ATTACHMENT TO AEP:NRC:0692AR

PROPOSED CHANGES TO THE

DONALD C. COOK NUCLEAR PLANT UNIT NOS 1 AND 2

TECHNICAL SPECIFICATIONS

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3

a. One charging pump in the boron injection flow path required by Specification 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE emergency bus.

b. One charging flowpath associated with support of Unit 2 shutdown functions shall be in service.*

APPLICABILITY: Specification 3.1.2.3.a. - MODES 5 and 6
Specification 3.1.2.3.b. - At all times when Unit 2 is in MODES 1, 2, 3, or 4.

ACTION:

a. With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity.

b. With more than one charging pump OPERABLE or with a safety injection pump(s) OPERABLE when the temperature of any RCS cold leg is less than or equal to 170°F, unless the reactor vessel head is removed, remove the additional charging pump(s) and the safety injection pump(s) motor circuit breakers from the electrical power circuit within one hour.

c. The provisions of Specification 3.0.3 are not applicable.

d. In addition to the above, when Specification 3.1.2.3.b is applicable and the required flowpath is inoperable: Continue attempts to restore the required flowpath to an OPERABLE condition and conduct a roving firewatch patrol every 12 hours in the affected Unit 2 areas. If at the end of 30 days the flow path is still inoperable, write and submit to the NRC, within the next 10 days, a report detailing the plans and schedule to restore the flow path to OPERABLE status.

e. The requirements of Specification 3.0.4 are not applicable when Specification 3.1.2.3.b applies.

SURVEILLANCE REQUIREMENTS

4.1.2.3.1 The above-required charging pump shall be demonstrated OPERABLE at least once per 31 days by:

a. Starting (unless already operating) the pump from the control room,

b. Verifying, that on recirculation flow, the pump develops a discharge pressure of 2390 psig,

* A maximum of one centrifugal charging pump shall be OPERABLE whenever the temperature of one or more of the RCS cold legs is less than or equal to 170°F.

c. Verifying pump operation for at least 15 minutes, and

d. Verifying that the pump is aligned to receive electrical power from an OPERABLE emergency bus.

4.1.2.3.2 All charging pumps and safety injection pumps, excluding the above-required OPERABLE charging pump, shall be demonstrated inoperable by verifying that the motor circuit breakers have been removed from their electrical power supply circuits at least once per 12 hours, except when:

a. The reactor vessel head is removed, or

b. The temperature of all RCS cold legs is greater than 170°F.

4.1.2.3.3 Charging line cross-tie valves to Unit 2 will be cycled full travel at least once per 18 months. Following cycling, the valves will be verified to be in their closed positions.

TABLE 3.3-9

REMOTE SHUTDOWN MONITORING INSTRUMENTATION

INSTRUMENT	READOUT LOCATION	MEASUREMENT RANGE	MINIMUM CHANNELS OPERABLE
1. Reactor Trip Breaker Indication	Hot Shutdown Panel in Unit No. 2 Control Room	OPEN-CLOSE	1/trip breaker
2. Pressurizer Pressure	Hot Shutdown Panel in Unit No. 2 Control Room	1700-2500 psig	1
3. Pressurizer Level	Hot Shutdown Panel in Unit No. 2 Control Room	0-100% of instrument span	1
4. Steam Generator Pressure	Hot Shutdown Panel in Unit No. 2 Control Room	0-1200 psig	1/steam generator
5. Steam Generator Level	Hot Shutdown Panel in Unit No. 2 Control Room	0-100% wide range instrument span	1/steam generator
6. Steam Generators 1 and 4 Level	ISI Cabinet 1 and ISI Cabinet 4	0-100% wide range instrument span	one on each ISI cabinet for each steam generator
7. Steam Generators 2 and 3 Level	ISI Cabinet 2 and ISI Cabinet 4	0-100% wide range instrument span	one on each ISI cabinet for each steam generator
8. Steam Generators 1 and 4 Pressure	ISI Cabinet 4 and ISI Cabinet 5	0-1500 psig	one on each ISI cabinet for each steam generator
9. Steam Generators 2 and 3 Pressure	ISI Cabinet 4 and ISI Cabinet 6	0-1500 psig	one on each ISI cabinet for each steam generator

TABLE 3.3-9 (cont.)

REMOTE SHUTDOWN MONITORING INSTRUMENTATION

INSTRUMENT	READOUT LOCATION	MEASUREMENT RANGE	MINIMUM CHANNELS OPERABLE
10. Reactor Coolant Loops 1 and 4 Temperature (Cold)	LSI Cabinet 4 and LSI Cabinet 5	0-700°F	one on each LSI cabinet for each coolant loop
11. Reactor Coolant Loops 1 and 4 Temperature (Hot)	LSI Cabinet 4 and LSI Cabinet 5	0-700°F	one on each LSI cabinet for each coolant loop
12. Reactor Coolant Loops 2 and 3 Temperature (Cold)	LSI Cabinet 4 and LSI Cabinet 6	0-700°F	one on each LSI cabinet for each coolant loop
13. Reactor Coolant Loops 2 and 3 Temperature (Hot)	LSI Cabinet 4 and LSI Cabinet 6	0-700°F	one on each LSI cabinet for each coolant loop
14. Pressurizer Level	LSI Cabinet 3	0-100% of instrument span	1
15. Reactor Coolant System Pressure	LSI Cabinet 3	0-3000 psig	1
16. Charging Cross-Flow Between Units	Corridor Elev. 587'	0-150 gpm	1
17. Source Range Neutron Detector (N-23)	LSI Cabinet 4	1-1 X 10^6 cps	1

TABLE 4.3-6

REMOTE SHUTDOWN MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	LOCATION	CHANNEL CHECK	CHANNEL CALIBRATION
1. Reactor Trip Breaker Indication	Hot Shutdown Panel in Unit No. 2 Control Room	N.A.	N.A.
2. Pressurizer Pressure	Hot Shutdown Panel in Unit No. 2 Control Room	M	R
3. Pressurizer Level	Hot Shutdown Panel in Unit No. 2 Control Room	M	R
4. Steam Generator Level	Hot Shutdown Panel in Unit No. 2 Control Room	M	R
5. Steam Generator Pressure	Hot Shutdown Panel in Unit No. 2 Control Room	M	R
6. Steam Generators 1 and 4 Level	LSI Cabinet 1 and LSI Cabinet 4	M	R
7. Steam Generators 2 and 3 Level	LSI Cabinet 2 and LSI Cabinet 4	M	R
8. Steam Generators 1 and 4 Pressure	LSI Cabinet 4 and LSI Cabinet 5	M	R
9. Steam Generators 2 and 3 Pressure	LSI Cabinet 4 and LSI Cabinet 6	M	R
10. Reactor Coolant Loops 1 and 4 Temperature (Cold)	LSI Cabinet 4 and LSI Cabinet 5	M	R

TABLE 4.3-6 (cont.)

REMOTE SHUTDOWN MONITORING INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

INSTRUMENT	LOCATION	CHANNEL CHECK	CHANNEL CALIBRATION
11. Reactor Coolant Loops 1 and 4 Temperature (Hot)	LSI Cabinet 4 and LSI Cabinet 5	M	R
12. Reactor Coolant Loops 2 and 3 Temperature (Cold)	LSI Cabinet 4 and LSI Cabinet 6	M	R
13. Reactor Coolant Loops 2 and 3 Temperature (Hot)	LSI Cabinet 4 and LSI Cabinet 6	M	R
14. Pressurizer Level	LSI Cabinet 3	M	R
15. Reactor Coolant System Pressure	LSI Cabinet 3	M	R
16. Charging Cross-Flow Between Units	Corridor Elev. 587'	n/a	R*
17. Source Range Neutron Detector (N-23)	LSI Cabinet 4	n/a	R

* Charging Cross-Flow between Units is an instrument common to both Unit 1 and 2. This surveillance will only be conducted on an interval consistent with Unit 1 refueling.

PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2

a. At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:

   1. Two feedwater pumps, each capable of being powered from separate emergency busses, and

   2. One feedwater pump capable of being powered from an OPERABLE steam supply system.

b. At least one auxiliary feedwater flowpath in support of Unit 2 shutdown functions shall be OPERABLE.

APPLICABILITY: Specification 3.7.1.2.a - MODES 1, 2, 3.
Specification 3.7.1.2.b - At all times when Unit 2 is in MODES 1, 2, or 3.

ACTIONS:

When Specification 3.7.1.2.a is applicable.

a. With one auxiliary feedwater pump inoperable, restore the required auxiliary feedwater pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With two auxiliary feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status as soon as possible.

When Specification 3.7.1.2.b is applicable:

With less than one flowpath OPERABLE, continue attempts to restore the flowpath and conduct a firewatch patrol in affected Unit 2 areas every 12 hours. If at the end of 30 days the flow path is still inoperable, write and submit to the NRC, within the next 10 days, a report detailing the plans and schedule to restore the flow path to OPERABLE status. The requirements of Specification 3.0.4 are not applicable.

4.7.1.2 Each auxiliary feedwater pump shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verifying that each motor driven pump develops an equivalent discharge pressure of $\geq$ 1375 psig at 60°F on recirculation flow.

2. Verifying that the steam turbine driven pump develops a discharge pressure of $\geq$ 1285 psig at 60°F and at a flow of $\geq$ 700 gpm when the secondary steam supply pressure is greater than 310 psig. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3.

3. Verifying that each non-automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in its correct position.

4. Verifying that each automatic valve in the flow path is in the fully open position whenever the auxiliary feedwater system is placed in automatic control or when above 10% RATED THERMAL POWER. This requirement is not applicable for those portions of the Auxiliary Feedwater System being used intermittently to maintain steam generator level.

b. At least once per 18 months during shutdown by:

1. Verifying that each automatic valve in the flow path actuates to its correct position upon receipt of the appropriate engineered safety features actuation test signal required by Specification 3/4.3.2.

2. Verifying that each auxiliary feedwater pump starts as designed automatically upon receipt of the appropriate engineered safety features actuation test signal required by Specification 3/4.3.2.

3. Verifying that the unit cross-tie valves can cycle full travel. Following cycling, the valves will be verified to be in their closed positions.

PLANT SYSTEMS

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1

a. At least two independent component cooling water loops shall be OPERABLE.

b. At least one component cooling water flowpath in support of Unit 2 shutdown functions shall be OPERABLE.

APPLICABILITY: Specification 3.7.3.1.a. - MODES 1, 2, 3, 4.
Specification 3.7.3.1.b. - At all times when Unit 2 is in MODES 1, 2, 3, or 4.

ACTION:

When Specification 3.7.3.1.a is applicable.

With only one component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

When Specification 3.7.3.1.b is applicable:

With in OPERABLE flowpath to Unit 2, continue attempts to restore the required flowpath and conduct a firewatch patrol in the affected Unit 2 areas every 12 hours. If at the end of 30 days the flow path is still inoperable, write and submit to the NRC, within the next 10 days, a report detailing the plans and schedule to restore the flow path to OPERABLE status. The requirements of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two component cooling water loops shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by:

1. Starting (unless already operating) each pump from the control room.

2. Verifying that each pump develops at least 93% of the discharge pressure for the applicable flow rate as determined from the manufacturer's Pump Performance Curve.

3. Verifying that each pump operates for at least 15 minutes.

4. Cycling each testable power operated or automatic valve servicing safety related equipment through at least one complete cycle of full travel.

5. Verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown, by:

1. Cycling each power operated (excluding automatic) valve servicing safety related equipment that is not testable during plant operation, through at least one complete cycle of full travel.

2. Verifying that each automatic valve servicing safety related equipment actuates to its correct position on a safety injection signal.

3. Verify that the cross-tie valves can cycle full travel. Following cycling, the valves will be verified to be in their closed positions.

PLANT SYSTEMS

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1

a. At least two independent essential service water loops shall be OPERABLE.

b. At least one essential service water flowpath associated with support of Unit 2 shutdown functions shall be OPERABLE.

APPLICABILITY: Specification 3.7.4.1.a. - MODES 1, 2, 3, and 4.
Specification 3.7.4.1.b. - At all times when Unit 2 is in MODES 1, 2, 3 or 4.

ACTION:

When Specification 3.7.4.1.a is applicable.

With only one essential service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

When Specification 3.7.4.1.b is applicable:

With no essential service water flowpath OPERABLE in support of Unit 2 shutdown functions, continue attempts to restore the flowpath and conduct a firewatch patrol every 12 hours in the affected Unit 2 areas. If at the end of 30 days the flow path is still inoperable, write and submit to the NRC, within the next 10 days, a report detailing the plans and schedule to restore the flow path to OPERABLE status. The requirements of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two essential service water loops shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by:

1. Starting (unless already operating) each pump from the control room.

2. Verifying that each pump develops at least 93% of the discharge pressure for the applicable flow rate as determined from the manufacturer's Pump Performance Curve.

3. Verifying that each pump operates for at least 15 minutes.

4. Cycling each testable power operated or automatic valve servicing safety related equipment through at least one complete cycle of full travel.

5. Verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown, by:

1. Cycling each power operated (excluding automatic) valve servicing safety related equipment that is not testable during plant operation, through at least one complete cycle of full travel.

2. Verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection signal.

BORATION SYSTEMS (Continued)

With the RCS average temperature above 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The limitation for a maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps and safety injection pumps, except the required OPERABLE charging pump, to be inoperable below 170°F, unless the reactor vessel head is removed, provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The boration capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1% $\Delta k/k$ after xenon decay and cooldown from 200°F to 140°F. This condition requires either 835 gallons of 20,000 ppm borated water from the boric acid storage tanks or 9690 gallons of 1950 ppm borated water from the refueling water storage tank. The charging flowpath of Unit 1 required for Unit 2 shutdown support ensures that flow is available to Unit 2 and addresses the requirements of 10 CFR 50 Appendix R. The flowpath consists of a charging pump powered from an electrical bus and associated water supplies and delivery system.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of rod ejection accident are limited. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original criteria are met. Misalignment of a rod requires measurement of peaking factors or a restriction in THERMAL POWER; either of these restrictions provide assurance of fuel rod integrity during continued operation. The reactivity worth of a misaligned rod is limited for the remainder of the fuel cycle to prevent exceeding the assumptions used in the accident analysis for a rod ejection accident.

MOVABLE CONTROL ASSEMBLIES (Continued)

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the accident analyses. Measurement with $T_{avg} \geq 541^{\circ}F$ and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCO's are satisfied.

U = Maximum number of inoperable safety valves per operating steam line = 1, 2, or 3.

(109) = Power Range Neutron Flux-High Trip Setpoint for 4 loop operation.

(76) = Maximum percent of RATED THERMAL POWER permissible by P-8 Setpoint for 3 loop operation.

X = Total relieving capacity of all safety valves per steam line = 4,288,450 lbs/hour.

Y = Maximum relieving capacity of any one safety valve = 857,690 lbs/hour.

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the auxiliary feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of off-site power.

Each electric driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 450 gpm at a pressure of 1065 psig to the entrance of the steam generators. The steam driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 900 gpm at a pressure of 1065 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the Residual Heat Removal System may be placed into operation.

The acceptance discharge pressures for the auxiliary feedwater pumps are based on a fluid temperature of 60°F. Water density corrections are permitted to allow comparison of test results which vary depending on ambient conditions.

In addition to its safety design function, the AFW system is used to maintain steam generator level during startup (including low power operation). During this time, the system design allows for automatic initiation of the auxiliary feedwater pumps and their related automatic valves in the flow path.

The auxiliary feedwater flowpath, with a pump and associated water supplies and piping, will support shutdown cooling requirements of Unit 2. This capacity addresses the 10 CFR 50 Appendix R safe shutdown requirements.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values taken at +10°F and are sufficient to prevent brittle fracture.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident analyses.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

The OPERABILITY of the essential service water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a signal failure, is consistent with the assumptions used in the accident conditions within acceptable limits.

3/4.7.3 and 3/4.7.4

The OPERABILITY of the Unit 1 flowpaths which support Unit 2 shutdown functions ensures the availability of cooling functions on Unit 2 and addresses the requirements of 10 CFR 50 Appendix R. The required flowpath consists of a pump and associated water supplies and delivery systems.

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3

a. One charging pump in the boron injection flow path required by Specification 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE emergency bus.

b. One charging flowpath associated with support of Unit 1 shutdown functions shall be in service.*

APPLICABILITY: Specification 3.1.2.3.a. - MODES 5 and 6.
Specification 3.1.2.3.b. - At all times when Unit 1 is in MODES 1, 2, 3, or 4.

ACTION:

a. With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.**

b. With more than one charging pump OPERABLE or with a safety injection pump(s) OPERABLE when the temperature of any RCS cold leg is less than or equal to 152°F, unless the reactor vessel head is removed, remove the additional charging pump(s) and the safety injection pump(s) motor circuit breakers from the electrical power circuit within one hour.

c. The provisions of Specification 3.0.3 are not applicable.

d. In addition to the above, the Specification 3.1.2.3.b is applicable and the required flowpath is inoperable: Continue attempts to restore the required flowpath to an OPERABLE condition and conduct a roving firewatch patrol every 12 hours in the affected Unit 1 areas. If at the end of 30 days the flow path is still inoperable, write and submit to the NRC, within the next 10 days, a report detailing the plans and schedule to restore the flow path to OPERABLE status.

e. The requirements of Specification 3.0.4 are not applicable when Specification 3.1.2.3.b applies.

SURVEILLANCE REQUIREMENTS

4.1.2.3.1 The above-required charging pump shall be demonstrated OPERABLE by verifying, that no recirculation flow, the pump develops a discharge pressure of 2405 psig when tested pursuant to Specification 4.0.5.

*A maximum of one centrifuged charging pump shall be OPERABLE whenever the temperature of one or more of the RCS cold legs is less than or equal to 152°F.

**For purposes of this specification, addition of water from the RWST does not constitute a positive reactivity addition provided the boron concentration in the RWST is greater than the minimum required by Specification 3.1.2.7.b.2.

4.1.2.3.2 All charging pumps and safety injection pumps, excluding the above-required OPERABLE charging pump, shall be demonstrated inoperable by verifying that the motor circuit breakers have been removed from their electrical power supply circuits at least once per 12 hours, except when:

a. The reactor vessel head is removed, or

b. The temperature of all RCS cold legs is greater than 152°F.

4.1.2.3.3 Charging line cross-tie valves to Unit 1 will be cycled full travel at least once per 18 months. Following cycling, the valves will be verified to be in their closed positions.

TABLE 3.3-9

REMOTE SHUTDOWN MONITORING INSTRUMENTATION

INSTRUMENT	READOUT LOCATION	MEASUREMENT RANGE	MINIMUM CHANNELS OPERABLE
1. Reactor Trip Breaker Indication	Hot Shutdown Panel in Unit No. 1 Control Room	OPEN-CLOSE	1/trip breaker
2. Pressurizer Pressure	Hot Shutdown Panel in Unit No. 1 Control Room	1700-2500 psig	1
3. Pressurizer Level	Hot Shutdown Panel in Unit No. 1 Control Room	0-100% of instrument span	1
4. Steam Generator Pressure	Hot Shutdown Panel in Unit No. 1 Control Room	0-1200 psig	1/steam generator
5. Steam Generator Level	Hot Shutdown Panel in Unit No. 1 Control Room	0-100% wide range instrument span	1/steam generator
6. Steam Generators 1 and 4 Level	LSI Cabinet 1 and LSI Cabinet 4	0-100% wide range instrument span	one on each LSI cabinet for each steam generator
7. Steam Generators 2 and 3 Level	LSI Cabinet 2 and LSI Cabinet 4	0-100% wide range instrument span	one on each LSI cabinet for each steam generator
8. Steam Generators 1 and 4 Pressure	LSI Cabinet 4 and LSI Cabinet 5	0-1500 psig	one on each LSI cabinet for each steam generator
9. Steam Generators 2 and 3 Pressure	LSI Cabinet 4 and LSI Cabinet 6	0-1500 psig	one on each LSI cabinet for each steam generator

TABLE 3.3-9 (cont.)

REMOTE SHUTDOWN MONITORING INSTRUMENTATION

INSTRUMENT	READOUT LOCATION	MEASUREMENT RANGE	MINIMUM CHANNELS OPERABLE
10. Reactor Coolant Loops 1 and 4 Temperature (Cold)	LSI Cabinet 4 and LSI Cabinet 5	0-700°F	one on each LSI cabinet for each coolant loop
11. Reactor Coolant Loops 1 and 4 Temperature (Hot)	LSI Cabinet 4 and LSI Cabinet 5	0-700°F	one on each LSI cabinet for each coolant loop
12. Reactor Coolant Loops 2 and 3 Temperature (Cold)	LSI Cabinet 4 and LSI Cabinet 6	0-700°F	one on each LSI cabinet for each coolant loop
13. Reactor Coolant Loops 2 and 3 Temperature (Hot)	LSI Cabinet 4 and LSI Cabinet 6	0-700°F	one on each LSI cabinet for each coolant loop
14. Pressurizer Level	LSI Cabinet 3	0-100% of instrument span	1
15. Reactor Coolant System Pressure	LSI Cabinet 3	0-3000 psig	1
16. Charging Cross-Flow Between	Corridor ELEV. 587'	0-150 gpm	1
17. Source Range Neutron Detector (N-23)	LSI Cabinet 4	1-1 X 10^6 cps	1

TABLE 4.3-6

REMOTE SHUTDOWN MONITORING INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

INSTRUMENT	LOCATION	CHANNEL CHECK	CHANNEL CALIBRATION
1. Reactor Trip Breaker Indication	Hot Shutdown Panel in Unit No. 1 Control Room	N.A.	N.A.
2. Pressurizer Pressure	Hot Shutdown Panel in Unit No. 1 Control Room	M	R
3. Pressurizer Level	Hot Shutdown Panel in Unit No. 1 Control Room	M	R
4. Steam Generator Level	Hot Shutdown Panel in Unit No. 1 Control Room	M	R
5. Steam Generator Pressure	Hot Shutdown Panel in Unit No. 1 Control Room	M	R
6. Steam Generators 1 and 4 Level	LSI Cabinet 1 and LSI Cabinet 4	M	R
7. Steam Generators 2 and 3 Level	LSI Cabinet 2 and LSI Cabinet 4	M	R
8. Steam Generators 1 and 4 Pressure	LSI Cabinet 4 and LSI Cabinet 5	M	R
9. Steam Generators 2 and 3 Pressure	LSI Cabinet 4 and LSI Cabinet 6	M	R
10. Reactor Coolant Loops 1 and 4 Temperature (Cold)	LSI Cabinet 4 and LSI Cabinet 5	M	R

TABLE 4.3-6 (cont.)

REMOTE SHUTDOWN MONITORING INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

INSTRUMENT	LOCATION	CHANNEL CHECK	CHANNEL CALIBRATION
11. Reactor Coolant Loops 1 and 4 Temperature (Hot)	LSI Cabinet 4 and LSI Cabinet 5	M	R
12. Reactor Coolant Loops 2 and 3 Temperature (Cold)	LSI Cabinet 4 and LSI Cabinet 6	M	R
13. Reactor Coolant Loops 2 and 3 Temperature (Hot)	LSI Cabinet 4 and LSI Cabinet 6	M	R
14. Pressurizer Level	LSI Cabinet 3	M	R
15. Reactor Coolant System Pressure	LSI Cabinet 3	M	R
16. Charging Cross-Flow Between Units	Corridor Elev. 587'	n/a	R*
17. Source Range Neutron Detector (N-23)	LSI Cabinet 4	n/a	R

* Charging Cross-Flow between Units is an instrument common to both Unit 1 and 2. This surveillance will only be conducted on an interval consistent with Unit 1 refueling.

PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2

a. At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:

1. Two feedwater pumps, each capable of being powered from separate emergency busses, and

2. One feedwater pump capable of being powered from an OPERABLE steam supply system.

b. At least one auxiliary feedwater flowpath in support of Unit 1 shutdown functions shall be OPERABLE.

APPLICABILITY: Specification 3.7.1.2.a - MODES 1, 2, 3.
Specification 3.7.1.2.b - At all times when Unit 1 is in MODES 1, 2, and 3.

ACTIONS:

When Specification 3.7.1.2.a is applicable:

a. With one auxiliary feedwater pump inoperable, restore the required auxiliary feedwater pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With two auxiliary feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status as soon as possible.

When Specification 3.7.1.2.b is applicable:

With less than one flowpath OPERABLE, continue attempts to restore the flowpath and conduct a firewatch patrol in affected Unit 1 areas every 12 hours. If at the end of 30 days the flow path is still inoperable, write and submit to the NRC, within the next 10 days, a report detailing the plans and schedule to restore the flow path to OPERABLE status. The requirements of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.1.2 Each auxiliary feedwater pump shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verifying that each motor driven pump develops an equivalent discharge pressure of 1240 psig at 60°F on recirculation flow.

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that the steam turbine driven pump develops an equivalent discharge pressure of $\geq$ 1180 psig at 60°F and at a flow of $\geq$ 700 gpm when the secondary steam supply pressure is greater than 310 psig. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3.

3. Verifying that each non-automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in its correct position.

4. Verifying that each automatic valve in the flow path is in the fully open position whenever the auxiliary feedwater system is placed in automatic control or when above 10% RATED THERMAL POWER. This requirement is not applicable for those portions of the Auxiliary Feedwater System being used intermittently to maintain steam generator level.

b. At least once per 18 months during shutdown by:

1. Verifying that each automatic valve in the flow path actuates to its correct position upon receipt of the appropriate engineered safety features actuation test signal required by Specification 3/4.3.2.

2. Verifying that each auxiliary feedwater pump starts as designed automatically upon receipt of the appropriate engineered safety features actuation test signal required by Specification 3/4.3.2.

3. Verifying that the unit cross-tie valves can cycle full travel. Following cycling, the valves will be verified to be in their closed positions.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1

a. At least two independent component cooling water loops shall be OPERABLE.

b. At least one component cooling water flowpath in support of Unit 1 shutdown functions shall be OPERABLE.

APPLICABILITY: Specification 3.7.3.1.a. - MODES 1, 2, 3, 4.
Specification 3.7.3.1.b. - At all times when Unit 1 is in MODES 1, 2, 3, or 4.

ACTION:

When Specification 3.7.3.1.a is applicable:

With only one component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

When Specification 3.7.3.1.b is applicable:

With no OPERABLE flowpath to Unit 1, continue attempts to restore the required flowpath and conduct a firewatch patrol in the affected Unit 1 areas every 12 hours. If at the end of 30 days the flow path is still inoperable, write and submit to the NRC, within the next 10 days, a report detailing the plans and schedule to restore the flow path to OPERABLE status. The requirements of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two component cooling water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown, by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

4.7.3.2 At least once per 18 months during shutdown, verify that the unit cross-tie valves can cycle full travel. Following cycling, the valves will be verified to be in their closed position.

PLANT SYSTEMS

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1

a. At least two independent essential service water loops shall be OPERABLE.

b. At least one essential service water flowpath associated with support of Unit 1 shutdown functions shall be OPERABLE.

APPLICABILITY: Specification 3.7.4.1.a. - MODES 1, 2, 3, and 4.
Specification 3.7.4.1.b. - At all times when Unit 1 is in MODES 1, 2, 3 or 4.

ACTION:

When Specification 3.7.4.1.a is applicable.

With only one essential service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

When Specification 3.7.4.1.b is applicable:

With no essential service water flowpath OPERABLE in support of Unit 1 shutdown functions, continue attempts to restore the flowpath and conduct a firewatch patrol every 12 hours in the affected Unit 1 areas. If at the end of 3 days the flow path is still inoperable, write and submit to the NRC, within the next 10 days, a report detailing the plans and schedule to restore the flow path to OPERABLE status. The requirements of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two essential service water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown, by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

BORATION SYSTEMS (Continued)

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The limitation for a maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps and safety injection pumps, except the required OPERABLE charging pump, to be inoperable below 152°F, unless the reactor vessel head is removed, provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The boration capability of either system is sufficient to provide the required SHUTDOWN MARGIN from expected operating conditions after xenon decay and cooldown to 200°F. The maximum expected boration capability usable volume requirement is 3700 gallons of 20,000 ppm borated water from the boric acid storage tanks or 118,000 gallons of 2000 ppm borated water from the refueling water storage tank. The numbers included in the Technical Specifications (BAST: 5470 gallons / RWST: 350,000 gallons) conservatively bound these and other applicable accident analysis requirements.

With the RCS average temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 200°F is sufficient to provide the required MODE 5 SHUTDOWN MARGIN after xenon decay and cooldown from 200°F to 140°F. This condition requires usable volumes of either 4300 gallons of 20,000 ppm borated water from the boric acid storage tanks or 90,000 gallons of 2000 ppm borated water from the refueling water storage tank. The charging flowpath of Unit 2 required for Unit 1 shutdown support ensures that flow is available to Unit 1 and addresses the requirements of 10 CFR 50 Appendix R. The flowpath consists of a charging pump powered from an electrical bus and associated water supplies and delivery system.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 8.5 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The OPERABILITY of boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the auxiliary feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of off-site power.

Each electric driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 450 gpm at a pressure of 1065 psig to the entrance of the steam generators. The steam driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 900 gpm at a pressure of 1065 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the Residual Heat Removal System may be placed into operation.

The acceptance discharge pressures for the auxiliary feedwater pumps are based on a fluid temperature of 60°F. Water density corrections are permitted to allow comparison of test results which vary depending on ambient conditions.

In addition to its safety design function, the AFW system is used to maintain steam generator level during startup (including low power operation). During this time, the system design allows for automatic initiation of the auxiliary feedwater pumps and their related automatic valves in the flow path.

The auxiliary feedwater flowpath, with a pump and associated water supplies and piping, will support shutdown cooling requirements of Unit 1. This capacity addresses the 10 CFR 50 Appendix R safe shutdown requirements.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values taken at +10°F and are sufficient to prevent brittle fracture.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident analyses.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

The OPERABILITY of the essential service water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a signal failure, is consistent with the assumptions used in the accident conditions within acceptable limits.

3/4.7.3 and 3/4.7.4

The OPERABILITY of the Unit 2 flowpaths which support Unit 1 shutdown functions ensures the availability of cooling functions on Unit 1 and addresses the requirements of 10 CFR 50 Appendix R. The required flowpath consists of a pump and associated water supplies and delivery systems.

3/4.7.5 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

The OPERABILITY of the control room EMERGENCY ventilation system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criteria 19 of Appendix "A", 10 CFR 50.