

ATTACHMENT 2A TO AEP:NRC:1314

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HOT SHUTDOWN

LIMITING CONDITION FOR OPERATION

- 3.4.1.3 a. The coolant loops listed below shall be OPERABLE and in operation as required by items b and c:
1. Reactor Coolant Loop 1 and its associated steam generator and reactor coolant pump,*
 2. Reactor Coolant Loop 2 and its associated steam generator and reactor coolant pump,*
 3. Reactor Coolant Loop 3 and its associated steam generator and reactor coolant pump,*
 4. Reactor Coolant Loop 4 and its associated steam generator and reactor coolant pump,*
 5. Residual Heat Removal - East, ~~***~~
 6. Residual Heat Removal - West, ~~***~~
- b. At least two of the above coolant loops shall be OPERABLE and at least one loop in operation if the reactor trip breakers are in the open position, or the control rod drive system is not capable of rod withdrawal.*** **
- c. At least three of the above reactor coolant loops shall be OPERABLE and in operation when the reactor trip system breakers are in the closed position and the control rod drive system is capable of rod withdrawal.

APPLICABILITY: MODES 4 and 5

~~* A reactor coolant pump shall not be started with one or more of the RCS cold leg temperatures less than or equal to 152°F unless 1) the pressurizer water volume is less than 62% of span or 2) the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.~~

~~*** The normal or emergency power source may be inoperable in MODE 5.~~

~~***~~ All reactor coolant pumps and residual heat removal pumps may be de-energized for up to 1 hour provided 1) no operations are permitted that would cause dilution of the reactor coolant system boron concentration***, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

~~***~~ For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2. (MODE 4) or 3.1.2.7.b.2 (MODE 5).

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

LIMITING CONDITION FOR OPERATION (Continued).

ACTION:

- a. With less than the above required coolant loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible; be in COLD SHUTDOWN within 20 hours.
- b. With less than the number of operating coolant loops required by item c above, restore the required number of coolant loops within 2 hours or open the reactor trip breakers.
- c. With no coolant loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System⁷⁶ and immediately initiate corrective action to return the required coolant loop to operation.

SURVEILLANCE REQUIREMENTS

- 4.4.1.3.1 The required residual heat removal loop(s) shall be determined OPERABLE per Specification 4.0.5.
- 4.4.1.3.2 The required reactor coolant pump(s), if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.
- 4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side level to be greater than or equal to 25% of wide range instrument span at least once per 12 hours.
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- 4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

⁷⁶For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2 (MODE 4) or 3.1.2.7.b.2 (MODE 5).

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4 At least one residual heat removal (RHR) loop[†] shall be OPERABLE and in operation*, and either:

- a. One additional RHR loop shall be OPERABLE**, or
- b. The secondary side water level of at least two steam generators shall be greater than or equal to 76% of wide range instrument span.

APPLICABILITY: MODE 5 with reactor coolant loops filled.***

ACTION:

- a. With one of the RHR loops inoperable and with less than the required steam generator water level, immediately initiate corrective action to return the inoperable RHR loop to OPERABLE status or restore the required steam generator water level as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

- 4.4.1.4.1 The secondary side water level of at least two steam generators when required shall be determined to be within limits at least once per 12 hours.
- 4.4.1.4.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

* The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,^{††} and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

** One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

*** A reactor coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 152°F unless (1) the pressurizer water volume is less than 62% of span or (2) the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

† The normal or emergency power source may be inoperable.

†† For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.5 At least two residual heat removal (RHR) loops*** shall be OPERABLE* and at least one RHR loop shall be in operation.**

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

- a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.5 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

* One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

** The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,[†] and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

*** The normal or emergency power source may be inoperable.

[†] For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4.4.1 REACTOR COOLANT LOOPS

The plant is designed to operate with all reactor coolant loops in operation, and maintain DNBR above the safety analysis limit during all normal operations and anticipated transients. A loss of flow in two loops will cause a reactor trip if operating above P-7 (11 percent of RATED THERMAL POWER) while a loss of flow in one loop will cause a reactor trip if operating above P-8 (31 percent of RATED THERMAL POWER).

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE. Three loops are required to be OPERABLE and to operate if the control rods are capable of withdrawal and the reactor trip breakers are closed. The requirement assures adequate DNBR margin in the event of an uncontrolled rod withdrawal in this mode.

In ~~MODES 4 and 5~~, a single reactor coolant loop or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. Thus, ~~if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.~~ (either RHR or RCS)

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump below P-7 with one or more RCS cold legs less than or equal to 152°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

Insert text from following page

4, and in MODE 5 with reactor coolant loops filled,

INSERT FOR PAGE B 3/4 4-1 (Unit 1)

In order for an RHR loop to be operable in MODE 4, the essential service water and component cooling water systems that support it shall be OPERABLE as well.

In MODE 5 with reactor coolant loops not filled, a single RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations, and the unavailability of the steam generators as a heat removing component, require that at least two RHR loops be OPERABLE.

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HOT

SHUTDOWN

LIMITING CONDITION FOR OPERATION

- 3.4.1.3 a. The coolant loops listed below shall be OPERABLE and in operation as required by items b and c:
1. Reactor Coolant Loop 1 and its associated steam generator and reactor coolant pump,*
 2. Reactor Coolant Loop 2 and its associated steam generator and reactor coolant pump,*
 3. Reactor Coolant Loop 3 and its associated steam generator and reactor coolant pump,*
 4. Reactor Coolant Loop 4 and its associated steam generator and reactor coolant pump,*
 5. Residual Heat Removal - East, ~~***~~
 6. Residual Heat Removal - West ~~***~~
- b. At least two of the above coolant loops shall be OPERABLE and at least one loop in operation if the reactor trip breakers are in the open position, or the control rod drive system is not capable of rod withdrawal.*** **
- c. At least three of the above reactor coolant loops shall be OPERABLE and in operation when the reactor trip system breakers are in the closed position and the control rod drive system is capable of rod withdrawal.

APPLICABILITY: MODES 4 and 5

~~* A reactor coolant pump shall not be started with one or more of the RGS cold leg temperatures less than or equal to 152°F unless 1) the pressurizer water volume is less than 62% of span or 2) the secondary water temperature of each steam generator is less than 50°F above each of the RGS cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.~~

~~** The normal or emergency power source may be inoperable in MODE 5.~~

~~*** All reactor coolant pumps and residual heat removal pumps may be de-energized for up to 1 hour provided 1) no operations are permitted that would cause dilution of the reactor coolant system boron concentration***, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.~~

~~**** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2. (MODE 4) or 3.1.2.7.b.2 (MODE 5).~~

LIMITING CONDITION FOR OPERATION (Continued)

ACTION:

- a. With less than the above required loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible; be in COLD SHUTDOWN within 20 hours.
- b. With less than the number of operating coolant loops required by item c above, restore the required number of coolant loops within 2 hours or open the reactor trip breakers.
- c. With no coolant loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System ^{***} and immediately initiate corrective action to return the required coolant loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.3.1 The required residual heat removal loop(s) shall be determined OPERABLE per Specification 4.0.5.

4.4.1.3.2 The required reactor coolant pump(s), if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.

4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side level to be greater than or equal to 25% of wide range instrument span at least once per 12 hours. 76

4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

**** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2, (MODE 4) or 3.1.2.7.b.2 (MODE 5).

3/4 4 REACTOR COOLANT SYSTEM

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3/4.4 REACTOR COOLANT SYSTEM

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3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4 At least one residual heat removal (RHR) loop[†] shall be OPERABLE and in operation*, and either:

- a. One additional RHR loop shall be OPERABLE**, or
- b. The secondary side water level of at least two steam generators shall be greater than or equal to 76% of wide range instrument span.

APPLICABILITY: MODE 5 with reactor coolant loops filled.***

ACTION:

- a. With one of the RHR loops inoperable and with less than the required steam generator water level, immediately initiate corrective action to return the inoperable RHR loop to OPERABLE status or restore the required steam generator water level as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

- 4.4.1.4.1 The secondary side water level of at least two steam generators when required shall be determined to be within limits at least once per 12 hours.
- 4.4.1.4.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

* The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,^{††} and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

** One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

*** A reactor coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 152°F unless (1) the pressurizer water volume is less than 62% of span or (2) the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

† The normal or emergency power source may be inoperable.

†† For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.5 At least two residual heat removal (RHR) loops*** shall be OPERABLE* and at least one RHR loop shall be in operation.**

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

- a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.5 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

* One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

** The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,[†] and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

*** The normal or emergency power source may be inoperable.

[†] For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4.4 REACTOR COOLANT SYSTEM

BASES

3/4.4.1 REACTOR COOLANT LOOPS

The plant is designed to operate with all reactor coolant loops in operation, and maintain calculated DNBR above the design DNBR value during Condition I and II events. A loss of flow in two loops will cause a reactor trip if operating above P-7 (11 percent of RATED THERMAL POWER) while a loss of flow in one loop will cause a reactor trip if operating above P-8 (31 percent of RATED THERMAL POWER).

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE. Three loops are required to be OPERABLE and to operate if the control rods are capable of withdrawal and the reactor trip breakers are closed. The requirement assures adequate DNBR margin in the event of an uncontrolled rod withdrawal in this mode.

In MODES ~~4 and 5~~, a single reactor coolant loop ^(either RHR or RCS) or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. ~~Thus, if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.~~

→ The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more RCS cold legs less than or equal to 152°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into, or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

Insert text from following page

4, and in MODE 5 with reactor coolant loops filled,

INSERT FOR PAGE B 3/4 4-1 (Unit 2)

In order for an RHR loop to be operable in MODE 4, the essential service water and component cooling water systems that support it shall be OPERABLE as well.

In MODE 5 with reactor coolant loops not filled, a single RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations, and the unavailability of the steam generators as a heat removing component, require that at least two RHR loops be OPERABLE.

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3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

HOT SHUTDOWN

LIMITING CONDITION FOR OPERATION

- 3.4.1.3 a. The coolant loops listed below shall be OPERABLE and in operation as required by items b and c:
1. Reactor Coolant Loop 1 and its associated steam generator and reactor coolant pump,*
 2. Reactor Coolant Loop 2 and its associated steam generator and reactor coolant pump,*
 3. Reactor Coolant Loop 3 and its associated steam generator and reactor coolant pump,*
 4. Reactor Coolant Loop 4 and its associated steam generator and reactor coolant pump,*
 5. Residual Heat Removal - East,
 6. Residual Heat Removal - West,
- b. At least two of the above coolant loops shall be OPERABLE and at least one loop in operation if the reactor trip breakers are in the open position, or the control rod drive system is not capable of rod withdrawal.**
- c. At least three of the above reactor coolant loops shall be OPERABLE and in operation when the reactor trip system breakers are in the closed position and the control rod drive system is capable of rod withdrawal.

APPLICABILITY: MODE 4

* Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

** All reactor coolant pumps and residual heat removal pumps may be de-energized for up to 1 hour provided 1) no operations are permitted that would cause dilution of the reactor coolant system boron concentration***, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

*** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

LIMITING CONDITION FOR OPERATION (Continued)

ACTION:

- a. With less than the above required coolant loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible; be in COLD SHUTDOWN within 20 hours.
- b. With less than the number of operating coolant loops required by item c above, restore the required number of coolant loops within 2 hours or open the reactor trip breakers.
- c. With no coolant loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System*** and immediately initiate corrective action to return the required coolant loop to operation.

SURVEILLANCE REQUIREMENTS

- 4.4.1.3.1 The required residual heat removal loop(s) shall be determined OPERABLE per Specification 4.0.5.
- 4.4.1.3.2 The required reactor coolant pump(s), if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.
- 4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side level to be greater than or equal to 76% of wide range instrument span at least once per 12 hours.
- 4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

*** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4 At least one residual heat removal (RHR) loop[†] shall be OPERABLE and in operation*, and either:

- a. One additional RHR loop shall be OPERABLE**, or
- b. The secondary side water level of at least two steam generators shall be greater than or equal to 76% of wide range instrument span.

APPLICABILITY: MODE 5 with reactor coolant loops filled.***

ACTION:

- a. With one of the RHR loops inoperable and with less than the required steam generator water level, immediately initiate corrective action to return the inoperable RHR loop to OPERABLE status or restore the required steam generator water level as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

- 4.4.1.4.1 The secondary side water level of at least two steam generators when required shall be determined to be within limits at least once per 12 hours.
- 4.4.1.4.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

* The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,^{††} and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

** One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

*** A reactor coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 152°F unless (1) the pressurizer water volume is less than 62% of span or (2) the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

† The normal or emergency power source may be inoperable.

†† For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

- 3.4.1.5 At least two residual heat removal (RHR) loops*** shall be OPERABLE* and at least one RHR loop shall be in operation.**

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

- a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

- 4.4.1.5 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

* One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

** The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,[†] and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

*** The normal or emergency power source may be inoperable.

[†] For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4 BASES
3/4.4 REACTOR COOLANT SYSTEM

3/4.4.1 REACTOR COOLANT LOOPS

The plant is designed to operate with all reactor coolant loops in operation, and maintain DNBR above the safety analysis limit during all normal operations and anticipated transients. A loss of flow in two loops will cause a reactor trip if operating above P-7 (11 percent of RATED THERMAL POWER) while a loss of flow in one loop will cause a reactor trip if operating above P-8 (31 percent of RATED THERMAL POWER).

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE. Three loops are required to be OPERABLE and to operate if the control rods are capable of withdrawal and the reactor trip breakers are closed. The requirement assures adequate DNBR margin in the event of an uncontrolled rod withdrawal in this mode.

In MODE 4, and in MODE 5 with reactor coolant loops filled, a single reactor coolant loop or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops (either RHR or RCS) be OPERABLE. In order for an RHR loop to be OPERABLE in MODE 4, the essential service water and component cooling water systems that support it shall be OPERABLE as well.

In MODE 5 with reactor coolant loops not filled, a single RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations, and the unavailability of the steam generators as a heat removing component, require that a least two RHR loops be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump below P-7 with one or more RCS cold legs less than or equal to 152°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

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3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

HOT SHUTDOWN

LIMITING CONDITION FOR OPERATION

- 3.4.1.3 a. The coolant loops listed below shall be OPERABLE and in operation as required by items b and c:
1. Reactor Coolant Loop 1 and its associated steam generator and reactor coolant pump,*
 2. Reactor Coolant Loop 2 and its associated steam generator and reactor coolant pump,*
 3. Reactor Coolant Loop 3 and its associated steam generator and reactor coolant pump,*
 4. Reactor Coolant Loop 4 and its associated steam generator and reactor coolant pump,*
 5. Residual Heat Removal - East,
 6. Residual Heat Removal - West
- b. At least two of the above coolant loops shall be OPERABLE and at least one loop in operation if the reactor trip breakers are in the open position, or the control rod drive system is not capable of rod withdrawal.**
- c. At least three of the above reactor coolant loops shall be OPERABLE and in operation when the reactor trip system breakers are in the closed position and the control rod drive system is capable of rod withdrawal.

APPLICABILITY: MODE 4

* Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

** All reactor coolant pumps and residual heat removal pumps may be de-energized for up to 1 hour provided 1) no operations are permitted that would cause dilution of the reactor coolant system boron concentration***, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

*** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

LIMITING CONDITION FOR OPERATION (Continued)

ACTION:

- a. With less than the above required loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible; be in COLD SHUTDOWN within 20 hours.
- b. With less than the number of operating coolant loops required by item c above, restore the required number of coolant loops within 2 hours or open the reactor trip breakers.
- c. With no coolant loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System*** and immediately initiate corrective action to return the required coolant loop to operation.

SURVEILLANCE REQUIREMENTS

- 4.4.1.3.1 The required residual heat removal loop(s) shall be determined OPERABLE per Specification 4.0.5.
- 4.4.1.3.2 The required reactor coolant pump(s), if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.
- 4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side level to be greater than or equal to 76% of wide range instrument span at least once per 12 hours.
- 4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

*** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2 (MODE 4).

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4 At least one residual heat removal (RHR) loop[†] shall be OPERABLE and in operation*, and either:

- a. One additional RHR loop shall be OPERABLE**, or
- b. The secondary side water level of at least two steam generators shall be greater than or equal to 76% of wide range instrument span.

APPLICABILITY: MODE 5 with reactor coolant loops filled.***

ACTION:

- a. With one of the RHR loops inoperable and with less than the required steam generator water level, immediately initiate corrective action to return the inoperable RHR loop to OPERABLE status or restore the required steam generator water level as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

- 4.4.1.4.1 The secondary side water level of at least two steam generators when required shall be determined to be within limits at least once per 12 hours.
- 4.4.1.4.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

* The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,^{††} and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

** One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

*** A reactor coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 152°F unless (1) the pressurizer water volume is less than 62% of span or (2) the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

† The normal or emergency power source may be inoperable.

†† For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

- 3.4.1.5 At least two residual heat removal (RHR) loops*** shall be OPERABLE* and at least one RHR loop shall be in operation.**

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

- a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

- 4.4.1.5 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

* One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

** The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,[†] and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

*** The normal or emergency power source may be inoperable.

[†] For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4 BASES
3/4.4 REACTOR COOLANT SYSTEM

3/4.4.1 REACTOR COOLANT LOOPS

The plant is designed to operate with all reactor coolant loops in operation, and maintain calculated DNBR above the design DNBR value during Condition I and II events. A loss of flow in two loops will cause a reactor trip if operating above P-7 (11 percent of RATED THERMAL POWER) while a loss of flow in one loop will cause a reactor trip if operating above P-8 (31 percent of RATED THERMAL POWER).

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE. Three loops are required to be OPERABLE and to operate if the control rods are capable of withdrawal and the reactor trip breakers are closed. The requirement assures adequate DNBR margin in the event of an uncontrolled rod withdrawal in this mode.

In MODE 4, and in MODE 5 with reactor coolant loops filled, a single reactor coolant loop or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops (either RHR or RCS) be OPERABLE. In order for an RHR loop to be OPERABLE in MODE 4, the essential service water and component cooling water systems that support it shall be OPERABLE as well.

In MODE 5 with reactor coolant loops not filled, a single RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations, and the unavailability of the steam generators as a heat removing component, require that at least two RHR loops be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more RCS cold legs less than or equal to 152°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into, or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

ATTACHMENT 4 TO AEP:NRC:1314

EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATION

Evaluation Of Significant Hazards Consideration

The licensee has evaluated this proposed amendment and determined that it involves no significant hazards consideration. According to 10 CFR 50.92(c), a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

1. Involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated;
2. Create the possibility of a new or different kind of accident from any previously analyzed; or
3. Involve a significant reduction in a margin of safety.

The licensee proposes to revise technical specification (T/S) 3.4.1.3, "Reactor Coolant System - Shutdown" for Donald C. Cook Nuclear Plant unit 1 and unit 2 to provide separate coolant loop requirements for mode 4, mode 5 with loops filled, and mode 5 with loops not filled. Currently T/S 3.4.1.3 has the same requirements for mode 4 and mode 5; however, the action statements for mode 5 are more restrictive than those in the Standard Technical Specifications. The change is required to support plant restart activities.

The determination that the criteria set forth in 10 CFR 50.92 are met for this amendment request is indicated below:

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

The proposed changes do not affect any accident initiators or precursors. In mode 4 and mode 5, coolant loops are required to remove decay heat and to mitigate a boron dilution event. The proposed changes allow the steam generators to be used to remove heat in mode 5 with the reactor coolant loops filled. The redundancy requirements continue to be met. Allowing an additional heat removal source increases the availability of a backup source. Increasing the required steam generator water level in mode 4 when a reactor coolant pump and associated steam generator are used is considered conservative. This provides reasonable assurance that decay heat can be removed as required. The proposed value bounds values previously used for emergency and abnormal operations. The proposed value includes margin for instrument uncertainties and process errors.

There are no significant impacts on loss of a residual heat removal system loop. The risk associated with reduced RHR inventory is minimized by ensuring that adequate heat removal capability is available and by implementing commitments made in response to NRC Generic Letter 88-17, "Loss of Decay Heat

Removal," and Generic Letter 87-12, "Loss of RHR While RCS Partially Filled."

The proposed changes do not impact the ability of the low temperature overpressure protection (LTOP) system to protect the RCS from overpressure transients. A review determined that the proposed changes do not impact the Licensee's previous commitments regarding LTOP. The proposed changes for mode 5 do not affect the ability of the LTOP devices to limit pressure in the RCS. Two events that would cause a transient are startup of an idle reactor coolant pump with secondary water temperature of the steam generator less than or equal to 50°F above the RCS cold leg temperature, or the start of a charging pump and its injection into a water solid RCS. The first event is addressed by limitations in notes to the mode 5 T/S. The second event is precluded by T/S 3.1.2.3. The proposed changes do not introduce any new events that could cause a pressure transient. Therefore, the LTOP system continues to serve its function.

The proposed changes have no impact on the ability to mitigate the postulated accidents. A review of the accident analyses determined that they remain bounding. The proposed changes provide assurance that decay heat is removed as designed and that redundancy is maintained. Therefore, it was concluded that there is no effect on the types or increase in the amounts of any effluent that may be released offsite. It was also concluded that the consequences of an accident are unchanged.

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

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

The proposed changes do not affect the design or operation of any system, structure, or component in the plant. The steam generators are designed to transfer heat from the primary coolant to the secondary coolant. Using them as an alternate heat sink in mode 5 with the reactor coolant loops filled is consistent with this design. There are no changes to parameters governing plant operation, and no new or different type of equipment will be installed. Therefore, it was concluded that the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

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

The proposed changes do not introduce new equipment, equipment modifications, or new or different modes of plant operation. These changes do not affect the operational characteristics of any equipment or systems. Increasing the required steam

generator water level in mode 4 increases the amount of heat that can be removed from the primary coolants. Allowing an alternate heat removal source in mode 5 with the loops filled increases margin by cooling the primary via a passive system (natural circulation). Therefore, it was concluded that no reduction in the margin of safety will occur as a result.

Therefore, these changes do not involve a significant reduction in the margin of safety.

In summary, based upon the above evaluation, the Licensee has concluded that these changes involve no significant hazards consideration.

ATTACHMENT 5 TO AEP:NRC:1314

ENVIRONMENTAL ASSESSMENT

Environmental Assessment

The Licensee has evaluated this license amendment request against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. The Licensee has determined that this license amendment request meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10 CFR 50 that changes a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or that changes an inspection or a surveillance requirement, and the amendment meets the following specific criteria:

- (i) The amendment involves no significant hazards consideration.

As demonstrated in attachment 4, this proposed amendment does not involve any significant hazards consideration.

- (ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.

As documented in attachment 1, there will be no change in the types or significant increase in the amounts of any effluents released offsite.

- (iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed changes will not result in significant changes in the operation or configuration of the facility. There will be no change in the level of controls or methodology used for processing of radioactive effluents or handling of solid radioactive waste, nor will the proposal result in any change in the normal radiation levels within the plant. Therefore, there will be no increase in individual or cumulative occupational radiation exposure resulting from this change.

