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June 10, 1994
 C311-94-2073
 6000-94-036

William T. Russell
 Director, NRR
 US Nuclear Regulatory Commission
 Washington, DC 20555

Subject: Three Mile Island Nuclear Station, Unit 1 (TMI-1)
 Operating License No. DPR-50
 Docket No. 50-289
 Simulation Facility Report

Dear Mr. Russell:

This letter and its attachments documents that the Three Mile Island Unit 1 Simulation Facility continues to meet the Commission's regulations as contained in 10 CFR 55.4. GPU Nuclear initially certified in letter C311-90-2092 dated June 28, 1990, that the Three Mile Island Unit 1 Simulation Facility met the Commission's regulations. 10 CFR 55.45.b.5 (ii) and (vi) require a report to the Commission every four years which identifies any uncorrected performance test failures, a schedule to correct these test failures, description of performance testing completed, and test schedule for the next four year period.

There are no uncorrected test failures for the Three Mile Island Simulation Facility. GPU Nuclear has enclosed a copy of the following test information for the Three Mile Island Simulation Facility.

- Attachment A - Exceptions to ANSI/ANS 3.5-1985
- Attachment B - Description of Simulator Testing Completed Since June 1990
- Attachment C - Simulator Certification Test Schedule
- Attachment D - Description of Simulator Testing To Be Completed

Sincerely,

C. A. Mascari
 C. A. Mascari
 Director, Nuclear Assurance

DVH/emf 9406220131 940610
 PDR ADDCK 05000289
 P PDR

- cc: M. G. Evans - TMI Senior Resident Inspector (w/o attachment)
 R. W. Hernan - Senior Project Manager (w/o attachment)
 T. T. Martin - NRC Regional Administrator, Region I (w/o attachment)

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ATTACHMENT A

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

EXCEPTIONS TO ANSI/ANS 3.5-1985

Item Number	1
ANS 3.5 Reference	Appendix B B2.1(1) B2.2.3 B2.2.4
Requirement	Record pressurizer pressure during selected performance tests.
Justification for Exception	<p>In accordance with the reference plant design, the simulator pressurizer pressure instrument is ranged from 0 - 500 PSIG for accurate indications at low reactor coolant system pressure. Where pressurizer pressure response was required to be recorded, a reactor coolant pressure instrument which was on-scale was used so that meaningful data was collected to document simulator performance.</p> <p>There should be no impact on the conduct of operator licensing examinations due to this exception.</p>
Item Number	2
ANS 3.5 Reference	Appendix B B2.2.1
Requirement	Record total steam flow (if available) during selected performance tests.
Justification for Exception	<p>There is no total steam flow instrumentation installed in the reference plant, therefore there is no steam flow instrumentation on the simulator panels.</p> <p>There should be no impact on the conduct of operator licensing examinations due to this exception.</p>

ATTACHMENT A

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

EXCEPTIONS TO ANSI/ANS 3.5-1985

Item Number	3
ANS 3.5 Reference	Appendix B B2.2.4
Requirement	Record relief valve flow (if available) during selected performance tests.
Justification for Exception	<p>There are no relief valve flow indicators installed in the reference plant, therefore there is no relief valve flow instrumentation on the simulator panels.</p> <p>There should be no impact on the conduct of operator licensing examinations due to this exception.</p>
Item Number	4
ANS 3.5 Reference	Appendix B B2.2.4
Requirement	Record reactor vessel level (if available) during a selected performance test.
Justification for Exception	<p>This indication is available on the plant process computer if the operator stops all four Reactor Coolant Pumps. Since the Reactor Coolant Pumps were not stopped during this test (in accordance with Appendix B requirements) the indication was not available, and therefore was not recorded. In actual plant operation the operators would secure the Reactor Coolant Pumps, and the indication would be activated.</p> <p>Current ATOG procedures do not require the operator to use this indication, therefore there should be no impact on the conduct of operator licensing examinations due to this exception.</p>

ATTACHMENT A

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

EXCEPTIONS TO ANSI/ANS 3.5-1985

Item Number	5
ANS 3.5 Reference	3.4.2 3.1.2
Requirement	It shall be possible to conveniently insert and terminate the plant malfunctions specified in Section 3.1.2 (Plant Malfunctions).
Justification for Exception	<p>The Fuel Failure malfunction (TH01) can not be terminated following activation on the TMI Plant-Referenced Simulator. This exception is justified since fuel failure is not recoverable during a normal training or testing scenario. All malfunctions (including TH01) are automatically cleared during simulator Reset operations, where the instructor ends the scenario and changes to a new Initial Condition.</p> <p>There should be no impact on the conduct of operator licensing examinations due to this exception.</p>

ATTACHMENT B

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

DESCRIPTION OF SIMULATOR TESTING COMPLETED SINCE JUNE 1990

The following list describes the simulator certification tests conducted since the initial submittal dated June 28, 1990. In accordance with the 4-year schedule included in the initial simulator certification submittal, tests marked with an asterisk (*) were conducted annually, and the remaining tests were conducted once over the 4-year certification.

A. REAL TIME TEST

TEST DESCRIPTION

- * RTT01 Real Time Test

B. STEADY STATE PERFORMANCE TESTS

TEST DESCRIPTION

- * SSP01 Simulator Stability
- * SSP02 Simulator Accuracy

C. NORMAL OPERATIONS TESTS

TEST DESCRIPTION

- NOT01 Plant Heatup
- NOT02 Plant Start-up
- NOT03 Reactor Trip and Recovery
- NOT04 3 RC Pump Operations
- NOT05 Zero Power Physics Testing
- NOT06 Core Flood System Valve Operability Test
- NOT07 Emergency Power System
- NOT08 RB 30 PSIG Analog Channels
- NOT09 Main Steam Isolation Valves Surveillance
- NOT10 Main Steam Isolation Valves Monthly Surveillance
- NOT11 Shift and Daily Checks Surveillance
- NOT12 Weekly Surveillance Checks
- NOT13 RCS Leakrate

ATTACHMENT B

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

**DESCRIPTION OF SIMULATOR TESTING COMPLETED
SINCE JUNE 1990**

C. NORMAL OPERATIONS TESTS (Continued)

TEST DESCRIPTION

- NOT14 Control Rod Movement
- NOT15 RB Cooling and Isolation System Logic Channel and Component Test
- NOT16 Loading Sequence and Component Test and HPI Logic Channel Test
- NOT17 High Pressure Injection
- NOT18 RB Emergency Cooling System
- NOT19 ES System Emergency Sequence and Power Transfer Test
- NOT20 Turbine Overspeed Testing
- NOT21 Low Pressure Injection
- NOT22 Plant Shutdown
- NOT23 Plant Cooldown
- NOT24 Shutdown Margin and Reactivity Balance
- NOT25 Heat Balance Calculations

D. TRANSIENT TEST SERIES

TEST DESCRIPTION

- TTS01 OTSG Tube Leak
- TTS02 OTSG Tube Rupture
- TTS03 RCS Leak Inside Containment
- TTS04 RCS Leak Outside Containment
- TTS05 Large Break LOCA
- TTS06 Small Break LOCA
- * TTS07 RCS Safety Valve Failure
- TTS08 RCS PORV Failure
- TTS09 Loss of Instrument Air
- TTS10 Station Blackout
- TTS11 DC Distribution Failure

ATTACHMENT B

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR
**DESCRIPTION OF SIMULATOR TESTING COMPLETED
SINCE JUNE 1990**

D. TRANSIENT TEST SERIES (Continued)

TEST DESCRIPTION

- TTS12 Emergency Diesel Generator
- TTS13 6.9 KV Bus Fault
- TTS14 4.16 KV Bus Fault
- TTS15 480 V Bus Fault
- TTS16 480 V MCC Fault
- TTS17 ICS Auto Power Failure
- TTS18 Inverter Failure
- * TTS19 Loss of Forced Flow
- TTS20 Loss of Condenser Vacuum
- TTS21 Condenser Level Control Failure
- TTS22 Loss of Service Water
- TTS23 Loss of Shutdown Cooling
- TTS24 Loss of Component Cooling
- TTS25 Loss of Normal Feedwater
- TTS26 Normal Feedwater System Failure
- * TTS27 Loss of all Feedwater
- TTS28 Loss of Protective System Channel
- TTS29 Stuck Control Rod
- TTS30 Continuous Rod Insertion
- TTS31 Dropped Rod
- TTS32 Uncoupled Rod
- TTS33 Inability to Drive Rods
- TTS34 Failed Fuel
- * TTS35 Turbine Trip
- TTS36 Generator Trip
- TTS37 Inadvertent OTSG Isolation
- TTS38 Inadvertent OTSG Overfeed
- TTS39 Pressurizer Level Control Failure
- TTS40 Pressurizer Heater Failure

ATTACHMENT B

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

**DESCRIPTION OF SIMULATOR TESTING COMPLETED
SINCE JUNE 1990**

D. TRANSIENT TEST SERIES (Continued)

TEST DESCRIPTION

- TTS41 Reactor Trip
- * TTS42 Main Steam Leak Inside RB
- TTS43 Main Steam Leak Outside RB
- TTS44 Main Feedwater Line Break Inside RB
- TTS45 Main Feedwater Line Break Outside RB
- TTS46 NI 5 Failure
- TTS47 NI 6 Failure
- TTS48 Pressurizer Level Control
- TTS49 Feedwater Flow Transmitter Failure
- TTS50 RC Cold Leg Temperature Transmitter Failure
- TTS51 OTSG Pressure Transmitter Failure
- TTS52 Emergency Diesel Generator Failure
- TTS53 Emergency Feedwater Failure
- TTS54 ESAS Actuation Failure
- TTS55 ATWS
- * TTS56 Manual Reactor Trip
- * TTS57 Simultaneous Closure of all MSIVs
- * TTS58 Loss of One RC Pump
- * TTS59 Maximum Rate Power Ramp
- * TTS60 Loss of Offsite Power with Design Basis LOCA

ATTACHMENT C

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

SIMULATOR CERTIFICATION TEST SCHEDULE

Annual Simulator Test Requirements

100% of ANSI/ANS 3.5-1985 Benchmark Tests (10)

25% of Transient Test Series (TTS)

25% of Normal Operations Tests (NOT)

100% Steady State Performance Tests (SSP)

100% Meter Accuracy Tests

Real Time Test

**Annual
Tests**

Quadrennial

Benchmark Tests	Additional *Year #1 Tests	*Year #2 Tests	*Year #3 Tests	*Year #4 Tests
TTS07	TTS01	TTS15	TTS30	TTS44
TTS19	TTS02	TTS16	TTS31	TTS45
TTS27	TTS03	TTS17	TTS32	TTS46
TTS35	TTS04	TTS18	TTS33	TTS47
TTS42	TTS05	TTS20	TTS34	TTS48
TTS56	TTS06	TTS21	TTS36	TTS49
TTS57	TTS08	TTS22	TTS37	TTS50
TTS58	TTS09	TTS23	TTS38	TTS51
TTS59	TTS10	TTS24	TTS39	TTS52
TTS60	TTS11	TTS25	TTS40	TTS53
	TTS12	TTS26	TTS41	TTS54
<u>Steady State Tests</u>	TTS13	TTS28	TTS43	TTS55
	TTS14	TTS29		
SSP01	NOT01	NOT08	NOT14	NOT20
SSP02	NOT02	NOT09	NOT15	NOT21
	NOT03	NOT10	NOT16	NOT22
<u>Real Time Test</u>	NOT04	NOT11	NOT17	NOT23
	NOT05	NOT12	NOT18	NOT24
	NOT06	NOT13	NOT19	NOT25
RTT01	NOT07			

- * Year #1 = July 1994 through June 1995
- * Year #2 = July 1995 through June 1996
- * Year #3 = July 1996 through June 1997
- * Year #4 = July 1997 through June 1998

ATTACHMENT D

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

DESCRIPTION OF SIMULATOR TESTING TO BE CONDUCTED

The following list describes the simulator certification tests to be conducted in support of the Three Mile Island Plant-Referenced Simulator certification program during the next four (4) years. The scheduled tests will be conducted in accordance with the four year test plan. When simulator modifications produce significant deviations in simulator response, selected certification tests will be conducted as part of the acceptance for the modification.

A. REAL TIME TEST

TEST DESCRIPTION

RTT01 Real Time Test

B. STEADY STATE PERFORMANCE TESTS

TEST DESCRIPTION

SSP01 Simulator Stability
SSP02 Simulator Accuracy

C. NORMAL OPERATIONS TESTS

TEST DESCRIPTION

NOT01 Plant Heatup
NOT02 Plant Start-up
NOT03 Reactor Trip and Recovery
NOT04 3 RC Pump Operations
NOT05 Zero Power Physics Testing
NOT06 Core Flood System Valve Operability Test
NOT07 Emergency Power System
NOT08 RB 30 PSIG Analog Channels
NOT09 Main Steam Isolation Valves Surveillance
NOT10 Main Steam Isolation Valves Monthly Surveillance
NOT11 Shift and Daily Checks Surveillance

ATTACHMENT D

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

DESCRIPTION OF SIMULATOR TESTING TO BE CONDUCTED

C. NORMAL OPERATIONS TESTS (Continued)

TEST DESCRIPTION

- NOT12 Weekly Surveillance Checks
- NOT13 RCS Leakrate
- NOT14 Control Rod Movement
- NOT15 RB Cooling and Isolation System Logic Channel and Component Test
- NOT16 Loading Sequence and Component Test and HPI Logic Channel Test
- NOT17 High Pressure Injection
- NOT18 RB Emergency Cooling System
- NOT19 ES System Emergency Sequence and Power Transfer Test
- NOT20 Turbine Overspeed Testing
- NOT21 Low Pressure Injection
- NOT22 Plant Shutdown
- NOT23 Plant Cooldown
- NOT24 Shutdown Margin and Reactivity Balance
- NOT25 Heat Balance Calculations

D. TRANSIENT TEST SERIES

TEST DESCRIPTION

- TTS01 OTSG Tube Leak
- TTS02 OTSG Tube Rupture
- TTS03 RCS Leak Inside Containment
- TTS04 RCS Leak Outside Containment
- TTS05 Large Break LOCA
- TTS06 Small Break LOCA
- TTS07 RCS Safety Valve Failure
- TTS08 RCS PORV Failure
- TTS09 Loss of Instrument Air
- TTS10 Station Blackout

ATTACHMENT D

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

DESCRIPTION OF SIMULATOR TESTING TO BE CONDUCTED

D. TRANSIENT TEST SERIES (Continued)

TEST DESCRIPTION

TTS11 DC Distribution Failure
TTS12 Emergency Diesel Generator
TTS13 6.9 KV Bus Fault
TTS14 4.16 KV Bus Fault
TTS15 480 V Bus Fault
TTS16 480 V MCC Fault
TTS17 ICS Auto Power Failure
TTS18 Inverter Failure
TTS19 Loss of Forced Flow
TTS20 Loss of Condenser Vacuum
TTS21 Condenser Level Control Failure
TTS22 Loss of Service Water
TTS23 Loss of Shutdown Cooling
TTS24 Loss of Component Cooling
TTS25 Loss of Normal Feedwater
TTS26 Normal Feedwater System Failure
TTS27 Loss of all Feedwater
TTS28 Loss of Protective System Channel
TTS29 Stuck Control Rod
TTS30 Continuous Rod Insertion
TTS31 Dropped Rod
TTS32 Uncoupled Rod
TTS33 Inability to Drive Rods
TTS34 Failed Fuel
TTS35 Turbine Trip
TTS36 Generator Trip
TTS37 Inadvertent OTSG Isolation
TTS38 Inadvertent OTSG Overfeed
TTS39 Pressurizer Level Control Failure
TTS40 Pressurizer Heater Failure
TTS41 Reactor Trip
TTS42 Main Steam Leak Inside RB

ATTACHMENT D

THREE MILE ISLAND PLANT-REFERENCED SIMULATOR

DESCRIPTION OF SIMULATOR TESTING TO BE CONDUCTED

D. TRANSIENT TEST SERIES (Continued)

TEST DESCRIPTION

- TTS43 Main Steam Leak Outside RB
- TTS44 Main Feedwater Line Break Inside RB
- TTS45 Main Feedwater Line Break Outside RB
- TTS46 NI 5 Failure
- TTS47 NI 6 Failure
- TTS48 Pressurizer Level Control
- TTS49 Feedwater Flow Transmitter Failure
- TTS50 RC Cold Leg Temperature Transmitter Failure
- TTS51 OTSG Pressure Transmitter Failure
- TTS52 Emergency Diesel Generator Failure
- TTS53 Emergency Feedwater Failure
- TTS54 ESAS Actuation Failure
- TTS55 ATWS
- TTS56 Manual Reactor Trip
- TTS57 Simultaneous Closure of all MSIVs
- TTS58 Loss of One RC Pump
- TTS59 Maximum Rate Power Ramp
- TTS60 Loss of Offsite Power with Design Basis LOCA