NRC Comments on Record 23-15

1. Likely NRC Condition on Component Categorization:
    a. NRC anticipates placing a condition on which specific risk category of components (categorized through an NRC-approved process such as 10 CFR 50.69 or RG 1.233 as described in RG 1.87, Rev. 2 for high temperature materials) these alternate rules apply to since the code case only states "items commensurate with their contribution to safety and risk."
    b. This condition would also make explicitly clear that these alternate rules are not applicable for use on safety-related components.

    Reply: Thank you for this comment. The committee understands the NRC's position and proposed path forward.

2. Concerning using ultrasonic testing (UT) in lieu of radiography (RT):
    a. Code Case provides a limited technical basis to justify using UT in lieu of RT (basis comparable to that provided for Code Case N-831-1 would be needed).
    b. Need specific detail on critical/allowable flaw sizes, etc.
    c. No technical basis for leaving in construction defects which are more vulnerable to high temperature degradation (such as creep, etc.).
    d. Since UT is challenged at distinguishing between planar and volumetric flaw, what acceptance criteria will be used, taking into consideration 2.c above?
    e. How can the staff have confidence in the effectiveness of UT inspections without performance demonstration?

    Reply: The proposed scope for this alternate requirement is piping and piping supports with minimal contribution to safety or risk. As stated in the background document for Record 23-15, page 3, item 4, UT is an option for volumetric examination permitted in industrial standards that are approved for use through 10CFR50.69 for this scope of components. As shown in slides 14 through 32 in the background document, the requirements for qualification of personnel (slides 22-23), acceptance criteria (slides 24-26), and performance demonstration (slides 27-31) proposed in this code case meet or exceed the requirements in applicable industrial standards.

3. Concerning using 5% random sample for UT:
    a. Insufficient technical basis for random sampling and the proposed value of 5% (including statistical justification of the proposed value).
    b. Insufficient technical basis for sample expansion, and no targeted inspection of most susceptible/vulnerable locations.

    Reply: The proposed scope for this alternate requirement is piping with minimal contribution to safety or risk. As stated in the background document for Record 23-15, page 5, item 5, random sampling is an

option for volumetric examination permitted in industrial standard B31.3-22 para 341.4, which includes elevated temperature service applications, that are approved for use through 10CFR50.69 for this scope of components.

4. The wording in Annex C leads one to believe the valve is designed to B16.34, rather than simply using the hydrostatic test times. Clarification is needed.
    a. In addition, what data and experience are there for the proposed hydrostatic testing rules that are based on B16.34?

    Reply: The wording in Annex C of the Code Case has been updated to be clear that only the hold times for the shell pressure test holding times and valve closure test holding times are being altered but other rules for valves in Section III are applicable. As stated in the background document for Record 23-15, page 5, item 6, the hold times proposed in B16.34 are sufficient to test for pressure integrity for applications with minimal contribution to safety or risk.

5. If only 5% welds are inspected and only receive a leak test during construction, then how does this affect inservice inspection, particularly if done under RIM?
    a. Part of applying RIM or any ISI program would be partially based on the design and quality of the item fabricated, but since a majority of the welds will not receive an inspection and may never see an inservice inspection, what confidence is there that the item will continue to perform its intended function? There has to be an interface between construction quality and inservice inspection/testing.
    b. Specify the interface between the proposed construction quality (fabrication and inspection/testing) and the inservice inspection/testing program.
    c. RG 1.174 identifies performance monitoring as essential for risk-informed applications. What is the performance monitoring strategy for the lower safety significant components that would potentially screen out from RIM?

    Reply: The scope of inservice inspection (Section XI, Division 1) or monitoring and nondestructive examinations (Section XI, Division 2) are beyond the scope of Section III and are up to agreements between the Owner and regulating authority. Additionally, the scope of RIM is limited to safety related components which generally will not fall into the scope of items covered in this Case.

6. What is the technical basis for the use of two codes with different requirements? Typically, systems/components designated as low safety significant, such as under 10 CFR 50.69 can be design, fabricated and inspected to commercial codes. These commercial codes design the components with specific design margin that considers the level of fabrication and inspection. However, this code case intends to design components to Section III (design by analysis (reduced margin compared to design by rule) in lieu of the design by rule (additional margin) but does not include the additional measures in Section III (e.g., quality assurance, additional inspections, etc.) to compensate for the reduced margin.

a. Provide basis on how Section III can be used for design without additional measures described above for advanced reactors with new and novel designs and limited or no operating experience.
b. Provide justification on how does utilizing two different codes (with differing levels of requirements that may be less in total than using just one of the codes), provide reasonable confidence of the reliability of the system.

Reply: Designating the safety significance of an item is outside the scope of Section III and is an agreement between the Owner and regulating authority. When there is agreement that a component or system is of minimal contribution to safety or risk, these alternate rules may be used. As discussed in the response to Comment #4, wording in Annex C has been updated to be clear that only the hold times for the shell pressure test and valve closure pressure test are being altered but other rules for valves in Section III are applicable. The hold times proposed in B16.34 are sufficient for applications with minimal contribution to safety or risk.

Two Codes are not being used. The proposed rules will be adopted and approved entirely within Section III. Industrial standards are consulted as part of the technical basis, as these are already recognized by the NRC for acceptable construction of these items. As stated in the background document for Record 23-15, page 2, item 2, at the time service levels were established, the published basis for service levels is the frequency of events and was not based on either NDE or hydrostatic testing. Stress limits are based on development of plastic hinges and collapse mechanisms of continuously supported pipe at supports or mid-span of supports without considering the location of welds. Therefore, permitting alternate NDE or pressure testing requirements (aligned with industrial standards) does not invalidate the basis for the Section III design rules or limits.

7. The iterative process of NEI 18-04 should be emphasized. Assumptions made in design may be disproven with operating experience.
a. If the risk-informed SSC categorization process evolves over time to change the categorization of certain SSCs, how would this be handled? Would this warrant repair/replacement with a higher pedigree part?

Reply: Section III is strictly limited by scope to the construction of components. Defining safety classifications/categorizations, system design, PRA, inservice inspection (Section XI, Division 1), monitoring and nondestructive examinations (Section XI, Division 2) are beyond the scope of Section III and subject to agreements between the Owner and regulating authority.

8. B-1000 allows the owner to define moderate energy systems for non-water piping systems.
a. It is not clear what the implication is for potential failures of systems that meet this definition. From an LMP perspective, the ASME treatment of such systems would potentially be considered as non-safety related systems with

special treatment (i.e., the special treatment being conformance with the code case). In addition, LMP would evaluate both non-safety related systems with special treatment and non-safety systems to ensure their failure does not impact a required safety function. For example, the failure of a non-safety system that leads to chemical interactions or other interactions that could impact a required safety function. A clarification is needed.

Reply: The definition of moderate energy systems was updated to be more inclusive of the various non-light water reactor technologies. System design requirements, PRA and system interactions are beyond the scope of Section III.

9. Under XXX-1000(d), the term "exemption" should be replaced due to the regulatory connotation. Perhaps "alternative" would be a better word?

Reply: The term exemption was replaced with "alternate requirements" to address Mr. Hill's comment.