TABLE 3.3.2-1

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION	VALVE GROUPS OPERATED BY SIGNAL	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM (b)	APPLICABLE OPERATIONAL CONDITION	ACTION
A. AUTOMATIC INITIATION				
1. PRIMARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level				
(1) Low, Level 3	7	2	1, 2, 3	20
(2) Low Low, Level 2	2, 3	2	1, 2, 3	20
(3) Low Low Low, Level 1	1, 10	2	1, 2, 3	20
b. Drywell Pressure - High	2, 7, 10	2	1, 2, 3	20
c. Main Steam Line				
1) DELETED				
2) Pressure - Low	1	2	1	23
3) Flow - High	1	$2/line^{(d)}$	1, 2, 3	21
d. DELETED				
e. Main Steam Line Tunnel ΔTemperature - High	1	2	$1^{(i)(j)}$, $2^{(i)(j)}$, $3^{(i)(j)}$	21
f. Condenser Vacuum - Low	1	2	1, 2*, 3*	21
2. SECONDARY CONTAINMENT ISOLATION				
a. Reactor Building Vent Exhaust Plenum Radiation - High	$4^{(c)(e)}$	2	1, 2, 3 and **	24
b. Drywell Pressure - High	$4^{(c)(e)}$	2	1, 2, 3	24
c. Reactor Vessel Water Level - Low Low, Level 2	$4^{(c)(e)}$	2	1, 2, 3, and #	24
d. Fuel Pool Vent Exhaust Radiation - High	$4^{(c)(e)}$	2	1, 2, 3, and **	24

No changes provided for continuity only.

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

INSERT A

TRIP FUNCTION	VALVE GROUPS OPERATED BY SIGNAL	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM (b)	APPLICABLE OPERATIONAL CONDITION	ACTION
3. REACTOR WATER CLEANUP SYSTEM ISOLATION				
a. Δ Flow - High	5	1	1, 2, 3	22
b. Heat Exchanger Area Temperature - High	5	1/heat exchanger	1, 2, 3	22
c. Heat Exchanger Area Ventilation ΔT - High	5	1/heat exchanger	1, 2, 3	22
d. SLCS Initiation	5[f]	NA	1, 2, 3	22
e. Reactor Vessel Water Level - Low Low, Level 2	5	2	1, 2, 3	22
4. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION				
a. RCIC Steam Line Flow - High	8	1	1, 2, 3	22
b. RCIC Steam Supply Pressure - Low	8, 9[g]	2	1, 2, 3	22
c. RCIC Turbine Exhaust Diaphragm Pressure - High	8	2	1, 2, 3	22
d. RCIC Equipment Room Temperature - High	8	1	1, 2, 3	22
e. RCIC Steam Line Tunnel Temperature - High	8	1	1, 2, 3	22
f. RCIC Steam Line Tunnel Δ Temperature - High	8	1	1, 2, 3	22
g. Drywell Pressure - High	9[g]	2	1, 2, 3	22
h. RCIC Equipment Room Δ Temperature - High	8	1	1, 2, 3	22

ATTACHMENT B

MARKED-UP PAGES FOR PROPOSED CHANGES

INSERT A*

TRIP FUNCTION	*VALVE GROUPS OPERATED BY SIGNAL*	*MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM (b)*	*APPLICABLE OPERATIONAL CONDITION*	*ACTION*
f. Pump and Valve Area Temperature - High	5	1/area	1, 2, 3	22
g. Pump and Valve Area Ventilation ΔT - High	5	1/area	1, 2, 3	22
h. Holdup Pipe Area Temperature - High	5	1	1, 2, 3	22
i. Holdup Pipe Area Ventilation ΔT - High	5	1	1, 2, 3	22
j. Filter/Demineralizer Valve Room Area Temperature - High	5	1	1, 2, 3	22
k. Filter/Demineralizer Valve Room Area Ventilation ΔT - High	5	1	1, 2, 3	22
l. Pump Suction Flow - High	5	1	1, 2, 3	22

* Headings in Italics are provided for information only.

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

DELETED

TRIP FUNCTION	VALVE GROUPS OPERATED BY SIGNAL	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM (b)	APPLICABLE OPERATIONAL CONDITION	ACTION
5. RHR SYSTEM STEAM CONDENSING MODE ISOLATION				
a. RHR Equipment Area Δ Temperature - High	8	1/RHR area	1, 2, 3	22
b. RHR Area Temperature - High	8	1/RHR area	1, 2, 3	22
c. RHR Heat Exchanger Steam Supply Flow - High	8	1	1, 2, 3	22
6. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION				
a. Reactor Vessel Water Level - Low, Level 3	6	2	1, 2, 3	25
b. Reactor Vessel (RHR Cut-in Permissive) Pressure - High	6	1	1, 2, 3	25
c. RHR Pump Suction Flow - High	6	1	1, 2, 3	25
d. RHR Area Temperature - High	6	1/RHR area	1, 2, 3	25
e. RHR Equipment Area ΔT - High	6	1/RHR area	1, 2, 3	25
B. MANUAL INITIATION				
1. Inboard Valves	1, 2, 5, 6, 7	1/group	1, 2, 3	26
2. Outboard Valves	1, 2, 5, 6	1/group	1, 2, 3	26
3. Inboard Valves	4(c)(d)	1/group	1, 2, 3 and **,#	26
4. Outboard Valves	4(c)(e)	1/group	1, 2, 3 and **,#	26
5. Inboard Valves	3, 8, 9	1/valve	1, 2, 3	26
6. Outboard Valves	3, 8, 9	1/valve	1, 2, 3	26
7. Outboard Valve	8(h)	1/group	1, 2, 3	26

No changes, provided for continuity only

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

ACTION 25 - Lock the affected system isolation valves closed within 1 hour and declare the affected system inoperable.

ACTION 26 - Provided that the manual initiation function is OPERABLE for each other group valve, inboard or outboard, as applicable, in each line, restore the manual initiation function to OPERABLE status within 24 hours; otherwise, restore the manual initiation function to OPERABLE status within 8 hours; otherwise:
a. Be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours, or
b. Close the affected system isolation valves within the next hour and declare the affected system inoperable.

TABLE NOTATIONS

* May be bypassed with all turbine stop valves not full 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 ALTERATIONS and operations with a potential for draining the reactor vessel.
(a) Deleted.
(b) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the channel in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter. In addition for those trip systems with a design providing only one channel per trip system, the channel may be placed in an inoperable status for up to 8 hours for required surveillance testing without placing the channel in the tripped condition provided that the redundant isolation valve, inboard or outboard, as applicable, in each line is operable and all required actuation instrumentation for that redundant valve is OPERABLE, or place the trip system in the tripped condition.
(c) Also actuates the standby gas treatment system.
(d) A channel is OPERABLE if 2 of 4 instruments 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 inlet outboard valve.

No changes, provided for continuity only

TABLE 3.3.2-1 (Continued)

NOTES (Continued)

(g) Requires RCIC steam supply pressure-low coincident with drywell pressure-high.

(h) Manual initiation isolates 2E51-F008 only and only with a coincident reactor vessel water level-low, level 2, signal.

(i) Both channels of each trip system may be placed in an inoperable status for up to 4 hours for required reactor building ventilation system corrective maintenance, filter changes, damper cycling and surveillance tests, other than Surveillance Requirement 4.6.5.1.c, without placing the trip system in the tripped condition.

(j) Both channels of each trip system may be placed in an inoperable status for up to 12 hours due to loss of reactor building ventilation or for performance of Surveillance Requirement 4.6.5.1.c without placing the trip system in the tripped condition.

TABLE 3.3.2-2
ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
A. AUTOMATIC INITIATION		
1. PRIMARY CONTAINMENT ISOLATION		
a. Reactor Vessel Water Level		
1) Low, Level 3	≥ 12.5 inches*	≥ 11.0 inches*
2) Low Low, Level 2	≥ -50 inches*	≥ -57 inches*
3) Low Low Low, Level 1	≥ -129 inches*	≥ -136 inches*
b. Drywell Pressure - High	≤ 1.69 psig	≤ 1.89 psig
c. Main Steam Line		
1) DELETED		
2) Pressure - Low	≥ 854 psig	≥ 834 psig
3) Flow - High	≤ 111 psid	≤ 116 psid
d. DELETED		
e. Main Steam Line Tunnel Δ Temperature - High	≤ 65°F	≤ 70°F
f. Condenser Vacuum - Low	> 7 inches Hg vacuum	> 5.5 inches Hg vacuum
2. SECONDARY CONTAINMENT ISOLATION		
a. Reactor Building Vent Exhaust Plenum Radiation - High	≤ 10 mr/h	≤ 15 mr/h
b. Drywell Pressure - High	≤ 1.69 psig	≤ 1.89 psig
c. Reactor Vessel Water Level - Low Low, Level 2	≥ -50 inches*	≥ -57 inches*
d. Fuel Pool Vent Exhaust Radiation - High	≤ 10 mr/h	≤ 15 mr/h
3. REACTOR WATER CLEANUP SYSTEM ISOLATION		
a. ΔFlow - High	≤ 70 gpm	≤ 87.5 gpm
b. Heat Exchanger Area Temperature - High	≤ 181°F (149°)	≤ 187°F (156.8°F)
c. Heat Exchanger Area Ventilation ΔT - High	≤ 85° (33°F)	≤ 91°F (40.3°F)
d. SLCS Initiation	N.A.	N.A.
e. Reactor Vessel Water Level - Low Low, Level 2	≥ -50 inches*	≥ -57 inches*

INSERT B

ATTACHMENT B

MARKED-UP PAGES FOR PROPOSED CHANGES

INSERT B*

TRIP FUNCTION	*TRIP SETPOINT*	*ALLOWABLE VALUE*
f. Pump and Valve Area Temperature - High	≤ 201°F	≤ 209°F
g. Pump and Valve Area Ventilation ΔT - High	≤ 86°F	≤ 92.5°F
h. Holdup Pipe Area Temperature - High	≤ 201°F	≤ 209°F
i. Holdup Pipe Area Ventilation ΔT - High	≤ 86°F	≤ 92.5°F
j. Filter/Demineralizer Valve Room Area Temperature - High	≤ 201°F	≤ 209°F
k. Filter/Demineralizer Valve Room Area Ventilation ΔT - High	≤ 86°F	≤ 92.5°F
l. Pump Suction Flow - High	≤ 560 gpm	≤ 610 gpm

* Headings in Italics are provided for information only.

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
4. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION		
a. RCIC Steam Line Flow - High	≤ 290% of rated flow, 178" H_2O	≤ 295% of rated flow, 185" H_2O
b. RCIC Steam Supply Pressure - Low	≥ 57 psig	≥ 53 psig
c. RCIC Turbine Exhaust Diaphragm Pressure - High	≤ 10.0 psig	≤ 20.0 psig
d. RCIC Equipment Room Temperature - High	≤ 200°F	≤ 206°F
e. RCIC Steam Line Tunnel Temperature - High	≤ 200°F	≤ 206°F
f. RCIC Steam Line Tunnel Δ Temperature - High	≤ 117°F	≤ 123°F
g. Drywell Pressure - High	≤ 1.69 psig	≤ 1.89 psig
h. RCIC Equipment Room Δ Temperature - High	≤ 120°F	≤ 126°F
5. RHR SYSTEM STEAM CONDENSING MODE ISOLATION		
a. RHR Equipment Area Δ Temperature - High	≤ 50°F	≤ 56°F
b. RHR Area Cooler Temperature - High	≤ 200°F	≤ 206°F
c. RHR Heat Exchanger Steam Supply Flow - High	≤ 123" H_2O	≤ 128" H_2O

DELETED

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
6. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION		
a. Reactor Vessel Water Level - Low, Level 3	≥ 12.5 inches*	≥ 11.0 inches*
b. Reactor Vessel (RHR Cut-in Permissive) Pressure - High	≤ 135 psig**	≤ 145 psig**
c. RHR Pump Suction Flow - High	≤ 180" H_2O	≤ 186" H_2O
d. RHR Area Cooler Temperature - High	≤ 200°F	≤ 206°F
e. RHR Equipment Area ΔT - High	≤ 50°F	≤ 56°F
B. MANUAL INITIATION	N.A.	N.A.
1. Inboard Valves		
2. Outboard Valves		
3. Inboard Valves		
4. Outboard Valves		
5. Inboard Valves		
6. Outboard Valves		
7. Outboard Valve		

*See Bases Figure B 3/4 3-1.
**Corrected for cold water head with reactor vessel flooded.
N.A. - Not Applicable.

TABLE 3.3.2-3

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
A. AUTOMATIC INITIATION	
1. PRIMARY CONTAINMENT ISOLATION	
a. Reactor Vessel Water Level	
1) Low, Level 3	N/A
2) Low Low, Level 2	N/A
3) Low Low Low, Level 1	≤ 1.0*,##
b. Drywell Pressure - High	N/A
c. Main Steam Line	
1) DELETED	
2) Pressure - Low	≤ 2.0*,##
3) Flow - High	≤ 0.5*,##
d. DELETED	
e. Condenser Vacuum - Low	N/A
f. Main Steam Line Tunnel ΔTemperature - High	N/A
2. SECONDARY CONTAINMENT ISOLATION	N/A
a. Reactor Building Vent Exhaust Plenum Radiation - High	
b. Drywell Pressure - High	
c. Reactor Vessel Water Level - Low, Level 2	
d. Fuel Pool Vent Exhaust Radiation - High	
3. REACTOR WATER CLEANUP SYSTEM ISOLATION	N/A
a. ΔFlow - High	
b. Heat Exchanger Area Temperature - High	
c. Heat Exchanger Area Ventilation ΔT-High	
d. SLCS Initiation	
e. Reactor Vessel Water Level - Low Low, Level 2	
4. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION	N/A
a. RCIC Steam Line Flow - High	
b. RCIC Steam Supply Pressure - Low	
c. RCIC Turbine Exhaust Diaphragm Pressure - High	
d. RCIC Equipment Room Temperature - High	
e. RCIC Steam Line Tunnel Temperature - High	
f. RCIC Steam Line Tunnel ΔTemperature - High	
g. Drywell Pressure - High	
h. RCIC Equipment Room ΔTemperature - High	
5. RHR SYSTEM STEAM CONDENSING MODE ISOLATION	N/A
a. RHR Equipment Area ΔTemperature - High	
b. RHR Area Cooler Temperature - High	
c. RHR Heat Exchanger Steam Supply Flow High	

INSERT C

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ATTACHMENT B

MARKED-UP PAGES FOR PROPOSED CHANGES

INSERT C

f. Pump and Valve Area
   Temperature - High

g. Pump and Valve Area
   Ventilation ΔT - High

h. Holdup Pipe Area
   Temperature - High

i. Holdup Pipe Area
   Ventilation ΔT - High

j. Filter/Demineralizer Valve Room
   Area Temperature - High

k. Filter/Demineralizer Valve Room
   Area Ventilation ΔT - High

l. Pump Suction Flow - High

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
6. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION	N/A
a. Reactor Vessel Water Level - Low, Level 3	
b. Reactor Vessel (RHR Cut-In Permissive) Pressure - High	
c. RHR Pump Suction Flow - High	
d. RHR Area Cooler Temperature High	
e. RHR Equipment Area ΔT High	
B. MANUAL INITIATION	N/A
1. Inboard Valves	
2. Outboard Valves	
3. Inboard Valves	
4. Outboard Valves	
5. Inboard Valves	
6. Outboard Valves	
7. Outboard Valve	

TABLE NOTATIONS

* Isolation system instrumentation response time for MSIVs only. No diesel generator delays assumed.

\# Isolation system instrumentation response time specified for the Trip Function actuating the MSIVs shall be added to MSIV isolation time to obtain ISOLATION SYSTEM RESPONSE TIME for each valve.

\#\# Sensor is eliminated from response time testing for the MSIV actuation logic circuits. Response time testing and conformance to the administrative limits for the remaining channel including trip unit and relay logic are required.

N/A Not Applicable.

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
A. AUTOMATIC INITIATION				
1. PRIMARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level				
1) Low, Level 3	S	Q	R	1, 2, 3
2) Low Low, Level 2	NA	Q	R	1, 2, 3
3) Low Low Low, Level 1	S	Q	R	1, 2, 3
b. Drywell Pressure - High	NA	Q	Q	1, 2, 3
c. Main Steam Line				
1) DELETED				
2) Pressure - Low	NA	Q	Q	1
3) Flow - High	NA	Q	R	1, 2, 3
d. DELETED				
e. Condenser Vacuum - Low	NA	Q	Q	1, 2*, 3*
f. Main Steam Line Tunnel Δ Temperature - High	NA	Q	R	1, 2, 3
2. SECONDARY CONTAINMENT ISOLATION				
a. Reactor Building Vent Exhaust Plenum Radiation - High	S	Q	R	1, 2, 3 and **
b. Drywell Pressure - High	NA	Q	Q	1, 2, 3
c. Reactor Vessel Water Level - Low Low, Level 2	NA	Q	R	1, 2, 3, and #
d. Fuel Pool Vent Exhaust Radiation - High	S	Q	R	1, 2, 3 and **
3. REACTOR WATER CLEANUP SYSTEM ISOLATION				
a. Δ Flow - High	S	Q	R	1, 2, 3
b. Heat Exchanger Area Temperature - High	NA	Q	Q	1, 2, 3
c. Heat Exchanger Area Ventilation ΔT - High	NA	Q	Q	1, 2, 3
d. SLCS Initiation	NA	R	NA	1, 2, 3
e. Reactor Vessel Water Level - Low Low, Level 2	NA	Q	R	1, 2, 3

INSERT D

ATTACHMENT B

MARKED-UP PAGES FOR PROPOSED CHANGES

INSERT D*

TRIP FUNCTION	*CHANNEL CHECK*	*CHANNEL FUNCTIONAL TEST*	*CHANNEL CALIBRATION*	OPERATIONAL CONDITIONS FOR WHICH *SURVEILLANCE REQUIRED*
f. Pump and Valve Area Temperature - High	NA	Q	Q	1, 2, 3
g. Pump and Valve Area Ventilation ΔT - High	NA	Q	Q	1, 2, 3
h. Holdup Pipe Area Temperature - High	NA	Q	Q	1, 2, 3
i. Holdup Pipe Area Ventilation ΔT - High	NA	Q	Q	1, 2, 3
j. Filter/Demineralizer Valve Room Area Temperature - High	NA	Q	Q	1, 2, 3
k. Filter/Demineralizer Valve Room Area Ventilation ΔT - High	NA	Q	Q	1, 2, 3
l. Pump Suction Flow - High	S	Q	R	1, 2, 3

* Headings in Italics are provided for information only.

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				
a. RCIC Steam Line Flow - High	NA	Q	Q	1, 2, 3
b. RCIC Steam Supply Pressure - Low	NA	Q	Q	1, 2, 3
c. RCIC Turbine Exhaust Diaphragm Pressure - High	NA	Q	Q	1, 2, 3
d. RCIC Equipment Room Temperature - High	NA	Q	Q	1, 2, 3
e. RCIC Steam Line Tunnel Temperature - High	NA	Q	Q	1, 2, 3
f. RCIC Steam Line Tunnel Δ Temperature - High	NA	Q	Q	1, 2, 3
g. Drywell Pressure - High	NA	Q	Q	1, 2, 3
h. RCIC Equipment Room Δ Temperature - High	NA	Q	Q	1, 2, 3
5. RHR SYSTEM STEAM CONDENSING MODE ISOLATION				
a. RHR Equipment Area Δ Temperature - High	NA	Q	Q	1, 2, 3
b. RHR Area Cooler Temperature - High	NA	Q	Q	1, 2, 3
c. RHR Heat Exchanger Steam Supply Flow - High	NA	Q	Q	1, 2, 3

DELETED

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
6. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION				
a. Reactor Vessel Water Level - Low, Level 3	S	Q	R	1, 2, 3
b. Reactor Vessel (RHR Cut-in Permissive) Pressure-High	NA	Q	Q	1, 2, 3
c. RHR Pump Suction Flow-High	NA	Q	Q	1, 2, 3
d. RHR Area Temperature-High	NA	Q	Q	1, 2, 3
e. RHR Equipment Area ΔT-High	NA	Q	Q	1, 2, 3
B. MANUAL INITIATION				
1. Inboard Valves	NA	R	NA	1, 2, 3
2. Outboard Valves	NA	R	NA	1, 2, 3
3. Inboard Valves	NA	R	NA	1, 2, 3 and **,#
4. Outboard Valves	NA	R	NA	1, 2, 3 and **,#
5. Inboard Valves	NA	R	NA	1, 2, 3
6. Outboard Valves	NA	R	NA	1, 2, 3
7. Outboard Valve	NA	R	NA	1, 2, 3

* Not required when all turbine stop valves are not full 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 ALTERATIONS and operations with a potential for draining the reactor vessel.

ATTACHMENT C

SIGNIFICANT HAZARDS CONSIDERATION

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

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

ComEd proposes to amend Appendix A, Technical Specifications, of Facility Operating License NPF-18, LaSalle County Station Unit 2. The proposed amendment requests a change to the Technical Specifications which:

- adds automatic primary containment isolation on Ambient and Differential Temperature (ΔT)-High for the Reactor Water Cleanup System (RWCU) Pump, Pump Valve, Holdup Pipe, and Filter/Demineralizer (F/D) Valve Rooms;
- adds automatic primary containment isolation on RWCU Pump Suction Flow - High;
- revises the ambient temperature and ΔT isolation setpoints in the RWCU Heat Exchanger Rooms;
- eliminates the Residual Heat Removal (RHR) System steam condensing mode isolation actuation instrumentation; and
- eliminates the ambient temperature and ΔT alarm and isolation functions for the RHR System shutdown cooling mode.

Currently the RWCU pump rooms have no temperature monitoring because they contain "cold" piping. A design modification that restores "hot" suction to the RWCU pumps determined that the RWCU pump rooms and associated new pump valve room require leak detection isolation instrumentation. The setpoints for the heat exchanger rooms are being changed as a result of new design basis calculations. The new ambient temperature and ΔT leak detection for the RWCU holdup pipe area and the F/D valve room and the RWCU pump suction high flow switch are being added to minimize the impact of line breaks in these areas. The steam condensing mode of the RHR system is no longer utilized. Area temperature monitoring of the RHR shutdown cooling mode lines is being deleted, because the system mode has been recognized as a moderate energy line; and, because area temperature monitoring is not effective, since the energy in these lines is not sufficient to increase the area temperatures to detectable levels. These lines are in service in Cold Shutdown or at low reactor pressures in Hot Shutdown.

The proposed leak detection changes for LaSalle Unit 2 are same, except for minor differences, as the LaSalle Unit 1 changes approved by Amendment 129 to LaSalle County Station Unit 1 Facility Operating License NPF-11, issued July 6, 1998. Unless otherwise specified, all references to Technical Specifications are to LaSalle Unit 2 Technical Specifications.

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

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

   a) There is no effect on accident initiators so there is no change in probability of an accident. A line break in the subject areas, would consist of an instantaneous circumferential break downstream of the outermost isolation valve of one of these systems. The leak detection isolation is only a precursor of a break, and thus does not affect the probability of a break.

   b) There is minimal effect on the consequences of analyzed accidents due to changing the leak detection ambient temperature or ΔT setpoint and allowable values to detect 25 gpm equivalent leakage. The addition of more ambient temperature and ΔT leak detection monitoring, along with the addition of the high flow break detection will actually decrease the consequences of the associated accidents. The worst case accident outside the primary containment boundary is a main steam line break which bounds the dose consequences of all line breaks and therefore bounds any size of leak.

The deletion of the RHR steam condensing mode isolation actuation instrumentation trip functions from the LaSalle Technical Specifications does not increase the probability or consequences of an accident previously evaluated, because this mode of operation of the RHR system has been deleted from the LaSalle design basis and the lines that were previously high energy lines are isolated during unit operation, including Operational Condition 1 (Run mode), Operational Condition 2 (Startup mode), and Operational Condition 3 (Hot Shutdown)

The deletion of the RHR shutdown cooling mode leak detection T and ΔT isolation actuation instrumentation trip functions from the LaSalle Technical Specifications does not increase the probability or consequences of an accident previously evaluated, because the leak detection is only a precursor of a break, and thus does not affect the probability of a break. Also, there are two other methods of detecting abnormal leakage and isolating the system in Technical Specification trip functions A.6.a, Reactor Vessel Water Level - Low, Level 3 and A.6.c, RHR Pump Suction Flow - High. In addition, other means to detect leakage from the RHR system, such as sump monitoring and area radiation monitoring, are also available. In accordance with Technical Specification Administrative Requirement 6.2.F.1, LaSalle has a leakage reduction program to reduce leakage from those portions of systems outside primary containment that contain radioactive fluids. RHR, including piping and components associated with the shutdown cooling mode, is part of this program, which includes periodic visual inspection of the system for leakage. The sump monitoring, radiation monitoring and periodic inspections for system leakage makes the probability of a leak of 5 gpm going undetected for more than a day very low.

Also, due to the low reactor pressures (less than 135 psig) at which RHR shutdown cooling mode is able to operate, reactor coolant makeup and outflow is very low compared to normal plant operation. A change in flow balance due to a leak is thus more readily detectable with reactor coolant water level changes and makeup flow rate, and thus precludes a significant leak going undetected before break detection instrumentation would cause automatic isolation.

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

2) Create the possibility of a new or different kind of accident from any accident previously evaluated because:

The purpose of the leak detection system, as it applies to the RWCU and RHR system areas, is to provide the capability for leak detection and automatic isolation of the system as necessary in the event of leakage in these areas. This change maintains this capability with at least two different methods of detection of abnormal leakage for protection from the flooding concerns of a significant leak or line break when the RHR system is operating in the shutdown cooling mode, so that redundant systems will not be affected.

This change also maintains or adds primary containment isolation logic for the leak detection isolation based on temperature monitoring in RWCU areas and break detection based on RWCU pump suction flow - high. The additional instrumentation and the associated isolation logic is the same or similar to existing instrumentation and logic for containment isolation actuation instrumentation, so no new failure modes are created in this way.

Therefore, these proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3) Involve a significant reduction in the margin of safety because:

The change to the automatic isolation setpoint for high ΔT leak detection in the heat exchanger rooms is based on current configuration calculated/analyzed response to a small leak compared to a circumferential break. The increased leakage rate in the RWCU heat exchanger rooms that is necessary to actuate isolation on ambient temperature during winter conditions, does not adversely affect the margin of safety. This increased leakage rate is below the critical crack leakage rate as represented in UFSAR Figure 5.2-11. Additionally, differential temperature leak detection is conservative under these same conditions, and will actuate isolation at a leakage rate less than the established limit. The leak detection isolation logic is unchanged and thus remains single failure proof.

The addition of automatic primary containment isolation on ambient temperature and ΔT-High for the Reactor Water Cleanup System (RWCU) Pump, Pump Valve, Holdup Pipe, and Filter/Demineralizer (F/D) Valve Rooms and the addition of the RWCU Pump Suction Flow High line break isolation add to the margin of safety with respect to leak detection and line breaks in the RWCU system, because the system isolation diversity is increased and the amount of system piping monitored for leakage is increased.

The setpoints for the ambient temperature and ΔT leak detection isolations being changed or added and the RWCU pump suction flow - high are set sufficiently high enough so as not to increase the possibility of spurious actuation. In the event that a spurious actuation does occur, little safety significance is presented since the RWCU system performs no safety function. The setpoints and allowable values for the proposed changes also assure sufficient margin to the analytical values and are high enough to prevent spurious actuations based on calculations consistent with Regulatory Guide 1.105.

The deletion of the RHR steam condensing mode isolation actuation instrumentation does not effect the margin of safety, because this mode is no longer utilized by LaSalle in Operational Conditions 1, 2, or 3 (Run mode, Startup mode, or Hot Shutdown).

The elimination of the temperature based trip functions for the RHR shutdown cooling mode area is based on the determination that temperature is not the appropriate parameter for leak detection as it does not provide meaningful indication and will not provide setpoints that would be sufficiently above the normal range of ambient conditions to avoid spurious isolations.

There are two other methods of detecting abnormal leakage and isolating the system in Technical Specification trip function A.6, which are A.6.a, Reactor Vessel Water Level - Low, Level 3 and A.6.c, RHR Pump Suction Flow - High. In addition, other means to detect leakage from the RHR system, such as sump monitoring and area radiation monitoring, are also available. Also, in accordance with Technical Specification

ATTACHMENT C

SIGNIFICANT HAZARDS CONSIDERATION

Administrative Requirement 6.2.F.1, LaSalle has a leakage reduction program to reduce leakage from those portions of systems outside primary containment that contain radioactive fluids. RHR, including piping and components associated with the shutdown cooling mode, is part of this program, which includes periodic visual inspection of the system for leakage.

The previous evaluation of diversity of isolation parameters, as presented in Table 5.2-8 of the UFSAR remains unchanged. Adequate diversity of isolation parameters is maintained because there are at least two different methods available to detect and allow isolation of the system for a line break, as necessary.

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

Therefore, based upon the above evaluation, ComEd has concluded that these changes involve no significant hazards consideration.

ATTACHMENT D

ENVIRONMENTAL ASSESSMENT STATEMENT APPLICABILITY REVIEW

ComEd has evaluated this proposed operating license amendment request against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. ComEd has determined that the proposed license amendment request meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9) and as such, has determined that no irreversible consequences exist in accordance with 10 CFR 50.92(b). This determination is based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10 CFR 50 that changes a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or that change an inspection or a surveillance requirement, and the amendment meets the following specific criteria:

(i) the amendment involves no significant hazards consideration.

As demonstrated in Attachment C, this proposed amendment does not involve any significant hazards consideration.

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

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

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

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

ATTACHMENT E

SUMMARY OF SARGENT AND LUNDY (S&L) CALCULATIONS FOR REVISED HEAT LOADS FOR THE RWCU AREAS AFFECTED BY THE MODIFICATION THAT CHANGES THE RWCU SYSTEM FROM A COLD SUCTION TO A HOT SUCTION

Summary of Sargent and Lundy (S&L) Calculations for Revised Heat Loads for the RWCU Areas Affected by the Modification that Changes the RWCU System from a Cold Suction to a Hot Suction

Cooling Load Requirements and Supply Air Flowrates for the RWCU Pump Valve Room and the North and South Pump Rooms; Cooling Load Requirements and Supply Air Flowrates for the RWCU Holdup Pipe Room; and Cooling Load Requirements and Supply Air Flowrates for the RWCU Heat Exchanger and Valve Rooms Summary.

Sargent & Lundy (S&L) Calculations L-001325, L-001332, and L-001374 were revised to address both LaSalle Units 1 & 2. These calculations determine the revised heat loads for the areas affected by the modification that changes the RWCU system from cold suction to hot suction. Air flowrates necessary to maintain the room design temperature are calculated based on the new heat loads. These heat loads and air flowrates are used as input to the RWCU area ambient temperature and differential temperature (T and ΔT) leak detection calculation. It should be noted that the RWCU Filter/Demineralizer Valve Room was not affected by the change to hot suction for the RWCU pumps, so the original calculations for heat balance are not affected and were performed similarly to the discussion below.

For piping heat loads, values for the heat loss per foot of pipe length are obtained through the use of S&L Program HEATLS Version 1.0 (Program No. 03.7.290-1.0). The input data for the program includes the pipe outer diameter, insulation thickness, ambient room temperature, pipe emissivity and the temperature of the fluid inside the pipe. The heat gain due to the heat loss from the piping, loads from equipment (such as the pump motor for the pump rooms and the heat exchangers for the heat exchanger rooms) and lighting are then calculated. Finally, based on the heat load and room design temperature, the required supply air flowrate to each of the rooms is calculated. Note that the "Mezzanine Area" as referred to in the calculations is the same as the RWCU Holdup Pipe Room.

The calculations were originally prepared for the piping, equipment, and room configurations for the Unit 1 areas. The revisions were prepared to incorporate the heat load and supply air flowrates for the corresponding Unit 2 areas. The piping, equipment, and room configurations for Unit 2 were compared to those of Unit 1 and no differences were noted that affect the calculated heat loads or air flowrates. Accordingly, the heat loads and supply air flowrates originally calculated for Unit 1 are confirmed to be applicable for Unit 2.

Summary of Results:

Trip Function areas or rooms	Trip Function subareas or rooms	(Btu/hr) Heat Load With Equipment in Operation	(°F) Design Temperature	(SCFM) Airflow	Ref. Calc. No.
RWCU Holdup Pipe (Mezzanine)		17,602	122	889	L-001332
RWCU Pump and Pump Valve Room	Pump Valve Room	17,928	122	905	L-001325
	North Pump Room	33,840	122	1709	
	South Pump Room	33,840	122	1709	
RWCU Heat Exchanger Room	South Hx	34,142	122	1724	L-001374
	North Hx	37,953	122	1917	
	South Valve	13,119	122	663	
	North Valve	13,189	122	666	

ATTACHMENT F

SUMMARY OF CALCULATION NO. L-001281
RWCU AREAS TEMPERATURE RESPONSE DUE TO HIGH ENERGY RWCU FLUID LEAKAGE

Summary of Calculation No. L-001281
RWCU Areas Temperature Response Due to High Energy RWCU Fluid Leakage

Calculation L-001281 was revised to address both LaSalle Unit 1 and Unit 2. It determines the steady-state room temperatures and room differential temperatures for the Reactor Water Cleanup (RWCU) system areas as a result of high energy fluid leakage. Based on these temperature responses, analytical limits for establishing leak detection instrument setpoints are determined.

The Leak Detection system consists of ambient temperature as well as differential temperature sensors located in the HVAC supply and return air system for the RWCU system areas. In the event of a pipe failure in one of the rooms, a percentage of the high energy fluid released from the pipe would flash to steam. As a result, the ambient room temperature would quickly rise, setting off high temperature alarms in the control room. If the temperature continues to rise, the RWCU system is isolated by actuation of the inboard and outboard isolation valves, (G33-F001 and G33-F004) preventing additional flow into the system.

The calculation of the room temperature response for a given fluid leakage rate is based on solving steady-state equations for mass and energy balances for the room in question. The mass and energy of the leaking fluid is added to the inlet air stream and the thermodynamic properties of moist air are used to determine the exit air conditions. If the leaking fluid provides sufficient moisture to produce 100% relative humidity in the room, the properties of saturated air are used to define the exiting air temperature. The analytical limits are based on conservative analysis of temperature responses for various operating scenarios (e.g., summer, winter, equipment operating or not operating, etc.). In addition, the potential for false alarms is minimized. The room air flowrates are based on Calculations L-001325, L-001332, and L-001374 which were revised to address both LaSalle Unit 1 and Unit 2. The results of this calculation are used as input into the leak detection temperature setpoint calculation (L-001420).

The results of this calculation for Unit 2 are the same as the Unit 1 results. Table 1 on the following page summarizes the results for the Normal (Zero Leak), Alarm (5 gpm) Analytical Limit, and Isolation (25 gpm) Analytical Limit Cases.

Summary of Results:

The analytical limits for alarm are determined for temperatures corresponding to 5 gpm leakage. The analytical limits for isolation are determined for temperatures corresponding to a 25 gpm leak. Table 1 contains the results of Calculation L-001281. These results are valid for both LaSalle Units 1 and 2.

Table 1

RWCU Leak Detection System Analytical Limits

RWCU Room		Leakage (gpm)	Analytical Limit ΔT (°F)	Analytical Limit T_{high} (°F)
RWCU Pump Rooms	Normal	0	18.0	122.0
	Alarm	5	32.4	136.4
	Isolation	25	94.0	212.0
RWCU Pump Valve Room	Normal	0	17.6	121.6
	Alarm	5	41.0	145.0
	Isolation	25	94.0	212.0
RWCU Heat Exchanger Room	Normal	0	17.6	121.6
	Alarm	5	24.6	128.6
	Isolation	25	41.8	159.8
RWCU Mezzanine Room	Normal	0	17.3	121.3
	Alarm	5	40.8	144.8
	Isolation	25	94.0	212.0
RWCU F/D Valve Room	Normal	0	19.6	123.6
	Alarm	5	44.5	148.5
	Isolation	25	94.0	212.0

ATTACHMENT G

SUMMARY OF CALCULATION NO. L-001324
AREA AMBIENT AND DIFFERENTIAL TEMPERATURE DESIGN BASIS CALCULATIONS FOR REACTOR COOLANT LEAK DETECTION

Summary of Calculation No. L-001324, Area Ambient and Differential Temperature Design Basis Calculation for Reactor Coolant Leak Detection

LaSalle County Station Units 1 and 2 have a Leak Detection (LD) system for pipelines containing reactor coolant that are outside of the primary containment. The purpose of safety-related calculation L-001324 is to define and document the methodology and calculations used in determining inputs for the LD temperature sensors. These inputs (analytical setpoints) consist of a determination of the theoretical room area ambient temperature (T) and differential room temperature rise (ΔT) due to pipe leaks of various sizes.

The calculation contained an unverified assumption concerning the applicability of the results to Unit 2. Therefore, the calculation was revised in order to verify that the results were also applicable for Unit 2. The verification process required the preparation of a new scoping document (Attachment J of the calculation), which identified the Unit 2 rooms that should contain a temperature based LD system. The conclusion of this review is that temperature based leak detection is appropriate for the same Unit 2 rooms as previously identified for Unit 1.

In addition to summarizing the results of LD calculations contained in documents L-001281, RWCU Areas Temperature Response Due to High Energy RWCU Fluid Leakage; 3C7-1184-001, ECCS Room Leak Detection Setpoints; and BSA-L-95-05, LaSalle MS Tunnel Temperature Response Due to Steam Leakage with Ventilation System in Operation, analyses are included to determine LD analytical setpoints for the RCIC Pipe Chase (710'-0") and RCIC Equipment Room (673'-4"). Also, a check is included for the RWCU Pipe Tunnel (796'-0") to determine the pipe leak rate which would "shut off" the inlet air flow normally induced into the tunnel by the VR system exhaust fans.

All calculations are performed using an enhanced version of an Excel spreadsheet initially developed for use in Calculation L-001281. The enhanced version includes additional analytical capability to allow for the analysis of rooms for which the inlet air flow is held constant (e.g., the RCIC Pipe Chase), and rooms where the high pressure steam leaking from the pipe expands to superheated steam in the room (e.g., the RCIC Pipe Chase and RCIC Equipment Room).

The results of the RCIC Pipe Chase and RCIC Equipment Room calculations are applicable to Unit 1 and Unit 2 and demonstrate that a 25 gpm leak will produce analytical ambient temperatures and differential temperatures which are higher than the current allowable isolation values in the Technical Specification. The calculations also show that a 5 gpm leak will produce temperatures greater than the current detection alarm setpoints.

	25 gpm leak - "Isolation", Ambient T		25 gpm leak - "Isolation", Differential T		5 gpm leak - "Detection," Ambient T		5 gpm leak - "Detection," Differential T	
	Calc.	Allow-able	Calc.	Allow-able	Calc.	Allow-able	Calc.	Allow-able
RCIC Pipe Chase	270	206	170	123	244	180	154	110
RCIC Equipment Room	299	206	195	126	144	120	45	300

The RWCU Pipe Tunnel inlet and exhaust ventilation air flow rate is high, 7650 SCFM. The existing temperature LD sensors are not located at the room ventilation discharge. Therefore, when a pipe leak occurs in the tunnel the sensors will not become effective until the pipe leak rate reaches a level which shuts off the induced ventilation air flow, and steam completely fills the tunnel. The calculation is applicable to Unit 1 and Unit 2 and determines that a pipe leak rate of 92 gpm will cause the induced ventilation air flow to be shut off. (This calculated leak rate is lower than the previously calculated value of 165 gpm due to the enhanced calculation methodology.) Until the pipe leak rate reaches 92 gpm, the LD system in the RWCU Pipe Tunnel is believed to be adequate for the following reasons:

- The steam will be exhausted by the room ventilation system out of the ventilation stack. Therefore, it is not released to any general plant areas. Some piping in the RWCU Tunnel contains fluid that has just been drawn from the reactor vessel with high radiation activity levels. The radiation monitors in the ventilation stack would identify a leak below 92 gpm in this piping in the RWCU Pipe Tunnel.

- Redundant LD is required in "equipment areas." There is no safety related equipment in the RWCU Pipe Tunnel. This area only contains piping. Therefore, a pipe leak will have no significant effect on plant operation or safe shutdown.

- Some piping in the RWCU Tunnel contains water from downstream of the demineralizers which is being returned to the feedwater system. Therefore, any radiation released due to a leak in this piping will be minor due to the reduced radiation activity level of the fluid at this location in the RWCU system, and will not affect off site doses.

- The room contains a sump monitoring LD system which will detect leak rates below 92 gpm.

ATTACHMENT H

SUMMARY OF CALCULATION NO. 3C7-1184-001
ECCS ROOM LEAK DETECTION SETPOINTS

Summary of Calculation No. 3C7-1184-001, ECCS Room Leak Detection Setpoints

Calculation 3C7-1184-001 determines the room temperature in the ECCS equipment rooms (RHR Pump Room A, RHR Pump Room B &C, and RCIC Pump Room) for both LaSalle Units 1 & 2 due to high energy fluid leakage within the room. The calculations were originally performed for the Steam Condensing Mode of operation. No change was made to this calculation as it already applies to both LaSalle Units 1 & 2.

The steam condensing mode of the RHR while in operating conditions 1,2, or 3, was deleted as reported in the ComEd October 20, 1992 letter. The UFSAR was updated accordingly at the time, however no Technical Specification change was submitted. The need to have consistent documentation results in this Technical Specification change request to delete the associated isolation actuation trip functions. Area temperature monitoring of the RHR shutdown cooling mode lines is intended to provide assurance that important variables are monitored with a sufficient precision so that the isolation control system shall respond correctly to the sensed variables. However, calculations for temperature response show that the RHR shutdown cooling area temperature and ΔT sensors are not affected significantly as a result of the leak because the shutdown cooling lines are moderate energy lines. Therefore, these variables are not the important variables that can be monitored with precision to assure correct response of the isolation control system.

Because the steam condensing mode of operation has been removed from the UFSAR there is no need to postulate high energ, ine breaks during this mode. Therefore, the requirement for a leak detection system as ociated with the steam condensing mode is being removed from the UFSAR, and the associated isolation trip functions should be eliminated from the LaSalle Technical Specifications.

Also, the RHR shutdown cooling lines are moderate energy lines. Leakage from moderate energy lines is not detectable by a T and ΔT leak detection system. Therefore, there is no technical basis to support the requirement in the LaSalle Technical Specification for a T and ΔT leak detection system in the RHR Rooms. As such, these isolation trip functions should be eliminated from the LaSalle Technical Specifications.

ATTACHMENT I

SUMMARY OF CALCULATION NO. L-001384, REACTOR BUILDING ENVIRONMENTAL TRANSIENT CONDITIONS FOLLOWING RWCU AND RCIC HELBs CALCULATION

Summary of Calculation No. L-001384, Reactor Building Environmental Transient Conditions following RWCU and RCIC HELBs Calculation

Calculation L-001384, "Reactor Building Environmental Transient Conditions Following RWCU and RCIC HELBs," was revised to address both LaSalle Unit 1 and Unit 2. This calculation determines the short-term environmental conditions, specifically temperature and relative humidity, in the general floor areas of the Reactor Building that result from postulated RCIC and RWCU HELBs, and the short-term RCIC Turbine Room transient temperatures that result from postulated RCIC HELBs. In addition, Calculation L-001384 determines the upper bound of the analytical limit for the high RWCU flow instrumentation based on the system volumetric flow rate which would result from a postulated guillotine pipe break in the RWCU system during normal RWCU operation. The calculation results indicated no impact to the existing RCIC Technical Specification setpoints. Therefore, this calculation summary only discusses the RWCU portion of the calculation.

A postulated HELB for the purpose of Calculation L-001384 is considered to be guillotine rupture of a pipe with the ends offset and assumed break opening time of 1 msec. Per FSAR Appendix C, Section C.2, pipe breaks are postulated for lines of 4-inch diameter or larger. Mass and energy releases from the postulated pipe breaks are determined based on the methodology outlined in ANSI/ANS-58.2-1980. Mass and energy releases from selected pipe break locations are calculated by considering blowdown flow from both ends of the guillotine pipe break. The blowdown of the fluid downstream of the pipe break is determined based on removal of all fluid inventory between the pipe break and the first check valve downstream of the pipe break at a choked flow rate. The initial blowdown of the fluid inventory upstream of the pipe break is determined based on the removal of all fluid inventory between the Reactor Pressure Vessel and the pipe break at a choked flow rate. Following the removal of the inventory upstream of the pipe break, a steady-state blowdown is calculated until the pipe break is isolated from the Reactor Pressure Vessel.

RWCU pipe breaks are postulated in each area of the Reactor Building through which the RWCU piping is routed. RWCU pipe breaks are considered to be detected by the high RWCU flow instrumentation. The time required to isolate the RWCU break from the Reactor Pressure Vessel is determined based upon the time required to accelerate the flow above the high RWCU flow setpoint limit, the RWCU flow instrument response time including a time delay incorporated to limit spurious isolations resulting from operational transients, and the time required to stroke the RWCU isolation valves closed. Bounding RWCU mass and energy releases based upon high RWCU flow detection and isolation are considered in each respective area of the Reactor Building containing RWCU pipe.

A model of the Reactor Building is generated by dividing the Reactor Building into nodes, which represent rooms. The boundaries of rooms are based on features such as walls, doorways, blowout panels, hallways, and grating. The rooms are connected via a system of "room junctions" that provide paths for mass and energy to travel to surrounding rooms. The "room junctions" consist of stairways, equipment hatches, doorways, hallways, open areas above walls that do not extend to the top of the ceiling (wall-top slots), blowout paths, and other open areas providing a means of communication between rooms. Blowout paths are junctions such as doors and blowout panels that are initially closed, yet are assumed fully open when the differential pressure across the junction is greater than its specified blowout limit. Flow between rooms via the room junctions are a function of the cross-sectional area available in each room for flow to travel (usually occurring at the actual junction between rooms), the effective inertia for each flow path, and the hydraulic loss coefficients associated with flow from one room to the next. The heat loads associated with normal plant operations and heat transmission between Reactor Building rooms at different temperatures are included in the model. The effects of steam condensing on the concrete and steel surface area are included. When the surface temperature of a heat sink is equal to or greater than the room temperature, a natural convection heat transfer is considered. Finally, heat transfer via natural convection through various equipment hatches, stairway openings, hallways, and tunnels has been incorporated into the model during the post-HELB period.

Using the Reactor Building model developed and the mass and energy releases calculated for the postulated RWCU and RCIC HELBs, transient analyses are performed using the COMPARE computer program. This code was developed by Los Alamos National Laboratory under contract for the US NRC to perform subcompartment analysis. In addition, COMPARE is cited in Section 6.2.1.2 of the Standard Review Plan "Subcompartment Analysis:" as the applicable tool used by the NRC for review of subcompartment analysis. COMPARE/MODT-PC supplements the original COMPARE/MOD1 code to permit compliance with requirements of Appendix B of NUREG 0588 for environmental qualification calculations. The COMPARE model is used to determine the room temperature and junctions flow rates. The COMPARE/MODT-PC model is run, and the results include the transient room temperatures and relative humidities for each room in the model. From the results, the maximum room temperature and relative humidities are determined for the various line breaks considered.

The results of this calculation indicate the following peak room temperatures:

Room	Peak Temperature (°F)	Break Location
Main Room (761'0") (General Access Area)	144	RWCU Pump Valve Room
Main Room (786'6")(General Access Area)	143	South RWCU Heat Exchanger Valve Room
Main Room - East Side (820'6")(General Access Area)	114	South RWCU Heat Exchanger Valve Room

Calculation L-001384 also determines the upper bound high flow analytical limit for a guillotine break of 4" or larger RWCU pipe. The high flow analytical limit is the minimum flow rate from a full guillotine pipe break during normal RWCU operation. This value is determined for normal (Mode A) RWCU operation. This value is based on a process temperature of 534 °F, and a reactor dome pressure of 1020 psia. This analytical limit is design input for determination of the high flow setpoint. The analytical limit is determined to be 650 gpm and includes a reduction of 5.13% to account for errors in the measured RWCU flow rate.

The upper bound of the analytical limit for the RWCU high flow instrumentation is determined based on the system volumetric flow rate which would result from a postulated guillotine pipe break of the smallest size pipe postulated in the FSAR for the RWCU system during normal RWCU operation. Larger breaks would result in higher flows which would be detected and isolated.

Note that 650 GPM is approximately 85% greater than the normal operating flow rate of 352 GPM. This high flow analytical limit is used as input to the RWCU high flow setpoint calculation (L-001443).

Calculation L-001384 was initially prepared for Unit 1 and Unit 2, but contained unverified assumptions for Unit 2. The revised calculation verifies that the results are valid and applicable for both LaSalle Units 1 & 2.

ATTACHMENT J

SUMMARY OF CALCULATION NO. L-001420
RWCU AREA AMBIENT AND DIFFERENTIAL TEMPERATURE
SETPOINT CALCULATION

Summary of Calculation No. L-001420, RWCU Area Ambient and Differential Temperature Setpoint Calculation

Calculation L-001420, "RWCU Room Setpoint Margin Analysis," determines the setpoints and allowable values for the RWCU Room Differential Temperature and Ambient Temperature isolation functions. It also determines the calibration setpoints for the high RWCU Room Differential and Ambient Temperature alarms. This instrumentation detects a RWCU pipe leak in the room based on a rise in the ambient or the differential temperatures in the room. Each room has differential and ambient temperature loops that will alarm when a 5 gpm leak occurs and isolate the RWCU system when a 25 gpm leak occurs. The room temperatures during normal operation, 5 gpm leak, and 25 gpm leak conditions for both summer and winter, were determined in Calculation L-001281 "RWCU Areas Temperature Response Due to High Energy RWCU Fluid Leakage," and are used in this calculation.

This calculation revises the previous RWCU Room Setpoint Margin Analysis and Loop Accuracy calculation submitted for Unit 1. The revision employs the same methodology but incorporates the Unit 2 specific instrumentation. There are no differences between the units that impact this calculation.

The results of Calculation L-001420, "RWCU Room Setpoint Margin Analysis" conclude that the following alarm setpoints, isolation setpoints, and allowable values provide assurance that the Analytical Limit will not be exceeded for the Unit 2 RWCU Leak Detection System.

	ΔT				Ambient			
RWCU Rooms	Inst. No. (2E31-)	Allowable Value (°F)	Isolation Setpoint (°F)	Alarm Setpoint (°F)	Inst. No. (2E31-)	Allowable Value (°F)	Isolation Setpoint (°F)	Alarm Setpoint (°F)
Pump Rooms (A,B)	N600A,B,C, D	92.5	86	---------	N601A,B, C,D	209	201	---------
	R611B	---------	---------	28	R608B	---------	---------	131
Pump Valve Room	N600E,F	92.5	86	---------	N601E,F	209	201	---------
	R611B	---------	---------	37	R608B	---------	---------	140
HX Rooms (A,B)	N600G,H, J,K	40.3	33	---------	N601G,H, J,K	156.8	149	---------
	R611B	---------	---------	20	R608A	---------	---------	124
Holdup Pipe Area	N621A,B	92.5	86	---------	N620A,B	209	201	---------
	R611A	---------	---------	37	R608A	---------	---------	140
F/D Valve Room	N623A,B	92.5	86	---------	N622A,B	209	201	---------
	R611A	---------	---------	40	R608A	---------	---------	143

ATTACHMENT K

SUMMARY OF CALCULATION NO. L-001443
REACTOR WATER CLEANUP HIGH FLOW ISOLATION
SETPOINT CALCULATION

Summary of Calculation No. L-001420, RWCU Area Ambient and Differential Temperature Setpoint Calculation

Calculation L-001443, "Reactor Water Cleanup High Flow Isolation Setpoint Error Analysis," calculates the calibration setpoint and allowable value for the RWCU High Flow Switch. The setpoint is selected based on detecting a postulated guillotine pipe break in the RWCU piping of 4-inch or larger diameter during normal (Mode A) RWCU operation. The RWCU Flow based on a postulated guillotine pipe break in the RWCU piping was calculated by Calculation L-001384, "Reactor Building Environmental Transient Conditions following RWCU and RCIC HELB's" and is used by this calculation.

This calculation (performed for Unit 1) was revised to incorporate the Unit 2 instrumentation and employs the same methodology for both units. A difference exists between units for the flow element output. This difference is accounted for in the scaling of the differential pressure transmitter and does not impact the flow setpoint determination. There are not other differences between units for the RWCU High Flow Instrumentation.

The results of Calculation L-001443, "Reactor Water Cleanup High Flow Isolation Setpoint Error Analysis," conclude that a RWCU High Flow Nominal Trip Setpoint of 560 GPM and Allowable Value of 610 GPM provides assurance that the Analytical Limit of 650 GPM will not be exceed for Unit 2.