PSEG NUCLEAR L.L.C.
SALEM/OPERATIONS

S1.OP-AB.CONT-0001(Q) - REV. 13

CONTAINMENT CLOSURE

- Biennial Review Performed: Yes ____ No ✓
- Change Package(s) and Affected Document Number(s) incorporated into this revision: None
- The following OTSC(s) were incorporated into this Revision: None

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REVISION SUMMARY:

The following changes were incorporated into this revision:

- Revised Attachment 1 (Page 10 of 10) to reflect deletion of 11-15SW57 and 11-15SW65 due to installation of DCP 80092249, CFCU Simplification - Fixed Resistance Control Scheme **[80092249-0350]**
- Revised Step 3.6.3 to indicate notifying the "LLRT Evolution Team" versus the "IST Test Engineer(s)" to isolate any penetration that is breached to support LLRT. This change was incorporated due to organizational changes, and is considered to be editorial in nature.

IMPLEMENTATION REQUIREMENTS

Effective Date: 10/24/2008

- DCP 80092249, CFCU Simplification - Fixed Resistance Control Scheme

CONTAINMENT CLOSURE [C0330]

1.0 ENTRY CONDITIONS

DATE: _____ TIME: _____

1.1 Any condition requiring Containment Closure to limit the potential release of radioactive material when the Plant is in Mode 5 or 6.

1.2 Entry from another abnormal operating procedure.

2.0 IMMEDIATE ACTIONS

2.1 None

3.0 SUBSEQUENT ACTIONS

NOTE

- The OEH Door may be closed with the four corner bolts torqued to meet requirements that support closure prior to Core Boiling. When Maintenance is notified to secure the OEH door, clear communication is required to ensure ALL bolts are to be secured to establish Containment Closure.
- When operating in a reduced RCS inventory condition OR when the RCS is vented to the Containment atmosphere, Closure of the Containment Outage Equipment Hatch (OEH), Personnel Airlocks, and Containment Purge Supply, Purge Exhaust and Pressure/Vacuum Relief penetrations should be established prior to time to Core Boiling following a Loss of RHR event (Refer to 80082938, Operation 0140).
- During movement of irradiated fuel in the containment, Containment Closure should be established within one hour following a Fuel Handling Accident.
- When the initiating event is other than a loss of RHR or a Fuel Handling Accident, Containment Closure should be established within four hours of the initiating event.

___ 3.1 **IF AT ANY TIME**, Radiation Protection determines the Containment is uninhabitable, THEN **EVACUATE** all personnel from Containment.

___ 3.2 **EVACUATE** all non-essential personnel from Containment.

___ 3.3 **REQUEST** Radiation Protection provide radiological coverage of Containment personnel.

___ 3.4 **REQUEST** Containment Coordinator to provide personnel as required for Containment Closure.

___ 3.5 **INFORM** all Containment Closure personnel that high temperature fluids and/or radioactive water and gases may be present near any RCS openings.

NOTES

- This procedure provides the minimum actions necessary to satisfy Containment Closure. Additional actions may be taken (e.g., closing lines from both inside and outside Containment) to ensure Containment Closure is satisfied.
- Blind flanges may be used to satisfy valve closure.

___ 3.6 **DIRECT** Containment Closure personnel to perform the following:

___ 3.6.1 IF Containment Equipment Hatch is open,
THEN:

___ A. **REMOVE** obstructions from inner Containment Equipment Hatch, AND **INSTALL** inner Containment Equipment Hatch with a minimum of four bolts to eliminate air gaps.

OR

___ B. **INSTALL** Outage Equipment Hatch IAW SC.MD-FR.CAN-0001(Q) AND **ENSURE** all penetrations are closed or Blind Flanged to eliminate air gaps.

OR

___ C. IF the Outage Equipment Hatch is installed with the OEH door opened OR latched closed with four corner bolts,
THEN direct Maintenance to **SECURE** the door in the closed position with ALL ten bolts IAW SC.MD-FR.CAN-0001(Q) AND **ENSURE** all penetrations are closed or Blind Flanged to eliminate air gaps.

NOTE

When the OEH door is in the process of being closed, one Airlock should remain open until notified by Maintenance that the OEH door is closed. The other Airlock should be closed.

___ 3.6.2 IF any Personnel Airlock is open,
THEN:

___ A. **REMOVE** obstructions from Personnel Air Locks.

___ B. **CLOSE** both inner AND outer Personnel Air Lock doors.

___ C. **ENSURE** Personnel Air Lock door interlock is in service.

___ 3.6.3 Notify the LLRT Evolution Team to **ISOLATE** any penetration that is breached to support LLRT.

___ 3.7 IF Containment Closure is not established IAW S1.OP-ST.CAN-0007(Q), Refueling Operation - Containment Closure,
THEN **OBTAIN** a blank copy of S1.OP-ST.CAN-0007(Q), Refueling Operations - Containment Closure for a listing of Containment Closure valves located inside AND outside Containment.

NOTES

- When the OEH door is in the process of being closed, one Airlock should remain open OR the Containment Purge should remain in service until notified by Maintenance that the OEH door is closed.
- Containment Closure should be accomplished by closing the most readily available valves located either inside or outside Containment. If valves on one side of Containment can NOT be closed to satisfy Containment Closure, then the valves on the opposite side for the associated penetration line shall be closed, as applicable.
- Containment Purge may be restored after Containment airborne activity conditions have stabilized AND Radiation Protection release calculations are within acceptable limits.

___ 3.8 IF Containment Closure is being established due to the potential release of radioactive material,
THEN **CLOSE** Containment Ventilation penetrations as follows:

___ ♦ EITHER **CLOSE** the Outside Isolation valve and Outside Test valve for each line listed in the table below,
OR **CLOSE** the Inside Isolation Valve and Inside Vent valve for associated line,
OR **ENSURE** the Inside Isolation Blind Flange (1VCF2/1VCF3) is installed (as applicable), and Inside Vent valve for associated line is closed.

LINE	OUTSIDE ISOLATION	OUTSIDE TEST	INSIDE ISOLATION	INSIDE VENT
PURGE SUPPLY	1VC1 *	1VC917	1VCF2	1VC901
PURGE EXHAUST	1VC4 *	1VC916	1VCF3	1VC900
PRESS RELIEF	1VC5 *	1VC918	1VC6 *	1VC902

* Operated from the Control Room

___ 3.9 IF Containment Closure is not established IAW S1.OP-ST.CAN-0007(Q), THEN **INITIATE** Preliminary Containment Closure as follows:

___ 3.9.1 **REVIEW** Components "Off Normal and Off-Normal Tagged" List(s), AND any maintenance in progress on the following systems for effect on Containment Closure:

___ ♦ Control Air (CA)
___ ♦ Service Water (SW)
___ ♦ Component Cooling (CC)
___ ♦ Residual Heat Removal (RHR)
___ ♦ Safety Injection (SJ)
___ ♦ Chemical & Volume Control (CVC)

___ 3.9.2 IF any CA, SW, CC, RHR, SJ, or CVC System penetration line that is not in service may communicate between Containment atmosphere and the outside environment, THEN **CLOSE** either the outside valves OR the inside valves listed in Attachment 1, Containment Penetrations, for that line.

___ 3.9.3 **DOCUMENT** valves closed in blank copy of S1.OP-ST.CAN-0007(Q), Refueling Operations - Containment Closure.

___ 3.10 **ENSURE** integrity of Containment Pressure Instrumentation (Elev. 78, Inner Penetration Area):

♦ 1PA-2386
♦ 1PA-2405
♦ 1PT-948A
♦ 1PT-948B
♦ 1PT-948C
♦ 1PT-948D

___ 3.11 IF Fuel Transfer Canal is open to Containment with Reactor Cavity drained, THEN **CLOSE** Refueling Cavity from Fuel Handling Building as follows:

___ 3.11.1 **MOVE** Fuel Transfer Cart to Containment.

___ 3.11.2 **CLOSE** Fuel Transfer Tube Gate Valve.

___ 3.12 EITHER **CLOSE** OR **INSTALL** a blind flange on ALL open electrical penetrations.

___ 3.13 IF Preliminary Containment Closure is complete, THEN **INITIATE** completion of S1.OP-ST.CAN-0007(Q), Refueling Operations - Containment Closure, to verify Containment Closure.

___ 3.14 IF required for Containment cooling, THEN **PLACE** all available CFCUs with Service Water available in SLOW speed IAW S1.OP-SO.CBV-0001(Q), Containment Ventilation Operation.

___ 3.15 **MONITOR** Containment Radiation Monitors for increased activity:

___ 3.15.1 IF Containment airborne activity increases,
THEN **OPERATE** the Iodine Removal Units IAW S1.OP-SO.CBV-0001(Q), Containment Ventilation Operation.

___ 3.15.2 **CONTINUE** operation of Iodine Removal Units until Radiation Protection determines that airborne activity is within limits.

___ 3.16 **NOTIFY** SM/CRS to refer to the Event Classification Guide and Technical Specifications.

___ 3.17 IF any Containment line/penetration can NOT be closed off to isolate the Containment environment from the outside atmosphere,
THEN **CONTACT** SM/CRS for further direction.

___ 3.18 WHEN the following conditions are satisfied, Containment Closure is no longer required:

- ♦ RCS temperature is stable or decreasing.
- ♦ RHR flow is stable.
- ♦ EITHER RCS level is stable and greater than 97.5 ft,
OR Refueling Cavity level is greater than 23 ft. above the Reactor Pressure Vessel flange.
- ♦ Radiation Protection determines that Containment can be opened for access.
- ♦ Technical Specification Action statements are exited.

___ 3.19 WHEN Containment Closure is no longer required:

___ 3.19.1 **RESTORE** Containment Ventilation to normal lineup IAW S1.OP-SO.CBV-0001(Q), Containment Ventilation Operation.

___ 3.19.2 **RETURN** Personnel Air Locks to positions as directed by SM/CRS.

___ 3.19.3 **RETURN** inner Containment Equipment Hatch OR Outage Equipment Hatch to positions as directed by SM/CRS.

___ 3.19.4 **RESTORE** access to Containment.

4.0 COMPLETION AND REVIEW

___ 4.1 **UPDATE** WCM to reflect valves that were closed IAW S1.OP-ST.CAN-0007(Q).

___ 4.2 **COMPLETE** Attachment 2, Sections 1.0 and 2.0,
AND **FORWARD** this procedure to SM/CRS for review and approval.

___ 4.3 SM/CRS **PERFORM** the following:

___ 4.3.1 **REVIEW** this procedure with Attachments 1 and 2 for completeness and accuracy.

___ 4.3.2 **COMPLETE** Attachment 2, Section 3.0.

___ 4.3.3 **FORWARD** completed procedure to Operations Staff.

END OF PROCEDURE

ATTACHMENT 1
(Page 1 of 10)
CONTAINMENT PENETRATIONS

1.0 Steam Generator Closure

NOTE

Satisfactory installation of manways and handholes is accomplished by installing the component with a minimum of bolts. Gaskets are NOT required.

LINE	OUTSIDE VALVES **	INSIDE ISOLATION
AF/BF	11BF22 * AND EITHER 11AF11 *, 11AF21 *, 11AF116, 11AF117, 11AF118, 11AF119, 11AF124, 11AF126, 11AF129, 11AF132, 11AF22 (ilv), 11AF23 (cv), 11AF86 (ilv), 11AF920 (cv), 11AF921 (cv), OR 11AF23, 11AF129, 11AF132	11BF57 Steam Generator manways & handholes on both primary and secondary sides. Steam Generator openings on piping systems including: Main Feedwater System Chemical Feed/Wet Layup System Steam Generator level columns
AF/BF	12BF22 * AND EITHER 12AF11 *, 12AF21 *, 12AF116, 12AF117, 12AF118, 12AF119, 12AF122, 12AF123, 12AF124, 12AF125, 12AF126, 12AF134, 12AF22 (ilv), 12AF23 (cv) 12AF86 (ilv), OR 12AF23	12BF57 Steam Generator manways & handholes on both primary and secondary sides. Steam Generator openings on piping systems including: Main Feedwater System Chemical Feed/Wet Layup System Steam Generator level columns

* Operated from the Control Room

** If stopcheck valve AF23 is CLOSED, then only the inboard vent and drain valves listed with it need to be closed for that AF line. Valve BF22 is required to be closed in either case.

(cv) = check valve; (ilv) = inline valve; (rv) = relief valve

ATTACHMENT 1
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CONTAINMENT PENETRATIONS

1.0 Steam Generator Closure (Continued)

LINE	OUTSIDE VALVES **	INSIDE ISOLATION
AF/BF	13BF22 * AND EITHER 13AF11 *, 13AF21 *, 13AF116, 13AF117, 13AF118, 13AF119, 13AF126, 13AF129, 13AF131, 13AF22 (ilv), 13AF23 (cv), 13AF86 (ilv), 13AF921 (cv), OR 13AF23 & 13AF129	13BF57 Steam Generator manways & handholes on both primary and secondary sides. Steam Generator openings on piping systems including: Main Feedwater System Chemical Feed/Wet Layup System Steam Generator level columns
AF/BF	14BF22 * AND EITHER 14AF11 *, 14AF21 * 14AF116, 14AF117 14AF119, 14AF122, 14AF123, 14AF124, 14AF126, 14AF22 (ilv), 14AF23 (cv), 14AF86 (ilv), 14AF920 (cv), OR 14AF23	14BF57 Steam Generator manways & handholes on both primary and secondary sides. Steam Generator openings on piping systems including: Main Feedwater System Chemical Feed/Wet Layup System Steam Generator level columns

* Operated from the Control Room

** if stopcheck valve AF23 is CLOSED, then only the inboard vent and drain valves listed with it need to be closed.

(cv) = check valve; (ilv) = inline valve; (rv) = relief valve

ATTACHMENT 1
(Page 3 of 10)
CONTAINMENT PENETRATIONS

1.0 Steam Generator Closure (Continued)

LINE	OUTSIDE VALVES	INSIDE VALVES
GB	11GB4 *, 11GB47	11GB3 (ilv)
GB	12GB4 *, 12GB47	12GB3 (ilv)
GB	13GB4 *, 13GB47	13GB3 (ilv)
GB	14GB4 *, 14GB47	14GB3 (ilv)
MS	11MS6, 11MS10 *, 11MS18 *, 11MS45, 11MS130, 11MS146, 11MS167 *, 11MS199, 11MS11-15 (rv), 11MS943	*** 11MS2-5, 11MS61, 11MS189
MS	12MS6, 12MS10 *, 12MS18 *, 12MS130, 12MS146, 12MS167 *, 12MS199, 12MS11-15 (rv), 12MS943	*** 12MS2-5 12MS61, 12MS189
MS	13MS6, 13MS10 *, 13MS18 *, 13MS45, 13MS130, 13MS146, 13MS167 *, 13MS199, 13MS11-15 (rv), 13MS943	*** 13MS2-5 13MS61, 13MS189
MS	14MS6, 14MS10 *, 14MS18 *, 14MS130, 14MS146, 14MS167 *, 14MS199, 14MS11-15 (rv), 14MS943	*** 14MS2-5 14MS61, 14MS189

* Operated from the Control Room

*** This line cannot be closed from inside Containment. These valves will provide the best boundary if the line cannot be closed from outside Containment. **ENSURE** SM/CRS is notified if this line cannot be closed from outside Containment.

(cv) = check valve; (ilv) = inline valve; (rv) = relief valve

ATTACHMENT 1
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CONTAINMENT PENETRATIONS

1.0 Steam Generator Closure (Continued)

LINE	OUTSIDE VALVES	INSIDE VALVES
SS	11SS94 *	11SS93 **
SS	12SS94 *	12SS93 **
SS	13SS94 *	13SS93 **
SS	14SS94 *	14SS93 **

2.0 Phase "A" Penetrations

LINE	OUTSIDE VALVES	INSIDE VALVES
CA	11CA330 *	1CA930, 11CA542, 11CA543, 11CA360 (cv)
CA	12CA330 *	1CA931, 12CA542, 12CA543, 12CA360 (cv)
CC	1CC113 * & 1CC215 *	1CC110, 1CC179, 1CC180, 1CC205, 1CC274, 1CC275, 1CC278, 1CC109 (cv), 1CC112 (rv)
CVC	1CV7 *	1CV3 *, 1CV4 *, 1CV5 *, 1CV6 (rv)
CVC	1CV69 * & 1CV288	1CV75 *, 1CV77 *, 1CV79 *, 1CV272, 1CV290, 1CV74 (cv), 1CVE24 ***
CVC	1CV116 * & 1CV335	1CV114 *, 1CV134 *, 1CV284 (ilv) *, 1CV336, 1CV338, 1CV360, 11-14CV107, 11-14CV108, 1CV296 (cv), 1CV115 (rv)

* Operated from the Control Room

** Operated from the Primary Sample Room

*** **ENSURE** boundary of Heat Exchanger (1CVE24) on the Charging line side.

(cv) = check valve; (ilv) = inline valve; (rv) = relief valve

ATTACHMENT 1
(Page 5 of 10)
CONTAINMENT PENETRATIONS

2.0 Phase "A" Penetrations (Continued)

LINE	OUTSIDE VALVES	INSIDE VALVES
DR	1DR29 * & 1DR915	1DR31, 1DR50, 1DR54, 1DR121, 1DR30 (cv)
FP	1FP147 *	1FP275, 1FP284, 1FP285, 1FP148 (cv)
NT	1NT25 *	1NT45, 1NT46, 1NT47, 1NT26 (cv)
NT	1NT32 *	1NT35 *, 1NT55, 1NT56, 1NT33 (rv), 1NT34 (cv), 11-14SJ93 *
PR	1PR18 *	1PR17 *
SJ	1SJ53 *, 1SJ60 *, 1SJ212	1SJ123 *
SS	1SS27 *	1SS103 *
SS	1SS33 *	1SS104 *
SS	1SS49 *	1SS107 *
SS	1SS64 *	1SS110 *
VC ***	1VC8 * & 1VC12 *	1VC7 * & 1VC11 *

* Operated from the Control Room

*** **STOP** APD 1R11/12 Sample Pump from Control Room Rack Area (Rack 109) prior to closing valves.

(cv) = check valve; (ilv) = inline valve; (rv) = relief valve

ATTACHMENT 1
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CONTAINMENT PENETRATIONS

2.0 Phase "A" Penetrations (Continued)

LINE	OUTSIDE VALVES	INSIDE VALVES
WL	1WL13 *	1WL12 *
WL	1WL17 *	1WL16 *
WL	1WL97 *	1WL96 *
WL	1WL99 & 1WL108 *	1WL98 *
WR	1WR80 *	1WR82 *, 1WR96, 1WR97, 1WR125, 1WR126, 11-14WR62 *, 1WR81 (cv)

3.0 Phase "B" Penetrations

LINE	OUTSIDE VALVES	INSIDE VALVES
CC	1CC118 *	1CC183, 1CC184, 1CC294, 1CC307, 1CC308, 11-14CC120, 1CC119 (cv)
CC	1CC131 *	1CC189, 1CC283, 1CC285, 1CC287, 1CC303, 1CC305, 11-14CC130, 1CC190 (ilv) *, 1CC208 (cv)
CC	1CC136 *	1CC185, 1CC242, 1CC279, 1CC280, 1CC301, 1CC302, 11-14CC127, 1CC187 (ilv) *, 1CC186 (cv), 1CC135 (rv)

* Operated from the Control Room

(cv) = check valve; (ilv) = inline valve; (rv) = relief valve

ATTACHMENT 1
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CONTAINMENT PENETRATIONS

4.0 Other Penetrations

LINE	OUTSIDE VALVES	INSIDE VALVES
CA	1CA1714 (100' Airlock)	1CA1718 (100' Airlock)
CA	1CA1715 (130' Airlock)	1CA1721 (130' Airlock)
CS	1CS902 & 1CS903	1CS900 & 1CS901
CS	11CS2 *, 11CS10, 11CS36, 11CS46, 11CS51, 11CS52, 1CS60, 11CS4 (cv), 11CS5 (rv)	11CS6, 11CS44, 11CS49, 11CS67, 11CS48 (cv)
CS	12CS2 *, 12CS10, 12CS36, 12CS46, 12CS52, 12CS4 (cv), 12CS5 (rv)	12CS6, 12CS44, 12CS49, 12CS67, 12CS48 (cv)
CVC	11CV98 & 11CV318	11CV291, 11CV293, 11CV295, 11CV99 (cv)
CVC	12CV98	12CV291, 12CV293, 12CV295, 12CV99 (cv)
CVC	13CV98 & 13CV318	13CV291, 13CV293, 13CV295, 13CV99 (cv)
CVC	14CV98	14CV291, 14CV293, 14CV295, 14CV99 (cv)

* Operated from the Control Room

(cv) = check valve; (ilv) = inline valve; (rv) = relief valve

ATTACHMENT 1
(Page 8 of 10)
CONTAINMENT PENETRATIONS

4.0 Other Penetrations (Continued)

LINE	OUTSIDE VALVES	INSIDE VALVES
PR/ CS/ CVC/ SJ/ RHR	1PR36, 1PR40, 1PR41, 1CS64, 11-12CS5 (rv), 1CV309, 1CV365, 1CV43 (rv), 1SJ229, 1SJ293, 1SJ32 (rv), 11-12SJ39 (rv), 11-12SJ48 (rv), 1SJ167 (rv), 1RH3 (rv), 1RH25 (rv)	1PR31, 1PR32, 1PR25 (cv) ***
RHR	11-12RH19 *, 1RH20 *, 1RH21, 1RH24, 1RH41, 1RH46 (cv), 1RH58, 1RH72	1RH26 *, 1RH47, 1RH25 (rv)
RHR/SJ	11-12RH4 *, 11-12RH36, 1RH33, 1RH81, 1RH45 (cv), 1SJ69 *, 1SJ160, 1SJ70 (cv)	1RH2 *, 1RH49, 1RH63, 1RH64, 1RH3 (rv)
SA	1SA591 (sf) & 1SA905	1SA120, 1SA121, 1SA272, 1SA119 (cv)
SA	1SA262 & 1SA263	1SA264
SA	1SA265 & 1SA266	1SA267
SA	1SA268 & 1SA269	1SA270
SF/WL	1SF22 & 1SF73	1WL191
SF/WL	1SF36 & 1SF76	1WL190

*** This line cannot be closed from inside Containment. These valves will provide the best boundary if the line cannot be closed from outside Containment. **ENSURE** SM/CRS is notified if this line cannot be closed from outside Containment.

(cv) = check valve; (ilv) = inline valve; (rv) = relief valve; (sf) = spectacle blind plate & flange

ATTACHMENT 1
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CONTAINMENT PENETRATIONS

4.0 Other Penetrations (Continued)

LINE	OUTSIDE VALVES	INSIDE VALVES
SJ	1SJ12 *, 1SJ13 *, 1SJ309	1SJ166 *, 1SJ149, 1SJ150 (cv), 1SJ19 *, 1SJ311, 11-14SJ14, 11-14SJ15, 11-14SJ16 (ilv), 11-14SJ388
SJ	11SJ44 *, 11SJ126	**
SJ	12SJ44 *, 12SJ126	**
SJ	11SJ49 *	11SJ50 *, 11SJ154, 1SJ224, 11SJ43 (cv), 13SJ43 (cv) ***
SJ	12SJ49 *	12SJ50 *, 12SJ154, 1SJ218, 1SJ220, 12SJ43 (cv), 14SJ43 (cv) ***
SJ	11SJ40 *, 11SJ145, 1SJ216	1SJ63 *, 1SJ248, 13-14SJ136, 13-14SJ137, 13-14SJ138 ****
SJ	12SJ40 *, 1SJ194, 1SJ252, 12SJ145	1SJ159 *, 1SJ250, 11-12SJ136, 11-12SJ137, 11-12SJ138 ****
SJ	1SJ135 *	1SJ158 *, 1SJ214, 11-14SJ141, 11-14SJ142, 11-14SJ143 ****

* Operated from the Control Room

** This line cannot be closed from inside Containment. **ENSURE** SM/CRS is notified if this line cannot be closed from outside Containment.

*** This line cannot be closed from inside Containment. These valves will provide the best boundary if the line cannot be closed from outside Containment. **ENSURE** SM/CRS is notified if this line cannot be closed from outside Containment.

**** These valves are preset to prevent pump runout and should only be closed as a last resort effort to establish Containment Closure.

(cv) = check valve; (ilv) = inline valve; (rv) = relief valve

ATTACHMENT 1
(Page 10 of 10)
CONTAINMENT PENETRATIONS

4.0 Other Penetrations (continued)

LINE	OUTSIDE VALVES	INSIDE VALVES
SS	1SS901	N/A
SW	11SW58 *, ***	11SW62, 11SW63, 11SW64, 11SW67, 11SW69, 11SW248, 11SW269 AND 11 CFCU Piping, Fan Cooler, and Motor Cooler are INTACT
SW	11SW72 *, ***	
SW	12SW58 *, ***	12SW62, 12SW63, 12SW64, 12SW67, 12SW69, 12SW248, 12SW269 AND 12 CFCU Piping, Fan Cooler, and Motor Cooler are INTACT
SW	12SW72 *, ***	
SW	13SW58 *, ***	13SW62, 13SW63, 13SW64, 13SW67, 13SW69, 13SW248, 13SW269, 13SW280, 13SW283 AND 13 CFCU Piping, Fan Cooler, and Motor Cooler are INTACT
SW	13SW72 *, ***	
SW	14SW58 *, ***	14SW62, 14SW63, 14SW64, 14SW67, 14SW69, 14SW248, 14SW269, 14SW280, 14SW283 AND 14 CFCU Piping, Fan Cooler, and Motor Cooler are INTACT
SW	14SW72 *, ***	
SW	15SW58 *, ***	15SW62, 15SW63, 15SW64, 15SW67, 15SW69, 15SW248, 15SW269 AND 15 CFCU Piping, Fan Cooler, and Motor Cooler are INTACT
SW	15SW72 *, ***	
VC	1VC10*	1VC9*
VC	1VC14*	1VC13*

* Operated from the Control Room

*** Closing these valves isolates the Containment Fan Coil Unit from its associated relief valve path eliminates the CFCUs overpressure protection. If these valves are closed then the associated CFCU should be drained to prevent damage to the CFCU coils in the event of a sudden temperature increase inside Containment.

ATTACHMENT 2
(Page 1 of 2)

COMPLETION SIGN-OFF SHEET

1.0 **COMMENTS:**

(Include procedure deficiencies and corrective actions. Attach additional pages as necessary.)

ATTACHMENT 2
(Page 2 of 2)

COMPLETION SIGN-OFF SHEET

2.0 **SIGNATURES:**

Print	Initials	Signature	Date

3.0 **SM/CRS FINAL REVIEW AND APPROVAL:**

This procedure with Attachments 1 and 2 is reviewed for completeness and accuracy. Entry conditions and all deficiencies, including corrective actions, are clearly recorded in the COMMENTS Section of this attachment.

Signature: _____ Date: _____
SM/CRS

CONTAINMENT CLOSURE/INTEGRITY
TECHNICAL BASES DOCUMENT

1.0 REFERENCES

1.1 Technical Documents

A. Salem Generating Station Updated Final Safety Analysis Report:
   1. Section 6.2, Containment Systems

B. Salem Generating Station Technical Specifications Unit 1:
   1. 3.6.1.1, Containment Integrity
   2. 3.6.3.1, Containment Isolation Valves
   3. 3.9.4, Containment Building Penetrations
   4. 3.9.10, Water Level - Reactor Vessel

C. Configuration Baseline Documentation:
   1. DE-CB.CBV-0026(Q), Containment Building Ventilation System
   2. DE-CB.CAN-0043(Q), Containment Internal Structures

D. Event Classification Guide:
   1. Section 6, Fission Product Boundary Failure
   2. Section 7, Radiological Releases / Occurrences
   3. Section 18, Technical Specification / Plant Status Changes

1.2 Procedures

A. S1.OP-AB.RHR-0001(Q), Loss of RHR
B. S1.OP-AB.RHR-0002(Q), Loss of RHR at Reduced Inventory
C. S1.OP-SO.CBV-0001(Q), Containment Ventilation Operation
D. S1.OP-SO.WG-0006(Q), Containment Purge to the Plant Vent
E. S1.OP-ST.CAN-0007(Q), Refueling Operations-Containment Isolation
F. SC.MD-FR.CAN-0001(Q), Outage Equipment Hatch Installation, Removal, and Seal Replacement

1.3 Industry Concerns

A. NUREG 1269, Loss of Residual Heat Removal System Diablo Canyon Unit 2
B. NUREG 1410, Loss of Vital AC Power and the Residual Heat Removal System During Mid-Loop Operations at Vogtle Unit 1 on March 20, 1990
C. INPO SOER 88-03, Losses of Residual Heat Removal with Reduced Reactor Vessel Level at PWRs, Recommendation 2.h, Instructions to Restore Containment Closure
D. INPO SOER 85-01, Reactor Cavity Seal Failure
E. INPO SER 86-21, Dropped Fuel Assembly at a PWR
F. NRC INFO 86-58, Dropped Fuel Assembly at Haddam Neck Plant
G. Westinghouse Owners Group Abnormal Response Guideline (WOG-ARG-1), Loss of RHR while Operating at Mid-Loop Conditions
H. NUMARC 91-06, Guidelines for Industry Actions to Assess Shutdown Management.

1.4 Drawings

A. 205201, Reactor Coolant
B. 205202, Steam Generator Feed & Condensate
C. 205203, Main, Reheat & Turbine By-Pass Steam
D. 205217, Compressed Air
E. 205222, Fire Protection
F. 205225, Steam Generator Drains & Blowdown
G. 205228, Chemical & Volume Control Operation
H. 205231, Component Cooling
I. 205232, Residual Heat Removal
J. 205233, Spent Fuel Cooling
K. 205234, Safety Injection
L. 205235, Containment Spray
M. 205236, Auxiliary Feedwater
N. 205238, Containment Ventilation
O. 205239, Waste Disposal Liquid
P. 205242, Service Water Nuclear Area
Q. 205244, Sampling
R. 205246, Demineralized Water - Restricted Areas
S. 205247, Control Air
T. 207533, Unit 1 Safety Inj. Sys. Cont. spray Instrument Sch. - Control
U. 222702, Unit 1 Penetration Area Electrical Power Penetration Diagram

1.5 Other

A. S-C-SW-MEE-1236, Generic Letter GL96-06, Service Water System Modifications, Station Blackout Evaluation
B. NLR-N89001, Dated January 6, 1989, Response to NRC Generic Letter 88-17
C. NLR-N890014, Dated January 27, 1989, 90 Day Response to NRC Generic Letter 88-17
D. S-C-CA-CSE-0881, OEH UFSAR Change Notice 99-014 and Procedure SC.MD-FR.CA-0001(Q). Use during modes 5, 6, and Undefined.
E. S-2-RC-MEE-1931,
F. S-2-RC-MEE-1931, Containment Habitability following Loss of RHR Cooling with the RCS Drained to the Rx Flange
G. 70047277-0200, Clarify definition of Closure

1.6 Conformance Documents

A. C0330, NRC GL 88-17, Develop Procedures For Containment Closure
B. S00-056, 50.59 Safety Evaluation, Nuclear Licensing Commitment Change to NL-N89001 to allow an open OEH door during mid-loop conditions when boiling will not occur

2.0 DISCUSSION

2.1 This procedure provides the instructions necessary for establishing Containment Closure. Accidents with the potential of radiological releases to the environment require that the Containment be isolated from the general public. Operation in Mode 5 & 6 frequently requires Containment openings such as penetrations, hatches, and access ways. A method to provide rapid closure of Containment has been recognized following several industry events which resulted in actual or near releases to the environment.

It is the intent of this discussion to provide the reasoning behind the logic and flowpath of the procedure. It is not intended to provide additional direction to the procedure.

The Nuclear Regulatory Commission has provided the following definition:

CLOSED CONTAINMENT - A containment that provides at least one integral barrier to the release of radioactive material. Sufficient separation of the containment atmosphere from the outside environment is to be provided such that a barrier to the escape of radioactive material is reasonably expected to remain in place following a core melt accident. This can be accomplished by providing reasonable assurance that the following conditions are met:

A. The inner Equipment Hatch is installed and held in place by a sufficient number of bolts such that no air gaps exist in the sealing surface OR the Outage Equipment Hatch is installed using all bolts and the OEH door is capable of being closed within one hour during Mid-Loop operation IAW SC.MD-FR.CAN-0001(Q) OR OEH door is closed and secured with the four corner bolts torqued.

B. A minimum of one door in each airlock is closed, and

C. Each penetration providing access from the containment atmosphere to the outside atmosphere shall be closed by a valve or a blind flange. Closure by a valve or blind flange used for containment isolation during power operation meets this specification. Closure by other valves or blind flanges may be used if they are similar in capability to those provided for containment isolation. These may be constructed of standard materials and may be justified on the basis of either normal analysis methods or reasonable engineering judgement.

2.2 Entry Conditions - Entry conditions are based on the requirement for establishing Containment Closure. The most significant requirement is to prevent or stop radiological releases to the environment. This can be from several occurrences, such as a Fuel Handling incident in Containment, loss of Refueling Cavity level during Refueling, loss of RHR cooling with the potential for core boiling before restoration, and other similar casualties. Each of these specific events have an Abnormal Operating Procedure associated with the casualty which will direct Containment Closure when prudent.

2.3 Immediate Actions - None

2.4 Subsequent Actions - A note is provided at Step 3.1 to inform the Operator that Containment Closure should be established prior to core boiling when operating in a reduced RCS inventory condition or with the RCS vented to the Containment atmosphere, OR within one hour when movement of irradiated fuel in the containment, OR should be established within four hours when NOT operating in a reduced RCS inventory condition OR movement of irradiated fuel in the containment. This time limit is to establish Containment Closure prior to core damage. The time available between the loss of RHR cooling, core uncovery, and core damage varies depending on Plant conditions at the time of event initiation. For adverse conditions, the time to core damage could be as little as 30 minutes. For more favorable conditions, the time would exceed two hours. In any event, Containment Closure should be established before core damage occurs (ref: Westinghouse Owners Group ARG-1).

Additional administrative controls are in place to ensure Containment Closure is established within allowable times:

(1) RCS inventory is not reduced until at least 72 hours after Unit shutdown to assure time to core uncovery is two hours or greater.

(2) Because both the Equipment Hatch and the Outage Equipment Hatch require four hours to install, installation is required prior to operating at reduced inventory (ref: PSE&G Response to GL 88-17, NLR-N89001 & NLR-N89014).

(3) If the Outage Equipment Hatch is installed, the OEH door can either be opened or closed IAW S1.OP-ST.CAN-0007(Q) prior to and during operating at reduced inventory conditions or movement of irradiated fuel in containment. The Outage Equipment Hatch door must be capable of being switched from the Standby Position to the Closed Position in less than one hour during movement of irradiated fuel in containment OR prior to the time to core boil when at reduced inventory conditions. The OEH Door may be closed with the four corner bolts torqued to meet requirements to support closure prior to Core Boiling. When Containment Closure is required by this procedure ALL bolts are to be secured.

Therefore, this procedure establishes a time limit of either one hour, four hours, or prior to time to core boil based on existing Plant conditions.

Step 3.1 is a conditional statement directing immediate evacuation of all personnel in the Containment if at any time Radiation Protection determines the Containment is uninhabitable. A significant safety hazard may be present due to airborne activity, high temperatures, extreme humidity, and ionizing radiation. In all cases, personnel not involved in Containment Closure or in combating the initiating event are evacuated from the Containment (Step 3.2).

Step 3.3 requests Radiation Protection Department provide radiological coverage to Containment personnel. This is intended to reduce the possibility of inadvertent overexposure.

Step 3.4 requests the Containment Coordinator provide personnel to assist with Containment Closure.

Step 3.5 directs the Operator to inform all Containment Closure personnel of the potential for high temperature fluids and/or radioactive water/gases near RCS openings.

A note at Step 3.6 informs the Operator that this procedure provides the minimum actions necessary to satisfy Containment Closure. The note is intended to inform the Operator that additional actions may be taken to ensure Containment Closure is satisfied, such as closing additional valves, closing both the inner and outer Personnel Airlocks, installing blind flanges, etc. The note also clarifies that blind flanges satisfy valve closure. Step 3.6 directs Containment Closure personnel to take the necessary actions to close the Equipment Hatch OR the Outage Equipment Hatch, and the Personnel Air Locks. Installation of the Equipment Hatch OR the Outage Equipment Hatch in the Closed Position with all air gaps eliminated has been deemed sufficient protection against radiological releases since the highest pressures postulated in Containment are less than the peak pressure expected in the Design Basis Accident (ref: Westinghouse Owners Group ARG-1).

Steps 3.7 direct the Operator to obtain a copy of S1.OP-ST.CAN-0007(Q), Refueling Operations - Containment Closure. This surveillance identifies the valves outside and inside Containment that may need to be closed in order to establish Containment Closure.

A note preceding Step 3.8 informs the Operator that Containment Closure should be accomplished by closing the most readily available valves located either inside or outside Containment. If valves on one side of Containment can not be closed, then the corresponding valves on the opposite side of Containment for the associated line should be closed. Additionally, the note states that Containment Purge may be restored if Radiation Protection concurs and conditions requiring Containment Closure have stabilized. The ability to automatically isolate Containment Ventilation due to radiological conditions is still available providing protection against uncontrolled airborne releases. Step 3.8 closes Containment Ventilation from the environment if a potential release of radioactive material is present.

Step 3.9 directs initiation of Preliminary Containment Closure. The intent of preliminary closure is two-fold; first, to review Components "Off Normal" and "Off Normal Tagged" lists and any maintenance in progress for CA, SW, CC, RHR, SJ, & CVC Systems. Any line within these systems that may communicate between the Containment atmosphere and the outside environment is closed off to ensure Containment Closure. Second, to document all valves that are closed to satisfy Preliminary Containment Closure for each penetration line listed on Attachment 1.

Attachment 1 identifies each penetration line with the corresponding valves located outside and inside Containment.

While preliminary closure is in progress, the Operator is directed to ensure integrity of other lines penetrating Containment. Step 3.10 ensures integrity of Containment Pressure Instrumentation. Step 3.12 ensures the integrity of electrical penetrations. Step 3.11 ensures the Fuel Transfer Canal is closed.

After Preliminary Containment Closure has been performed, direction is given (Step 3.13) to verify Containment Closure by performing S1.OP-ST.CAN-0007(Q). In many cases, only one valve, either inside or outside of Containment, is required to be closed. However, because of outage activities, a single valve may not be available to satisfy closure. Therefore, it may be necessary to close multiple valves on the opposite side of the penetration to satisfy closure. S1.OP-ST.CAN-0007(Q), Refueling Operations - Containment Closure, is performed to verify containment penetrations are isolated or operable. This procedure is performed to ensure the boundary of check valves, relief valves, and inline valves for the valve group that are being used satisfy Containment Closure. Boundary of check valves and other inline valves is checked to ensure a release path is not present through an open valve body. Relief valves may be used to satisfy Containment Closure as they are normally closed, automatic-acting valves. Footnotes in the attachment provide additional information or direction to the Operator as necessary.

Step 3.14 directs the Operator to place all available Containment Fan Coil Units (CFCUs) with Service water available in slow speed if required for containment cooling. This is to minimize temperature and pressure increases in Containment even if core boiling occurs. Operating CFCUs in slow speed is the analyzed configuration in the UFSAR. Operating CFCUs without Service Water cooling provides no additional cooling. Therefore, only CFCUs with Service Water available are placed in service. Step 3.15 places Containment Iodine Removal Units in service if airborne activity exceeds limits established by Radiation Protection.

The SM/CRS is directed to refer to the Event Classification Guide and Technical Specifications in Step 3.16.

Step 3.17 directs the Operator to contact the SM/CRS if any Containment penetration cannot be closed.

Step 3.18 lists the conditions that are to be satisfied before the procedure can be exited and Step 3.19 directs actions for the Operator to take when Containment Closure is no longer required.

The procedure is then exited in Section 4.0.

END OF DOCUMENT