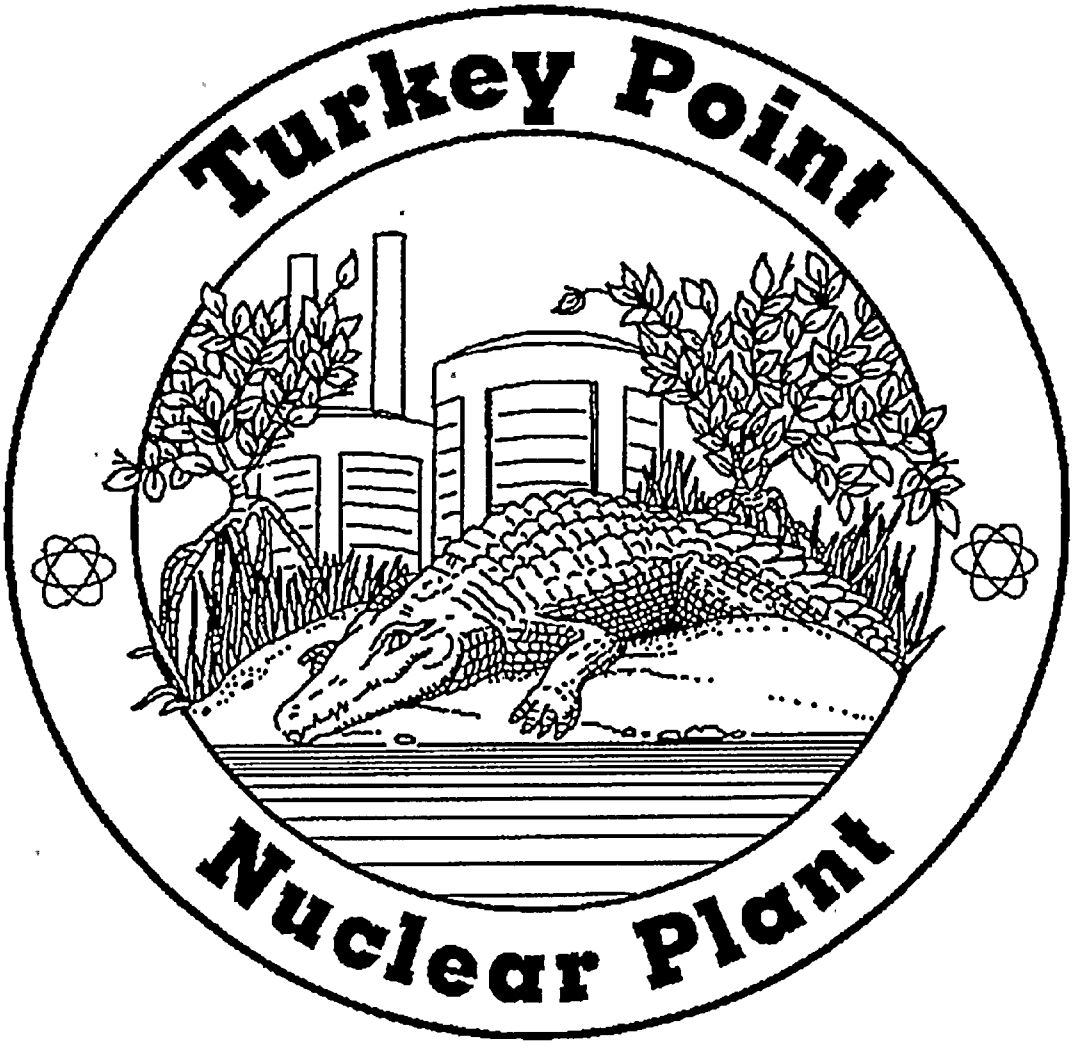

SIMULATOR
CERTIFICATION UPDATE # 2

Plant-Referenced Simulator Certification Report

Turkey Point Units 3 and 4

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT UNIT 3
SIMULATOR CERTIFICATION UPDATE NUMBER 2

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1.0 INTRODUCTION

In accordance with the requirements of 10 CFR 55.45 (b)(5)(ii) and (b)(5)(vi), this report is submitted for the Turkey Point Unit 3 Simulator. Turkey Point Unit 4 training will be performed using the Unit 3 Training Simulator. Changes to the test plan as described in this update do not change the basis for the Unit 4 certification. The differences between Unit 3 and Unit 4 were reviewed by the Simulator Configuration Review Board (SCRB)[1] and it was determined that none will have a negative affect on operator training or examinations.

This report presents the information required to be submitted on a four year cycle per the referenced sections of 10 CFR 55.45. Included herein are the certification tests completed during the previous four years, outstanding Simulator Discrepancy Reports (DR's), and the schedule for completion of these DR's.

Experience gained during initial certification testing and the testing during the last four year cycle, changes to the plant, and the availability of plant data have resulted in some changes to the plan. The changes made to the test plan for the next four year cycle are presented along with a discussion of the basis for the changes. The changes in the plan are organized into the following three categories: Changes, Deletions, and Additions. Ten tests have been changed, three tests have been deleted, and two tests have been added. Changes to the Turkey Point Simulator test plan have been reviewed and approved by the SCRB.

The certification test plan is presented for each of the next four years and the abstracts for the tests that have been added or changed are included in Appendix A.

[1] The Turkey Point SCRB was established by administrative procedure 0-ADM-305, Simulator Configuration Management. The SCRB provides overall control and direction of changes to the Simulator. The SCRB also reviews and approves the Certification test program and test results. Membership on the SCRB is selected per the guidelines of the Institute of Nuclear Plant Operations, "Simulator Configuration Management System," INPO 87-016, August 1987.

2.0 SIMULATOR TESTS COMPLETED (1995 - 1998)

2.1 1995 TESTS

TEST #	TEST DESCRIPTION	COMPLETION DATE
MFW-002	Loss of Normal Feedwater	08-25-95
MFW-007	Equivalent TMI-2 Scenario	12-11-95
MGG-002	Loss of 4KV Bus 3A	07-21-95
MGG-003	Loss of 4KV Bus 3B	07-21-95
MGG-004	Loss of All AC	11-09-95
MGG-005	Loss of 4KV Bus 3C	07-21-95
MGG-006	Loss of 4KV Bus 3D	07-21-95
MMP-001	Loss of Vital AC Bus 3P06	08-25-95
MMP-002	Loss of Vital AC Bus 3P07	08-25-95
MMP-003	Loss of Vital AC Bus 3P08	08-25-95
MMP-004	Loss of Vital AC Bus 3P09	08-25-95
MMP-005	Loss of DC Bus 3A (3D01)	08-25-95
MMP-006	Loss of DC Bus 3B (3D23)	08-25-95
MMP-007	Loss of DC Bus 4B (4D01)	08-25-95
MMP-008	Loss of DC Bus 4A (4D23)	08-25-95
MRC-006	Loss of a Single RCP With Power Below P-8	11-09-95
MRC-007	Stuck Open Spray Valve	08-25-95
MSG-007	Main Steam Line Break from Hot Standby with Reduced Shutdown Margin	12-11-95
MSP-001	Bus Stripping and Load Sequencing Tests	12-11-95
NPE-002	Plant Startup Cold Shutdown to Hot Standby	11-17-95
NPE-003	Plant Startup from Hot Standby to Rated Power	12-11-95
SUR-026	Engineered Safeguards Integrated Test, 3-OSP-203.1 & 3-OSP-203.2	11-17-95
SUR-030	Full Length RCC - Periodic Exercise, OP-1604.1	08-25-95
SUR-031	Inducing Xenon Oscillations to Produce Various Incore Axial Offsets, 0-OP-059.3	11-09-95

1995 TESTS (CONTINUED)

ANNUAL TESTS

TEST #	TEST DESCRIPTION	COMPLETION DATE
MFW-003	Loss of Normal and Emergency Feedwater	08-25-95
MRC-002	Large Break LOCA Inside Containment With Loss of Offsite Power	07-21-95
MRC-004	PORV Failure (Open) Without High Pressure Injection	07-21-95
MRC-005	Loss of Forced Reactor Coolant Flow	11-09-95
MRX-001	Maximum Rate Power Ramp (100% to 75% and back to 100%)	11-17-95
MRX-009	Manual Reactor Trip from 100% Power	07-21-95
MSG-001	Main Steam Line Break Inside Containment	11-09-95
MSG-003	Simultaneous Closure of All MSIV's	08-25-95
MTU-001	Turbine Trip Which Does Not Cause Automatic Reactor Trip	08-25-95
SST-001	Steady State 50% Power Heat Balance	11-09-95
SST-002	Steady State 75% Power Heat Balance	11-09-95
SST-003	Steady State 100% Power Heat Balance	11-09-95
SST-004	100% Power 60 min Null Transient	07-21-95

2.2 1996 TESTS

TEST #	TEST DESCRIPTION	COMPLETION DATE
MCV-001	Uncontrolled Maximum Rate Boron Dilution	12-03-96
MCV-002	Charging System Failures	12-03-96
MCV-004	Letdown and Volume Control Tank Operations and Malfunctions	12-03-96
MFW-004	Feedwater Line Break Inside Containment	12-03-96
MFW-006	Failure of Steam Generator Level Channel Providing Input to the Feedwater Controller	09-27-96
MRC-003	Small Break LOCA Inside Containment	09-27-96
MRC-009	Fast Load Reduction, 3-ONOP-100	12-03-96
MRX-010	Spurious High Containment Pressure SI	12-03-96
MSG-006	Closure of a Single MSIV At Several Different Power Levels	09-27-96
MTU-003	Turbine Lube Oil System (Bearings)	09-27-96
MTU-005	Turbine Turning Gear Operation	09-27-96
MTU-009	Turbine Lube Oil Control & Auto-Stop Oil	12-03-96
MTU-011	Failure of Turbine Control Valve Spring	12-03-96
NPE-005	Plant Shutdown from Rated Power to Hot Standby	12-03-96
NPE-006	Cooldown from Hot Standby to Cold Shutdown	12-03-96
SUR-004	Component Cooling Water Pumps Low Header Pressure Start Test, 3-OSP-030.5	07-03-96
SUR-009	Reactor Protection System Logic Test, 3-OSP-049.1	12-03-96
SUR-015	Intermediate Range Nuclear Instrumentation Analog Channel Operational Test, 3-OSP-059.2	07-03-96
SUR-017	Power Range Nuclear Instrumentation Analog Channel Operational Test, 3-OSP-059.4	07-03-96
SUR-020	Main Steam Isolation Valve Closure Test, 3-OSP-072	09-23-96
SUR-035	Containment Isolation Racks QR50 and QR51 Periodic Test, OP-4004.4	09-23-96
SUR-036	Component Cooling Water System Flow Balance, 3-OSP-030.9	12-03-96
SUR-037	Determination of Quadrant Power Tilt Ratio, 3-OSP-059.10	07-03-96

1996 TESTS (CONTINUED)

ANNUAL TESTS

TEST #	TEST DESCRIPTION	COMPLETION DATE
MFW-003	Loss of Normal and Emergency Feedwater	09-27-96
MRC-002	Large Break LOCA Inside Containment With Loss of Offsite Power	07-03-96
MRC-004	PORV Failure (Open) Without High Pressure Injection	09-27-96
MRC-005	Loss of Forced Reactor Coolant Flow	09-27-96
MRX-001	Maximum Rate Power Ramp (100% to 75% and back to 100%)	12-03-96
MRX-009	Manual Reactor Trip from 100% Power	09-27-96
MSG-001	Main Steam Line Break Inside Containment	09-27-96
MSG-003	Simultaneous Closure of All MSIV's	12-03-96
MTU-001	Turbine Trip Which Does Not Cause Automatic Reactor Trip	09-27-96
SST-001	Steady State 50% Power Heat Balance	12-03-96
SST-002	Steady State 75% Power Heat Balance	12-03-96
SST-003	Steady State 100% Power Heat Balance	07-03-96
SST-004	100% Power 60 min Null Transient	09-27-96

2.3 1997 TESTS

TEST #	TEST DESCRIPTION	COMPLETION DATE
MCS-001	Component Cooling Water Operations and Malfunctions	12-11-97
MFW-001	Loss of Vacuum Tests, Including Loss of Condenser Level Control	12-11-97
MGG-001	Generator Trip	08-18-97
MRC-001	Steam Generator Tube Rupture	08-18-97
MRX-003	Nuclear Instrumentation Failure During Startup	08-18-97
MRX-006	Dropped Control Rod	08-18-97
MRX-007	Dropped With Inability to Drive Control Rods	12-11-97
MRX-011	Loss of C 4KV Bus Reactor Trip	12-11-97
MSG-005	Failure of Reference Temperature to Steam Dumps	08-18-97
MTU-002	Turbine Trip from 100% Power	08-18-97
NPE-001	Plant Fill and Vent from a Partial Drain Down to a Solid Pressurizer	12-11-97
RTT-001	Simulator Real Time Test	05-29-97
RTT-002	Simulator Real Time Test Validation Test	05-29-97
SUR-003	Diesel Generator 24 Hour Load Test and Load Rejection, 3-OSP-023.2	08-18-97
SUR-005	Reactor Coolant System Leak Rate Calculations, 3-OSP-041.1	05-29-97
SUR-010	RHR MOV's/System Pressure Interlock Test, 3-OSP-050.7	05-29-97
SUR-011	RHR MOV's 750, 751, 862, 863, Interlock Test, 3-OSP-050.8	05-29-97
SUR-021[1]	Standby Steam Generator Feedwater Pumps / Cranking Diesels Test, 0-OSP-074.4	05-29-97
SUR-022	Auxiliary Feedwater Train 1 Operability Verification, 3-OSP-075.1	05-29-97

[1]Procedure 0-OSP-074.4 cancelled due to PC/M 95-060, Elimination of cranking diesels tie to Units 3 & 4. Procedure 0-OSP-074.4 replaced with 0-OSP-074.3, Standby Steam Generators Feedwater Pumps Availability Test.

1997 TESTS (CONTINUED)

TEST #	TEST DESCRIPTION	COMPLETION DATE
SUR-024	Main Turbine Valves Operability Test, 3-OSP-089	08-18-97
SUR-032[1]	Normal Operation of Incore Moveable Detector System And Power Distribution Surveillance, OP-12404.1	12-11-97
SUR-033	Accident Monitoring Instrumentation Channel Checks, 3-OSP-204	05-29-97
SUR-034	Safeguards Relay Rack Train A, B, Periodic Test, OP-4004.2	05-29-97

The following tests were moved up from 1998 to 1997 due to the incorporation of the Cycle 15 core into the simulator.

TEST #	TEST DESCRIPTION	COMPLETION DATE
SUR-001	Initial Criticality after Refueling, 0-OSP-040.6	08-18-97
SUR-002[2]	Nuclear Design Check Tests During Startup Sequence After Refueling, 0-OSP-040.5	08-18-97

[1]Procedure OP-12404.1 Cancelled and replaced by 0-OP-059.4, Operation of the Moveable Incore Detectors.
[2]Procedure 0-OSP-040.5 title changed to Nuclear Design Verification.

1997 TESTS (CONTINUED)

ANNUAL TESTS

TEST #	TEST DESCRIPTION	COMPLETION DATE
MFW-003	Loss of Normal and Emergency Feedwater	08-18-97
MRC-002	Large Break LOCA Inside Containment With Loss Of Offsite Power	12-11-97
MRC-004	PORV Failure (Open) Without High Pressure Injection	08-18-97
MRC-005	Loss of Forced Reactor Coolant Flow	08-18-97
MRX-001	Maximum Rate Power Ramp (100% to 75% and back to 100%)	08-18-97
MRX-009	Manual Reactor Trip from 100% Power	08-18-97
MSG-001	Main Steam Line Break Inside Containment	08-18-97
MSG-003	Simultaneous Closure of All MSIV's	08-18-97
MTU-001	Turbine Trip Which Does Not Cause Automatic Reactor Trip	08-18-97
SST-001	Steady State 50% Power Heat Balance	12-11-97
SST-002	Steady State 75% Power Heat Balance	08-18-97
SST-003	Steady State 100% Power Heat Balance	08-18-97
SST-004	100% Power 60 min Null Transient	05-29-97

2.4 1998 TESTS

TEST #	TEST DESCRIPTION	COMPLETION DATE
MCN-001	Containment Emergency Systems Operations and Malfunctions	09-15-98
MCS-002	Intake Cooling Water System Operations and Malfunctions	09-15-98
MCS-003	Turbine Plant Cooling Water Operation and Malfunctions	09-15-98
MCS-004	Instrument Air System Operation and Malfunctions	09-15-98
MCV-005	Non-Regenerative Heat Exchanger Tube Leak	09-15-98
MFW-005	Main Feedwater Line Break Outside Containment	09-01-98
MFW-008	Loss of Normal Feedwater/ATWS	09-15-98
MRX-002	Loss of Protection System Channel	09-01-98
MRX-004	Stuck Control Rod	09-01-98
MRX-005	Uncoupled Control Rod Test	09-01-98
MRX-008	Fuel Cladding Failure Resulting in High Reactor Coolant Activity	09-15-98
MSG-002	Main Steam Line Break Outside Containment	04-22-98
MSS-001	Small Leak in Safety Injection Piping Outside Containment	09-01-98
MSS-002	Accumulator Operations and Malfunctions	09-15-98
MSS-003	Loss of RHR While in Cold Shutdown	09-01-98
MSS-004	Loss of Inventory During A Shutdown and Partial Draindown Condition	09-01-98
MTU-006	Hydrogen Seal Oil	09-01-98
MTU-008	Hydrogen Cooling	09-01-98
NPE-004	Reactor Trip Followed By Recovery to Rated Power	08-05-98
SUR-014	Source Range Nuclear Instrumentation Analog Channel Operational Test, 3-OSP-059.1	08-05-98
SUR-016	Intermediate Range NIS Setpoint Verification, 3-OSP-059.3	08-05-98
SUR-019	Process Radiation Monitoring Operability Test, 3-OSP-067.1	08-05-98

1998 TESTS (CONTINUED)

ANNUAL TESTS

TEST #	TEST DESCRIPTION	COMPLETION DATE
MFW-003	Loss of Normal and Emergency Feedwater	04-22-98
MRC-002	Large Break LOCA Inside Containment With Loss Of Offsite Power	04-22-98
MRC-004	PORV Failure (Open) Without High Pressure Injection	04-22-98
MRC-005	Loss of Forced Reactor Coolant Flow	04-22-98
MRX-001	Maximum Rate Power Ramp (100% to 75% and back to 100%)	08-05-98
MRX-009	Manual Reactor Trip from 100% Power	08-05-98
MSG-001	Main Steam Line Break Inside Containment	04-22-98
MSG-003	Simultaneous Closure of All MSIV's	04-22-98
MTU-001	Turbine Trip Which Does Not Cause Automatic Reactor Trip	08-05-98
SST-001	Steady State 50% Power Heat Balance	08-05-98
SST-002	Steady State 75% Power Heat Balance	08-05-98
SST-003	Steady State 100% Power Heat Balance	08-05-98
SST-004	100% Power 60 min Null Transient	04-22-98

3.0 CERTIFICATION TEST CHANGES (1995 - 1998)

Experience gained during initial certification testing and during the last four year cycle has resulted in several changes to the Turkey Point Simulator Certification Test plan. These changes in the plan are organized into the following three categories: Changes, Deletions, and Additions. These modifications to the test plan were made to eliminate duplication, eliminate test runs that provide little or no incremental information and to modify tests to reflect changes in the plant.

The abstracts for tests added and changed are included in Appendix A. Table 1 in Appendix B updates the profile of the certification test program by general type of test. Table 2 provides an updated cross-reference between each ANS-3.5-1985 section and the associated Turkey Point certification test(s).

3.1 CHANGES

MCS-004, Instrument Air Operations and Malfunctions
This test consists of 6 cases: (1) Loss of diesel air compressor, (2) Instrument air dryer fouling, (3) Instrument air reservoir leak, (4) Complete loss of instrument air, (5) Loss of containment air header, and (6) Loss of turbine air header. PCM 93-108 removed the portable diesel instrument air compressors and replaced them with permanent diesel and electric air compressors on each unit. The new air compressors auto start on low air pressure while the old portable compressors had to be manually started. This necessitated a change to the scenario to fail one or more of the compressors either initially or during the scenario to get the desired loss of air. Run 1, Loss of Diesel Air Compressor was changed to Sequential Loss of Air Compressors and Control Valve Logic. This run verifies the auto start capability of each air compressor and then verifies that the control valves that cross tie the units, isolate to protect the unaffected unit. Run 3, instrument air reservoir leak, is performed as part of Run 1 to verify auto start capability of each of the compressors. Therefore Run 3 will be deleted and replaced with a loss of Unit 3 instrument air. In this run, Unit 4 will still be supplying air to the intake area, the control room and the auxiliary building.

MCV-002, Charging System Failures
This test consists of four runs: (1) Seal injection filter clogging, (2) Charging pump discharge valve failed closed, (3) Charging pump discharge leak, and (4) Loss of all charging. Run 1 provides little indication in the control room with the exception of an alarm. Therefore this failure provides little training value and this run will be deleted. Runs 2, 3, and 4 produce very similar results. They all involve a loss of charging to the regenerative heat exchanger, which causes the letdown line to flash. Therefore Run 2 will be deleted and Run 4 will be modified. Currently Run 4 involves a total loss of charging with no operator actions. The scenario will be changed to perform operator actions using ONOP-047.1, Loss of All Charging. The scenario will start from 50% power and will involve shutting the unit down to hot standby, blocking SI, starting an HHSI pump and depressurizing the RCS until the HHSI pump begins to inject.

MCV-004, Letdown and Volume Control Tank Operations and Malfunctions
This test consists of four runs: (1) Letdown pressure control valve failed open, (2) Letdown pressure control valve failed closed, (3) VCT level control valve failed in the Divert position, and (4) Letdown isolation valve failed closed. Run 3, which simply failed the valve to divert will be modified to fail VCT level transmitter LT-115 high. This will cause the valve to go to divert but will also bring in the VCT Hi/Lo level annunciator, prevent an auto makeup to the VCT and prevent auto swap over of the charging pump suction from the VCT to the RWST. No operator action will take place until all of the failures can be verified. Then 3-ONOP-046.4, Malfunction of the Boron Concentration Control System will be used to recover from the failure.
Runs 2 and 4 both involve letdown line valve closure and produce very similar results. Therefore, Run 4 will be replaced by failure of VCT level transmitter LT-112 high. This will cause the VCT level control valve to go to full divert and if the makeup flow is less than charging flow, actual VCT level will drop. When the failure has been identified, then ONOP-046.4 will be used to recover from the transient.

MFW-006, Failure of Steam Generator Level Channel Providing Input to the Feedwater Controller
This test currently runs two cases, one in which no operator action is taken, and one in which manual operator action is taken to stabilize the plant. A third case was run in 1996 to compare a failure of the steam flow input to the feedwater controller that occurred on Unit 3 in 1995. The test description will be modified to run a third case that will compare the simulator against the 1995-plant failure or against newer plant data if it becomes available. The title will be changed to "Failure of Input Channels to the Feedwater Controller".

MRX-003, Nuclear Instrumentation Failure During Startup
This test consisted of two runs: (1) Failure of both intermediate range channels to prevent the source range trip from being blocked and (2) Failure of 3 out of the 4 power range channels to prevent the intermediate range trip from being blocked. These scenarios involve multiple failures and operator actions that are unrealistic. Therefore, these failures will be deleted and replaced by three new runs: (1) Failure of a source range channel, (2) failure of an intermediate range channel, and (3) failure of a power range channel. In each run the appropriate off-normal procedure will be used to take the failed channel out of service. The title of MRX-003 will be changed to "Nuclear Instrumentation Failures".

MRX-007, Dropped Rod with Inability to Drive Control Rods
This test consisted of a dropped rod causing an automatic turbine runback to 70% power with control rods immovable. With the elimination of the dropped rod runback the scenario is very similar to certification test MRX-006, Dropped Rod. Since this test was intended to satisfy ANS-3.5 section 3.1.2 (13) "Inability to insert control rods" the scenario will be changed. The initial condition will be 50% power versus 100% power and the initiating event will be an urgent failure in the logic cabinet. This will require a shutdown to hot standby using boration only. The test will be renamed "Shutdown with Inability to Drive Control Rods".

SUR-001 Initial Criticality After Refueling, 0-OSP-040.6
Plant procedures 0-OSP-040.5, Nuclear Design Verification and 0-OSP-040.6, Initial Criticality After Refueling have been cancelled and combined into one procedure: 0-OSP-040.16, Initial Criticality After Refueling and Nuclear Design Verification. Therefore SUR-001, Initial Criticality after Refueling and SUR-002, Nuclear Design Verification will be combined into one test, SUR-001, Initial Criticality after Refueling and Nuclear Design Verification and SUR-002 will be deleted.

SUR-030 Full Length RCC – Periodic Exercise, OP-1604.1
The plant has cancelled OP-1604.1 and replaced it with 3-OSP-028.6, RCCA Periodic Exercise. Therefore SUR-030 will be renamed "RCCA Periodic Exercise, 3-OSP-028.6", however, the intent of this test remains the same.

SUR-034 Safeguards Relay Rack Train A,B, Periodic Test, OP-4004.2
The plant has cancelled OP-4004.2 and replaced it with 3-OSP-063.1, Safeguards Actuation System Logic Test. Therefore SUR-034 will be renamed "Safeguards Actuation Systems Logic Test, 3-OSP-063.1", however, the intent of this test remains the same.

SUR-035 Containment Isolation Racks QR50 and QR51 Periodic Test, OP-4004.4
The plant has cancelled OP-4004.4 and replaced it with 3-OSP-063.2, Containment Isolation System Logic Test. Therefore SUR-035 will be renamed "Containment Isolation System Logic Test, 3-OSP-063.2", however, the intent of this test remains the same.

3.2 DELETIONS

MTU-006, Hydrogen Seal Oil
This test checks normal and abnormal operation of the seal oil system. All of the controls and indicators for the seal oil system are located outside of the control room. The only indication in the control room of a seal oil failure is the hydrogen panel trouble annunciator. Thus, continuing to test this system provides little value in terms of training. This test was successfully run in 1990, 1994, and 1998. Therefore MTU-006 will be deleted.

RTT-001 Simulator Real Time Test
This test is designed to verify that the simulator is operating in real time. In order to run in real time the execution of all of the modules must be completed every 200 milliseconds. Modules are divided into 4 legs of 50 milliseconds each. If the computer is unable to complete all module calculations within one leg, an overrun is generated. When an overrun occurs, the computer reschedules the missed tasks, and tries to makeup the time during the remaining legs. Four consecutive overruns would mean that all calculations were not completed within the 200 millisecond time step and the computer would no longer be running in real time. This test used to modify the computers to abort if four consecutive overruns occurred and then run various transients such as LBLOCA's, steam breaks, and ATWS's for an hour. After the test was over the computers were set back to not abort on overruns. However to ensure that overruns were not occurring during training, the computers were modified in 1994 to abort on four consecutive overruns. Therefore the simulator is continuously monitored and will abort during training, examinations or during certification testing if it is not operating in real time. Therefore this test is no longer required and will be deleted. Note that RTT-002 Simulator Real Time Validation Test will still be run. This test verifies that the simulator will abort if: (1) Four consecutive overruns occur, (2) One of the computers stops running, or (3) An overflow condition such as dividing by zero occurs.

SUR-002 Nuclear Design Verification, 0-OSP-040.5
As explained in Section 3.1, SUR-001 and SUR-002 have been combined into one test (SUR-001) and SUR-002 will be deleted.

3.3 ADDITIONS

MRC-010, Pressurizer Pressure and Level Control Malfunctions
This test will consist of two runs: (1) Failure of the pressure control channel (PT-444) high, and (2) Failure of the level control channel (LT-459A) low. The intent of this test will be to demonstrate correct simulator response to the control failure. Therefore, operator action will be delayed until proper simulator response can be verified. However, operator action will be permitted quickly enough to prevent a reactor trip and re-establish normal operations. In Run 1 ONOP-041.5, Pressurizer Pressure Control Malfunction will be used to recover from the failure while in Run 2 ONOP-041.6, Pressurizer Level Control Malfunction will be used.

MRX-012, Control Room Evacuation, 0-ONOP-105
This test will simulate the evacuation of the control room due to a fire and the stabilization of the plant using the alternate shutdown panel. 0-ONOP-105 will be used to shutdown the plant, control the plant at hot standby and then begin a cooldown to cold shutdown.

4.0 FOUR YEAR TEST PLAN (1999-2002)

Per the requirements of Regulatory Guide 1.149, the Simulator Certification test program will be conducted in its entirety on a four year cycle. All of the ANSI/ANS-3.5-1985 Appendix B tests will be performed annually. Approximately 25% of the remaining tests in the Certification program will be performed each year.

Table 4-1 presents the ANSI/ANS-3.5-1985 tests that will be performed annually. Tables 4-2 through 4-5 present the test plan for each of the next four years. The tests planned each year represent a cross section of the various types of tests. As in the previous four year cycle, tests may be added to meet new or special requirements.

The 1999-2002 Turkey Point Simulator test plan has been reviewed and approved by the Simulator Configuration Review Board (SCRB).

Table 4-1

Annual Tests

MFW-003	Loss of Normal and Emergency Feedwater
MRC-002	Large Break LOCA Inside Containment With Loss Of Offsite Power
MRC-004	PORV Failure (Open) Without High Pressure Injection
MRC-005	Loss of Forced Reactor Coolant Flow
MRX-001	Maximum Rate Power Ramp (100% To 75% and back to 100%)
MRX-009	Manual Reactor Trip from 100% Power
MSG-001	Main Steam Line Break Inside Containment
MSG-003	Simultaneous Closure of All MSIV's
MTU-001	Turbine Trip Which Does Not Cause Automatic Reactor Trip
SST-001	Steady State 50% Power Heat Balance
SST-002	Steady State 75% Power Heat Balance
SST-003	Steady State 100% Power Heat Balance
SST-004	100% Power 60 Minute Null Transient

Table 4-2

1999 Test Plan

MFW-002	Loss of Normal Feedwater
MFW-007	Equivalent TMI-2 Scenario
MGG-002	Loss of 4KV Bus 3A
MGG-003	Loss of 4KV Bus 3B
MGG-004	Loss of All AC
MGG-005	Loss of 4KV Bus 3C
MGG-006	Loss of 4KV Bus 3D
MMP-001	Loss of Vital AC Bus 3P06
MMP-002	Loss of Vital AC Bus 3P07
MMP-003	Loss of Vital AC Bus 3P08
MMP-004	Loss of Vital AC Bus 3P09
MMP-005	Loss of DC Bus 3A (3D01)
MMP-006	Loss of DC Bus 3B (3D23)
MMP-007	Loss of DC Bus 4B (4D01)
MMP-008	Loss of DC Bus 4A (4D23)
MRC-006	Loss of a Single Reactor Coolant Pump With Power Below P-8
MRC-007	Stuck Open Spray Valve
MSG-007	Main Steam Line Break from Hot Standby with Reduced Shutdown Margin.
MSP-001	Bus Stripping and Load Sequencing Tests
NPE-002	Plant Startup Cold Shutdown to Hot Standby
NPE-003	Plant Startup from Hot Standby to Rated Power
SUR-026	Engineered Safeguards Integrated Test, 3-OSP-203.1 & 3-OSP-203.2
SUR-030	RCCA Periodic Exercise, 3-OSP-028.6
SUR-031	Inducing Xenon Oscillations to Produce Various Incore Axial Offsets,0-OP-059.3

Table 4-3

2000 Test Plan

MCV-001	Uncontrolled Maximum Rate Boron Dilution
MCV-002	Charging System Failures
MCV-004	Letdown and Volume Control Tank Operations and Malfunctions
MFW-004	Feedwater Line Break Inside Containment
MFW-006	Failure of Input Channels to the Feedwater Controller
MRC-003	Small Break LOCA Inside Containment
MRC-009	Fast Load Reduction, 3-ONOP-100
MRX-010	Spurious High Containment Pressure SI
MSG-006	Closure of a Single MSIV At Several Different Power Levels
MTU-003	Turbine Lube Oil System (Bearings)
MTU-005	Turbine Turning Gear Operation
MTU-009	Turbine Lube Oil Control & Auto-Stop Oil
MTU-011	Failure of Turbine Control Valve Spring
NPE-005	Plant Shutdown from Rated Power to Hot Standby
NPE-006	Cooldown from Hot Standby to Cold Shutdown
SUR-004	Component Cooling Water Pumps Low Header Pressure Start Test, 3-OSP-030.5
SUR-009	Reactor Protection System Logic Test, 3-OSP-049.1
SUR-015	Intermediate Range Nuclear Instrumentation Analog Channel Operational Test, 3-OSP-059.2
SUR-017	Power Range Nuclear Instrumentation Analog Channel Operational Test, 3-OSP-059.4
SUR-020	Main Steam Isolation Valve Closure Test, 3-OSP-072
SUR-035	Containment Isolation System Logic Test, 3-OSP-063.2
SUR-036	Component Cooling Water System Flow Balance, 3-OSP-030.9
SUR-037	Determination of Quadrant Power Tilt Ratio, 3-OSP-059.10

Table 4-4

2001 Test Plan

MCS-001	Component Cooling Water Operations and Malfunctions
MFW-001	Loss of Vacuum Tests, Including Loss of Condenser Level Control
MGG-001	Generator Trip
MRC-001	Steam Generator Tube Rupture
MRC-010	Pressurizer Pressure and Level Control Malfunctions
MRX-003	Nuclear Instrumentation Failures
MRX-006	Dropped Control Rod
MRX-007	Shutdown With Inability to Drive Control Rods
MRX-011	Loss of C 4KV Bus Reactor Trip
MSG-005	Failure of Reference Temperature to Steam Dumps
MTU-002	Turbine Trip from 100% Power
NPE-001	Plant Fill and Vent from a Partial Drain Down to a Solid Pressurizer
RTT-002	Simulator Real Time Test Validation Test
SUR-003	Diesel Generator 24 Hour Load Test and Load Rejection, 3-OSP-023.2
SUR-005	Reactor Coolant System Leak Rate Calculations, 3-OSP-041.1
SUR-010	RHR MOV's/System Pressure Interlock Test, 3-OSP-050.7
SUR-011	RHR MOV's 750, 751, 862, 863, Interlock Test, 3-OSP-050.8
SUR-021	Standby Steam Generator Feedwater Pumps Availability Test, 0-OSP-074.3
SUR-022	Auxiliary Feedwater Train 1 Operability Verification, 3-OSP-075.1
SUR-024	Main Turbine Valves Operability Test, 3-OSP-089
SUR-032	Operation of the Moveable Incore Detectors, 0-OP-059.4
SUR-033	Accident Monitoring Instrumentation Channel Checks, 3-OSP-204
SUR-034	Safeguard Actuation System Logic Test, 3-OSP-063.1

Table 4-5

2002 Test Plan

MCN-001	Containment Emergency Systems Operation and Malfunctions
MCS-002	Intake Cooling Water System Operations and Malfunctions
MCS-003	Turbine Plant Cooling Water Operation and Malfunctions
MCS-004	Instrument Air System Operation and Malfunctions
MCV-005	Non-Regenerative Heat Exchanger Tube Leak
MFW-005	Main Feedwater Line Break Outside Containment
MFW-008	Loss of Normal Feedwater / ATWS
MRX-002	Loss of Protection System Channel
MRX-004	Stuck Control Rod
MRX-005	Uncoupled Control Rod Test
MRX-008	Fuel Cladding Failure Resulting in High Reactor Coolant Activity
MRX-012	Control Room Evacuation, 3-ONOP-105
MSG-002	Main Steam Line Break Outside Containment
MSS-001	Small Leak in Safety Injection Piping Outside Containment
MSS-002	Accumulator Operations and Malfunctions
MSS-003	Loss of RHR While in Cold Shutdown
MSS-004	Loss of Inventory During Partial Draindown
MTU-008	Hydrogen Cooling
NPE-004	Reactor Trip Followed By Recovery to Rated Power
SUR-001	Initial Criticality after Refueling and Nuclear Design Verification, 0-OSP-040.16
SUR-014	Source Range Nuclear Instrumentation Analog Channel Operational Test, 3-OSP-059.1
SUR-016	Intermediate Range NIS Setpoint Verification, 3-OSP-059.3
SUR-019	Process Radiation Monitoring Operability Test, 3-OSP-067.1

5.0 OUTSTANDING DISCREPANCIES

In general all Simulator Discrepancy Reports (DR's) are addressed within one calendar year after they are written. The schedule may be extended beyond one year in special circumstances such as the need for certain equipment or very low priority DR's. The SCRB will review and approve the extension of the schedule for any DR that will not be completed in one year.

5.1 1995 CERTIFICATION TEST DR's

40 Certification test DR's were written and all have been completed.

5.2 1996 CERTIFICATION TEST DR's

17 Certification test DR's were written and all have been completed.

5.3 1997 CERTIFICATION TEST DR's

16 Certification test DR's were written and all have been completed.

5.4 1998 CERTIFICATION TEST DR's

20 Certification test DR's were written and 6 have been completed. The open DR's are listed in Table 5-1.

Table 5-1
OPEN DISCREPANCIES

TEST	DR #	TITLE	DUE DATE
MCN001	9800103	Iodine concentrations increase when ECF fans started	09-02-99
MCS003	9800107	H2 cooler inlet temperature drops to zero momentarily	09-16-99
MCS004	9800104	CV-1605 setpoint incorrect	09-16-99
MCV005	9800074	NRHX tube leak does not work properly	07-17-99
	9800108	R-17B spiked during NRHX tube leak	09-16-99
MFW008	9800109	Investigate RETRAN / Simulator pressure difference	09-16-99
MRC005	9800008	High MSR temperatures after Rx trip	02-09-99
MRX009	9800006	MSR relief valves don't lift when MSR steam supply valves left open	02-09-99
MSS003	9800098	RCS pressure decreases below atmospheric pressure	09-02-99
	9800099	Cold Leg Temperature decreases throughout transient	09-01-99
SST001	9800048	Hotwell level doesn't match plant	04-24-99
SUR016	9800077	Add 5 minute average ΔT to ERDADS display	07-17-99
	9800078	Tave and Tref need 2 decimal precision on ERDADS MA2 display	07-17-99
N/A	9800105	Physical Fidelity	12-31-98

TURKEY POINT UNIT 3 SIMULATOR CERTIFICATION UPDATE NUMBER 2

APPENDIX A TEST ABSTRACTS

A.1 TESTS ADDED

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *PRESSURIZER PRESSURE AND LEVEL CONTROL MALFUNCTIONS*

NUMBER: *MRC-010*

ANS 3.5 REFERENCE SECTIONS: *3.1.2 (18) Failure of reactor coolant pressure and volume control systems*

DESCRIPTION

This test examines the simulator's ability to model malfunctions in the pressurizer pressure and level control system. Two cases will be run. In the first case, the pressure control transmitter PT-3-444 will be failed high. After the response of the simulator is verified operator action will be taken to mitigate the transient using 3-ONOP-041.5, Pressurizer Pressure Control Malfunction. In the second case, pressurizer level control transmitter LT-459A will be failed low. After the response of the simulator is verified operator action will be taken to mitigate the transient using 3-ONOP-041.6, Pressurizer Level Control Malfunction.

OPTIONS

This test could be performed at any power level and at any time in core life.

INITIAL CONDITIONS

Full power steady state.

FINAL CONDITIONS

Plant stabilized in accordance with the ONOP.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *CONTROL ROOM EVACUATION, 0-ONOP-105*

NUMBER: *MRX-012*

ANS 3.5 REFERENCE SECTIONS: *3.1.2 Plant Malfunctions*

DESCRIPTION

This test simulates a control room evacuation and the stabilization of the plant using the alternate shutdown panel. The control Room Evacuation procedure, 3-ONOP-105 will be used to shutdown the plant, control the plant at hot standby, and then begin a cooldown to cold shutdown.

OPTIONS

This test could be performed at any power level and at any time in core life.

INITIAL CONDITIONS

Full power steady state.

FINAL CONDITIONS

Plant stabilized at HSB and a cooldown begun in accordance with the ONOP.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT UNIT 3 SIMULATOR CERTIFICATION UPDATE NUMBER 2

APPENDIX A TEST ABSTRACTS

A.2 TESTS CHANGED

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *INSTRUMENT AIR SYSTEM OPERATIONS AND MALFUNCTIONS*

NUMBER: *MCS-004*

ANS 3.5 REFERENCE SECTIONS: *3.1.2(2) Loss of Instrument Air*

DESCRIPTION

The purpose of this test is to verify the proper performance of the simulator during operations involving the instrument air system and with various instrument air malfunctions. There will be six separate runs involved in the completion of this test. The first run involves an air reservoir leak to test the logic associated with auto starting of the diesel and electric air compressors and the Units 3 & 4 cross tie control valves. The ability to supply instrument air from the service air header is also verified. The second run involves fouling of the instrument air dryer and verifies the ability to supply air from Unit 4. The third run involves a loss of Unit 3 instrument air. The Unit 4 cross tie control valve will isolate to protect Unit 4's air supply and continue to supply Unit 3's intake area, the control room, and the auxiliary building. The fourth run will involve a total loss of instrument air on both Units 3 & 4. The fifth run will be a loss of the containment air header and the sixth run will be a loss of the turbine air header.

OPTIONS

Leaks of variable size are available on the simulator in numerous locations, including each major air header and the instrument air reservoir. Multiple leaks or individual leaks can be instated. The diesel air compressor discharge pressure and the amount and rate of dryer fouling can also be varied. The instrument air filters can be used instead of the dryers.

INITIAL CONDITIONS

MOL, steady state at 100% power

FINAL CONDITIONS

Simulator response to the failure verified.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *CHARGING SYSTEM FAILURES*

NUMBER: *MCV-002*

ANS 3.5 REFERENCE SECTIONS: *3.1.2 (18) Failure of Reactor Coolant System Pressure and Volume Control Systems*

DESCRIPTION

The purpose of this test is to simulate various malfunctions in the charging and seal injection systems in order to verify proper simulator modeling of these systems. Two cases will be run. The first run will consist of a leak downstream of HCV-121 with no operator actions. The second run will be a total loss of charging and 3-ONOP-047.1, Loss of All Charging will be used to mitigate the event.

OPTIONS

The Turkey Point simulator has the capability of failing almost any component in the charging system. Therefore there are wide variety of failures are possible.

INITIAL CONDITIONS

Run 1: 100% power, steady state.
Run 2: 50% power, steady state.

FINAL CONDITIONS

Run 1: System parameters stabilized
Run 2: 3-ONOP-047.1 completed, HHSI pumps maintaining pressurizer level.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ DATE: _____

_____ DATE: _____

_____ DATE: _____

TEST TEAM

_____ DATE: _____

_____ DATE: _____

_____ DATE: _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *LETDOWN AND VOLUME CONTROL TANK SYSTEM OPERATIONS AND MALFUNCTIONS*

NUMBER: *MCV-004*

ANS 3.5 REFERENCE SECTIONS: *3.1.2 (18) Failure of Reactor Coolant Pressure and Volume Control Systems*

DESCRIPTION

The test checks the response of the Letdown and Volume Control Tank portions of the CVCS system. Various malfunctions, which affect this system, will be initiated to verify proper system response. A total of four different malfunction tests will be run: (1) The letdown control valve PCV-145 will be failed open, (2) PCV-145 will be failed closed, (3) The VCT level control transmitter LT-115 will be failed high, and (4) The VCT level transmitter LT-112 failed high. Runs 1 and 2 will be left to run without any operator action. In Runs 3 and 4 operator action will be taken using 3-ONOP-046.4, Malfunction of the Boron Control System.

OPTIONS

There are numerous malfunctions, which can be run on the Letdown and Volume Control Tank systems. Representative malfunctions should be chosen to exercise as many parts of the systems as possible.

INITIAL CONDITIONS

100% power, normal letdown lineup.

FINAL CONDITIONS

Runs 1 and 2: Terminate after system parameters have stabilized.
Runs 3 and 4: Terminate after 3-ONOP-046.4 complete.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *FAILURE OF INPUT CHANNELS TO THE FEEDWATER CONTROLLER*

NUMBER: *MFW-006*

ANS 3.5 REFERENCE SECTIONS: *3.1.2 (9) Normal Feedwater System Failures*
3.1.2 (22) Process Instrumentation, Alarm, and Control System Failures

DESCRIPTION

This test checks the response of the simulator to a failed steam generator level, steam flow, or feed flow channel when that channel is the controlling input to the feedwater regulating valve. Three cases will be run. The first run will be a failure of the controlling level channel with no operator actions. The second run will be the failure of the controlling level channel but operator action will be taken to stabilize the plant. The last run will be a failure of one the controlling inputs (steam flow, feed flow or level) where plant data is available and operator action will be taken to mitigate the event.

OPTIONS

Any of the three steam generators may be used.

INITIAL CONDITIONS

100% power, steady state.

FINAL CONDITIONS

Run 1 - Plant stable after the reactor trip
Run 2 - Plant stable with the associated channel in auto
Run 3 – Plant stable

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *NUCLEAR INSTRUMENTATION FAILURES*

NUMBER: *MRX-003*

ANS 3.5 REFERENCE SECTIONS: *3.1.2 (21) Nuclear Instrumentation Failures*

DESCRIPTION

This test examines the simulator's ability to model malfunctions of the nuclear instrumentation system. Three cases will be run. In the first case, a source range channel will be failed. Operator action will be taken to remove the channel from service using 3-ONOP-059.5, Source Range Nuclear Instrumentation Malfunction. In the second case, an intermediate range channel will be under-compensated and the reactor tripped. After the channel is visually verified to be under-compensated it will be taken out of service using 3-ONOP-059.7, Intermediate Range Nuclear Instrumentation Malfunction. In the third case, a power range channel will be failed. The channel will be removed from service using 3-ONOP-059.8, Power Range Nuclear Instrumentation Malfunction.

OPTIONS

Any of the source, intermediate, or power range channels may be failed.

INITIAL CONDITIONS

Run 1: Cold shutdown.
Run 2: Full power steady state.
Run 3: Full power steady state.

FINAL CONDITIONS

Run 1: Source range channel removed from service per 3-ONOP-059.5.
Run 2: Intermediate range channel removed from service per 3-ONOP-059.7.
Run 3: Power range channel removed from service per 3-ONOP-059.8.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *SHUTDOWN WITH INABILITY TO DRIVE CONTROL RODS*

NUMBER: *MRX-007*

ANS 3.5 REFERENCE SECTIONS:
3.1.1 (6) Load Changes
3.1.2 (12) Control Rod Failures Including Stuck, Uncoupled, Misaligned, and Dropped rods
3.1.2 (13) Inability to Drive Control Rods

DESCRIPTION

This test will perform a shutdown to hot standby without control rods. An urgent failure in the logic cabinet will prevent rod movement and require a shutdown to hot standby. The plant will be stabilized using boration alone in accordance with 3-ONOP-028, Reactor Control System Malfunction and GOP-103, Power to Hot Standby.

OPTIONS

None

INITIAL CONDITIONS

Steady state 50% power, MOL

FINAL CONDITIONS

Stable in hot standby.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *INITIAL CRITICALITY AFTER REFUELING AND NUCLEAR DESIGN VERIFICATION, 0-OSP-040.16*

NUMBER: *SUR-001*

ANS 3.5 REFERENCE SECTIONS: *3.1.1 (9) Core Performance Testing*

DESCRIPTION

This test will be a performance of the initial criticality after refueling and nuclear design verification procedure, 0-OSP-040.16. The procedure will be followed as closely as possible to insure that the simulator can support training on the initial criticality and core performance testing procedures. The reactor will be diluted to criticality and power escalated to establish the point of adding nuclear heat. Core performance testing including measurement of the boron endpoint, differential boron worth, isothermal temperature coefficient and control rod worth will be performed. The results will be compared with plant test data and design data from the nuclear design report.

OPTIONS

Parts of the test require chemistry testing for boron concentration. The simulator computed values for boron concentration may be used for these steps.

INITIAL CONDITIONS

BOL, hot standby. All rods in.

FINAL CONDITIONS

Surveillance procedure complete

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *RCCA PERIODIC EXERCISE, 3-OSP-028.6*

NUMBER: *SUR-030*

ANS 3.5 REFERENCE SECTIONS: *3.1.1(10) Operator Conducted Surveillance Testing on Safety Related Equipment*

DESCRIPTION

This test will consist of performing the surveillance procedure 3-OSP-028.6, which exercises the control and shutdown rods. In this surveillance each bank of rods is moved in 10 to 20 steps. The step counters and rod position indicators (RPI's) will be monitored for proper movement and for less than 12 steps deviation. The proper operation of the rod off top lights will be checked and the actuation of the shutdown bank off top alarm will be verified for shutdown banks A and B. With no malfunctions present this test should pass the applicable acceptance criteria contained in 3-OSP-028.6. The data sheets of this test will be compared with the data sheets from an actual performance of this test at Turkey Point.

OPTIONS

This test can be conducted from any steady state power level.

INITIAL CONDITIONS

100% power.

FINAL CONDITIONS

The test is complete when the procedure is complete.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *SAFEGUARDS ACTUATION SYSTEM LOGIC TEST, 3-OSP-063.1*

NUMBER: *SUR-034*

ANS 3.5 REFERENCE SECTIONS: *3.1.1 (10) Operator Conducted Surveillance on Safety-Related Equipment or Systems*

DESCRIPTION

This certification test will demonstrate the ability of the simulator to support the operator conducted surveillance procedure 3-OSP-063.1, Safeguards Actuation System Logic Test. With no malfunctions present, the ability to successfully perform this surveillance will be verified.

OPTIONS

This test can be performed at any power level and at time in core life.

INITIAL CONDITIONS

100% power, steady state, MOL

FINAL CONDITIONS

Surveillance complete.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TURKEY POINT SIMULATOR CERTIFICATION TEST PROCEDURE

TITLE: *CONTAINMENT ISOLATION SYSTEM LOGIC TEST, 3-OSP-063.2*

NUMBER: *SUR-035*

ANS 3.5 REFERENCE SECTIONS: *3.1.1 (10) Operator Conducted Surveillance on Safety-Related Equipment or Systems*

DESCRIPTION

This certification test will demonstrate the ability of the simulator to support the operator conducted surveillance procedure 3-OSP-063.2, Containment Isolation System Logic Test. With no malfunctions present, the ability to successfully perform this surveillance will be verified.

OPTIONS

This test can be performed at any power level and at time in core life.

INITIAL CONDITIONS

100% power, steady state, MOL

FINAL CONDITIONS

Surveillance complete.

SIMULATOR CONFIGURATION REVIEW BOARD APPROVAL FOR USE

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:* _____

TEST TEAM

_____ *DATE:* _____

_____ *DATE:* _____

_____ *DATE:*

TURKEY POINT UNIT 3 SIMULATOR CERTIFICATION UPDATE NUMBER 2

APPENDIX B TEST MATRICIES

TABLE B-1
TURKEY POINT CERTIFICATION TEST MATRIX PROFILE

CATEGORY	NUMBER OF TESTS
MALFUNCTIONS	
CONTAINMENT (MCN)	1
COMMON SERVICES (MCS)	4
CHEMICAL & VOLUME CONTROL SYSTEM (MCV)	4
FEEDWATER (MFW)	8
GENERATOR & GRID (MGG)	6
MAIN POWER DISTRIBUTION (MMP)	8
REACTOR COOLANT SYSTEM (MRC)	9
REACTOR (MRX)	12
STEAM GENERATOR & MAIN STEAM (MSG)	6
STANDBY POWER & SYNCHRONIZATION (MSP)	1
SAFETY SYSTEMS (MSS)	4
TURBINE (MTU)	7
SUBTOTAL	70
OTHERS	
COMPUTER REAL TIME TEST (RTT)	1
STEADY STATE TESTS (SST)	4
NORMAL PLANT EVOLUTIONS (NPE)	6
OPERATOR CONDUCTED SURVEILLANCE TESTING (SUR)	25
SUBTOTAL	36
TOTAL	106

TABLE B-2

ANSI/ANS-3.5-1985 CERTIFICATION TEST MATRIX

ANS 3.5 SECTION	CERTIFICATION TEST	
3.1.1(1)	NPE-001	Plant Fill and Vent from a Partial Drain Down to a Solid Pressurizer
	NPE-002	Plant Startup from Cold Shutdown to Hot Standby
3.1.1(2)	NPE-003	Plant Startup from Hot Standby to Rated Power
	NPE-004	Reactor Trip Followed By Recovery to Rated Power
3.1.1(3)	NPE-003	Plant Startup from Hot Standby to Rated Power
	NPE-004	Reactor Trip Followed By Recovery to Rated Power
3.1.1(4)	NPE-004	Reactor Trip Followed By Recovery to Rated Power
3.1.1(5)	NPE-002	Plant Startup from Cold Shutdown to Hot Standby
	NPE-003	Plant Startup from Hot Standby to Rated Power
	NPE-004	Reactor Trip Followed By Recovery to Rated Power
	NPE-005	Plant Shutdown from Rated Power to Hot Standby
	NPE-006	Cooldown from Hot Standby to Cold Shutdown
3.1.1(6)	MRC-009	Fast Load Reduction, 3-ONOP-100
	MRX-007	Shutdown with Inability to Drive Control Rods
	NPE-003	Plant Startup from Hot Standby to Rated Power
	NPE-004	Reactor Trip Followed By Recovery to Rated Power
	NPE-005	Plant Shutdown from Rated Power to Hot Standby
3.1.1(7)	NOT APPLICABLE	
3.1.1(8)	NPE-005	Plant Shutdown from Rated Power to Hot Standby
	NPE-006	Cooldown from Hot Standby to Cold Shutdown
3.1.1(9)	SUR-001	Initial Criticality After Refueling and Nuclear Design Verification, 0-OSP-040.16

ANS 3.5 SECTION	CERTIFICATION TEST	
3.1.1(10)	NPE-006	Cooldown from Hot Standby to Cold Shutdown
	SUR-003	Diesel Generator 24 Hour Load Test and Load Rejection, 3-OSP-023.2
	SUR-004	Component Cooling Water Pumps Low Header Pressure Start Test, 3-OSP-030.5
	SUR-005	Reactor Coolant System Leak Rate Calculations, 3-OSP-041.1
	SUR-009	Reactor Protection System Logic Test, 3-OSP-049.1
	SUR-010	RHR MOV's/System Pressure Interlock Test, 3-OSP-050.7
	SUR-011	RHR MOV's 750, 751, 862, 863, Interlock Test, 3-OSP-050.8
	SUR-014	Source Range Nuclear Instrumentation Analog Channel Operational Test, 3-OSP-059.1
	SUR-015	Intermediate Range Nuclear Instrumentation Analog Channel Operational Test, 3-OSP-059.2
	SUR-016	Intermediate Range NIS Setpoint Verification, 3-OSP-059.3
	SUR-017	Power Range Nuclear Instrumentation Analog Channel Operational Test, 3-OSP-059.4
	SUR-019	Process Radiation Monitoring Operability Test, 3-OSP-067.1
	SUR-020	Main Steam Isolation Valve Closure Test, 3-OSP-072
	SUR-021	Standby Steam Generator Feedwater Pumps Availability Test, 0-OSP-074.3
	SUR-022	Auxiliary Feedwater Train 1 Operability Verification, 3-OSP-075.1
	SUR-024	Main Turbine Valves Operability Test, 3-OSP-089
	SUR-026	Engineered Safeguards Integrated Test, 3-OSP-203.1 & 3-OSP-203.2
	SUR-030	RCCA Periodic Exercise, 3-OSP-028.6
	SUR-031	Inducing Xenon Oscillations to Produce Various Incore Axial Offsets, 0-OP-059.3
	SUR-032	Operation of the Moveable Incore Detectors, 0-OP-059.4
	SUR-033	Accident Monitoring Instrumentation Channel Checks, 3-OSP-204
	SUR-034	Safeguard Actuation System Logic Test, 3-OSP-063.1
	SUR-035	Containment Isolation System Logic Test, 3-OSP-063.2
	SUR-036	Component Cooling Water System Flow Balance, 3-OSP-030.9
	SUR-037	Determination of Quadrant Power Tilt Ratio, 3-OSP-059.10
3.1.2(1)(a)	MRC-001	Steam Generator Tube Rupture
3.1.2(1)(b)	MRC-002	Large Break LOCA Inside Containment With Loss Of Offsite Power
	MRC-003	Small Break LOCA Inside Containment
	MCV-005	Non-Regenerative Heat Exchanger Tube Leak
	MSS-001	Small Leak in Safety Injection Piping Outside Containment

ANS 3.5 SECTION	CERTIFICATION TEST	
3.1.2(1)(c)	MRC-002	Large Break LOCA Inside Containment With Loss Of Offsite Power
	MRC-003	Small Break LOCA Inside Containment
3.1.2(1)(d)	MRC-004	PORV Failure (Open) Without High Pressure Injection
	MFW-007	Equivalent TMI-2 Scenario
3.1.2(2)	MCS-004	Instrument Air System Operation and Malfunctions
3.1.2(3)	MGG-002	Loss of 4kV Bus 3A
	MGG-003	Loss of 4kV Bus 3B
	MGG-004	Loss of All AC Power
	MGG-005	Loss of 4kV Bus 3C
	MGG-006	Loss of 4kV Bus 3D
	MMP-001	Loss of Vital AC Bus 3P06
	MMP-002	Loss of Vital AC Bus 3P07
	MMP-003	Loss of Vital AC Bus 3P08
	MMP-004	Loss of Vital AC Bus 3P09
	MMP-005	Loss of DC Bus 3A (3D01)
	MMP-006	Loss of DC Bus 3B (3D23)
	MMP-007	Loss of DC Bus 4B (4D01)
	MMP-008	Loss of DC Bus 4A (4D23)
	MRX-011	Loss of C 4KV Bus Reactor Trip
	MSP-001	Bus Stripping and Load Sequencing Tests
3.1.2(4)	MRC-005	Loss of Forced Reactor Coolant Flow
	MRC-006	Loss of a Single Reactor Coolant Pump With Power Below P-8
3.1.2(5)	MFW-001	Loss of Vacuum Tests, Including Loss of Condenser Level Control
3.1.2(6)	MCS-002	Intake Cooling Water System Operations and Malfunctions
	MCS-003	Turbine Plant Cooling Water Operation and Malfunctions
3.1.2(7)	MSS-003	Loss of RHR While in Cold Shutdown
	MSS-004	Loss of Inventory During a Shutdown and Partial Draindown Condition
3.1.2(8)	MCS-001	Component Cooling Water Operations and Malfunctions

ANS 3.5 SECTION	CERTIFICATION TEST	
3.1.2(9)	MFW-002	Loss of Normal Feedwater
	MFW-006	Failure of Input Channels to the Feedwater Controller
	MFW-007	Equivalent TMI-2 Scenario
	MFW-008	Loss of Feedwater/ATWS
3.1.2(10)	MFW-003	Loss of Normal and Emergency Feedwater
3.1.2(11)	MRX-002	Loss of Protection System Channel
3.1.2(12)	MRX-004	Stuck Control Rod
	MRX-005	Uncoupled Control Rod Test
	MRX-006	Dropped Control Rod
	MRX-007	Shutdown With Inability to Drive Control Rods
	MRX-011	Loss of C 4KV Bus Reactor Trip
3.1.2(13)	MRX-007	Shutdown With Inability to Drive Control Rods
3.1.2(14)	MRX-008	Fuel Cladding Failure Resulting in High Reactor Coolant Activity
3.1.2(15)	MTU-001	Turbine Trip Which Does Not Cause Automatic Reactor Trip
	MTU-002	Turbine Trip from 100% Power
3.1.2(16)	MGG-001	Generator Trip
3.1.2(17)	MCV-001	Uncontrolled Maximum Rate Boron Dilution
3.1.2(18)	MRC-007	Stuck Open Spray Valve
	MRC-010	Pressurizer Pressure and Level Control Malfunctions
	MCV-002	Charging System Failures
	MCV-004	Letdown and Volume Control Tank Operations and Malfunctions
	MCV-005	Non-Regenerative Heat Exchanger Tube Leak
3.1.2(19)	MRX-009	Manual Reactor Trip from 100% Power
	MRX-010	Spurious High Containment Pressure SI
	MRX-011	Loss of C 4KV Bus Reactor Trip
3.1.2(20)	MSG-001	Main Steam Line Break Inside Containment
	MSG-002	Main Steam Line Break Outside Containment
	MSG-007	Main Steam Line Break With Reduced Shutdown Margin
	MFW-004	Feedwater Line Break Inside Containment
	MFW-005	Main Feedwater Line Break Outside Containment

ANS 3.5 SECTION	CERTIFICATION TEST	
3.1.2(21)	MRX-003	Nuclear Instrumentation Failures
3.1.2(22)	MFW-006	Failure of Input Channels to the Feedwater Controller
	MRC-009	Fast Load Reduction, 3-ONOP-100
	MRC-010	Pressurizer Pressure and Level Control Malfunctions
	MSG-005	Failure of Reference Temperature to Steam Dumps
	MSG-006	Closure of a Single MSIV at Several Different Power Levels
	MTU-003	Turbine Lube Oil System (Bearings)
	MTU-008	Hydrogen Cooling
	MTU-009	Turbine Lube Oil Control & Auto-Stop Oil
	MTU-011	Failure of Turbine Control Valve Spring
3.1.2(23)	MSS-001	Small Leak in Safety Injection Piping Outside Containment
	MSS-002	Accumulator Operations and Malfunctions
	MCN-001	Containment Emergency Systems Operations and Malfunctions
3.1.2(24)	MFW-008	Loss of Feedwater/ATWS
3.1.2(25)	NOT APPLICABLE	
A.3.1	RTT-002	Simulator Real Time Test Validation Test
B.2.1	SST-003	Steady State 100% Power Heat Balance
	SST-002	Steady State 75% Power Heat Balance
	SST-001	Steady State 50% Power Heat Balance
	SST-004	100% Power 60 minute Null Transient
B.2.2(1)	MRX-009	Manual Reactor Trip from 100% Power
B.2.2(2)	MFW-003	Loss of Normal and Emergency Feedwater
B.2.2(3)	MSG-003	Simultaneous Closure of All MSIV's
B.2.2(4)	MRC-005	Loss of Forced Reactor Coolant Flow
B.2.2(5)	MRC-005	Loss of Forced Reactor Coolant Flow
B.2.2(6)	MTU-001	Turbine Trip Which Does Not Cause Automatic Reactor Trip
B.2.2(7)	MRX-001	Maximum Rate Power Ramp (100% To 75% and Back to 100%)
B.2.2(8)	MRC-002	Large Break LOCA Inside Containment With Loss Of Offsite Power
B.2.2(9)	MSG-001	Main Steam Line Break Inside Containment
B.2.2(10)	MRC-004	PORV Failure (Open) Without High Pressure Injection