

Dresden Station Simulator
1999 Certification Report

I. Introduction

The Commonwealth Edison (ComEd) Company owned General Electric BWR 3, 2527 MWt power plant simulator, hereafter referred to as the Dresden Simulator or Simulator, is used to train the Dresden Station Units 2 and 3 operators. Because of the close duplication of the two units, it is considered a plant specific simulator for both Dresden Station, Units 2 and 3. The Simulator models Unit 2, which is considered the Reference Plant.

The Simulator was constructed by Apollo Systems, under contract with General Electric Company, and placed into operation in 1968. In 1986, ComEd and General Electric Company entered into a contract to upgrade and modify the Simulator in preparation for its subsequent purchase by ComEd. The contract was amended in 1988 to include modifications that occurred between January, 1986, the freeze date of the original contract, and October 1988. The Dresden Simulator was declared "Ready for Training" on March 18, 1991, and was then moved to the new ComEd Standardized Training Facility located at Dresden Nuclear Power Station, Morris, Illinois. The Dresden Simulator was ready to resume training on May 15, 1991.

II. References

- A. Title 10, Code of Federal Regulations, Part 55, "Operator Licenses," Subpart E, Section 45.
- B. U.S. Nuclear 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 10CFR55.45 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.
- 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 test, if different, to be conducted on the simulation facility during the subsequent 4 year period.
- D. Paragraph 55.45 (b) (5) (vi): A schedule for the conduct of approximately 25% of the performance tests per year for the subsequent 4 years.

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IV. Report of 10CFR55.45 requirements

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

There are no outstanding uncorrected performance test failures. Several previously certified malfunctions are to be modified to enhance their usability in training. None of these malfunctions are needed to satisfy ANSI/ANS 3.5-1985, Section 3.1.2, "Plant Malfunctions," and will not be authorized for training without individual testing, until the work request has been completed.

- B. A description of Performance Training Testing Completed for the Simulation Facility.

The Dresden Simulator completed all annual and quadrennial performance test for the years 1995-1999 as scheduled in the previous Dresden Simulator four year report dated March 14, 1995. Dresden procedures still do NOT allow hot standby operation, so the normal operations tests that require hot standby conditions are still deleted from the schedule.

1. Computer Real Time Testing is done annually, and has been satisfactory from 1995 through 1999.
2. Steady State Testing is done annually, and has been satisfactory each year from 1995 through 1999.
3. Normal Operations Tests are conducted using the Dresden Station Procedures and using only operator actions normal to Dresden Station. The normal Operations Test, for certification year 1991/1992, consisted of all of the Normal Plant Evolutions listed in Section 3.1.1 of ANSI/ANS 3.5-1985.
4. Malfunction testing is done at a rate of 25% per year, and has been satisfactory each year from 1995 through 1999, with a few minor exceptions that were or are being corrected by the work request process. Work requests are open on several malfunctions to enhance their usability, and these malfunctions will not be authorized for training unless individually tested prior to their use. None of these malfunctions are needed to satisfy the requirements of ANSI/ANS-3.5-1985, Section 3.1.2, "Plant Malfunctions."

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- C. A description of Performance Tests, if different, to be conducted on the simulation facility during the subsequent 4 year period.
1. The following model changes, both logic and dynamics, have been completed on the simulator since the last Four Year Certification Report dated March 14, 1995.
 - Nuclear Vessel Instrumentation
 - Station Black Out Diesel
 - Sequence of Event System
 - Feed Water Level Control
 - Isolation Condenser
 - Lift Station
 - Plant Process Computer
 - 345/138 Kv
 - Main Steam Line Radiation Monitors
 2. The following upgrades have been put in place since the last report:
 - Implementation of "Switch Check"
 - Installation of "Back Panels"
 - Installation of all "New" Input/Output (I/O) devices.
 - Installation of "New" carpeting.
 3. Various Plant Design changes handled in accordance with ANSI/ANS-3.5-1985, Section 5.2, were previously reported in the Annual Update report.
 4. Due to model changes and upgrades since the report of March 14, 1995, the malfunction testing schedule and original list of malfunctions has changed. Attachment "A" contains a complete performance testing schedule of all currently certified malfunctions, for test years 99/00 – 02/03.

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5. The Performance Test Schedule for 1999/2000 – 2002/2003 is identical to the four-year letter of March 14, 1995, with the exception of the addition of some new malfunctions. The test schedule is as follows:

<u>Description:</u>	<u>Next Test:</u>
a. Real Time Test	Annually
b. Steady State Test	Annually
c. Transient Test	Annually
1) Manual Scram	
2) Loss of All Feedwater	
3) Closure of MSIVs	
4) Trip of one Recirc Pump	
5) Trip of Both Recirc Pumps	
6) Main Turbine Trip (not resulting in Reactor Scram)	
7) Ramp power down and then back up	
8) LOCA with Loss of Power	
9) Main Steam Line Rupture	
10) MSIV Closure and with Stuck Open SRV	
d. Normal Operations Test	25% Annually
1) Normal Unit Startup (DGP 1-1)	2001
2) Turbine Startup (DGP 1-1)	2001
3) Reactor Trip and Recovery (DGP 2-3)	2000
4) Routine Power Changes (DGP 3-1)	2000
5) Startup/Shutdown & Power Operations with less than full reactor coolant flow (DGPs 1-3/2-4, Deleted)	(See note 1)
6) Shutdown and Cooldown (DGP 2-1)	2002
7) Operator Conducted Surveillances on Safety Related equipment or systems.	2003
8) Core Performance Testing	(See Note 2)

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Notes:

1. Item C.5.d(5) was not performed, since "startup and shutdown with reduced flow" is not a permitted evolution at Dresden. Operations in "Hot Standby" is no longer allowed; therefore, this normal operations evolution has been deleted from the schedule.
2. Item C.5.d(8) only needs to be performed only when the simulator core model has been replaced or modified.

"Current Certified Malfunctions"

SysNum	Syntax	Description	RecertDate
0201			
	A55	ENABLE FULL CORE OSCILLATION	02/03
	RLR	REDUCED LEAK RATE	99/00
0202			
	F41	LOOP A SUCTION BREAK STATUS	02/03
	F42	LOOP B SUCTION BREAK STATUS	02/03
	F43	LOOP A DISCHARGE BREAK STATUS	02/03
	F44	LOOP B DISCHARGE BREAK STATUS	02/03
	FP1	LOOP A SUCTION BREAK SIZE	02/03
	FP2	LOOP B SUCTION BREAK SIZE	02/03
	FP3	LOOP A DISCHARGE BREAK SIZE	02/03
	FP4	LOOP B DISCHARGE BREAK SIZE	02/03
	RRM004AF	RECIRC PUMP SUCTION VALVE 4A OVERLOAD TRIP	99/00
	RRM004BF	RECIRC PUMP SUCTION VALVE 4B OVERLOAD TRIP	99/00
	RRM005AF	RECIRC PUMP DISCHARGE VALVE 5A OVERLOAD TRIP	99/00
	RRM005BF	RECIRC PUMP DISCHARGE VALVE 5B OVERLOAD TRIP	99/00
	RRMAFDBK	MG SET 2A SPEED FEEDBACK SIGNAL (TCH) FAILURE	99/00
	RRMASDND	MASTER CONTROLLER FAIL DOWNSCALE POT 0 -1.0	99/00
	RRMASDNF	MASTER CONTROLLER FAIL DOWNSCALE FLAG	99/00
	RRMASUNS	MASTER CONTROLLER UNSTABLE	99/00
	RRMASUPD	MASTER CONTROLLER FAIL UPSCALE POT 0 - 1.0	99/00
	RRMASUPF	MASTER CONTROLLER FAIL UPSCALE FLAG	99/00
	RRMAUNST	MG SET 2A CONTROLLER SIGNAL UNSTABLE	99/00
	RRMBFDBK	MG SET 2B SPEED FEEDBACK SIGNAL (TCH) FAILURE	99/00
	RRMBUNST	MG SET 2B CONTROLLER SIGNAL UNSTABLE	99/00

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
	RRMDIFFA	MG SET 2A GENERATOR DIFFERENTIAL CURRENT	99/00
	RRMDIFFB	MG SET 2B GENERATOR DIFFERENTIAL CURRENT	99/00
	RRMFAEXH	MG SET 2A VENT Supply Filter Clogging	99/00
	RRMFBEXH	MG SET 2B VENT Supply Filter Clogging	99/00
	RRMFNALO	MG SET VENT FAN 2A TRIP	99/00
	RRMFBLO	MG SET VENT FAN 2B TRIP	99/00
	RRMGGAHI	MG SET 2A GENERATOR HIGH TEMPERATURE	99/00
	RRMGGBHI	MG SET 2B GENERATOR HIGH TEMPERATURE	99/00
	RRMGMAHI	MG SET 2A MOTOR HIGH TEMPERATURE	99/00
	RRMGMAOC	MG SET 2A MOTOR OVERCURRENT	99/00
	RRMGMBHI	MG SET 2B MOTOR HIGH TEMPERATURE	99/00
	RRMGMBOC	MG SET 2B MOTOR OVERCURRENT	99/00
	RRMINCSA	MG SET 2A INCOMPLETE SEQUENCE START	99/00
	RRMINCSB	MG SET 2B INCOMPLETE SEQUENCE START	99/00
	RRMNEUTA	MG SET 2A GENERATOR NEUTRAL OVERVOLTAGE	99/00
	RRMNEUTB	MG SET 2B GENERATOR NEUTRAL OVERVOLTAGE	99/00
	RRMPMAHI	RECIRC PUMP 2A MOTOR HIGH TEMPERATURE	99/00
0250	ADS3?BFF	ADS VALVE BELLOWS FAILURE (ADS3ABFF)	99/00
	ADS3?BNF	ADS VALVE BINDING FLAG (ADS3ABNF)	99/00
	ADS3?BNS	ADS VALVE BINDING SETPOINT (ADS3ABNS .50)	99/00
	ADS3?SDS	ADS VALVE SETPOINT DRIFT SETPOINT (ADS3ASDS 400)	99/00
	ADS3?SFF	ADS VALVE SOLENOID FAILURE (ADS3ASFF)	99/00
	ADS4?BNF	SAFETY VLV BINDING FLAG	99/00
	ADS4?BNS	SAFETY VLV BINDING SETPOINT	99/00
	ADS4?SDF	SAFETY VLV SET POINT DRIFT FLAG	99/00
	ADS4?SDS	SAFETY VLV DRIFT SETPOINT	99/00

SysNum	Syntax	Description	RecertDate
I01		MSIV 203-1A FAST CLOSURE	00/01
I02		MSIV 203-1C SLOW CLOSURE	00/01
I03		MSIV 203-2B FAST CLOSURE	00/01
I04		MSIV 203-2C FAST CLOSURE	00/01
I11		MSIV 203-2B (OUTBOARD) DRIFT CLOSED	99/00
I12		MSIV 203-1A MECHANICAL BINDING	99/00
I13		MSIV 203-1B MECHANICAL BINDING	99/00
I14		MSIV 203-1C MECHANICAL BINDING	99/00
I15		MSIV 203-1D MECHANICAL BINDING	99/00
I16		MSIV 203-2A MECHANICAL BINDING	99/00
I17		MSIV 203-2B MECHANICAL BINDING	99/00
I18		MSIV 203-2C MECHANICAL BINDING	99/00
I19		MSIV 203-2D MECHANICAL BINDING	99/00
I21		STEAM LEAK BEFORE RESTRICTORS STATUS	99/00
I22		STEAM LEAK AFTER RESTRICTORS STATUS	99/00
I31		STEAM LINE RUPTURE IN TUNNEL STATUS	99/00
IP1		STEAM LEAK BEFORE RESTRICTORS SIZE	99/00
IP2		STEAM LEAK AFTER RESTRICTORS SIZE	99/00
IP3		STEAM LINE RUPTURE IN TUNNEL SIZE	99/00
0260			
NVMP156F		ATS "A" Pressure Trans. Variance Flag	99/00
NVMP156P		ATS "A" Pressure Trans. Variance Pot (-1500..1500)	99/00
NVMP20AF		ATWS "A" Pressure Trans. Variance Flag	99/00
NVMP20AP		ATWS "A" Pressure Trans. Variance Pot (-1500..1500)	99/00
NVMP20BF		ATWS "B" Pressure Trans. Variance Flag	99/00
NVMP20BP		ATWS "B" Pressure Trans. Variance Pot (-1500..1500)	99/00
NVMP20CF		ATWS "C" Pressure Trans. Variance Flag	99/00

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
	NVMP20CP	ATWS "C" Pressure Trans. Variance Pot (-1500..1500)	99/00
	NVMP20DF	ATWS "D" Pressure Trans. Variance Flag	99/00
	NVMP20DP	ATWS "D" Pressure Trans. Variance Pot (-1500..1500)	99/00
	NVMPR27F	ATS "B" Pressure Trans. Variance Flag	99/00
	NVMPR27P	ATS "B" Pressure Trans. Variance Pot (-1500..1500)	99/00
0263			
	NVM100AF	MR-A LI 100A Trans Output Adjust Flag	99/00
	NVM100AP	MR-A LI 100A Trans Output Adjust Pot (-120..120)	99/00
	NVM100BF	MR-B LI 100B Trans Output Adjust Flag	99/00
	NVM100BP	MR-B LI 100B Trans Output Adjust Pot (-120..120)	99/00
	NVM106AF	FZ-A 2/3 Core Height Transmitter Adj Flag	99/00
	NVM106AP	FZ-A 2/3 Core Height Transmitter Adj Pot (-400 ..400)	99/00
	NVM106BF	FZ-B 2/3 Core Height Transmitter Adj Flag	99/00
	NVM106BP	FZ-B 2/3 Core Height Transmitter Adj Pot (-400 ..400)	99/00
	NVML112F	WR LI-112 & 101 Transmitter Adj. Flag	99/00
	NVML112P	WR LI-112 & 101 Transmitter Adj. Pot (-400 ..400)	99/00
	NVML23AF	ATWS Transmitter A Output Adjust Flag	99/00
	NVML23AP	ATWS Transmitter A Output Adjust Pot (-120..120)	99/00
	NVML23BF	ATWS Transmitter B Output Adjust Flag	99/00
	NVML23BP	ATWS Transmitter B Output Adjust Pot (-120..120)	99/00
	NVML23CF	ATWS Transmitter C Output Adjust Flag	99/00
	NVML23CP	ATWS Transmitter C Output Adjust Pot (-120..120)	99/00
	NVML23DF	ATWS Transmitter D Output Adjust Flag	99/00
	NVML23DP	ATWS Transmitter D Output Adjust Pot (-120..120)	99/00
	NVML57AF	MR-A GP. 1,2,3 scram Trans Adj. Flag	99/00
	NVML57AP	MR-A GP. 1,2,3 scram Trans Adj. Pot (-120..120)	99/00
	NVML58BF	MR-B GP. 1,2,3 scram Trans Adj. Flag	99/00

SysNum	Syntax	Description	RecertDate
	NVML58BP	MR-B GP. 1,2,3 scram Trans Adj. Pot (-120..120)	99/00
	NVML72AF	MR A&C ECCS Trans. Output Adjust Flag	99/00
	NVML72AP	MR A&C ECCS Trans. Output Adjust Pot (-120..120)	99/00
	NVML72BF	MR B&D ECCS Trans. Output Adjust Flag	99/00
	NVML72BP	MR B&D ECCS Trans. Output Adjust Pot (-120..120)	99/00
0300			
	RDASUCLG	CRD SUCTION FILTER "A" CLOGGING	01/02
	RDFCFHI	CRD FLOW CONTROLLER FAILED HI	01/02
	RDFCFLO	CRD FLOW CONTROLLER FAILED LOW	01/02
	RDFCVFCL	CRD FLOW CONTROL VALVE FAILED CLOSED	01/02
	RDFHYLK	FULL HYDRAULIC LOCK	01/02
	RDHITEMP	CRD HIGH TEMPERATURE	01/02
	RDHLDEGA	WEST SDV HYDRAULIC LOCK DEGRADATION 0 - 100%	01/02
	RDHLDEGB	EAST SDV HYDRAULIC LOCK DEGRADATION 0 - 100%	01/02
	RDHLVFPA	WEST SDV HYDRAULIC LOCK VOLUME FILL 0 - 100%	01/02
	RDHLVFPB	EAST SDV HYDRAULIC LOCK VOLUME FILL 0 - 100%	01/02
	RDPPATRP	CRD PUMP "A" TRIP	01/02
	RDPPBTRP	CRD PUMP "B" TRIP	01/02
	RDRMCSTF	RMCS TIMER MALFUNCTION	01/02
	RDWSLD	WORN SEAL LEAK DEGRADATION POT 0 - 100%	01/02
	ROD???AT	ACCUM TROUBLE FOR ROD (???)	01/02
	ROD???DI	DRIFT IN FOR ROD (???)	01/02
	ROD???DN	DOUBLE NOTCH FOR ROD (???)	01/02
	ROD???DO	DRIFT OUT FOR ROD (???)	01/02
	ROD???ST	STUCK CONTROL ROD (???)	01/02
	ROD???UC	UNCOUPLE CONTROL ROD (???)	01/02
	ROD???WS	WORN SEAL FOR ROD (???)	01/02

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
0400			
	RDFAILM4	ROD M-04 FAILURE OF RPIS INPUTS TO RWM	01/02
0500			
	B01	RPS MG A (BUS B) FAILURE	99/00
	B02	RPS MG B (BUS A) FAILURE	99/00
	B06	RPS SUBCHANNEL A TRIP	99/00
	B07	RPS SUBCHANNEL B TRIP	99/00
	B08	RX SCRAM GR II ISOLATION INST. DRIFT	00/01
	B09	RX SCRAM GR II ISOLATION INST. DRIFT FLAG	00/01
	B12	RPS SYSTEM FAIL TO SCRAM	99/00
	B14	PARTIAL HALF SCRAM RPS CH A	99/00
	B15	PARTIAL HALF SCRAM RPS CH B	99/00
0600			
	NVML29AF	NR- LI 29A Transmitter Adj. Flag	99/00
	NVML29AP	NR- LI 29A Transmitter Adj. Pot (-60 ..60)	99/00
	NVML29BF	NR- LI 29B Transmitter Adj. Flag	99/00
	NVML29BP	NR- LI 29B Transmitter Adj. Pot (-60 ..60)	99/00
	NVML59AF	MR-A Runout Flw Trans. Adjust Flag	99/00
	NVML59AP	MR-A Runout Flw Trans. Adjust Pot (-120..120)	99/00
	NVML59BF	MR-B Runout Flw Trans. Adjust Flag	99/00
	NVML59BP	MR-B Runout Flw Trans. Adjust Pot (-120..120)	99/00
	NVMP25AF	FWLC PI -25A Press. Trans. Variance Flag	99/00
	NVMP25AP	FWLC PI -25A Press. Trans. Variance Pot (-1200..1200)	99/00
	NVMP25BF	FWLC PI -25B Press. Trans. Variance Flag	99/00
	NVMP25BP	FWLC PI -25B Press. Trans. Variance Pot (-1200..1200)	99/00
	NVMP28F	NR Pressure Trans. Variance (Flag)	99/00
	NVMP28P	NR Pressure Trans. Variance POT (-100..100)	99/00

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
0700			
	LPXXYYLD	LPRM XXYY AT LEVEL L (A,B,C,D) Fails downscale	02/03
	LPXXYYLU	LPRM XXYY AT LEVEL L (A,B,C,D) Fails upscale	02/03
	LPXXYYLW	LPRM XXYY AT LEVEL L (A,B,C,D) Whisker Spike	02/03
	NIA1FLG	APRM Channel 1 Fail to (0 - 125%) (Flag)	99/00
	NIA1POT	APRM Channel 1 Fail to (0 - 125%) (Pot)	99/00
	NIA2FLG	APRM Channel 2 Fail to (0 - 125%) (Flag)	99/00
	NIA2POT	APRM Channel 2 Fail to (0 - 125%) (Pot)	99/00
	NIA3FLG	APRM Channel 3 Fail to (0 - 125%) (Flag)	99/00
	NIA3POT	APRM Channel 3 Fail to (0 - 125%) (Pot)	99/00
	NIA4FLG	APRM Channel 4 Fail to (0 - 125%) (Flag)	99/00
	NIA4POT	APRM Channel 4 Fail to (0 - 125%) (Pot)	99/00
	NIA5FLG	APRM Channel 5 Fail to (0 - 125%) (Flag)	99/00
	NIA5POT	APRM Channel 5 Fail to (0 - 125%) (Pot)	99/00
	NIA6FLG	APRM Channel 6 Fail to (0 - 125%) (Flag)	99/00
	NIA6POT	APRM Channel 6 Fail to (0 - 125%) (Pot)	99/00
	NII11DET	IRM Channel 11 Detector Stuck	99/00
	NII11FLG	IRM Channel 11 Fail to (0 -125%) (Flag)	99/00
	NII11POT	IRM Channel 11 Fail to (0 -125%) (Pot)	99/00
	NII12DET	IRM Channel 12 Detector Stuck	99/00
	NII12FLG	IRM Channel 12 Fail to (0 -125%) (Flag)	99/00
	NII12POT	IRM Channel 12 Fail to (0 -125%) (Pot)	99/00
	NII13DET	IRM Channel 13 Detector Stuck	99/00
	NII13FLG	IRM Channel 13 Fail to (0 -125%) (Flag)	99/00
	NII13POT	IRM Channel 13 Fail to (0 -125%) (Pot)	99/00
	NII14DET	IRM Channel 14 Detector Stuck	99/00
	NII14FLG	IRM Channel 14 Fail to (0 -125%) (Flag)	99/00

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
NII14POT		IRM Channel 14 Fail to (0 -125%) (Pot)	99/00
NII15DET		IRM Channel 15 Detector Stuck	99/00
NII15FLG		IRM Channel 15 Fail to (0 -125%) (Flag)	99/00
NII15POT		IRM Channel 15 Fail to (0 -125%) (Pot)	99/00
NII16DET		IRM Channel 16 Detector Stuck	99/00
NII16FLG		IRM Channel 16 Fail to (0 -125%) (Flag)	99/00
NII16POT		IRM Channel 16 Fail to (0 -125%) (Pot)	99/00
NII17DET		IRM Channel 17 Detector Stuck	99/00
NII17FLG		IRM Channel 17 Fail to (0 -125%) (Flag)	99/00
NII17POT		IRM Channel 17 Fail to (0 -125%) (Pot)	99/00
NII18DET		IRM Channel 18 Detector Stuck	99/00
NII18FLG		IRM Channel 18 Fail to (0 -125%) (Flag)	99/00
NII18POT		IRM Channel 18 Fail to (0 -125%) (Pot)	99/00
NIR7FLG		RBM Channel 7 Fail to (0 - 125%) (Flag)	99/00
NIR7POT		RBM Channel 7 Fail to (0 - 125%) (Pot)	99/00
NIR8FLG		RBM Channel 8 Fail to (0 - 125%) (Flag)	99/00
NIR8POT		RBM Channel 8 Fail to (0 - 125%) (Pot)	99/00
NIS21Det		SRM Channel 21 Detector Stuck	99/00
NIS21FLG		SRM Channel 21 Fail to (1.0X10 ⁻¹ - 6.0X10 ⁺⁵ CPS) (Flag)	99/00
NIS21Pot		SRM Channel 21 Fail to (1.0X10 ⁻¹ - 6.0X10 ⁺⁵ CPS) (Pot)	99/00
NIS22Det		SRM Channel 22 Detector Stuck	99/00
NIS22FLG		SRM Channel 22 Fail to (1.0X10 ⁻¹ - 6.0X10 ⁺⁵ CPS) (Flag)	99/00
NIS22Pot		SRM Channel 22 Fail to (1.0X10 ⁻¹ - 6.0X10 ⁺⁵ CPS) (Pot)	99/00
NIS23Det		SRM Channel 23 Detector Stuck	99/00
NIS23FLG		SRM Channel 23 Fail to (1.0X10 ⁻¹ - 6.0X10 ⁺⁵ CPS) (Flag)	99/00
NIS23Pot		SRM Channel 23 Fail to (1.0X10 ⁻¹ - 6.0X10 ⁺⁵ CPS) (Pot)	99/00
NIS24Det		SRM Channel 24 Detector Stuck	99/00

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
	NIS24FLG	SRM Channel 24 Fail to (1.0X10 ⁻¹ - 6.0X10 ⁺⁵ CPS) (Flag)	99/00
	NIS24Pot	SRM Channel 24 Fail to (1.0X10 ⁻¹ - 6.0X10 ⁺⁵ CPS) (Pot)	99/00
1000			
	SDLKACT?	SDC LOOP (?) SYSTEM LEAK FLAG	01/02
	SDLKPOT?_	SDC SYSTEM LEAK POT SET AT ? (1 - 100%)	01/02
	SDPMPOC?	SDC PUMP (?) MAGNETIC OVERLOAD TRIP - NOT INSTANTANEOUS	00/01
1100			
	SCPMPOCA	2A SBLC PUMP OVERCURRENT TRIP	01/02
	SCPMPOCB	2B SBLC PUMP OVERCURRENT TRIP	01/02
	SCRLFVAD	2A RELIEF VALVE SETPOINT DRIFT 0 - 1500 PSIG	99/00
	SCRLFVBD	2B RELIEF VALVE SETPOINT DRIFT 0 - 1500 PSIG	01/02
1200			
	CIRWCUAP	INCOMPLETE RWCU INBOARD ISOLATION	00/01
	CIRWCUBP	INCOMPLETE RWCU OUTBOARD ISOLATION	00/01
	CIRWCUI	SPURIOUS RWCU ISOLATION CIRCUIT FAILURE	00/01
	U11	RWCU PUMP 1205A OVERCURRENT TRIP	99/00
	U12	RWCU PUMP 1205B OVERCURRENT TRIP	99/00
	U13	RWCU PUMP 1206 OVERCURRENT TRIP	99/00
	U21	RWCU PRESSURE CONTROL VLV FAIL OPEN	99/00
	U22	RWCU PRESSURE INSTABILITY	99/00
	U31	STAT OF LEAK DWNSTRM OF RWCU VLV 1	00/01
	U32	LEAK DWNSTRM OF RWCU VLV 1	00/01
	U33	RWCU STAT OF LEAK AT MAIN PUMP SUCTION	99/00
	U34	RWCU LEAK AT MAIN PUMP SUCTION	99/00
1300			
	IC1VBNF	FLAG IC VALVE 2-1301-1 BINDS 0%-100% 0%=CLSD 100%=FULL OPN	01/02

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
	IC1VBNP	POT IC VALVE 2-1301-1 BINDS 0%-100% 0%=CLSD 100%=FULL OPN	01/02
	IC3VLVLF	FLAG IC VALVE 2-1301-3 LEAK THROUGH Flag	01/02
	ICCNDDBKF	Condensate Line Break inside Reactor Bld. d/s of 1301-3 vlv	01/02
	ICCNDDBKP	Condensate Line Break inside Reactor Bld. d/s of 130103 vlv	01/02
	ICGP5SPP	POT GR 5 ISOLATION SETPT DRIFT 0 - 320% FLOW	01/02
	ICGRP5SPF	FLAG GR 5 ISOLATION SETPT DRIFT 0 - 320% FLOW	01/02
	ICSPDFTF	FLAG IC AUTO INIT PRESS SETPOINT DRIFT 0 - 1200 PSIG	01/02
	ICSPDFTP	POT IC AUTO INIT PRESS SETPOINT DRIFT 0 - 1200 PSIG	01/02
	ICSTMDWF	Steam Line Break inside Drywell downstream of the 1301-1 vlv	01/02
	ICSTMDWP	Steam Line Break inside Drywell downstream of the 1301-1 vlv	01/02
	ICSTMRBF	Steam Line Break inside Reactor Bld. upstream of 1301-2 vlv	01/02
	ICSTMRBP	Steam Line Break inside Reactor Bld. upstream of 1302-2 vlv	01/02
	ICTUBLKF	TUBE TO SHELL LEAK Flag	01/02
	ICTUBLKP	FLAG TO SHELL LEAK Pot	01/02
1400			
	CSBRKSEV	CS LOOP A SUCTION BREAK SEVERITY POT	02/03
	CSCHKALK	CS CHECK VLV 1402-9A LEAKAGE	02/03
	CSCHKBLK	CS CHECK VLV 1402-9B LEAKAGE	02/03
	CSPPABRK	CS PP A BREAK AT PIPE TO CASING WELD -FLAG	02/03
	CSPPADEG	2A CS PUMP DEGRADED-POT	02/03
	CSPPAFLG	2A CS PUMP DEGRADED FLAG	02/03
	CSPPAFLT	2A CS PUMP OVERCURRENT TRIP	02/03
	CSPPASEV	CS PP A BREAK SEVERITY - POT	02/03
	CSPPBBRK	CS PP B BREAK AT PIPE TO CASING WELD- FLAG	02/03
	CSPPBDEG	2B CS PUMP DEGRADED -POT	02/03
	CSPPBFLG	2B CS PUMP DEGRADED -FLAG	02/03

SysNum	Syntax	Description	RecertDate
	CSPPBFLT	2B CS PUMP OVERCURRENT TRIP	02/03
	CSPPBSEV	CS PP B BREAK SEVERITY - POT	02/03
	CSSUCTBK	CS LOOP A SUCTION BREAK UPSTREAM 1402-3A VLV - FLAG	02/03
1500			
	CCSWPAOC	PP 2A OVERCURRENT TRIP	01/02
	CCSWPBOC	PP 2B OVERCURRENT TRIP	01/02
	CCSWPCOC	PP 2C OVERCURRENT TRIP	01/02
	CCSWPDOC	PP 2D OVERCURRENT TRIP	01/02
	L13	LPCI PUMP A DEGRADED	99/00
	L14	LPCI PUMP D DEGRADED	99/00
	LPCIPAOC	PP 2A OVERCURRENT TRIP	01/02
	LPCIPBOC	PP 2B OVERCURRENT TRIP	01/02
	LPCIPCOC	PP 2C OVERCURRENT TRIP	01/02
	LPCIPDOC	PP 2D OVERCURRENT TRIP	01/02
1600			
	CIGP1I	SPURIOUS GROUP 1 ISOLATION	00/01
	CIGP2I	SPURIOUS GROUP II ISOLATION	00/01
	CIGP2P	INCOMPLETE GROUP II ISOLATION	00/01
	CIGP5AP	INCOMPLETE GROUP V INBOARD ISOLATION	00/01
	CIGP5BP	INCOMPLETE GROUP V OUTBOARD ISOLATION	00/01
	P00	TORUS/DW VAC BRKR FAIL 20% OPEN AGGREGATE	00/01
	P01	PURGE DAMPER FAIL ON HI FLOW	00/01
2300			
	HP4VLBNF	2301-4 VALVE BINDING-FLAG	02/03
	HP4VLBNP	2301-4 VALVE BINDING -POT	02/03
	HP4VLPWR	LOSS OF 120 VAC CONTROL POWER TO 2301-4 VALVE	02/03

SysNum	Syntax	Description	RecertDate
	HPAOPASF	HPCI AUX OIL PUMP FAILS TO AUTO START	02/03
	HPAOPOC	HPCI AUX OIL PUMP OVERCURRENT	02/03
	HPDWBRKF	STEAM BREAK IN DW DOWNSTREAM OF 2301-4	02/03
	HPDWBRKP	STEAM BREAK IN DW DOWNSTREAM OF 2301-4	02/03
	HPESMGU	LOSS OF ESS POWER TO MGU	02/03
	HPINIT	SPURIOUS HPCI INITIATION	02/03
	HPMGUFBK	LOSS OF MGU POSITION FEEDBACK - MGU WILL GO TO THE HSS	02/03
	HPPMPDGF	HPCI MAIN PUMP IMPELLER DEGRADATION FLAG	02/03
	HPPMPDGP	HPCI MAIN PUMP IMPELLER DEGRADATION POT	02/03
	HPRBBRKF	STM BREAK IN RX BLDG (TORUS AREA) UPSTREAM OF 2301-5 VALVE	02/03
	HPRBBRKP	STM BREAK IN RX BLDG (TORUS AREA) UPSTREAM OF 5 VALVE	02/03
	HPRMBRKF	STM BREAK IN HPCI ROOM UPSTREAM OF 2301-3 VALVE	02/03
	HPRMBRKP	STM BREAK IN HPCI ROOM UPSTREAM OF 2301-3 VALVE	02/03
	HPRUPDSK	HPCI TURBINE EXHAUST RUPTURE DISK FAILS	02/03
	HPTBTRIP	SPURIOUS HPCI TURBINE TRIP	02/03
	HPTGFAIL	TURB TURNING GEAR FAILS TO AUTO ENGAGE	02/03
	NVM389AF	HPCI "A" Isolation Trans. Variance Flag	02/03
	NVM389AP	HPCI "A" Isolation Trans. Variance Pot (-1500..1500)	02/03
	NVM389BF	HPCI "B" Isolation Trans. Variance Flag	02/03
	NVM389BP	HPCI "B" Isolation Trans. Variance Pot (-1500..1500)	02/03
	NVM389CF	HPCI "C" Isolation Trans. Variance Flag	02/03
	NVM389CP	HPCI "C" Isolation Trans. Variance Pot (-1500..1500)	02/03
	NVM389DF	HPCI "D" Isolation Trans. Variance Flag	02/03
	NVM389DP	HPCI "D Isolation Trans. Variance Pot (-1500..1500)	02/03

3200

SysNum	Syntax	Description	RecertDate
	H31	REACTOR FEEDWATER PUMP 2A TRIP	01/02
	H32	REACTOR FEEDWATER PUMP 2B TRIP	01/02
	H33	REACTOR FEEDWATER PUMP 2C-21 TRIP	01/02
	H34	REACTOR FEEDWATER PUMP 2C-22 TRIP	01/02
	HP3	FEEDWATER SYSTEM LEAK	00/01
	HP4	FEEDWATER SYSTEM LEAK IN DRWLL	01/02
3300			
	H21	CONDEN/ BOOSTER PUMP 2A TRIP	01/02
	H22	CONDEN/ BOOSTER PUMP 2B TRIP	01/02
	H23	CONDEN/ BOOSTER PUMP 2C TRIP	01/02
	H24	CONDEN/ BOOSTER PUMP 2D TRIP	01/02
	HP1	CONDENSER TUBE LEAK	01/02
	HP5	INCREASED AIR IN-LEAKAGE	01/02
	HQ1	CONDENSER TUBE LEAK FLAG	01/02
3500			
	FWHDSHLS	FW HEATER LEAK VALUE FOR STRING-S,HEATER H,ie FWHD1ALS 30.0	01/02
	FWHDSHTL	FW HEATER LEAK FLAG FOR STRING-S,HEATER H,ie FWHD1ATL	01/02
3700			
	Q01	RBCCW PUMP 2A TRIP	00/01
	Q02	RBCCW PUMP 2B TRIP	00/01
	Q03	RBCCW PUMP 2/3 (24-1) TRIP	00/01
	Q04	RBCCW PUMP 2/3 (34-1) TRIP	00/01
3800			
	Q11	TBCCW PUMP 2A TRIP	00/01
	Q12	TBCCW PUMP 2B TRIP	00/01
3900			

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
	Q21	SW PUMP 2A TRIP	01/02
	Q22	SW PUMP 2B TRIP	01/02
	Q23	SW PUMP 2/3 (24) TRIP	01/02
	Q31	SW STRAINER DISCHARGE LEAK STATUS	00/01
	Q33	SW PUMP 2/3 (34) TRIP	01/02
	Q41	SW PUMP 3A TRIP	01/02
	Q42	SW PUMP 3B TRIP	01/02
	QP1	SW STRAINER DISCHARGE LEAK	00/01
4400			
	HP6	CIRC WATER PUMP 2A OVERCURRENT TRIP	01/02
	HP7	CIRC WATER PUMP 2B OVERCURRENT TRIP	01/02
	HP8	CIRC WATER PUMP 2C OVERCURRENT TRIP	01/02
	HQ2	CONDENSER PIT FLOODING - POT	01/02
	HQ3	CONDENSER PIT FLOODING - FLAG	01/02
	HQ4	TRAVELING SCREENS FOULING UP	01/02
4600			
	N01	SERV AIR COMP 2 TRIP	01/02
	N02	SERV AIR COMP 3 TRIP	01/02
	NP1	SERV AIR LEAK SIZE	01/02
4700			
	N21	INST AIR COMP 2A TRIP	01/02
	N22	INST AIR COMP 2B TRIP	01/02
	N31	INST AIR COMP 3A TRIP	01/02
	N32	INST AIR COMP 3B TRIP	01/02
	N33	INST AIR COMP 3C TRIP	01/02
	NP2	INST AIR LEAK SIZE	01/02
5350			

SysNum	Syntax	Description	RecertDate
	K07	H2 EMERG SEAL OIL PUMP BRK TRIP	00/01
	K50	H2 MAIN SEAL OIL PUMP BRK TRIP	00/01
	T25	H2 SEAL OIL VACUUM PUMP BRK TRIP	00/01
5400			
	H11	OFFGAS EXPLOSION AT HOLDUP ENTRANCE	01/02
	H12	SJAE PRESSURE CONTROL VALVE FAILED CLOSE	01/02
5600			
	J22	TURBINE TRIP	00/01
	J24	TURB GOVERNOR FAILS LOW	00/01
	J41	HPT JOURNAL #2 HIGH VIBRATION	00/01
	J42	LPT-B JOURNAL #5 HIGH VIBRATION	00/01
	J43	GEN JOURNAL #9 HIGH VIBRATION	00/01
	J66	CV 1 FAILS FULL OPEN	00/01
5650			
	J02	PRESSURE FEEDBACK SIGNAL FAILURE	00/01
	J03	B PRESS REGULATOR FAILS HIGH VALVES OPEN	00/01
	J04	PRESSURE REGULATOR B FAILURE LOW	00/01
	J11	TURBINE ACCEL. CONTROL FAILURE	00/01
	J14	PRESSURE REGULATOR A FAILURE LOW	00/01
	J21	MASTER TRIP RELAY FAILURE	00/01
	J33	EHC OIL PUMP 2A OVERCURRENT TRIP	00/01
	J34	EHC OIL PUMP 2B OVERCURRENT TRIP	00/01
	J51	CV 1 SERVO FAILURE	00/01
	J52	CV 2 SERVO FAILURE	00/01
	J53	CV 3 SERVO FAILURE	00/01
	J54	CV 4 SERVO FAILURE	00/01
	J61	BYPASS VALVE 1 FAILS AS IS	99/00

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
	J62	BYPASS VALVE 2 FAILS AS IS	99/00
	J63	BYPASS VALVE 3 FAILS AS IS	99/00
	J64	BYPASS VALVE 4 FAILS AS IS	99/00
	J81	BYPASS VALVE 5 FAILS AS IS	99/00
	J82	BYPASS VALVE 6 FAILS AS IS	99/00
	J83	BYPASS VALVE 7 FAILS AS IS	99/00
	J84	BYPASS VALVE 8 FAILS AS IS	99/00
	J91	BYPASS VALVE 9 FAILS AS IS	99/00
5750			
	DW1	2A DW COOLER TRIP	99/00
	DW2	2B DW COOLER TRIP	99/00
	DW3	2C DW COOLER TRIP	99/00
	DW4	2D DW COOLER TRIP	99/00
	DW5	2E DW COOLER TRIP	99/00
	DW6	2F DW COOLER TRIP	99/00
	DW7	2G DW COOLER TRIP	99/00
	X04	RBVS 2A VENT FAN LOW FLOW TRIP	00/01
	X05	RBVS 2B VENT FAN LOW FLOW TRIP	00/01
	X06	RBVS 2C VENT FAN LOW FLOW TRIP	00/01
	X07	RBVS 2A EXH FAN LOW FLOW TRIP	00/01
	X08	RBVS 2B EXH FAN LOW FLOW TRIP	00/01
	X09	RBVS 2C EXH FAN LOW FLOW TRIP	00/01
6000			
	K00	AMPLIDYNE CONTACTOR RELAY 6 TRIPPED	00/01
	K01	MAIN GEN DIFFERENTIAL CURRENT TRIP	00/01
	K03	VOLT REG UNDER EXC AMP LIMITER #1 FAILED	00/01
	K35	EXC FLD VARIAC FAILED HIGH	00/01

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
	K36	EXC FLD VARIAC FAILED LOW	00/01
	K38	BACKUP LOCKOUT RELAY 86-G2B FAILED	00/01
	K39	PRIME LOCKOUT RELAY 86-G2 FAILED	00/01
	L71	BUS DUCT BLOWER MOTOR TRIP	00/01
	T45	REVERSE POWER RELAYS 32-G2 & 92-G2 FAILED	00/01
	T48	VOLTAGE ADJUSTER FAILED LOW	00/01
	T76	VOLTAGE ADJUSTER FAILED HIGH	00/01
6400			
	K05	XFMR-2 SUDDEN PRESSURE TRIP	00/01
	K09	XFMR-21 SUDDEN PRESSURE TRIP	00/01
	L70	XFMR-2 OR XFMR-21 DIFF CURRENT TRIP	00/01
	L72	XFMR-22 DIFFERENTIAL CURRENT	00/01
	T69	XFMR-22 SUDDEN PRESSURE TRIP	00/01
6500			
	K20	BUS 21 OVERCURRENT	02/03
	K21	BUS 22 OVERCURRENT	02/03
	K22	BUS 23 OVERCURRENT	02/03
	K23	BUS 23-1 OVERCURRENT	02/03
	K24	BUS 24 OVERCURRENT	02/03
	K25	BUS 24-1 OVERCURRENT	02/03
	M97	BUS 23 BUS TIE DIFFERENTIAL	02/03
	M98	BUS 24 BUS TIE DIFFERENTIAL	02/03
	M99	BUS 24-1/34-1 BUS TIE DIFFERENTIAL	02/03
6600			
	K33	DG2 COMP AIR S/U SOL VALVE FAILED CLOSED	00/01
	T11	DG2/3 COMP AIR S/U SOL VALVE FAILED CLOSED	00/01
	T12	DG2 AUTO START RELAY-2 FAILURE	00/01

<u>SysNum</u>	<u>Syntax</u>	<u>Description</u>	<u>RecertDate</u>
	T13	DG2/3 AUTO START RELAY-2/3-2 FAILURE	00/01
	T14	DG2 TRBL LOW WTR PRESS LO BRG LO PR CRKCASE HI PR	00/01
	T15	DG2/3 TRBL LOW WTR PRESS LO BRG LO PR CRKCASE HI PR	00/01
	T16	DG2 DIFF CURRENT RELAY TRIP	00/01
	T17	DG2/3 DIFF CURRENT RELAY TRIP	00/01
	T18	DG2 COOLING WATER PUMP TRIP	00/01
	T19	DG2/3 COOLING WATER PUMP TRIP	00/01
6700			
	K26	BUS 20 OVERCURRENT	02/03
	K27	BUS 25 OVERCURRENT	02/03
	K28	BUS 26 OVERCURRENT	02/03
	K29	BUS 27 OVERCURRENT	02/03
	K30	MCC 28-8/29-7 Failure To Auto-Swap	
	K40	BUS 28 OVERCURRENT	02/03
	K41	BUS 29 OVERCURRENT	02/03
6800			
	K42	INSTRUMENT BUS OVERCURRENT	02/03
6900			
	T61	LOSS OF 125V DC RESERVE BUS 2B	02/03
7400			
	K11	STATOR COOLING PUMP 2A BRK TRIP	00/01
	T47	STATOR COOLING PUMP 2B BRK TRIP	00/01
	T49	STATOR COOLING PANEL TROUBLE MALFUNCTION	00/01
	T80	ALTERREX PANEL TROUBLE MALFUNCTION	00/01
9900			
	J55	SER COMPUTER STALL	99/00

SysNum

Syntax

Description

RecertDate