

Discussion of RAI Response Regarding:
Hatch Units 1 and 2 Request to Relax the Required Number of
Fully Tensioned Reactor Pressure Vessel Head Closure Studs in
Technical Specification Table 1.1-1, “MODES”

Agenda

- On November 28, 2023, NRC staff and SNC had a public meeting [ML23338A259] regarding SNC's RAI responses dated October 20, 2023 [ML23293A235].
- The purpose of this meeting is to present additional information that explains SNC's position and to better understand the NRC staff's questions.
- The topics / numbering follow the order of the meeting summary [ML23338A259].

1. RAI-01 / OPERABILITY

In November 28, 2023 public meeting, NRC staff questioned SNC's position that the Technical Specification term "OPERABILITY" does not apply to the reactor pressure vessel (RPV) closure studs.

- No safety evaluation (SE) for any precedent Technical Specification Table 1.1-1 change has mentioned the words operable, operability, inoperable, or inoperability.
- SE for Watts Bar emergency amendment No. 161 regarding change to TS Table 1.1-1 "MODES" [ML23125A220]:
 - "While the changes revise the definition of when the plant is in each of these operating modes, they do not substantively affect any other WBN Unit 1 technical specification requirements."
 - Finds TS change acceptable since it is derived from acceptable analysis and the other technical specification requirements were unchanged (e.g., TS 3.4.13)
 - Uses terms "out of service" and "untensioned"

1. RAI-01 / OPERABILITY

- SE for Callaway conversion to Improved Technical Specifications (ITS) [ML021640446] and SE dated May 26, 1988 [ML20155J490]
 - SE dated May 26, 1988 mentions meeting ASME Section III stress limits and leakage requirements but does not mention operability.
 - Only the ITS SE mentions TS – only mentions Table 1.1-1

1. RAI-01 / OPERABILITY

In November 28, 2023 public meeting, NRC staff posited that the RPV is in the scope of TS 3.4.1, “Recirculation Loops Operating”

- TS 3.4.1:

- Requires two recirculation loops with matched flows to be in operation or one loop in operation with more restrictive thermal limits to be applied; it does not use term OPERABLE nor does TS Bases B 3.4.1 use the term OPERABLE.
- Recirculation loops are part of the RCPB but are external to the reactor vessel [ref TS Bases 3.4.1].
 - » The reactor coolant recirculation system is arranged such that a piping failure cannot compromise the integrity of the floodable inner volume of the reactor vessel, thereby ensuring adequate core cooling following a LOCA [U2 FSAR 5.1]. The reactor vessel flange and head flange are well above this piping and floodable volume.

1. RAI-01 / OPERABILITY

- TS 3.4.4, “RCS Operational LEAKAGE”
 - Neither TS 3.4.4 nor TS Bases B 3.4.4 use the term “OPERABLE”
 - LCO places limits on leakage
 - » Analyses concluded that leakage through the flange would not occur

2. RAI-03 / Material Alteration

- Operating with stud(s) not in service is a configuration change, however:
 - Does not alter the requirements of the RPV to meet ASME Section III Code stress limits
 - » Analyses show that the RPV, if operated with stud(s) not in service, would still meet the ASME Section III requirements and would not experience leakage through the flange
 - » The proposed TS and proposed license conditions are consistent with the analyses
 - Does not require changing operating limits (e.g., pressure, temperature, etc.) as ASME Section III is met under existing limits

2. RAI-03 / NRC Staff Suggestion of New LCO

- ASME Section XI provides the “reasonable assurance” that SSC can be relied upon.
- ASME Section XI is incorporated by reference into the 10 CFR 50.55a regulation, thus is legally binding.
 - If ASME Section XI requirements cannot be met, NRC approval is required.
- The proposed TS change does not exempt SNC from ASME Section XI requirements
 - ASME Section XI would still apply to in service SSCs.
- Analyses establish that with stud(s) out of service, ASME Section III Code limits would continue to be met and flange geometry would be preserved. Thus, the RPV’s functions to withstand design basis loads and to preclude leakage would continue to be performed.

3. RAI-04 / TS and License Condition Markups

Unit 1 TS Markup

Unit 1 License Condition Markup

Table 1.1-1 (page 1 of 1)
MODES

MODE	TITLE	REACTOR MODE SWITCH POSITION	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	Run	NA
2	Startup	Refuel ^(a) or Startup/Hot Standby	NA
3	Hot Shutdown ^(a)	Shutdown	> 212
4	Cold Shutdown ^(a)	Shutdown	≤ 212
5	Refueling ^(b)	Shutdown or Refuel	NA

- (a) ~~All~~ At least 51 reactor vessel head closure bolts fully tensioned.
- (b) ~~One or more reactor vessel head closure bolts less~~ Fewer than 51 reactor vessel head closure bolts fully tensioned.

(12) Reactor Vessel Head Closure Bolts

Hatch Nuclear Plant Unit 1 is approved to operate in Modes 1 – 4 with at least 51 of 52 reactor vessel head closure bolts fully tensioned. In addition, a reactor vessel head closure bolt cannot be considered “fully tensioned” unless all applicable ASME Section XI acceptance criteria are met (irrespective of any existing NRC approved alternative to, or relief from, the acceptance criteria). Upon implementation of Amendment No. _____, Southern Nuclear Operating Company shall update the Reactor Vessel Reassembly procedure to include this requirement.

3. RAI-04 / TS and License Condition Markups

Unit 2 TS Markup

Table 1.1-1 (page 1 of 1)
MODES

MODE	TITLE	REACTOR MODE SWITCH POSITION	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	Run	NA
2	Startup	Refuel ^(a) or Startup/Hot Standby	NA
3	Hot Shutdown ^(a)	Shutdown	> 212
4	Cold Shutdown ^(a)	Shutdown	≤ 212
5	Refueling ^(b)	Shutdown or Refuel	NA

- (a) ~~All~~ At least 54 reactor vessel head closure bolts fully tensioned.
- (b) ~~One or more reactor vessel head closure bolts less~~ Fewer than 54 reactor vessel head closure bolts fully tensioned.

Unit 2 License Condition Markup

(j) Reactor Vessel Head Closure Bolts

Hatch Nuclear Plant Unit 2 is approved to operate in Modes 1 – 4 with at least 54 reactor vessel head closure bolts fully tensioned. In addition, a reactor vessel head closure bolt cannot be considered "fully tensioned" unless all applicable ASME Section XI acceptance criteria are met (irrespective of any existing NRC approved alternative to, or relief from, the acceptance criteria). Any bolt that is less than fully tensioned shall have at least nine adjacent bolts on either side that are fully tensioned. Upon implementation of Amendment No. _____, Southern Nuclear Operating Company shall update the Reactor Vessel Reassembly procedure to include this requirement.

3. RAI-04 / TS and License Condition Markups

The proposed license conditions are worded such that no RPV stud could be credited as in service if it does not meet ASME Section XI requirements.

- Additionally, regardless of any license condition, SNC is required to seek approval/relief when ASME Section XI requirements are not met.
- The word “flaw” is defined in ASME Section XI
 - » Flaw: an imperfection or unintentional discontinuity that is detectable by nondestructive examination.

4. RAI-05 / Analysis Assumptions

- Analysis assumptions and conditions are straightforward.
 - Unit 1 only allows one stud to be out of service or untensioned.
 - Unit 2 allows two studs to be out of service or untensioned provided there are at least nine studs between the two.
- It is not necessary to impose any sort of ASME Section XI assumptions as those are regulatory requirements that, if not met, would require NRC approval. Nonetheless, the proposed license condition would reinforce that a stud that does not meet ASME Section XI requirements cannot be credited.