process for reviewing license amendment requests (LARs) from commercial operating reactor licensees. The purpose of the U.S. Nuclear Regulatory Commission (NRC) TR program is to minimize industry and NRC time and effort by providing for a streamlined review and approval of a safety-related subject with subsequent referencing in licensing actions, rather than repeated reviews of the same subject.

A TR is a stand-alone report containing technical information about a nuclear power plant safety topic, which meets the criteria of a TR. A TR improves the efficiency of the licensing process by allowing the NRC staff to review a proposed methodology, design, operational requirements, or other safety-related subjects that will be used by multiple licensees, following approval, by referencing the approved TR. The TR provides the technical basis for a licensing action.

Request an explanation as to how TR NEI 09-10, Revision 1, will be used in licensing actions or improve efficiencies for the NRC and licensees."

NEI RESPONSE to RAI 1

TR NEI 09-10, revision 1 should improve the efficiency of a number of licensing activities including:

- Closure of GL 2008-001 – In their responses to GL 2008-001 a number of licensees committed to implement a gas management program. Needless to say, without guidance on what a gas management program should look like, the programs that may be adopted by licensees could vary considerably. In this case, the NRC would have to evaluate each on its merits. NEI 09-10 establishes expectations for a gas management program that, if endorsed by the NRC and used in lieu of a regulatory guide, could establish consistency in this matter.
- 10CFR50.59 evaluations for design modifications – The process for evaluating changes to facilities or procedures to determine if prior NRC review is required (10CFR50.59) includes a number of questions that could be affected by gas accumulation in fluid systems, for example:
 - (ii) "Result in a more than minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the Final Safety Analysis Report."
 - (vi) "Create the possibility for a malfunction of a SSC important to safety with a different result than any previously evaluated in the Final Safety Analysis Report."

A positive answer to these questions would require a license amendment request (LAR) to be submitted and reviewed. Changing a system or procedure in a manner that follows the

guidance in an NRC endorsed version of NEI 09-10 should preclude the occurrence of gas accumulation and thereby avoid a positive answer to either of the above questions, the associated LAR, and the licensee and NRC effort required to process it.

- The NRC has stated that if NEI 09-10 is not endorsed, the Staff will prepare a regulatory guide on the subject. The preparation of a regulatory guide and the process of reviewing it and resolving public comments on its content requires a significant amount of time and licensee and NRC resources. A regulatory guide will not be necessary if NEI 09-10 is endorsed as one acceptable means of preventing gas accumulation in fluid systems.
 - Alternately, if the NRC does not endorse NEI 09-10 and writes a regulatory guide on the subject, and the industry proceeds with the publication of NEI 09-10, the result will be the existence of two standards on the same subject. This is an undesirable situation because of the confusion and additional interpretation effort caused by multiple standards.
- NEI 09-10 contains guidance on pump suction void acceptance criteria and the simplified equation that provide a means for licensees to assess the operability of systems with gas voids. Endorsement of NEI 09-10 will provide a consistent approach to these subjects and avoid misunderstanding between licensees and NRC inspectors when the guidance is applied to operability evaluations.

The generic technical specification change model (TSTF-523) that is being developed to address the gas management issue will not reference NEI 09-10. Instead the TSTF will be a stand-alone document with any information needed to explain the technical specification requirements captured in the Technical Specification Bases, consistent with 10 CFR 50.36(a). To our knowledge no licensee presently intends to reference NEI 09-10 in a license amendment request and the industry has no commitment from licensees to use NEI 09-10 in this manner in the future. Note that licensees may choose to reference NEI 09-10 in license amendment requests for their own purposes.

In summary, endorsement of NEI 09-10 will provide multiple opportunities for efficiency in the licensing process and also avoid wasting the effort expended to-date and that which would be required in the future to produce a new standard.

NRC RAI Question 2

The second question in the NRC request for additional information is quoted immediately below. Bold font has been added to emphasize the main question that the industry addresses in its response.

“It is stated in Section 2.0 of the TR, within paragraph 4, “The approach identified in this document is intended to satisfy 10 CFR [Title 10 of the *Code of Federal Regulations* Part] 50 Appendix B Quality Assurance requirements. Criterion III requires measures to ensure that applicable regulatory requirements and the design basis, as defined in 10 CFR 50.2, “Definitions,” and as specified in the license, are correctly translated into controlled specifications, drawings, procedures, and instructions. Criterion V requires important activities to be prescribed by documented instructions,

procedures, or drawings, which must include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Criterion XI requires a test program to ensure that the subject systems will perform satisfactorily in service. Test results shall be documented and evaluated to ensure that test requirements have been satisfied.”

However, it is not apparent to the NRC staff specifically how Sections 3 through 14 apply to NRC regulations. Similar to an NRC Regulatory Guide, a TR should provide guidance to licensees on a way to meet regulatory requirements, therefore, **the NRC staff requests more detail as to how the TR satisfies regulatory compliance.”**

Response to RAI 2

If endorsed by the NRC, NEI 09-10 will provide an acceptable method for managing fluid system gas accumulation and system operation so that applicable systems are operated in a manner consistent their design and licensing basis. Therefore, the regulations that help define the licensing basis for fluid systems are those pertinent to this document. These regulations include the Quality Assurance requirements listed in section 2.0 of NEI 09-10 and the General Design Criteria.

The General Design Criteria documented in Appendix A to 10CFR50 “...establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety...” [10CFR50 App. A, Introduction]. As their name implies, these are general requirements. The General Design Criteria in Section IV (Fluid Systems) that are specifically applicable to the guidance in NEI 09-10 are:

- GDC 34: Residual Heat Removal
- GDC 35: Emergency Core Cooling
- GDC 37: Testing of Emergency Core Cooling System

During a reactor plant’s licensing process, the NRC Staff determines if a specific design meets the General Design Criteria. The documentation developed during this process becomes the design and licensing basis for the plant. It is then up to the licensee to ensure that the plant continues to be operated and modified, if necessary, in accordance with its licensing and design basis. Accurate understanding of what is required to operate and maintain safety systems in a manner that preserves the licensing basis is essential. NEI 09-10 provides guidance that facilitates this understanding in the area of fluid system gas accumulation.

Sections 3 through 14 of NEI 09-10 provide guidance on principles and practices that will effectively prevent, identify, manage and monitor accumulation of gas that would otherwise challenge the capability of a system to satisfy its design functional requirements specified in GDC 34, 35, and 37 and Quality Assurance Criteria III, V, and XI. NEI 09-10 will be changed to make these references clear when it is revised to address all the comments received from the NRC.

In summary, the approach in NEI 09-10 is intended to ensure that fluid systems susceptible to gas accumulation are operated and maintained in a manner that meets the intent of:

- GDC 34, 35, and 37,
- Quality Assurance Criteria III, V, and XI, and
- The applicable system design and licensing basis

so that these systems and components remain ready to perform their intended design basis function when required.