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January 27, 2020
GO2-20-008

10 CFR 50.90

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397
LICENSE AMENDMENT REQUEST TO REVISE TECHNICAL SPECIFICATIONS TO ADOPT TSTF-566, "REVISE ACTIONS FOR INOPERABLE RHR SHUTDOWN COOLING SUBSYSTEMS" USING THE CONSOLIDATED LINE ITEM IMPROVEMENT PROCESS**

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Energy Northwest is submitting a request for an amendment to the Technical Specifications (TS) for Columbia Generating Station (Columbia).

Energy Northwest requests adoption of TSTF-566, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems," which is an approved change to the Improved Standard Technical Specifications (ISTS), into the Columbia TS. The proposed amendment revises the TS actions applicable when a residual heat removal (RHR) shutdown cooling subsystem is inoperable.

The Attachment 1 provides a description and assessment of the proposed changes. Attachment 2 provides the existing TS pages marked to show the proposed changes. Attachment 3 provides revised (clean) TS pages. Attachment 4 provides existing TS Bases pages marked to show the proposed changes for information only.

Approval of the proposed amendment is requested one year from the date of this letter. Once approved, the amendment shall be implemented within 90 days thereafter.

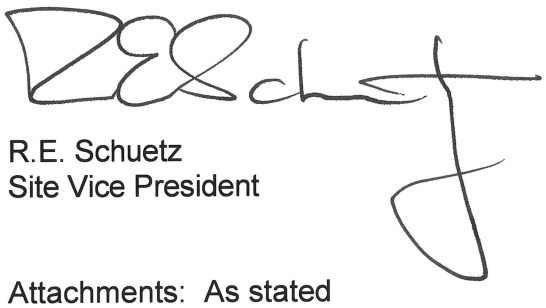
There are no regulatory commitments made in this submittal.

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

If there are any questions or if additional information is needed, please contact Ms. D. M. Wolfgramm, Licensing Supervisor, at 509-377-4792.

I declare under penalty of perjury that the foregoing is true and correct.
Executed this 27 day of January, 2020.

Respectfully,



R.E. Schuetz
Site Vice President

Attachments: As stated

cc: NRC RIV Regional Administrator
NRC NRR Project Manager
NRC Senior Resident Inspector/988C
CD Sonoda – BPA/1399 (email)
EFSECutc.wa.gov – EFSEC (email)
E Fordham – WDOH (email)
R Brice – WDOH (email)
L Albin – WDOP (email)

Description and Assessment

1.0 DESCRIPTION

Energy Northwest requests adoption of Technical Specification Task Force (TSTF)-566, "Revise Actions for Inoperable RHR-Shutdown Cooling Subsystems," which is an approved change to the Improved Standard Technical Specifications (ISTS), into the Columbia Generating Station (Columbia) Technical Specifications (TS). The proposed amendment revises the TS actions applicable when a residual heat removal (RHR) shutdown cooling subsystem is inoperable.

2.0 ASSESSEMENT

2.1 Applicability of Safety Evaluation

Energy Northwest has reviewed the safety evaluation for TSTF-566 provided to the Technical Specifications Task Force in a letter dated February 21, 2019. This review included a review of the NRC staff's evaluation, as well as the information provided in TSTF-566. As described herein, Energy Northwest has concluded that the justifications presented in TSTF-566 and the safety evaluation prepared by the NRC staff are applicable to Columbia and justify this amendment for the incorporation of the changes to the Columbia TS.

2.2 Variations

Columbia is a Boiling Water Reactor (BWR)/5 plant. Columbia's TS 3.4.9, 3.4.10, 3.9.8, and 3.9.9 are aligned with BWR/6 Standard Technical Specifications (STS) (NUREG-1434).

Energy Northwest is not proposing any variations from the TS changes described in NUREG-1434 for TSTF-566 or the applicable parts of the NRC staff's safety evaluation dated February 21, 2019.

Energy Northwest is proposing the following variations associated with TS Bases markups provided in NUREG-1434 for TSTF-566. These variations do not affect the applicability of TSTF-566 or the NRC's staff's safety evaluation dated February 21, 2019.

2.2.1 TS Bases 3.4.9

NUREG-1434, contains "Spent Fuel Pool Cooling System" as an alternate method for decay heat removal. Columbia's TS Bases does not contain "Spent Fuel Pool Cooling System." Columbia's Fuel Pool Cooling System does not contain the word "Spent." This is an acceptable variation.

Columbia's Fuel Pool Cooling System cannot be aligned for use for decay heat removal from the core as an alternate method of decay heat removal without the Reactor Pressure Vessel (RPV) head off and the RPV cavity flooded up to the Fuel Pool level with the gates open between the RPV cavity and the Fuel Pool. This an acceptable variation.

Additionally, Columbia TS Bases contains additional systems not included in NUREG-1434; Condensate, Main Steam, Control Rod Drive and Emergency Core Cooling Systems (ECCS). These systems are Columbia specific systems used in alternate decay heat removal alignments and provide more detail than currently specified in NUREG-1434 and TSTF-566. As such, this is an acceptable variation.

2.2.2 TS Bases 3.4.10

NUREG-1434, contains "Spent Fuel Pool Cooling System" as an alternate method for decay heat removal. Columbia's Fuel Cooling System does not contain the word "Spent." This is an acceptable variation.

Columbia's Fuel Pool Cooling System cannot be aligned for use for decay heat removal from the core as an alternate method of decay heat removal without the Reactor Pressure Vessel (RPV) head off and the RPV cavity flooded up to the Fuel Pool level with the gates open between the RPV cavity and the Fuel Pool. This an acceptable variation.

Additionally, Columbia TS Bases contains additional systems not included in NUREG-1434; Condensate, Control Rod Drive, and Emergency Core Cooling Systems (ECCS). These systems are Columbia specific systems used in alternate decay heat removal alignments and provide more detail than currently specified in NUREG-1434 and TSTF-566. As such, this is an acceptable variation.

2.2.3 TS Bases 3.9.8

NUREG-1434, contains "Spent Fuel Pool Cooling System" as an alternate method for decay heat removal. Columbia's Fuel Pool Cooling System does not contain the word "Spent." This is an acceptable variation.

Additionally, Columbia TS Bases contains additional systems not included in NUREG-1434; Condensate and Control Rod Drive Systems. These systems are Columbia specific systems used in alternate decay heat removal alignments and provide more detail than currently specified in NUREG-1434 or TSTF-566. As such, this is an acceptable variation.

2.2.4 TS Bases 3.9.9

NUREG-1434, contains “Spent Fuel Pool Cooling System” as an alternate method for decay heat removal. Columbia’s Fuel Pool Cooling System does not contain the word “Spent.” This is an acceptable variation.

Additionally, Columbia TS Bases contains additional systems not included in NUREG-1434; Condensate and Control Rod Drive Systems. These systems are Columbia specific systems used in alternate decay heat removal alignments and provide more detail than currently specified in NUREG-1434 or TSTF-566. As such, this is an acceptable variation.

3.0 REGULATORY ANALYSIS

3.1 SIGNIFICANT HAZARDS CONSIDERATION

Energy Northwest requests adoption of Technical Specification Task Force (TSTF)-566, "Revise Actions for Inoperable RHR [Residual Heat Removal] Shutdown Cooling Subsystems," which is an approved change to the Improved Standard Technical Specifications (ISTS), into the Columbia Generating Station (Columbia) Technical Specifications (TS).

The proposed amendment revises the TS actions applicable when a RHR shutdown cooling subsystem is inoperable.

Energy Northwest has evaluated whether or not a significant hazards consideration is involved with the proposed amendment 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 revises the actions to be taken when a RHR shutdown cooling subsystem is inoperable. The RHR System in the shutdown cooling mode performs the important safety function of removing decay heat from the reactor coolant system during shutdown. The RHR System in the shutdown cooling mode is not an initiator of any accident previously evaluated or assumed to mitigate any accident previously evaluated. The design and function of the RHR System are not affected by the proposed change.

   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 revises the actions to be taken when a RHR shutdown cooling subsystem is inoperable. The proposed change does not affect the design function or operation of the RHR shutdown cooling subsystems. No new equipment is being installed as a result of the proposed change. The proposed change only affects the actions taken when an RHR shutdown cooling subsystem is inoperable, so no new failure mechanisms are 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 revises the actions to be taken when a RHR shutdown cooling subsystem is inoperable. The proposed change does not change any specific values or controlling parameters that define margin in the design or licensing basis. No safety limits are affected by the proposed change. The RHR System in the shutdown cooling mode removes decay heat from the reactor coolant system during shutdown. The proposed change does not affect any design or safety limits associated with the RHR System.

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

Based on the above, Energy Northwest concludes that the proposed amendment does not involve a 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.

4.0 CONCLUSIONS

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.

5.0 ENVIRONMENTAL CONSIDERATION

The proposed change 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 change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or 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 change 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 change.

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Attachment 2

Proposed Columbia Technical Specification Changes (Mark-Up)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown

LCO 3.4.9 Two RHR shutdown cooling subsystems shall be OPERABLE, and, with no recirculation pump in operation, at least one RHR shutdown cooling subsystem shall be in operation.

----------NOTES----------
1. Both RHR shutdown cooling subsystems and recirculation pumps may be removed from operation for up to 2 hours per 8 hour period.

2. One RHR shutdown cooling subsystem may be inoperable for up to 2 hours for performance of Surveillances.

APPLICABILITY: MODE 3 with reactor steam dome pressure less than 48 psig.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each RHR shutdown cooling subsystem.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two RHR shutdown cooling subsystems inoperable.	~~A.1 Initiate action to restore RHR shutdown cooling subsystem to OPERABLE status.~~ ~~AND~~ A.~~2~~1 Verify an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem. ~~AND~~ ~~A.3 Be in MODE 4.~~	~~Immediately~~ 1 hour AND Once per 24 hours thereafter ~~24 hours~~
B. Required Action and associated Completion	B.1 Initiate action to restore RHR shutdown cooling	Immediately

CONDITION	REQUIRED ACTION	COMPLETION TIME
Time of Condition A not met.	subsystem(s) to OPERABLE status.	

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~B~~C. No RHR shutdown cooling subsystem in operation. AND No recirculation pump in operation.	~~B~~C.1 Initiate action to restore one RHR shutdown cooling subsystem or one recirculation pump to operation. AND	Immediately
	~~B~~C.2 Verify reactor coolant circulation by an alternate method.	1 hour from discovery of no reactor coolant circulation AND Once per 12 hours thereafter
	AND	
	~~B~~C.3 Monitor reactor coolant temperature and pressure.	Once per hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	----------NOTE---------- Not required to be met until 2 hours after reactor steam dome pressure is less than 48 psig. ---------- Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown

LCO 3.4.10 Two RHR shutdown cooling subsystems shall be OPERABLE, and, with no recirculation pump in operation, at least one RHR shutdown cooling subsystem shall be in operation.

----------NOTES----------
1. Both RHR shutdown cooling subsystems and recirculation pumps may be removed from operation for up to 2 hours per 8 hour period.

2. One RHR shutdown cooling subsystem may be inoperable for up to 2 hours for the performance of Surveillances.

APPLICABILITY: MODE 4.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each RHR shutdown cooling subsystem.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two RHR shutdown cooling subsystems inoperable.	A.1 Verify an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem.	1 hour AND Once per 24 hours thereafter
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to restore RHR shutdown cooling subsystem(s) to OPERABLE status.	Immediately

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~B~~C. No RHR shutdown cooling subsystem in operation. AND No recirculation pump in operation.	~~B~~C.1 Verify reactor coolant circulating by an alternate method. AND ~~B~~C.2 Monitor reactor coolant temperature and pressure.	1 hour from discovery of no reactor coolant circulation AND Once per 12 hours thereafter Once per hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program
SR 3.4.10.2	Verify RHR shutdown cooling subsystem locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

Proposed Columbia Technical Specification Changes (Re-Typed)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown

LCO 3.4.9 Two RHR shutdown cooling subsystems shall be OPERABLE, and, with no recirculation pump in operation, at least one RHR shutdown cooling subsystem shall be in operation.

----------NOTES----------
1. Both RHR shutdown cooling subsystems and recirculation pumps may be removed from operation for up to 2 hours per 8 hour period.

2. One RHR shutdown cooling subsystem may be inoperable for up to 2 hours for performance of Surveillances.

APPLICABILITY: MODE 3 with reactor steam dome pressure less than 48 psig.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each RHR shutdown cooling subsystem.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two RHR shutdown cooling subsystems inoperable.	A.1 Verify an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem.	1 hour AND Once per 24 hours thereafter
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to restore RHR shutdown cooling subsystem(s) to OPERABLE status.	Immediately

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. No RHR shutdown cooling subsystem in operation. AND No recirculation pump in operation.	C.1	Initiate action to restore one RHR shutdown cooling subsystem or one recirculation pump to operation.	Immediately
	AND		
	C.2	Verify reactor coolant circulation by an alternate method.	1 hour from discovery of no reactor coolant circulation AND Once per 12 hours thereafter
	AND		
	C.3	Monitor reactor coolant temperature and pressure.	Once per hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	----------NOTE---------- Not required to be met until 2 hours after reactor steam dome pressure is less than 48 psig. ----------	
	Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown

LCO 3.4.10 Two RHR shutdown cooling subsystems shall be OPERABLE, and, with no recirculation pump in operation, at least one RHR shutdown cooling subsystem shall be in operation.

----------NOTES----------

1. Both RHR shutdown cooling subsystems and recirculation pumps may be removed from operation for up to 2 hours per 8 hour period.

2. One RHR shutdown cooling subsystem may be inoperable for up to 2 hours for the performance of Surveillances.

APPLICABILITY: MODE 4.

ACTIONS

----------NOTE----------

Separate Condition entry is allowed for each RHR shutdown cooling subsystem.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two RHR shutdown cooling subsystems inoperable.	A.1 Verify an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem.	1 hour AND Once per 24 hours thereafter
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to restore RHR shutdown cooling subsystem(s) to OPERABLE status.	Immediately

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. No RHR shutdown cooling subsystem in operation. AND No recirculation pump in operation.	C.1 Verify reactor coolant circulating by an alternate method. AND C.2 Monitor reactor coolant temperature and pressure.	1 hour from discovery of no reactor coolant circulation AND Once per 12 hours thereafter Once per hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program
SR 3.4.10.2	Verify RHR shutdown cooling subsystem locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

Proposed Technical Specification Bases Markup Pages
For information Only

BASES

ACTIONS

A Note has been provided to modify the ACTIONS related to RHR shutdown cooling subsystems. Section 1.3, Completion Times, specifies once a Condition has been entered, subsequent divisions, subsystems, components or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable shutdown cooling subsystems provide appropriate compensatory measures for separate inoperable shutdown cooling subsystems. As such, a Note has been provided that allows separate Condition entry for each inoperable RHR shutdown cooling subsystem.

A.1~~, A.2, and A.3~~

With one RHR shutdown cooling subsystem inoperable for decay heat removal, except as permitted by LCO Note 2, ~~the inoperable subsystem must be restored to OPERABLE status without delay. In this condition, the remaining OPERABLE subsystem can provide the necessary decay heat removal. T~~the overall reliability is reduced~~, however,~~ because a single failure in the OPERABLE subsystem could result in reduced RHR shutdown cooling capability. Therefore an alternate method of decay heat removal must be provided.

With both RHR shutdown cooling subsystems inoperable, an alternate method of decay heat removal must be provided in addition to that provided for the initial RHR shutdown cooling subsystem inoperability. This re-establishes backup decay heat removal capabilities, similar to the requirements of the LCO. The 1 hour Completion Time is based on the decay heat removal function and the probability of a loss of the available decay heat removal capabilities. Furthermore, verification of the functional availability of these alternate method(s) must be reconfirmed every 24 hours thereafter. This will provide assurance of continued heat removal capability.

The required cooling capacity of the alternate method should be ~~ensured~~ sufficient to ~~by verifying (by calculation or demonstration) its capability to~~ maintain or reduce temperature. Decay heat removal by ambient losses can be considered as, or contributing to, the alternate method capability. Alternate methods that can be used include (but are not limited to) the Condensate and Main Steam Systems, the Reactor Water Cleanup System (by itself, or using feed and bleed in combination with the Control Rod Drive System or Condensate System)~~ and~~, a combination of an ECCS pump and a safety/relief valve, or an inoperable but functional RHR shutdown cooling subsystem.

~~However, due to the potentially reduced reliability of the alternate methods of decay heat removal, it is also required to reduce the reactor coolant temperature to the point where MODE 4 is entered.~~

B.1

If the required alternate method(s) of decay heat removal cannot be verified within one hour, immediate action must be taken to restore the inoperable RHR shutdown cooling subsystem(s) to operable status. The Required Action will restore redundant decay heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

BASES

ACTIONS (continued)

~~B~~C.1, ~~B~~C.2, and ~~B~~C.3

With no RHR shutdown cooling subsystem and no recirculation pump in operation, except as is permitted by LCO Note 1, reactor coolant circulation by the RHR shutdown cooling subsystem or one recirculation pump must be restored without delay.

Until RHR or recirculation pump operation is re-established, an alternate method of reactor coolant circulation must be placed into service. This will provide the necessary circulation for monitoring coolant temperature. The 1 hour Completion Time is based on the coolant circulation function and is modified such that the 1 hour is applicable separately for each occurrence involving a loss of circulation. Furthermore, verification of the functioning of the alternate method must be reconfirmed every 12 hours thereafter. This will provide assurance of continued temperature monitoring capability.

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR shutdown cooling subsystem or recirculation pump), the reactor coolant temperature and pressure must be periodically monitored to ensure proper function of the alternate method. The once per hour Completion Time is deemed appropriate.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

This Surveillance verifies that one RHR shutdown cooling subsystem or recirculation pump is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This Surveillance is modified by a Note allowing sufficient time to align the RHR System for shutdown cooling operation after achieving less than 48 psig reactor steam dome pressure, or for placing a recirculation pump in operation. The Note takes exception to the requirements of the Surveillance being met (i.e., forced coolant circulation is not required for this initial 2 hour period), which also allows entry into the Applicability of this Specification in accordance with SR 3.0.4 since the Surveillance will not be "not met" at the time of entry into the Applicability.

BASES

ACTIONS (continued)

capabilities, similar to the requirements of the LCO. The 1 hour Completion Time is based on the decay heat removal function and the probability of a loss of the available decay heat removal capabilities. Furthermore, verification of the functional availability of these alternate method(s) must be reconfirmed every 24 hours thereafter. This will provide assurance of continued heat removal capability.

The required cooling capacity of the alternate method should be ~~ensured by verifying (by calculation or demonstration) its capability~~sufficient to maintain or reduce temperature. Decay heat removal by ambient losses can be considered as, or contributing to, the alternate method capability. Alternate methods that can be used include (but are not limited to) ~~-~~the Reactor Water Cleanup System (by itself, or using feed and bleed in combination with the Control Rod Drive System, or Condensate System), ~~and~~ a combination of an ECCS pump and a safety/relief valve, or an inoperable but functional RHR shutdown cooling subsystem.

B.1

If the required alternate method(s) of decay heat removal cannot be verified within one hour, immediate action must be taken to restore the inoperable RHR shutdown cooling subsystem(s) to operable status. The Required Action will restore redundant decay heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

~~B~~C.1 and ~~B~~C.2

With no RHR shutdown cooling subsystem and no recirculation pump in operation, except as is permitted by LCO Note 1, and until RHR or recirculation pump operation is re-established, an alternate method of reactor coolant circulation must be placed into service. This will provide the necessary circulation for monitoring coolant temperature. The 1 hour Completion Time is based on the coolant circulation function and is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation. Furthermore, verification of the functioning of the alternate method must be reconfirmed every 12 hours thereafter. This will provide assurance of continued temperature monitoring capability.

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR shutdown cooling subsystem or recirculation pump), the reactor coolant temperature and pressure must be periodically monitored to ensure proper function of the

BASES

LCO (continued)

reactor coolant temperature as required. However, to ensure adequate core flow to allow for accurate average reactor coolant temperature monitoring, nearly continuous operation is required. A Note is provided to allow a 2 hour exception for the operating subsystem to be removed from operation every 8 hours.

APPLICABILITY

One RHR shutdown cooling subsystem must be OPERABLE in MODE 5, with irradiated fuel in the RPV and the water level ≥ 22 ft above the top of the RPV flange, to provide decay heat removal. RHR shutdown cooling subsystem requirements in other MODES are covered by LCOs in Section 3.4, Reactor Coolant System (RCS). RHR shutdown cooling subsystem requirements in MODE 5, with irradiated fuel in the RPV and the water level < 22 ft above the RPV flange, are given in LCO 3.9.9, "Residual Heat Removal (RHR) - Low Water Level."

ACTIONS

A.1

With no RHR shutdown cooling subsystem OPERABLE, an alternate method of decay heat removal must be established within 1 hour. In this condition, the volume of water above the RPV flange provides adequate capability to remove decay heat from the reactor core. However, the overall reliability is reduced because loss of water level could result in reduced decay heat removal capability. The 1 hour Completion Time is based on the decay heat removal function and the probability of a loss of the available decay heat removal capabilities. Furthermore, verification of the functional availability of the alternate method must be reconfirmed every 24 hours thereafter. This will ensure continued heat removal capability.

Alternate decay heat removal methods are available to the operators for review and preplanning in the unit Operating Procedures. The required cooling capacity of the alternate method should be ~~ensured by verifying (by calculation or demonstration) its capability to~~sufficient to maintain or reduce temperature. Decay heat removal by ambient losses can be considered as, or contributing to, the alternate method capability. Alternate methods that can be used include (but are not limited to) the Fuel Pool Cooling System, the Reactor Water Cleanup System, or an inoperable but functional RHR shutdown cooling subsystem.~~For example, this may include the use of the Fuel Pool Cooling System, and the Reactor Water Cleanup System operating with the regenerative heat exchanger bypassed or in combination with the Control Rod Drive System or Condensate System.~~ The method used to remove the decay heat should be the most prudent choice based on unit conditions.

BASES

APPLICABILITY

Two RHR shutdown cooling subsystems are required to be OPERABLE in MODE 5, with irradiated fuel in the RPV and the water level < 22 ft above the top of the RPV flange, to provide decay heat removal. RHR shutdown cooling subsystem requirements in other MODES are covered by LCOs in Section 3.4, Reactor Coolant System (RCS). RHR shutdown cooling subsystem requirements in MODE 5, with irradiated fuel in the RPV and the water level ≥ 22 ft above the RPV flange, are given in LCO 3.9.8, "Residual Heat Removal (RHR) - High Water Level."

ACTIONS

A.1

With one of the two RHR shutdown cooling subsystems inoperable, the remaining subsystem is capable of providing the required decay heat removal. However, the overall reliability is reduced. Therefore, an alternate method of decay heat removal must be provided. With both RHR shutdown cooling subsystems inoperable, an alternate method of decay heat removal must be provided in addition to that provided for the initial RHR shutdown cooling subsystem inoperability. This re-establishes backup decay heat removal capabilities, similar to the requirements of the LCO. The 1 hour Completion Time is based on the decay heat removal function and the probability of a loss of the available decay heat removal capabilities. Furthermore, verification of the functional availability of these alternate method(s) must be reconfirmed every 24 hours thereafter. This will ensure continued heat removal capability.

Alternate decay heat removal methods are available to the operators for review and preplanning in the unit Operating Procedures. The required cooling capacity of the alternate method~~(s)~~ should ~~be ensured by verifying (by calculation or demonstration) their capacity~~sufficient to maintain or reduce temperature. Decay heat removal by ambient losses can be considered as, or contributing to, the alternate method capability. Alternate methods that can be used include (but are not limited to) the Fuel Pool Cooling System, the Reactor Water Cleanup System, or an inoperable but functional RHR shutdown cooling subsystem~~For example, this may include the use of the Fuel Pool Cooling System, and the Reactor Water Cleanup System operating with the regenerative heat exchanger bypassed or in combination with the Control Rod Drive System or Condensate System.~~ The method used to remove decay heat should be the most prudent choice based on unit conditions.

B.1, B.2, and B.3

With the required decay heat removal subsystem(s) inoperable and the required alternate method(s) of decay heat removal not available in accordance with Required Action A.1, additional actions are required to minimize any potential fission product release to the environment. This includes ensuring secondary containment is OPERABLE, one standby