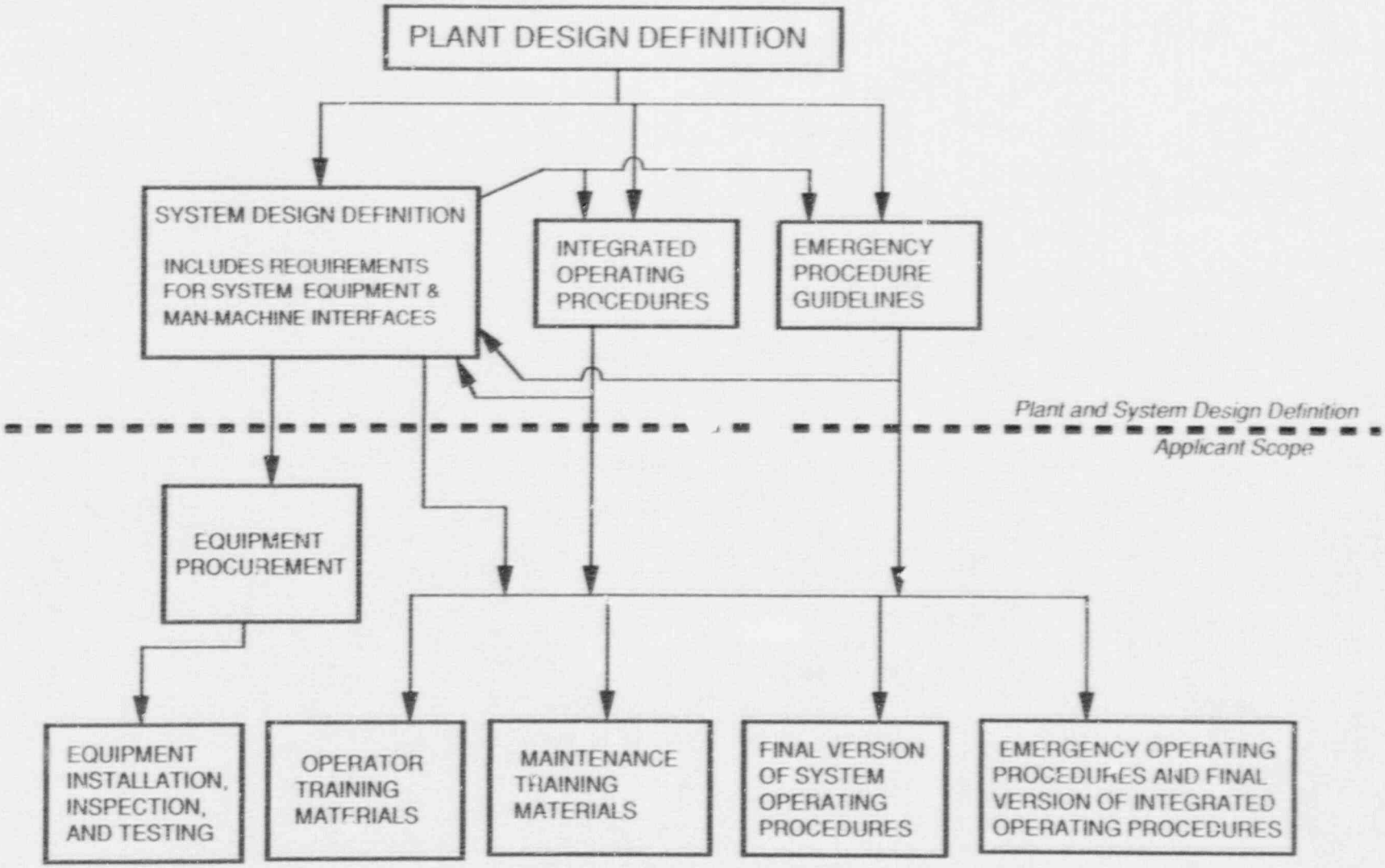

Figure 1
Relationship of System Training Material Preparation
to Other Plant Design and Procurement Activities

EIS IDENT: R'IR SOP-E11

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REVISION STATUS SHEET

DOCUMENT TITLE RESIDUAL HEAT REMOVAL SYSTEM OPERATING PROCEDURES, SOP-E11

LEGEND OR DESCRIPTION OF GROUPS

TYPE: OPERATING PROCEDURE

FMF: K 6 / 7

MPL ITEM NO: A80-3030

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1.0 PURPOSE

This procedure provides the detailed instructions for operating the Residual Heat Removal System(RHR). The various operating modes of RHR are covered, from startup to shutdown. In addition to these operating modes, procedures are presented for system flushing and draining of the reactor cavity after refueling.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Technical Specification Requirements:

[later]

2.2 The Leak Detection and Isolation System isolates RHR Shutdown Cooling Suction Isolation valves F012A, B, C and F013A, B, C, on any of the following conditions:

–Reactor Vessel water level 3 [setpoint later],

–Reactor Pressure high [setpoint later], or

–High RHR Equipment Room Temperature [setpoint later].

2.3 Refer to Emergency Operating Procedures SEOP- [later] for Drywell Spray and Wetwell Spray.

3.0 STARTUP OF THE RHR SYSTEM

The following prerequisites shall be satisfied prior to conducting the system "Startup to Standby Readiness" in Section 4.

3.1. The following support systems available as follows:

3.1.1 The Suppression Pool System [later] , to provide and maintain a pool water level of [later] sufficient to maintain adequate net positive suction head to the RHR pumps.

3.1.2 The Reactor Building Cooling Water System(P21), to provide cooling water to the RHR heat exchangers.

3.1.3 Electrical Power Distribution System (R10), to provide power for the RHR pumps, system motor-operated valves, controls and instrumentation.

3.0 STARTUP OF THE RHR SYSTEM(continued)

3.1.4 Emergency Diesel Generators, to provide a standby source of electric power should outside sources of power not be available.

3.2 System electrical lineup completed per Enclosures 1 and 2.

3.3 System valve lineup completed per Enclosures 3 and 4.

3.4 System instrumentation and control lineup completed per Enclosure 5.

4.0 PLACING THE RHR SYSTEM IN STANDBY READINESS CONDITION

Place the RHR System in standby readiness per the following :

4.1 Open the following valves:

Suppression Pool Suction valves F001A(B, C),

Heat Exchanger Outlet valves F006A(B,C), and

Minimum Flow valve F022 A(B, C),

Line Fill Pump valve F030A(B,C); open at designated [later] position.

4.2 Place the RHR A(B, C) SYSTEM OUT OF SERVICE switches in the OFF position.

| | 4.3 Start the Line Fill Pumps C002A(B, C). Adjust F030A(B,C) to obtain [later] pressure from PI–701 A(B,C).

| | 4.4 Verify that the following annunciators are clear:

RHR A(B,C) OUT OF SERVICE
RHR PUMP A(B,C) LOW DISCHARGE PRESSURE
RHR SUCTION VALVE CLOSED
FILL PUMP TRIP

4.5 Vent the RHR pumps <u>locally</u> as follows:

Pump	Valves
A	F609, F608, F610, F611
B	F619, F618, F621, F620
C	F633, F634, F635, F636

4.6 Vent the RHR System pipings <u>locally</u> as follows:

System	Valves
A	F655, F656
B	F645, F646
C	F648, F649

| | 4.7 Locally vent the RHR Heat Exchanger shell.

5.0 EMERGENCY CORE COOLING AND DRYWELL SPRAY

5.1 Automatic Initiation

* * * NOTE * * *

The Emergency Mode of the RHR System will initiate automatically on either a high drywell pressure of [later] or a low vessel water level of [later]. Automatic startup can also be initiated by actuation of the respective RHR MANUAL INITIATION pushbuttons for each division. In addition, drywell spray can be initiated by the operator after a system permissive of drywell pressure exceeding [setpoint].

* * * * * * * * * * *

5.1.1 Upon receipt of an initiation signal, verify that the RHR System automatically achieves the following configuration:

–RHR Pumps C001A, B, & C start,

–The emergency diesel generators start ,

–The Line Fill Pumps C002A, B, & C stop,

–The following valves close, if open:

Test return valves F021A, B, &C

Wetwell Spray Valves F066B, C

Drywell Spray Valves F059B, F060B
F059C, F060C

[These valves close when injection valves F047B, C opens.]

Heat Exchanger Tube Side Bypass Valves
F007A, B, & C

Fuel Pool Isolation Valves F037B, F037C

Discharge To Liquid
Waste Isolation Valves F032A, B, C
F033A, B, C

5.1 Automatic Initiation(continued)

–The following valves open, if closed:

Injection valves F047A, B, & C if reactor pressure is ≤ [36.5 kg/cm^{2}g],

Heat Exchanger Outlet valves F006A, B, & C,

Testable Check Valve Disks F048A, B, & C open when flow starts to inject into the reactor.

–Verify that the Minimum Flow valves F022A, B, & C are closed when their respective loop flows are greater than [later].

–Verify that normal Heat Exchanger RCW water flow is established.

5.2 Manual Startup for Reactor Injection

5.2.1 Verify that the RHR is lined up in Standby Readiness per 4.0.

5.2.2 To start the respective RHR loops, initiate its division logic by arming and depressing its MANUAL INITIATION switch.

5.2.3 Verify that the RHR loop initiates as in 5.1.

CAUTION
Execute the following step only as directed by Emergency Operating Procedure EOP-[later], Primary Containment Control.

5.3 Drywell Spray

5.3.1 Verify that drywell pressure is greater than 0.14 kg/cm2.

5.3.2 Close injection valve F047B(C) and initiate RHR B(C) per Section 5.2.

5.3.3 Open Drywell Spray isolation valve F060B(C).

5.3.4 Throttle open F059B(C) to initiate drywell sprays.

5.3.5 Terminate Drywell Spray as directed by EOPs when drywell pressure decreases below [later kg/cm2].

5.4 Shutdown to Standby Readiness

*** *NOTE* ***

This procedure may be conducted anytime after the conditions causing the initiation have cleared or it has been verified that an emergency no longer exists.

****

5.4.1 If the RHR System was started with the Manual Initiation switch, return the collar to the DISARM position and depress the System RESET pushbutton to clear the initiation logic for a division.

5.4.2 Terminate Drywell Spray, if directed by Emergency Operating Procedure EOP-[later] Containment Control, by closing the drywell spray valves F059B(C) and F060B(C).

5.4.3 Close Injection valves F047A, B, & C.

5.4.4 Verify that the respective Minimum Flow to Suppression Pool valves F022A, B, & C open when their respective loop flows drop to less than [later].

5.4.5 Before stopping an RHR pump, start the Line Fill Pump for the respective loop and verify it is running.

5.4.6 Stop RHR Pump A, B, & C.

5.4 Shutdown to Standby Readiness(continued)

5.4.7 Verify Testable Check valve disks F048A, B, & C are closed.

5.4.8 Stop the emergency diesel generators, if running and no longer required.

5.4.19 Close Heat Exchanger RCW Water Discharge valves P21-F013A,B, & C.

5.5 Injection Valve and RHR Pump Override

5.5.1 Injection Valve F047 Manual Override

CAUTION

Stopping injection flow with an automatic initiation signal present should only be performed if it can be proven that a LOCA condition does not exist or that adequate core cooling can be maintained by other injection systems, or if directed by the Emergency Operating Procedures.

5.5.1.1 To Override the injection valve auto open signal, momentarily place the injection valve F047 control switch in the CLOSE position and then release it to spring return to AUTO.

CAUTION

Closing the injection valve while an initiation signal is present prevents any further automatic opening of the valve until the initiation signal clears and is reset. Manual operation of the valve will be required if flow is required to maintain reactor water level.

5.5.1.2 Verify that the indicator RHR INJECTION VALVE F047A (B,C) MANUAL OVERRIDE is received.

5.5.1.3 Verify that the Minimum Flow to Suppression Pool valve F022A (B, C) opens when system flow decreases below [later] with the RHR pump running.

5.5.1.4 If necessary to inject into the reactor vessel, manually reopen the injection valve.

5.5.2 RHR Pump C002 Override

CAUTION

Stopping injection flow with an automatic initiation signal present should only be performed if it can be proven that a LOCA condition does not exist or that adequate core cooling can be maintained by other injection systems, or if directed by the Emergency Operating Procedures.

5.5.2.1 Close injection valve F047A (B,C) per 5.5.1.

5.5.2.2 Stop the RHR Pump C001A (B,C) and place its control switch to PULL LOCK position.

CAUTION

Stopping the RHR Pump while an initiation signal is present prevents any further automatic starting of the pump in the emergency injection mode, until the initiation signal clears and is reset.

5.5.2.3 Verify that the annunciator RHR PUMP A(B,C) MANUAL OVERRIDE is received.

5.5.2.4 If necessary to inject into the vessel, restart RHR Pump and open injection F047A(B,C) valve.

6.0 SUPPRESSION POOL COOLING AND WETWELL SPRAY

6.1 System Startup of the Suppression Pool Cooling Mode

6.1.1 Verify that the system is lined up for Standby Readiness per 4.0.

6.1.2 Start RHR Pump A(B,C).

6.1.3 Verify that the respective Minimum Flow to Suppression Pool Valves F022A, B, & C open (8 seconds after pump start) whenever their respective loop flows are less than [later].

6.1.4 Open Wetwell Return valve F021A (B,C). Throttle F021A(B,C) as required to control suppression pool temperature.

6.1.5 Verify Minimum Flow valve F022A(B,C) closes.

> CAUTION
>
> Execute the following step only as directed by Emergency Operating Procedure SEOP–[later], Primary Containment Control.

6.1.6 Open Wetwell Spray valve F066B(C) to initiate wetwell spray.

6.1.7 Terminate wetwell spray as directed by EOPs when wetwell air space pressure decreases below [later] kg/cm^2.

6.2 Shutdown to Standby Readiness

When suppression pool cooling is no longer required, shutdown the Suppression Pool Cooling Mode to Standby Readiness as follows:

6.2.1 Close the Wetwell Return valve F021A(B, C).

6.2.2 Close the Wetwell Spray Sparger valves F066B(C).

6.2.3 Verify that the respective Minimum Flow to Suppression Pool Valves F022A, B, & C open [8 second delay] when their respective loop flows are less than [later].

6.2.4 Before shutting down an RHR pump, start the respective Line Fill pump and verify it is running.

6.2.5 Stop RHR Pump A (B, C).

7.0 SHUTDOWN COOLING AND FUEL POOL COOLING

7.1 System Startup of the Shutdown Cooling Mode

7.1.1 Prerequisites for Startup

7.1.1.1 The system is lined up for Standby Readiness per 4.0.

7.1.1.2 RHR System is flushed and conductivity is less than [later]. Refer to Subsection 9.1 for flushing procedures.

7.1.1.3 Begin the shutdown cooling operation only after the reactor pressure has been reduced to below [9.5 kg/cm] and reactor water level is above Level 3.

*** NOTE ***

Refer to [later] Procedure if reactor is shutdown by boron injection.

****

7.1.2 Valve Alignment after System Flushing

7.1.2.1 Verify that the following valves are aligned as follows after flushing of the selected RHR loop to be used for shutdown cooling per Section 9.1:

Valve	Description	Position
F028A(B,C)	Line Fill Pump Isolation	Closed
F001A(B,C)	Suppression Pool Suction	L.C.
F007A(B,C)	Heat Exchanger Bypass	Closed
F006A(B,C)	Heat Exchanger outlet	Closed
F022A(B,C)	Minimum Flow	Open
F047A(B,C)	RHR Injection	Closed
F002A(B,C)	Shutdown Cooling Isolation	Closed
F021A(B,C)	Return to Suppression Pool	Closed

7.1.2.1 Verify that the following valves are aligned as follows after flushing of the selected RHR loop to be used for shutdown cooling per Section 9.1:(continued):

F059B(C)	Drywell Spray Sparger	Closed
F060B(C)	Drywell Spray Sparger	Closed
F066B(C)	Wetwell Spray Sparger	Closed
F070B(C)	Fuel Pool Return Suction Isolation	Closed

7.1.3 Warming of Discharge Piping

[NOTE: Loop A discharge piping is warmed with CUW return to feedwater line A. Loops B & C are warmed with reactor water.]

These steps may be performed when RPV pressure is below [30 kg/cm2] and prior to the RHR shutdown cooling interlocks clear.

7.1.3.1 Open RCW valves P21-F013B(C,A) to establish cooling water flow through the RHR heat exchanger.

7.1.3.2 Open Warmup valve F049B(C,A).

7.1.3.3 Open Injection valve F047B(C,A).

7.1.3.4 Open Heat Exchanger Bypass valve F007B(C,A).

7.1.3.5 Open Discharge to Radwaste Isolation valve F032B(C,A).

7.1.3.6 Slowly throttle open Discharge to Radwaste valve F033B(C,A) to initiate warming and control the warming rate to less than [55 °C/nour]. Throttle valve P21-F013A(B,C) as necessary for warmup. Use F020B(C,A) to control flow if discharging to the suppression pool.

7.1.3.7 Closely monitor the heat exchanger inlet temperature [later]. When heat exchanger inlet temperature is within [55°C] of reactor temperature[later], close F033B(C,A) or F020B(C,A) as appropriate.

7.1.3.8 Close Warmup valve F049B(C,A) and Injection Valve F047B(C,A).

7.1.4 Warming of Pump Suction Side for RHR Loops B(C,A)

Perform warming of the suction side of the system after the shutdown cooling interlocks clear.

7.1.4.1 Close Heat Exchanger Bypass valve F007B(C,A)

7.1.4.2 Verify that RCW cooling water flow to the heat exchangers has been established.

7.1.4.3 Open Shutdown Cooling Suction Isolation valve F002B (C,A).

7.1.4.4 Open shutdown Cooling Suction valves F012B (C,A) and F013B(C,A).

7.1.4.5 Open Discharge to Liquid Waste valve F032B (C,A).

7.1.4.6 Slowly throttle open Discharge to Radwaste valve F033B(C,A) to initiate warming and control the warming rate to less than [55 °C/hour]. Throttle valve P21-F013A(B,C) as necessary for warmup. Use F020B(C,A) to control flow if discharging to the suppression pool.

7.1.4.7 Closely monitor the heat exchanger inlet temperature [later]. When heat exchanger inlet temperature is within [55°C] of reactor temperature[later], close F033B(C,A) or F020B(C,A) as appropriate.

7.1.4.8 Lock close Discharge to Liquid Waste valve F032B(C,A).

7.1.5 Startup of RHR Shutdown Cooling

Place RHR Loops B and C, and then as required, Loop A into shutdown cooling operation as follows:

7.1.5.1 Throttle Heat Exchanger Bypass valve F007B(C,A) to 20% open.

| | 7.1.5.2 Start RHR Pump B (C,A).

| | 7.1.5.3 Open Injection valve F047B(C,A).

7.1.5.4 Throttle open Heat Exchanger Bypass Valve F007B(C,A). |

7.1.5.5 Throttle open Heat exchanger outlet valve F006B (C,A). Maintain the required cooldown rate by adjusting the positions of Heat Exchanger outlet valve F006B(C,A) and/or Heat Exchanger Bypass valve F007B(C,A).

7.1.5.6 Monitor reactor coolant temperature on Display Format [later].

7.2 Fuel Pool Cooling

7.2.1 Normal Refueling Operation

7.2.1.1 Verify that the Fuel Pool Cooling System is in operation per SOP-G41.

7.2.1.2 Place RHR System B(C) in the Shutdown Cooling Mode per 7.1. Throttle open Heat Exchanger outlet valve F006B(C) and close Heat Exchanger bypass valve F007B(C).

7.2.1.3 Open Fuel Pool return Isolation valves F037B(C) and F038B(C).

7.2.1.4 Close Injection valve F047B(C) to begin returning water to the fuel pools.

7.2.1.5 When the cooling of the fuel pool is no longer required, reopen Injection valve F047B(C) and close Fuel Pool Isolation valves F037B(C) and F038B(C) to return to Shutdown Cooling Mode.

7.2.2 Fuel Pool Cooling for Complete Core Removal

7.2.2.1 Verify that the Fuel Pool Cooling System is in operation per SOP-G41.

7.2.2.2 Verify that manual valves G41-F029 is open to provide a suction path for the RHR pumps. Verify manual valves G41-F093 and G41-F017 are open and G41-F022 is closed to provide a return flow path to the spent fuel storage pool.

7.2.2.3 Place RHR System B(C) in the Shutdown Cooling Mode per 7.1.

7.2.2.4 Open Fuel Pool Isolation valves F037B(C) and F038B(C).

7.2.2.5 Close Injection valve F047B(C).

7.2.2.6 Open Fuel Pool Suction valve F070B(C).

7.2.2.7 Close Shutdown Cooling Isolation valves F012B(C) and F013B(C).

7.2.2 Fuel Pool Cooling for Complete Core Removal (continued)

7.2.2.8 When fuel pool cooling is no longer required,

- Open Injection valve F047B(C).
- Open Shutdown Cooling Isolation valves F012B(C) and F013B(C).
- Close manual valve G41-F029.
- Close Fuel Pool Isolation valves F037B(C) and F038B(C).
- Close Fuel Pool Suction valve F070B(C) to return to the Shutdown Cooling Mode.

7.3 Shutdown To Standby Readiness

7.3.1 Close Heat Exchanger Bypass valve F007A(B,C).

7.3.2 Close Injection valve F047A(B,C).

7.3.3 Stop RHR Pump A(B,C).

7.3.4 Close Shutdown Cooling to Pump valve F002A(B,C).

7.3.5 Close Shutdown Cooling Suction valve F012A(B,C).

7.3.6 Close Shutdown Cooling Suction valve F013A(B,C).

7.3.7 Close the Minimum Flow to Suppression Pool valve F022A(B,C).

7.3.8 Close valve P21–F013A(B,C) to secure cooling water flow to the heat exchangers.

7.3.9 Open Flushing Water Supply valve F026A(B,C).

7.3.10 Open F004A(B,C).

7.3.11 Open F043A(B,C), F017A(B,C), F032A(B,C) and throttle open F033A(B,C) to discharging flushing water to Radwaste.

7.3.12 After flushing, close valves F017A(B,C), F043A(B,C), F004A(B,C), and F026A(B,C).

7.3 Shutdown To Standby Readiness (continued)

7.3.13 Lock open the Suppression Pool Suction valve F001A(B,C).

7.3.14 Open the Minimum Flow to Suppression Pool valve F022A(B,C).

7.3.15 Start the Line Fill Pump C002A(B,C).

7.3.16 Verify that the following annunciator RHR A(B,C) PUMP DISCHARGE LOW PRESSURE is clear.

8.0 TEST MODE

8.1 Prerequisite for Test Mode

The System is lined up for Standby Readiness per 4.0.

8.2 Startup of the Test Mode

8.3.1 Open Heat Exchanger cooling water discharge valve P21-F013A(B,C).

8.2.2 To start the respective RHR loop, start RHR Pump A(B,C).

8.2.3 Open Test Return to Suppression Pool valve F021A(B,C).

8.2.4 Verify that Minimum Flow to Suppression Pool valve F022A(B,C) closes when flow is greater than [setpoint].

8.2.5 Monitor Display Format [later] and verify that the rated flow is ≥ 954 m3/hour.

8.3 Shutdown to Standby Readiness Condition

8.3.1 Close Test Return valve F021A(B,C).

8.3.2 Verify that Minimum Flow to Suppression Pool valves F022A(B,C) open when their respective loop flows drop to less than [later].

8.3.3 Verify that the Line Fill Pump is running for the respective loop, then stop RHR Pump A(B,C).

8.3.4 Close Heat Exchanger cooling water discharge valve P21-F013A(B,C).

9.0 OTHER OPERATIONS

9.1 RHR System Flushing

NOTE

When a reactor shutdown has been scheduled or becomes necessary, coordinate operation of the RHR system flush with the Radwaste operation.

9.1.1 Flushing RHR Loop A

[Flushing of Loop A is typical of Loops B and C.]

9.1.1.1 Operate RHR Loop A in the Suppression Pool Cooling Mode per Subsection 6.0 of this procedure for approximately [later, minutes], then open Heat Exchanger Bypass valve F007A for approximately [later, minutes] for crud removal prior to flushing.

9.1.1.2 Stop RHR pump A and Line Fill pump A.

9.1.1.3 Lock closed Suppression Pool Suction valve F001A.

9.1.1.4 Close Test Return valve F021A.

9.1.1.5 If open, close Minimum Flow valve F022A.

9.1.1.6 Locally, close Line Fill pump suction valve F028A.

9.1.1.7 Close Heat Exchanger Bypass valve F007A and open Outlet valve F006A.

9.1.1.8 Locally open Flushing valve F026A to initiate flushing of the heat exchanger outlet piping.

9.1.1.9 Open Discharge to Radwaste valve F032A. Throttle F033A to drain to Radwaste.

9.1.1.10 When the conductivity of water being discharged to Radwaste is less than 1 $\mu S/cm^2$, open the Heat Exchanger Bypass valve F007A and close Outlet valve F006A to begin flushing the heat exchanger and associated piping.

9.1.1 Flushing RHR Loop A (continued)

9.1.1.11 When the conductivity of water being discharged to Radwaste is less than 1 $\mu S/cm^2$, close Heat Exchanger Bypass Valve F007A and Flushing Water Supply valve F026A to terminate flushing of the heat exchanger.

9.1.1.12 Open Shutdown Cooling Isolation valve F002A and open Flushing Water Supply valve F014A to initiate flushing of the pump suction and discharge pipings.

9.1.1.13 When the conductivity of water being discharged to Radwaste is less than 1 $\mu S/cm^2$, close Discharge to Radwaste valves F033A and F032A and Flushing Water Supply valve F014A to terminate flushing.

9.1.1.14 Close Shutdown Cooling Isolation valve F002A.

9.1.1.15 If the system is to be aligned for Shutdown Cooling, proceed to Section 7.0 of this procedure.

9.1.1.16 If the system is to be aligned for Standby Readiness, align valves per Section 4 of this procedure.

9.2 Reactor Cavity Drain to the Suppression Pool Surge Tank or to the Suppression Pool

When required to drain the reactor cavity pool water to the suppression pool after refueling operations, perform the following steps:

9.2.1 Verify that Section 6.3, steps 6.3.1 through 6.3.4 of SOP-G41 have been completed. Verify that the following valves are open to provide a suction path to the reactor cavity well: G41-F026, 028, 001, 002, and 029.

9.2.2 Verify that RHR B(C) is in the Standby Readiness condition per Section 4 of this procedure. Close Suppression Pool Suction Isolation valve F001B(C).

9.2.3 Locally open Fuel Pool Suction Isolation valve F070B(C).

9.2.4 Open Shutdown Cooling suction isolation valve F002B(C).

9.2.5 Start RHR Pump B(C).

If draining to the suppression pool surge tank(SPH), open valve [later] to the surge tank, and open valve F032B(C) and throttle open F033B(C) to discharge flow to the surge tank.

If draining to the suppression pool, close F033B(C) and F032B(C), and throttle open F020B(C) to discharge flow to the suppression pool.

9.2.6 After the reactor cavity is drained, return the RHR System to the Standby Readiness condition, and locally close manual valves G41-F026, 028, 001, 002, and 029.

10. REFERENCES

10.1 Residual Heat Removal System Design Specification, 22A6275, Revision 2, PAE NO. 3.52.

10.2 Residual Heat Removal System P&ID, 795E880, Revision 2, PAE NO. 3.53.

10.3 Residual Heat Removal System Process Diagram, 796E327, Revision 3, PAE NO. 3.54.

10.4 Residual Heat Removal System IBD, 137C8326, Revision 1, PAE NO. 3.55.

10.5 Emergency Operation Procedure [PPE 1.B.21, 23A6146, draft].

10.6 Reactor Building Cooling Water System P&ID, Toshiba Drawing No. NT-5000071, Revision 2, PAE NO. 1.131.

10.7 Reactor Building Cooling Water System IBD, Toshiba Drawing No. 3W1U0236, Revision 2, PAE NO. 3.133.

ENCLOSURE 1. RHR SYSTEM ELECTRICAL LINEUP, DIVISION A

COMPONENT	DESCRIPTION	BREAKER NO. or CONTROL SW	STATUS/POSITION
C001	RHR Pump A	later	Open
C002A	Line Fill Pump A	later	Open
F001A	Suppression Pool Suction	later	Closed
F002A	Shutdown Suction Isolation	later	Closed
F006A	Heat Exchanger Outlet	later	Closed
F007A	Heat Exchanger Bypass	later	Closed
F012A	Shutdown Cooling Isolation	later	Closed
F013A	Shutdown Cooling Isolation	later	Closed
F021A	Test Return to Suppression Pool	later	Closed
F022A	Minimum Flow to Supp. Pool	later	Closed
F032A	Discharge to Liquid Waste Isolation	later	Closed
F033A	Discharge to Liquid Waste Isolation	later	Closed
F034A	Hx Exchanger Service Water Disch.	later	Closed
F047A	Injection	later	Closed
F049A	Injection Check Bypass	later	Closed

ENCLOSURE 2. RHR SYSTEM ELECTRICAL LINEUP, DIVISIONS B & C

COMPONENT	DESCRIPATION	BREAKER NO. or CONTROL SW	STATUS/POSITION
C001B,C	RHR Pump	later	Open
C002B,C	Line Fill Pump	later	Open
F001B,C	Suppression Pool Suction	later	Closed
F002B,C	Shutdown Suction Isolation	later	Closed
F006B,C	Heat Exchanger Inlet	later	Closed
F007B,C	Heat Exchanger Bypass	later	Closed
F012B,C	Shutdown Cooling Isolation	later	Closed
F013B,C	Shutdown Cooling Isolation	later	Closed
F021B,C	Test Return to Suppression Pool	later	Closed
F022B,C	Minimum Flow to Supp. Pool	later	Closed
F032B,C	Discharge to Liquid Waste Isolation	later	Closed
F033B,C	Discharge to Liquid Waste Isolation	later	Closed
F034B,C	Hx Exchanger Service Water Disch.	later	Closed
F037B,C	Fuel Pool Isolation	later	Closed
F038B,C	Fuel Pool Isolation	later	Closed
F047B,C	Injection	later	Closed
F049B,C	Injection Check Bypass	later	Closed
F059B,C	Drywell Spray	later	Closed
F060B,C	Drywell Spray	later	Closed
F065B,C	Wetwell Spray	later	Closed
F066B,C	Wetwell Spray	later	Closed
F070B,C	Fuel Pool Suction Isolation	later	Closed

ENCLOSURE 3. RHR SYSTEM DIVISION A VALVE LINEUP

	VALVE	DESCRIPTION	SWITCH NUMBER	SWITCH POSITION	VALVE POSITION
| |	F001A	Suppression Pool Suction	later	LOCKED CLOSE	CLOSED
| |	F002A	Shutdown Suction Isolation	later	CLOSE/NORMAL	CLOSED
| |	F006A	Heat Exchanger Outlet	later	AUTO	CLOSED
	F007A	Heat Exchanger Bypass	later	AUTO	CLOSED
	F012A	Shutdown Cooling Isolation	later	AUTO	CLOSED
| |	F013A	Shutdown Cooling Isolation	later	AUTO	CLOSED
	F020A	Warmup to Suppression Pool	later	CLOSE/NORMAL	CLOSED
	F021A	Test Return to Suppression Pool	later	AUTO	CLOSED
	F022A	Minimum Flow to Supp. Pool	later	AUTO	CLOSED
| |	F032A	Discharge to Liquid Waste Isolation	later	CLOSE/NORMAL	CLOSED
| |	F033A	Discharge to Liquid Waste Isolation	later	CLOSE/NORMAL	CLOSED
	F034A	Hx Exchanger RCW Water Disch.	later	AUTO	CLOSED
	F047A	Injection	later	AUTO	CLOSED
| |	F048A	Testable Check	later	N/A	CLOSED
	F049A	Injection Check Bypass	later	AUTO	CLOSED
	F083A	Manual Shutdown Cooling Isolation	N/A	N/A	OPEN

ENCLOSURE 4. RHR SYSTEM DIVISION B & C VALVE LINEUP

VALVE	DESCRIPTION	SWITCH NO.	SWITCH POSITION	VALVE POSITION
F001B,C	Suppression Pool Suction	later	LOCKED CLOSE	CLOSED
F002B,C	Shutdown Suction Isolation	later	CLOSE/NORMAL	CLOSED
F006B,C	Heat Exchanger Outlet	later	AUTO	CLOSED
F007B,C	Heat Exchanger Bypass	later	AUTO	CLOSED
F012B,C	Shutdown Cooling Isolation	later	AUTO	CLOSED
F013B,C	Shutdown Cooling Isolation	later	AUTO	CLOSED
F016B,C	Manual Injection Shutoff	N/A	N/A	OPEN
F020B,C	Warmup to Suppression Pool	later	CLOSE/NORMAL	CLOSED
F021B,C	Test Return to Suppression Pool	later	AUTO	CLOSED
F022B,C	Minimum Flow to Supp. Pool	later	AUTO	CLOSED
F032B,C	Discharge to Liquid Waste Isolation	later	CLOSE/NORMAL	CLOSED
F033B,C	Discharge to Liquid Waste Isolation	later	CLOSE/NORMAL	CLOSED
F034B,C	Heat Exchanger RCW Discharge	later	AUTO	CLOSED
F037B,C	Fuel Pool Isolation	later	CLOSE/NORMAL	CLOSED
F038B,C	Fuel Pool Isolation	later	CLOSE/NORMAL	CLOSED
F047B,C	Injection	later	AUTO	CLOSED
F048B,C	Testable Check	later	N/A	CLOSED
F049B,C	Injection Check Bypass	later	CLOSE/NORMAL	CLOSED
F059B,C	Drywell Spray	later	NORMAL	CLOSED
F060B,C	Drywell Spray	later	NORMAL	CLOSED
F066B,C	Wetwell Spray	later	AUTO	CLOSED
F070B,C	Fuel Pool Suction Isolation(Manual)	N/A	N/A	CLOSED
F064	Manual Shutdown Cooling Shutoff	N/A	N/A	OPEN
F065C	Manual Shutdown Cooling Shutoff	N/A	N/A	OPEN

ENCLOSURE 5. RHR SYSTEM INSTRUMENTATION & CONTROL LINEUP

COMPONENT NO.	DESCRIPTION	REQUIRED POSITION
later	RHR DIVISION A OUT OF SERVICE Control Switch	OFF
later	RHR DIVISION B OUT OF SERVICE Control Switch	OFF
later	RHR DIVISION C OUT OF SERVICE Control Switch	OFF
later	RHR DIVISION A MANUAL INITIATION Switch	DISARM
later	RHR DIVISION A MANUAL INITIATION Switch	DISARM
later	RHR DIVISION A MANUAL INITIATION Switch	DISARM
later	RHR DIVISION A INITIATION SIGNAL RESET Switch	RESET
later	RHR DIVISION B INITIATION SIGNAL RESET Switch	RESET
later	RHR DIVISION C INITIATION SIGNAL RESET Switch	RESET
later	RHR Pump A Mode Switch	NORMAL
later	RHR Pump B Mode Switch	NORMAL
later	RHR Pump C Mode Switch	NORMAL