

Development of TSTF-523, "Generic Letter 2008-01, Managing Gas Accumulation"

Background

- Generic Letter 2008-01, states, "the NRC staff plans to use this information during activities that are being planned as a follow up to this GL and for guidance in the Technical Specifications Task Force program to develop improved TSs."
- The TSTF formed advisory teams from each Owners Group to determine appropriate TS changes regarding gas management in the subject systems.

Background

- TSTF and NRC met with the NRC in 2008 and 2009 to discuss the incorporation of the concerns in GL 2008-01 in the Technical Specifications.
- The NRC feedback concerned aspects of operability, enforceability, flexibility, and what belongs in the Technical Specifications.
- The TSTF considered the NRC's feedback in developing TSTF-523.

Approach

- The team considered a wide range of alternatives, considering the advantages and disadvantages of each, to determine the best approach from a safety and operational perspective.
- The purpose of this presentation is to explain this approach and how we reached our conclusion.

Evaluation

- The team's evaluation started with the following facts:
 - In the GL, the NRC referenced General Design Criteria (GDC) 1, 34, 35, 36, 37, 38, 39, and 40 and QA Criteria III, V, XI, XVI, and XVII as the regulatory basis for requiring licensees to ensure that the Operability of the subject systems is not impaired by entrained gas.
 - The NRC also referenced commitments to other QA documents, such as Reg Guide 1.33 which requires instructions for filling and venting the ECCS and DHR systems, as well as for draining and refilling heat exchangers.

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Evaluation

- In the GL, the NRC noted that the ISTS and most TS contain SRs to verify that portions of the subject systems are full of water, but did not rely on TS compliance as the regulatory basis for the GL.
 - The scope & frequency of the verification varies between designs and plants, and some plants have no similar TS requirements.
 - The TS requires verification that piping is full of water, which is subject to interpretation.
- Therefore, the current TS need to be modified.

Evaluation

- The conclusion of an NRC TIA response regarding the interpretation of the current surveillance, dated 10/21/08, equated management of entrained gas with system Operability.
- It stated, in part: "When voids are discovered in piping, if the licensee can establish through an operability determination that there is a reasonable expectation that the system in question will perform its specified safety function, the system piping can be considered filled with water such that the surveillance requirement is met. "

Evaluation

- The definition of Operability states:
 - "A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, [train/division], component, or device to perform its specified safety function(s) are also capable of performing their related support function(s)."

Evaluation

- The NRC's Final Policy Statement for Technical Specification Improvements for Nuclear Power Plants (58 FR 39182) states:
 - "The purpose of Technical Specifications is to impose those conditions or limitations upon reactor operation necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety by identifying those features that are of controlling importance to safety and establishing on them certain conditions of operation which cannot be changed without prior Commission approval." (emphasis added)
 - The ISTS, which were developed in response to the Final Policy Statement, retained in the Tech Specs those parameters that can be tied back to specific safety analysis assumptions, such as setpoints, tank volumes, pump flowrates, etc.

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Evaluation

- We deduced from this information that a TS change should be:
 - Clearly Enforceable
 - Flexible to future changes in technical knowledge
 - Flexible to various plant designs
 - Consistent with the NRC Final Policy Statement
 - Consistent with other, similar regulatory requirements for Operability
 - Easily Adopted and Implemented by plants

Evaluation

- From these facts, we concluded:
 - A very high standard is set for adding requirements to the Technical Specifications.
 - Technical Specification requirements are tied to specific safety analysis assumptions.
 - The appropriate basis for managing entrained gas is 10 CFR 50, Appendix B, and system Operability requirements in TS.

Success Criteria

- The industry believes any changes to the TS to address GL 2008-01 should be:
 - Sufficiently flexible to adjust the scope (including within systems) and frequency of inspections based on past performance and plant-specific vulnerabilities.
 - Evaluations have identified a wide variation in the susceptibility to entrained gas between plants, systems, portions of systems, and operating conditions.
 - Sufficiently flexible to adjust the acceptance criteria as needed to ensure system Operability.
 - The acceptance criteria will vary by plant, system, location, and plant condition, and will vary over time as inspections are performed and mitigating actions and vulnerabilities are identified.

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Success Criteria

- The industry believes any changes to the TS to address GL 2008-01 should be: (continued)
 - Easy to adopt and review, i.e., able to be submitted for NRC review without including plant-specific variations or evaluations which duplicate the GL responses and inspections.

Development

- In developing TSTF-523, the industry considered three approaches:
 - Modify the existing Surveillance Requirements, and or
 - Add a TS Administrative Controls Program, or
 - Revise LCO Bases to explicitly discuss the Operability requirements related to entrained gas.

Surveillance

- The industry considered modifying the existing Surveillance Requirement to capture the concept of "sufficiently full to support Operability" with a fixed Frequency.
- Approach is consistent with the NRC's TIA response regarding the intent of the current Surveillance.

Surveillance

- We determined a Surveillance is not appropriate for this application:
 - Surveillances require performance of specific verifications to meet stated acceptance criteria within fixed Frequencies.
 - Imposition of an SR with specific methods, scope, and acceptance criteria would likely result in substantial over-performance of some activities and under-performance of others, depending on plant design, and future modification as more is learned, both generically and plant-specifically.
 - The acceptance criteria for entrained gas do not have a specific safety analysis assumption.

Administrative Controls

- The industry considered creating a Technical Specification Administrative Controls program that stated the minimum requirements for the licensee's program to manage entrained gas.
- The existing Surveillance Requirements would require deletion as any Surveillance would simply direct activities to be performed in accordance with the program at the Frequencies dictated by the program.

Administrative Controls

- A TS Administrative Controls program does meet our criteria for this application :
 - Entrained gas is one of many aspects of Operability, most of which are not explicitly stated in TS, such as cooling water, flow balancing, recirculation flow, component integrity, and lubrication.
 - Just like entrained gas, these other aspects of Operability are established and verified by licensee design control, operations and maintenance programs, all of which are subject to the Quality Assurance requirements established in 10 CFR 50, Appendix B and the definition of Operability.

Administrative Controls

- A TS Administrative Controls program would not enhance existing requirements as stated in responses to the Generic Letter.
 - These requirements are now firmly established in the licensing basis.
 - Licensees acknowledge the effect of gas accumulation on systems, and the need to manage its effects in order to comply with TS operability requirements.
 - Licensees have taken actions to monitor and mitigate entrained gas in the specified systems.
 - NRC may inspect compliance with those requirements.

Manage as an Aspect of Operability

- The TS LCOs require a system to be Operable and the LCO Bases describe the specifics.
- The affected LCO Bases can be expanded to state that managing entrained gas is important to Operability and by referencing UFSAR requirements.

Manage as an Aspect of Operability

- In other similar instances in which the NRC has identified a potential threat to system Operability, the response has been licensee-controlled activities, not new TS requirements.
 - Generic Letter 89-08, "Erosion/Corrosion-Induced Pipe Wall Thinning,"
 - Bulletin 85-03, "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings,"
 - Generic Letter 87-12, "Loss of Residual Heat Removal (RHR) While the System (RCS) is Partially Filled,"
 - Generic Letter 88-17, "Loss of Decay Heat Removal,"
 - Generic Letter 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance,"

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Manage as an Aspect of Operability

- Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," and
 - Generic Letter 97-04, "Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps."
- Licensees responded to these issues by revising inspections, procedures, preventive maintenance measures, etc., without the adoption of additional TS requirements.
 - Entrained gas is no different from nor does it impose any higher risk than these issues and therefore, GL 2008-01 should be treated in a similar manner.

Manage as an Aspect of Operability

- The NRC inspection process, the Maintenance Rule, and the performance indicators have proven sufficient to ensure these technical issues are addressed without imposing additional TS requirements.

Conclusion

- In the GL, the NRC did not rely on TS requirements as the basis for the need to manage entrained gas or to determine Operability of the subject safety systems.
 - The NRC's TIA response 2008-03, dated October 21, 2008, acknowledged that the existing SRs are met by determining system operability through an operability determination when gas is found.
 - This is consistent with the approach that was taken in the development of TSTF-523.

Conclusion

- The TSTF-523 approach of managing entrained gas as an aspect of Operability meets the success criteria:
 - Allows flexibility for actions on systems and portions of systems.
 - Allows inspection frequencies and acceptance criteria to be rapidly adjusted based on operating experience.
 - Allows easy implementation of revised actions based on industry and plant-specific experience.
 - Is consistent with NRC's policy regarding TS requirements.
 - Treats entrained gas consistently with other aspects of Operability.

Conclusion

- Acknowledging entrained gas as an aspect of Operability and including information in the UFSAR referencing the plant-specific GL 2008-01 responses, in conjunction with Part 9900 of the NRC Inspection Manual, the Maintenance Rule, the Quality Assurance Program, and the NRC's Performance Indicators are sufficient to ensure the issues raised in GL 2008-01 are addressed without imposing additional TS requirements, while also providing the NRC an enforcement.