Technical Specifications Task Force
Improved Standard Technical Specifications Change Traveler

Eliminate Automatic RWCU System Isolation on SLC Initiation

NUREGs Affected: ☐ 1430 ☐ 1431 ☐ 1432 ☑ 1433 ☑ 1434 ☐ 2194

Classification: 1) Technical Change

Recommended for CLIIP?: Yes

Correction or Improvement: Improvement

NRC Fee Status: Not Exempt

Benefit: Retires Equipment

Changes Marked on ISTS Rev 5.0

PWROG RISD & PA (if applicable): None

See attached.

Revision History

OG Revision 0 Revision Status: Active

Revision Proposed by: Columbia

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 23-Mar-21

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 19-Aug-21

TSTF Review Information

TSTF Received Date: 01-Sep-21 Date Distributed for Review 01-Sep-21

TSTF Comments:
(No Comments)

TSTF Resolution: Approved Date: 17-Sep-21

Affected Technical Specifications

Bkgnd 3.3.6.1 Bases	Primary Containment Isolation Instrumentation	NUREG(s)- 1433 1434 Only
S/A 3.3.6.1 Bases	Primary Containment Isolation Instrumentation	NUREG(s)- 1433 1434 Only
LCO 3.3.6.1	Primary Containment Isolation Instrumentation Change Description: Table 3.3.6.1-1	NUREG(s)- 1433 1434 Only
Action 3.3.6.1.B Bases	Primary Containment Isolation Instrumentation	NUREG(s)- 1433 1434 Only

Action 3.3.6.1.I	Primary Containment Isolation Instrumentation	NUREG(s)- 1433 1434 Only
	Change Description: Deleted	
Action 3.3.6.1.I Bases	Primary Containment Isolation Instrumentation	NUREG(s)- 1433 1434 Only
	Change Description: Deleted	
Action 3.3.6.1.J	Primary Containment Isolation Instrumentation	NUREG(s)- 1433 1434 Only
	Change Description: Renamed I	
Action 3.3.6.1.J Bases	Primary Containment Isolation Instrumentation	NUREG(s)- 1433 1434 Only
	Change Description: Renamed I	
Action 3.3.6.1.K	Primary Containment Isolation Instrumentation	NUREG(s)- 1434 Only
	Change Description: Renamed J	
Action 3.3.6.1.K Bases	Primary Containment Isolation Instrumentation	NUREG(s)- 1434 Only
	Change Description: Renamed J	

1. SUMMARY DESCRIPTION

The proposed change removes the Technical Specifications (TS) 3.3.6.1, "Primary Containment Isolation Instrumentation," requirement that the Reactor Water Cleanup (RWCU) System automatically isolate on initiation of the Standby Liquid Control (SLC) System. The proposed change modifies NUREG-1433, "Standard Technical Specifications - General Electric BWR/4 Plants," and NUREG-1434, "Standard Technical Specifications, General Electric BWR/6 Plants" (the STS).[1]

2. DETAILED DESCRIPTION

2.1. System Descriptions

2.1.1. Reactor Water Cleanup System

The RWCU System is a filtration and ion exchange system used to maintain reactor vessel water quality. The RWCU pumps remove water from both recirculation system loops and the reactor vessel bottom head and pass it through regenerative and non-regenerative heat exchangers to reduce its temperature before the water enters the filter demineralizer units. The outlet of the filter demineralizers normally returns to the reactor vessel via the regenerative heat exchangers and both feedwater lines.

The RWCU System is not required to be operable by the TS.

In a typical BWR design, the RWCU System supply and/or return isolation valves will automatically close on a number of signals that indicate that the RWCU piping or components have been breached, such as:

- Low low reactor vessel water level (Level 2);
- RWCU System high differential flow;
- Main steam tunnel penetration area temperature high; and
- RWCU heat exchanger/pump/filter demineralizer unit area high temperature

The automatic closure of the supply and/or isolation valves coupled with the dual check valves in each RWCU return line effectively isolates the RWCU System from the reactor coolant pressure boundary.

2.1.2. Anticipated Transient Without Scram

An Anticipated Transient Without Scram (ATWS) is defined in 10 CFR 50.62 as an anticipated operational occurrence followed by the failure of the reactor trip portion of the protection

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[1] NUREG-1433 is based on the boiling water reactor (BWR)/4 plant design, but is also representative of the BWR/2, BWR/3, and, in this case, BWR/5 designs. NUREG-1434 is based on the BWR/6 plant design, and is representative, in some cases, of the BWR/5 design.

system. For BWR plants, 10 CFR 50.62 requires two risk reduction strategies to be implemented: an alternate rod injection system that is diverse from the reactor trip system, and a Standby Liquid Control (SLC) System capable of injecting a borated water solution into the reactor pressure vessel that will render the reactor subcritical under all reactivity conditions without credit for the control rods.

The regulation also requires that the reactor coolant recirculating pumps automatically trip on high reactor steam dome pressure or low reactor vessel water level conditions, which are indicative of an ATWS. This function is required by TS 3.3.4.2, "Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT)," and adds negative reactivity following events in which a scram does not (but should) occur to lessen the effects of an ATWS event. Tripping the recirculation pumps adds negative reactivity from the increase in steam voiding in the core area as core flow decreases.

2.1.3. Standby Liquid Control System

The SLC System provides the capability to bring the reactor from full power to a subcritical condition without crediting the control rods. It provides a diverse shutdown capability as discussed in 10 CFR 50, Appendix A, "General Design Criteria," Number 26. The SLC System satisfies the requirements of 10 CFR 50.62(c)(4) which also requires the SLC System to be automatic for plants granted a construction permit after July 26, 1984, and for plants that have already been designed and built to include this feature. There were no BWR construction permits issued after July 26, 1984, and there are no BWR plants that credit automatic initiation of SLC[2].

The SLC System is manually initiated from the main control room, as directed by the emergency operating procedures, if the operator believes the reactor cannot be shut down or kept shut down with the control rods. The SLC System injects a quantity of borated water into the reactor core to add negative reactivity sufficient to compensate for all of the various reactivity effects that could occur during plant shutdown.

In addition to being used to mitigate an ATWS, some plants credit manual actuation of the SLC system following a loss of coolant accident (LOCA) to control primary containment pH.

2.2. Current Technical Specifications Requirements

TS 3.3.6.1, "Primary Containment Isolation Instrumentation," contains a number of functions related to RWCU System isolation. NUREG-1433 Function 5.d, "Reactor Water Cleanup (RWCU) System Isolation – SLC System Initiation," and NUREG-1434, TS 3.3.6.1 Function 4.i, "Reactor Water Cleanup (RWCU) System Isolation – Standby Liquid Control System Initiation," are applicable in Modes 1 and 2. These functions isolate the RWCU System from the reactor pressure vessel when the SLC System is manually initiated. SLC System initiation signals are

[2] One BWR plant, Hope Creek, has automatic SLC initiation hardware, but the emergency procedures only credit manual SLC initiation. No other BWR plant is designed with automatic SLC initiation.

initiated from the two SLC pump start signals. There is no Allowable Value associated with the Function since the channels are mechanically actuated based solely on the position of the SLC System initiation switch.

TS 3.1.7, "Standby Liquid Control (SLC) System," requires two SLC subsystems to be operable in Modes 1 and 2. Some plant's TS require the SLC System to be operable in Mode 3. An operable SLC System requires the borated solution in the storage tank to be within limits and the availability of a flow path to the reactor pressure vessel. Each SLC subsystem contains a pump, an explosive valve, and the associated piping, valves, instruments, and controls to ensure an operable flow path.

2.3. Reason for the Proposed Change

The automatic isolation of the RWCU System on a SLC initiation signal complicates plant maintenance because it is a "failed close" signal. Any maintenance evolution that results in interruption of power to the signal results in automatic isolation of the RWCU System.

Isolation of RWCU has a negative effect on reactor pressure vessel chemistry. In addition, restarting RWCU is a lengthy process that requires warming the system prior to starting the pump that typically requires control room and field actions, and diverts operator attention from more safety significant tasks. Further, shutdown and restart of the RWCU increases wear on the pump motors. The RWCU motors and pumps are replaced as a unit requiring extensive maintenance in a high radiation field.

RWCU restart could be avoided if isolation of the RWCU System was a procedurally controlled manual action prior to manual SLC initiation.

The change to the TS enables evaluation of a change to the facility under 10 CFR 50.59 to remove the automatic isolation of the RWCU System on SLC initiation and modification of the emergency procedures to instead require manual isolation of the RWCU System prior to manually initiating the SLC System.

2.4. Description of the Proposed Change

The proposed change removes the requirement for automatic isolation of the RWCU System on SLC isolation.

In NUREG-1433:

- TS 3.3.6.1, Function 5.d, "Reactor Water Cleanup (RWCU) System Isolation – SLC System Initiation," is deleted.

The following changes are needed for consistency:

- TS 3.3.6.1, Function 5.e, "Reactor Vessel Water Level – Low Low, Level 2," is renumbered as Function 5.d.
- TS 3.3.6.1, Function 5.f, "Manual Initiation," is renumbered as Function 5.e.
- Table 3.3.6.1-1, Footnote (b), if present, is only referenced from Function 5.d, and is deleted.

- TS 3.3.6.1, Action I, which is only referenced in Function 5.d, is deleted.
- TS 3.3.6.1, Action J is renumbered Action I.

In NUREG-1434:

- TS 3.3.6.1 Function 4.l, "Reactor Water Cleanup (RWCU) System Isolation – Standby Liquid Control System Initiation," is deleted.

The following changes are needed for consistency:

- TS 3.3.6.1, Function 4.m, "Manual Initiation," is renumbered as Function 4.l.
- TS 3.3.6.1, Action I, which is only referenced in Function 4.l, is deleted.
- TS 3.3.6.1, Action J is renumbered Action I.
- TS 3.3.6.1, Action K is renumbered Action J.

The SLC TS requirements or Bases are not affected by the proposed change.

The TS Bases are revised to reflect these changes. The regulation at Title 10 of the Code of Federal Regulations (10 CFR), Part 50.36, states, "A summary statement of the bases or reasons for such specifications, other than those covering administrative controls, shall also be included in the application, but shall not become part of the technical specifications." A licensee may make changes to the TS Bases without prior NRC review and approval in accordance with the Technical Specifications Bases Control Program. The proposed TS Bases changes are consistent with the proposed TS changes and provide the purpose for each requirement in the specification consistent with the Commission's Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors, dated July 2, 1993 (58 FR 39132). Therefore, the Bases changes are provided for information and approval of the Bases is not requested.

A model application is attached. The model may be used by licensees desiring to adopt the traveler following NRC approval.

3. TECHNICAL EVALUATION

In the original proposal for the BWROG STS (NEDC-31466, "Technical Specification Screen Criteria Application and Risk Assessment," 1987) the automatic isolation of the RWCU System on SLC initiation function was not included in the requirements that should be retained in the TS. The evaluation stated:

> The isolation of the Reactor Water Cleanup (RWCU) System on initiation of the Standby Liquid Control System (SLCS) is not required since the SLCS is not assumed to function to mitigate any DBA or transient. The isolation of the RWCU system on initiation of the SLCS does ensure that the borated solution will remain in the vessel and not be removed by the RWCU system. However, since injection of the SLC system is assumed during an ATWS event, reactor vessel water level low (Level 2) will also initiate isolation of the RWCU system.

The BWROG report also stated that the SLC System initiation function was not required to be in the TS because SLC is not assumed to function to mitigate any design basis accident or transient. However, the NRC staff did not agree and the SLC System was retained in the TS under

10 CFR 50.36(c)(2)(ii), Criterion 4. While no documentation of the decision could be found, it appears that the RWCU isolation on SLC initiation function was retained in the TS because the SLC System was retained, even though the function does not satisfy any 10 CFR 50.36 criteria.

The automatic isolation of RWCU on SLC initiation is not assumed as part of the primary success path of any design basis accident or transient. For the plants that credit manual SLC initiation following a LOCA for pH control, the RWCU would have been isolated due to other signals during the LOCA. Therefore, automatic isolation of the RWCU on SLC initiation is not required for the SLC to perform its post-accident function. The Commission's "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Plants," (July 22, 1993) states that the SLC System must be retained in the TS under Criterion 4 but makes no mention of RWCU isolation.

Plant procedures can be revised to require the RWCU System to be confirmed to be isolated or to be manually isolated prior to initiation of the SLC System. Manual isolation can be performed from the main control room by shutting either the inboard or outboard primary containment isolation valve. On closure of either isolation valve, the RWCU pumps will trip and the filter demineralizers will isolate on low system flow. This will accomplish the required function without automatic isolation.

In an actual ATWS event, reactor vessel water level will drop below Level 2 which will initiate isolation of the RWCU System. This accomplishes the desired aim of preventing the RWCU System from removing SLC System boron from the reactor pressure vessel.

As the SLC System is only initiated manually, adding the additional step of manually isolating RWCU System will have a negligible effect on ATWS response, while providing the flexibility to perform maintenance without unnecessarily isolating the RWCU System and the attendant negative effects.

4. REGULATORY EVALUATION

Section IV, "The Commission Policy," of the "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (58 Federal Register 39132), dated July 22, 1993, states in part:

> 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.
>
> …[T]he Commission will also entertain requests to adopt portions of the improved STS, even if the licensee does not adopt all STS improvements.
>
> …The Commission encourages all licensees who submit Technical Specification related submittals based on this Policy Statement to emphasize human factors principles.

> …In accordance with this Policy Statement, improved STS have been developed and will be maintained for [BWR designs]. The Commission encourages licensees to use the improved STS as the basis for plant-specific Technical Specifications.
>
> …[I]t is the Commission intent that the wording and Bases of the improved STS be used … to the extent practicable.

As described in the Commission's "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors," recommendations were made by NRC and industry task groups for new STS that include greater emphasis on human factors principles in order to add clarity and understanding to the text of the STS, and provide improvements to the Bases of STS, which provides the purpose for each requirement in the specification. Improved vendor-specific STS were developed and issued by the NRC in September 1992.

The regulation at Title 10 of the Code of Federal Regulations (10 CFR) Section 50.36(a)(1) requires an applicant for an operating license to include in the application proposed TS in accordance with the requirements of 10 CFR 50.36. The applicant must include in the application a "summary statement of the bases or reasons for such specifications, other than those covering administrative controls…." However, per 10 CFR 50.36(a)(1), these technical specification bases "shall not become part of the technical specifications." The Final Policy Statement provides the following description of the scope and the purpose of the Technical Specification Bases:

> Appropriate Surveillance Requirements and Actions should be retained for each LCO [limiting condition for operation] which remains or is included in the Technical Specifications. Each LCO, Action, and Surveillance Requirement should have supporting Bases. The Bases should at a minimum address the following questions and cite references to appropriate licensing documentation (e.g., FSAR, Topical Report) to support the Bases.
>
> 1. What is the justification for the Technical Specification, i.e., which Policy Statement criterion requires it to be in the Technical Specifications?
>
>   The primary containment isolation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). The proposed change does not alter the applicable Policy Statement criterion.
>
> 2. What are the Bases for each LCO, i.e., why was it determined to be the lowest functional capability or performance level for the system or component in question necessary for safe operation of the facility and, what are the reasons for the Applicability of the LCO?
>
>   The proposed change eliminates an instrumentation function and removes the corresponding LCO Bases discussion of the function.
>
> 3. What are the Bases for each Action, i.e., why should this remedial action be taken if the associated LCO cannot be met; how does this Action relate to other Actions associated with the LCO; and what justifies continued operation of the system or

component at the reduced state from the state specified in the LCO for the allowed time period?

The proposed change eliminates an instrument function and the TS Action that would apply if the eliminated function is not operable. The Bases of the removed TS Action are also removed.

4. What are the Bases for each Safety Limit?

The proposed change does not affect any Safety Limits or their associated Bases.

5. What are the Bases for each Surveillance Requirement and Surveillance Frequency; i.e., what specific functional requirement is the surveillance designed to verify? Why is this surveillance necessary at the specified frequency to assure that the system or component function is maintained, that facility operation will be within the Safety Limits, and that the LCO will be met?

The proposed change does not affect any Surveillance Requirements or their associated Bases.

Note: In answering these questions the Bases for each number (e.g., Allowable Value, Response Time, Completion Time, Surveillance Frequency), state, condition, and definition (e.g., operability) should be clearly specified. As an example, a number might be based on engineering judgment, past experience, or PSA [probabilistic safety assessment] insights; but this should be clearly stated.

The proposed change does not alter an Allowable Value, Response Time, Completion Time, etc. Therefore, no change to the Bases is required.

Additionally, 10 CFR 50.36(b) requires:

> Each license authorizing operation of a … utilization facility … will include technical specifications. The technical specifications will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto, submitted pursuant to [10 CFR] 50.34 ["Contents of applications; technical information"]. The Commission may include such additional technical specifications as the Commission finds appropriate.

The categories of items required to be in the TS are provided in 10 CFR 50.36(c). As required by 10 CFR 50.36(c)(2)(i), the TS will include LCOs, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. Per 10 CFR 50.36(c)(2)(i), when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TS until the condition can be met.

The regulation at 10 CFR 50.36(c)(3) requires TS to include items in the category of SRs, which are requirements relating to test, calibration, or inspection to assure that the necessary quality of

systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

Per 10 CFR 50.90, whenever a holder of a license desires to amend the license, application for an amendment must be filed with the Commission, fully describing the changes desired, and following as far as applicable, the form prescribed for original applications.

Per 10 CFR 50.92(a), in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses to the extent applicable and appropriate.

The NRC staff's guidance for the review of TS is in Chapter 16, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (SRP), dated March 2010 (ADAMS Accession No. ML100351425). As described therein, as part of the regulatory standardization effort, the NRC staff has prepared STS for each of the light-water reactor nuclear designs.

In conclusion, based on the considerations discussed above, the proposed revision does not alter the current manner of operation and (1) there is reasonable assurance that the health and safety of the public will not be endangered by continued operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

5. REFERENCES

1. None

Model Application

[DATE] 10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

DOCKET NO.PLANT NAME
50-[xxx]
SUBJECT: Application to Revise Technical Specifications to Adopt TSTF-584, "Eliminate Automatic RWCU System Isolation on SLC Initiation"

Pursuant to 10 CFR 50.90, [LICENSEE] is submitting a request for an amendment to the Technical Specifications (TS) for [PLANT NAME, UNIT NOS.].

[LICENSEE] requests adoption of TSTF 584, "Eliminate Automatic RWCU System Isolation on SLC Initiation." Technical Specifications (TS) 3.3.6.1, "Primary Containment Isolation Instrumentation," is revised to remove the requirement that the Reactor Water Cleanup (RWCU) System automatically isolate on manual initiation of the Standby Liquid Control (SLC) System. This change to the TS facilitates a future change to the plant design and procedures to require manually isolating the RWCU System prior to manual SLC System initiation.

The enclosure provides a description and assessment of the proposed changes. Attachment 1 provides the existing TS pages marked to show the proposed changes. Attachment 2 provides revised (clean) TS pages. Attachment 3 provides the existing TS Bases pages marked to show revised text associated with the proposed TS changes and is provided for information only.

[[LICENSEE] requests that the amendment be reviewed under the Consolidated Line Item Improvement Process (CLIIP).] Approval of the proposed amendment is requested within 6 months of acceptance. Once approved, the amendment shall be implemented within [ ] days.

There are no regulatory commitments made in this submittal.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated [STATE] Official.

[In accordance with 10 CFR 50.30(b), a license amendment request must be executed in a signed original under oath or affirmation. This can be accomplished by attaching a notarized affidavit confirming the signature authority of the signatory, or by including the following statement in the cover letter: "I declare under penalty of perjury that the foregoing is true and correct. Executed on (date)." The alternative statement is pursuant to 28 USC 1746. It does not require notarization.]

If you should have any questions regarding this submittal, please contact [NAME, TELEPHONE NUMBER].

Sincerely,

[Name, Title]

Enclosure: Description and Assessment

Attachments:
1. Proposed Technical Specification Changes (Mark-Up)
2. Revised Technical Specification Pages
3. Proposed Technical Specification Bases Changes (Mark-Up) – For Information Only

[The attachments are to be provided by the licensee and are not included in the model application.]

cc: NRC Project Manager
NRC Regional Office
NRC Resident Inspector
State Contact

ENCLOSURE

DESCRIPTION AND ASSESSMENT

1.0 DESCRIPTION

[LICENSEE] requests adoption of TSTF 584, "Eliminate Automatic RWCU System Isolation on SLC Initiation," into the [PLANT NAME, UNIT NOS] Technical Specifications (TS). TS 3.3.6.1, "Primary Containment Isolation Instrumentation," is revised to remove the requirement that the Reactor Water Cleanup (RWCU) System automatically isolate on manual initiation of the Standby Liquid Control (SLC) System. This change to the TS facilitates a future change to the plant design and procedures to require manually isolating the RWCU System prior to manual SLC System initiation.

2.0 ASSESSMENT

2.1 Applicability of Safety Evaluation

[LICENSEE] has reviewed the safety evaluation for TSTF-584 provided to the Technical Specifications Task Force in a letter dated [DATE]. This review included a review of the NRC staff's evaluation, as well as the information provided in TSTF-584. [LICENSEE] has concluded that the justifications presented in TSTF-584 and the safety evaluation prepared by the NRC staff are applicable to [PLANT, UNIT NOS.] and justify this amendment for the incorporation of the changes to the [PLANT] TS.

[Discuss differences, if any, between the plant design and the plant design assumed in the Standard Technical Specifications that are related to the proposed change and why those differences do not affect the applicability of the TSTF-584 safety evaluation to the plant.]

2.2 Optional Changes and Variations

[LICENSEE is not proposing any variations from the TS changes described in TSTF-584 or the applicable parts of the NRC staff's safety evaluation dated [DATE].] [LICENSEE is proposing the following variations from the TS changes described in TSTF-584 or the applicable parts of the NRC staff's safety evaluation: describe the variations]

[The [PLANT] TS utilize different [numbering][and][titles] than the Standard Technical Specifications on which TSTF-584 was based. Specifically, [describe differences between the plant-specific TS numbering and/or titles and the TSTF-584 numbering and titles.] These differences are administrative and do not affect the applicability of TSTF-584 to the [PLANT] TS.]

[The [PLANT] TS contain requirements that differ from the Standard Technical Specifications on which TSTF-584 was based but are encompassed in the TSTF-584 justification. Describe differences and why TSTF-584 is still applicable. [Include any difference in the Applicability of the specifications.]]

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration Analysis

[LICENSEE] requests adoption of TSTF 584, "Eliminate Automatic RWCU System Isolation on SLC Initiation," into the into the [PLANT NAME, UNIT NOS] Technical Specifications (TS). TS 3.3.6.1, "Primary Containment Isolation Instrumentation," is revised to remove the requirement that the Reactor Water Cleanup (RWCU) System automatically isolate on manual initiation of the Standby Liquid Control (SLC) System. The SLC System is manually actuated in response to an Anticipated Transient Without Scram (ATWS) event. This change to the TS facilitates a future change to the plant design and procedures to require manually isolating the RWCU System prior to manual SLC System initiation.

[LICENSEE] has evaluated if a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed change eliminates the TS requirement that the RWCU System automatically isolate on manual initiation of the SLC System. The SLC System is manually initiated in response to an ATWS event. The TS function that requires isolation of the RWCU System on SLC initiation is not an initiator to an ATWS event.

   Should an ATWS event occur and the SLC System be manually initiated per plant procedure, plant procedures may also direct isolation of the RWCU System by closing either of two isolation valves from the control room. In addition, an ATWS event will result in a lowering of reactor pressure vessel water level to the point that the RWCU System is automatically isolated (a function that will continue to be required by the TS.) As a result, removal of the RWCU System isolation on SLC initiation function from the TS will not result in an increase in the consequences of an ATWS event.

   [In addition to being used to mitigate an ATWS, the accident analysis credits manual actuation of the SLC system following a loss of coolant accident (LOCA) to control primary containment pH. A LOCA will result in automatic isolation of the RWCU System by other TS-required functions. As a result, the proposed change will have no effect on the consequences of a LOCA.]

   Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

The proposed change eliminates the TS requirement that the RWCU System automatically isolate on manual initiation of the SLC System. The proposed change does not affect the design function of the RWCU System or the SLC System. The replacement of the automatic action to isolate the RWCU System on SLC initiation with manual action has the potential to introduce human error as a failure mechanism; however, in an ATWS event [or LOCA], the RWCU System isolation would also be automatically initiated by low water level in the reactor pressure vessel. Consequently, no new failure mechanism is created, and no new or different kind of accident is created.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

The proposed change eliminates the TS requirement that the RWCU System automatically isolate on manual initiation of the SLC System. The proposed change does not alter any controlling values of parameters established in the plant's licensing basis. The proposed change does not alter a design basis or safety limit (i.e., the controlling numerical value for a parameter established in the UFSAR or the license). Consequently, the margin of safety is not significantly affected.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, [LICENSEE] concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

3.2 Conclusion

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission’s regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

4.0 ENVIRONMENTAL EVALUATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact

statement or environmental assessment need be prepared in connection with the proposed amendment.

Technical Specifications and Bases Changes

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. As required by Required Action C.1 and referenced in Table 3.3.6.1-1. OR Required Action and associated Completion Time for Condition F or G not met.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours
~~I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.~~	~~I.1 Declare associated standby liquid control subsystem (SLC) inoperable.~~ ~~OR~~ ~~I.2 Isolate the Reactor Water Cleanup System.~~	~~1 hour~~ ~~1 hour~~
~~I~~J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	~~I~~J.1 Initiate action to restore channel to OPERABLE status.	Immediately

Table 3.3.6.1-1 (page 6 of 7)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. RWCU System Isolation					
b. Area Temperature - High	1, 2, 3	[3] [1 per room]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.6 SR 3.3.6.1.7 [SR 3.3.6.1.8]	≤ [150]°F
c. Area Ventilation Differential Temperature - High	1, 2, 3	[3] [1 per room]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.6 SR 3.3.6.1.7 [SR 3.3.6.1.8]	≤ [67]°F
~~d. SLC System Initiation~~	~~1, 2~~	~~[2](b)~~	~~I~~	~~SR 3.3.6.1.7~~	~~NA~~
~~d~~e. Reactor Vessel Water Level - Low Low, Level 2	1, 2, 3	[2]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.6 SR 3.3.6.1.7 SR 3.3.6.1.8	≥ [-47] inches
[~~e~~f. Manual Initiation	1, 2, 3	[1 per group]	G	SR 3.3.6.1.7	NA]
6. Shutdown Cooling System Isolation					
a. Reactor Steam Dome Pressure - High	1, 2, 3	[1]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.6 SR 3.3.6.1.7	≤ [145] psig
b. Reactor Vessel Water Level - Low, Level 3	3	[2]	~~I~~J	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.6 SR 3.3.6.1.7	≥ [10] inches

~~(b) SLC System Initiation only inputs into one of the two trip systems.~~

B 3.3 INSTRUMENTATION

B 3.3.6.1 Primary Containment Isolation Instrumentation

BASES

BACKGROUND

The primary containment isolation instrumentation automatically initiates closure of appropriate primary containment isolation valves (PCIVs). The function of the PCIVs, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs). Primary containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a DBA.

The isolation instrumentation includes the sensors, relays, and switches that are necessary to cause initiation of primary containment and reactor coolant pressure boundary (RCPB) isolation. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a primary containment isolation signal to the isolation logic. Functional diversity is provided by monitoring a wide range of independent parameters. The input parameters to the isolation logics are (a) reactor vessel water level, (b) area ambient and differential temperatures, (c) main steam line (MSL) flow measurement, ~~(d) Standby Liquid Control (SLC) System initiation,~~ (**d**~~e~~) condenser vacuum, (**e**~~f~~) main steam line pressure, (**f**~~g~~) high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) steam line flow, (**g**~~h~~) drywell radiation and pressure, (**h**~~i~~) HPCI and RCIC steam line pressure, (**i**~~j~~) HPCI and RCIC turbine exhaust diaphragm pressure, (**j**~~k~~) reactor water cleanup (RWCU) differential flow, and (**k**~~l~~) reactor steam dome pressure. Redundant sensor input signals from each parameter are provided for initiation of isolation. ~~The only exception is SLC System initiation.~~ In addition, manual isolation of the logics is provided.

Primary containment isolation instrumentation has inputs to the trip logic of the isolation functions listed below.

1. Main Steam Line Isolation

Most MSL Isolation Functions receive inputs from four channels. The outputs from these channels are combined in a one-out-of-two taken twice logic to initiate isolation of all main steam isolation valves (MSIVs). The outputs from the same channels are arranged into two two-out-of-two logic trip systems to isolate all MSL drain valves. Each MSL drain line has two isolation valves with one two-out-of-two logic system associated with each valve.

BASES

BACKGROUND (continued)

Primary Containment Isolation Drywell Pressure - High and Reactor Vessel Water Level - Low, Level 3 Functions isolate the Group 2, 6, 7, 10, and 12 valves. Reactor Building and Refueling Floor Exhaust Radiation - High Functions isolate the Group 6, 10, and 12 valves. Primary Containment Isolation Drywell Radiation - High Function isolates the containment purge and vent valves.

3, 4. High Pressure Coolant Injection System Isolation and Reactor Core Isolation Cooling System Isolation

Most Functions that isolate HPCI and RCIC receive input from two channels, with each channel in one trip system using a one-out-of-one logic. Each of the two trip systems in each isolation group is connected to one of the two valves on each associated penetration.

The exceptions are the HPCI and RCIC Turbine Exhaust Diaphragm Pressure - High and Steam Supply Line Pressure - Low Functions. These Functions receive inputs from four turbine exhaust diaphragm pressure and four steam supply pressure channels for each system. The outputs from the turbine exhaust diaphragm pressure and steam supply pressure channels are each connected to two two-out-of-two trip systems. Each trip system isolates one valve per associated penetration.

HPCI and RCIC Functions isolate the Group 3, 4, 8, and 9 valves.

5. Reactor Water Cleanup System Isolation

The Reactor Vessel Water Level - Low Low, Level 2 Isolation Function receives input from four reactor vessel water level channels. The outputs from the reactor vessel water level channels are connected into two two-out-of-two trip systems. The Differential Flow - High ~~and SLC System Initiation~~ Function~~s~~ receive**s** input from two channels, with each channel in one trip system using a one-out-of-one logic. The Area Temperature - High Function receives input from six temperature monitors, three to each trip system. The Area Ventilation Differential Temperature - High Function receives input from six differential temperature monitors, three in each trip system. These are configured so that any one input will trip the associated trip system. Each of the two trip systems is connected to one of the two valves on each RWCU penetration.

RWCU Functions isolate the Group 5 valves.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Area and area ventilation differential temperature signals are initiated from temperature elements that are located in the room that is being monitored. Six thermocouples provide input to the Area Temperature - High Function (two per area). Six channels are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

Twelve thermocouples provide input to the Area Ventilation Differential Temperature - High Function. The output of these thermocouples is used to determine the differential temperature. Each channel consists of a differential temperature instrument that receives inputs from thermocouples that are located in the inlet and outlet of the area cooling system and for a total of six available channels (two per area). Six channels are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Area and Area Ventilation Differential Temperature - High Allowable Values are set low enough to detect a leak equivalent to 25 gpm.

These Functions isolate the Group 5 valves.

~~5.d. SLC System Initiation~~

~~The isolation of the RWCU System is required when the SLC System has been initiated to prevent dilution and removal of the boron solution by the RWCU System (Ref. 4). SLC System initiation signals are initiated from the two SLC pump start signals.~~

~~There is no Allowable Value associated with this Function since the channels are mechanically actuated based solely on the position of the SLC System initiation switch.~~

~~Two channels (one from each pump) of the SLC System Initiation Function are available and are required to be OPERABLE only in MODES 1 and 2, since these are the only MODES where the reactor can be critical, and these MODES are consistent with the Applicability for the SLC System (LCO 3.1.7).~~

~~As noted (footnote (b) to Table 3.3.6.1-1), this Function is only required to close one of the RWCU isolation valves since the signals only provide input into one of the two trip systems.~~

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

5.~~d~~e. Reactor Vessel Water Level - Low Low, Level 2

Low RPV water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of some interfaces with the reactor vessel occurs to isolate the potential sources of a break. The isolation of the RWCU System on Level 2 supports actions to ensure that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46. The Reactor Vessel Water Level - Low Low, Level 2 Function associated with RWCU isolation is not directly assumed in the FSAR safety analyses because the RWCU System line break is bounded by breaks of larger systems (recirculation and MSL breaks are more limiting).

Reactor Vessel Water Level - Low Low, Level 2 signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level - Low Low, Level 2 Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level - Low Low, Level 2 Allowable Value was chosen to be the same as the ECCS Reactor Vessel Water Level - Low Low, Level 2 Allowable Value (LCO 3.3.5.1), since the capability to cool the fuel may be threatened.

This Function isolates the Group 5 valves.

5.~~e~~f. Manual Initiation

The Manual Initiation push button channels introduce signals into the RWCU System isolation logic that are redundant to the automatic protective instrumentation and provide manual isolation capability. There is no specific FSAR safety analysis that takes credit for this Function. It is retained for overall redundancy and diversity of the isolation function as required by the NRC in the plant licensing basis.

There are two push buttons for the logic, one manual initiation push button per trip system. There is no Allowable Value for this Function, since the channels are mechanically actuated based solely on the position of the push buttons.

Two channels of the Manual Initiation Function are available and are required to be OPERABLE in MODES 1, 2, and 3 since these are the MODES in which the RWCU System Isolation automatic Functions are required to be OPERABLE.

BASES

ACTIONS (continued)

~~I.1 and I.2~~

~~If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the associated SLC subsystem(s) is declared inoperable or the RWCU System is isolated. Since this Function is required to ensure that the SLC System performs its intended function, sufficient remedial measures are provided by declaring the associated SLC subsystems inoperable or isolating the RWCU System.~~

~~The 1 hour Completion Time is acceptable because it minimizes risk while allowing sufficient time for personnel to isolate the RWCU System.~~

~~I~~J.1

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the associated penetration flow path should be closed. However, if the shutdown cooling function is needed to provide core cooling, these Required Actions allow the penetration flow path to remain unisolated provided action is immediately initiated to restore the channel to OPERABLE status. Actions must continue until the channel is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.

As noted at the beginning of the SRs, the SRs for each Primary Containment Isolation instrumentation Function are found in the SRs column of Table 3.3.6.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Refs. 5 and 6) assumption of the average time required to perform channel surveillance. That analysis

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. As required by Required Action C.1 and referenced in Table 3.3.6.1-1. OR Required Action and associated Completion Time of Condition F or G not met.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours
~~I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.~~	~~I.1 Declare associated standby liquid control subsystem inoperable.~~ ~~OR~~ ~~I.2 Isolate the Reactor Water Cleanup System.~~	~~1 hour~~ ~~1 hour~~
~~I~~J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	~~I~~J.1 Initiate action to restore channel to OPERABLE status.	Immediately
~~J~~K. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	~~J~~K.1 Isolate the affected penetration flow path(s). OR ~~J~~K.2 Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment].	Immediately Immediately

Table 3.3.6.1-1 (page 3 of 7)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Primary Containment Isolation					
g. Containment and Drywell Ventilation Exhaust Radiation-High	1,2,3	[2]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≤ [4.0] mR/hr
	[(b)]	[2]	~~J~~K	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≤ [4.0] mR/hr
[h. Manual Initiation	1,2,3	[2]	G	SR 3.3.6.1.6	NA]
3. Reactor Core Isolation Cooling (RCIC) System Isolation					
a. RCIC Steam Line Flow - High	1,2,3	[1]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≤ [64] inches water
[b. RCIC Steam Line Flow Time Delay	[1,2,3]	[1]	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≥ [3] seconds and ≤ [7] seconds]
c. RCIC Steam Supply Line Pressure - Low	1,2,3	[1]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≥ [53] psig
d. RCIC Turbine Exhaust Diaphragm Pressure - High	1,2,3	[2]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.5 SR 3.3.6.1.6	≤ [20] psig

[(b) During movement of [recently] irradiated fuel assemblies in [primary or secondary containment.]

Table 3.3.6.1-1 (page 6 of 7)
Primary Containment Isolation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4.	RWCU System Isolation					
i.	Main Steam Line Tunnel Ambient Temperature – High	1,2,3	[1]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ [191]°F
j.	Main Steam Line Tunnel Differential Temperature - High	1,2,3	[1]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ [104]°F
k.	Reactor Vessel Water Level - Low Low, Level 2	1,2,3	[2]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≥ [-43.8] inches
~~l.~~	~~Standby Liquid Control System Initiation~~	~~1,2~~	~~[1]~~	~~I~~	~~SR 3.3.6.1.6~~	~~NA~~
[~~m.~~	Manual Initiation	1,2,3	[2]	G	SR 3.3.6.1.6	NA]
5.	Shutdown Cooling System Isolation					
a.	RHR Equipment Room Ambient Temperature - High	2,3	[1 per room]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ [171]°F
b.	RHR Equipment Room Differential Temperature - High	2,3	[1 per room]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ [102]°F
c.	Reactor Vessel Water Level - Low, Level 3	3	[2]	~~I~~J	SR 3.3.6.1.1 SR 3.3.6.1.2 [SR 3.3.6.1.3] SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≥ [10.8] inches

B 3.3 INSTRUMENTATION

B 3.3.6.1 Primary Containment Isolation Instrumentation

BASES

BACKGROUND

The primary containment isolation instrumentation automatically initiates closure of appropriate primary containment isolation valves (PCIVs). The function of the PCIVs, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs). Primary containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a DBA.

The isolation instrumentation includes the sensors, relays, and switches that are necessary to cause initiation of primary containment and reactor coolant pressure boundary (RCPB) isolation. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a primary containment isolation signal to the isolation logic. Functional diversity is provided by monitoring a wide range of independent parameters. The input parameters to the isolation logic are (a) reactor vessel water level, (b) ambient and differential temperatures, (c) main steam line (MSL) flow measurement, ~~(d) Standby Liquid Control (SLC) System initiation,~~ (**d**~~e~~) condenser vacuum loss, (**e**~~f~~) main steam line pressure, (**f**~~g~~) reactor core isolation cooling (RCIC) and RCIC/residual heat removal (RHR) steam line flow, (**g**~~h~~) ventilation exhaust radiation, (**h**~~i~~) RCIC steam line pressure, (**i**~~j~~) RCIC turbine exhaust diaphragm pressure, (**j**~~k~~) reactor water cleanup (RWCU) differential flow, (**k**~~l~~) reactor steam dome pressure, and (**l**~~m~~) drywell pressure. Redundant sensor input signals are provided from each such isolation initiation parameter. ~~The only exception is SLC System initiation.~~ In addition, manual isolation of the logics is provided.

The primary containment isolation instrumentation has inputs to the trip logic from the isolation Functions listed below.

1. Main Steam Line Isolation

Most Main Steam Line Isolation Functions receive inputs from four channels. The outputs from these channels are combined in one-out-of-two taken twice logic to initiate isolation of all main steam isolation valves (MSIVs). The outputs from the same channels are arranged into two two-out-of-two logic trip systems to isolate all MSL drain valves. Each MSL drain line has two isolation valves with one two-out-of-two logic system associated with each valve.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4.k. Reactor Vessel Water Level - Low Low, Level 2

Low RPV water level indicates the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of some reactor vessel interfaces occurs to isolate the potential sources of a break. The isolation of the RWCU System on Level 2 supports actions to ensure that fuel peak cladding temperature remains below the limits of 10 CFR 50.46. The Reactor Vessel Water Level - Low Low, Level 2 Function associated with RWCU isolation is not directly assumed in any transient or accident analysis, since bounding analyses are performed for large breaks such as MSLBs.

Reactor Vessel Water Level - Low Low, Level 2 signals are initiated from level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level - Low Low, Level 2 Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level - Low Low, Level 2 Allowable Value was chosen to be the same as the ECCS Reactor Vessel Water Level - Low Low, Level 2 Allowable Value (LCO 3.3.5.1), since the capability to cool the fuel may be threatened.

This Function isolates the Group 8 valves.

~~4.l. SLC System Initiation~~

~~The isolation of the RWCU System is required when the SLC System has been initiated to prevent dilution and removal of the boron solution by the RWCU System (Ref. 4). SLC System initiation signals are initiated from the two SLC pump start signals.~~

~~There is no Allowable Value associated with this Function since the channels are mechanically actuated based solely on the position of the SLC System initiation switch.~~

~~Two channels (one from each pump) of SLC System Initiation Function are available and are required to be OPERABLE only in MODES 1 and 2, since these are the only MODES where the reactor can be critical, and these MODES are consistent with the Applicability for the SLC System (LCO 3.1.7).~~

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4.~~l~~m. Manual Initiation

The Manual Initiation push button channels introduce signals into the RWCU System isolation logic that are redundant to the automatic protective instrumentation and provide manual isolation capability. There is no specific FSAR safety analysis that takes credit for this Function. It is retained for overall redundancy and diversity of the isolation function as required by the NRC in plant licensing basis.

There are four push buttons for the logic, two manual initiation push buttons per trip system. There is no Allowable Value for this Function, since the channels are mechanically actuated based solely on the position of the push buttons.

Four channels of the Manual Initiation Function are available and are required to be OPERABLE in MODES 1, 2, and 3 since these are the MODES in which the RWCU System Isolation automatic Functions are required to be OPERABLE.

5. Shutdown Cooling System Isolation

5.a, 5.b. Ambient and Differential Temperature - High

Ambient and Differential Temperature - High is provided to detect a leak from the associated system steam piping. The isolation occurs when a very small leak has occurred and is diverse to the high flow instrumentation. If the small leak is allowed to continue without isolation, offsite dose limits may be reached. These Functions are not assumed in any FSAR transient or accident analysis, since bounding analyses are performed for large breaks such as MSLBs.

Ambient and Differential Temperature - High signals are initiated from thermocouples that are appropriately located to protect the system that is being monitored. Two instruments monitor each area. Four channels for RHR Ambient and Differential Temperature - High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

Eight thermocouples provide input to the Area Ventilation Differential Temperature - High Function. The output of these thermocouples is used to determine the differential temperature. Each channel consists of a differential temperature instrument that receives inputs from thermocouples that are located in the inlet and outlet of the area cooling system for a total of four available channels.

BASES

ACTIONS (continued)

B.1

Required Action B.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in redundant automatic isolation capability being lost for the associated penetration flow path(s). The MSL isolation Functions are considered to be maintaining isolation capability when sufficient channels are OPERABLE or in trip such that both trip systems will generate a trip signal from the given Function on a valid signal. The other isolation Functions are considered to be maintaining isolation capability when sufficient channels are OPERABLE or in trip such that one trip system will generate a trip signal from the given Function on a valid signal. This ensures that one of the two PCIVs in the associated penetration flow path can receive an isolation signal from the given Function. For Functions 1.a, 1.b, 1.d, 1.e, and 1.f, this would require both trip systems to have one channel OPERABLE or in trip. For Function 1.c, this would require both trip systems to have one channel, associated with each MSL, OPERABLE or in trip. For Functions 2.a, 2.b, 2.c, 2.d, 2.e, 2.f, 2.g, 3.d, 4.k, 5.c, 5.d, and 5.e, this would require one trip system to have two channels, each OPERABLE or in trip. For Functions 3.a, 3.b, 3.c, 3.e, 3.f, 3.g, 3.h, 3.i, 3.l, 3.m, 4.a, 4.b, 4.c, 4.d, 4.g, 4.h, 4.i, **and** 4.j~~, and 4.l~~, this would require one trip system to have one channel OPERABLE or in trip. For Functions 3.j, 3.k, 4.e, 4.f, 5.a, and 5.b, each Function consists of channels that monitor several different locations. Therefore, this would require one channel per location to be OPERABLE or in trip (the channels are not required to be in the same trip system). The Condition does not include the Manual Initiation Functions (Functions 1.g, 2.h, 3.n, and 4.l~~m~~), since they are not assumed in any accident or transient analysis. Thus, a total loss of manual initiation capability for 24 hours (as allowed by Required Action A.1) is allowed.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

C.1

Required Action C.1 directs entry into the appropriate Condition referenced in Table 3.3.6.1-1. The applicable Condition specified in Table 3.3.6.1-1 is Function and MODE or other specified condition dependent and may change as the Required Action of a previous Condition is completed. Each time an inoperable channel has not met

BASES

ACTIONS (continued)

Alternatively, if it is not desired to isolate the affected penetration flow path(s) (e.g., as in the case where isolating the penetration flow path(s) could result in a reactor scram), Condition H must be entered and its Required Actions taken.

The Completion Time is acceptable because it minimizes risk while allowing sufficient time for plant operations personnel to isolate the affected penetration flow path(s).

G.1

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, plant operations may continue if the affected penetration flow path(s) is isolated. Isolating the affected penetration flow path(s) accomplishes the safety function of the inoperable channels. The 24 hour Completion Time is acceptable due to the fact that these Functions (Manual Initiation) are not assumed in any accident or transient analysis in the FSAR. Alternately, if it is not desired to isolate the affected penetration flow path(s) (e.g., as in the case where isolating the penetration flow path(s) could result in a reactor scram), Condition H must be entered and its Required Actions taken.

H.1 and H.2

If the channel is not restored to OPERABLE status or placed in trip, or any Required Action of Condition F or G is not met and the associated Completion Time has expired, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

~~I.1 and I.2~~

~~If the channel is not restored to OPERABLE status within the allowed Completion Time, the associated SLC subsystem(s) is declared inoperable or the RWCU System is isolated. Since this Function is required to ensure that the SLC System performs its intended function, sufficient remedial measures are provided by declaring the associated SLC subsystem inoperable or isolating the RWCU System.~~

BASES

ACTIONS (continued)

~~The Completion Time of 1 hour is acceptable because it minimizes risk while allowing sufficient time for personnel to isolate the RWCU System.~~

~~I~~J.1

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the associated penetration flow path should be closed. However, if the shutdown cooling function is needed to provide core cooling, these Required Actions allow the penetration flow path to remain unisolated provided action is immediately initiated to restore the channel to OPERABLE status. ACTIONS must continue until the channel is restored to OPERABLE status.

~~J~~K.1 and ~~J~~K.2

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the associated penetration flow path(s) should be isolated (Required Action ~~J~~K.1). Isolating the affected penetration flow path(s) accomplishes the safety function of the inoperable instrumentation. Alternately, the plant must be placed in a condition in which the LCO does not apply. If applicable, movement of [recently] irradiated fuel assemblies must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe condition.

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.

As noted at the beginning of the SRs, the SRs for each Primary Containment Isolation Instrumentation Function are found in the SRs column of Table 3.3.6.1-1.

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required