CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9902260043 DOC.DATE: 99/02/12 NOTARIZED: NO DOCKET #
FACIL:50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
AUTH.NAME AUTHOR AFFILIATION
STALL,J.A. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
Records Management Branch (Document Control Desk)

SUBJECT: Forwards 1999 plant reference simulator certification rept for St Lucie,Units 1 & 2,per 10CFR55.45(b)(5)(ii) & 10CFR55.45(b)(5)(vi).Rept contains description & schedules for correcting test failures & testing completed.

DISTRIBUTION CODE: A005D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 31
TITLE: Simulator Facility Certification - GL-90-08

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	GLEAVES,W	1	1			
INTERNAL:	FILE CENTER 01	1	1			
EXTERNAL:	NRC PDR	1	1			

CATEGORY 1

DOCUMENT

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTTR 3 ENCL 3

Florida Power & Light Company, 6351 S. Ocean Drive, Jensen Beach, FL 34957

February 12, 1999

L-99-32
10 CFR 55.45
10 CFR 50.4

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

RE: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
1999 Plant-Referenced Simulator Certification Report

Pursuant to 10 CFR 55.45(b)(5)(ii) and 10 CFR 55.45 (b)(5)(vi), attached is the 1999 *Plant-Referenced Simulator Certification Report* for St. Lucie Units 1 and 2. This report is required every four years. The original certification was submitted on February 21, 1991, by FPL letter L-91-48. FPL letter L-95-04 submitted the *1995 Plant Referenced Simulator Certification Report* on February 15, 1995. The report is required to contain a description and schedule for correcting test failures, a description of the testing completed, and a description and schedule of testing, if different, to be performed during the next four year interval.

The required information is included in the enclosed report. Section 1 is a list of certification tests performed by year during the past four years. Section 2 is a list of open deficiencies identified during the interval tests and includes the scheduled completion dates. Section 3 identifies the single plant change/modification that has not yet been incorporated into the simulator. Section 4 is a list of additions, deletions, and revisions to the certification test program. Section 5 is the test schedule for the next interval. Section 6 includes abstracts of new test procedures to be included in the next interval.

Please contact us if there are any questions about this submittal.

Very truly yours,

J. A. Stall
Vice President
St. Lucie Plant

JAS/GRM

240041

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

ST. LUCIE UNITS 1 AND 2

1999 PLANT REFERENCED SIMULATOR

CERTIFICATION REPORT

SECTION 1

CERTIFICATION TEST LIST

FOR PERIOD 1995-1998

Cert. Test #	Certification Tests Performed in 1995 Certification Test Title
TRN-001	Reactor Trip
TRN-002	Loss Of All Feedwater
TRN-003	Main Steam Valve Closure
TRN-004	Loss Of All Rcps
TRN-005	Loss Of One RCP
TRN-006	Turbine Trip From <15% Power
TRN-007	Maximum Rate Power Ramp
TRN-008	Large Break LOCA With LOOP
TRN-009	Mslb Inside Containment
TRN-010	Failed Open PZR Safety Valve With No HPSI
MAL-002	Rapid Gross Failure Of Multiple Steam Generator Tubes
MAL-005	Small Break Loca
MAL-006	Failed Open PORV With Loss Of Off-Site Power
MAL-008	Loss Of Instrument Air Compressors
MAL-010	Loss Of Off-Site Power With Both Diesel Generators Failing
MAL-017	Loss Of Condenser Level Control
MAL-025	Loss Of Both Main Feedwater Pumps
MAL-046	Wide Range Nuclear Instrumentation Failed High
MAL-050	T-Cold Failed High (Input To RPS)
MAL-054	Rcs Flow (Steam Generator Differential Pressure) Instrument Failure
MAL-068	Anticipated Transient Without Scram (Atws)
NPE-001	Reactor Plant Heatup – Cold To Hot Standby
NPE-002	Nuclear Startup From Hot Standby
NPE-003	Turbine Startup And Generator Synchronization
NPE-005	Plant Shutdown – From Rated Power To Cold Shutdown
SST-001	Steady State Test At 100% Power
SST-002	Steady State Test At 30, 50, And 70% Power

Cert. Test #	Certification Tests Performed in 1996 Certification Test Title
TRN-001	Reactor Trip
TRN-002	Loss Of All Feedwater
TRN-003	Main Steam Valve Closure
TRN-004	Loss Of All Rcps
TRN-005	Loss Of One RCP
TRN-006	Turbine Trip From <15% Power
TRN-007	Maximum Rate Power Ramp
TRN-008	Large Break LOCA With LOOP
TRN-009	Mslb Inside Containment
TRN-010	Failed Open PZR Safety Valve With No HPSI
MAL-003	LOCA Outside Containment In The Letdown System
MAL-009	Loss Of Off-Site Power
MAL-012	Loss Of MA Instrument Bus
MAL-013	Loss Of Non-Safety Vital AC
MAL-026	Loss Of All Feedwater Pumps
MAL-030	One Dropped Rod Test
MAL-032	Freeze Control Rod Drive System
MAL-035	Trip Generator From 100% Power
MAL-042	Main Steam Line Break Outside Containment
MAL-045	Large Feedwater Line Break Inside Containment
MAL-047	Linear Power Range Failed High
MAL-051	T-Cold (Rrs) Failed High
MAL-055	Feedwater Flow (Input To 3-Element Controller)
MAL-059	Rwt Level Transmitter (Safety Channel) Failure
MAL-062	Alarm Window Incorrectly Actuates
MAL-064	ESFAS Failure With Small Break LOCA
MAL-066	MSIS Fails To Actuate
MAL-067	AFAS Fails To Actuate
MAL-068	Anticipated Transient Without Scram (Atws)
SST-001	Steady State Test At 100% Power
SST-002	Steady State Test At 30, 50, And 70% Power

Cert. Test #	Certification Tests Performed in 1996 Certification Test Title
SUR-002	Isothermal Temperature Coefficient Determination
SUR-004	Aro Critical Boron Concentration Determination
SUR-005	Plant Heat Balance
SUR-008	Surveillance Requirements For Shutdown Margin, Modes 2, 3, 4, And 5 (Subcritical)
SUR-018	Boron Flow Test

Cert. Test #	Certification Tests Performed in 1997 Certification Test Title
TRN-001	Reactor Trip
TRN-002	Loss Of All Feedwater
TRN-003	Main Steam Valve Closure
TRN-004	Loss Of All Rcps
TRN-005	Loss Of One RCP
TRN-006	Turbine Trip From <15% Power
TRN-007	Maximum Rate Power Ramp
TRN-008	Large Break LOCA With LOOP
TRN-009	Mslb Inside Containment
TRN-010	Failed Open PZR Safety Valve With No HPSI
MAL-001	Complete Rupture Of One Steam Generator U-Tube
MAL-004	Large Break LOCA With LOOP
MAL-007	Loss Of Instrument Air: Air Header Rupture
MAL-011	Loss Of A Safety Related AC Bus
MAL-021	Loss Of Shutdown Cooling From Suction Valve Closure
MAL-022	Loss Of One CCW Header
MAL-024	RCS Leak Into CCW From RCP Seal Cooler
MAL-028	One Stuck Rod
MAL-029	One Uncoupled Rod During Startup
MAL-031	One Slipped Rod Test
MAL-034	Turbine Trip From <15% Power
MAL-038	Pressurizer Pressure And Level Control Failures
MAL-039	Reactor Coolant Volume Control Failures
MAL-040	Reactor Trip Initiated By A Low Steam Generator Level
MAL-041	Double Ended MSLB In Containment
MAL-043	Failed Open Main Steam Safety Valve
MAL-048	Steam Generator Level Instrument Failure
MAL-052	Rcs Hot Leg Temperature Monitor (Control Channel) Failure
MAL-056	Steam Flow (Input To 3-Element Controller) Failure
MAL-058	Containment Radiation Monitor Failure (Esfas)
MAL-060	Annunciator Panel Failures

Cert. Test #	Certification Tests Performed in 1997 Certification Test Title
MAL-065	RAS Fails To Actuate
NPE-004	Reactor Trip And Recovery To Rated Power
SST-001	Steady State Test At 100% Power
SST-002	Steady State Test At 30, 50, And 70% Power
SUR-003	Rod Worth Measurement
SUR-009	Reactor Coolant System Inventory Balance
SUR-010	Wide Range Nuclear Instrumentation Channels Functional Test
SUR-012	Reactor Protection System – Periodic Logic Matrix Test
SUR-013	Cea Periodic Test
SUR-014	Turbine Valve Testing
SUR-015	Hydrogen Recombiner Test

Cert. Test #	Certification Tests Performed in 1998 Certification Test Title
TRN-001	Reactor Trip
TRN-002	Loss Of All Feedwater
TRN-003	Main Steam Valve Closure
TRN-004	Loss Of All Rcps
TRN-005	Loss Of One RCP
TRN-006	Turbine Trip From <15% Power
TRN-007	Maximum Rate Power Ramp
TRN-008	Large Break LOCA With LOOP
TRN-009	Mslb Inside Containment
TRN-010	Failed Open PZR Safety Valve With No HPSI
MAL-014	Loss Of 2B/2BB DC Bus
MAL-015	Loss Of All Rcps; Natural Circulation Cooldown
MAL-016	Slow Condenser Vacuum Leak
MAL-018	Loss Of One ICW Header
MAL-019	Rupture Of One ICW Header
MAL-020	Loss Of Shutdown Cooling
MAL-023	Rupture Of "B" CCW Header
MAL-025	Loss Of Both Main Feedwater Pumps
MAL-027	Failed Power Supply To One RPS Channel
MAL-033	Excessive Reactor Coolant Activity
MAL-036	Inadvertent Dilution At Power
MAL-037	Steam Bypass Control System Valve Fails Open
MAL-044	Small Feedwater Line Break Outside Containment
MAL-049	Containment Pressure Transmitter Failure
MAL-053	Rcs Hot Leg Rtd Failure
MAL-057	Steam Generator Pressure Transmitter Failed Low
MAL-061	Alarm Window Fails To Actuate
MAL-069	Hot Shutdown Control Panel Cooldown
MAL-070	Loss Of One Heater Drain Pump From 100% Power
SST-001	Steady State Test At 100% Power
SST-002	Steady State Test At 30, 50, And 70% Power

Cert. Test #	Certification Tests Performed in 1998 Certification Test Title
SUR-006	Moderator Coefficient Determination At Power
SUR-011	Diesel Generator Monthly Test

Note: The following certification test numbers were deleted as noted in Table 3-2, St. Lucie Certification Test Matrix, of the Initial Certification Report dated February 15, 1991

SUR-001	SUR-007	SUR-016	SUR-017	SUR-019
MAL-063				

SECTION 2

OPEN DISCREPANCY REPORTS ON CERTIFICATION TESTS

During the previous certification interval, a total of 21 deficiency reports have been written during certification tests. Of these 21 deficiency reports, none remain open at the conclusion of the interval.

SECTION 3

PLANT CHANGES/MODIFICATIONS (PC/M)

Of the plant change/modifications (PC/M) reviewed and approved for incorporation in the Simulator, only two remain outstanding.

1. PC/M 95178-2 has replaced the outdated Tracor Westronics recorders on the Unit 2 HVAC panel with a newer model recorder. Replacement recorders are on order for the Simulator HVAC panel. The expected completion date for this PC/M is July 2000.

2. The reactor turbine gage boards (RTGB) and other cabinets in the plant have been repainted a different color. The schedule for painting the Simulator has not been determined.

SECTION 4

ADDITIONS, DELETIONS, AND REVISIONS

TO THE CERTIFICATION TEST PROGRAM

Procedure No.	Procedure Description
MAL-069	Hot Shutdown Control Panel Cooldown – The original initial condition of this certification test has the Simulator in hot standby with control already established at the Hot Shutdown Panel. In order to increase the dynamic scope of this test, the initial condition of the test has been changed to steady state 100% power. This change allows the certification test to include the Simulator's response to all of the applicable initial steps of 2-ONP-100.2, Control Room Inaccessibility. These steps include the tripping of the reactor and turbine, the securing of RCPs and other system components, and finally, the transfer of control to the Hot Shutdown Panel.
MAL-070	Loss of One Heater Drain Pump – The last Simulator Four-Year Report committed to developing and performing a new Malfunction Certification Test. The new test involved the loss of one Heater Drain Pump (HDP) from 100% power. The report stated that the HDP would be lost due to a malfunction with its electrical breaker. Subsequently, it was decided to use a failure of the 4B Feed Water Heater Alternate Drain to trigger the malfunction and the ultimate loss of the 2B HDP. This scenario was chosen in an attempt to replicate the events of IHE-92-067 closer. This failure examines a larger portion of the Simulator's "balance of plant" response. The final condition of the certification test has the Simulator stable at approximately 93% power with the 2B HDP off. To restart the 2B HDP and return the Simulator to 100% power, as stated in the report is not necessary. Certification Test NPE-003, Turbine Startup and Generator Synchronization, examines a similar Simulator response when the second HDP is started during the power increase to 100%.
MAL-071	Plant Transient to Solid Plant Operation – Due to an increased interest in solid plant operations, a certification test for this condition will be developed and performed during the ensuing four year cycle. The initial conditions will be steady state 100% power. A series of plant malfunctions will then be utilized to take the plant solid. The final condition of the test will be solid plant operations with the RCS temperature and pressure stable and within acceptable limits.

SECTION 5

NEXT FOUR YEAR TESTING SCHEDULE

Cert. Test #	Certification Test Schedule for 1999 Certification Test Title
TRN-001	Reactor Trip
TRN-002	Loss Of All Feedwater
TRN-003	Main Steam Valve Closure
TRN-004	Loss Of All Rcps
TRN-005	Loss Of One RCP
TRN-006	Turbine Trip From <15% Power
TRN-007	Maximum Rate Power Ramp
TRN-008	Large Break LOCA With LOOP
TRN-009	Mslb Inside Containment
TRN-010	Failed Open PZR Safety Valve With No HPSI
MAL-002	Rapid Gross Failure Of Multiple Steam Generator Tubes
MAL-005	Small Break Loca
MAL-006	Failed Open PORV With Loss Of Off-Site Power
MAL-008	Loss Of Instrument Air Compressors
MAL-010	Loss Of Off-Site Power With Both Diesel Generators Failing
MAL-017	Loss Of Condenser Level Control
MAL-022	Loss Of One CCW Header
MAL-025	Loss Of Both Main Feedwater Pumps
MAL-035	Trip Generator From 100% Power
MAL-046	Wide Range Nuclear Instrumentation Failed High
MAL-048	Steam Generator Level Instrument Failure
MAL-050	T-Cold Failed High (Input To RPS)
MAL-054	Rcs Flow (Steam Generator Differential Pressure) Instrument Failure
MAL-058	Containment Radiation Monitor Failure (Esfas)
MAL-066	MSIS Fails To Actuate
MAL-068	Anticipated Transient Without Scram (Atws)
MAL-071	Plant Transient To Solid Plant Operation
NPE-005	Plant Shutdown - From Rated Power To Cold Shutdown
SST-001	Steady State Test At 100% Power
SST-002	Steady State Test At 30, 50, And 70% Power

Cert. Test #	Certification Test Schedule for 2000 Certification Test Title
TRN-001	Reactor Trip
TRN-002	Loss Of All Feedwater
TRN-003	Main Steam Valve Closure
TRN-004	Loss Of All Rcps
TRN-005	Loss Of One RCP
TRN-006	Turbine Trip From <15% Power
TRN-007	Maximum Rate Power Ramp
TRN-008	Large Break LOCA With LOOP
TRN-009	Mslb Inside Containment
TRN-010	Failed Open PZR Safety Valve With No HPSI
MAL-003	LOCA Outside Containment In The Letdown System
MAL-009	Loss Of Off-Site Power
MAL-012	Loss Of MA Instrument Bus
MAL-013	Loss Of Non-Safety Vital AC
MAL-026	Loss Of All Feedwater Pumps
MAL-030	One Dropped Rod Test
MAL-032	Freeze Control Rod Drive System
MAL-042	Main Steam Line Break Outside Containment
MAL-045	Large Feedwater Line Break Inside Containment
MAL-047	Linear Power Range Failed High
MAL-051	T-Cold (Rrs) Failed High
MAL-055	Feedwater Flow (Input To 3-Element Controller)
MAL-059	Rwt Level Transmitter (Safety Channel) Failure
MAL-062	Alarm Window Incorrectly Actuates
MAL-064	ESFAS Failure With Small Break LOCA
MAL-067	AFAS Fails To Actuate
NPE-001	Reactor Plant Heatup – Cold To Hot Standby
NPE-002	Nuclear Startup From Hot Standby
NPE-003	Turbine Startup And Generator Synchronization
SST-001	Steady State Test At 100% Power
SST-002	Steady State Test At 30, 50, And 70% Power

Cert. Test #	Certification Test Schedule for 2000 Certification Test Title
SUR-002	Isothermal Temperature Coefficient Determination
SUR-004	Aro Critical Boron Concentration Determination
SUR-005	Plant Heat Balance
SUR-008	Surveillance Requirements For Shutdown Margin, Modes 2, 3, 4, And 5 (Subcritical)
SUR-018	Boron Flow Test

Cert. Test #	Certification Test Schedule for 2001 Certification Test Title
TRN-001	Reactor Trip
TRN-002	Loss Of All Feedwater
TRN-003	Main Steam Valve Closure
TRN-004	Loss Of All Rcps
TRN-005	Loss Of One RCP
TRN-006	Turbine Trip From <15% Power
TRN-007	Maximum Rate Power Ramp
TRN-008	Large Break LOCA With LOOP
TRN-009	Mslb Inside Containment
TRN-010	Failed Open PZR Safety Valve With No HPSI
MAL-001	Complete Rupture Of One Steam Generator U-Tube
MAL-004	Large Break LOCA With LOOP
MAL-007	Loss Of Instrument Air: Air Header Rupture
MAL-011	Loss Of A Safety Related AC Bus
MAL-021	Loss Of Shutdown Cooling From Suction Valve Closure
MAL-024	RCS Leak Into CCW From RCP Seal Cooler
MAL-028	One Stuck Rod
MAL-029	One Uncoupled Rod During Startup
MAL-031	One Slipped Rod Test
MAL-034	Turbine Trip From <15% Power
MAL-038	Pressurizer Pressure And Level Control Failures
MAL-039	Reactor Coolant Volume Control Failures
MAL-040	Reactor Trip Initiated By A Low Steam Generator Level
MAL-041	Double Ended MSLB In Containment
MAL-043	Failed Open Main Steam Safety Valve
MAL-052	Rcs Hot Leg Temperature Monitor (Control Channel) Failure
MAL-056	Steam Flow (Input To 3-Element Controller) Failure
MAL-060	Annunciator Panel Failures
MAL-065	RAS Fails To Actuate
NPE-004	Reactor Trip And Recovery To Rated Power
SST-001	Steady State Test At 100% Power

Cert. Test #	Certification Test Schedule for 2001 Certification Test Title
SST-002	Steady State Test At 30, 50, And 70% Power
SUR-003	Rod Worth Measurement
SUR-009	Reactor Coolant System Inventory Balance
SUR-010	Wide Range Nuclear Instrumentation Channels Functional Test
SUR-012	Reactor Protection System – Periodic Logic Matrix Test
SUR-013	Cea Periodic Test
SUR-014	Turbine Valve Testing
SUR-015	Hydrogen Recombiner Test

Cert. Test #	Certification Test Schedule for 2002 Certification Test Title
TRN-001	Reactor Trip
TRN-002	Loss Of All Feedwater
TRN-003	Main Steam Valve Closure
TRN-004	Loss Of All Rcps
TRN-005	Loss Of One RCP
TRN-006	Turbine Trip From <15% Power
TRN-007	Maximum Rate Power Ramp
TRN-008	Large Break LOCA With LOOP
TRN-009	Mslb Inside Containment
TRN-010	Failed Open PZR Safety Valve With No HPSI
MAL-014	Loss Of 2B/2BB DC Bus
MAL-015	Loss Of All Rcps; Natural Circulation Cooldown
MAL-016	Slow Condenser Vacuum Leak
MAL-018	Loss Of One ICW Header
MAL-019	Rupture Of One ICW Header
MAL-020	Loss Of Shutdown Cooling
MAL-023	Rupture Of "B" CCW Header
MAL-027	Failed Power Supply To One RPS Channel
MAL-033	Excessive Reactor Coolant Activity
MAL-036	Inadvertent Dilution At Power
MAL-037	Steam Bypass Control System Valve Fails Open
MAL-044	Small Feedwater Line Break Outside Containment
MAL-049	Containment Pressure Transmitter Failure
MAL-053	Rcs Hot Leg Rtd Failure
MAL-057	Steam Generator Pressure Transmitter Failed Low
MAL-061	Alarm Window Fails To Actuate
MAL-069	Hot Shutdown Control Panel Cooldown
MAL-070	Loss Of One Heater Drain Pump From 100% Power
SST-001	Steady State Test At 100% Power
SST-002	Steady State Test At 30, 50, And 70% Power
SUR-006	Moderator Coefficient Determination At Power

Cert. Test #	Certification Test Schedule for 2002 Certification Test Title
SUR-011	Diesel Generator Monthly Test

Note: The following certification test numbers were deleted as noted in Table 3-2, St. Lucie Certification Test Matrix, of the Initial Certification Report dated February 15, 1991

SUR-001	SUR-007	SUR-016	SUR-017	SUR-019
MAL-063				

SECTION 6

ABSTRACTS OF NEW TEST PROCEDURES

MAL-070
LOSS OF ONE HEATER DRAIN PUMP

5.0 DESCRIPTION:

5.1 Approach

This scenario is modeled after a Unit 2 event, IHE-92-067, where the 2B Heater Drain Pump tripped while at 100% power. During the event, the 4B Feed Water Heater Alternate Drain, LCV-11-18B, failed to re-close when the water level in the 4B Feed Water Heater returned to normal. The water drained from the 4B Feed Water Heater to the low-level setpoint, tripping the 2B HDP. This certification test will be initiated by failing high the controller for LCV-11-18B. The controller will signal LCV-11-18B to open fully. The level in the 4B Feed Water Heater will drain down to the low-level setpoint and thereby, trip the 2B HDP. A downpower will then be performed in order to stabilize the Simulator at approximately 93% power.

5.2 Initial Conditions/Final Conditions

Initial Conditions:

100% Power, Steady State, Middle Of Life.

Final Conditions:

Stable at approximately 93% power with the 2B HDP off.

5.3 Options

The simulator is capable of a loss of a HDP from several different causes. For the purpose of this test, the HDP will trip due to a low level in the 4B Feed Water Heater. This scenario was chosen in an attempt to replicate the events of IHE-92-067.

5.4 Limitations and Assumptions

This test involves only a loss of the 2B HDP, and does not include any other possible malfunctions. Due to different idiosyncrasies of individual operators, there will be differences in how the downpower is performed and the how the Simulator is stabilized. Therefore, the various graphs recorded during subsequent certification tests may not agree exactly.

5.0 DESCRIPTION: (continued)

5.5 General Certification Test Instructions

The Certification Test (CT) provides the specific instructions for operator actions which would be performed in the plant procedures. For each step required to be performed, a space is included in this procedure for the initials of the individual who is performing the test.

6.0 OBJECTIVES:

The objectives of this test are as follows:

6.1 Verify the proper response of the simulator to a loss of one HDP pump. (ANSI 3.5, Section 3.1.2.(18))

6.2 Ensure that the operator was required to take the same action on the simulator to mitigate the consequences of a loss of one HDP pump as would have been required on the reference plant using the plant procedures. (ANSI 3.5, Section 3)

6.3 Verify that the operators/instructors did not observe a difference between the response of the simulator control room instrumentation and the reference plant. (ANSI 3.5, Section 3.1)

6.4 Ensure that the transient showed plant operations of the reference plant, which occurred continuously and in real time. (ANSI 3.5, Section 3.1.1 and 3.1.2)

6.5 Verify that the critical parameters and the other parameters, which were important to the successful completion of this evolution, were displayed on the appropriate instrumentation and provided proper alarm or protective system action, or both. (ANSI 3.5, Section 3.1.1)

6.6 Verify that the loss of one HDP pump interaction with the other simulated systems provides total system integrated response. (ANSI 3.5, Section 3.3.1)

6.7 Verify that the simulator does not fail to cause an alarm or automatic action that would occur in the reference plant and conversely, does not cause an alarm or automatic action that would not occur in the reference plant for this evolution. (ANSI 3.5, Section 4.2.1(c))

6.0 OBJECTIVES: (continued)

6.8 Verify that the operator was able to control the transient to a steady state condition if the simulator operating limits were not exceeded. (ANSI 3.5, Section 3)

MAL-071
Plant Transient to Solid Plant Operation

5.0 DESCRIPTION:

5.1 Approach

This scenario uses a series of malfunctions to place the RCS into a solid condition. The first malfunction is a leak in the auxiliary spray system into the Pressurizer (PZR). This causes the PZR pressure to drop below the Thermal Margin Low-Pressure Trip (TMLP) setpoint resulting in an automatic reactor trip. Following the reactor trip, a second malfunction causes a rupture in the main steam line which blows down one of the Steam Generators. The RCS cooldown and resulting RCS shrink causes the RCS pressure to drop rapidly. The pressure drop is sufficient to initiate SIAS and allow HPSI injection. Once the Steam Generator has blown down, the RCS cooldown is halted and a RCS heat up starts. A third malfunction temporarily disables both of the Atmospheric Dump Valves on the unaffected Steam Generator. This limits the ability of the secondary system to depressurize and effectively remove decay heat from the RCS. The RCS heat up causes a rapid swell in the RCS liquid. The RCS pressure increases above the PORV setpoint causing them to lift, venting the steam bubble in the PZR to the containment. Once the steam bubble is completely vented, the RCS becomes a solid system. Once the RCS is solid, one of the ADVs becomes operable again, allowing the removal of decay heat from the RCS.

The test is complete when the RCS pressure and temperature is stabilized within acceptable limits. This will be performed by controlling the charging flow and adjusting steam flow through the available ADV.

5.2 Initial Conditions/Final Conditions

Initial Conditions:

100% Power, Steady State, Middle Of Life.

Final Conditions:

RCS in solid condition with the RCS pressure and temperature stabilized and within acceptable limits.

5.0 DESCRIPTION: (continued)

5.3 Options

The simulator is capable of being placed in solid plant operations from several different causes. For the purpose of this test, RCS is to be placed in solid plant operations by a rapid cooldown followed by a rapid heat up.

5.4 Limitations and Assumptions

This test involves only the placing the plant in solid conditions, and does not include any other possible malfunctions.

5.5 General Certification Test Instructions

The Certification Test (CT) provides the specific instructions for operator actions, which would be performed in the plant procedures. For each step required to be performed, a space is included in this procedure for the initials of the individual who is performing the test.

6.0 OBJECTIVES:

The objectives of this test are as follows:

6.1 Verify the proper response of the simulator to solid RCS Plant operations. (ANSI 3.5, Section 3.1.2.(18))

6.2 Ensure that the operator was required to take the same action on the simulator to mitigate the consequences of solid RCS Plant operations as would have been required on the reference plant using the plant procedures. (ANSI 3.5, Section 3)

6.3 Verify that the operators/instructors did not observe a difference between the response of the simulator control room instrumentation and the reference plant. (ANSI 3.5, Section 3.1)

6.4 Ensure that the transient showed plant operations of the reference plant which occurred continuously and in real time. (ANSI 3.5, Section 3.1.1 and 3.1.2)

6.0 OBJECTIVES: (continued)

6.5 Verify that the critical parameters and the other parameters, which were important to the successful completion of this evolution, were displayed on the appropriate instrumentation and provided proper alarm or protective system action, or both. (ANSI 3.5, Section 3.1.1)

6.6 Verify that the solid RCS Plant operations interaction with the other simulated systems provides total system integrated response. (ANSI 3.5, Section 3.3.1)

6.7 Verify that the simulator does not fail to cause an alarm or automatic action that would occur in the reference plant and conversely, does not cause an alarm or automatic action that would not occur in the reference plant for this evolution. (ANSI 3.5, Section 4.2.1(c))

6.8 Verify that the operator was able to control the transient to a steady state condition if the simulator operating limits were not exceeded. (ANSI 3.5, Section 3)