ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
Units 1, 2, and 3

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS-395
MARKED PAGES

I. AFFECTED PAGE LIST

Unit 1 - pages 3.5/4.5-11, 3.5/4.5-29
Unit 2 - pages 3.5/4.5-11, 3.5/4.5-27
Unit 3 - pages 3.5/4.5-11, 3.5/4.5-30

II. MARKED PAGES

See attached.

Table 3.5-1

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Minimum RHRSW and EECW Pump Assignment

Time Limit	1 Unit Fueled (2 Units Defueled)		2 Units Fueled (1 Unit Defueled)		3 Units Fueled	
	RHRSW	EECW(A)	RHRSW	EECW(A)	RHRSW	EECW(A)
None	4	and 3	~~5~~	and 3	~~7~~	and 3
			5(B)(D) OR 6(D)		8(D)	
30 Days	3	and 2	5	and 2	7	and 2
			(or)		(or)	
			4	and 3	6	and 3
7 Days	~~2~~ 2(C)	and 2	4	and 2	6	and 2

Note:

(A) At least one OPERABLE pump must be assigned to each header. Only automatically starting pumps may be assigned to EECW header service.

(B) When each pump is supplied from a separate 4-kv shutdown board.

(C) This condition is satisfied with 2 RHRSW pumps when each pump is aligned to a separate RHRSW header.

(D) For units with fuel loaded, the minimum RHRSW pump requirements may be reduced by one pump for each unit that has been in the COLD SHUTDOWN condition for more than 24 hours.

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are not safety related, are able to be fed from both headers thus assuring continuity of operation if either header becomes inoperable. The control air compressors only use the EECW north header as an emergency backup supply.

When the decay heat level has decreased sufficiently following shutdown, the entire shutdown cooling load can be adequately handled by one RHR heat exchanger.

There are four RHR heat exchanger headers (A, B, C, & D) with one RHR heat exchanger from each unit on each header. There are two RHRSW pumps on each header; one normally assigned to each header (A2, B2, C2, or D2) and one on alternate assignment (A1, B1, C1, or D1). One RHR heat exchanger header can adequately deliver the flow supplied by both RHRSW pumps to any two of the three RHR heat exchangers on the header. One RHRSW pump can supply the full flow requirement of one RHR heat exchanger. Two RHR heat exchangers can more than adequately handle the cooling requirements of one unit in any abnormal or postaccident situation.

The minimum number of RHRSW pumps which are required to be operable by this specification ensures that the RHRSW system will satisfy its safety functions for all three units following a design basis event on one unit and a postulated single active failure. This includes a single failure of diesel generator A or B which would result in the loss of two RHRSW pumps.

The RHR Service Water System was designed as a shared system for three units. The specification, as written, is conservative when consideration is given to particular pumps being out of service and to possible valving arrangements. If unusual operating conditions arise such that more pumps are out of service than allowed by this specification, a special case request may be made to the NRC to allow continued operation if the actual system cooling requirements can be assured.

Since the standby coolant supply capability provides added long term redundancy to the other emergency and containment cooling systems, a 5-hour time to establish flow path availability is allowed. This time limit does not reduce the other requirements associated with RHRSW/EECW system pump operability.

Should one of the two RHRSW pumps normally or alternately assigned to the RHR heat exchanger header supplying the standby coolant supply connection become inoperable, an equal capability for long-term fluid makeup to the unit reactor and for cooling of the unit containment remains OPERABLE. Because of the availability of an equal makeup and cooling capability, a 30-day repair period is justified. Should the capability to provide standby coolant supply be lost, a 10-day repair time is justified based on the low probability for ever needing the standby coolant supply.

With only one unit fueled, four RHRSW pumps are required to be OPERABLE for indefinite operation to meet the requirements of Specification 3.5.B.1 (RHR system). If only three RHRSW pumps are OPERABLE, a 30-day LCO exists because of the requirement of Specification 3.5.B.5 (RHR system).

3.5.D Equipment Area Coolers

There is an equipment area cooler for each RHR pump and an equipment area cooler for each set (two pumps, either the A and C or B and D pumps) of core spray pumps. The equipment area coolers take suction

Table 3.5-1

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Minimum RHRSW and EECW Pump Assignment

Time Limit	1 Unit Fueled (2 Units Defueled)		2 Units Fueled (1 Unit Defueled)		3 Units Fueled	
	RHRSW	EECW(A)	RHRSW	EECW(A)	RHRSW	EECW(A)
None	4	and 3	5	and 3	7	and 3
30 Days	3	and 2	5 (or) 4	and 2 and 3	7 (or) 6	and 2 and 3
7 Days	2	and 2	4	and 2	6	and 2

Note:

(A) At least one OPERABLE pump must be assigned to each header. Only automatically starting pumps may be assigned to EECW header service.

(B) When each pump is supplied from a separate 4-kv shutdown board.

(C) This condition is satisfied with 2 RHRSW pumps when each pump is aligned to a separate RHRSW header.

(D) For units with fuel loaded, the minimum RHRSW pump requirements may be reduced by one pump for each unit that has been in the COLD SHUTDOWN condition for more than 24 hours.

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are not safety related, are able to be fed from both headers thus assuring continuity of operation if either header becomes inoperable. The control air compressors only use the EECW north header as an emergency backup supply.

When the decay heat level has decreased sufficiently following shutdown, the entire shutdown cooling load can be adequately handled by one RHR heat exchanger.

There are four RHR heat exchanger headers (A, B, C, & D) with one RHR heat exchanger from each unit on each header. There are two RHRSW pumps on each header; one normally assigned to each header (A2, B2, C2, or D2) and one on alternate assignment (A1, B1, C1, or D1). One RHR heat exchanger header can adequately deliver the flow supplied by both RHRSW pumps to any two of the three RHR heat exchangers on the header. One RHRSW pump can supply the full flow requirement of one RHR heat exchanger. Two RHR heat exchangers can more than adequately handle the cooling requirements of one unit in any abnormal or postaccident situation.

The minimum number of RHRSW pumps which are required to be operable by this specification ensures that the RHRSW system will satisfy its safety functions for all three units following a design basis event on one unit and a postulated single active failure. This includes a single failure of diesel generator A or B which would result in the loss of two RHRSW pumps.

The RHR Service Water System was designed as a shared system for three units. The specification, as written, is conservative when consideration is given to particular pumps being out of service and to possible valving arrangements. If unusual operating conditions arise such that more pumps are out of service than allowed by this specification, a special case request may be made to the NRC to allow continued operation if the actual system cooling requirements can be assured.

Since the standby coolant supply capability provides added long term redundancy to the other emergency and containment cooling systems, a 5-hour time to establish flow path availability is allowed. This time limit does not reduce the other requirements associated with RHRSW/EECW system pump operability.

Should one of the two RHRSW pumps normally or alternately assigned to the RHR heat exchanger header supplying the standby coolant supply connection become inoperable, an equal capability for long-term fluid makeup to the unit reactor and for cooling of the unit containment remains OPERABLE. Because of the availability of an equal makeup and cooling capability, a 30-day repair period is justified. Should the capability to provide standby coolant supply be lost, a 10-day repair time is justified based on the low probability for ever needing the standby coolant supply.

With only one unit fueled, four RHRSW pumps are required to be OPERABLE for indefinite operation to meet the requirements of Specification 3.5.B.1 (RHR system). If only three RHRSW pumps are OPERABLE, a 30-day LCO exists because of the requirement of Specification 3.5.B.5 (RHR system).

3.5.D Equipment Area Coolers

There is an equipment area cooler for each RHR pump and an equipment area cooler for each set (two pumps, either the A and C or B and D pumps) of core spray pumps. The equipment area coolers take suction

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Table 3.5-1

Minimum RHRSW and EECW Pump Assignment

Time Limit	1 Unit Fueled (2 Units Defueled)		2 Units Fueled (1 Unit Defueled)		3 Units Fueled	
	RHRSW	EECW(A)	RHRSW	EECW(A)	RHRSW	EECW(A)
None	~~4~~ 4(D)	and 3	~~5~~ 5(B)(D) OR 6(D)	and 3	~~7~~ 8(D)	and 3
30 Days	3	and 2	5 (or) 4	and 2 and 3	7 (or) 6	and 2 and 3
7 Days	~~2~~ 2(C)	and 2	4	and 2	6	and 2

Note:

(A) At least one OPERABLE pump must be assigned to each header. Only automatically starting pumps may be assigned to EECW header service.

(B) When each pump is supplied from a separate 4-kv shutdown board.

(C) This condition is satisfied with 2 RHRSW pumps when each pump is aligned to a separate RHRSW header.

(D) For units with fuel loaded, the minimum RHRSW pump requirements may be reduced by one pump for each unit that has been in the COLD SHUTDOWN condition for more than 24 hours.

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are not safety related, are able to be fed from both headers thus assuring continuity of operation if either header becomes inoperable. The control air compressors only use the EECW north header as an emergency backup supply.

There are four RHR heat exchanger headers (A, B, C, & D) with one RHR heat exchanger from each unit on each header. There are two RHRSW pumps on each header; one normally assigned to each header (A2, B2, C2, or D2) and one on alternate assignment (A1, B1, C1, or D1). One RHR heat exchanger header can adequately deliver the flow supplied by both RHRSW pumps to any two of the three RHR heat exchangers on the header. One RHRSW pump can supply the full flow requirement of one RHR heat exchanger. Two RHR heat exchangers can more than adequately handle the cooling requirements of one unit in any abnormal or postaccident situation.

When the decay heat level has decreased sufficiently following shutdown, the entire shutdown cooling load can be adequately handled by one RHR heat exchanger.

The RHR Service Water System was designed as a shared system for three units. The specification, as written, is conservative when consideration is given to particular pumps being out of service and to possible valving arrangements. If unusual operating conditions arise such that more pumps are out of service than allowed by this specification, a special case request may be made to the NRC to allow continued operation if the actual system cooling requirements can be assured.

The minimum number of RHRSW pumps which are required to be operable by this specification ensures that the RHRSW system will satisfy its safety functions for all three units following a design basis event on one unit and a postulated single active failure. This includes a single failure of diesel generator A or B which would result in the loss of two RHRSW pumps.

Since the standby coolant supply capability provides added long term redundancy to the other emergency and containment cooling systems, a 5-hour time to establish flow path availability is allowed. This time limit does not reduce the other requirements associated with RHRSW/EECW system pump operability.

Should one of the two RHRSW pumps normally or alternately assigned to the RHR heat exchanger header supplying the standby coolant supply connection become inoperable, an equal capability for long-term fluid makeup to the unit reactor and for cooling of the unit containment remains OPERABLE. Because of the availability of an equal makeup and cooling capability, a 30-day repair period is justified. Should the capability to provide standby coolant supply be lost, a 10-day repair time is justified based on the low probability for ever needing the standby coolant supply.

With only one unit fueled, four RHRSW pumps are required to be OPERABLE for indefinite operation to meet the requirements of Specification 3.5.B.1 (RHR system). If only three RHRSW pumps are OPERABLE, a 30-day LCO exists because of the requirement of Specification 3.5.B.5 (RHR system).

3.5.D Equipment Area Coolers

There is an equipment area cooler for each RHR pump and an equipment area cooler for each set (two pumps, either the A and C or B and D pumps) of core spray pumps. The equipment area coolers take suction

ENCLOSURE 3

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
Units 1, 2, and 3

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS-395
REVISED PAGES

I. AFFECTED PAGE LIST

Unit 1 Pages 3.5/4.5-11, 3.5/4.5-29
Unit 2 Pages 3.5/4.5-11, 3.5/4.5-27
Unit 3 Pages 3.5/4.5-11, 3.5/4.5-30

II. REVISED PAGES

See attached.

Table 3.5-1

Minimum RHRSW and EECW Pump Assignment

Time Limit	1 Unit Fueled (2 Units Defueled)			2 Units Fueled (1 Unit Defueled)			3 Units Fueled		
	RHRSW		EECW(A)	RHRSW		EECW(A)	RHRSW		EECW(A)
None	4(D)	and	3	5(B)(D)	and	3	8(D)	and	3
					(or)				
				6(D)	and	3			
30 Days	3	and	2	5	and	2	7	and	2
					(or)			(or)	
				4	and	3	6	and	3
7 Days	2(C)	and	2	4	and	2	6	and	2

Note:

(A) At least one OPERABLE pump must be assigned to each header. Only automatically starting pumps may be assigned to EECW header service.

(B) When each pump is supplied from a separate 4-kv shutdown board.

(C) This condition is satisfied with 2 RHRSW pumps when each pump is aligned to a separate RHRSW header.

(D) For units with fuel loaded, the minimum RHRSW pump requirements may be reduced by one pump for each unit that has been in the COLD SHUTDOWN CONDITION for more than 24 hours.

are not safety related, are able to be fed from both headers thus assuring continuity of operation if either header becomes inoperable. The control air compressors only use the EECW north header as an emergency backup supply.

There are four RHR heat exchanger headers (A, B, C, & D) with one RHR heat exchanger from each unit on each header. There are two RHRSW pumps on each header; one normally assigned to each header (A2, B2, C2, or D2) and one on alternate assignment (A1, B1, C1, or D1). One RHR heat exchanger header can adequately deliver the flow supplied by both RHRSW pumps to any two of the three RHR heat exchangers on the header. One RHRSW pump can supply the full flow requirement of one RHR heat exchanger. Two RHR heat exchangers can more than adequately handle the cooling requirements of one unit in any abnormal or postaccident situation. When the decay heat level has decreased sufficiently following shutdown, the entire shutdown cooling load can be adequately handled by one RHR heat exchanger.

The RHR Service Water System was designed as a shared system for three units. The specification, as written, is conservative when consideration is given to particular pumps being out of service and to possible valving arrangements. The minimum number of RHRSW pumps which are required to be OPERABLE by this specification ensures that the RHRSW System will satisfy its safety functions for all three units following a design basis event on one unit and a postulated single active failure. This includes a single failure of diesel generator A or B which would result in the loss of two RHRSW pumps. If unusual operating conditions arise such that more pumps are out of service than allowed by this specification, a special case request may be made to the NRC to allow continued operation if the actual system cooling requirements can be assured.

Since the standby coolant supply capability provides added long term redundancy to the other emergency and containment cooling systems, a 5-hour time to establish flow path availability is allowed. This time limit does not reduce the other requirements associated with RHRSW/EECW system pump operability.

Should one of the two RHRSW pumps normally or alternately assigned to the RHR heat exchanger header supplying the standby coolant supply connection become inoperable, an equal capability for long-term fluid makeup to the unit reactor and for cooling of the unit containment remains OPERABLE. Because of the availability of an equal makeup and cooling capability, a 30-day repair period is justified. Should the capability to provide standby coolant supply be lost, a 10-day repair time is justified based on the low probability for ever needing the standby coolant supply.

With only one unit fueled, four RHRSW pumps are required to be OPERABLE for indefinite operation to meet the requirements of Specification 3.5.B.1 (RHR system). If only three RHRSW pumps are OPERABLE, a 30-day LCO exists because of the requirement of Specification 3.5.B.5 (RHR system).

3.5.D Equipment Area Coolers

There is an equipment area cooler for each RHR pump and an equipment area cooler for each set (two pumps, either the A and C or B and D pumps) of core spray pumps. The equipment area coolers take suction

Table 3.5-1

Minimum RHRSW and EECW Pump Assignment

Time Limit	1 Unit Fueled (2 Units Defueled)			2 Units Fueled (1 Unit Defueled)			3 Units Fueled		
	RHRSW		EECW(A)	RHRSW		EECW(A)	RHRSW		EECW(A)
None	4(D)	and	3	5(B)(D)	and	3	8(D)	and	3
					(or)				
				6(D)	and	3			
30 Days	3	and	2	5	and	2	7	and	2
					(or)			(or)	
				4	and	3	6	and	3
7 Days	2(C)	and	2	4	and	2	6	and	2

Note:

(A) At least one OPERABLE pump must be assigned to each header. Only automatically starting pumps may be assigned to EECW header service.

(B) When each pump is supplied from a separate 4-kv shutdown board.

(C) This condition is satisfied with 2 RHRSW pumps when each pump is aligned to a separate RHRSW header.

(D) For units with fuel loaded, the minimum RHRSW pump requirements may be reduced by one pump for each unit that has been in the COLD SHUTDOWN CONDITION for more than 24 hours.

are not safety related, are able to be fed from both headers thus assuring continuity of operation if either header becomes inoperable. The control air compressors only use the EECW north header as an emergency backup supply.

There are four RHR heat exchanger headers (A, B, C, & D) with one RHR heat exchanger from each unit on each header. There are two RHRSW pumps on each header; one normally assigned to each header (A2, B2, C2, or D2) and one on alternate assignment (A1, B1, C1, or D1). One RHR heat exchanger header can adequately deliver the flow supplied by both RHRSW pumps to any two of the three RHR heat exchangers on the header. One RHRSW pump can supply the full flow requirement of one RHR heat exchanger. Two RHR heat exchangers can more than adequately handle the cooling requirements of one unit in any abnormal or postaccident situation. When the decay heat level has decreased sufficiently following shutdown, the entire shutdown cooling load can be adequately handled by one RHR heat exchanger.

The RHR Service Water System was designed as a shared system for three units. The specification, as written, is conservative when consideration is given to particular pumps being out of service and to possible valving arrangements. The minimum number of RHRSW pumps which are required to be OPERABLE by this specification ensures that the RHRSW System will satisfy its safety functions for all three units following a design basis event on one unit and a postulated single active failure. This includes a single failure of diesel generator A or B which would result in the loss of two RHRSW pumps. If unusual operating conditions arise such that more pumps are out of service than allowed by this specification, a special case request may be made to the NRC to allow continued operation if the actual system cooling requirements can be assured.

Since the standby coolant supply capability provides added long term redundancy to the other emergency and containment cooling systems, a 5-hour time to establish flow path availability is allowed. This time limit does not reduce the other requirements associated with RHRSW/EECW system pump operability.

Should one of the two RHRSW pumps normally or alternately assigned to the RHR heat exchanger header supplying the standby coolant supply connection become inoperable, an equal capability for long-term fluid makeup to the unit reactor and for cooling of the unit containment remains OPERABLE. Because of the availability of an equal makeup and cooling capability, a 30-day repair period is justified. Should the capability to provide standby coolant supply be lost, a 10-day repair time is justified based on the low probability for ever needing the standby coolant supply.

With only one unit fueled, four RHRSW pumps are required to be OPERABLE for indefinite operation to meet the requirements of Specification 3.5.B.1 (RHR system). If only three RHRSW pumps are OPERABLE, a 30-day LCO exists because of the requirement of Specification 3.5.B.5 (RHR system).

3.5.D Equipment Area Coolers

There is an equipment area cooler for each RHR pump and an equipment area cooler for each set (two pumps, either the A and C or B and D pumps) of core spray pumps. The equipment area coolers take suction

Table 3.5-1

Minimum RHRSW and EECW Pump Assignment

Time Limit	1 Unit Fueled (2 Units Defueled)			2 Units Fueled (1 Unit Defueled)			3 Units Fueled		
	RHRSW		EECW(A)	RHRSW		EECW(A)	RHRSW		EECW(A)
None	4(D)	and	3	5(B)(D)	and	3	8(D)	and	3
					(or)				
				6(D)	and	3			
30 Days	3	and	2	5	and	2	7	and	2
					(or)			(or)	
				4	and	3	6	and	3
7 Days	2(C)	and	2	4	and	2	6	and	2

Note:

(A) At least one OPERABLE pump must be assigned to each header. Only automatically starting pumps may be assigned to EECW header service.

(B) When each pump is supplied from a separate 4-kv shutdown board.

(C) This condition is satisfied with 2 RHRSW pumps when each pump is aligned to a separate RHRSW header.

(D) For units with fuel loaded, the minimum RHRSW pump requirements may be reduced by one pump for each unit that has been in the COLD SHUTDOWN CONDITION for more than 24 hours.

are not safety related, are able to be fed from both headers thus assuring continuity of operation if either header becomes inoperable. The control air compressors only use the EECW north header as an emergency backup supply.

There are four RHR heat exchanger headers (A, B, C, & D) with one RHR heat exchanger from each unit on each header. There are two RHRSW pumps on each header; one normally assigned to each header (A2, B2, C2, or D2) and one on alternate assignment (A1, B1, C1, or D1). One RHR heat exchanger header can adequately deliver the flow supplied by both RHRSW pumps to any two of the three RHR heat exchangers on the header. One RHRSW pump can supply the full flow requirement of one RHR heat exchanger. Two RHR heat exchangers can more than adequately handle the cooling requirements of one unit in any abnormal or postaccident situation. When the decay heat level has decreased sufficiently following shutdown, the entire shutdown cooling load can be adequately handled by one RHR heat exchanger.

The RHR Service Water System was designed as a shared system for three units. The specification, as written, is conservative when consideration is given to particular pumps being out of service and to possible valving arrangements. The minimum number of RHRSW pumps which are required to be OPERABLE by this specification ensures that the RHRSW System will satisfy its safety functions for all three units following a design basis event on one unit and a postulated single active failure. This includes a single failure of diesel generator A or B which would result in the loss of two RHRSW pumps. If unusual operating conditions arise such that more pumps are out of service than allowed by this specification, a special case request may be made to the NRC to allow continued operation if the actual system cooling requirements can be assured.

Since the standby coolant supply capability provides added long term redundancy to the other emergency and containment cooling systems, a 5-hour time to establish flow path availability is allowed. This time limit does not reduce the other requirements associated with RHRSW/EECW system pump operability.

Should one of the two RHRSW pumps normally or alternately assigned to the RHR heat exchanger header supplying the standby coolant supply connection become inoperable, an equal capability for long-term fluid makeup to the unit reactor and for cooling of the unit containment remains OPERABLE. Because of the availability of an equal makeup and cooling capability, a 30-day repair period is justified. Should the capability to provide standby coolant supply be lost, a 10-day repair time is justified based on the low probability for ever needing the standby coolant supply.

With only one unit fueled, four RHRSW pumps are required to be OPERABLE for indefinite operation to meet the requirements of Specification 3.5.B.1 (RHR system). If only three RHRSW pumps are OPERABLE, a 30-day LCO exists because of the requirement of Specification 3.5.B.5 (RHR system).

3.5.D Equipment Area Coolers

There is an equipment area cooler for each RHR pump and an equipment area cooler for each set (two pumps, either the A and C or B and D pumps) of core spray pumps. The equipment area coolers take suction

ENCLOSURE 4

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
Units 1, 2, and 3

PROPOSED IMPROVED TECHNICAL SPECIFICATION (TS) CHANGE TS-395
MARKED PAGES

I. AFFECTED PAGE LIST

Unit 1 - pages 3.7-1 through -3, B3.7-1 through -6
Unit 2 - pages 3.7-1 through -3, B3.7-1 through -6
Unit 3 - pages 3.7-1 through -3, B3.7-1 through -6

II. REVISED PAGES

See attached.

3.7 PLANT SYSTEMS

3.7.1 Residual Heat Removal Service Water (RHRSW) System

----------Note----------
The number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for ≥ 24 hours.

LCO 3.7.1 ~~----------NOTES----------~~
~~1. With 1 or 2 units fueled, each subsystem must have at least one OPERABLE RHRSW pump.~~
~~2. With 3 units fueled, two RHRSW subsystems must have two OPERABLE RHRSW pumps.~~
~~---~~

~~Four RHRSW subsystems shall be OPERABLE.~~

Four RHRSW subsystems shall be OPERABLE with the number of OPERABLE pumps as listed below:
1. 1 unit fueled - four OPERABLE RHRSW pumps.
2. 2 units fueled - six OPERABLE RHRSW pumps.
3. 3 units fueled - eight OPERABLE RHRSW pumps.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

~~----------NOTE----------~~
~~Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System Hot Shutdown," for RHR shutdown cooling made inoperable by RHRSW System.~~
~~---~~

~~CONDITION~~	REQUIRED ACTION	COMPLETION TIME
~~A. One RHRSW subsystem or required pump inoperable.~~	~~A.1 Restore RHRSW subsystem or required pump to OPERABLE status.~~	~~30 days~~

(continued)

INSERT A

Insert A

CONDITION		REQUIRED ACTION		COMPLETION TIME
A.	One required RHRSW pump inoperable.	A.1	----------Notes---------- 1. Only applicable for the 2 units fueled condition. 2. Only four RHRSW pumps powered from a separate 4kV shutdown board are required to be OPERABLE if the other fueled unit has been in MODE 4 or 5 for ≥ 24 hours. ---------- Verify 5 RHRSW pumps powered from separate 4kV shutdown boards are OPERABLE.	Immediately 30 days
		OR		
		A.2	Restore required RHRSW pump to OPERABLE status.	

(continued)

INSERT B

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two RHRSW subsystems inoperable.	B.1 --------NOTE-------- Only applicable when two units are fueled. ---------- Verify at least three OPERABLE RHRSW pumps are associated with two OPERABLE RHRSW subsystems.	1 hour
	AND	
	B.2 --------NOTE-------- Only applicable when three units are fueled. ---------- Verify at least four OPERABLE RHRSW pumps are associated with two OPERABLE RHRSW subsystems.	1 hour
	AND	
	B.3 Restore one inoperable RHRSW subsystem to OPERABLE status.	7 days
C. Three or more RHRSW subsystems inoperable. OR Required Action B.1 or B.2 and associated Completion Time not met.	C.1 Restore the required RHRSW subsystems to OPERABLE status.	8 hours

(continued)

Insert B

CONDITION		REQUIRED ACTION		COMPLETION TIME
B.	One RHRSW subsystem inoperable.	B.1	----------Note---------- Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling - Hot Shutdown," for RHR shutdown cooling made inoperable by the RHRSW system. ---------- Restore RHRSW subsystem to OPERABLE status.	30 days
C.	Two required RHRSW pumps inoperable.	C.1	Restore one inoperable RHRSW pump to OPERABLE status	7 days
D.	Two RHRSW subsystems inoperable.	D.1	----------Note---------- Enter applicable conditions and Required actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by the RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status.	7 days
E.	Three or more required RHRSW pumps inoperable	E.1	Restore one RHRSW pump to OPERABLE status.	8 hours
F.	Three or more RHRSW subsystems inoperable.	F.1	----------Note---------- Enter applicable Conditions and Required Actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by the RHRSW system. ---------- Restore one RHRSW subsystem to OPERABLE status.	8 hours

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action A.1, B.3, or C.1 and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	31 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Required Action and associated Completion Time not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 4.	12 hours 36 hours

B 3.7 PLANT SYSTEMS

B 3.7.1 Residual Heat Removal Service Water (RHRSW) System

BASES

BACKGROUND

The RHRSW System is designed to provide cooling water for the Residual Heat Removal (RHR) System heat exchangers, required for a safe reactor shutdown following a Design Basis Accident (DBA) or transient. The RHRSW System is operated whenever the RHR heat exchangers are required to operate in the shutdown cooling mode or in the suppression pool cooling or spray mode of the RHR System.

The RHRSW System is common to the three BFN units and consists of four independent and redundant loops, each of which feeds one RHR heat exchanger in each unit. Each loop is made up of a header, two 4500 gpm pumps, a suction source, valves, piping, and associated instrumentation. One loop with one pump operating is capable of providing 50% of the required cooling capacity to maintain safe shutdown conditions for one unit ~~following a design basis accident. However, one pump is capable of providing sufficient cooling capacity to maintain a safe shutdown condition for each of the non-accident units.~~ As such, a subsystem consists of a loop with one or two OPERABLE pumps ~~dependent upon the number of fueled units.~~ The RHRSW System is designed with sufficient redundancy so that no single active component failure can prevent it from achieving its design function. The RHRSW System is described in the FSAR, Section 10.9 (Ref. 1).

, a heat exchanger, a suction source, and associated valves, piping and instrumentation.

Cooling water is pumped by the RHRSW pumps from the Wheeler Reservoir through the tube side of the RHR heat exchangers, and discharged back to the Wheeler Reservoir.

The system is initiated manually from each of the three units control rooms. If operating during a loss of coolant accident (LOCA), the system is automatically tripped on degraded bus voltage to allow the diesel generators to automatically power only that equipment necessary to reflood the core. The system can be manually started any time the degraded bus voltage signal ~~is manually overridden or~~ clears, and is assumed to be manually started within 10 minutes after the LOCA.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The RHRSW System removes heat from the suppression pool to limit the suppression pool temperature and primary containment pressure following a LOCA. This ensures that the primary containment can perform its function of limiting the release of radioactive materials to the environment following a LOCA. The ability of the RHRSW System to support long term cooling of the reactor or primary containment is discussed in the FSAR, Chapters 5 and 14 (Refs. 2 and 3, respectively). These analyses explicitly assume that the RHRSW System will provide adequate cooling support to the equipment required for safe shutdown. These analyses include the evaluation of the long term primary containment response after a design basis LOCA.

The safety analyses for long term cooling were performed for various combinations of RHR System failures and considers the number of units fueled. With one unit fueled, the worst case single failure that would affect the performance of the RHRSW System is any failure that would disable two subsystems or pumps of the RHRSW System (e.g, the failure of an RHR Suppression Pool Cooling/Spray return line valve which effectively disables two RHRSW subsystems or pumps). With two and three units fueled, a worst case single failure could also include the loss of two RHRSW pumps caused by losing a 4 kV shutdown board since there are certain alignment configurations that allow two RHRSW pumps to be powered from the same 4 kV shutdown board. As discussed in the FSAR, Section 14.6.3.3.2 (Ref. 4) for these analyses, manual initiation of the OPERABLE RHRSW subsystems and the associated RHR System is assumed to occur 10 minutes after a DBA. The RHRSW flow assumed in the analyses is ~~4500~~ 4000 gpm per pump with two pumps operating in one loop. In this case, the maximum suppression chamber water temperature and pressure are 177°F (as reported in Reference 7) and 49.6 psig, respectively, well below the design temperature of 281°F and maximum allowable pressure of 62 psig. ~~This is also below the 200°F limit imposed by Design Criteria BFN-50-7064A (Ref. 5) for all plant transients involving SRV operations.~~

The RHRSW System satisfies Criterion 3 of the NRC Policy Statement (Ref 6).

(continued)

Additionally, since the RHRSW pumps are shared between the three BFN units, the number of OPERABLE pumps required is also dependent on the number of units fueled.

BASES (continued)

LCO

Four RHRSW subsystems are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming the worst case single active failure occurs coincident with the loss of offsite power.

An OPERABLE RHRSW subsystem consists of:

~~a. The required number of OPERABLE RHRSW pumps dependent upon the number of units fueled; and~~

b. An OPERABLE flow path capable of taking suction from the intake structure and transferring the water to the required RHR heat exchangers at the assumed flow rate.

~~The LCO is modified by two Notes. Note 1 specifies that when 1 or 2 units are fueled, there must be at least one OPERABLE pump per RHRSW subsystem. Note 2 specifies that when 3 units are fueled, two of the RHRSW subsystems must have two OPERABLE RHRSW pumps.~~

with at least one OPERABLE RHRSW pump in the flow path.

In addition to the required number of OPERABLE subsystems, there must be an adequate number of pumps OPERABLE to provide cooling for the fueled non-accident units.

The number of required OPERABLE RHRSW pumps required is modified by a Note which specifies that the number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for over 24 hours. This Note acknowledges the fact that decay heat removal requirements are substantially reduced for fueled u... Mode 4 or 5 for over 24 h...

APPLICABILITY

In MODES 1, 2, and 3, the RHRSW System is required to be OPERABLE to support the OPERABILITY of the RHR System for primary containment cooling (LCO 3.6.2.3, "Residual Heat Removal (RHR) Suppression Pool Cooling," and LCO 3.6.2.4, "Residual Heat Removal (RHR) Suppression Pool Spray") and decay heat removal (LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown"). The Applicability is therefore consistent with the requirements of these systems.

In MODES 4 and 5, the OPERABILITY requirements of the RHRSW System are determined by the systems it supports.

ACTIONS

~~The Actions are modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.~~

(continued)

BASES

INSERT C

ACTIONS
(continued)

A.1

With one RHRSW subsystem or required pump inoperable, the inoperable RHRSW subsystem or required pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

B.1, B.2 and B.3

Required Action B.1 requires verification that at least three OPERABLE RHRSW pumps are associated with the two OPERABLE RHRSW subsystems. The Required Action is modified by a Note indicating that the required action is applicable only when two units are fueled. Required Action B.2 requires verification that at least four OPERABLE RHRSW pumps are associated with the two OPERABLE RHRSW subsystems. The Required Action is modified by a Note indicating that the required action is applicable only when three units are fueled.

Required Action B.3 requires that with two RHRSW subsystems inoperable, one inoperable RHRSW subsystem be restored to OPERABLE status within 7 days. With the unit(s) in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE RHRSW subsystems could result in loss of RHRSW function. The 7 day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE subsystems and the low probability of an event occurring requiring RHRSW during this period.

C.1

With three or more RHRSW subsystems inoperable, the RHRSW System is not capable of performing its intended function.

(continued)

Insert C

A.1 and A.2

Required Action A.1 requires immediate verification that five RHRSW pumps powered from separate 4kV shutdown boards are OPERABLE. The Required Action is modified by two Notes. Note 1 indicates that the required action is applicable only when two units are fueled. In the two unit fueled condition a single failure (loss of a 4kV shutdown board) could result in inadequate RHRSW pumps if two pumps are powered from the same power supply. This corresponds to the LCO requirement of six OPERABLE pumps when two units are fueled, which still provides the minimum required four RHRSW pumps with the worst case single failure. If five RHRSW pumps are powered from separate 4kV shutdown boards, then no postulated single active failure could occur to prevent the RHRSW system from performing its design function. This is equivalent to any six RHRSW pumps operable with a maximum of two sets of two pumps allowed to be powered from the same power supply. Operation can continue indefinitely if Required action A.1 is met.
Note 2 requires only four RHRSW pumps powered from separate 4kV shutdown boards to be OPERABLE if the other fueled unit has been in Mode 4 or 5 for over 24 hours. This acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for over 24 hours.

If Required action A.1 cannot be met, then Required Action A.2 must be complied with. With one RHRSW pump inoperable, the inoperable RHRSW pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

B.1

With one RHRSW subsystem inoperable, the inoperable RHRSW subsystem must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1

With two required RHRSW pumps inoperable the remaining RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure of the OPERABLE RHRSW pumps could result in a loss of RHRSW function. The seven day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE RHRSW pumps and the low probability of an event occurring during this period.

BASES

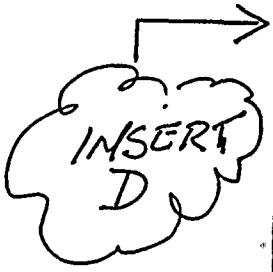
ACTIONS

C.1 (continued)

The requisite number of subsystems and pumps must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

D.1 and D.2

If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.



SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

Verifying the correct alignment for each manual and power operated valve in each RHRSW subsystem flow path provides assurance that the proper flow paths will exist for RHRSW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRSW System is a manually initiated system.

This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

(continued)

Insert D

D.1

With two RHRSW subsystems inoperable, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 7 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

E.1

With three or more required RHRSW pumps inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of pumps must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

F.1

With three or more required RHRSW subsystems inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of subsystems must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

G.1 and G.2

If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES (continued)

REFERENCES

1. FSAR, Section 10.9.
2. FSAR, Chapter 5.
3. FSAR, Chapter 14.
4. FSAR, Section 14.6.3.3.2.
5. ~~Design Criteria BFN-50-7064A, Primary Containment Systems - Units 2 and 3~~
6. ~~6.~~ NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
7. ~~7.~~ GE-NE-B13-01755-2, Revision 1, February 1996.

Note
The number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for ≥ 24 hours.

3.7 PLANT SYSTEMS

3.7.1 Residual Heat Removal Service Water (RHRSW) System

LCO 3.7.1

~~NOTES~~
~~1. With 1 or 2 units fueled, each subsystem must have at least one OPERABLE RHRSW pump.~~
~~2. With 3 units fueled, two RHRSW subsystems must have two OPERABLE RHRSW pumps.~~

~~Four RHRSW subsystems shall be OPERABLE.~~

Four RHRSW subsystems shall be OPERABLE with the number of OPERABLE pumps as listed below:
1. 1 unit fueled - four OPERABLE RHRSW pumps.
2. 2 units fueled - six OPERABLE RHRSW pumps.
3. 3 units fueled - eight OPERABLE RHRSW pumps.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

~~NOTE~~
~~Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," for RHR shutdown cooling made inoperable by RHRSW System.~~

~~CONDITION~~	REQUIRED ACTION	COMPLETION TIME
A. One RHRSW subsystem or required pump inoperable.	A.1 ~~Restore RHRSW subsystem or required pump to OPERABLE status.~~	30 days

(continued)

INSERT A

Insert A

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required RHRSW pump inoperable.	A.1 ----------Notes---------- 1. Only applicable for the 2 units fueled condition. 2. Only four RHRSW pumps powered from a separate 4kV shutdown board are required to be OPERABLE if the other fueled unit has been in MODE 4 or 5 for ≥ 24 hours. ---------- Verify 5 RHRSW pumps powered from separate 4kV shutdown boards are OPERABLE. OR A.2 Restore required RHRSW pump to OPERABLE status.	Immediately 30 days

(continued)

INSERT B

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two RHRSW subsystems inoperable.	B.1 --------NOTE-------- Only applicable when two units are fueled. ---------- Verify at least three OPERABLE RHRSW pumps are associated with two OPERABLE RHRSW subsystems.	1 hour
	AND	
	B.2 --------NOTE-------- Only applicable when three units are fueled. ---------- Verify at least four OPERABLE RHRSW pumps are associated with two OPERABLE RHRSW subsystems.	1 hour
	AND	
	B.3 Restore one inoperable RHRSW subsystem to OPERABLE status.	7 days
C. Three or more RHRSW subsystems inoperable. OR Required Action B.1 or B.2 and associated Completion Time not met.	C.1 Restore the required RHRSW subsystems to OPERABLE status.	8 hours

(continued)

Insert B

CONDITION		REQUIRED ACTION		COMPLETION TIME
B.	One RHRSW subsystem inoperable.	B.1	----------Note---------- Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling - Hot Shutdown," for RHR shutdown cooling made inoperable by the RHRSW system. ---------- Restore RHRSW subsystem to OPERABLE status.	30 days
C.	Two required RHRSW pumps inoperable.	C.1	Restore one inoperable RHRSW pump to OPERABLE status	7 days
D.	Two RHRSW subsystems inoperable.	D.1	----------Note---------- Enter applicable conditions and Required actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by the RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status.	7 days
E.	Three or more required RHRSW pumps inoperable	E.1	Restore one RHRSW pump to OPERABLE status.	8 hours
F.	Three or more RHRSW subsystems inoperable.	F.1	----------Note---------- Enter applicable Conditions and Required Actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by the RHRSW system. ---------- Restore one RHRSW subsystem to OPERABLE status.	8 hours

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action A.1, B.3, or C.1 and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	31 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Required Action and associated Completion Time not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 4.	12 hours 36 hours

B 3.7 PLANT SYSTEMS

B 3.7.1 Residual Heat Removal Service Water (RHRSW) System

BASES

BACKGROUND

The RHRSW System is designed to provide cooling water for the Residual Heat Removal (RHR) System heat exchangers, required for a safe reactor shutdown following a Design Basis Accident (DBA) or transient. The RHRSW System is operated whenever the RHR heat exchangers are required to operate in the shutdown cooling mode or in the suppression pool cooling or spray mode of the RHR System.

The RHRSW System is common to the three BFN units and consists of four independent and redundant loops, each of which feeds one RHR heat exchanger in each unit. Each loop is made up of a header, two 4500 gpm pumps, a suction source, valves, piping, and associated instrumentation. One loop with one pump operating is capable of providing 50% of the required cooling capacity to maintain safe shutdown conditions for one unit. ~~following a design basis accident. However, one pump is capable of providing sufficient cooling capacity to maintain a safe shutdown condition for each of the non-accident units.~~ As such, a subsystem consists of a loop with one or two OPERABLE pumps ~~dependent upon the number of fueled units.~~ The RHRSW System is designed with sufficient redundancy so that no single active component failure can prevent it from achieving its design function. The RHRSW System is described in the FSAR, Section 10.9 (Ref. 1).

, a heat exchanger, a suction source, and associated valves, piping and instrumentation.

Cooling water is pumped by the RHRSW pumps from the Wheeler Reservoir through the tube side of the RHR heat exchangers, and discharged back to the Wheeler Reservoir.

The system is initiated manually from each of the three units control rooms. If operating during a loss of coolant accident (LOCA), the system is automatically tripped on degraded bus voltage to allow the diesel generators to automatically power only that equipment necessary to reflood the core. The system can be manually started any time the degraded bus voltage signal ~~is manually overridden or~~ clears, and is assumed to be manually started within 10 minutes after the LOCA.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The RHRSW System removes heat from the suppression pool to limit the suppression pool temperature and primary containment pressure following a LOCA. This ensures that the primary containment can perform its function of limiting the release of radioactive materials to the environment following a LOCA. The ability of the RHRSW System to support long term cooling of the reactor or primary containment is discussed in the FSAR, Chapters 5 and 14 (Refs. 2 and 3, respectively). These analyses explicitly assume that the RHRSW System will provide adequate cooling support to the equipment required for safe shutdown. These analyses include the evaluation of the long term primary containment response after a design basis LOCA.

The safety analyses for long term cooling were performed for various combinations of RHR System failures and considers the number of units fueled. With one unit fueled, the worst case single failure that would affect the performance of the RHRSW System is any failure that would disable two subsystems or pumps of the RHRSW System (e.g, the failure of an RHR Suppression Pool Cooling/Spray return line valve which effectively disables two RHRSW subsystems or pumps). With two and three units fueled, a worst case single failure could also include the loss of two RHRSW pumps caused by losing a 4 kV shutdown board since there are certain alignment configurations that allow two RHRSW pumps to be powered from the same 4 kV shutdown board. As discussed in the FSAR, Section 14.6.3.3.2 (Ref. 4) for these analyses, manual initiation of the OPERABLE RHRSW subsystems and the associated RHR System is assumed to occur 10 minutes after a DBA. The RHRSW flow assumed in the analyses is ~~4500~~ 4000 gpm per pump with two pumps operating in one loop. In this case, the maximum suppression chamber water temperature and pressure are 177°F (as reported in Reference 7) and 49.6 psig, respectively, well below the design temperature of 281°F and maximum allowable pressure of 62 psig. ~~This is also below the 200°F limit imposed by Design Criteria BFN-50-7064A (Ref. 5) for all plant transients involving SRV operations.~~

The RHRSW System satisfies Criterion 3 of the NRC Policy Statement (Ref 6).

(continued)

Additionally, since the RHRSW pumps are shared between the three BFN units, the number of OPERABLE pumps required is also dependent on the number of units fueled.

BASES (continued)

LCO

Four RHRSW subsystems are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming the worst case single active failure occurs coincident with the loss of offsite power.

An OPERABLE RHRSW subsystem consists of:

~~a. The required number of OPERABLE RHRSW pumps dependent upon the number of units fueled; and~~

b. An OPERABLE flow path capable of taking suction from the intake structure and transferring the water to the required RHR heat exchangers at the assumed flow rate with at least one OPERABLE RHRSW pump in the flow path.

~~The LCO is modified by two Notes. Note 1 specifies that when 1 or 2 units are fueled, there must be at least one OPERABLE pump per RHRSW subsystem. Note 2 specifies that when 3 units are fueled, two of the RHRSW subsystems must have two OPERABLE RHRSW pumps.~~

In addition to the required number of OPERABLE subsystems, there must be an adequate number of pumps OPERABLE to provide cooling for the fueled non-accident units.

The number of required OPERABLE RHRSW pumps required is modified by a Note which specifies that the number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for over 24 hours. This Note acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in Mode 4 or 5 for over 24 ho

APPLICABILITY

In MODES 1, 2, and 3, the RHRSW System is required to be OPERABLE to support the OPERABILITY of the RHR System for primary containment cooling (LCO 3.6.2.3, "Residual Heat Removal (RHR) Suppression Pool Cooling," and LCO 3.6.2.4, "Residual Heat Removal (RHR) Suppression Pool Spray") and decay heat removal (LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown"). The Applicability is therefore consistent with the requirements of these systems.

In MODES 4 and 5, the OPERABILITY requirements of the RHRSW System are determined by the systems it supports.

ACTIONS

~~The Actions are modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.~~

(continued)

BASES

INSERT C

ACTIONS (continued)

A.1

With one RHRSW subsystem or required pump inoperable, the inoperable RHRSW subsystem or required pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

B.1, B.2 and B.3

Required Action B.1 requires verification that at least three OPERABLE RHRSW pumps are associated with the two OPERABLE RHRSW subsystems. The Required Action is modified by a Note indicating that the required action is applicable only when two units are fueled. Required Action B.2 requires verification that at least four OPERABLE RHRSW pumps are associated with the two OPERABLE RHRSW subsystems. The Required Action is modified by a Note indicating that the required action is applicable only when three units are fueled.

Required Action B.3 requires that with two RHRSW subsystems inoperable, one inoperable RHRSW subsystem be restored to OPERABLE status within 7 days. With the unit(s) in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE RHRSW subsystems could result in loss of RHRSW function. The 7 day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE subsystems and the low probability of an event occurring requiring RHRSW during this period.

C.1

With three or more RHRSW subsystems inoperable, the RHRSW System is not capable of performing its intended function.

(continued)

Insert C

A.1 and A.2

Required Action A.1 requires immediate verification that five RHRSW pumps powered from separate 4kV shutdown boards are OPERABLE. The Required Action is modified by two Notes. Note 1 indicates that the required action is applicable only when two units are fueled. In the two unit fueled condition a single failure (loss of a 4kV shutdown board) could result in inadequate RHRSW pumps if two pumps are powered from the same power supply. This corresponds to the LCO requirement of six OPERABLE pumps when two units are fueled, which still provides the minimum required four RHRSW pumps with the worst case single failure. If five RHRSW pumps are powered from separate 4kV shutdown boards, then no postulated single active failure could occur to prevent the RHRSW system from performing its design function. This is equivalent to any six RHRSW pumps operable with a maximum of two sets of two pumps allowed to be powered from the same power supply. Operation can continue indefinitely if Required action A.1 is met.
Note 2 requires only four RHRSW pumps powered from separate 4kV shutdown boards to be OPERABLE if the other fueled unit has been in Mode 4 or 5 for over 24 hours. This acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for over 24 hours.

If Required action A.1 cannot be met, then Required Action A.2 must be complied with. With one RHRSW pump inoperable, the inoperable RHRSW pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

B.1

With one RHRSW subsystem inoperable, the inoperable RHRSW subsystem must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1

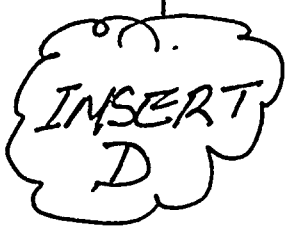
With two required RHRSW pumps inoperable the remaining RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure of the OPERABLE RHRSW pumps could result in a loss of RHRSW function. The seven day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE RHRSW pumps and the low probability of an event occurring during this period.

BASES

ACTIONS

C.1 (continued)

The requisite number of subsystems and pumps must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.



D.1 and D.2

If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

Verifying the correct alignment for each manual and power operated valve in each RHRSW subsystem flow path provides assurance that the proper flow paths will exist for RHRSW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRSW System is a manually initiated system.

This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

(continued)

Insert D

D.1

With two RHRSW subsystems inoperable, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 7 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

E.1

With three or more required RHRSW pumps inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of pumps must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

F.1

With three or more required RHRSW subsystems inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of subsystems must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

G.1 and G.2

If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES (continued)

REFERENCES

1. FSAR, Section 10.9.

2. FSAR; Chapter 5.

3. FSAR, Chapter 14.

4. FSAR, Section 14.6.3.3.2.

~~5. Design Criteria BFN-50-7064A, Primary Containment Systems - Units 2 and 3~~

5 → ~~6.~~ NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

6 → ~~7.~~ GE-NE-B13-01755-2, Revision 1, February 1996.

Note
The number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for ≥ 24 hours.

3.7 PLANT SYSTEMS

3.7.1 Residual Heat Removal Service Water (RHRSW) System

LCO 3.7.1

NOTES
1. With 1 or 2 units fueled, each subsystem must have at least one OPERABLE RHRSW pump.
2. With 3 units fueled, two RHRSW subsystems must have two OPERABLE RHRSW pumps.

~~Four RHRSW subsystems shall be OPERABLE.~~

Four RHRSW subsystems shall be OPERABLE with the number of OPERABLE pumps as listed below:
1. 1 unit fueled - four OPERABLE RHRSW pumps.
2. 2 units fueled - six OPERABLE RHRSW pumps.
3. 3 units fueled - eight OPERABLE RHRSW pumps.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

NOTE
Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," for RHR shutdown cooling made inoperable by RHRSW System.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHRSW subsystem or required pump inoperable.	A.1 Restore RHRSW subsystem or required pump to OPERABLE status.	30 days

(continued)

INSERT A

Insert A

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required RHRSW pump inoperable.	A.1 ----------Notes---------- 1. Only applicable for the 2 units fueled condition. 2. Only four RHRSW pumps powered from a separate 4kV shutdown board are required to be OPERABLE if the other fueled unit has been in MODE 4 or 5 for ≥ 24 hours. ---------- Verify 5 RHRSW pumps powered from separate 4kV shutdown boards are OPERABLE. OR A.2 Restore required RHRSW pump to OPERABLE status.	Immediately 30 days

(continued)

INSERT B

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two RHRSW subsystems inoperable.	B.1 --------NOTE-------- Only applicable when two units are fueled. ---------- Verify at least three OPERABLE RHRSW pumps are associated with two OPERABLE RHRSW subsystems.	1 hour
	AND	
	B.2 --------NOTE-------- Only applicable when three units are fueled. ---------- Verify at least four OPERABLE RHRSW pumps are associated with two OPERABLE RHRSW subsystems.	1 hour
	AND	
	B.3 Restore one inoperable RHRSW subsystem to OPERABLE status.	7 days
C. Three or more RHRSW subsystems inoperable. OR Required Action B.1 or B.2 and associated Completion Time not met.	C.1 Restore the required RHRSW subsystems to OPERABLE status.	8 hours

(continued)

Insert B

CONDITION		REQUIRED ACTION		COMPLETION TIME
B.	One RHRSW subsystem inoperable.	B.1	----------Note---------- Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling - Hot Shutdown," for RHR shutdown cooling made inoperable by the RHRSW system. ---------- Restore RHRSW subsystem to OPERABLE status.	30 days
C.	Two required RHRSW pumps inoperable.	C.1	Restore one inoperable RHRSW pump to OPERABLE status	7 days
D.	Two RHRSW subsystems inoperable.	D.1	----------Note---------- Enter applicable conditions and Required actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by the RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status.	7 days
E.	Three or more required RHRSW pumps inoperable	E.1	Restore one RHRSW pump to OPERABLE status.	8 hours
F.	Three or more RHRSW subsystems inoperable.	F.1	----------Note---------- Enter applicable Conditions and Required Actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by the RHRSW system. ---------- Restore one RHRSW subsystem to OPERABLE status.	8 hours

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action A.1, B.3, or C.1 and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	31 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Required Action and associated Completion Time not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 4.	12 hours 36 hours

B 3.7 PLANT SYSTEMS

B 3.7.1 Residual Heat Removal Service Water (RHRSW) System

BASES

BACKGROUND

The RHRSW System is designed to provide cooling water for the Residual Heat Removal (RHR) System heat exchangers, required for a safe reactor shutdown following a Design Basis Accident (DBA) or transient. The RHRSW System is operated whenever the RHR heat exchangers are required to operate in the shutdown cooling mode or in the suppression pool cooling or spray mode of the RHR System.

The RHRSW System is common to the three BFN units and consists of four independent and redundant loops, each of which feeds one RHR heat exchanger in each unit. Each loop is made up of a header, two 4500 gpm pumps, a suction source, valves, piping, and associated instrumentation. One loop with one pump operating is capable of providing 50% of the required cooling capacity to maintain safe shutdown conditions for one unit. ~~following a design basis accident. However, one pump is capable of providing sufficient cooling capacity to maintain a safe shutdown condition for each of the non-accident units.~~ As such, a subsystem consists of a loop with one or two OPERABLE pumps ~~dependent upon the number of fueled units.~~ The RHRSW System is designed with sufficient redundancy so that no single active component failure can prevent it from achieving its design function. The RHRSW System is described in the FSAR, Section 10.9 (Ref. 1).

, a heat exchanger, a suction source, and associated valves, piping and instrumentation.

Cooling water is pumped by the RHRSW pumps from the Wheeler Reservoir through the tube side of the RHR heat exchangers, and discharged back to the Wheeler Reservoir.

The system is initiated manually from each of the three units control rooms. If operating during a loss of coolant accident (LOCA), the system is automatically tripped on degraded bus voltage to allow the diesel generators to automatically power only that equipment necessary to reflood the core. The system can be manually started any time the degraded bus voltage signal ~~is manually overridden or~~ clears, and is assumed to be manually started within 10 minutes after the LOCA.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The RHRSW System removes heat from the suppression pool to limit the suppression pool temperature and primary containment pressure following a LOCA. This ensures that the primary containment can perform its function of limiting the release of radioactive materials to the environment following a LOCA. The ability of the RHRSW System to support long term cooling of the reactor or primary containment is discussed in the FSAR, Chapters 5 and 14 (Refs. 2 and 3, respectively). These analyses explicitly assume that the RHRSW System will provide adequate cooling support to the equipment required for safe shutdown. These analyses include the evaluation of the long term primary containment response after a design basis LOCA.

The safety analyses for long term cooling were performed for various combinations of RHR System failures and considers the number of units fueled. With one unit fueled, the worst case single failure that would affect the performance of the RHRSW System is any failure that would disable two subsystems or pumps of the RHRSW System (e.g, the failure of an RHR Suppression Pool Cooling/Spray return line valve which effectively disables two RHRSW subsystems or pumps). With two and three units fueled, a worst case single failure could also include the loss of two RHRSW pumps caused by losing a 4 kV shutdown board since there are certain alignment configurations that allow two RHRSW pumps to be powered from the same 4 kV shutdown board. As discussed in the FSAR, Section 14.6.3.3.2 (Ref. 4) for these analyses, manual initiation of the OPERABLE RHRSW subsystems and the associated RHR System is assumed to occur 10 minutes after a DBA. The RHRSW flow assumed in the analyses is ~~4500~~ 4000 gpm per pump with two pumps operating in one loop. In this case, the maximum suppression chamber water temperature and pressure are 177°F (as reported in Reference 7) and 49.6 psig, respectively, well below the design temperature of 281°F and maximum allowable pressure of 62 psig. ~~This is also below the 200°F limit imposed by Design Criteria BFN-50-7064A (Ref. 5) for all plant transients involving SRV operations.~~

The RHRSW System satisfies Criterion 3 of the NRC Policy Statement (Ref 6).

(continued)

Additionally, since the RHRSW pumps are shared between the three BFN units, the number of OPERABLE pumps required is also dependent on the number of units fueled.

BASES (continued)

LCO

Four RHRSW subsystems are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming the worst case single active failure occurs coincident with the loss of offsite power.

An OPERABLE RHRSW subsystem consists of:

~~a. The required number of OPERABLE RHRSW pumps dependent upon the number of units fueled; and~~

b. An OPERABLE flow path capable of taking suction from the intake structure and transferring the water to the required RHR heat exchangers at the assumed flow rate with at least one OPERABLE RHRSW pump in the flow path.

~~The LCO is modified by two Notes. Note 1 specifies that when 1 or 2 units are fueled, there must be at least one OPERABLE pump per RHRSW subsystem. Note 2 specifies that when 3 units are fueled, two of the RHRSW subsystems must have two OPERABLE RHRSW pumps.~~

In addition to the required number of OPERABLE subsystems, there must be an adequate number of pumps OPERABLE to provide cooling for the fueled non-accident units.

The number of required OPERABLE RHRSW pumps required is modified by a Note which specifies that the number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for over 24 hours. This Note acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in Mode 4 or 5 for over 24 h

APPLICABILITY

In MODES 1, 2, and 3, the RHRSW System is required to be OPERABLE to support the OPERABILITY of the RHR System for primary containment cooling (LCO 3.6.2.3, "Residual Heat Removal (RHR) Suppression Pool Cooling," and LCO 3.6.2.4, "Residual Heat Removal (RHR) Suppression Pool Spray") and decay heat removal (LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System-Hot Shutdown"). The Applicability is therefore consistent with the requirements of these systems.

In MODES 4 and 5, the OPERABILITY requirements of the RHRSW System are determined by the systems it supports.

ACTIONS

~~The Actions are modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.~~

(continued)

BASES

INSERT C

ACTIONS
(continued)

A.1

With one RHRSW subsystem or required pump inoperable, the inoperable RHRSW subsystem or required pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

B.1, B.2 and B.3

Required Action B.1 requires verification that at least three OPERABLE RHRSW pumps are associated with the two OPERABLE RHRSW subsystems. The Required Action is modified by a Note indicating that the required action is applicable only when two units are fueled. Required Action B.2 requires verification that at least four OPERABLE RHRSW pumps are associated with the two OPERABLE RHRSW subsystems. The Required Action is modified by a Note indicating that the required action is applicable only when three units are fueled.

Required Action B.3 requires that with two RHRSW subsystems inoperable, one inoperable RHRSW subsystem be restored to OPERABLE status within 7 days. With the unit(s) in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE RHRSW subsystems could result in loss of RHRSW function. The 7 day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE subsystems and the low probability of an event occurring requiring RHRSW during this period.

C.1

With three or more RHRSW subsystems inoperable, the RHRSW System is not capable of performing its intended function.

(continued)

Insert C

A.1 and A.2

Required Action A.1 requires immediate verification that five RHRSW pumps powered from separate 4kV shutdown boards are OPERABLE. The Required Action is modified by two Notes. Note 1 indicates that the required action is applicable only when two units are fueled. In the two unit fueled condition a single failure (loss of a 4kV shutdown board) could result in inadequate RHRSW pumps if two pumps are powered from the same power supply. This corresponds to the LCO requirement of six OPERABLE pumps when two units are fueled, which still provides the minimum required four RHRSW pumps with the worst case single failure. If five RHRSW pumps are powered from separate 4kV shutdown boards, then no postulated single active failure could occur to prevent the RHRSW system from performing its design function. This is equivalent to any six RHRSW pumps operable with a maximum of two sets of two pumps allowed to be powered from the same power supply. Operation can continue indefinitely if Required action A.1 is met.
Note 2 requires only four RHRSW pumps powered from separate 4kV shutdown boards to be OPERABLE if the other fueled unit has been in Mode 4 or 5 for over 24 hours. This acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for over 24 hours.

If Required action A.1 cannot be met, then Required Action A.2 must be complied with. With one RHRSW pump inoperable, the inoperable RHRSW pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

B.1

With one RHRSW subsystem inoperable, the inoperable RHRSW subsystem must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1

With two required RHRSW pumps inoperable the remaining RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure of the OPERABLE RHRSW pumps could result in a loss of RHRSW function. The seven day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE RHRSW pumps and the low probability of an event occurring during this period.

Insert C

A.1 and A.2

Required Action A.1 requires immediate verification that five RHRSW pumps powered from separate 4kV shutdown boards are OPERABLE. The Required Action is modified by two Notes. Note 2 indicates that the required action is applicable only when two units are fueled. In the two unit fueled condition a single failure (loss of a kV shutdown board) could result in inadequate RHRSW pumps if two pumps are powered from the same power supply. This corresponds to the LCO requirement of 6 OPERABLE pumps when two units are fueled, which still provides the minimum required four RHRSW pumps with the worst case single failure. If five RHRSW pumps are powered from separate 4kV shutdown boards, then no postulated single active failure could occur to prevent the RHRSW system from performing its design function. This is equivalent to any six RHRSW pumps operable with a maximum of two sets of two pumps allowed to be powered from the same power supply. Operation can continue indefinitely if Required action A.1 is met.
Note 2 requires only four RHRSW pumps powered from separate 4kV shutdown boards to be OPERABLE if the other fueled unit has been in Mode 4 or 5 for over 24 hours. This acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for over 24 hours.

If Required action A.1 cannot be met, then Required Action A.2 must be complied with. With one RHRSW pump inoperable, the inoperable RHRSW pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

B.1

With one RHRSW subsystem inoperable, the inoperable RHRSW subsystem must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1

With two required RHRSW pumps inoperable the remaining RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure of the OPERABLE RHRSW pumps could result in a loss of RHRSW function. The seven day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE RHRSW pumps and the low probability of an event occurring during this period.

BASES

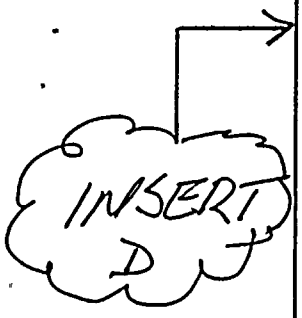
ACTIONS

C.1 (continued)

The requisite number of subsystems and pumps must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

D.1 and D.2

If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.



SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

Verifying the correct alignment for each manual and power operated valve in each RHRSW subsystem flow path provides assurance that the proper flow paths will exist for RHRSW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRSW System is a manually initiated system.

This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

(continued)

Insert D

D.1

With two RHRSW subsystems inoperable, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 7 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

E.1

With three or more required RHRSW pumps inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of pumps must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

F.1

With three or more required RHRSW subsystems inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of subsystems must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

The Required action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

G.1 and G.2

If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES (continued)

REFERENCES

1. FSAR, Section 10.9.
2. FSAR, Chapter 5.
3. FSAR, Chapter 14.
4. FSAR, Section 14.6.3.3.2.
~~5. Design Criteria BFN-50-7064A, Primary Containment Systems - Units 2 and 3~~
5 → ~~6.~~ NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
6 → ~~7.~~ GE-NE-B13-01755-2, Revision 1, February 1996.

ENCLOSURE 5

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
Units 1, 2, and 3

PROPOSED IMPROVED TECHNICAL SPECIFICATION (TS) CHANGE TS-395
REVISED - ITS

I. AFFECTED PAGE LIST

Unit 1 - Pages 3.7-1 through - 3, B3.7-1 through -8
Unit 2 - Pages 3.7-1 through - 3, B3.7-1 through -8
Unit 3 - Pages 3.7-1 through - 3, B3.7-1 through -8

II. REVISED PAGES

See attached.

3.7 PLANT SYSTEMS

3.7.1 Residual Heat Removal Service Water (RHRSW) System

LCO 3.7.1

----------NOTES----------
The number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for $\geq$ 24 hours.

Four RHRSW subsystems shall be OPERABLE with the number of OPERABLE pumps as listed below:

1. 1 unit fueled - four OPERABLE RHRSW pumps.
2. 2 units fueled - six OPERABLE RHRSW pumps.
3. 3 units fueled - eight OPERABLE RHRSW pumps.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required RHRSW pump inoperable.	A.1 -------NOTES------- 1. Only applicable for the 2 units fueled condition. 2. Only four RHRSW pumps powered from a separate 4 kV shutdown board are required to be OPERABLE if the other fueled unit has been in MODE 4 or 5 for $\geq$ 24 hours. ---------- Verify five RHRSW pumps powered from separate 4 kV shutdown boards are OPERABLE.	Immediately
	OR	
	A.2 Restore required RHRSW pump to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One RHRSW subsystems inoperable.	B.1 --------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling - Hot Shutdown," for RHR shutdown cooling made inoperable by the RHRSW system. ---------- Restore RHRSW subsystem to OPERABLE status.	30 days
C. Two required RHRSW pumps inoperable.	C.1 Restore one inoperable RHRSW pump to OPERABLE status.	7 days
D. Two RHRSW subsystems inoperable.	D.1 --------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.7, for RHR shutdown cooling made inoperable by the RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Three or more required RHRSW pumps inoperable.	E.1 Restore one RHRSW pump to OPERABLE status.	8 hours
F. Three or more RHRSW subsystems inoperable.	F.1 --------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by the RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status.	8 hours
G. Required Action and associated Completion Time not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	31 days

B 3.7 PLANT SYSTEMS

B 3.7.1 Residual Heat Removal Service Water (RHRSW) System

BASES

BACKGROUND

The RHRSW System is designed to provide cooling water for the Residual Heat Removal (RHR) System heat exchangers, required for a safe reactor shutdown following a Design Basis Accident (DBA) or transient. The RHRSW System is operated whenever the RHR heat exchangers are required to operate in the shutdown cooling mode or in the suppression pool cooling or spray mode of the RHR System.

The RHRSW System is common to the three BFN units and consists of four independent and redundant loops, each of which feeds one RHR heat exchanger in each unit. Each loop is made up of a header, two 4500 gpm pumps, a suction source, valves, piping, and associated instrumentation. One loop with one pump operating is capable of providing 50% of the required cooling capacity to maintain safe shutdown conditions for one unit. As such, a subsystem consists of a loop with one or two OPERABLE pumps, a heat exchanger, a suction source, and associated valves, piping and instrumentation. The RHRSW System is designed with sufficient redundancy so that no single active component failure can prevent it from achieving its design function. The RHRSW System is described in the FSAR, Section 10.9 (Ref. 1).

Cooling water is pumped by the RHRSW pumps from the Wheeler Reservoir through the tube side of the RHR heat exchangers, and discharged back to the Wheeler Reservoir.

The system is initiated manually from each of the three units control rooms. If operating during a loss of coolant accident (LOCA), the system is automatically tripped on degraded bus voltage to allow the diesel generators to automatically power only that equipment necessary to reflood the core. The system can be manually started any time the degraded bus voltage signal clears, and is assumed to be manually started within 10 minutes after the LOCA.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The RHRSW System removes heat from the suppression pool to limit the suppression pool temperature and primary containment pressure following a LOCA. This ensures that the primary containment can perform its function of limiting the release of radioactive materials to the environment following a LOCA. The ability of the RHRSW System to support long term cooling of the reactor or primary containment is discussed in the FSAR, Chapters 5 and 14 (Refs. 2 and 3, respectively). These analyses explicitly assume that the RHRSW System will provide adequate cooling support to the equipment required for safe shutdown. These analyses include the evaluation of the long term primary containment response after a design basis LOCA.

The safety analyses for long term cooling were performed for various combinations of RHR System failures and considers the number of units fueled. With one unit fueled, the worst case single failure that would affect the performance of the RHRSW System is any failure that would disable two subsystems or pumps of the RHRSW System (e.g, the failure of an RHR Suppression Pool Cooling/Spray return line valve which effectively disables two RHRSW subsystems or pumps). With two and three units fueled, a worst case single failure could also include the loss of two RHRSW pumps caused by losing a 4 kV shutdown board since there are certain alignment configurations that allow two RHRSW pumps to be powered from the same 4 kV shutdown board. As discussed in the FSAR, Section 14.6.3.3.2 (Ref. 4) for these analyses, manual initiation of the OPERABLE RHRSW subsystems and the associated RHR System is assumed to occur 10 minutes after a DBA. The RHRSW flow assumed in the analyses is 4000 gpm per pump with two pumps operating in one loop. In this case, the maximum suppression chamber water temperature and pressure are 177°F (as reported in Reference 6) and 49.6 psig, respectively, well below the design temperature of 281°F and maximum allowable pressure of 62 psig.

The RHRSW System satisfies Criterion 3 of the NRC Policy Statement (Ref 5).

(continued)

BASES (continued)

LCO

Four RHRSW subsystems are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming the worst case single active failure occurs coincident with the loss of offsite power. Additionally, since the RHRSW pumps are shared between the three BFN units, the number of OPERABLE pumps required is also dependent on the number of units fueled.

An OPERABLE RHRSW subsystem consists of an OPERABLE flow path capable of taking suction from the intake structure and transferring the water to the required RHR heat exchangers at the assumed flow rate with at least one OPERABLE RHRSW pump in the flow path.

In addition to the required number of OPERABLE subsystems, there must be an adequate number of pumps OPERABLE to provide cooling for the fueled non-accident units.

The number of required OPERABLE RHRSW pumps required is modified by a Note which specifies that the number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for over 24 hours. This Note acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for over 24 hours.

APPLICABILITY

In MODES 1, 2, and 3, the RHRSW System is required to be OPERABLE to support the OPERABILITY of the RHR System for primary containment cooling (LCO 3.6.2.3, "Residual Heat Removal (RHR) Suppression Pool Cooling," and LCO 3.6.2.4, "Residual Heat Removal (RHR) Suppression Pool Spray") and decay heat removal (LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown"). The Applicability is therefore consistent with the requirements of these systems.

In MODES 4 and 5, the OPERABILITY requirements of the RHRSW System are determined by the systems it supports.

(continued)

BASES (continued)

ACTIONS

A.1 and A.2

Required Action A.1 requires immediate verification that five RHRSW pumps powered from separate 4 kV shutdown boards are OPERABLE. The Required Action is modified by two notes. Note 1 indicates that the required action is applicable only when two units are fueled. In the two unit fueled condition, a single failure (loss of a 4 kV shutdown board) could result in inadequate RHRSW pumps if two pumps are powered from the same power supply. This corresponds to the LCO requirement of six OPERABLE pumps when two units are fueled, which still provides the minimum required four RHRSW pumps with the worst case single failure. If five RHRSW pumps are powered from separate 4 kV shutdown boards, then no postulated single active failure could occur to prevent the RHRSW system from performing its design function. This is equivalent to any six RHRSW pumps OPERABLE with a maximum of two sets of two pumps allowed to be powered from the same power supply. Operation can continue indefinitely if Required Action A.1 is met.

Note 2 requires only four RHRSW pumps powered from separate 4 kV shutdown boards to be OPERABLE if the other fueled unit has been in MODE 4 or 5 greater than 24 hours. This acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for greater than 24 hours.

If Required Action A.1 cannot be met, then Required Action A.2 must be complied with. With one RHRSW pump inoperable, the inoperable RHRSW pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

(continued)

BASES

ACTIONS (continued)

B.1

With one RHRSW subsystem inoperable, the inoperable RHRSW subsystem must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1

With two required RHRSW pumps inoperable, the remaining RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure of the OPERABLE RHRSW pumps could result in a loss of RHRSW function. The seven day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE RHRSW pumps and the low probability of an event occurring during this period.

(continued)

BASES

ACTIONS (continued)

D.1

With two RHRSW subsystems inoperable, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The seven day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

E.1

With three or more required RHRSW pumps inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of pumps must be restored to OPERABLE status within eight hours. The eight hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

F.1

With three or more required RHRSW subsystems inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of subsystems must be restored to OPERABLE status within eight hours. The eight hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

(continued)

BASES

ACTIONS

F.1 (continued)

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

G.1 and G.2

If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

Verifying the correct alignment for each manual and power operated valve in each RHRSW subsystem flow path provides assurance that the proper flow paths will exist for RHRSW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRSW System is a manually initiated system.

This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1 (continued)

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

REFERENCES

1. FSAR, Section 10.9.
2. FSAR, Chapter 5.
3. FSAR, Chapter 14.
4. FSAR, Section 14.6.3.3.2.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
6. GE-NE-B13-01755-2, Revision 1, February 1996.

3.7 PLANT SYSTEMS

3.7.1 Residual Heat Removal Service Water (RHRSW) System

LCO 3.7.1

----------NOTES----------
The number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for $\geq$ 24 hours.

Four RHRSW subsystems shall be OPERABLE with the number of OPERABLE pumps as listed below:

1. 1 unit fueled - four OPERABLE RHRSW pumps.
2. 2 units fueled - six OPERABLE RHRSW pumps.
3. 3 units fueled - eight OPERABLE RHRSW pumps.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required RHRSW pump inoperable.	A.1 -------NOTES------- 1. Only applicable for the 2 units fueled condition. 2. Only four RHRSW pumps powered from a separate 4 kV shutdown board are required to be OPERABLE if the other fueled unit has been in MODE 4 or 5 for $\geq$ 24 hours. ---------- Verify five RHRSW pumps powered from separate 4 kV shutdown boards are OPERABLE.	Immediately
	OR	
	A.2 Restore required RHRSW pump to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION		REQUIRED ACTION		COMPLETION TIME
B.	One RHRSW subsystems inoperable.	B.1	--------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling - Hot Shutdown," for RHR shutdown cooling made inoperable by the RHRSW system. ---------- Restore RHRSW subsystem to OPERABLE status.	30 days
C.	Two required RHRSW pumps inoperable.	C.1	Restore one inoperable RHRSW pump to OPERABLE status.	7 days
D.	Two RHRSW subsystems inoperable.	D.1	--------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.7, for RHR shutdown cooling made inoperable by the RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status.	7 days

(continued)

ACTIONS (continued)

CONDITION		REQUIRED ACTION		COMPLETION TIME
E.	Three or more required RHRSW pumps inoperable.	E.1	Restore one RHRSW pump to OPERABLE status.	8 hours
F.	Three or more RHRSW subsystems inoperable.	F.1	--------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by the RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status.	 8 hours
G.	Required Action and associated Completion Time not met.	G.1 AND G.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	31 days

B 3.7 PLANT SYSTEMS

B 3.7.1 Residual Heat Removal Service Water (RHRSW) System

BASES

BACKGROUND

The RHRSW System is designed to provide cooling water for the Residual Heat Removal (RHR) System heat exchangers, required for a safe reactor shutdown following a Design Basis Accident (DBA) or transient. The RHRSW System is operated whenever the RHR heat exchangers are required to operate in the shutdown cooling mode or in the suppression pool cooling or spray mode of the RHR System.

The RHRSW System is common to the three BFN units and consists of four independent and redundant loops, each of which feeds one RHR heat exchanger in each unit. Each loop is made up of a header, two 4500 gpm pumps, a suction source, valves, piping, and associated instrumentation. One loop with one pump operating is capable of providing 50% of the required cooling capacity to maintain safe shutdown conditions for one unit. As such, a subsystem consists of a loop with one or two OPERABLE pumps, a heat exchanger, a suction source, and associated valves, piping and instrumentation. The RHRSW System is designed with sufficient redundancy so that no single active component failure can prevent it from achieving its design function. The RHRSW System is described in the FSAR, Section 10.9 (Ref. 1).

Cooling water is pumped by the RHRSW pumps from the Wheeler Reservoir through the tube side of the RHR heat exchangers, and discharged back to the Wheeler Reservoir.

The system is initiated manually from each of the three units control rooms. If operating during a loss of coolant accident (LOCA), the system is automatically tripped on degraded bus voltage to allow the diesel generators to automatically power only that equipment necessary to reflood the core. The system can be manually started any time the degraded bus voltage signal clears, and is assumed to be manually started within 10 minutes after the LOCA.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The RHRSW System removes heat from the suppression pool to limit the suppression pool temperature and primary containment pressure following a LOCA. This ensures that the primary containment can perform its function of limiting the release of radioactive materials to the environment following a LOCA. The ability of the RHRSW System to support long term cooling of the reactor or primary containment is discussed in the FSAR, Chapters 5 and 14 (Refs. 2 and 3, respectively). These analyses explicitly assume that the RHRSW System will provide adequate cooling support to the equipment required for safe shutdown. These analyses include the evaluation of the long term primary containment response after a design basis LOCA.

The safety analyses for long term cooling were performed for various combinations of RHR System failures and considers the number of units fueled. With one unit fueled, the worst case single failure that would affect the performance of the RHRSW System is any failure that would disable two subsystems or pumps of the RHRSW System (e.g, the failure of an RHR Suppression Pool Cooling/Spray return line valve which effectively disables two RHRSW subsystems or pumps). With two and three units fueled, a worst case single failure could also include the loss of two RHRSW pumps caused by losing a 4 kV shutdown board since there are certain alignment configurations that allow two RHRSW pumps to be powered from the same 4 kV shutdown board. As discussed in the FSAR, Section 14.6.3.3.2 (Ref. 4) for these analyses, manual initiation of the OPERABLE RHRSW subsystems and the associated RHR System is assumed to occur 10 minutes after a DBA. The RHRSW flow assumed in the analyses is 4000 gpm per pump with two pumps operating in one loop. In this case, the maximum suppression chamber water temperature and pressure are 177°F (as reported in Reference 6) and 49.6 psig, respectively, well below the design temperature of 281°F and maximum allowable pressure of 62 psig.

The RHRSW System satisfies Criterion 3 of the NRC Policy Statement (Ref 5).

(continued)

BASES (continued)

LCO

Four RHRSW subsystems are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming the worst case single active failure occurs coincident with the loss of offsite power. Additionally, since the RHRSW pumps are shared between the three BFN units, the number of OPERABLE pumps required is also dependent on the number of units fueled.

An OPERABLE RHRSW subsystem consists of an OPERABLE flow path capable of taking suction from the intake structure and transferring the water to the required RHR heat exchangers at the assumed flow rate with at least one OPERABLE RHRSW pump in the flow path.

In addition to the required number of OPERABLE subsystems, there must be an adequate number of pumps OPERABLE to provide cooling for the fueled non-accident units.

The number of required OPERABLE RHRSW pumps required is modified by a Note which specifies that the number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for over 24 hours. This Note acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for over 24 hours.

APPLICABILITY

In MODES 1, 2, and 3, the RHRSW System is required to be OPERABLE to support the OPERABILITY of the RHR System for primary containment cooling (LCO 3.6.2.3, "Residual Heat Removal (RHR) Suppression Pool Cooling," and LCO 3.6.2.4, "Residual Heat Removal (RHR) Suppression Pool Spray") and decay heat removal (LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown"). The Applicability is therefore consistent with the requirements of these systems.

In MODES 4 and 5, the OPERABILITY requirements of the RHRSW System are determined by the systems it supports.

(continued)

BASES (continued)

ACTIONS

A.1 and A.2

Required Action A.1 requires immediate verification that five RHRSW pumps powered from separate 4 kV shutdown boards are OPERABLE. The Required Action is modified by two notes. Note 1 indicates that the required action is applicable only when two units are fueled. In the two unit fueled condition, a single failure (loss of a 4 kV shutdown board) could result in inadequate RHRSW pumps if two pumps are powered from the same power supply. This corresponds to the LCO requirement of six OPERABLE pumps when two units are fueled, which still provides the minimum required four RHRSW pumps with the worst case single failure. If five RHRSW pumps are powered from separate 4 kV shutdown boards, then no postulated single active failure could occur to prevent the RHRSW system from performing its design function. This is equivalent to any six RHRSW pumps OPERABLE with a maximum of two sets of two pumps allowed to be powered from the same power supply. Operation can continue indefinitely if Required Action A.1 is met.

Note 2 requires only four RHRSW pumps powered from separate 4 kV shutdown boards to be OPERABLE if the other fueled unit has been in MODE 4 or 5 greater than 24 hours. This acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for greater than 24 hours.

If Required Action A.1 cannot be met, then Required Action A.2 must be complied with. With one RHRSW pump inoperable, the inoperable RHRSW pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

(continued)

BASES

ACTIONS (continued)

B.1

With one RHRSW subsystem inoperable, the inoperable RHRSW subsystem must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1

With two required RHRSW pumps inoperable, the remaining RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure of the OPERABLE RHRSW pumps could result in a loss of RHRSW function. The seven day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE RHRSW pumps and the low probability of an event occurring during this period.

(continued)

BASES

ACTIONS (continued)

D.1

With two RHRSW subsystems inoperable, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The seven day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

E.1

With three or more required RHRSW pumps inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of pumps must be restored to OPERABLE status within eight hours. The eight hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

F.1

With three or more required RHRSW subsystems inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of subsystems must be restored to OPERABLE status within eight hours. The eight hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

(continued)

BASES

ACTIONS

F.1 (continued)

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

G.1 and G.2

If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

Verifying the correct alignment for each manual and power operated valve in each RHRSW subsystem flow path provides assurance that the proper flow paths will exist for RHRSW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRSW System is a manually initiated system.

This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1 (continued)

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

REFERENCES

1. FSAR, Section 10.9.
2. FSAR, Chapter 5.
3. FSAR, Chapter 14.
4. FSAR, Section 14.6.3.3.2.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
6. GE-NE-B13-01755-2, Revision 1, February 1996.

3.7 PLANT SYSTEMS

3.7.1 Residual Heat Removal Service Water (RHRSW) System

LCO 3.7.1

----------NOTES----------
The number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for $\geq$ 24 hours.

Four RHRSW subsystems shall be OPERABLE with the number of OPERABLE pumps as listed below:

1. 1 unit fueled - four OPERABLE RHRSW pumps.
2. 2 units fueled - six OPERABLE RHRSW pumps.
3. 3 units fueled - eight OPERABLE RHRSW pumps.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required RHRSW pump inoperable.	A.1 --------NOTES-------- 1. Only applicable for the 2 units fueled condition. 2. Only four RHRSW pumps powered from a separate 4 kV shutdown board are required to be OPERABLE if the other fueled unit has been in MODE 4 or 5 for $\geq$ 24 hours. ---------- Verify five RHRSW pumps powered from separate 4 kV shutdown boards are OPERABLE.	Immediately
	OR	
	A.2 Restore required RHRSW pump to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One RHRSW subsystems inoperable.	B.1 --------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling - Hot Shutdown," for RHR shutdown cooling made inoperable by the RHRSW system. ---------- Restore RHRSW subsystem to OPERABLE status.	30 days
C. Two required RHRSW pumps inoperable.	C.1 Restore one inoperable RHRSW pump to OPERABLE status.	7 days
D. Two RHRSW subsystems inoperable.	D.1 --------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.7, for RHR shutdown cooling made inoperable by the RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status.	7 days

(continued)

ACTIONS (continued)

CONDITION		REQUIRED ACTION		COMPLETION TIME
E.	Three or more required RHRSW pumps inoperable.	E.1	Restore one RHRSW pump to OPERABLE status.	8 hours
F.	Three or more RHRSW subsystems inoperable.	F.1	--------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by the RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status.	8 hours
G.	Required Action and associated Completion Time not met.	G.1 AND G.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	31 days

B 3.7 PLANT SYSTEMS

B 3.7.1 Residual Heat Removal Service Water (RHRSW) System

BASES

BACKGROUND

The RHRSW System is designed to provide cooling water for the Residual Heat Removal (RHR) System heat exchangers, required for a safe reactor shutdown following a Design Basis Accident (DBA) or transient. The RHRSW System is operated whenever the RHR heat exchangers are required to operate in the shutdown cooling mode or in the suppression pool cooling or spray mode of the RHR System.

The RHRSW System is common to the three BFN units and consists of four independent and redundant loops, each of which feeds one RHR heat exchanger in each unit. Each loop is made up of a header, two 4500 gpm pumps, a suction source, valves, piping, and associated instrumentation. One loop with one pump operating is capable of providing 50% of the required cooling capacity to maintain safe shutdown conditions for one unit. As such, a subsystem consists of a loop with one or two OPERABLE pumps, a heat exchanger, a suction source, and associated valves, piping and instrumentation. The RHRSW System is designed with sufficient redundancy so that no single active component failure can prevent it from achieving its design function. The RHRSW System is described in the FSAR, Section 10.9 (Ref. 1).

Cooling water is pumped by the RHRSW pumps from the Wheeler Reservoir through the tube side of the RHR heat exchangers, and discharged back to the Wheeler Reservoir.

The system is initiated manually from each of the three units control rooms. If operating during a loss of coolant accident (LOCA), the system is automatically tripped on degraded bus voltage to allow the diesel generators to automatically power only that equipment necessary to reflood the core. The system can be manually started any time the degraded bus voltage signal clears, and is assumed to be manually started within 10 minutes after the LOCA.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The RHRSW System removes heat from the suppression pool to limit the suppression pool temperature and primary containment pressure following a LOCA. This ensures that the primary containment can perform its function of limiting the release of radioactive materials to the environment following a LOCA. The ability of the RHRSW System to support long term cooling of the reactor or primary containment is discussed in the FSAR, Chapters 5 and 14 (Refs. 2 and 3, respectively). These analyses explicitly assume that the RHRSW System will provide adequate cooling support to the equipment required for safe shutdown. These analyses include the evaluation of the long term primary containment response after a design basis LOCA.

The safety analyses for long term cooling were performed for various combinations of RHR System failures and considers the number of units fueled. With one unit fueled, the worst case single failure that would affect the performance of the RHRSW System is any failure that would disable two subsystems or pumps of the RHRSW System (e.g, the failure of an RHR Suppression Pool Cooling/Spray return line valve which effectively disables two RHRSW subsystems or pumps). With two and three units fueled, a worst case single failure could also include the loss of two RHRSW pumps caused by losing a 4 kV shutdown board since there are certain alignment configurations that allow two RHRSW pumps to be powered from the same 4 kV shutdown board. As discussed in the FSAR, Section 14.6.3.3.2 (Ref. 4) for these analyses, manual initiation of the OPERABLE RHRSW subsystems and the associated RHR System is assumed to occur 10 minutes after a DBA. The RHRSW flow assumed in the analyses is 4000 gpm per pump with two pumps operating in one loop. In this case, the maximum suppression chamber water temperature and pressure are 177°F (as reported in Reference 6) and 49.6 psig, respectively, well below the design temperature of 281°F and maximum allowable pressure of 62 psig.

The RHRSW System satisfies Criterion 3 of the NRC Policy Statement (Ref 5).

(continued)

BASES (continued)

LCO

Four RHRSW subsystems are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming the worst case single active failure occurs coincident with the loss of offsite power. Additionally, since the RHRSW pumps are shared between the three BFN units, the number of OPERABLE pumps required is also dependent on the number of units fueled.

An OPERABLE RHRSW subsystem consists of an OPERABLE flow path capable of taking suction from the intake structure and transferring the water to the required RHR heat exchangers at the assumed flow rate with at least one OPERABLE RHRSW pump in the flow path.

In addition to the required number of OPERABLE subsystems, there must be an adequate number of pumps OPERABLE to provide cooling for the fueled non-accident units.

The number of required OPERABLE RHRSW pumps required is modified by a Note which specifies that the number of required RHRSW pumps may be reduced by one for each fueled unit that has been in MODE 4 or 5 for over 24 hours. This Note acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for over 24 hours.

APPLICABILITY

In MODES 1, 2, and 3, the RHRSW System is required to be OPERABLE to support the OPERABILITY of the RHR System for primary containment cooling (LCO 3.6.2.3, "Residual Heat Removal (RHR) Suppression Pool Cooling," and LCO 3.6.2.4, "Residual Heat Removal (RHR) Suppression Pool Spray") and decay heat removal (LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown"). The Applicability is therefore consistent with the requirements of these systems.

In MODES 4 and 5, the OPERABILITY requirements of the RHRSW System are determined by the systems it supports.

(continued)

BASES (continued)

ACTIONS

A.1 and A.2

Required Action A.1 requires immediate verification that five RHRSW pumps powered from separate 4 kV shutdown boards are OPERABLE. The Required Action is modified by two notes. Note 1 indicates that the required action is applicable only when two units are fueled. In the two unit fueled condition, a single failure (loss of a 4 kV shutdown board) could result in inadequate RHRSW pumps if two pumps are powered from the same power supply. This corresponds to the LCO requirement of six OPERABLE pumps when two units are fueled, which still provides the minimum required four RHRSW pumps with the worst case single failure. If five RHRSW pumps are powered from separate 4 kV shutdown boards, then no postulated single active failure could occur to prevent the RHRSW system from performing its design function. This is equivalent to any six RHRSW pumps OPERABLE with a maximum of two sets of two pumps allowed to be powered from the same power supply. Operation can continue indefinitely if Required Action A.1 is met.

Note 2 requires only four RHRSW pumps powered from separate 4 kV shutdown boards to be OPERABLE if the other fueled unit has been in MODE 4 or 5 greater than 24 hours. This acknowledges the fact that decay heat removal requirements are substantially reduced for fueled units in MODE 4 or 5 for greater than 24 hours.

If Required Action A.1 cannot be met, then Required Action A.2 must be complied with. With one RHRSW pump inoperable, the inoperable RHRSW pump must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

(continued)

BASES

ACTIONS (continued)

B.1

With one RHRSW subsystem inoperable, the inoperable RHRSW subsystem must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The 30 day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1

With two required RHRSW pumps inoperable, the remaining RHRSW pumps are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure of the OPERABLE RHRSW pumps could result in a loss of RHRSW function. The seven day Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE RHRSW pumps and the low probability of an event occurring during this period.

(continued)

BASES

ACTIONS (continued)

D.1

With two RHRSW subsystems inoperable, the remaining OPERABLE RHRSW subsystems are adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure could result in reduced primary containment cooling capability. The seven day Completion Time is based on the availability of equipment in excess of normal redundancy requirements and the low probability of an event occurring requiring RHRSW during this period.

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

E.1

With three or more required RHRSW pumps inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of pumps must be restored to OPERABLE status within eight hours. The eight hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

F.1

With three or more required RHRSW subsystems inoperable, the RHRSW System is not capable of performing its intended function. The requisite number of subsystems must be restored to OPERABLE status within eight hours. The eight hour Completion Time is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

(continued)

BASES

ACTIONS

F.1 (continued)

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7 be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable RHR shutdown cooling. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

G.1 and G.2

If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

Verifying the correct alignment for each manual and power operated valve in each RHRSW subsystem flow path provides assurance that the proper flow paths will exist for RHRSW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRSW System is a manually initiated system.

This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1 (continued)

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

REFERENCES

1. FSAR, Section 10.9.
2. FSAR, Chapter 5.
3. FSAR, Chapter 14.
4. FSAR, Section 14.6.3.3.2.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
6. GE-NE-B13-01755-2, Revision 1, February 1996.