ATTACHMENT 2

INSTRUMENTATION

3/4.3.2 ISOLATION ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The isolation actuation instrumentation channels shown in Table 3.3.2-1. shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.2-2 and with ISOLATION SYSTEM RESPONSE TIME as shown in Table 3.3.2-3.

APPLICABILITY: As shown in Table 3.3.2-1.

ACTION:

a. With an isolation actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.2-2, declare the channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

b. ~~With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system, place the inoperable channel(s) and/or that trip system in the tripped condition* within one hour. The provisions of Specification 3.0.4 are not applicable.~~

[Insert A]

c. With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement for both trip systems, place at least one trip system** in the tripped condition within one hour and take the ACTION required by Table 3.3.2-1.

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*

~~*An inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to OPERABLE status within 2 hours or the ACTION required by Table 3.3.2-1 for that Trip Function shall be taken.~~

~~**If more channels are inoperable in one trip system than in the other, place the trip system with more inoperable channels in the tripped condition, except when this would cause the Trip Function to occur.~~

* [Insert B]

Insert A to Section 3.3.2b

Delete Section 3.3.2b and replace with the following:

With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system:

1. If placing the inoperable channel(s) in the tripped condition would cause an isolation, the inoperable channel(s) shall be restored to OPERABLE status within
   a) 12 hours for trip functions common to RPS Instrumentation; and
   b) 24 hours for trip functions not common to RPS Instrumentation.

   or the ACTION required by Table 3.3.2-1 for the affected trip function shall be taken.

OR

2. If placing the inoperable channel(s) in the tripped conditions would not cause an isolation, the inoperable channel(s) and/or that trip system shall be placed in the tripped condition within
   a) 12 hours for trip functions common to RPS Instrumentation; and
   b) 24 hours for trip functions not common to RPS Instrumentation.

The provisions of Specification 3.0.4 are not applicable.

Insert B to Note Referenced in Section 3.3.2 Action c

Delete Note and replace with the following:

Place one trip system (with the most inoperable channels) in the tripped condition. The trip system need not be placed in the tripped condition when this would cause the isolation to occur.

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

ACTION STATEMENTS

ACTION 20 - Be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

ACTION 21 - Be in at least STARTUP with the associated isolation valves closed within 6 hours or be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

ACTION 22 - Close the affected system isolation valves within 1 hour and declare the affected system inoperable.

ACTION 23 - Be in at least STARTUP within 6 hours.

ACTION 24 - Restore the manual initiation function to OPERABLE status within 8 hours or close the affected system isolation valves within the next hour and declare the affected system inoperable or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

ACTION 25 - Establish SECONDARY CONTAINMENT INTEGRITY with the standby gas treatment system operating within 1 hour.

ACTION 26 - Lock close or close, as applicable, the affected system isolation valves within 1 hour and declare the affected system inoperable.

TABLE NOTATIONS

*May be bypassed with reactor steam pressure $\leq$ 1037 psig and all turbine stop valves closed.

**When handling irradiated fuel in the secondary containment and during CORE ALTERATIONS and operations with a potential for draining the reactor vessel.

#During CORE ALTERATIONS and operations with a potential for draining the reactor vessel.

(a)A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.

(b)Also actuates the standby gas treatment system.

(c)Also trips and isolates the mechanical vacuum pumps.

(d)A channel is OPERABLE if 2 of 4 detectors in that channel are OPERABLE.

(e)Also actuates secondary containment ventilation isolation dampers per Table 3.6.5.2-1.

(f)Closes only RWCU system outboard isolation valve RWCU-V-4.

(g)Only valves RHR-V-123A and RHR-V-123B in Valve Group 5 are required for primary isolation.

(h)Manual initiation isolates RCIC-V-8 only and only with a coincident reactor vessel level-low, level 3.

(i)Not required for RHR-V-8 when control is transferred to the alternate remote shutdown panel during operational conditions 1, 2 & 3 and the isolation interlocks are bypassed. When RHR-V-8 control is transferred to the remote shutdown panel under operational modes 1, 2, and 3 the associated key lock switch will be locked with the valve in the closed position. Except RHR-V-8 can be returned to, and operated from, the control room, with the interlocks and automatic isolation capability reestablished in operational conditions 2 and 3 when reactor pressure is less than 135 psig.

TABLE 4.3.2.1-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
3. REACTOR WATER CLEANUP SYSTEM ISOLATION				
a. Δ Flow - High	S	~~M~~ Q	R	1, 2, 3
b. Heat Exchanger Area Temperature - High	N.A.	SA	R	1, 2, 3
c. Heat Exchanger Area Ventilation Δ Temperature - High	N.A	SA	R	1, 2, 3
d. Pump Area Temperature - High				
Pump Room A	N.A	SA	R	1, 2, 3
Pump Room B	N.A.	SA	R	1, 2, 3
e. Pump Area Ventilation Δ Temp. - High				
Pump Room A	N.A.	SA	R	1, 2, 3
Pump Room B	N.A.	SA	R	1, 2, 3
f. SLCS Initiation	N.A.	R	N.A.	1, 2, 3
g. Reactor Vessel Water Level - Low Low, Level 2	N.A.	~~M~~ Q	R	1, 2, 3
h. RWCU/RCIC Line Routing Area Temperature - High	N.A.	SA	R	1, 2, 3
i RWCU Line Routing Area Temperature - High	N.A.	SA	R	1, 2, 3
j. Manual Initiation	N.A.	R	N.A.	1, 2, 3
4. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION				
a. RCIC Steam Line Flow - High	S	~~M~~ Q	R	1, 2, 3
b. RCIC/RHR Steam Line Flow - High	S	~~M~~ Q	R	1, 2, 3
c. RCIC Steam Supply Pressure - Low	N.A.	~~M~~ Q	R	1, 2, 3
d. RCIC Turbine Exhaust Diaphragm Pressure - High	N.A.	~~M~~ Q	R	1, 2, 3
e. RCIC Equipment Room Temperature - High	N.A.	SA	R	1, 2, 3
f. RCIC Equipment Room Δ Temperature - High	N.A.	SA	R	1, 2, 3

TABLE 4.3.2.1-1

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
1. PRIMARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level-				
1) Low, Level 3	S	~~M~~ Q	R	1, 2, 3
2) Low Low, Level 2	N.A.	~~M~~ Q	R	1, 2, 3
b. Drywell Pressure - High	N.A.	~~M~~ Q	R	1, 2, 3
c. Main Steam Line				
1) Radiation - High	S	~~M~~ Q	R	1, 2, 3
2) Pressure - Low	N.A.	~~M~~ Q	R	1
3) Flow - High	S	~~M~~ Q	R	1, 2, 3
d. Main Steam Line Tunnel Temperature - High	N.A.	SA	R	1, 2, 3
e. Main Steam Line Tunnel Δ Temperature - High	N.A.	SA	R	1, 2, 3
f. Condenser Vacuum - Low	N.A.	~~M~~ Q	R	1, 2*, 3*
g. Manual Initiation	N.A.	R	N.A.	1, 2, 3
2. SECONDARY CONTAINMENT ISOLATION				
a. Reactor Building Vent Exhaust Plenum Radiation - High	S	~~M~~ Q	R	1, 2, 3, and **
b. Drywell Pressure - High	N.A.	~~M~~ Q	R	1, 2, 3
c. Reactor Vessel Water Level - Low Low, Level 2	N.A.	~~M~~ Q	R	1, 2, 3, and #
d. Manual Initiation	N.A.	R	N.A.	1, 2, 3, and **

TABLE 4.3.2.1-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
4. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION (Continued)				
g. RWCU/RCIC Steam Line Routing Area Temperature - High	N.A.	SA	R	1, 2, 3
h. Drywell Pressure - High	N.A.	~~M~~ Q	R	1, 2, 3
i. Manual Initiation	N.A.	R	N.A.	1, 2, 3
5. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION				
a. Reactor Vessel Water Level - Low, Level 3	S	~~M~~ Q	R	1, 2, 3
b. Reactor Vessel (RHR Cut-in Permissive) Pressure - High	N.A.	~~M~~ Q	R	1, 2, 3
c. Equipment Area Temperature - High	N.A.	SA	R	1, 2, 3
d. Equipment Area Ventilation Δ Temp. - High	N.A.	SA	R	1, 2, 3
e. Shutdown Cooling Return Flow Rate - High	N.A.	~~M~~ Q	R	1, 2, 3
f. RHR Heat Exchanger Area Temperature - High	N.A.	SA	R	1, 2, 3
g. Manual Initiation	N.A.	R	N.A.	1, 2, 3

TABLE NOTATIONS

* When reactor steam pressure ≥ 1037 psig and/or any turbine stop valve is open.

** When handling irradiated fuel in the secondary containment and during CORE ALTERATIONS and operations with a potential for draining the reactor vessel.

\# During CORE ALTERATION and operations with a potential for draining the reactor vessel.

ATTACHMENT 3

GE Nuclear Energy

General Electric Company
175 Curtner Avenue, San Jose, CA 95125

March 5, 1991

Mr. P. L. Powell
Washington Public Power Supply System
North Power Plant Loop, Building 56
Mail Drop 956B
Richland, Washington 99352

Dear Mr. Powell:

Subject: Assessment of Hanford-2 Isolation Actuation Instrumentation Against NEDC-31677P-A Bounding Analyses

References:
1) Sullivan, W. P., et. al., "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," NEDC-31677P-A, General Electric Company, July 1990.

2) Frederick, L. G., et. al., "Technical Specification Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," NEDC-30851P-A Supplement 2, General Electric Company, March 1989.

3) WPPSS letter G02-89-038 dated March 8, 1989, G. C. Sorensen to Nuclear Regulatory Commission, Subject: Nuclear Plant No. 2, Operating License NPF-21, Request for Amendment to Technical Specification Table 4.3.2.1-1, Isolation Actuation Instrumentation Surveillance Requirements.

The Reference 1 document is an extension to the BWR Owners' Group Technical Specification Improvement analyses conducted for the BWR Reactor Protection System (RPS) and Emergency Core Cooling System (ECCS) actuation instrumentation. It provides an analysis of the isolation actuation instrumentation which is not common to the RPS and ECCS instrumentation. The analysis for isolation actuation instrumentation common to the RPS and ECCS instrumentation is presented in Reference 2. Bases are provided for extending the isolation actuation instrumentation surveillance test intervals from 1 to 3 months and allowed out-of-service times for tests and repairs from 2 hours and 1 hour to 6 hours and 24 hours, respectively. These test interval extensions reduce the potential for unnecessary plant scrams, excessive test cycles on equipment, and the diversion of plant personnel and resources to perform unnecessary testing. The allowed out-of-service time extensions enhance tests and repairs by reducing the potential for operator errors. The overall effect of the changes to the test intervals and allowed out-of-service times provides a net improvement to plant safety and operations.

The USNRC Safety Evaluation Reports (SERs) for References 1 and 2 conclude that they provide an acceptable basis for extending surveillance test intervals and allowed outage times for isolation actuation instrumentation. The SERs stipulate, that for plant-specific application of the technical specification changes for isolation instrumentation that are proposed, the licensee must confirm the applicability of the generic analyses to the plant. This letter responds to that stipulation.

References 1 and 2 provide bounding analyses of the impact of proposed technical specification changes for isolation actuation instrumentation. Section 5.5 of Reference 1 provides verification that the results of the generic analyses of the various product lines are applicable to the individual plant technical specification requirements. This evaluation included a comparison of isolation actuation instrumentation STIs and calibration intervals given in the current plant-specific technical specifications to those evaluated for the four product lines. Identified differences were then evaluated to verify that the product line analyses envelope these differences.

Enclosure 1 provides a matrix listing of STIs and calibration intervals given in current technical specifications of individual BWR5/6 plants included in this study with Hanford-2 added in the far right column for comparison (in place of Clinton, a BWR6 solid-state logic plant). The first column lists the isolation trips for Grand Gulf, the plant that was used in the analyses. The succeeding columns list the isolation trips for the remaining plants in the product line. As can be seen upon examination of this table, isolation trips for Hanford-2 are essentially equivalent, by isolation function, to those of the two La Salle plants.

It should also be pointed out that semi-annual surveillance test intervals are specified in the Hanford-2 Technical Specification for a number of temperature and delta-temperature trip circuits. Justification for these extended test intervals is provided in Reference 3. It is based upon replacement of equipment using Riley Model 86 temperature switches in the leak detection system with General Electric NUMAC instrumentation. According to Reference 3, all functions of the leak detection system remained unchanged, while overall system reliability was improved with channel functional test intervals extended to six months. These extensions are independent of the current assessment since their basis was improved hardware reliability.

The majority of the plants have the same logic and number of sensor variables that initiate system isolation, given a pipe break/leak or high radiation level. There are, however, specific cases where the number of sensor variables is less than the number for the majority of plants. The effect of these differences in the number of sensor variables on the overall analysis results was concluded to be small. This conclusion was based on the results from case studies performed for different types of instrumentation logic and number of sensor variables. Table 5.5 of Reference 1 (Enclosure 2) provides a summary of these case studies and results. As can be seen from this table there are, at most, negligible increases in isolation function failure frequencies when the STIs and AOTs are changed to the proposed values.

Hanford-2 isolation actuation instrumentation and logic were compared against the case studies summarized in Table 5.5 and were determined to be bounded by the envelope which they define. Therefore, the generic analyses of NEDC-30851P-A and NEDC-31677P-A are applicable to the Hanford-2 plant and provide an adequate basis for Technical Specification changes to extend the STIs and AOTs for Hanford-2 isolation actuation instrumentation.

R. P. Raftery, Principal Engineer
Reliability Engineering Services

A. E. Rogers, Manager
Reliability Engineering Services

W/Enclosures

ENCLOSURE 1

APPENDIX C-2 OF NEDC-31677P-A
WITH HANFORD-2 ADDED FOR COMPARISON

BWR-5/6 (RELAY) AND BWR-6 (SOLID STATE)
ISOLATION ACTUATION INSTRUMENTATION
TECHNICAL SPECIFICATION REQUIREMENTS

ISOLATION SIGNALS	Note No.	Grand Gulf BWR-6 Amend. #59	Perry 1 BWR-6 Amend. #16	Riverbend BWR-6 Amend. #20	LaSalle 1 BWR-5 Amend. #50	LaSalle 2 BWR-5 Amend. #33	NMP 2 BWR-5 Amend. #5	Hanford 2 BWR-5 Amend. #70
PRIMARY CONTAINMENT								
a. RPV Low Water Level 2		M R(16)	M R(16)	M R(16)	M R	M R	M R(16)	M R
b. RPV Low Water Level 2 (ECCS Div 3)		M R(16)	M R(16)					
c. RPV Low Level 1 (19) (ECCS Div 1 & 2)		M R(16)	M R(16)					
d. Drywell Pressure High		M R(16)	M R(16)	M R(16)	M Q	M Q	M R(16)	M R
e. Drywell Pressure High (ECCS Div 1 & 2)		M R(16)	M R(16)					
f. Drywell High Pressure (ECCS Div 3)		M R(16)	M R(16)					
g. Containment & Drywell Vent Exhaust Rad High		M(13) A(13)						
1. Cont. Bldg. HVAC								
2. Cont. Monitoring & Process Sampling								
h. Manual Initiation		M(17) NA	R NA	(2) (2)			M NA	R NA
i. RPV Low Water Level 3					M R	M R	M R(16)	M R
j. Standby Gas Treatment Sys Exhaust-Rad High							M R	

TOP LETTER = SURVEILLANCE TEST INTERVAL BOTTOM LETTER = CALIBRATION INTERVAL
W = WEEKLY M = MONTHLY Q = QUARTERLY SA = SEMIANNUALLY A = ANNUALLY R = REFUELING OUTAGE

ISOLATION SIGNALS	Note No.	Grand Gulf BWR-6 Amend. #59	Perry 1 BWR-6 Amend. #16	Riverbend BWR-6 Amend. #20	LaSalle 1 BWR-5 Amend. #50	LaSalle 2 BWR-5 Amend. #33	NMP 2 BWR-5 Amend. #5	Hanford 2 BWR-5 Amend. #70
PRIMARY CONTAINMENT (Continued)								
k. Containment Purge				M				
Radiation High				R				
l. Rx Bldg. Pipe Chase							M	
Temp-High (3 trips)							R	
m. Rx Bldg. Temp. High							M	
							R	
n. Cont. Bldg. Fuel Transf								
Pool Vent Plenum Rad								
o. Main Steam Line Rad. HI								
p. Cont/Drywell Purge			M					
Exhaust Plenum Rad High			R					

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ISOLATION SIGNALS	Note No.	Grand Gulf BWR-6 Amend. #59	Perry 1 BWR-6 Amend. #16	Riverbend BWR-6 Amend. #20	LaSalle 1 BWR-5 Amend. #50	LaSalle 2 BWR-5 Amend. #33	NMP 2 BWR-5 Amend. #5	Hanford 2 BWR-5 Amnd. #70
SECONDARY CONTAINMENT								
a. RPV Low Water Level 2		M R(16)	M R(16)	M R(16)	M R	M R		M R
b. Drywell Pressure High		M R(16)	M R(16)	M R(16)	M Q	M Q		M R
c. Fuel Handling Area/Vent Exhaust Rad High		M A					M(12) R(12)	
d. Fuel Handling Area Pool Sweep Exhaust Radiation High		M A						
e. Manual Initiation		M(17) NA	R NA	(2) (2)				R NA
f. Rx Bldg Annulus Vent Exhaust Rad. High				M R				
g. Containment Pres-High								
h. Fuel Building Vent High Radiation				M R				
i. Rx Bldg. Vent Exhaust Plenum Rad. - High					M R	M R		M R
j. Fuel Pool Vent Exhaust Radiation - High					M R	M R		
k. Rx Bldg. Below Refuel Floor - Rad. High							M R	

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ISOLATION SIGNALS	Note No.	Grand Gulf BWR-6 Amend. #59	Perry 1 BWR-6 Amend. #16	Riverbend BWR-6 Amend. #20	LaSalle 1 BWR-5 Amend. #50	LaSalle 2 BWR-5 Amend. #33	NMP 2 BWR-5 Amend. #5	Hanford 2 BWR-5 Amend. #70
MAIN STEAM LINE ISOLATION								
a. RPV Water Level 1		M	M	M	M	M	M	
		R(16)	R(16)	R(16)	R	R	R(3)(16)	
b. Main Steam Line		M	M	M	M(3)	M(3)	M(3)	M
High Radiation		R	R	R	R(3)	R(3)	R(3)	R
c. Main Steam Line		M	M	M	M(3)	M(3)	M(3)	M
Pressure - Low		R(16)	R(16)	R(16)	Q(3)	Q(3)	R(3)(16)	R
d. Main Steam Line		M	M	M	M(3)	M(3)	M(3)	M
Flow - High		R(16)	R(16)	R(16)	R(3)	R(3)	R(3)(16)	R
e. Condenser Vacuum-Low		M	M	M	M(3)	M(3)	M(3)	M
		R(16)	R(16)	R(16)	Q(3)	Q(3)	R(3)(16)	R
f. Main Steam Line		M	M	M	M(3)	M(3)	M(3)	SA
Tunnel Temp. High		A	R	R	R(3)	R(3)	R(3)	R
g. Main Steam Tunnel		M	M	M	M(3)	M(3)	M(3)	SA
Delta Temp High		A	R	R	R(3)	R(3)	R(3)	R
h. Manual Initiation		M(17)	R	(2)				
		NA	NA	(2)				
i. Turbine Bldg. MSL			M	M				
Temperature High			R	R(16)				
j. MSL Lead Enclosure							M(3)	
Temperature - High							R(3)	

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ISOLATION SIGNALS	Note No.	Grand Gulf BWR-6 Amend. #59	Perry 1 BWR-6 Amend. #16	Riverbend BWR-6 Amend. #20	LaSalle 1 BWR-5 Amend. #50	LaSalle 2 BWR-5 Amend. #33	NMP 2 BWR-5 Amend. #5	Hanford 2 BWR-5 Amend. #7
RWCU SYSTEM ISOLATION								
a. RWCU Delta Flow-High		M	M	M	M	M	M(3)	M
		R	R	R	R	R	R(3)	R
b. RWCU Delta Flow Timer		M	M	M			M(3)	
		Q	R	Q			R(3)	
c. RWCU Equip. Area	(9)	M	M	M				
Temperature High		A	R	R				
1. Pump Room A,B							M(3)	SA
& C (for Clinton)							R(3)	R
2. HX Room Temp - High					M(4)	M(4)	M(3)	SA
(2 rms. at Clinton)					Q(4)	Q(4)	R(3)	R
d. RWCU Equip. Area		M	M	M	M(4)	M(4)		SA*
Delta Temp. High		A	R	R	Q(4)	Q(4)		R
e. RPV Water Level 2		M	M	M	M	M		M
		R(16)	R(16)	R(16)	R	R		R
f. MSL Tunnel Temp-High		M	M	M				
		A	R	R				
g. MSL Tunnel Delta Temp		M	M	M				
High		A	R	R				
h. SLCS Initiation		M(18)	M(18)	M(18)	R	R	R(3)	R
		NA	NA	NA	NA	NA	NA(3)	NA
i. Manual Initiation		M(17)	R	(2)				R
		NA	NA	(2)				NA
j. Rx Bldg. Pipe Chase							M(3)	SA**
Temp - High (3 Trips)							R(3)	R

* - Two Rooms
** - Two Locations

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ISOLATION SIGNALS	Note No.	Grand Gulf BWR-6 Amend. #59	Perry 1 BWR-6 Amend. #16	Riverbend BWR-6 Amend. #20	LaSalle 1 BWR-5 Amend. #50	LaSalle 2 BWR-5 Amend. #33	NMP 2 BWR-5 Amend. #5	Hanford 2 BWR-5 Amend. #70
REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION								
a. RCIC Steam Line Flow		M	M	M	M	M	M	M
High		R(16)	R(16)	R(16)	Q	Q	R(16)	R
b. RCIC Steam Line Flow		M	M	M			M	
High - Time Delay		Q	R	Q			R	
c. RCIC Turbine Exhaust		M	M	M	M	M	M	M
Diaphram Pres. High		R(16)	R(16)	R(16)	Q	Q	R(16)	R
d. RCIC Steam Supply		M	M	M	M	M	M	M
Pressure - Low		R(16)	R(16)	R(16)	Q	Q	R(16)	R
e. RCIC Equip. Room Temp		M	M	M	M	M	M	SA
High		A	R	R	Q	Q	R	R
f. RCIC Equip. Room		M	M	M	M(11)	M(11)		SA
Delta Temp - High		A	R	R	Q	Q		R
g. MSL Tunnel Temp-High		M	M	M			M	
		A	R	R			R	
h. MSL Tunnel		M	M	M				
Delta Temp High		A	R	R				
i. MSL Tunnel Temp Timer		M	M	M				
		Q	R	Q				
j. RHR Equip. Room Temp.		M	M	M			M	
High		A	R	R			R	
k. RHR Equip Room		M	M	M				
Delta Temp - High		A	R	R				

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REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION (Continued)								
l. Drywell Pressure-High		M R(16)	M R(16)	M R(16)	M Q	M Q	M R(16)	M R
m. Manual Initiation		M NA	R NA	R NA			M NA	R NA
n. RHR/RCIC Steam Flow HI		M R(16)		M R(16)			M R(16)	M R
o. RCIC Tunnel Temp-High					M Q	M Q	M R	SA R
p. RCIC Tunnel Delta Temp-High	(15)				M Q	M Q		

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W = WEEKLY M = MONTHLY Q = QUARTERLY SA = SEMIANNUALLY A = ANNUALLY R = REFUELING OUTAGE

ISOLATION SIGNALS	Note No.	Grand Gulf BWR-6 Amend. #59	Perry 1 BWR-6 Amend. #16	Riverbend BWR-6 Amend. #20	LaSalle 1 BWR-5 Amend. #50	LaSalle 2 BWR-5 Amend. #33	NMP 2 BWR-5 Amend. #5	Hanford 2 BWR-5 Amend. #70
RHR SYSTEM ISOLATION	(11)							
a. RHR Equip. Room Temp		M	M	M	M(11)	M(11)	M(3)	SA
High		A	R	R	Q(11)	Q(11)	R(3)	R
b. RHR Equip. Room		M	M	M	M(11)	M(11)		SA
Delta Temp High		A	R	R	Q(11)	Q(11)		R
c. RPV Low Water Level 3		M	M	M	M(11)	M(11)		M
		R(16)	R(16)	R(16)	R(11)	R(11)		R
d. RPV Pressure High		M	M	M	M(11)	M(11)	M(3)	M
		R(16)	R(16)	R(16)	Q(11)	Q(11)	R(3)	R
e. Drywell Pressure High	(9)	M	M	M				
		R(16)	R(16)	R(16)				
1. RHR Test Line								
2. Fuel Pool Cooling								
f. Manual Initiation		M(17)	R	(2)				R
		NA	NA	(2)				NA
g. RPV Low Water Level 1				M				
				R(16)				
h. RHR Pump Suction Flow					M(11)	M(11)		M
High					Q(11)	Q(11)		R
i. RHR/RCIC Steam Line			M					
Flow - High			R					
j. RHR Area Cooler Temp					M	M		SA
High					Q	Q		R
k. RHR Heat Exch. Steam					M	M		
Supply Flow - High					Q	Q		
l. RHR Equip Area Delta	(15)				M	M		
Temp - High					Q	Q		

TOP LETTER = SURVEILLANCE TEST INTERVAL BOTTOM LETTER = CALIBRATION INTERVAL
W = WEEKLY M = MONTHLY Q = QUARTERLY SA = SEMIANNUALLY A = ANNUALLY R = REFUELING OUTAGE

ISOLATION SIGNALS	Note No.	Grand Gulf BWR-6 Amend. #59	Perry 1 BWR-6 Amend. #16	Riverbend BWR-6 Amend. #20	LaSalle 1 BWR-5 Amend. #50	LaSalle 2 BWR-5 Amend. #33	NMP 2 BWR-5 Amend. #5	Hanford 2 BWR-5 Amend. #70
MANUAL INITIATION				M(2) NA(2)	R(2) NA(2)	R(2) NA(2)		

TOP LETTER = SURVEILLANCE TEST INTERVAL BOTTOM LETTER = CALIBRATION INTERVAL
W = WEEKLY M = MONTHLY Q = QUARTERLY SA = SEMIANNUALLY A = ANNUALLY R = REFUELING OUTAGE

NOTES:

(1) Requirements stated under RCIC System Isolation. Noted in table under RHR since other plants note here.
(2) Requirements called out under "Manual Initiation" in Tech Spec. Other plants have specified under each isolation.
(3) Requirements stated under Primary Containment Isolation instead of location indicated in Table.
(4) Title for LaSalle 1 & 2 is RWCU Heat Exchanger Area versus RWCU Equipment Area.
Judged to be the same measurement with different titles.
(5) Entry appears in two locations - one under "RHR System Steam Condensing Mode Isolation" and another under "RHR System Shutdown Cooling Mode Isolation." Judged to be the same signal.
(6) Data entered under "Primary & Secondary Isolation" heading. No separation between Primary & Secondary Isolations.
(7) Same locations as "RWCU Equipment Area Temp High."
(8) Called out under both RCIC & RHR Isolations.
(9) Specific areas are not specified in all Tech Specs. Where general requirements are specified in Tech Specs, the calibration & functional test intervals are entered under the general title. If specific areas are specified these are entried under the specific titles noted.
(10) Deleted.
(11) Lasalle 1 & 2 have two divisions for RHR System Isolations. One is "RHR System Condensing Mode Isolation. The second is "RHR Shutdown Cooling Mode Isolations." These heading have been combined in the table under "RHR System Isolations."
(12) Titled "Rx Bldg. Above Refuel Floor Exhaust Radiation - High." Judged to be the same as "Fuel Handling Area Exhaust Radiation High" for other plants.
(13) Call out is general. Separation or additional detail not provided in Tech Spec.
(14) Titled "RHR Heat Exchanger A/B Ambient (Delta) Temperature - High." Judged to be similiar to RHR Room Ambient (Delta) Temperature - High."
(15) Tech Spec. for Lasalle 2 is stated as "W" Temp. We have noted this as Delta Temp. since other plants were specified this way.
(16) Calibrate trip unit at least once per 31 days.
(17) Manual initiation switches tested once per 18 months during shutdown. All other circuitry associated with manual isolation shall receive channel functional test once per 31 days as part of circuitry required to be tested for automatic system actuation.
(18) Each train or logic channel shall be tested at least every other 31 days.
(19) Level 2 for Clinton technical spacification.

ENCLOSURE 2
TABLE 5.5 OF NEDC-31677P-A

SUMMARY OF CASE STUDIES PERFORMED *
FOR PLANTS IN DIFFERENT PRODUCT LINES

Number of Sensor Variables	Logic Type Per Value Per Variable	Absolute Increase in Isolation Failure Freq. (Events/Yr)	
		Minimum	Maximum
4	2 out of 2	-3.5E-08	-1.5E-08
4	1-out -of-2 Twice	-1.1E-08	0
4**	1 out of 1	-1.0E-08	-4.4E-09
3	1 out of 1	-4.2E-10	5.0E-11
3**	1 out of 1	-4.0E-11	2.1E-10
2**	1 out of 1	2.9E-09	3.2E-09
1	1 out of 2	4.1E-11	9.1E-11
1	2 out of 2	5.5E-11	2.2E-08

* Does not include BWR-6 solid-state logic plant.
** High area and delta temperatures considered as one variable.