Commonwealth Edison Company
Byron Generating Station
4450 North German Church Road
Byron, IL 61010-9794
Tel 815-234-5441

ComEd

August 11, 1995

LTR: BYRON 95-0282
FILE: 1.10.0101

United States Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Byron Nuclear Power Station Units 1 and 2 "Byron Simulation Facility" Certification Renewal of Simulator Facility NRC Docket Number 50-454 and 50-455

REFERENCE: Title 10, Code of Federal Regulations, Part 55, Subpart E, Section 55.45, "Operating Tests"

Gentlemen:

The purpose of this letter is to submit the 1995 Byron Station Simulator Certification Report and NRC Form 474, Simulation Facility Certification. This report is being submitted as required by 10CFR55.45 on the fourth anniversary of the initial certification of the Byron Station Simulator. This submittal addresses both operating units at Byron Station with Byron Unit 1 serving as the reference plant.

The enclosed report describes performance tests conducted from 1991 to 1995 and provides a revised Performance Test Schedule for 1995 through 1999. These documents certify the Byron Simulation Facility meets the Nuclear Regulatory Commission's regulations.

NRC Forms 474 are enclosed due to the changes in the Performance Test Schedule.

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If you have any questions regarding this submittal, please contact Steve Pettinger, Operations Training Supervisor, at (815) 234-5441 ext. 3212 or Jeff Hamilton, Simulator Fidelity/Certification Coordinator, at (815) 234-5441 ext. 3221.

Respectfully,

K.L. Graesser
Site Vice President
Byron Nuclear Power Station

KLG/RC/rp

Attachment(s)

cc: H.J. Miller, NRC Regional Administrator - RIII
G.F. Dick Jr., Byron Project Manager - NRR
H. Peterson, Senior Resident Inspector - Byron
Office of Nuclear Facility Safety - IDNS

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NRC FORM 474 (10-92) U.S. NUCLEAR REGULATORY COMMISSION

SIMULATION FACILITY CERTIFICATION

APPROVED BY OMB: NO. 3150-0138
EXPIRES: 10/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 120 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0138), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

INSTRUCTIONS: This form is to be filed for initial certification, recertification (if required), and for any change to a simulation facility performance testing plan made after initial submittal of such a plan. Provide the following information and check the appropriate box to indicate reason for submittal.

FACILITY	DOCKET NUMBER
Byron Station - Unit 1	50- 454
LICENSEE	**DATE**
Com Ed	

This is to certify that:

1. The above named facility licensee is using a simulation facility consisting solely of a plant-referenced simulator that meets the requirements of 10 CFR 55.45.
2. Documentation is available for NRC review in accordance with 10 CFR 55.45(b).
3. This simulation facility meets the guidance contained in ANSI/ANS 3.5, 1985, as endorsed by NRC Regulatory Guide 1.149.

If there are any EXCEPTIONS to the certification of this item, CHECK HERE [ ] and describe fully on additional pages as necessary.

NAME (or other identification) AND LOCATION OF SIMULATION FACILITY

Byron Station Training Facility
4450 North German Church Road
Byron, IL 61010

[ ] SIMULATION FACILITY PERFORMANCE TEST ABSTRACTS ATTACHED. (For performance tests conducted in the period ending with the date of this certification.)

DESCRIPTION OF PERFORMANCE TESTING COMPLETED. (Attach additional pages as necessary and identify the item description being continued.)

See enclosure, four year Simulator Certification Renewal Report

[X] SIMULATION FACILITY PERFORMANCE TESTING SCHEDULE ATTACHED. (For the conduct of approximately 25* of performance tests per year for the four-year period commencing with the date of this certification.)

DESCRIPTION OF PERFORMANCE TESTING TO BE CONDUCTED. (Attach additional pages as necessary and identify the item description being continued.)

See enclosure, four year Simulator Certification Renewal Report and attached Malfunction Testing Schedule.

[X] PERFORMANCE TESTING PLAN CHANGE. (For any modification to a performance testing plan submitted on a previous certification.)

DESCRIPTION OF PERFORMANCE TESTING PLAN CHANGE (Attach additional pages as necessary and identify the item description being continued.)

See enclosure, Section IV.c of the four year Simulator Certification Renewal Report for Malfunctions added since the initial certification testing schedule.

[ ] RECERTIFICATION (Describe corrective actions taken, attach results of completed performance testing in accordance with 10 CFR 55.45(b)(5)(v). (Attach additional pages as necessary and identify the item description being continued.)

Any false statement or omission in this document, including attachments, may be subject to civil and criminal sanctions. I certify under penalty of perjury that the information in this document and attachments is true and correct.

SIGNATURE - AUTHORIZED REPRESENTATIVE	TITLE	DATE
K. C. Kaplan	Station Manager	8/9/95

In accordance with 10 CFR 55.5, Communications, this form shall be submitted to the NRC as follows:

BY MAIL ADDRESSED TO: DIRECTOR, OFFICE OF NUCLEAR REACTOR REGULATION, U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001

BY DELIVERY IN PERSON TO THE NRC OFFICE AT: ONE WHITE FLINT NORTH, 11555 ROCKVILLE PIKE, ROCKVILLE, MD

NRC FORM 474 (10-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0138
EXPIRES: 10/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 120 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0138), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

SIMULATION FACILITY CERTIFICATION

INSTRUCTIONS: This form is to be filed for initial certification, recertification (if required), and for any change to a simulation facility performance testing plan made after initial submittal of such a plan. Provide the following information and check the appropriate box to indicate reason for submittal.

FACILITY	DOCKET NUMBER
Byron Station - Unit 2	50- 455
LICENSEE	**DATE**
Com Ed	

This is to certify that:

1. The above named facility licensee is using a simulation facility consisting solely of a plant-referenced simulator that meets the requirements of 10 CFR 55.45.
2. Documentation is available for NRC review in accordance with 10 CFR 55.45(b).
3. This simulation facility meets the guidance contained in ANSI/ANS 3.5, 1985, as endorsed by NRC Regulatory Guide 1.149.

If there are any **EXCEPTIONS** to the certification of this item, CHECK HERE [ ] and describe fully on additional pages as necessary.

NAME *(or other identification)* AND LOCATION OF SIMULATION FACILITY

Byron Station Training Facility
4450 North German Church Road
Byron, IL 61010

[ ] SIMULATION FACILITY PERFORMANCE TEST ABSTRACTS ATTACHED. *(For performance tests conducted in the period ending with the date of this certification.)*

DESCRIPTION OF PERFORMANCE TESTING COMPLETED. *(Attach additional pages as necessary and identify the item description being continued.)*

See enclosure, four year Simulator Certification Renewal Report

[X] SIMULATION FACILITY PERFORMANCE TESTING SCHEDULE ATTACHED. *(For the conduct of approximately 25* of performance tests per year for the four-year period commencing with the date of this certification.)*

DESCRIPTION OF PERFORMANCE TESTING TO BE CONDUCTED. *(Attach additional pages as necessary and identify the item description being continued.)*

See enclosure, four year Simulator Certification Renewal Report and attached Malfunction Testing Schedule.

[X] PERFORMANCE TESTING PLAN CHANGE. *(For any modification to a performance testing plan submitted on a previous certification.)*

DESCRIPTION OF PERFORMANCE TESTING PLAN CHANGE *(Attach additional pages as necessary and identify the item description being continued.)*

See enclosure, Section IV.c of the four year Simulator Certification Renewal Report for Malfunctions added since the initial certification testing schedule.

[ ] RECERTIFICATION *(Describe corrective actions taken, attach results of completed performance testing in accordance with 10 CFR 55.45(b)(5)(v).)*
(Attach additional pages as necessary and identify the item description being continued.)

Any false statement or omission in this document, including attachments, may be subject to civil and criminal sanctions. I certify under penalty of perjury that the information in this document and attachments is true and correct.

SIGNATURE - AUTHORIZED REPRESENTATIVE	TITLE	DATE
K. E. Kofron	Station Manager	8/9/95

In accordance with 10 CFR 55.5, Communications, this form shall be submitted to the NRC as follows:

BY MAIL ADDRESSED TO: DIRECTOR, OFFICE OF NUCLEAR REACTOR REGULATION
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

BY DELIVERY IN PERSON TO THE NRC OFFICE AT: ONE WHITE FLINT NORTH
11555 ROCKVILLE PIKE

BYRON STATION SIMULATOR
FOUR YEAR CERTIFICATION REPORT
AUGUST, 1995

Simulator Certification Renewal Report Approval

Simulator Fidelity/Certification Coordinator — Date: 8-4-95

Operations Training Supervisor — Date: 8-4-95

Byron Station Training Supervisor — Date: 8-4-95

BYRON STATION SIMULATOR
FOUR YEAR CERTIFICATION REPORT
AUGUST, 1995

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Attachment: Certified Malfunction Test Schedule.

BYRON STATION SIMULATOR
FOUR YEAR CERTIFICATION REPORT
AUGUST, 1995

I. Introduction

The Byron Station Simulator is used to conduct NRC License operating tests and is therefore required to meet the criteria established in 10 CFR 55.45. To comply with this criteria, a report which identifies simulator testing status must be submitted every four years on the anniversary of the simulator certification. The Byron Station Simulator was originally certified on August 27, 1991.

The Commonwealth Edison owned Westinghouse PWR 4-loop, 3411 MW power plant simulator is used for training and testing the Byron Unit 1 and Unit 2 Operators. Because of the near exact duplication between the two units, it is considered a plant specific simulator for both Byron Unit 1 and Unit 2. The Byron Station Simulator is modeled after Byron Unit 1, with Byron Unit 1 being considered the referenced plant.

For the purposes of this report a certification year starts August 26 of the first year and ends August 25 of the next year.

II. References

A. Title 10, Code of Federal Regulations, Part 55, Subpart E, Section 55.45, "Operating Tests".

B. NRC Regulatory Guide 1.149, "Nuclear Power Plant Simulation Facilities for use in Operator License Examinations".

C. ANSI/ANS-3.5-1985, "Nuclear Power Plant Simulators for Use in Operator Training".

III. Reporting Requirements

The requirements of this report as outlined in 10 CFR 55.45 are :

A. Paragraph 55.45 (b)(5)(ii): Identify any uncorrected performance test failures, and submit a schedule for correction of such performance test failures, if any.

B. Paragraph 55.45 (b)(5)(vi): A description of performance testing completed for the simulation facility.

C. Paragraph 55.45 (b)(5)(vi): A description of performance tests, if different, to be conducted on the simulation facility during the subsequent four year period.

D. Paragraph 55.45 (b)(5)(vi): A schedule for the conduct of approximately 25 percent of the performance tests per year for the subsequent four years.

IV. Implementation

A. Identify any uncorrected performance test failures, and submit a schedule for correction of such performance test failures, if any.

1. All certified performance test failures have been corrected.

B. Description of performance testing completed for the simulation facility.

This section contains a description and the results of the performance testing completed during the last four year period.

1. Computer Real Time Test

The Computer Real Time Test is conducted annually using the Byron Simulator Real Time Test Procedure. This procedure verifies that the simulator complex operates in real time.

Certification year 1991/1992 Computer Real Time Test was satisfactory.
Certification year 1992/1993 Computer Real Time Test was satisfactory.
Certification year 1993/1994 Computer Real Time Test was satisfactory.
Certification year 1994/1995 Computer Real Time Test was satisfactory.

2. Steady State Tests

The Steady State Tests are conducted annually using the Byron Simulator Acceptance Test Procedure (Section 7.1, Steady State Testing).

The Steady State heat balance tests were performed at 30%, 90% and 100% power. These power levels were chosen due to the availability of Byron Unit 1 plant data. The simulator parameters were compared with plant data and heat balance information, all parameters were within the tolerances for critical and non-critical parameters as established in ANSI/ANS-3.5-1985.

The 100% power 60 minute stability test was performed by recording data at 100% power and then running the simulator for 60 minutes. Following 60 minutes of operation, data was recorded again. The final values did not vary more than ± 2% of the initial values. The test results are listed below:

Certification year 1991/1992 Steady State Tests were satisfactory.
Certification year 1992/1993 Steady State Tests were satisfactory.
Certification year 1993/1994 Steady State Tests were satisfactory.
Certification year 1994/1995 Steady State Tests were satisfactory.

3. Normal Operations Tests

Normal Operations Tests are conducted using the Byron Station General , Emergency Operating, and Operating Surveillance Procedures and using only operator actions normal to Byron Station. The Normal Operations Tests for certification year 1991/1992, consisted of performing all of the Normal Plant Evolutions listed in section 3.1.1 of ANSI/ANS-3.5-1985. The tests results are listed below:

Certification year 1991/1992 Normal Plant Operations Tests were satisfactory.

Effective with the 1992/1993 certification year, approximately 25% of the Normal Plant Evolutions listed in section 3.1.1 of ANSI/ANS-3.5-1985 was performed every year. Below is the normal operations test schedule and test results for certification years 1992/1993 through 1994/1995:

Certification year 1992/1993 - Plant startup from cold shutdown to hot standby, nuclear startup from hot standby to rated power, turbine startup and generator synchronization.

Certification year 1992/1993 Normal Plant Operations Tests were satisfactory.

Certification year 1993/1994 - Reactor trip followed by recovery to rated power, operations at hot standby and load changes.

Certification year 1993/1994 Normal Plant Operations Tests were satisfactory.

Certification year 1994/1995 - Surveillance testing on safety related equipment or systems (Surveillance Tests).

Certification year 1994/1995 Normal Plant Operations Tests were satisfactory.

4. Transient Tests

Transient tests are conducted annually using the Byron Simulator Acceptance Test Procedure (Section 7.2, Transient Tests).

The objective of the Byron Simulator Transient Tests is to verify the ability of the simulator to reproduce a defined set of transients. All transients listed in ANSI/ANS-3.5-1985 Appendix B 2.2 were performed. No operator followup action was taken. Data was collected as prescribed in ANSI/ANS-3.5-1985 Appendix B 2.2 at 0.5 second intervals. Transients were run until stable conditions were reached. The simulator response was reviewed by the Byron Simulator Transient Test Review Board. Where available, actual plant data was used to evaluate the simulator response. The test results are listed below:

Certification year 1991/1992 Transient Tests were satisfactory.
Certification year 1992/1993 Transient Tests were satisfactory.
Certification year 1993/1994 Transient Tests were satisfactory.
Certification year 1994/1995 Transient Tests were satisfactory.

5. Malfunction Tests

Malfunctions are tested using the Byron Simulator Acceptance Test Procedure (Section 4, Malfunction Testing). Approximately 25% of the certified malfunctions were tested each certification year in accordance with the test schedule submitted with the original certification report.

The test results are listed below:

Certification year 1991/1992 Certified Malfunction Tests were satisfactory.
Certification year 1992/1993 Certified Malfunction Tests were satisfactory
Certification year 1993/1994 Certified Malfunction Tests were satisfactory
Certification year 1994/1995 Certified Malfunction Tests were satisfactory

C. Description of performance tests, if different, to be conducted on the simulation facility during the subsequent four year period.

1. The following malfunction tests have been added to the certified malfunction test schedule:

CH05	ROD STUCK DURING HEAD REMOVAL
CH06	BREAK IN CONTAINMENT INTEGRITY
CH07	DROPPED FUEL BUNDLE DURING REFUELING
CH08	CONTAINMENT PRESSURE TRANSMITTER FAILURE
CV29	CHARGING PP DEGRADED IMPELLER
CV30	EXCESS LETDOWN LINE LEAK
CW04	NDCT CLOGGED FLUME SCREENS
FP03	FIRE DETECTION CAUSING CO2/HALON ACTUATION
HV02	AUX BLDG CHARCOAL BOOSTER FAN FAILS TO START/TRIP
MS11	LOW PRESS TURBINE INLET PRESS SWITCH FAILURE
RD14	CONTROL ROD SHEARED/UNCOUPLED SPIDER ASSEMBLY
RH11	RELIEF VALVE FAILURE
RP24	INADVERTENT SAFETY INJECTION
RP25	SSPS BLOWN GROUND RETURN FUSE
RP26	TRN A SAFEGUARD SEQUENCER RELAY FAILED DEENERGIZED
RP27	TRN A SAFEGUARD SEQUENCER RELAY FAILED ENERGIZED
RP28	TRN B SAFEGUARD SEQUENCER RELAY FAILED DEENERGIZED
RP29	TRN B SAFEGUARD SEQUENCER RELAY FAILED ENERGIZED
RX29	S/G FW REG VALVE AUTO CONTROLLER FAILURE
RX30	S/G FW REG BYPASS VALVE AUTO CONTROLLER FAILURE
RX31	S/G LEVEL SETPOINT FAILURE 1LI-505
SI12	SI ACCUMULATOR INCORRECT RELIEF VLV SETPOINT
TC18	INADVERTENT OTDT TURBINE RUNBACK
TH19	REACTOR VESSEL BOTTOM CRACK
TH20	PZR PORV ACCUMULATOR FAULTY RELIEF VLV SETPOINT
TH21	SAFETY VALVE SETPOINT FAILURE
TP04	CLOGGED GC FILTER

D. Schedule for the conduct of approximately 25 percent of the performance tests per year for the subsequent four years.

1. The following tests will be performed annually:

Computer Real Time Test.

Steady State Heat Balance Tests at 30%, 90% and 100% power.

100% Power 60 Minute Stability Test.

Manual Reactor Trip Transient Test.

Simultaneous Trip of all Main Feedwater Pumps Transient Test.

Simultaneous Closure of all Main Steam Isolation Valves Transient Test.

Simultaneous Trip of all Reactor Coolant Pumps Transient Test.

Trip of any single Reactor Coolant Pump Transient Test.

Main Turbine Trip From Less Than 30% Power Transient Test.

Maximum Rate Power Ramp Transient Test.

Maximum Size LOCA with a Loss of all Offsite Power Transient Test.

Maximum Size Unisolable Main Steamline Rupture Transient Test.

Slow Primary System Depressurization to Saturation Condition Transient Test.

2. The following performance tests will be performed during Certification Year 1995/1996:

Plant shutdown from rated power to hot standby and cooldown to cold shutdown conditions. This will include cooldown operations with less than full reactor coolant flow where applicable.

Approximately 25 percent of the malfunctions will be tested in accordance with the attached certified malfunction test schedule for the 1995/1996 annual testing period.

3. The following performance tests will be performed during Certification Year 1996/1997

   Plant heatup from cold shutdown to hot standby, nuclear startup from hot standby to rated power, turbine startup and generator synchronization. This will include heatup operations with less than full reactor coolant flow where applicable.

   Approximately 25 percent of the malfunctions will be tested in accordance with the attached certified malfunction test schedule for the 1996/1997 annual testing period.

4. The following performance tests will be performed during Certification Year 1997/1998

   Reactor trip followed by recovery to rated power, operations at hot standby, and load changes.

   Approximately 25 percent of the malfunctions will be tested in accordance with the attached certified malfunction test schedule for the 1997/1998 annual testing period.

5. The following performance tests will be performed during Certification Year 1998/1999:

   Calorimetric, Shutdown Margin, and Operator conducted surveillance testing on safety related equipment or systems (Surveillance Tests).

   Approximately 25 percent of the malfunctions will be tested in accordance with the attached certified malfunction test schedule for the 1998/1999 annual testing period.

BYRON SIMULATOR
MALFUNCTION TESTING SCHEDULE

NUMBER	TITLE	TEST CYCLE (QUARTER-YEAR)			
AN01	LOSS OF ANNUNCIATOR HORN	1st-1996			
AN02	LOSS OF FUSE TO THE AN CABINET RACK		1st-1997		
CC01	CCW PUMP FAILS TO STAR/TRIP	1st-1996			
CC02	CCW PUMP DISCH PRESS INDICATOR FAILURE	1st-1996			
CC03	CCW SURGE TANK LEVEL INDICATOR FAILURE		1st-1997		
CC04	ESSENTIAL CCW TO RHR HX LEAK	1st-1996			
CC05	CCW TO THE CCW HX PIPING BREAK		1st-1997		
CC06	NON-ESSENTIAL CCW SYSTEM LEAK			1st-1998	
CC07	RCP THERMAL BARRIER LEAK				1st-1999
CC08	CC HX TUBE LEAK				1st-1999
CC09	THERMAL BARRIER CCW FLOW X-MITTER FAILURE			1st-1998	
CH01	RCFC FAN FAILS TO START/TRIP, LOW SPEED		1st-1997		
CH02	RCFC FAN FAILS TO START/TRIP, HIGH SPEED			1st-1998	
CH03	CRDM FAN FAILS TO START/TRIP				1st-1999
CH04	REACTOR CAVITY BOOT FAILURE			1st-1998	
CH05	ROD STUCK DURING HEAD REMOVAL		1st-1997		
CH06	BREAK IN CONTAINMENT INTEGRITY		2nd-1997		
CH07	DROPPED FUEL BUNDLE DURING REFUELING			1st-1998	
CH08	CONTAINMENT PRESSURE TRANSMITTER FAILURE			2nd-1998	
CS01	CONTAINMENT SPRAY PUMP FAILS TO START/TRIP				1st-1999
CS02	CONTAINMENT SPRAY PUMP SUCTION LINE BREAK			1st-1998	
CV01	CHARGING PUMP FAILS TO START/TRIP		1st-1997		
CV02	PRI WATER MAKE-UP PUMP FAILS TO START/TRIP	1st-1996			
CV03	BORIC ACID XFER PUMP 1AB03P FAILS TO START/TRIP				1st-1999
CV04	VCT DIVERT VALVE FAILURE (112A)	1st-1996			
CV05	PCV 131 AUTO CONTROL FAILURE		1st-1997		
CV06	CLOGGED RCS FILTER (1CV3CF)	1st-1996			
CV07	CLOGGED SEAL INJ FILTER		1st-1997		
CV08	FAILURE OF PT-131 (LTDN PRESS)	1st-1996			
CV09	FAILURE OF TE-130 (LTDN HX TEMP)		1st-1997		
CV10	FLOW CONTROL VALVE 1CV121 FAILURE			1st-1998	
CV11	CVCS UNBORATED MIXED BED DEMINERALIZER	1st-1996			
CV12	LTDN RELIEF VALVE FAILS OPEN	1st-1996			
CV13	CHARGING LINE LEAK OUTSIDE CONTAINMENT		1st-1997		
CV14	REGENERATIVE HX TUBE LEAK	1st-1996			
CV15	SEALWATER HX TUBE LEAK		1st-1997		

BYRON SIMULATOR
MALFUNCTION TESTING SCHEDULE

NUMBER	TITLE	TEST CYCLE (QUARTER-YEAR)			
CV16	VCT LEVEL MALFUNCTION (112)			1st-1998	
CV17	VCT LEVEL MALFUNCTION (185)				1st-1999
CV18	VCT PRESS MALFUNCTION				1st-1999
CV19	MAKE-UP CONTROL FAILURE		1st-1997		
CV20	BORIC ACID FLOW TRANSMITTER (FT-110) FAILURE			1st-1998	
CV21	CHARGING HEADER HCV-182 CONTROL FAILURE				1st-1999
CV22	LTDN LINE LEAK INSIDE CONTAINMENT			1st-1998	
CV23	LTDN HX TUBE LEAK			1st-1998	
CV24	LTDN LINE LEAK OUTSIDE CONTAINMENT				1st-1999
CV25	CHARGING LINE LEAK INSIDE CONTAINMENT				1st-1999
CV26	SEAL INJ LINE LEAKS	1st-1996			
CV27	RCP SEAL #1 FAILURE			1st-1998	
CV28	RCP SEAL #2 FAILURE				1st-1999
CV29	CHARGING PP DEGRADED IMPELLER		4th-1996		
CV30	EXCESS LETDOWN LINE LEAK		4th-1997		
CW01	CIRC WATER PUMP FAILS TO START/TRIP		1st-1997		
CW02	CIRC WATER PUMP DISCHARGE VALVE FAILURE			1st-1998	
CW03	NDCT LOSS OF EFFICIENCY				1st-1999
CW04	NDCT CLOGGED FLUME SCREENS				1st-1999
ED01	345 KV SWITCHYARD BREAKER FAILS TO TRIP	1st-1996			
ED02	345 KV SWITCHYARD BREAKER TRIP		1st-1997		
ED03	FAILURE OF UNIT AUX TRANSFORMER (UAT)			1st-1998	
ED04	FAILURE OF SYSTEM AUX TRANSFORMER (SAT)				1st-1999
ED05	LOSS OF 6.9KV BUS	1st-1996			
ED06	FAILURE OF 6.9KV ABT		1st-1997		
ED07	LOSS OF 4160V BUS	1st-1996			
ED08	LOSS OF FEED TO 480V NON-ESF BUS OR MCC		1st-1997		
ED09	LOSS OF FEED TO 480V ESF BUS OR MCC			1st-1998	
ED10	LOSS OF 120 VAC ESF CONSTANT VOLTAGE XFMR	1st-1996			
ED11	120 VAC INSTRUMENT BUS INVERTER FAILURE		1st-1997		
ED12	LOSS OF DC DISTRIBUTION BUS				1st-1999
ED13	DC CONTROL POWER FAILURE (4160V)			1st-1998	
ED14	DC CONTROL POWER FAILURE (480V)				1st-1999
ED15	345 KV BUS FAULT	1st-1996			
ED16	LOSS OF FEED TO 120V NON-ESF PANEL			1st-1998	
ED17	LOSS OF FEED TO 120V ESF PANEL				1st-1999

BYRON SIMULATOR
MALFUNCTION TESTING SCHEDULE

NUMBER	TITLE	TEST CYCLE (QUARTER-YEAR)			
EG01	MAIN GENERATOR AUTO VOLTAGE REGULATOR FAILURE		1st-1997		
EG02	MAIN GENERATOR EXCITER FAILURE			1st-1998	
EG03	MAIN GENERATOR FIELD FORCING				1st-1999
EG04	BASE FOLLOWER UNIT FAILS TO TRACK	1st-1996			
EG05	MAIN POWER TRANSFORMER TRIP		1st-1997		
EG06	D/G FAILURE TO FLASH GENERATOR FIELD			1st-1998	
EG07	D/G ELECTRIC SPEED CONTROL FAILURE		2nd-1997		
EG08	D/G SEIZURE	1st-1996			
EG09	D/G DIFFERENTIAL OVERCURRENT TRIP		1st-1997		
FP01	MANUAL FIRE SUPRESSION WATER SYSTEM ACTIVATION			2nd-1998	
FP02	AUTO FIRE SUPRESSION WATER SYSTEM ACTIVATION				1st-1999
FP03	FIRE DETECTION CAUSING CO2/HALON ACTUATION		4th-1997		
FW01	MAIN FW PUMP FAILS TO START/TRIP (MOTOR)	2nd-1996			
FW02	MAIN FW PUMP FAILS TO START/TRIP (TURBINE)		2nd-1997		
FW03	START-UP FEED PUMP FAILS TO START/TRIP			2nd-1998	
FW04	MAIN FW OIL PUMP FAILS TO START/TRIP				2nd-1999
FW05	TURBINE DRIVEN MFP CONTROL VALVE FAILURE	2nd-1996			
FW06	TURBINE DRIVEN FW PUMP SPEED CONTROL FAILURE		2nd-1997		
FW07	FW PUMP SPEED CONTROL OSCILLATES			2nd-1998	
FW08	LOSS OF FW PUMP SPEED CONTROL				2nd-1999
FW09	S/G FW CONTROL VALVE FAILURE	2nd-1996			
FW10	FW REGULATION BYPASS VALVE FAILURE		2nd-1997		
FW11	FW TEMPERING LINE ISOLATION VALVE FAILURE			2nd-1998	
FW12	FW PREHEATER BYPASS VALVE FAILURE				2nd-1999
FW13	FW ISOLATION VALVE FAILURE	2nd-1996			
FW14	FEED LINE BREAK BETWEEN FW009 & CONTAINMENT		2nd-1997		
FW15	MAIN FW PUMP SHAFT BREAK			2nd-1998	
FW16	FW HEADER PRESS FAILURE				2nd-1999
FW17	HEATER DRAIN TANK LEVEL CONTROLLER FAILURE	2nd-1996			
FW18	FW HEATER TUBE LEAK (17)		2nd-1997		
FW19	FW LINE BREAK INSIDE CONTAINMENT			2nd-1998	
FW20	FW LINE BREAK OUTSIDE CONTAINMENT				2nd-1999
FW21	S/G TEMPERING LINE RUPTURE	2nd-1996			
FW22	CONDENSATE PUMP FAILS TO START/TRIP		2nd-1997		
FW23	FW HEATER BYPASS VALVE FAILURE (1CB025)			2nd-1998	
FW24	CONDENSER EXHAUST HOOD PRESS XMITTER FAILURE				2nd-1999

BYRON SIMULATOR
MALFUNCTION TESTING SCHEDULE

NUMBER	TITLE	TEST CYCLE (QUARTER-YEAR)			
FW25	GLAND STEAM CONDENSER MALFUNCTION	2nd-1996			
FW26	MAIN FEED REGULATING VALVE SEAT LEAKAGE		2nd-1997		
FW27	FW HEATER TUBE LEAK (11 DC)	2nd-1996			
FW28	FW HEATER TUBE LEAK (11)		2nd-1997		
FW29	FW HEATER TUBE LEAK (12)			2nd-1998	
FW30	FW HEATER TUBE LEAK (13)				2nd-1999
FW31	FW HEATER TUBE LEAK (14)	2nd-1996			
FW32	FW HEATER TUBE LEAK (15 DC)		2nd-1997		
FW33	FW HEATER TUBE LEAK (15)			2nd-1998	
FW34	FW HEATER TUBE LEAK (16)				2nd-1999
FW35	HEATER DRAIN PUMP FAILS TO START/TRIP			2nd-1998	
FW36	LOSS OF CONDENSER VACUUM				2nd-1999
FW37	HOTWELL LEVEL CONTROLLER FAILURE	2nd-1996			
FW38	HOTWELL LEVEL CONTROLLER FAILURE		2nd-1997		
FW39	HOTWELL LEVEL CONTROLLER FAILURE			2nd-1998	
FW40	HOTWELL LEVEL CONTROLLER FAILURE				2nd-1999
FW41	FW ISOL AUX RELAY FAILURE (TRAIN A)	2nd-1996			
FW42	FW ISOL AUX RELAY FAILURE (TRAIN B)		2nd-1997		
FW43	AUX FW PUMP FAILS TO START/TRIP (MOTOR)			2nd-1998	
FW44	AUX FW PUMP FAILS TO START/TRIP (TURBINE)				2nd-1999
FW45	AUX FW VALVE FAILURE	2nd-1996			
FW46	AUX FW LINE RUPTURE		2nd-1997		
HV01	CONTROL ROOM MAKE-UP FAN FAILS TO START/TRIP			2nd-1998	
HV02	AUX BLDG CHARCOAL BOOSTER FAN FAILS TO START/TRIP				2nd-1999
IA01	LOSS OF INSTRUMENT AIR	2nd-1996			
IA02	LOSS OF SERVICE AIR		2nd-1997		
IA03	IA LEAK INSIDE OF CONTAINMENT			2nd-1998	
IA04	IA LEAK ON THE TURBINE BLDG HEADER				2nd-1999
IA05	SERVICE AIR COMPRESSOR FAILS TO START/TRIP	2nd-1996			
IA06	MSIV ROOM HEADER LEAK		2nd-1997		
IA07	STEAM DUMP HEADER LEAK			2nd-1998	
IA08	AUX FEED VALVES HEADER LEAK				2nd-1999
IA09	PENETRATION AREA HEADER LEAK	2nd-1996			
MS01	FAILURE OF MAIN STEAM ISOLATION VALVE(S)		2nd-1997		
MS02	MSIV BYPASS VALVE FAILURE			2nd-1998	
MS03	S/G SAFETY VALVE FAILURE				2nd-1999

BYRON SIMULATOR
MALFUNCTION TESTING SCHEDULE

NUMBER	TITLE	TEST CYCLE (QUARTER-YEAR)			
MS04	S/G PORV CONTROLLER FAILURE	2nd-1996			
MS05	STUCK STEAM DUMP		2nd-1997		
MS06	MSR FAILS TO ISOLATE			2nd-1998	
MS07	STEAMLINE BREAK INSIDE CONTAINMENT				2nd-1999
MS08	STEAMLINE BREAK OUTSIDE CONTAINMENT	2nd-1996			
MS09	MAIN STEAM HEADER CROSS-TIE RUPTURE		2nd-1997		
MS10	HEATER 13 EXTRACTION STEAM LINE BREAK			2nd-1998	
MS11	LOW PRESS TURBINE INLET PRESS SWITCH FAILURE		3rd-1997		
NI01	SR CHANNEL FAILURE				2nd-1999
NI02	NOISY SR CHANNEL	2nd-1996			
NI03	SR CHANNEL HIGH VOLTAGE		2nd-1997		
NI04	FAILURE OF SR HIGH VOLTAGE TO DISCONNECT			2nd-1998	
NI05	SR DISCRIMINATOR FAILURE				2nd-1999
NI06	IR CHANNEL FAILURE	2nd-1996			
NI07	INTER. RANGE CHANNEL GAMMA COMPENSATION FAILURE		2nd-1997		
NI08	PR DETECTOR FAILURE			3rd-1998	
NI09	PR CHANNEL FAILURE				2nd-1999
NI10	INCORE MONITORING SYSTEM FAILURE	3rd-1996			
NI11	STUCK INCORE DETECTOR		3rd-1997		
NI12	LEAK INTO GUIDE TUBE FOR INCORE DETECTOR			3rd-1998	
RD01	ROD DRIVE MG SET TRIP				3rd-1999
RD02	DROPPED ROD	3rd-1996			
RD03	DROPPING ROD		3rd-1997		
RD04	ROD EJECTION			3rd-1998	
RD05	STUCK ROD				3rd-1999
RD06	RODS FAIL TO MOVE	3rd-1996			
RD07	UNCONTROLLED ROD MOVEMENT		3rd-1997		
RD08	DRPI - DATA CABINET FAILURE			3rd-1998	
RD09	AUTO ROD SPEED CONTROLLER FAILURE				3rd-1999
RD10	FAILURE ON LOGIC CABINET	3rd-1996			
RD11	POWER CABINET FAILURE		3rd-1997		
RD12	ROD STOPS FAIL			3rd-1998	
RD13	DRPI - OPEN OR SHORTED COIL				3rd-1999
RD14	CONTROL ROD SHEARED/UNCOUPLED SPIDER ASSEMBLY		4th-1996		
RH01	RHR PUMP FAILS TO START/TRIP	3rd-1996			
RH02	RHR HX FLOW CONTROL VALVE FAILURE		3rd-1997		

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MALFUNCTION TESTING SCHEDULE

NUMBER	TITLE	TEST CYCLE (QUARTER-YEAR)			
RH03	RHR HX BYPASS VALVE CONTROL FAILURE			3rd-1998	
RH04	RHR AUTO SWITCH-OVER MALFUNCTION				3rd-1999
RH05	RWST LEVEL TRANSMITTER MALFUNCTION	3rd-1996			
RH06	RHR HX TUBE LEAK		3rd-1997		
RH07	RHR HX BYPASS LINE LEAK			3rd-1998	
RH08	RWST LEAK				3rd-1999
RH09	RHR PUMP SUCTION HEADER BREAK	3rd-1996			
RH10	RHR PUMP DISCHARGE HEADER BREAK		3rd-1997		
RH11	RELIEF VALVE FAILURE			3rd-1998	
RM01	AREA RADIATION MONITOR ACTUATION				3rd-1999
RM02	INOPERABLE RADIATION MONITOR	3rd-1996			
RM03	INADVERTANT AUTO RADIATION MONITOR ACTUATION		3rd-1997		
RM04	PROCESS RADIATION MONITOR ACTUATION			3rd-1998	
RM05	RADIATION MONITOR INTERLOCK ACTUATION FAILURE				3rd-1999
RM06	GASEOUS AIR MONITOR FAILURE	3rd-1996			
RP01	REACTOR TRIP FAILURE		3rd-1997		
RP02	REACTOR TRIP BREAKER FAILURE			3rd-1998	
RP03	REACTOR TRIP BYPASS BREAKER FAILURE				3rd-1999
RP04	FAILURE OF PHASE A CNTMNT ISOL TO ACTUATE	3rd-1996			
RP05	FAILURE OF PHASE B CNTMNT ISOL TO ACTUATE		3rd-1997		
RP06	TURBINE TRIP INTERLOCK C-8 FAILS			3rd-1998	
RP07	UNDER-FREQUENCY ON RCP BUSES				3rd-1999
RP08	UNDER-VOLTAGE ON RCP BUS	3rd-1996			
RP09	INADVERTANT FW ISOLATION		3rd-1997		
RP10	INADVERTENT PHASE A CONTAINMENT ISOLATION			3rd-1998	
RP11	INADVERTENT PHASE B CONTAINMENT ISOLATION				3rd-1999
RP12	INADVERTENT CONTROL ROOM VENT ISOLATION	3rd-1996			
RP13	REACTOR TRIP PERMISSIVE P-4 FAILS TO ACTUATE		3rd-1997		
RP14	FAILURE OF SAFETY INJ TO ACTUATE			3rd-1998	
RP15	SAFEGUARD SEQUENCING FAILURE				3rd-1999
RP16	POWER PERMISSIVE P-6 FAILS TO ACTUATE	3rd-1996			
RP17	POWER PERMISSIVE P-7 FAILS TO ACTUATE		3rd-1997		
RP18	POWER PERMISSIVE P-8 FAILS TO ACTUATE			3rd-1998	
RP19	POWER PERMISSIVE P-10 FAILS TO ACTUATE				3rd-1999
RP20	PZR PRESS LOW PERMISSIVE P-11 FAILS TO ACTUATE	3rd-1996			
RP21	LO-LO TAVG PERMISSIVE P-12 FAILS TO ACTUATE		3rd-1997		

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MALFUNCTION TESTING SCHEDULE

NUMBER	TITLE	TEST CYCLE (QUARTER-YEAR)			
RP22	POWER PERMISSIVE P-13 FAILS TO ACTUATE			3rd-1998	
RP23	HI-HI S/G LEVEL PERMISSIVE P-14 FAILS TO ACTUATE				3rd-1999
RP24	INADVERTENT SAFETY INJECTION				2nd-1999
RP25	SSPS BLOWN GROUND RETURN FUSE			1st-1998	
RP26	TRN A SAFEGUARD SEQUENCER RELAY FAILED DEENERGIZED	4th-1995			
RP27	TRN A SAFEGUARD SEQUENCER RELAY FAILED ENERGIZED	4th-1995			
RP28	TRN B SAFEGUARD SEQUENCER RELAY FAILED DEENERGIZED	4th-1995			
RP29	TRN B SAFEGUARD SEQUENCER RELAY FAILED ENERGIZED	4th-1995			
RX01	STEAM PRESS DETECTOR FAILURE	3rd-1996			
RX02	UNSTABLE S/G LEVEL CONTROLLER		3rd-1997		
RX03	STEAM FLOW DETECTOR FAILURE			3rd-1998	
RX04	FW FLOW TRANSMITTER FAILURE				3rd-1999
RX05	STEAM LINE PRESS DETECTOR (PT-507) FAILURE	3rd-1996			
RX06	NARROW RANGE S/G LEVEL FAILURE		3rd-1997		
RX07	WIDE RANGE S/G LEVEL FAILURE			3rd-1998	
RX08	STEAM DUMP COOLDOWN VALVES CONTROL FAILURE				3rd-1999
RX09	STEAM FLOW OSCILLATION - TIME	3rd-1996			
RX10	FIRST STAGE PRESS TRANSMITTER FAILURE		3rd-1997		
RX11	STEAM FLOW OSCILLATION - MAGNITUDE			3rd-1998	
RX12	TREF FAILURE				3rd-1999
RX13	PZR LEVEL CHANNEL FAILURE	3rd-1996			
RX14	FW PUMP MASTER SPEED CONTROLLER FAILURE		3rd-1997		
RX15	PZR PRESS MASTER CONTROLLER FAILURE			3rd-1998	
RX16	PZR LEVEL MASTER CONTROLLER FAILURE				3rd-1999
RX17	ROD CONTROL SYSTEM FAILURE	3rd-1996			
RX18	FAULTY PRIMARY RTD (NARROW RANGE) (TC&TH)		4th-1996		
RX19	LOSS OF LOAD INTERLOCK C-7 FAILS		4th-1997		
RX20	CONDENSER AVAILABLE INTERLOCK C-9 FAILS				3rd-1999
RX21	PZR PRESS CHANNEL FAILURE (455 & 456)	4th-1995			
RX22	PZR PRESS CHANNEL FAILURE (457 & 458)		4th-1996		
RX23	OVERPOWER DELTA T SETPOINT FAILURE		4th-1997		
RX24	OVERTEMPERATURE DELTA T SETPOINT FAILURE			4th-1998	
RX25	RCS PRESS TRANSMITTER FAILURE (403 & 405)	4th-1995			
RX26	RCS PRESS TRANSMITTER FAILURE (406 & 407)		4th-1996		
RX27	RCS PRESS TRANSMITTER FAILURE (408 & 409)		4th-1997		
RX28	RCS LOOP FLOW TRANSMITTER FAILURE			4th-1998	

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MALFUNCTION TESTING SCHEDULE

NUMBER	TITLE	TEST CYCLE (QUARTER-YEAR)			
RX29	S/G FW REG VALVE AUTO CONTROLLER FAILURE			4th-1998	
RX30	S/G FW REG BYPASS VALVE AUTO CONTROLLER FAILURE				3rd-1999
RX31	S/G LEVEL SETPOINT FAILURE 1LI-505			4th-1998	
SI01	SAFETY INJ PUMP FAILS TO START/TRIP	4th-1995			
SI02	SI ACCUMULATOR LEVEL XMITTER FAILURE		4th-1996		
SI03	COLD LEG INJ CHECK VALVE LEAKAGE (SI8818)		4th-1997		
SI04	COLD LEG INJ CHECK VALVE LEAKAGE (SI8819)			1st-1998	
SI05	COLD LEG INJ CHECK VALVE LEAKAGE (SI8948)	4th-1995			
SI06	COLD LEG INJ CHECK VALVE LEAKAGE (SI8956)				1st-1999
SI07	HOT LEG INJ CHECK VALVE LEAKAGE (SI8905)		4th-1997		
SI08	HOT LEG INJ CHECK VALVE LEAKAGE (SI8841)			4th-1998	
SI09	HOT LEG INJ CHECK VALVE LEAKAGE (SI8949)	4th-1995			
SI10	HIGH HEAD SI LEAK INSIDE CONTAINMENT		4th-1996		
SI11	SI ACCUMULATOR TANK RUPTURE		4th-1997		
SI12	SI ACCUMULATOR INCORRECT RELIEF VLV SETPOINT	1st-1996			
SW01	SX PUMP FAILS TO START/TRIP			4th-1998	
SW02	SX BREAK INSIDE CONTAINMENT	4th-1995			
SW03	LOSS OF SX COOLING TO D/G		4th-1996		
SW04	SX DISCHARGE HEADER BREAK		4th-1997		
SW05	WS HEADER BREAK			4th-1998	
TC01	INADVERTENT TURBINE RUNBACK	4th-1995			
TC02	TURBINE TRIP ON LOW LOAD INDICATION (PDS-T0071)		4th-1996		
TC03	TURBINE AUTO TRIP FAILURE		4th-1997		
TC04	TURBINE AUTO RUNBACK FAILURE			4th-1998	
TC05	OPC - LP TURB INLET PRESS SENSOR (PT-MS003) FAILURE	4th-1995			
TC06	DEHC - IMPULSE PRESS TRANSMITTER FAILURE (PT-MS002)		4th-1996		
TC07	DEHC - MW TRANSDUCER FAILURE		4th-1997		
TC08	DEHC - GV/TV OSCILLATION - TIME			4th-1998	
TC09	DEHC - GV/TV OSCILLATION - MAGNITUDE	4th-1995			
TC10	LOSS OF DEHC SPEED CONTROL CHANNEL(S)		4th-1996		
TC11	LOSS OF DEHC SUPERVISORY SPEED CHANNEL		4th-1997		
TC12	EHC PILOT OPERATED IA VALVE STICKS (1EH5042)			4th-1998	
TC13	TV SERVO FAILURE - VALVE FAILS	4th-1995			
TC14	GV SERVO FAILURE - VALVE FAILS		4th-1996		
TC15	EH SYSTEM LEAK		4th-1997		
TC16	GOVERNOR VALVES NOT TRACKING AUTO			4th-1998	

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MALFUNCTION TESTING SCHEDULE

NUMBER	TITLE	TEST CYCLE (QUARTER-YEAR)			
TC17	EH PUMP FAILS TO START/TRIP	4th-1995			
TC18	INADVERTENT OTDT TURBINE RUNBACK			4th-1998	
TH01	PZR STEAM SPACE LEAK		4th-1996		
TH02	PZR RELIEF TANK LEAK		4th-1997		
TH03	S/G TUBE LEAK			4th-1998	
TH04	RCS LEAK, HOT LEG (HIGH)	4th-1995			
TH05	RCS LEAK, HOT LEG (MEDIUM)		4th-1996		
TH06	RCS LEAK, COLD LEG		4th-1997		
TH07	REACTOR VESSEL FLANGE LEAK			4th-1998	
TH08	RCS FUEL ELEMENT FAILURE	4th-1995			
TH09	RTD MANIFOLD FAULTY FLOW CONDITIONS		4th-1996		
TH10	PZR SPRAY VALVE FAILURE		4th-1997		
TH11	PZR POWER OPERATED RELIEF VALVE FAILURE			4th-1998	
TH12	PZR SAFETY VALVE FAILURE	4th-1995			
TH13	PZR LEVEL DETECTOR REF/VARIABLE LEG LEAK		4th-1996		
TH14	PZR RELIEF LINE RTD FAILURE		4th-1997		
TH15	RCS WIDE RANGE RTD FAILURE			4th-1998	
TH16	RCP FAILS TO START/TRIP	4th-1995			
TH17	RCP DEGRADED PERFORMANCE/LOCKED ROTOR		4th-1996		
TH18	RCP SHAFT BREAK		4th-1997		
TH19	REACTOR VESSEL BOTTOM CRACK			4th-1998	
TH20	PZR PORV ACCUMULATOR FAULTY RELIEF VLV SETPOINT		3rd-1997		
TH21	SAFETY VALVE SETPOINT FAILURE	2nd-1996			
TP01	STATOR COOLING WATER PUMP FAILS TO START/TRIP			4th-1998	
TP02	STATOR COOLING WATER HIGH CONDUCTIVITY	4th-1995			
TP03	SEAL OIL SYSTEM PUMP FAILS TO START/TRIP		4th-1996		
TP04	CLOGGED GC FILTER			3rd-1998	
TU01	TURBINE VIBRATION		4th-1997		
TU02	TURBINE BEARING OIL PUMP FAILS TO START/TRIP			4th-1998	
TU03	TURBINE HP SEAL OIL B/U PUMP FAILS TO START/TRIP	4th-1995			
TU04	TURBINE DC EMER OIL PUMP FAILS TO START/TRIP		4th-1997		
TU05	TURBINE OIL SYSTEM LEAK		4th-1996		
TU06	BEARING LIFT PUMP SUCTION STRAINER CLOG	3rd-1996			
WD01	GAS DECAY TANK RUPTURE		4th-1996		
YR01	LOSS OF RM-11 COMMUNICATION LOOP			4th-1998	