SUSQUEHANNA STEAM ELECTRIC STATION
DETAILED CONTROL ROOM DESIGN REVIEW
SUPPLEMENTAL SUMMARY REPORT

Prepared for
The Nuclear Regulatory Commission

Pennsylvania Power & Light Company

MARCH 1, 1985

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SECTION

1.0 Introduction

1.0 Introduction

1.1 Reason for a Supplemental Report

This Supplemental Report to the Detailed Control Room Design Review Summary Report is submitted to fulfill a SSES Unit 2 license requirement and a Unit 1 confirmatory order.

1.2 Executive Summary

This report addresses the three DCRDR review requirements found unsatisfactory. The following is a summary of compliance with all nine points.

Requirement #1 - Establishment of a qualified multidisciplinary team - Satisfactory.

Requirement #2 - Use of function and task analyses to identify control room operator tasks and information and control requirements - Not satisfactory. Information and control requirements were insufficiently defined. Also, the task analysis must be updated to Rev. 3 EPGs.

Requirement #3 - A comparison of the display and control requirements with a control room inventory to identify missing displays and controls - Not satisfactory. Once #2 is completed, then #3 can be completed.

Requirement #4 - Control room survey - Satisfactory.

Requirement #5 - Assessment of human engineering discrepancies - Satisfactory.

Requirement #6 - Selection of Design Improvements - Not Satisfactory. Additional information regarding specific design improvements (for HEDs) and a schedule for implementation are required.

Requirement #7 - Verification that selected design improvements will provide the necessary correction - Satisfactory.

Requirement #8 - Verification that improvements will not introduce new HEDs - Satisfactory

Requirement #9 - Coordination of control room improvements with changes from other programs - Satisfactory.

1.3 SSES Control Room Human Factors Milestones

To provide the background behind this report, the historical milestones relating to Susquehanna and PP&L's human factors effort are listed below:

1971 on - Human Factors considerations are an intrinsic factor in the design of Susquehanna's control rooms (See DCRDR Summary Report - Section 1).

1979 - TMI-2 accident

1980 - PP&L submits Preliminary Design Assessment (PDA) per NUREG 0660 and NUREG 0694. 42 HEDs scheduled for correction.

1981 - DCRDR Program Plan submitted.

1981 - General Physics hired; DCRDR initiated.

1983 - Integrated schedule for emergency response elements submitted, per Supplement 1 to NUREG 0737.

1983 - NRC comments on DCRDR Program Plan

1983 - DCRDR Summary Report submitted, as scheduled on Nov. 11.

1984 - March meeting including NRC, SAI, PP&L, and GP to discuss SER and TER review of the DCRDR. As a result, additional information is requested by the NRC (short term) in addition to a Supplemental DCRDR Summary Report (longer term).

1984 - On-site audit of Susquehanna's DCRDR by NRC and consultants. Basis for SER audit results is defined.

1985 - SER, based on the on-site audit, received by PP&L on January 31.

1985 - Supplemental Summary Report to the Detailed Control Room Design Review submitted on March 1.

2.0 Function and Task Analysis

2.0 Function and Task Analysis (T.A.) Upgrade

Discussion:

This section of the Supplemental Report to the DCRDR consists of two sections. A description of each follows:

Section 2.1 Upgrade of the Original T.A. Worksheet -

The original worksheets (pre-fill and post-fill) were considered deficient in several areas. Consequently, the format has been modified to incorporate:

2.1.1 A new layout - Redundant column headings are combined into a new column, "A Priori" Information and Control Requirements. This improves comprehension, and allows for the addition of missing information.

2.1.2 Typed data - Replaces handwritten entries on the original worksheets.

2.1.3 Index numbers - (Operating sequence - task number - element) have been assigned to tasks. This allows traceability, and helps distinguish between tasks analyzed and those yet to be analyzed (e.g. no number assigned). This is explained in more detail in Section 2.2.

2.1.4 Parameters - Key parameter values are inserted where applicable.

2.1.5 Control and Display Characteristics - Such information as range, setpoints, accuracy, rate, gain, etc. have been added when required.

Section 2.2 The Plan for Updating the T.A. from Rev. 0 to Rev. 3 EPGs - This plan was requested because the original DCRDR T.A. was based upon the EOPS that existed at the time, in 1982. The update plan for EOPS derived from Rev. 3 EPGs is described in this section.

The requirement to update to Rev. 3 EPGs is traced to a memo from S. H. Weiss (Section Ldr. - HFEB/NRC) to V. A. Moore (Chief - HFEB) summarizing a joint NRC - BWROG meeting on May 4, 1984. This meeting centered around the task analysis requirements (information and control needs) of Supplement 1 to NUREG-0737.

It was concluded that the Rev. 3 EPGs provide a functional analysis that identifies on a high level, generic information and control needs. However, plant specific information and control needs must be extracted from plant - specific analysis, not the generic EPGs.

2.1 Upgrade of the Original Task Analysis Worksheets

Operating Sequence Guideline

Sequence No.	Operating Sequence Title
01	Large Steamline Break Inside Drywell
02	Startup from Hot Standby - MSIVs Closed
03	Reactor Shutdown from Minimum Power (5%) to Refueling
04	ATWS with Loss of Off-site Power
05	Inadequate Core Cooling
06	Small Break LOCA Inside Containment
07	LRW Tank Failure
08	Reactivity Anomaly Resulting in Clad Failure
09	Remote Shutdown

Key to Task Analysis Terms

Sources of setpoint information for Apriori information and control requirements -

(TS) - Technical Specifications

(SME) - Subject Matter Expert

(PROCEDURE) - Plant Operating Procedures

Non-standard abbreviations -

(FAR) - Degrees Fahrenheit

(DCS) - Display Control System

(SCO) - Second Control Operator - (the PCO assigned to operate at the ECCS or electrical panel in an emergency)

(DEC) - Decrease(ing)

(INC) - Increase(ing)

(SIG) - Signal

(ARESD) - Air Removal Emergency Shutdown

SSES TASK ANALYSIS

INDEX NUMBER	SUBTASK	ELEMENT	SYSTEM	A PRIORI INFORMATION AND CONTROL REQUIREMENTS	EXISTING CONTROL ROOM INSTRUMENTATION	EXISTING CONTROLS MANIPULATED (OR BRANCH POINT)
01-01-01	EVALUATE CONDITION	OBSERVE ANNUNCIATORS	RX CONTROL	ANNUNCIATORS BLINKING AND ALARM ENERGIZED RX AUTO SCRAM PRIMARY CONTAINMENT HI PRESS TRIP RX VESSEL LO LEVEL TRIP	AR3 RX AUTO SCRAM A1/A2 PRIMARY CONTAINMENT HI PRESS TRIP RX VESSEL LO LEVEL TRIP AR4 RX AUTO SCRAM B1/B2 PRIMARY CONTAINMENT HIGH PRESSURE TRIP RX VESSEL LO LEVEL TRIP	
01-02-01	VERIFY/ENFORCE AUTO. ACTIONS	MODE SWITCH TO SHUTDOWN	RX CONTROL	SWITCH POSITION TO SHUTDOWN ANNUNCIATORS RX MANUAL SCRAM		RX MODE SWITCH IC72A-501
01-02-02	VERIFY/ENFORCE AUTO. ACTIONS	VERIFY ALL RODS FULLY INSERTED	RX CONTROL	RODS FULL IN INDICATION	FULL CORE DISPLAY AND/OR RSCS DISPLAY (IC12-S06) CRT DISPLAY # 5	IF NOT FULL IN BRANCH TO TRIP RECIR PUMPS
01-02-03	VERIFY/ENFORCE AUTO. ACTIONS	INSERT SRM/IRM DETECTORS	RX CONTROL	ALL PB'S BACKLIT "OUT" LIGHTS GO OUT "DRIVING IN" LIGHT COMES ON	STATUS SRM/IRM DETECTOR DRIVE	SRM A-D SELECT PB'S IRM A-H SELECT PB'S POWER ON PB DRIVE IN PB
01-02-04	VERIFY/ENFORCE AUTO. ACTIONS	TRIP MAIN TURBINE	TURBINE CONTROL	TRIPPED LIGHT ILLUMINATES MAIN TURB TRIP ANNUNCIATOR SOUNDS	MAIN TURBINE PB TO TRIP	TURBINE TRIP PB
01-03-01	VERIFY/ENFORCE AUTO. ACTIONS	ACKNOWLEDGE ANNUNCIATORS	RX CONTROL	ANNUNCIATORS SILENT AND GO SOLID		ALARM SILENCE (A71A501)
01-04-01	EVALUATE CONDITIONS	CHANGE CRT DISPLAYS (DCS)	RX CONTROL	PB BACKLIGHTS CRT'S CHANGE FORMAT		MASTER DISPLAY SELECT MATRIX-"EMERG. SHTDN" PB
01-04-02	EVALUATE CONDITIONS	MONITOR RX POWER, VESSEL LEVEL, VESSEL PRESSURE	RX CONTROL	BARGRAPHS RESPOND DW PRESS) 1.69 (TS) 0-75 PSIG +/- 0.1 R.V. LEVEL (13" (TS) -150 TO +80" +/- 5IN MSL ISOLATION DUE TO RV PRESSURE (861 PSIG (TS) 0-1500 PSIG +/- 50 PSIG REACTOR POWER 0% APRM (SME) 0-125% +/- 5%	CRT'S ON UOB CRT'S ON UMC	IRM RANGE SWITCHES A-H CONFIRMS ENTRY CONDITIONS FOR EO-00-021 & 023

SSES TASK ANALYSIS

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01-05-01	DETERMINE PLANT CONDITIONS	OBSERVE CRT'S, SIP, AND ECCS BOARD INDICATIONS, REPORT TO SUPV, D.W., SUPP POOL, AND RX	RX CONTROL, ECCS, SIP	LEVEL CAN'T BE DETERMINED DW PRESS HIGH)20 PSIG (SME) 0 +/- 0.1 PSIG 0-75 PSIG DW TEMP HIGH)212 DEGREE (SME) 0 +/- 5 DEGREE F 0-350 DEGREE F RX PRESS LOW (100 PSIG (SME) 0-1500 PSIG +/- 50 PSIG	PCO DCS/CRT'S #1&3 ON IC651 METERS ON SIP IC652 IC32 R608 IC32 605 IC32 606A IC32 606B IC32 606C B21R 604 SCO IC601 B11R615 IC601 B21R623A&B IC601 PR 15702 IC601 LR15776A&B IC601 PR15710A&B IC601 TR15790A&B IC601 RCIC-ANNUNCIATORS & INDICATORS CS A&B-ANN & INC RHR/LPCI ANN & IND A&B MSIV'S POSIT IND & ANN ALL CONTAINMENT ISOLATED HPCI-ANN & IND	CONDITIONS THEN DICTATE APPLICABLE STEPS OF EO'S
01-06-01	VERIFY PROPER AUTO INITIATION/ RESPONSE	OBSERVE ECCS BOARD IND FOR ECCS SYSTEM RESPONSE	ECCS	RCIC SYS OUT OF SERVICE BOTH CS SYS INJECTING @ 6350 GPM EACH (TS) 0-8500 GPM +/- 50 GPM BOTH LPCI LOOPS INJECTING @ 24,400 GPM EACH (TS) +/- 50 GPM ALL MSIV'S CLOSED (ISOL) ALL VLV POSIT IND CLOSED HPCI OUT OF SERVICE		
01-06-02	VERIFY PROPER AUTO INITIATION/ RESPONSE	VERIFY AUX BUS FAST TRANSFER	ELECT BOARD	FAST TRANSFER COMPLETE UNIT AUX BUSSES @ 60 HZ (SME) 0-80 HZ +/- 0.1HZ RUNNING UNLOADED & D/G @ 60 HZ 4160 KV (SME) 0-5500 VOLTS +/- 50V RESPECTIVE BUSSES ENERGIZED 4160 KV 0 AMPS (SME) 0-1000 AMPS +/- 50 AMPS	IC653 OFFSITE PWR/AUX BUSSES DIESEL/GENERATORS	
01-07-01	INITIATE ACTIONS AS REQ'D AND DIRECTED BY SHIFT SUPERVISION	VERIFY VESSEL LEVEL (SCO)	ECCS	LEVEL CANNOT BE DETERMINED DUE TO REF LEG FLASHING DW TEMP)212 DEGREE F) (SME) 0-350 DEGREE F +/- 5 DEGREE F	IC601 LEVEL RECORDERS AND INDICATORS RESTORE WATER LEVEL)+13 INCHES	SHOULD PROCEED TO EO-00-024 LEVEL RESTORATION

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01-07-02	INTTIATE ACTIONS AS REQ'D AND DIRECTED BY SHIFT SUPERVISION	VERIFY SUPP POOL TEMP (SCO)	ECCS(RHR)	TEMP)110 FAR (SME) 0-212 DEGREE F	IC601 E11A R601 (RHR SUPP POOL SUCT TEMP) SUPP POOL WATER TEMP (90F	)90 FAR, INITIATE SUPP POOL COOLING PER OP-49-001 (SECT 3.9.1)
01-07-03	INITIATE ACTIONS AS REC'D AND DIRECTED BY SHIFT SUPERVISION	INITIATE SUPP POOL COOLING (SCO)		RHRSW FLOW 9000 GPM (SME) 0-12,000 GPM +/- 50 GPM RHRHX FLOW 10,000 GPM (SME) 0-40,000 GPM +/- 100 GPM	RHR SYSTEM IN STANDBY RHR SERVICE WATER AVAILABLE HV-01222A(B) RHR PUMP RUNNING RHR HX FLOW SUPRESSION POOL TEMP RHR PUMP FLOW RHRSW FLOW THROUGH THE RHR HX SPRAY POND AVAILABLE	1. HS-11202A/B RESET 2. HS-11210A/B THROTTLED 10% 3. HS-11215A/B OPEN 4. HS-11202 A/B START 5. THROTTLE OPEN HS-11210A/B 6. HSE11AS18A(B) OVERRIDE 7. HSE11AS17A(B) MANUAL 8. HS E11AS14A(B) OPEN 9. HSE11AS12A(B) THROTTLE
01-07-04	INITIATE ACTIONS AS REQ'D AND DIRECTED BY SHIFT SUPERVISION	VERIFY DRYWELL TEMP (SCO)	ECCS	(320 FAR AND DECREASING (SME) 0-350 DEGREE F +/- 5 DEGREE F	IC601 TR-157 90 A/B DRYWELL TEMP (135F	NONE END OF DW TEMP RESPONSE
01-07-05	INITIATE ACTIONS AS REC'D AND DIRECTED BY SHIFT SUPERVISION	VERIFY CONTAINMENT PRESSURE(SCO)	ECCS	PRESS (25 PSIG AND DECREASING (SME) 0-75 PSIG +/- 5 PSIG	IC601 PR-15710A/B,CONTAINMENT PRESSURE	NONE-END OF CONTAINMENT PRESS RESPONSE
01-07-06	INITIATE ACTIONS AS REQUESTED & DIRECTED BY THE SHIFT SUPV.	VERIFY SUPPRESSION POOL LEVEL (SCO)	ECCS	LEVEL BETWEEN 22'& +/- 24'(TS) 0-50 ' +1 '	IC601 CR15776A/B SUPPRESSION POOL LEVEL	NONE
02-01-01	ESTABLISH CONDENSER VACUUM	VERIFY/CLOSE VACUUM BREAKERS	CONDENSER AIR REM	VERIFY POSITION INDICATIONS	IC668	HS-0742 A,B,C TO CLOSE
02-01-02	ESTABLISH CONDENSER VACUUM	VERIFY/START AUX BOILER	AUXILIARY BOILER	AUX STEAM PRESS)250 PSIG (SME) 0-350 PSIG +/- 5 PSIG	IC653	HS-02109 A/B TO OPEN

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02-01-03	ESTABLISH CONDENSER VACUUM	START STEAM PACKING EXHAUSTER	COND AIR REMOVAL	INCREASING METER READING HEADER PRESSURE ~10 INCHES H20 VAC (SME) 0-20 "H20 VAC +/- 1"	IC668 PR-10756 PR10756	HS-10740 A/B TO RUN
02-01-04	ESTABLISH CONDENSER VACUUM	ESTABLISH STEAM SEAL OFF AUX STEAM	STEAM SEALS	SEALING STEAM HEADER PRESSURE 4 PSIG (SME) 0-10 PSIG +/- 0.5 PSIG	IC668 PI10738 INCREASE PI10711 A,B,C INCREASE AR19 1-5 CLEAR AR20 2-7,5-7,8-7 CLEAR	HS-12731 A,B,C TO OPEN HS-10710 A,B,C TO OPEN HS-10765 TO OPEN HS-10706 TO OPEN
02-01-05	ESTABLISH CONDENSER VACUUM	START MECH VAC PUMP	COND AIR REMOVAL	INCREASING VAC ON CONDENSER VACUUM GOES FROM 0 TO 21 INCHES HG (SME) 0-30" HG VAC +/- 5" HG	IC668 PI10502 (IC668) PR10502 (IC652) IC652 AND CRT'S	HS-10734 TO OPEN HS-10732 TO RUN
02-02-01	OPEN MSIV'S	BYPASS LO VAC ISOLATION	ECCS (MN STM) PCIS	ANNUNCIATOR ALARM	ISOLATION RESET IC601 AP11 4-2 AR12 4-2	NONE-LOCAL CONTROL
02-02-02	OPEN MSIV'S	RESET ISOLATION LOGIC	MN STM PCIS	ANNUNCIATORS	ANNUNCIATORS AR11 4-1 AR12 4-1	HSB21H-S32 AND 33 DEPRESSED
02-02-03	OPEN MSIV'S	OPEN OUTBOARD MSIV'S	MN STM PCIS	POSITION INDICATION LIGHTS		HSB21H-S2 A,B,C,D TO "AUTO"
02-02-04	OPEN MSIV'S	EQUALIZE AROUND INBD MSIV'S	MS STM PCIS TURB CONTROL TURB TEST	PRESSURE INCREASES FROM 0 PSIG TO 200 PSIG (SME) 0-1500 PSIG +/- 50 PSIG	IC651 IC668 PR10101C	HSB21-S6 AND S35(?) TO OPEN
02-02-05	OPEN MSIV'S	OPEN INBD MSIV'S	ECCS MN STM	VALVE POSITION INDICATION	IC601	HSB21H-S1A,B,C,&D TO "AUTO"
02-03-01	WARM A REACTOR FEED PUMP	RESET THE TURB TRIP	FEEDWATER	TURBINE INDICATOR LIGHT	IC651 ANN AR 1 ANN AR 10-1 ANN AR 12-1 ANN AR 14-1	HS-12745 A/B/C TO RESET
02-03-02	WARM A REACTOR FEED PUMP	OPEN SUCTION ISOLATION VALVES	FEEDWATER	VALVE INDICATOR LIGHTS	IC651 AND PMS/CRT	HS-106016 A2/B2/C2 TO OPEN HS-106016 A1/B1/C1 TO OPEN HS-10601E A2/B2/C2 TO CLOSE
02-03-03	WARM A REACTOR FEED PUMP	OPEN RFPT LP AND HP ISO. VALVES AND MN STM SUPP ISO	FEEDWATER	RFPT LP AND HP ISO VALVE AND MN STM SUPP ISO VALVE INDICATIONS	IC668 AMD PMS/CRT	HS-10111 TO OPEN HS-12709 A/B/C TO OPEN

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02-03-04	WARM A REACTOR FEED PUMP	RAISE TURB SPEED TO MIN	FEEDWATER	RPM INCREASES TO 1100 RPM 0-8000 RPM +/- 100 RPM	IC651 AND DCS/CRT	HIC 10604 (A,B,C) IN AUTO HS-12730 A2 (B2/C2) PB SLOW
02-04-01	SHIFT STEAM SEALS TO MN STM SSE IN SERVICE (ALL STEPS)	OPEN MN STM SUPPLY	COND AIR REMOVAL	POSITION INDICATION	IC668	HS-10109 TO OPEN HS-10767 TO OPEN HS-10703 TO OPEN HS-10768 TO OPEN GO-00-002
02-04-02	SHIFT STEAM SEALS TO MN STM (SHIFT SEAL IN SERVICE)	OPEN SHELL VENT	COND AIR REMOVAL	POSITION INDICATION	IC668	HS-10728 TO OPEN
02-04-03	SHIFT STEAM SEALS TO MN STM (STEAM SEALS IN SERVICE)	ESTABLISH FEED TO SHELL	COND AIR REMOVAL	POSITION INDICATION	IC668	HS-10749 TO OPEN
02-04-04	SHIFT STEAM SEALS TO MN STM (STEAM SEALS IN SERVICE)	ESTABLISH TUBE SIDE DRAIN	COND AIR REMOVAL	POSITION INDICATION	IC668	HS-10270 A,B,C TO OPEN
02-04-05	SHIFT STEAM SEALS TO MN STM (STEAM SEAL IN SERVICE)	ESTABLISH SSE PRESS CONTROL	COND AIR REMOVAL	POSITION INDICATION	IC668	HS-10709 TO OPEN
02-04-06	SHIFT STEAM SEALS TO MN STEAM	REMOVE AUX STEAM FROM SEALS	COND AIR REMOVAL	SHELL PRESSURE INCREASE 5-7 PSIG (SME) +/- 0.5 (0-10 PSIG) TUBE PRESSURE INCREASE 50 PSIG (SME) +/- 5 (0-100 PSIG) LEVEL AT "0" INCREASE (SME) +1" (-10" TO +10") HEADER PRESSURE INCREASE 2-3 PSIG (SME) +/- 0.5 0-10 PSIG	PI10747 PI10738 LI10749 PI10723	HS-10761 TO OPEN HS 10706 TO CLOSE
02-05-01	PLACE SJAE IN SERVICE	VERIFY) 200 PSIG	TURB TEST	)200 PSIG (SME) 0-250 PSIG +/- 10 PSIG	IC668 PR10101C	
02-05-02	PLACE SJAE IN SERVICE	ESTABLISH STEAM SUPPLY	COND AIR REMOVAL	INCREASE TO 110 PSIG (SME) 0-250 PSIG +/- 10 PSIG	IC668 PI10701	HS 10107 TO OPEN HS 10701 A(B) TO "AUTO"

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2-05-03	PLACE SJAE IN SERVICE	PLACE 2ND STG JETS IN SERVICE		INCREASE)10" HG (SME) (0-15" HG) +/- 1" INCREASE)200 DEGREE F (SME) (0-500 DEGREE F) +/- 5 DEGREE F INCREASE 110 PSIG (SME) 0-250 PSIG +10 PSIG INCREASE)100 SCFM 0-200 SGFM +/- 10 SCFM	PI10720 TI10724 PI10702 FI10724	HS-10721 TO OPEN HS-10702 TO OPEN
2-05-04	PLACE SJAE IN SERVICE	PLACE 1ST STG JETS IN SERVICE		INCREASE)28" HG (SME) 0-30" HG VAC +/- 1" HG	PI 10502 ANNUNCIATOR AR31 1-8 ALARMS	HS-10722 TO OPEN HS-10716 TO OPEN
2-05-05	PLACE SJAE IN SERVICE	SHUTDOWN MECH VAC PUMP			ANNUNCIATOR AR21 1-2 ALARMS	HS-10734 TO CLOSE HS-10732 TO STOP
2-06-01	WITHDRAW CONTROL RODS TO CRITICAL	LOG S/U DATA SRM COUNTS RECIRC LOOP TEMP REACTOR PRESS ROD SEQUENCE	NUET MONIT RECIRC RX INSTR RSCS	SRM)5 CPS (10E5 CPS (SME) (+/- 1 X 10 LOG SCALE) 0-10E6 CPS LOOP TEMP 350 DEGREE F (SME) +/- 5 DEGREE 0 - 600 DEGREE F RX PRESS 200 PSIG (SME) +/- 50 PSI 0 - 1500 PSIG	IC651 CRT #6 CRT #4 CRT #4,5 C12506 IC652 C51R601 B31R650 C32R609	
2-06-02	WITHDRAW CONTROL RODS TO CRITICAL	ALIGN DCS CRT'S	DCS	CRT SELECTER	ALL DCS CRT'S FULL CORE DISPLAY	HOT S/U HOT RECOV PB DEPRESSED
2-06-03	WITHDRAW CONTROL RODS TO CRITICAL	WITHDRAW RODS IAW RSCS (PULL SHEET)	DCS RMCS CRD HYD RPIS NUET MONIT	ROD INSERT AND WITHDRAW INDICATERS ROD POSITION CHANGE(4 ROD DISPLAY) 00 TO 48 (SME) NORM W/D FLOW(APROX 2 GPM) 0-6 GPM (+/- .5 GPM) SRM COUNT RATE INC SRM PERIOD INC FROM INFINITY TO 100 SEC (SME) W/D LIGHT OUT SETTLE LIGHT ON SETTLE LIGHT OUT ROD POSITION CONSTANT @ 48 (SME) CRD FLOW 0 GPM (SME) 0-6 GPM (+/- .5 GPM)	IC651 CRT 5&6 ROD SELECT AND MOTION CONTROL IC652 4 ROD DISPLAY CRD FLOWS	ROD SELECT PB'S DEPRESS CONT WITHDRAW AND/OR WITHDRAW PB'S RELEASE WITHDRAW PB'S

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02-06-04	WITHDRAW CONTROL RODS TO CRITICAL	PERFORM UNCOUPLING CHECK @ POSIT 48	RMCS CRD HYD CRD MECH RPIS	ROD POSITION CONSTANT @ 48 (SME)	IC651 CRT 5&6 ROD SELECT AND MOTION CONTROL IC652 4 ROD DISPLAY CRD FLOWS ANN AR-4,5-8,&6-8 C12R604 (IC601) DCS CRT #6 OR IC652 C51R600 C51R601	MAINTAIN WITHDRAW PB DEPRESSED RELEASE WITHDRAW PB
02-07-01	DETERMINE REACTOR CRITICAL-ITY	VERIFY INCREASING COUNTS CONSTANT POSITIVE PERIOD	NEUT MONIT	COUNT RATE INCREASE PERIOD IS STEADY ~100 SEC		
02-07-02	DETERMINE REACTOR CRITICAL-ITY	ANNOUNCE CRITICAL	PA SYSTEM	"UNIT ONE REACTOR IS CRITICAL" (SME)		PAGING SYSTEM
02-07-03	DETERMINE REACTOR CRITICAL-ITY	TAKE CRITICAL DATA		TIME, DATE, ROD SEQUENCE, ROD ID, PERIOD (100 SEC) LOOP TEMP (350 DEGREE) (PROCEDURE) 0-600 DEGREE F +/- 5 DEGREE	DCS,CRT'S IC652 C51R601 B31R650 C32R609	
02-07-04	DETERMINE REACTOR CRITICAL-ITY	MONITOR POWER INCREASE	NEUT MONIT	DECREASE IN IRM SCALE READING AS POSIT INCREASES 75/125 TO 25/125 (SME) 0 TO 125/125 +/- 5/125	DCS CRT'S C51508 C51509 A-D IC652 C51R603 A-D	INCREASE IRM RANGE SW POSITIONS
02-08-01	ESTABLISH AND MANTAIN HEATUP RATE UP TO 500 psig	WITHDRAW RODS AS REQUIRED	DCS RMCS CRD HYD RPIS NUET MONIT	ROD INSERT AND WITHDRAW INDICATER LIGHTS ROD POSITION CHANGE(4 ROD DISPLAY) NORM W/D FLOW(APROX 2 GPM) (SME) 0-6 GPM +/- .5 GPM SRM COUNT RATE INC SRM PERIOD INC ROD POSITION CONSTANT	IC651 CRT 5&6 ROD SELECT AND MOTION CONTROL IC652 4 ROD DISPLAY CRD FLOWS	DEPRESS CONT WITHDRAW AND/OR WITHDRAW PB'S RELAEASE WITHDRAW PB'S
02-08-02	ESTABLISH AND MAINTAIN HEAT UP RATE UP TO 500 PSIG	MAINTAIN EHC PRESS SET 50-100 PSIG) Rx PRESS	EHC	PRESS SETPOINT INDICATOR INCREASE SCALE Rx PRESS + 100 PSI (PROCEDURE)	IC651-TURB CONT PANEL	DEPRESS "INCREASE" PB

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02-09-01	REMOVE RHR AND RCIC FROM STEAM CONDEN MODE	ISOLATE RHR HEAT EXCHANGER DRAINS	RHR HX STEAM COND AND MOV TEST LOGIC		IC601 AR9,5-2 OR AR19,5-2	E11-S62 (A,B) TO TEST B21H-S13 TO CLOSE E11A-S37 (A,B) TO CLOSE E11A-S14 (A,B) TO CLOSE B21HS17&20 TO CLOSE E11AS07 (A,B) TO CLOSE E51R600 DEPRESS "CLOSE" PB TO MIN SPEED
02-09-02	REMOVE RHR AND RCIC FROM STEAM COND MODE	SHUTDOWN RCIC TURBINE	RCIC TURB CONT AND WATER	DEC SPEED TO 2200 RPM (SME) 0-6000 RPM +/- 100 RPM (SME) DEC DISCH PRESS 0" PSIG 0-1500 PSIG +/- 50 PSIG INC SUCT PRESS 25 PSIG (SME) 10" HG TO +100 PSIG +/- 5 PSIG	IC601 E51R600 R66-1 R601 R604 R603 AR7,2-5 E51 S-9 AR-7,5-7,5-2	DEPRESS E51-S17 E51A5-25 E51 S-6 S-9 E51AS3 TO CLOSE S25 TO OPEN
02-09-03	REMOVE RHR AND RCIC FROM STEAM COND MODE	REMOVE RHR HEAT EXCHANGER FROM SERVICE	RHR STM COND	INDICATION TO 100% 0-100% +/- 5%	IC601 E11R604(A,B) E21R606(A,B) ZI-11210 E11R602(1500) PI11203 TI11208 AR9 3-8 OR AR19 3-8 E11AR61&611	E51AS VAC PUMP SW TO STOP E51S8 TO CLOSE E11A-S36(A,B)CLOSE S41(A,B)CLOSE E11A-S72(A,B)CLOSE E11A-S75&76 CLOSE THROT HS-11210(A,B) HS-11202(A,B)STOP HS-11210(A,B) CLOSE

SSES TASK ANALYSIS

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						HS-112?(OUTLET)CLOSE E11A-S54&540 CLOSE
						E11R608 TO MAN PB DEPRESS CLOSE E11R606 TO MAN PB DEPRESS CLOSE E11R604 TO MAN PB TO DEPRESS OPEN C32-R602 IN "AUTO" AND SET POINT @ 30"
02-10-01	MAINTAIN RV LEVEL VIA LO LOAD VALVE	MONITOR AND CONTROL VESSEL LEVEL	FEEDWATER	RX LEVEL SLIGHT INCREASE/DECREASE (OSCILLATION) -150 TO +80" +/- 5"	IC651 DCS CRT'S	
02-11-01	PLACE FIRST RFP IN SERVICE	STOP INCREASING PRESS. SET @ 500 PSIG	EHC BYPASS STEAM CONDENSATE	AS HEAT UP CONTINUES FIRST BYPASS VALVE OPENS TO FULL OPEN	TURBINE CONTROL C651	PRESS SET PB
02-11-02	PLACE FIRST RFP IN SERVICE	START SECOND COND PUMP		POSITION INDICATOR LIGHT RUN INDICATOR LIGHT	IC668 IC651 AND DCS CRT LR10514(B) HS10514 POS IND HS10560D POS IND	HS-10501(A,B,C,D) TO OPEN HS-10510 (A,B,C,D) TO START
02-11-03	PLACE FIRST RFP IN SERVICE	PLACE 1ST FEED PUMP IN SERVICE	FEEDWATER TURB CONTROL	TURBINE SPEED INCREASE TO 2100 RPM (SME) 0-6000 RPM +/- 100 RPM DISCHARGE PRESSURE INCREASE TO 800 PSIG (SME) 0-1500 PSIG +/- 1500 DEMAND DECREASE	IC651 & DCS CRT IC652 C32R602	HS-10651 (A,B,C) TO OPEN HS-12730 (A,B,C) DEPRESS SLOW
02-11-04	PLACE FIRST RFP IN SERVICE	WARM 2ND FEED PUMP	SAME AS 1ST RFP, SCENARIO	SAME AS 1ST RFP	SAME AS 1ST RFP	SAME AS 1ST RFP
02-12-01	CONTINUE PLANT HEATUP	INCREASE RX PRESS	EHC	RX PRESS INCREASE TO 920 PSIG (SME) 0-1500 PSIG +/- 50 PSIG RECIRC LOOP TEMP INCREASE TO 535 DEGREE F (SME) 0-600 DEGREE F +/- 5 DEGREE F	IC651 TURB CONT PANEL DCS CRT'S	DEPRESS "PRESS SET" PB MAINTAIN SET POINT 50-100 PSIG) RX PRESS
02-12-02	CONTINUE PLANT HEATUP	MAINTAIN 100 FAR/HR HEAT UP	RMCS RSCS CRD HYD RPIS		DCS CRT'S IC652	ROD WITHDRAWAL

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02-13-01	WARM THE MAIN TURBINE	RESET MN TURB	EHC TURB CONTROL	ISV OPEN	IC651 TURB CONT PANEL AR5 2-4 AR5 1-1, 1-2, 2-5, 1-8, 1-3	DEPRESS RESET PB
02-13-02	WARM THE MAIN TURBINE	WARM THE STEAM CHEST	EHC TURB CONTROL	PB BACKLIGHTS ISV'S CLOSE PB BACKLIGHTS WHILE DEPRESSED WARM DEMAND % INCREASE TO 10% (SME) 0-100% +/- 5% MSV-2 MILLIAMP INCREASE & RETURN TO ZERO (SME) 0-50 MA +/- 5MA CHEST TEMP INCREASE DEMAND % DECREASE TO ZERO (SME) 0-100% +/- 5%	DCS CRT IC-652 XR10110 IC651 TURB CONT PANEL	DEPRESS "CHEST" PB DEPRESS "INCREASE" (CHEST/SHELL WARMING) DEPRESS "DECREASE" (WARMING DEMAND) DEPRESS "SHELL"
				CONTROL VALVE POS IND INCREASE TO 100% (SME) TO 100% 0-100% +/- 5% ISV POS IND DECREASE TO 0% (SME) 0-100% BACKLIGHTS DEMAND INCREASE TO 10% (SME) 0-100% +/- 5% SHELL TEMP INCREASE BYPASS VALVES OPEN AS PWR INCREASES	IC652XR10110	DEPRESS "INCREASE"
02-14-01	PLACE THE MODE SWITCH TO "RUN"	MAINTAIN STEAM LINE PRESS @ 920 PSIG	EHC	MAIN STEAM PRESSURE CONSTANT @ 920 PSIG (SME) 0-1500 PSIG +/- 50 PSIG	IC651 TURB CONT PANEL	STOP RAISING PRESS SET WHEN @ 920 PSIG
02-14-02	PLACE THE MODE SWITCH TO "RUN"	INCREASE POWER VIA ROD WITHDRAW	RMCS NEUT MONIT RSCS RPIS CRD HYD	RX PRESS CONSTANT @ 920 PSIG (SME) 0-1500 PSIG +/- 5 PSIG BYPASS VALVE POSITION INCREASE (SME) 0-100% +/- 5%	IC651 DCS CRTS	ROD W/D PB'S
02-14-03	PLACE THE MODE SWITCH TO "RUN"	VERIFY APRM DOWNSCALE CLEAR		DCS CRT'S CHANGE FORMAT RECORDER PENS DECREASE TO 8% (SME) 0-125% +/- 5%	IC651 DCS CRT'S AND RMCS CONSOLE IC652	DEPRESS "IRM/APRM OVERLAP VERIF" P.B. ON MASTER DISPLAY SELECT PLACE CS:A 503&4 A-D TO APRM (IC652)

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						PLACE C72A501 TO "RUN"
02-14-04	PLACE THE MODE SWITCH TO "RUN"	GO TO "RUN"				
03-01-01	REDUCE POWER	INSERT CONTROL RODS	CRD HYD RMCS RSCS RWM RPIS	SELECTED ROD PB'S BACKLIGHT FULL CORE DISPLAY INDICATES SELECTED ROD CRT CHANGES TO INDICATED SELECTED ROD DISPLAY CHANGES TO SELECTED ROD INDICATION OF ROD INWARD MOVEMENT AND DRIVE FLOW OF 4 GPM (SME) 0-6 GPM +/- 5 GPM POSIT INDICATION AT "00" DRIVE FLOW INDIC FALLS TO "0" (SME) 0-6 GPM +.5 GPM +/- 5% IRM INDICATIONS DECREASE TO 25% (SME) 0 TO 125/125 + 5% UNTIL RANGE SW MOVED TO LOWER SCALE THEN INCREASE TO 75% (SME) 0 TO 125/125 +/-5%	DCS CRT'S #5 AND #6 SIP (IC652) IC601 C12R604	IC651 DEPRESS CONTROL ROD COORDINATE PB'S FOR SELECTED ROD (ROD SELECT AND MOTION CONTROL) AND RELEASE DEPRESS "INSERT ROD" PB AND MAINTAIN RELEASE "INSERT ROD" PB WHEN AT POSITION "00"
03-01-02	REDUCE POWER	MONITOR POWER REDUCTION	NMS DCS	"DRIVING IN" BACKLIGHTS UNTIL DETECTORS FULL IN AS DETECTORS MOVE IN PERIOD INCREASES TO 50 SEC (SME) INFINITY TO 0 SEC THEN DECREASE TO INFINITY COUNTS INCREASE THEN DECREASE MAY RECEIVE UPSCALE ALARM @ 10E5 COUNTS (TS) 0-1X10E6 COUNTS	CRT #6 SIP IC652 IC651 CRT #6 & IC651 C51R600 & C51R601	REDUCE RANGE SW POSITIONS (C51A508A-D & 509A-D) TO MAINTAIN IRM INDIC BETWEEN 75&25% OF SCALE INSERT SRM'S BY DEPRESS & RELEASE "SRMA(B,C,D)SELECT" PB'S DEPRESS "POWER ON" PB DEPRESS "DRIVE IN/OUT"PB ON "DCS MASTER DISPLAY SELECT" MATRIX DEPRESS "SRM/IRM OVERLAP VERIF" PB

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				AND/OR UPSCALE TRIP ALARMS @ 5 TO 10E5 COUNTS (TS) PB BACKLIGHTS CRT'S CHANGE TO PROPER FORMAT		
03-02-01	COMMENCE COOLDOWN @ (OR EQUAL TO 100 DEGREES FAR./HR	ESTABLISH COOLDOWN	EHC MN COND	PERCENT INDICATOR INCREASES TO 10% (SME) 0-100% +/- 5% BPV #1 IND % INCREASES MA INCREASES	IC651 TURB TEST PANEL AND DCS CRT #8 (POSSIBLY DCS/PMS CRT #9 IS SELECTED)	DEPRESS "BYPASS VALVE OPENING JACK" "INCREASE" PB
03-02-02	COMMENCE COOLDOWN @ (OR EQUAL TO 100 FAR./HR	MONITOR AND PLOT RATE OF COOLDOWN	RECIRC	RECIRC PP SUCT TEMP DECREASES 0-600 DEGREE F +/- 5 DEGREE F RX PRESS DECREASES 0-1500 PSIG +/- 50 PSIG TOT FW FLOW DECREASES 0-20X10E6 LB M/HR +/- 100 TOT STEAM FLOW DECREASES PROPORTIONAL TO THE POWER DECREASE 0-20X10E6 LB M/HR +/- 100	IC651 CRT #4 & 8 IC651 (B31R650) (C32R609) RED (C32R607)	MONITOR AND PLOT RECIRC LOOP A (B) SUCTION TEMP ADJUST BPV POSITION (AS ABOVE) TO MAINTAIN)100 DEGREES F/HR (TS)
03-02-03	COMMENCE COOLDOWN @(OR EQUAL TO 100 FAR./HR	MAINTAIN PRESS SET WITHIN 50 PSIG OF RX PRESS	EHC	MAINTAIN PRESS SET (OR EQUAL TO 50 PSIG) RX PRESSURE (PROCEDURE)	TURB CONTROL PANEL "PRESS SET PT A" AND "B" DECREASE (INDIC)	DEPRESS "PRESSURE SETPOINT SELECTOR" "DECREASE" PB TO MAINTAIN PRESS SET (OR EQUAL TO 50 PSIG) RX PRESSURE (PROCEDURE)
03-03-01	OPEN MAIN STEAM LINE DRAINS		MN STEAM		IC601	PLACE HS B21H-535 TO OPEN HS B21H-56 TO OPEN HS B21A-58 TO OPEN HS B21A-59 TO OPEN
03-04-01	REMOVE THE LAST FEEDPUMP FROM SERVICE	REMOVE FEEDPUMP TURBINE FROM SERVICE	FEEDWATER CONDENSATE	DEMAND SIGNAL DECREASES TO ZERO 0-100% +/- 5% FEED FLOW (TOTAL) DECREASES TO ZERO RFPT SPEED DECREASES TO ZERO 0-6000 RPM +/- 100 RPM FD INLET FLOW DECREASES TO ZERO 0-8X10E6 LB M/HR +/- 100 COND PUMP DISCHG PRESS INCREASES TO 680 PSIG	IC651 C32R607 C32R604A(B,C) SI-12728A1(B1,C1) PR-10609 PR-10607 PI 10651 IC652 CRT #3 & #2 ZI 12728 A(B,C) IC668 PI-12710A(B,C) PI-12709A(B,C)	DEPRESS "CLOSE" PB ON C32-R601A(B,C) UNTIL "0" DEMAND

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				0-800 PSIG +/- 50 PSIG FEED PUMP DISCHG PRESS INCREASES TO RX PRESS 0-1500 PSIG +/- 50 PSIG FEED PUMP SUCT PRESS INCREASES TO 680 PSIG 0-800 PSIG +/- 50 PSIG RFP DISCHG HDR PRESS INCREASES TO RX PRESS 0-1500 PSIG +/- 50 PSIG		
				HP & LP STM PRESS INCREASES TO 600 PSIG (SME) 0-1500 PSIG +/- 50 PSIG DEMAND DECREASES TO ZERO (SME) 0-100% +/- 5% FEED PUMP DISCHG PRESS DECREASES TO ZERO (SME) 0-1500 PSIG +/- 50	IC668	DEPRESS HS-12730A-1 (B OR C) TO LSS DEPRESS HS-10603 A(B OR C) UNTIL CLOSED DEPRESS HS-12745A(B,C)
03-04-02	REMOVE THE LAST FEEDPUMP FROM SERVICE	STOP ONE OF THE TWO REMAINING CONDENSATE PUMPS	COND	DEMAND DECREASE TO ZERO (SME) 0-100% +/- 5% DECREASE TO ZERO 0-5000 GPM +/- 50 GPM	DCS CRT #2 (C651) FIC & FI 10508 (C668)	DEPRESS HS-10510A (B,C, OR D,) "STOP" PB DEPRESS HS-10502A (B,C, OR D) CLOSE PB INSTRUCT LOCAL OPERATOR
03-04-03	REMOVE THE LAST FEEDPUMP FROM SERVICE	REMOVE FILTER DEMINS TO MAINTAIN FLOW AT) 900 GPM MIN	COND			
03-05-01	TRANSFER SEALS TO AUX. STEAM	VERIFY RX PRESS (OR EQUAL TO 250 PSIG	NUC INST	(OR EQUAL TO 250 PSIG	C652 C32-R605 DCS CRT #7 C653 P102118 FI02114A1 AND/OR B1 HS02109A1 (B1) WHITE "AVAIL" LIGHT	
03-05-02	TRANSFER SEALS TO AUX. STEAM	VERIFY AUX BOILER AVAILABLE	AUX STEAM STEAM SEALS MN TURB	)250 PSIG (SME) 0-380 PSIG +/- 50 PSIG		

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03-05-03	TRANSFER SEALS TO AUX. STEAM	ESTABLISH AUX STEAM	AUX STEAM STEAM SEALS MN TURB	SSE PRESS DEC TO ABOUT 4 PSIG 0-10 PSIG +/- 1 PSIG SHELL PRESS DEC TO ZERO (SME) 0-100 PSIG +/- 1 PSIG SSE PRESS DEC TO ZERO 0-100 PSIG +/- 5 PSIG	C668 PI-10723 PI10747 PI10738	OPEN/CHECK OPEN HV0765 (HS10765)&HV0766 (HS10766) OPEN HV-0706 (HS10706) CLOSE HV0216A(HS10709) CLOSE CV/HV-0703 (HS10703) CLOSE HV-0749 (HS10749) CLOSE HV-0270A,B,C (HV0270A,B,C) CLOSE HV0761
03-06-01	ESTABLISH SHUTDOWN COOLING	FILL RHR PIPING	RHR	DEMAND SIG INCREASE TO 10% (SME) 0-100% +/- 5% DEMAND SIG DECREASE TO 0% (SME) 0-100% +/- 5%	IC601 IC668	DIRECT NPO TO OPEN 161121 151083 151F066 PLACE B21H37B TO "TEST" OPEN F008 (HSB21S10) CLOSE 151F004C(D) HSS04C(D) THROTTLE OPEN HV15186 W/HIC 15186 DIRECT NPO TO VENT FROM 151090 & RECLOSE 151F066, 151083&161121 CLOSE HV15186 DEPRESS "FLASHER RESET" CHECK OPEN 151F047A(B) 48A(B) 03A(B) PLACE TEST SW IN TEST S62A&B OPEN HV151F009 B21H-S09 WASTE SENT TO RADWASTE ORDER NPO TO REPLACE OVERLOADS FOR 151F010AB OPEN 151F010A(B) 507A(B) 151F103A(B)104AB E11540A(B)&5540(2)
03-06-02	ESTABLISH SHUTDOWN COOLING	PREWARM RHR SUCTION PIPING	RHR	VENT FLOW INCREASE TO 10 SCFM (SME) 0-100 SCFM +/- 10 SCFM	C601 AR18A (3-6) C601 E11R610A(B) R611A(B) ANN 5-2 (AR21A) (AR18A)	

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				HT EXCHG OUT INC 220 DEGREE F (SME) 0-350 DEGREE F CROSS TIE TEMP INC 220 DEGREE F (SME) 0-350 DEGREE F CONDUCTIVITY INC) 10 MICRO MHO (SME) 0-100 MICRO MHO THEN DECREASES)2 MICRO MHO (SME) 0-100 MICRO MHO	C601 C601 TRS151R601 CR12351 ANN 6-5 AR18A(21A)	HAVE NPO OPEN 151088 CHECK 151089 CLOSED OPEN HV 151F043 OPEN 151F079A(B) SV151F080A(B) B21HS18&S21 HAVE NPO OPERATE LOCAL SAMPLE RACK VLVS THROTTLE OPEN HV151
03-06-03	ESTABLISH SHUTDOWN COOLING	PLACE RHR IN SHUTDOWN COOLING	RECIRC & MG SET	GEN SPEED DEC TO ZERO (SME) 0-100% GEN DEMAND DEC TO ZERO (SME) 0-100% BKR IND (MOTOR&FLD) DRIVE FLOW DEC TO ZERO (SME) 0-70,000 GPM CORE FLOW DEC 0 MLBM/HR (SME) 0-150X10E6 LBM/HR CORE PLATE DELTA P DEC TO 0 PSID JP FLOW DEC TP ZERO (SME)	C651 DCS CRT #4 B31A11A & 11B(2A)AND B C652 B31R614 21R613 21R609 21R611 31R613 31R617 31R612 R624 R628 R623	SECURE THE LINE UP BY REVERSING THE ABOVE STEPS F040 DEPRESS STOP ON BOTH MG SET DR MTR BKRS (B31A-501A&B) CLOSE F031A&B (HSB31A 507A&B) TO CLOSE PCO DIRECTS NPO TO ISOLATE SEAL PURGE SYS PCO VERIFIES POSITION OF HV143F031 A&B HV143F032 A&B HV143F023 A&B HV151F017 A(B) HV151F015 A(B) OPEN HV-11210A(B) TO 10% (HS-1120A1(B1)) OPEN HV11215A(B) (HS11215A1(B1)) START RHRSW PUMP (HS-11202A2(B2))
			RHRSW ESW RHR NUC INST RECIRC RWCU	LOOP FLW DEC TO ZERO (SME) 75X10E6 LBM/HR PP DIFF PRESS DEC TO ZERO (SME) 0-300 PSID MTR PWR & 0-6X10E3 WATTS CURRNT DEC TO ZERO (SME) 0-1.5X10E3 AMPS HX FLW INC TO 1000 GPM 0-12000 GPM	C601 FI11208A(B) PI11208A(B) E11R602A(B)TI-11210A(B) C653 FDR-01204A(B) PI-01107A(B) FI-01109A(B)	THROTTLE HV-1210A(B) TO 7000-9000 GPM HS01102A(C) AND/OR B(D) PCO VERIFIES POSITION OF HV151F047A(B)&48A(B)

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				DISCH PRESS INC TO 120 PSIG (SME) 0-500 PSIG DISCH TEMP DEC TO (200 DEGREE F (SME) 0-350 DEGREE F ESW SPRAY POND BPV OPENS INLET FLOW INC TO 9000 GPM (SME) 0-1500 GPM DISCHG PRESS DEC TO 90 PSI (SME) 0-150 PSIG ESW HDR PRESS INC TO 100 PSI (SME) 0-150 PSIG LOOP FLOW INC TO 9000 GPM (SME) 0-15000 GPM		
03-06-04	ESTABLISH SHUTDOWN COOLING	ESTABLISH HEAD SPRAY	RHR	FLOW INCREASE 1000 GPM (SME) 0-2000 GPM	C601 R607	OPEN HV151F022 (B21H 5-34) OPEN HV151F020 THROTTLE CV 151F023 TO 1000 GPM OPPOSITE OF 3:6:4
03-06-05	ESTABLISH SHUTDOWN COOLING	SHUTDOWN HEAD SPRAY				
03-07-01	ISOLATE MAIN STEAM SYS AND BREAK VACUUM	CLOSE ALL BYPASS VALVES	EHC	% POSIT IND DECREASE TO ZERO (SME) 0-100%	C651 CRT AND POS IND	DEPRESS "CLOSE" PB ON "BYPASS VALVE OPENING JACK"
03-07-02	ISOLATE MAIN STEAM SYS AND BREAK VACUUM	CLOSE MSIV'S	MN STM	VALVE INDICATIONS	C601	PLACE HSB21HS1A, B, C, D & S2A, B, C, D TO "CLOSED"
03-07-03	ISOLATE MAIN STEAM SYS AND BREAK VACUUM	BREAK CONDENSER VACUUM	CONDENSER & AIR REMOVAL	ST, SYPPLY PRESS DECREASE TO ZERO (SME) 0-300 PSIG SJAE DISCHG PRESS DECREASE TO ZERO (SME) 0-15" HG TEMP DECREASE TO 70 DEGREE F	C668 PI10502 PI10701 PI10720 TI10724 PI10702 FI10724 C652 PR-10502 ANNUNCIATOR 55 A-1 (1-8) ANN AR-1 (10-3) (12-3) (14-3) AR-5 (2-1) (2-2)	CLOSE HV-0716-19(HS-10716) CLOSE HS-10722 CLOSE HS-10702 CLOSE HS-10721 CLOSE HS-10752 OPEN HV-0742 (HS-10742)

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03-07-04	ISOLATE MAIN STEAM SYSTEM AND BREAK VACUUM	ISOLATE STEAM SEALS	AUX STEAM	(SME) 0-500 DEGREE F PRESS DECREASE TO ZERO (SME) 0-250 PSIG FLOW DECREASE TO ZERO 0-200 SCFM COND VACUUM DECREASE TO ZERO (SME) 0-30" HG SPE HDR PRESS DEC TO ZERO (SME) 0-10 PSIG RFPT SEAL STM PRESS DEC TO ZERO (SME) 0-[illegible] PSIG	C668 PR-10756 PI-10711A,B&C	CLOSE HV 0706 (HS-10706) STOP EXHAUSTER (HS-10740 A (B))
03-07-05	ISOLATE MAIN STEAM SYS AND BREAK VACUUM	STOP CIRC WATER SYSTEM	CIRC WTR COOLING TOWERS	SUCT PRESS INC TO 20 PSI (SME) 0-50 PSI DISCH PRESS DEC TO ZERO (SME) 0-200 PSIG WATER BOX DELTA P DEC TO ZERO (SME) 0-20 PSID TEMP INC TO 90 DEGREE F (SME) 0-150 DEGREE F BLOWDOWN FLOW DEC TO ZERO (SME) 0-2000 GPM VLV POS DEC TO ZERO (SME) 0-100% INDICATOR LIGHTS	C668 PI11513A AND B 11511A AND B PDI11542 A-D ZI-11503 FR-11503 TR-11501	STOP ALL OPERATING CIRC PUMPS BY DEPRESSING HS-11512A-D "OFF" PB CLOSE HV1503 (HS11503)
03-08-01	COMPLETE RX SHUTDOWN AND ISOLATION	VENT THE RPV	NUC BLR		IC601	OPEN F001, F002 AT (OR EQUAL TO 212 FAR.) (HSB21AS1,S2) C72AS01
03-08-02	COMPLETE RX SHUTDOWN AND ISOLATION	PLACE MODE SWITCH IN SHUTDOWN AND RESET SCRAM	RPS		IC651	(SEE RX SCRAM FOR ACTIONS) CLOSE F032 A AND B (HS B11A-S11 AND 12)
03-09-01	ISOLATE RPV FEED	ISOLATED FEEDWATER TO RPV	FEED AND CONDENSATE	COND DISCHG PRESS INCREASE TO 200 PSIG (SME) 0-800 PSIG COND RECIRC FLOW INCREASE TO 2000 GPM (SME) 0-8X10E3 GPM DEMAND DECREASE TO ZERO 0-100% COND PUMP DISCHG PRESS DECREASE TO 650 PSIG (SME) 0-800 PSIG	C651 CRT #2 AND 3 C668 FI10508 FIC10508	CLOSE C32R602 OPEN 10510 AND 10569

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03-10-01	COOL THE RX SHELL AND FLANGE	RAISE RX LEVEL TO) OR EQUAL TO 41.5 "(OR EQUAL TO 265.5"	FEED AND CONDENSATE RWCU MN. STM	RECIRC FLOW DECREASE TO ZERO 0-8X10E3 GPM DEMAND INCREASE TO 50% (SME) 0-100% LEVEL INCREASE TO (265.5" (SME) 0-300" COND PUMP DISCHARGE PRESS DECREASE TO 600 PSIG (SME) 0-800 PSIG COND RECIRC FLOW DECREASE TO ZERO (SME) 0-8X10E3 GPM	C651 CRT #3 AND #1 C32-R602 C601 B21R605 ANNUNCIATORS AR1 17-1 17-2	OPEN F032A(B) CLOSE G33502 OPEN LO LOAD VALVE C32R602
03-10-02	COOL THE RX SHELL AND FLANGE	LOWER RX LEVEL TO (OR EQUAL TO 169.5 ") OR EQUAL TO 145.5"		DEMAND DECREASE TO ZERO (SME) RV LEVEL DECREASE TO (169.5" (SME) 0-300" HOTWELL LEVEL INCREASE TO 7 FT (SME) 0-15 FT		CLOSE LO LOAD VALVE C32R602 OPEN G33502 OPEN G33R606 TO MAX
03-10-03	COOL THE RX SHELL AND FLANGE	REPEAT STEP 1 AND 2 UNTIL ABOUT 150 FAR.				PCO DIRECTS NOP TO GET TEMP READINGS
03-11-01	VENT RX VESSEL HEAD AREA	INSTALL FILTERS, PIPINGS AND AIR LINE				PCO DIRECTS MAINTENANCE TO INSTALL EQUIPMENT
03-11-02	VENT RX VESSEL HEAD AREA	START SBGTS AND VENT	STANDBY GAS TREAT	FLOW INCREASE THEN DECREASE	IC680 IC601	TURN CONTROL SWITCH FROM "AUTO" TO "START" PLACE HS-B21A S1 AND S2 TO "OPEN" (HEAD VENTS) DIRECTS NPO TO OPEN 151056
03-12-01	REMOVE VESSEL HEAD	STOP VENTING				NPO TO CLOSE 151056
03-12-02	REMOVE VESSEL HEAD	INSTALL TEMP PIPE				MAINT TO INSTALL TEMP PIPE
03-12-03	REMOVE VESSEL HEAD	FILL RX VESSEL TO APPROX. 217.5		LEVEL INCREASES LEVEL STEADIES @ 217.F" (SME) 0-300"	C651	OPEN C32R602 & TO 500 GPM THEN CLOSE CLOSE HEAD VENTS (HSB21A S1 & S2)
03-12-04	REMOVE VESSEL HEAD	LIFT AND REMOVE VESSEL HEAD				PCO DIRECTS MAINTENANCE TO REMOVE VESSEL HEAD
04-01-01	EVALUATE CONDITION	OBSERVE ANNUNCIATORS		ALL ESS-4 KV BUSES LO VOLTAGE ESS TRANSFORMERS TROUBLE 13 KV SOURCE BKRS OPEN 4KV SOURCE [illegible] TRIP	ALL CONTROL RM ANNUNCIATOR PANELS	"ALARM SILENCE" PB(S)

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INDEX NUMBER	SUBTASK	ELEMENT	SYSTEM	A PRIORI INFORMATION AND CONTROL REQUIREMENTS	EXISTING CONTROL ROOM INSTRUMENTATION	EXISTING CONTROLS MANIPULATED (OR BRANCH POINT)
04-01-02	EVALUATE CONDITION	EVALUATE CONDITION	4KV		IC653	DETERMINE LOSS OF ALL OFF-SITE POWER BRANCH TO EO-00-004
04-01-03	EVALUATE CONDITION	VERIFY AUTO ACTIONS (LOSS OF POWER)	MN DIST MN TURB MS STM HPCI RCIC RX VESSEL ESW	ALL/DG'S START AND ENERGIZE RESPECTIVE BUSES BUS FREQUENCY 60 HZ BUS VOLTAGE 4.16 KV SEE 01-06-02 GEN OCB OPEN AMBER & EXCITER FLD BKR OPEN MN TURB TRIPS (VARIOUS ALARMS) SEE SYSTEM RESPONSE FOR 01-02-04 NORM LIGHTING OFF (UNTIL D/G START) RX SCRAM SEE CONTROL ROOM INFO FOR 01-01-01 EXCEPT PRIMARY CONTAINMENT HIGH PRESS TRIP MSIV'S CLOSE HPCI AND RCIC AUTO START ON RPV LEVEL OF (-38" -150 TO +80 SRV'S OPEN @)1086 PSIG 0-1500) PSIG ESW AUTO START 55 SEC AFTER D/G STARTS	OC653 C651 C651 C601 C653	AT THIS POINT OPERATOR SHOULD VERIFY NO SCRAM BRANCH TO EO-00-014 AND EO-00-001
04-01-04	EVALUATE CONDITION	VERIFY/ENFORCE AUTO ACTIONS (ATWS)	RCIRC	BOTH RECIRC PUMPS TRIP ON RPV LOW LEVEL OF -38" AND/OR RPV PRESSURE)1120 PSIG 0-1500 PSIG	IC651	
04-02-01	INITIATE EO-00-014	ATTEMPT MANUAL SCRAM	RPS		IC651 ANN AR-3 2-1 AND 3-1 ANN AR4 2-1 AND 3-1	ROTATE COLLARS AND DEPRESS C72A-S03 A & B OR C & D PLACE C72A-S01 TO "SHUTDOWN" IF SUCCESSFUL BRANCH TO EO-00-001

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04-02-02	INITIATE EO-00-014	INCREASE CRD FLOW TO HCU'S START 2ND CRD PUMP OPEN FCV OPEN PCV	CRDH	SYSTEM FLOW INCREASES TO)90 GPM 0-250 GPM SYSTEM PRESS DECREASES TO ~1200PSIG 0-1800 PSIG	C601 C12R606 C12R601	HS C12B-53 (A,B) TO START (DIRECT PLANT OPERATOR TO OPEN DISCHARGE VALVE) PLACE C12-R600 IN MANUAL AND FULL OPEN DEMAND PLACE C12B-S1 TO FULL OPEN
04-02-03	INITIATE EO-00-014	DE-ENERGIZE RPS A AND B	RPS			ACTIONS DIRECTED TO PLANT OPERATOR. IF SUCCESSFUL, BRANCH TO EO-00-001.
04-02-04	INITIATE EO-00-014	DEPRESSURIZE SCRAM AIR HDR	CRDH			ACTIONS DIRECTED TO PLANT OPERATOR. IF SUCCESSFUL, BRANCH TO EO-00-001.
04-02-05	INITIATE EO-00-014	INDIVIDUAL SCRAM RODS				THESE ACTIONS ARE DIRECTED TO PLANT OPERATOR. IF SUCCESSFUL BRANCH TO EO-00-001.
04-02-06	INITIATE EO-00-014	INJECT SBCC	SBLC	SLC TK LEVEL DECREASE FROM)90% TO ~5% 0-100% PUMP DISCHARGE PRESS INCREASE TO 1100 PSIG 0-1800 PSIG RX PWR DECREASE (SLOW) 0-125%	IC601 C41R601 C41R600	PLACE C41A-S1 TO SYS A OR SYS B
04-02-07	INITIATE EO-00-014	STABILIZE RX PRESSURE	MS/SRV	RX PRESS DECREASES TO ~900 PSIG 0-1500 PSIG THEN STABLE RX POWER DECREASE TO ~8 TO 20% 0-125% THEN STABLE	IC601	PLACE B21S-8 (9,10) TO "OPEN"
04-02-08	INITIATE EO-00-014	PREVENT ALL INJECTION OF WATER UNTIL TOP OF ACTIVE FUEL	HPCI RCIC RHR & CS		IC601 ANN 22A 4-2 ANN 17A 5-2 ANN 18A 2-2 21A 2-2	DEPRESS E51A S23 (MANUAL ISOLATION) (DEPRESS E41-S32) MANUAL ISOLATION PLACE E21-S07 A & B TO CLOSE
04-02-09	INITIATE EO-00-014	INITIATE SUPP POOL COOLING START RHRSW START RHR LINE UP FOR SUPP POOL COOLING	RHR RHRSW	SEE (03-06-03)	IC601 E1-11210A(B) E11-R602A(B) PI-11203A(B) TI-11208A(B) E11-R608	HS-112 (HV OUT VLV) TO OPEN HS-11212A1 B1 TO OPEN (20%) HS-11202A2 TO START (B2) E11A-S03A OR C (B OR D) TO START E11A-S39A TO "CLOSE" (HX BYPASS) E11A-S14A (B) TO OPEN E11A-S[illegible](B) OPEN

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04-03-01	INITIATE EO-00-004 SUBSEQUENT OPERATOR ACTIONS	TRANSFER RBCCW AND TBCCW COOLING TO ESW VERIFY ESW IN OPERATION.	ESW	PRESSURE INCREASE TO 100 PSIG 0-200 PSIG FLOW INCREASE TO 9000 GPM 0-1500 GPM TEMPERATURE INCREASE)70 DEGREE F 0-150 DEGREE F	IC653 PI-01107 A AND B TI-01106 A AND B FI-01109 A AND B TI-01115 A,B,C,D FDR01204 A AND B (GREEN)	
04-03-02	INITIATE EO-00-004 SUBSEQUENT OPERATOR ACTIONS	SHIFT ESW	ESW TBCCW RBCCW	INDICATION LIGHT	C668	HS11024 A AND B HS10943 A AND B TO EMERG
04-03-03	INITIATE EO-00-004 SUBSEQUENT OPERATOR ACTIONS	RESTART INST AIR	INST AIR	INDICATION LIGHT	IC668	HS 12500 A1 AND B1 TO "AUTO"
04-03-04	INITIATE EO-00-004 SUBSEQUENT OPERATOR ACTIONS	RESTORE CONTROL STRUCTURE CHILLED WATER	CSCWS	INDICATOR LIGHT	IC680	RESTART CS CW PUMP RESTART CS CHILLER
04-04-01	INCREASE RX LEVEL	WHEN RX IS S/D DUE TO BORON INJECTION RAISE LEVEL				BRANCH TO RX S/D TO REFUEL
05-02-01	EVALUATE CONDITIONS	OBSERVE ANNUNCIATORS	RPS VESSEL LEVEL INST RPS MN TURB MN GEN RWCU RFPT	ANNUNCIATORS FLASHING AND AUDIBLE ALARM	IC651 ANNUNCIATORS AR 3&4 RX AUTO SCRAM A1/A2 RX AUTO SCRAM B1/B2 RX VESSEL LO LEVEL TRIP TURB STOP VLV CLOSURE TRIP MSIV NOT FULL OPEN TRIP DISCHARGE VOLUME HIGH WATER LEVEL/TRIP SCRAM DISCHARGE VOLUME NOT DRAINED ANNUNCIATORS AR5&6 MAIN TURB MASTER TRIP LOSS OF EMER TRIP OIL PRESS GEN LOCKOUT TRIP ANNUNCIATOR AR1&2 RWCU PUMP LO FLOW RWCU PUMP HI-LO FLOW RFPT A TRIP RFPT B TRIP RFPT C TRIP	DEPRESS ALARM SILENCE (AS REQUIRED)

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			RECIRC		RX WATER HI LEVEL RX WATER HI-LO RECIRC MG GEN A LOCKOUT TRIP RECIRC MG GEN B LOCKOUT TRIP IC601 AR17 & 18 RCIC OUT OF SERVICE RX LO LEVEL INITIATION SYSTEM I & II RX LO PRESS SYS I & II AR19 RX LO LEVEL CONFIRMED ADS A & B CORE SPRAY RHR PUMP RUNNING PERM PRESS RELIEF ADS OR SAFETY LEAKING AR20 MN STM LINE LOGIC A/C & B/D LO PRESS RX LO LO LEVEL SYS A&B DRWL/SUPP CHMB HI-LO PRESS SUPP CHAMB HI TEMP AR22 HPCI TURB TRIPPED SUPP POOL HI LEVEL HPCI TURB TRIP 501 ENERGIZED OC653 AUX X FMR II TROUBLE 13.8 KV SOURCE BKR TO BUS 1 A/B AUTO TRANSFER DCS CRT'S	
			RCIC CS RHR ADS NSSSS			
			HPCI ELECT DIST			
05-03-0.	EVALUATE CONDITIONS	EVALUATE INDICATIONS		RX LEVEL RAPID INCREASE TO)+54" -150 TO +80 THEN DECREASE TO (-38" -150 TO +80 (DUE TO SWELL) ERRATIC INDICATION DUE TO REF. LEG FLASH FROM RAPID DEPRESS RX PRESSURE RAPID DECREASE TO 0 PSIG 0-1500 PSIG DUE TO STUCK OPEN RELIEF VALVES		

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				RX POWER RAPID DECREASE TO 0% APRM 0-125% DUE TO SCRAM AND VOIDING STM FLOW RAPID DECREASE TO ZERO (0-20X10E6 LBM/HR) (MSIV CLOSURE) ON RPV LOW LEVEL -38" FEED FLOW RAPID DECREASE RFPT TRIP HI-LO LEVEL)+54" 0-20X10E6 LBM/HR RAPID DECREASE TO "0" MLBM/HR 0-150X10E6 BLBM/HR DUE TO PUMP TRIP		
05-04-01	VERIFY AUTO ACTIONS	VERIFY RX SCRAM				BRANCH TO RX SCRAM PROCEDURE EO-00-001 STEP 2.C.2 "IF LEVEL BELOW TAF OR CANNOT BE DETERMINED"- BRANCH TO EO-00-024 LEVEL RESTORATION
05-05-01	EXECUTE EO-00-021	CONFIRM GROUP ISOLATIONS ECCS OPERATION D/G OPERATIONS		LEVEL INDICATIONS ARE ERRATIC AND INCONSISTANT DUE TO REFERENCE LEG FLASHING FROM RAPID DEPRESSURIZATION	ANNUNCIATORS AND INDICATORS AS LISTED PREVIOUSLY	
05-05-02	EXECUTE EO-00-024 LEVEL RESTORA-TION	LINE UP/VERIFY PUMP RUNNING IN INJECTION SYSTEMS	RHR CS	PUMP DISCHG PRESS INC PUMP/LOOP FLOW INC SEE 01-06-01 SYSTEM RESPONSE (PROCEDURE NOT AVAILABLE NOT NECESSARY SINCE VESSEL IS DEPRESSURIZED)	IC601	ALL RHR AND CS PUMPS RUNNING AND INJECTING STEP 2.1.2-LEVEL CAN'T BE DETERMINED BRANCH TO EO-00-027 (RAPID DEPRESSURIZATION)
05-05-03	EXECUTE EO-00-024 LEVEL/RESTO RATION	MONITOR RPV LEVEL AND PRESSURE	DCS CRT'S	LEVEL INC RAPIDLY TO)250 0-300" PRESSURE DEC TO ZERO THEN INC TO ~330 PSIG 0-1500 PSIG (TO SHUTOFF PRESS OF ECCS SYS PUMPS)	IC651	AT THIS POINT PROCEDURES SEND OPERATOR BACK TO EO-00-021. STEP 2.e BRANCHES TO EO-00-022.
05-06-01	EXECUTE EO-00-022	MAINTAIN RPV WATER LEVEL BETWEEN +54" AND TAF			IC601	

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05-06-02	EXECUTE EO-00-022	SEQUENTIALLY REMOVE ECCS SYSTEMS FROM SERVICE	RHR CS	INITIATION ANNUNCIATORS CLEAR RHR A & B 0-40000 GPM 0-500 PSIG LOOP PRESS AND FLOW DECREASE TO ZERO ANNUNCIATORS CLEAR CS A & B LOOP 0-850 GPM 0-500 PSIG PRESS AND FLOW DECREASE TO ZERO RX PRESS IND DECREASE TO ZERO 0-1500 PSIG		DEPRESS HS E11556A&B (TO RESET INITIATION SIGNAL) TURN HS E11A 503A, B, C, D TO STOP DEPRESS E21A516A&B (RESET INITIATION SIGNAL) PLACE HSE51505A, B, C, D TO "STOP"
05-06-03 05-06-04	EXECUTE EO-00-022 EXECUTE EO-00-022	MAINTAIN LEVEL WITH COND. SYSTEM COOLDOWN PER GO-00-005	COND			ADJUST HIC 10640 AS REQUIRED BRANCH TO GO-00-005 SEE RX SHUTDOWN FROM MIN POWER TO REFUEL MONITOR
05-07-01 05-08-01	EXECUTE EO-00-023 CONTAIN-MENT CONTROL	SUPPRESION POOL TEMP-MONITOR INITIATE SUPPRESSION POOL COOLING	RHR	)110 FAR. 0-212 DEGREE F	C601 E11A R601 SEE LARGE STEAM LINE BRAKE INSIDE DRYWELL	SEE LARGE STEAM LINE BREAK INSIDE DRYWELL 01-07-03 01-07-03
05-08-02	CONTAIN-MENT CONTROL	DRYWELL TEMP MONITOR		(135 FAR. 0-350 DEGREE F	SEE LARGE STEAM LINE BREAK INSIDE DRYWELL	SEE LARGE STEAM LINE BREAK INSIDE DRYWELL 01-07-04 01-07-04
05-08-03	CONTAIN-MENT CONTROL	DRYWELL PRESSURE MONITOR		(2 # 0-75 PSIG	SEE LARGE STEAM LINE BREAK INSIDE DRYWELL	SEE LARGE STEAM LINE BREAK INSIDE DRYWELL 01-07-05 01-07-05
05-08-04	CONTAIN-MENT CONTROL	SUPPRESSION POOL LEVEL MONITOR		22-24 FT. 0-50 FT	SEE LARGE STEAM LINE BREAK INSIDE DRYWELL	SEE LARGE STEAM LINE BREAK INSIDE DRYWELL 01-07-06 01-07-06
06-01-02	EVALUATE CONDITIONS	OBSERVE ANNUNCIATORS		ANNUNCIATORS FLASHING AND AUDIBLE ALARM	IC651 AR3&4 RX AUTO SCRAM A1/A2 B1/B2 RX VESSEL LO LEVEL TRIP TURB STOP VLV CLOSURE TRIP MSIV NOT FULL OPEN TRIP SCRAM DISCHG VOL NOT DRAINED SCRAM DISCHG VOL HI LVL TRIP PRIMARY CONT HI PRESS TRIP AR5&6 MA[redacted]RB [redacted]ER	DEPRESS ALARM SILENCE (AS REQUIRED)

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					LOSS OF EMER TRIP OIL PRESS GEN LOCKOUT TRIP AR1&2 RWCU PUMP LO FLOW RWCU HI-LO PRESS RX WATER HI-LO RECIRC MG GEN A LOCKOUT RECIRC MG GEN B LOCKOUT IC601 RCIC PUMP DISCHG LOW FLOW HI DRYWELL PRESS SYSI&II CONTAINMENT HI TEMP LOOP A&B CONTAINMENT HI MOISTURE DRYWELL EQUIP DRN SUMP HI HI LEVEL DRYWELL FLOOR DRN SUMP A&B HI HI LEVEL IC601 RX LO LO LEVEL SYS A&B CONTAINMENT HI RAD LOOP A&B OC653 AUX XFMR1I TROUBLE 13KV SOURCE BKR TO BUS 1A/B AUTO TRANSFER	
06-02-01	EVALUATE CONDITIONS	EVALUATE INDICATORS		RX POWER RAPID DECREASE TO IRM RANGE 8 OR BELOW 0/125 TO 125/125 RX LEVEL (-38" & DECREASING -150 TO +80" RX PRESSURE REMAINS HIGH)1035 (1086 0-1500 PSIG STM FLOW RAPID DECREASE TO ZERO 0-20X10E6 LBM/HR (MSIV CLOSURE ON 38")		

INDEX NUMBER	SUBTASK	ELEMENT	SYSTEM	A PRIORI INFORMATION AND CONTROL REQUIREMENTS	EXISTING CONTROL ROOM INSTRUMENTATION	EXISTING CONTROLS MANIPULATED (OR BRANCH POINT)
				FEED FLOW SLOW DECREASE TO ZERO 0-20X10E6 LBM/HR (MSIV CLOSURE) CORE FLOW DECREASE TO ~25% DUE TO RECIRC PUMP TRIPS 0-150X10E6 LBM/HR CONTAINMENT PRESS)1.69 AND INCREASING 0-75 PSIG TEMP INCREASE TO)200 DEGREE F 0-350 DEGREE F		
06-02-02	VERIFY AUTO ACTIONS	VERIFY RX SCRAM				BRANCH TO EO-00-001 (SEE RX SCRAM
06-02-03	VERIFY AUTO ACTIONS	VERIFY GROUPS I, II, III, VI, & VII ISOLATION		INBOARD & OUTBOARD MSIV'S CLOSED INDICATORS STEAM LINE DRAINS & RCIRC SAMPLE ISO'S CLOSED INDICATORS DWF & DWEDT ISO VLVS CLOSED INDICATORS SBGTS START RWCU ISO VLVS INDICATOR SHUT & PUMPS OFF INDICATOR ALL CONTAINMENT VENT & PURGE VLVS CLOSED INDICATORS CORE FLOW ~25% (NAT CIRC) 0-150X10E6 LBM/HR DIESELS AT RATED VOLTAGE AND FREQUENCY (4.16 KV AND 60 HZ)		
06-02-04	VERIFY AUTO ACTIONS	VERIFY RECIRC PUMPS TRIP				
06-03-01	VERIFY AUTO ACTIONS	VERIFY DIESELS AUTO START				
06-04-01	EXECUTE EO-00-021 (LEVEL CONTROL)	RESTORE AND MAINTAIN RPV LEVEL BETWEEN +13 AND +54"		SEE 01-06-02 HPCI 0-6000 RPM, RCIC 0-6000 RPM SPEED DECREASE 2200 RPM HPCI 0-7500 GPM, RCIC 0-750 GPMFLOW DECREASE 100 GPM (HPCI) RX PRESSURE DECREASE TO ~500 PSIG 0-1500 PSIG	IC601	PLACE MANUAL/AUTO SWITCH (FOR HPCI AND RCIC CONTROLLERS) TO MANUAL DEPRESS "LOWER" P.B.-DECREASE TURBINE SPEED (THEREFORE MAINTAIN LEVEL

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				(DUE TO DEPRESS FROM SCRAM AND COLD WATER ADDITION) CONTAINMENT PRESSURE SLOW INCREASE TO (20 PSIG 0-75 PSIG SUPP POOL WATER TEMP DECREASE 0-212 DEGREE F		
06-04-02	EXECUTE EO-00-023 CONTAIN-MENT CONTROL	INITIATE SUPPRESSION POOL COOLING				SEE LARGE STEAM LINE BREAK INSIDE DRYWELL PREFILL-PG 4 OF 5 01-07-03
06-05-01	EXECUTE EO-00-023 CONTAIN-MENT CONTROL	OPERATE ALL AVAILABLE DW COOLERS		DRYWELL TEMP AND PRESSURE DECREASE TO, 1.69 PSIG 0-75 PSIG 135 DEGREE F 0-350 DEGREE F INDICATOR LIGHTS	IC681	PLACE ALL AVAILABLE COOLER HS TO "START HIGH"
06-05-02	PLANT RESTORA-TION	WHEN RPV LEVEL IS RETURNED TO NORMAL & DW PRESS REDUCED TO (1.69 PSIG, RESET ISOLATIONS & INITIATION SIGNALS			IC601	DEPRESS ISOLATION RESET PB'S (MSIV PANEL) DEPRESS INITIATION RESET PB'S (RCIC & HPCI) BRANCH TO GO-00-004
06-05-03	PLANT RESTORA-TION	SHUTDOWN THE PLANT TO COLD SHUTDOWN				
07-01-01	EVALUATE CONDITION	OBSERVE ANNUNCIATORS		)100 MR/HR (1000 MR/HR	C651 ANNUNCIATORS LRW COLLECTION SYS TROUBLE C653 ANNUNCIATORS EMER OUTSIDE AIR INTAKE HI HI RAD EMER OUSIDE AIR INTAKE HI RAD RX BLDG AREA HI RAD RADWASTE BLDG HI RAD IC600 MULTIPOINT RECORDER	ACKNOWLEDGE ANNUNCIATORS
07-01-02	EVALUATE CONDITION	EVALUATE TREND		VARIOUS RADWASTE Rx BLDG AND CONT STRUCTURE RAD LEVELS INCREASING		
07-02-01	VERIFY AUTO ACTIONS	VERIFY CONT STRUCT ISOLATION AND CREDAS INITIATION	IC681	EMER OUTSIDE AIR SUPPLY FAN STARTS	HD-07802A(B) AND HD-07834A1-A6 (B1-B6) HD-07812A&B 11A&B 14A&B	

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07-02-02	VERIFY AUTO ACTIONS	VERIFY ZONE I AND/OR ZONE III ISOLATION AS REQUIRED		INDICATOR LIGHTS	IC681 HD-17524A&B 17576A&B 17564A&B 17514A&B 17302A&B	
07-03-01	EVALUATE CONDITION	OBSERVE ANNUNCIATORS	CONTAIN-MENT ARM'S PRM'S MSIV (MN STM)	ANNUNCIATORS STOP ALARM WINDOWS GO SOLID	IC601 AR 11 & 12 4-7 "CONTAINMENT HI RAD" (LOOP A - LOOP B) IC651 AR1,5-2 "RX BLDG HI RAD" AR1, 5-4 "REFUEL DOOR HI RAD" IC668 AR21, 2-7 "OFFGASS HI RAD" IC601 "MSL HI RAD"	DEPRESS "ALARM SILENCE"
07-03-02	EVALUATE CONDITION	VERIFY/EVALUATE CONDITION		RAD LEVELS INCREASE)100 MR/HR 0-10E6 MR/HR	(NOT IN SIMULATOR) IC601 RR 1572 A & B IC600 RR-R603 R601 R602 P & ARM PANEL IC651 AR 3&4, 1-4 MSL HI RAD TRIP	
07-04-01	VERIFY AUTO ACTIONS	OBSERVE ANNUNCIATORS			IC601 MSIV LOGIC STATUS LIGHTS (A, B, C, D) MSIV'S (INBOARD AND OUTBOARD) POSITION IND MSL DRAINS POS IND RWCU SAMPLE VALVES IC668 SJAE 2ND STG STM 1ST STG STM AUX STM COND SUCT'S (4)	
07-04-03	VERIFY AUTO ACTIONS	VERIFY GROUP I ISOLATION	NSSSS	POSITION INDICATIONS		BRANCH TO ED-00-021 LEVEL CONTROL
07-04-04	VERIFY AUTO ACTIONS	VERIFY ARESD	COND AIR REMOVAL	POSITIONS INDICATIONS		

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07-04-05	VERIFY AUTO ACTIONS	VERIFY RAD LEVELS DECREASING	ARM'S PRM'S	RAD LEVELS DECREASE TO (100 MR/HR 0-10E6 MR/HR		BRANCH TO EMERG PLAN I.P'S
07-05-01	ENTER EO-00-07 INITIATE IMMEDIATE OPERATOR ACTIONS	SCRAM THE PLANT	RPS		IC651 AR 3&4 MAN SCRAM SW ARMED RX MANUAL SCRAM SYS A&B	ROTATE COLLARS AND DEPRESS MAN SCRAM PB'S C72A-S03 A&B OR C&D, BRANCH TO EO-00-001 AND SEE SCRAM
07-05-02	ENTER EO-00-07 INITIATE IMMEDIATE OPERATOR ACTIONS	CLOSE THE MSIV'S	MS	INDICATOR LIGHTS	IC601	PLACE HSB21HS1A, B, C, &D AND HSB21HS2A, B, C, &D TO "CLOSED"
07-05-03	ENTER EO-00-07 INITIATE IMMEDIATE OPERATOR ACTIONS	EVACUATE THE CONTROL ROOM				EVACUATE TO IC201
07-06-01	TRANSFER CONTROL TO REMOTE SHUTDOWN PANEL	TRANSFER INSTRUMENTATION INDICATION TO IC201	VESSEL INST AND RCIC CONTROL	INDICATOR LIGHTS	IC201	PLACE INST TRNSF SWS TO "EMER" (HSS 14901 A & 15101 A)
07-07-01	VERIFY AUTO ACTIONS	ESTABLISH COMMUNICATIONS WITH PLANT OPERATORS AND VERIFY AUTO ACTION LOCALLY				FIELD OPERATORS VERIFY AND REPORT PER EO-00-007 STEP 4.2
07-07-02	VERIFY AUTO ACTIONS	VERIFY MSIV'S CLOSED	MN STM	INBOARD MSIV POSITION INDICATION	IC201	
07-07-03	VERIFY AUTO ACTIONS	VERIFY RCIC AUTO INITIATION AND TAKE MAN CONTROL	RCIC	LEVEL INCREASES -150 TO +80" PRESSURE DECREASES 0-1500 PSIG	IC201	FC-4903 TO MAN & REDUCE SPEED TO 2200RPM NOTE: AT THIS POINT HPCI & RCIC SHOULD BE RUNNING, THEN LEVEL WILL INCREASE UNTIL +54" WHEN BOTH WILL TRIP.
07-08-01	LINE UP AND RUN REQ'D SUPPORT SYSTEMS	VERIFY ESW A&C PUMPS RUNNING OR START LOCALLY (4KV SWGR) IF REQUIRED	ESW 4KV DIST			LOCAL OPERATOR REPORTS OR PERFORMS

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07-08-02	LINE UP AND RUN REC'D SUPPORT SYSTEMS	VERIFY ESW B&D PUMPS RUNNING OR START FROM IC201	ESW	INDICATOR LIGHTS	IC201	LOCAL OPERATOR REPORTS TO START: EMER TRANF SW TO "EMERG" HSS 15117 A&B START ESW B&D (HS TO "RUN") OPEN SPRAY POND B1 NETWORK (HV-1221 B1) CLOSE BYPASS (SPRAY POND) (HV-1222B) OPERATOR DIRECTS REMOTE OPERATION
07-09-01	MAINTAIN CONDENSER VACUUM	SHIFT STEAM SUPPLY TO AIR EJECTORS TO AUX STEAM	MN COND			
07-10-01	ESTABLISH SUPP POOL COOLING	TRANSFER RHR SYSTEM CONTROL TO IC201	RHR	VERIFY INDICATOR LIGHT	IC201	PLACE CONTROL TRANSFER SWITCHES TO "EMERG" HSS 15111,12,13,14,15,16,17 A & B
07-10-02	ESTABLISH SUPP POOL COOLING	VERIFY PROPER LINEUP	RHR		IC201	PER EO-00-007 STEP 4.10.3
07-10-03	ESTABLISH SUPP POOL COOLING	START RHRSW	RHRSW	SYS FLOW INCREASES TO ~1000 GPM 0-12000 GPM SYSTEM FLOW INCREASES TO 9000 GPM	IC201 FI 11207B	HV-11215B TO OPEN HV-11210B THROTTLE OPEN HS-11202B TO "RUN" THROTTLE OPEN HV11210B
07-10-04	ESTABLISH SUPP POOL COOLING	START RHR PUMP "B" AND ESTABLISH FLOW	RHR	SYS PRESS INCREASE 0-500 PSIG SYS PRESS DECREASE SYS FLOW INCREASE 0-40000 GPM	FI 15105	HS-503 "B" TO RUN OPEN F028 B AND F024 B THROTTLE F024 B CLOSE F048 B
07-10-05	ESTABLISH SUPP POOL COOLING	MONITOR SUPP POOL TEMP		SYS FLOW @ 10,000 GPM (OR EQUAL TO 110 FAR. 0-212 DEGREE F	IC201 TI 5795B3	
07-11-01	PROCEED TO COLD SHUTDOWN	VERIFY CONTAINMENT INST GAS I/S OR RESTART	SIG			RESTART DONE REMOTELY
07-11-02	PROCEED TO COLD SHUTDOWN	DECREASE REACTOR PRESSURE	MN STM RELIEF VALVES	RX PRESS DECREASE 0-1500 PSIG RX LEVEL INCREASE 45" THEN DECREASE TO 30" -150" TO +80" RECIRC LOOP TEMP DECREASES PROPORTIONAL TO COOLDOWN RATE 0-100 DEGREE F	IC201	SEQUENTIALLY CYCLE OPEN PSV F013 A, B, AND C

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INDEX NUMBER	SUBTASK	ELEMENT	SYSTEM	A PRIORI INFORMATION AND CONTROL REQUIREMENTS	EXISTING CONTROL ROOM INSTRUMENTATION	EXISTING CONTROLS MANIPULATED (OR BRANCH POINT)
07-11-03	PROCEED TO COLD SHUTDOWN	MAINTAIN VESSEL LEVEL WITH RCIC	RCIC			ADJUST FC-4903 TO MAINTAIN 20"-25" LEVEL EO-00-007 ATTACHMENT 2
07-11-04	PROCEED TO COLD SHUTDOWN	MONITOR AND MAINTAIN (OR EQUAL 100 FAR/HR COOLDOWN				
07-11-05	PROCEED TO COLD SHUTDOWN	SHUTDOWN NON-ESSENTIAL BOP EQUIPMENT (I.E.) ALL BUT 1 COND PUMP, ALL BUT 2 CIRC WATER PUMPS				REMOTE (FIELD) OPERATION
07-11-06	PROCEED TO COLD SHUTDOWN	WHEN RX PRESS (OR EQUAL TO 150#, REMOVE RCIC FROM SERVICE		TURB SPEED DECREASE TO 2200 RPM 0-6000 RPM TURB SPEED DECREASE TO ZERO		FC-4903 RPM HV-F045 TO CLOSE HV-F013 TO CLOSE
07-12-01	ESTABLISH SHUTDOWN COOLING					BRANCH TO 03-06-01 AND PERFORM APPLICABLE STEPS FROM IC201 AND/OR LOCAL PLANT OPERATIONS
08-01-01	EVALUATE CONDITIONS	OBSERVE ANNUNCIATORS	CONTAIN-MENT ARM'S PRM'S	ANNUNCIATORS STOP ALARM WINDOWS GO SOLID	IC601 AR 11 & 12, 4-7 "CONTAINMENT HI RAD" (LOOP A-LOOP B) IC651 AR1 5-2 "RX BLDG HI RAD" AR1, 5-4 "REFUEL DOOR HI RAD" IC668 AR21, 2-7 "OFFGASS HI RAD" IC601 "MSL HI RAD"	DEPRESS "ALARM SILENCE"
08-01-02	EVALUATE CONDITIONS	VERIFY/EVALUATE CONDITION		RAD LEVELS INCREASE ON MAIN STEAM LINE)1000 MR/HR 0-10E6 MR/HR		

SSES TASK ANALYSIS

INDEX NUMBER	SUBTASK	ELEMENT	SYSTEM	A PRIORI INFORMATION AND CONTROL REQUIREMENTS	EXISTING CONTROL ROOM INSTRUMENTATION	EXISTING CONTROLS MANIPULATED (OR BRANCH POINT)
08-02-01	VERIFY AUTO ACTIONS	OBSERVE ANNUNCIATORS			IC651 AR 3 & 4 1-4 MSL HI RAD TRIP VARIOUS	
08-02-02	VERIFY AUTO ACTIONS	VERIFY SCRAM	RPS RPIS CRD NSSSS			BRANCH TO EO-00-001
08-02-03	VERIFY AUTO ACTIONS	VERIFY GROUP 1 ISOLATION		POSITION INDICATOR LIGHTS	IC601 MSIV LOGIC STATUS LIGHTS (A,B,C,D) MSIV'S (INBOARD & OUTBOARD) POSITION INDICATORS MSL DRAINS POSITION INDICATORS RWCU SAMPLE VALVES	BRANCH TO EO-00-021 LEVEL CONTROL
08-02-04	VERIFY AUTO ACTIONS	VERIFY ARESD	COND AIR REMOVAL	POSITION INDICATION LIGHTS	IC66B SJAE 2ND STG STM 1ST STG STM AUX STM COND SUC'S (4)	
08-02-05	VERIFY AUTO ACTIONS	VERIFY RAD LEVELS DECREASING	COND AIR REMOVAL	RAD LEVELS DECREASE 1000 MR/HR 0-10E6 MR/HR	IC66B	BRANCH TO EMERG PLAN I.P.'S
08-04-02	VERIFY AUTO ACTIONS	VERIFY SCRAM	RPS RPIS CRD RPS		VARIOUS	BRANCH TO EO-00-001
09-01-01	ENTER EO-00-007 INITIATE IMMEDIATE OPERATOR ACTIONS	SCRAM THE PLANT			IC651 AR 3 AND 4 MAN SCRAM SW ARMED RX MANUAL SCRAM SYS A&B	ROTATE COLLARS AND DEPRESS MAN SCRAM P.B.'S C72A-503 A&B OR C&D BRANCH TO EO-00-001 AND SEE SCRAM PLACE
09-01-02	ENTER EO-00-007 INITIATE IMMEDIATE OPERATOR ACTIONS	CLOSE THE MSIV'S	MS	INDICATOR LIGHTS	IC601	HSB21HS1A,B,C,&D, HSB21HS2,A,B,C,&D TO "CLOSED"
09-01-03	ENTER EO-00-007 INITIATE IMMEDIATE OPERATOR ACTIONS	EVACUATE THE CONTROL ROOM				EVACUATE TO IC201

SSES TASK ANALYSIS

INDEX NUMBER	SUBTASK	ELEMENT	SYSTEM	A PRIORI INFORMATION AND CONTROL REQUIREMENTS	EXISTING CONTROL ROOM INSTRUMENTATION	EXISTING CONTROLS MANIPULATED (OR BRANCH POINT)
09-02-01	TRANSFER CONTROL TO REMOTE SHUTDOWN PANEL	TRANSFER INSTRUMENTATION INDICATION TO IC201	VESSEL INST AND RCIC CONTROL	INDICATOR LIGHTS	IC01	PLACE INST TRNSF SWS TO "EMER" (HSS14901 A AND 15101 A)
09-03-01	VERIFY AUTO ACTIONS	ESTABLISH COMMUNICATIONS WITH PLANT OPERATORS AND VERIFY AUTO ACTIONS LOCALLY				FIELD OPERATORS VERIFY AND REPORT PER EO-00-007 STEP 4.2
09-03-02	VERIFY AUTO ACTIONS	VERIFY MSIV'S CLOSED	MN STM	INBD MSIV POS IND	IC201	
09-03-03	VERIFY AUTO ACTIONS	VERIFY RCIC AUTO INITIATION AND TAKE MAN CONTROL	RCIC	LEVEL INCREASES TO)+54" -150" TO +80" PRESSURE DECREASES TO ~ 500 PSIG 0-1500 PSIG	IC201	FC-4903 TO MAN AND REDUCE SPEED TO 2200 RPM NOTE: AT THIS POINT HPCI AND RCIC SHOULD BE RUNNING-LEVEL WILL INCREASE UNTIL +54" WHEN BOTH WILL TRIP LOCAL OPERATOR REPORTS OR PERFORMS
09-04-01	LINE UP AND RUN REQ'D SUPPORT SYSTEMS	VERIFY ESW A & C PUMPS RUNNING OR START LOCALLY (4KV SWGR) IF REQ'D	ESW 4KV DIST			
09-04-02	LINE UP AND RUN REQ'D SUPPORT SYSTEMS	VERIFY ESW B & D PUMPS RUNNING OR START FORM IC201	ESW	INDICATOR LIGHTS	IC201	LOCAL OPERATOR REPORTS TO START: EMER TRANF SW TO "EMERG" HSS15117 A&B START ESW B&D (HS TO "RUN") OPEN SPRAY POND B1 NETWORK (HV-1221 B1) CLOSE BYPASS (SPRAY POND) (HV-1222B) OPERATOR DIRECTS REMOTE OPERATION
09-05-01	MAINTAIN CONDENSER VACUUM	SHIFT STEAM SUPPLY TO AIR EJECTORS TO AUX STEAM	MN COND			
09-06-01	ESTABLISH SUPP POOL COOLING	TRANSFER RHR SYSTEM CONTROL TO IC201	RHR	VERIFY INDICATOR LIGHTS	IC201	PLACE CONTROL TRANSFER SWITCHES TO "EMERG" HSS 15111 A&B, 15112 A&B, 15113 A&B, 15114 A&B, 15115 A&B, 15116 A&B, 15117 A&B.

SSES TASK ANALYSIS

INDEX NUMBER	SUBTASK	ELEMENT	SYSTEM	A PRIORI INFORMATION AND CONTROL REQUIREMENTS	EXISTING CONTROL ROOM INSTRUMENTATION	EXISTING CONTROLS MANIPULATED (OR BRANCH POINT)
09-06-02	ESTABLISH SUPP POOL COOLING	VERIFY PROPER LINEUP	RHR		IC201	PER EO-00-007 STEP 4.10.3
09-06-03	ESTABLISH SUPP POOL COOLING	START RHRSW	RHRSW	SYS FLOW INCREASE 0-12000 GPM TO 9000 GPM	IC201 FI11207B	HV-11215B TO OPEN HV-11210B THROTTLE OPEN HS-11202B TO "RUN" THROTTLE OPEN HV1210B
09-06-04	ESTABLISH SUPP POOL COOLING	START RHR PUMP "B" AND ESTABLISH FLOW	RHR	SYS PRESS INCREASE 0-500 PSIG SYS PRESS DECREASE 0-500 PSIG SYS FLOW INCREASE 0-40000 GPM SYS FLOW @ 10,000	FI 15105	HS-503 "B" TO RUN OPEN F028B AND F024B THROTTLE F024B CLOSE F048B
09-06-05	ESTABLISH SUPP POOL COOLING	MONITOR SUPP POOL TEMP		(OR EQUAL TO 110 FAR 0-212 DEGREE F	IC201 TI 5795B3	
09-07-01	PROCEED TO COLD SHUTDOWN	VERIFY CONTAINMENT INST GAS I/S OR RESTART	CIG			RESTART DONE REMOTELY
09-07-02	PROCEED TO COLD SHUTDOWN	DECREASE REACTOR PRESSURE	MN STM RELIEF VALVES	RX PRESS DECREASE 0-1500 PSIG RX LEVEL INCREASE TO +45" -150" TO +80" THEN DECREASE TO 30" RECIRC LOOP TEMP DECREASE 0-600 DEGREE F PROPORTIONAL TO COOLDOWN	IC201	SEQUENTIALLY CYCLE OPEN PSV F013 A, B, AND C
09-07-03	PROCEED TO COLD SHUTDOWN	MAINTAIN VESSEL LEVEL WITH RCIC	RCIC			ADJUST FC-4903 TO MAINTAIN 20"-25" LEVEL
09-07-04	PROCEED TO COLD SHUTDOWN	MONITOR AND MAINTAIN (OR EQUAL TO 100 FAR/HR COOLDOWN				EO-00-007 ATTACHMENT 2
09-07-05	PROCEED TO COLD SHUTDOWN	NON-ESSENTIAL BOP EQUIPMENT (I.E.) ALL BUT 1 COND PUMP, ALL BUT 2 CIRC WATER PUMPS				REMOTE FIELD OPERATION
09-07-06	PROCEED TO COLD SHUTDOWN	WHEN RX PRESS (OR EQUAL TO 150 #, REMOVE RCIC FROM SERVICE		TURB SPEED DECREASE TO 2200 RPM 0-6000 RPM TURB SPEED DECREASE TO ZERO		FC-4903 HV-F045 TO CLOSE HV-F013 TO CLOSE

2.2 Plan for Updating the Task Analysis from Rev. 0 to Rev. 3 EPG's

2.2 Plan for Updating Task Analysis from Rev. 0 to Rev. 3

2.2.1 Rev. 0 EOPs

The process for performing the DCRDR system function review and task analysis was described in both the SSES Program Plan and the Summary Report. In response to NUREG-0660 and NUREG-0694, Susquehanna, being an NTOL, submitted a PDA in 1980. Because of the momentum established on the PDA, it was decided to utilize these same resources directly in the DCRDR effort.

In parallel with this effort, the Emergency Operating Procedures (Rev. 0) were written, derived from Rev. 0 EPGs. These procedures were used to guide the pre-fill and post-fill (videotaping) segment of the task analysis. Rev. 0 EPGs covered 3 basic functions:

- RPV level control
- Cool-down control
- Containment control

The task analysis, associated with these functions, was upgraded in the preceding section (2.1).

2.2.2 EOPs Derived from Rev. 3 EPGs

PP&L's Procedure Generation Package is currently in draft form undergoing review. The current schedule calls for submittal of the PGP to the NRC in 1985. The plan is to generate plant specific EOPs in flow chart format derived from Rev. 3 EPGs. The major difference of Rev. 3 over Rev. 0 is the addition of:

- Reactivity control
- Secondary containment control
- Radioactivity release control

Rev. 3 of the EPGs provides a functional analysis that identifies at a high level the generic information and control needs. However, the EPGs do not go into a detailed enough level to identify plant-specific information and control needs. The EPGs will be made plant specific in a two step process; conversion of EPGs to an SSES-EPG and writing SSES EOPS based on the SSES EPGs.

Conversion of the Rev. 3 EPGs to the SSES-EPG is characterized by four distinct processes:

- Determination and substitution of specific plant parameters.

- Adaptation of the EPG to the plant design.

- Determination of deviations from the EPG.

- Documentation and control of the finished product

2.2.3 EOPs Derived from the SSES-EPG

Flow chart EOPs will be derived from the plant specific SSES-EPGs. The Writer's Guide will be used as an intrinsic part of this derivation. The PGP also describes two other programs used in EOP development, verification and validation.

2.2.3.1 Verification Addresses:

- Written correctness - proper incorporation of information from the SSES Writer's Guide and other appropriate administrative policies.

- Technical accuracy - proper incorporation of generic and/or plant-specific technical information from EOP source documents into the EOPs.

2.2.3.2 Validation Addresses:

- Usability - Do the EOPs provide sufficient information that is understandable to the operator?

- Operational correctness - Are the EOPs compatible with plant responses, plant hardware, and shift manpower?

The PGP also covers in detail training plans for the new EOPs and the process for modifying them, if necessary.

2.2.4 Task Differences: EOPs Derived from Rev. 0 vs. Rev 3 EPGs

The new EOPs contain functions not found in the Rev. 0 EOPs. Consequently, when these functions are broken down into respective tasks, there may be a number of tasks never covered under the original task analysis (submitted in the DCRDR Summary Report). These tasks must be identified as new tasks to be analyzed.

All new tasks will be compared to the previous task set. Each of the original tasks has an index number assigned. Match-ups will be set aside and the old and the new task will be analyzed for any evolutionary

differences. If differences are significant, the task will be considered new and treated as described in the following paragraph.

Tasks with no previous task analysis performed will be earmarked for the second round task analysis. It is expected the majority of new tasks will come from the additional functions added to the EPGs.

2.2.5 Task Analysis Methodology

The primary objective of the T.A. will be to determine operator information and control requirements for the new tasks or differences. A description of this methodology follows:

2.2.5.1 Event Sequences

The event sequences used for the original T.A. will be examined for applicability to the new tasks. Event sequences may be modified, or new ones developed, depending on the nature of tasks to be analyzed.

2.2.5.2 Independent Analysis

A multi-disciplined review team will use a table-top method to talk through each event

sequence and associated tasks. Typical items to be recorded are initiating cues, required aids, terminating cues, controls and displays and their associated requirements. This will be done independently of existing control room controls and displays.

2.2.5.3 Deriving Characteristics from Requirements

This step involves quantifying the requirements by describing in greater detail the necessary characteristics of displays and controls. This is similar to writing equipment specifications. Examples of characteristics are:

Information - parameter type, range, setpoints, resolution, accuracy, response speed, units, need for trending

Control - discrete vs. continuous, manual vs. automatic, rate, gain, response, transfer function, frequency of use.

2.2.5.4 Simulator Exercises

The Procedures Generation Package describes our plan for EOP validation. This involves videotaping germane operating sequences, using the new EOPS. If necessary, non-EOP procedures will be used up to the point it can be ascertained the EOP main task has been completed. The tapes are then reviewed by operators who explain what their actions were and why they were taken. This is captured on separate audio tape.

Both audio and video tapes will be saved for the second round task analysis. They should prove a valuable source of information to supplement the table-top task analysis.

This step will not attempt to reconcile differences between pre-specified requirements and existing instruments and controls. This will be done during the next step described, "verification".

2.2.5.5 Verification

This step integrates the inventory requirement (Element #3) of the DCRDR with

the task analysis requirement. This is done through a comparison of the independent requirements with existing instruments and controls. This verification process involves 2 steps:

- o Availability - Is the item present?
- o Suitability - Does it fit the task? (Comparing against the independent characteristics.)

2.2.5.6 Other Considerations

Although the primary consideration is information and control requirements, other considerations to be addressed during the task analysis are:

- o Is the sequence valid?
- o Is manpower adequate?
- o Are traffic patterns unobstructive?
- o What skills and knowledge are required for the task?

All of these areas will be addressed in the same manner described in the Program Plan.

2.2.6 HED Assessment and Resolution

Any HEDs generated during the second round task analysis will be prioritized and resolved by the process described in the DCRDR Program Plan (See Section 5)

2.2.7 Schedule for HED Resolutions

The process for scheduling resources to correct HEDs is described in Section 4.0. All post-DCRDR HEDs will go through this process.

2.2.8 Documentation

Documentation will follow the description presented in the DCRDR Program Plan (Section 3.0). The basic objective of this plan will be to explain:

- What was done
- By whom
- For what purpose

- When it was done

- Findings

2.2.9 Integration of Initiatives

The emergency response initiatives (SPDS, EOPS, DCRDR, Reg. Guide 1.97, etc.) should be complete (or nearly complete) by the time the second round task analysis is complete. However, the documentation described in 2.2.8 will prove useful in deciding if complete integration of all elements has occurred. The test of that conclusion will be the System 1 Validation, described in Section 5.0 - Validation of Emergency Response Elements.

3.0 HEDs: Selection of Design Improvements

3.0 Human Engineering Discrepancies (HEDs)

This section deals with the NRC request to upgrade DCRDR review requirement #6, the selection of design improvements. More specifically, PP&L has been asked to provide further information regarding specific design improvements on certain HEDs. Because many of the original HEDs have been reported in several categories, understanding current HED status is sometimes difficult. To promote clarity, this section is composed of 3 categories of HEDs, based upon the January 1985 SER of the DCRDR. A brief explanation of each category follows:

3.1 Original 45 "TO DO" HEDs (identified in original summary report)

3.1.1 5 Completed HEDs

3.1.2 40 Scheduled HEDs

Schedule is in Section 4.0

3.2 Additional HEDs resulting from the NRC audit

3.2.1 1 Completed HED

3.2.2 3 Unscheduled HEDs

These 3 HEDs were originally dispositioned as No Action Required in the Summary Report. After review with NRC personnel during the October 1984 audit, PP&L agreed to re-evaluate the original resolution. Resolution of these HEDs could not be scheduled in time for inclusion in this report. (See Section 4.0 for a discussion of PP&L's scheduling process.)

3.3 No Action Planned

The HEDs in this category were provided with expanded or clarified statements regarding why PP&L believes no action is required.

3.1 "TO DO" HEDs from DCRDR Summary Report

3.1.1 Completed "TO DO" HEDs

HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: TREMAINE DATE: 03/10/82 NO: 29

PANEL NUMBER : COMPONENT IDENTIFIER

673 GENERIC TO PANEL

DESCRIPTION OF DISCREPANCY

A LIST OF STANDARD NAMES, ACRONYMS, ABBREVIATIONS SHOULD BE PLACED IN THE CONTROL ROOM.

REVIEW SECTION CODE:
. LABELS & AIDS

GUIDELINE NO: 6.6.3.3 A
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

PROVIDE LISTS (AS NOTED ABOVE) IN CONTROL ROOM.

IMPLEMENTATION

LISTS NOTED ABOVE WILL BE PROVIDED IN THE CONTROL ROOM. DOCUMENT J-651, STANDARD LIST OF ACRONYMS AND ABBREVIATIONS, WILL BE PROVIDED IN ADDITION TO CONTROL ROOM STICK FILES (SETS #34 and #127).

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: TREMAINE

DATE: 03/10/82

NO: 30

PANEL NUMBER	:	COMPONENT IDENTIFIER
673		GENERIC TO PANEL RHRSW HX B INLET FLOW B HPCI TURBINE SPEED

DESCRIPTION OF DISCREPANCY

PROCEDURES REFER TO INSTRUMENT NUMBERS, BUT THESE NUMBERS ARE NOT ALWAYS INCLUDED IN THE LABEL LEGENDS.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.3.3 C
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

IF INSTRUMENTS ARE REFERRED TO BY INSTRUMENT NUMBERS IN PROCEDURES, THEN THESE NUMBERS SHOULD BE INCLUDED IN LABELS.

IMPLEMENTATION

REFERENCED INSTRUMENT NUMBERS HAVE BEEN PLACED ON LABELS AS REQUIRED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/24/82

NO: 63

PANEL NUMBER : COMPONENT IDENTIFIER

COMPUTER

DESCRIPTION OF DISCREPANCY

SCREEN LOADING OFTEN EXCEEDED THE 25% MAXIMUM BY APPROXIMATELY 40% ADDITIONAL INFORMATION-BEARING, ACTIVATED SCREEN AREA.

REVIEW SECTION CODE:
7. COMPUTERS/CRT

GUIDELINE NO: 6.7.2.5 M
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

EACH OUTPUT-ONLY DISPLAY WILL BE REVIEWED TO DETERMINE IF THE AMOUNT OF DYNAMIC INFORMATION EXCEEDS THE 25% LIMIT.

IMPLEMENTATION

THIS HED IS COMPLETE. OUR REVIEW INDICATES DYNAMIC INFORMATION DOES NOT EXCEED THE 25% GUIDELINE FOR ANY FORMAT.

SYSTEM	# OF FORMATS	DENSITY RANGE
PMS	70	0 - 16%
DCS	107	1 - 23%

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 02/12/82

NO: 176

PANEL NUMBER	:	COMPONENT IDENTIFIER
GENERIC		GENERIC

DESCRIPTION OF DISCREPANCY

SIT-STAND DESKS ARE BELOW THE 36" MINIMUM HEIGHT. THE PERMANENT COMPUTER CONSOLE DESK IS 29". THE SCREEN IS TILTED TO ALLOW VISIBILITY.

REVIEW SECTION CODE:
1. WORKSPACE

GUIDELINE NO: 6.1.2.7 D-2
CATEGORY: III

COMMENTS

SURVEY

RECOMMENDATION

NO CHANGE RECOMMENDED. HOWEVER, LAYDOWN SPACE AT OR NEAR PANELS SHOULD BE PROVIDED TO AVOID LAYING PROCEDURES ON PANEL.

IMPLEMENTATION

THE DESK PROBLEM HAS BEEN CORRECTED BY DCP 83-173. LAYDOWN SPACE IS COVERED UNDER HED #467.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ATL

DATE: 03/02/82

NO: 352

PANEL NUMBER : COMPONENT IDENTIFIER

GENERIC PROCEDURES

DESCRIPTION OF DISCREPANCY

THERE ARE NO KNOWN ADMINISTRATIVE PROCEDURES IN PLACE REGARDING THE USE OF TEMPORARY LABELS.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.5.2
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

IMPLEMENT ADMINISTRATIVE PROCEDURES REGARDING THE APPLICATION, DURATION OF USE, AND LOCATION OF TEMPORARY LABELS.

IMPLEMENTATION

ADMINISTRATIVE PROCEDURE (AD-QA-324), HAS BEEN DEVELOPED ADDRESSING ALL ASPECTS OF TEMPORARY LABEL UTILIZATION.

3.1.2 Uncompleted "TO DO" HEDs

(Schedule in Section 4.0)

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: RL

DATE: 08/18/82

NO: 2

PANEL NUMBER : COMPONENT IDENTIFIER

COMPUTER

DESCRIPTION OF DISCREPANCY

NO POSITIVE INDICATION OF WHICH CRT DISPLAYS ARE UNDER LOCAL OR MASTER CONTROL IS PROVIDED.

REVIEW SECTION CODE:
7. COMPUTERS/CRT

GUIDELINE NO: 6.7.1 5C
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

ADD INDICATION AS TO WHICH DISPLAYS ARE UNDER MASTER CONTROL.

IMPLEMENTATION

THE WORD MASTER WILL BE ADDED TO LINE #48 OF ALL CRT DISPLAYS WHICH ARE UNDER MASTER CONTROL.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: RL

DATE: 08/18/82

NO: 4

PANEL NUMBER : COMPONENT IDENTIFIER

COMPUTER

DESCRIPTION OF DISCREPANCY

NO PROVISIONS ARE MADE TO ALLOW OPERATORS TO REQUEST PRINTOUTS BY ALARM GROUP.

REVIEW SECTION CODE:
7. COMPUTERS/CRT

GUIDELINE NO: 6.7.3.2 C
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

PROVIDE REQUEST PRINTOUT CAPABILITY TO OPERATORS.

IMPLEMENTATION

AN UPGRADE OF THE COMPUTER BASED ALARM SYSTEM IS UNDER DEVELOPMENT. DUE TO THE SHIFT FROM EVENT BASED PROCEDURES TO SYMPTOM BASED PROCEDURES, ALARMS WILL BE GROUPED BY PRIORITY, BASED ON THE NEW PHILOSOPHY. CRT DISPLAYS WILL EXHIBIT THE 5 MOST RECENT ALARMS (all 3 PRIORITIES), FOLLOWED BY DEMARCATED GROUPS OF PRIORITY #1, 2, AND 3 ALARMS.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: TREMAINE DATE: 03/10/82 NO: 16

PANEL NUMBER :	COMPONENT IDENTIFIER
673	CHILLER A DSCH TEMPERATURE METERS

DESCRIPTION OF DISCREPANCY

THESE TWO METERS DISPLAYING THE SAME PARAMETER HAVE SCALES WHICH DIFFER FROM EACH OTHER IN NUMERICAL PROGRESSION AND DIFFER FROM THE CHILLER B DSCH TEMPERATURE METERS (BOTH OF WHICH ARE COMPATIBLE) AS WELL.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.5 D
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

MODIFY METER SCALES THAT DISPLAY SAME PARAMETERS TO HAVE THE SAME SCALE CONFIGURATION.

IMPLEMENTATION

ALL METER SCALES WILL BE MADE THE SAME.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: TREMAINE

DATE: 03/10/82

NO: 33

PANEL NUMBER : COMPONENT IDENTIFIER

673

DESCRIPTION OF DISCREPANCY

ROMAN NUMERALS ARE USED ON THIS PANEL FOR UNIT 1 AND UNIT 2 AND ARE USED INTERCHANGEABLY WITH UNIT I AND UNIT II WHERE ONLY ARABIC NUMERALS SHOULD BE USED.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.3.4 E
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

CHANGE ROMAN NUMERALS TO ARABIC NUMERALS.

IMPLEMENTATION

ARABIC NUMERS ARE TO BE USED ON ALL PANELS.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/23/82

NO: 60

PANEL NUMBER : COMPONENT IDENTIFIER

COMPUTER

DESCRIPTION OF DISCREPANCY

THE NSS FUNCTION CONTROLS ARE NOT CLEARLY LABELED TO INDICATE FUNCTIONS TO THE OPERATOR (i.e., THE NUMERICAL DESIGNATION DOES NOT LINE UP WITH THE OD NUMBER).

REVIEW SECTION CODE:
7. COMPUTERS/CRT

GUIDELINE NO: 6.7.1.5 D-3
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

LABEL NSS FUNCTION CONTROLS.

IMPLEMENTATION

THE NSS FUNCTION BUTTONS WILL BE RE-ENGRAVED TO CORRESPOND TO THE OD PROGRAM NUMBER WHICH THE BUTTON ACTIVATES.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/24/82

NO: 62

PANEL NUMBER : COMPONENT IDENTIFIER

COMPUTER

DESCRIPTION OF DISCREPANCY

DIRECTIONS TO THE OPERATOR ACCOMPANYING A LIST OF OPTIONS SUCCEED RATHER THAN PRECEDE THE MENU PRESENTATION.

REVIEW SECTION CODE:
7. COMPUTERS/CRT

GUIDELINE NO: 6.7.2.5 J
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

IMPLEMENT SOFTWARE MODIFICATION THAT WILL RESULT IN A PRECEDING MENU PRESENTATION.

IMPLEMENTATION

ACTION WILL BE TAKEN TO RESOLVE THE HED. ALL PMS SERVICE DISPLAYS AVAILABLE IN THE CONTROL ROOM WILL BE MODIFIED SUCH THAT THE DIRECTIONS PRECEDE THE MENU PRESENTATION. RFM TO BE GENERATED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/24/82

NO: 68

PANEL NUMBER : COMPONENT IDENTIFIER

COMPUTER

DESCRIPTION OF DISCREPANCY

TABLE COLUMNS ON CRT DISPLAYS ARE NOT SEPARATED INTO GROUPS BY A SPACE OF 5.

REVIEW SECTION CODE:
7. COMPUTERS/CRT

GUIDELINE NO: 6.7.3.3 D-2
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

IMPLEMENT SOFTWARE MODIFICATION TO PROVIDE 5-SPACE COLUMN SEPARATION.

IMPLEMENTATION

ALL CRT SUMMARIES WILL BE MODIFIED TO INCLUDE A BLANK LINE BETWEEN DATA GROUPS OF 5 ELEMENTS. (NOTE: FOR DISPLAYS WHICH ALTERNATE BETWEEN A DATA LINE/BLANK LINE, NO MODIFICATION WILL BE MADE.) RFM TO BE GENERATED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/16/82

NO: 80

PANEL NUMBER	:	COMPONENT IDENTIFIER
1C 651		TREND RECORDERS 1, 2, and 3

DESCRIPTION OF DISCREPANCY

ALTHOUGH LABELS DO IDENTIFY THE PARAMETERS RECORDED, HORIZONTALLY THE SCALES ON EACH RECORDER READ GREEN, BLUE, RED (LEFT TO RIGHT) WHILE VERTICALLY THE LABEL LISTS RED, BLUE, GREEN (TOP TO BOTTOM).

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.4.2 A-1
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

RELABEL CONSISTENTLY.

IMPLEMENTATION

WILL BE RELABELED AS RECOMMENDED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/16/82

NO: 87

PANEL NUMBER	:	COMPONENT IDENTIFIER
1C 651, OC 653		MIMIC FOR ELECTRICAL

DESCRIPTION OF DISCREPANCY

ROMAN NUMERAL I IS USED ON 651 AND II IS USED ON 653.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.3.4 E
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NUMBERING SYSTEMS ARE TO BE CONSISTENT.

IMPLEMENTATION

ARABIC NUMBERS WILL BE USED EXCLUSIVELY.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: ST DATE: 02/17/82 NO: 97

PANEL NUMBER	:	COMPONENT IDENTIFIER
1C 651		LIFT PUMPS START/STOP SWITCH

DESCRIPTION OF DISCREPANCY

ALTHOUGH THESE AMBER AND RED LIGHTS ARE LOCATED ABOVE THE CONTROL SWITCH FOR THE LIFT PUMPS, THE DISPLAY RELATIONSHIP IS NOT CLEARLY APPARENT.

REVIEW SECTION CODE:
9. C/D INTEGRATION

GUIDELINE NO: 6.9.1.2 B-6
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

ENHANCE CONTROL/DISPLAY RELATIONSHIP WITH DEMARCATION OR APPROPRIATE LABELING.

IMPLEMENTATION

THESE COMPONENTS WILL BE COMPARED AGAINST A STANDARD FOR LABELING FOR THE SACR, AND CHANGES WILL BE IMPLEMENTED IF DEEMED NECESSARY.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/19/82

NO: 108

PANEL NUMBER : COMPONENT IDENTIFIER

GENERIC

LAMP TEST CAPABILITY

DESCRIPTION OF DISCREPANCY

NO LAMP TEST HAS BEEN PROVIDED.

REVIEW SECTION CODE:
4. CONTROLS

GUIDELINE NO: 6.4.3.3 C-1
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

IMPLEMENTATION

PP&L HAS IN PLACE AN OPERATING PROCEDURE TO VERIFY LAMP INTEGRITY FOR ALL DUAL INDICATION (E.G. VALVE OPEN/CLOSED) LAMP INSTALLATIONS ON THE CONTROL PANEL BY CHECKING, BOTH DAILY (FOR AT LEAST ONE LAMP BEING LIT) AND AT ANY TIME THE ASSOCIATED CONTROLS ARE OPERATED.

A LONG-TERM STUDY IS NEARING COMPLETION ON THIS ISSUE ADDRESSING SINGLE INDICATION SITUATIONS AND LAMPS THAT ARE NOT NORMALLY LIT, SUCH AS LEGEND LIGHTS.

(Continued)

STUDIES TO DATE ON THIS ISSUE HAVE SHOWN THAT IT IS NOT PRACTICAL TO ADD AN INTRINSIC LAMP TEST FEATURE WITHIN EXISTING SSES PANELS DUE TO SEPARATION, SPACE AND SEISMIC QUALIFICATION PROBLEMS. THESE STUDIES HAVE EXAMINED ALL TYPES OF LIGHTS ON THE PANELS AND DETERMINED THAT THESE CONCLUSIONS ARE APPLICABLE TO ALL PRESENT SITUATIONS.

THE TWO ALTERNATIVES NOW UNDER FINAL REVIEW AND SELECTION BY MANAGEMENT ARE:

1. DEVELOP A HAND-HELD TESTING DEVICE AND SURVEILLANCE PROCEDURE FOR UNLIT LAMPS WITH TESTING AT SPECIFIED INTERVALS.

2. OBTAIN LONG-LIFE TESTED BULBS AND RE-LAMP CONTROL ROOM ON A PERIODIC BASIS THAT IS A FRACTION OF THE DESIGN MTBF FOR THE LAMPS, MAKING LAMP FAILURE A LOW PROBABILITY.

THE PRESENT LAMP SURVEILLANCE PROCEDURES FOR LIT LAMPS WOULD BE CONTINUED.

EITHER OF THESE SOLUTIONS CAN BE IMPLEMENTED ON A TIME SCHEDULE CONSISTENT WITH THE OVERALL HED RESOLUTION SCHEDULE.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/18/82

NO: 160

PANEL NUMBER	:	COMPONENT IDENTIFIER
ANNUN		ANNUNCIATOR WARNING SYSTEM

DESCRIPTION OF DISCREPANCY

ANNUNCIATOR ALARM SIGNAL INTENSITY IS NOT CURRENTLY CONTROLLED BY ADMINISTRATIVE PROCEDURE.

REVIEW SECTION CODE:
3. ANNUNCIATORS

GUIDELINE NO: 6.3.2.1 B
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

PROVIDE ADMINISTRATIVE CONTROL PROCEDURES TO MAINTAIN MINIMUM SIGNAL INTENSITY.

IMPLEMENTATION

ADMINISTRATIVE CONTROL PROCEDURES WILL BE IMPLEMENTED TO MAINTAIN SIGNAL INTENSITY AT PRESCRIBED LEVELS COMPATIBLE WITH NUREG-0700 GUIDELINES.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/18/82

NO: 165

PANEL NUMBER	:	COMPONENT IDENTIFIER
ANNUN		ANNUNCIATOR WARNING SYSTEM

DESCRIPTION OF DISCREPANCY

NO COORDINATE DESIGNATION EXISTS FOR BACK PANEL ANNUNCIATOR MATRICES.

REVIEW SECTION CODE:
3. ANNUNCIATORS

GUIDELINE NO: 6.3.3.3 C-2
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

PROVIDE COORDINATE DESIGNATION FOR BACK PANEL ANNUNCIATOR PANELS.

IMPLEMENTATION

COORDINATE DESIGNATION FOR BACK PANEL ANNUNCIATOR PANELS WILL BE PROVIDED.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: AL DATE: 02/12/82 NO: 184

PANEL NUMBER	:	COMPONENT IDENTIFIER
GENERIC		GENERIC

DESCRIPTION OF DISCREPANCY

LEGEND PUSHBUTTONS ARE NOT READILY DISTINGUISHABLE FROM LEGEND LIGHTS.

REVIEW SECTION CODE:
4. CONTROLS

GUIDELINE NO: 6.4.3.3 A
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

PROVIDE VISUAL CODING TO INDICATE LEGEND PUSHBUTTONS. A SMALL SYMBOL ON LENS WOULD SUFFICE.

IMPLEMENTATION

LEGEND PUSHBUTTONS WILL BE DISTINGUISHED FROM LEGEND LIGHTS BY A SMALL SYMBOL MADE PART OF THE LENS CAP OR LEGEND.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/02/82

NO: 211

PANEL NUMBER	:	COMPONENT IDENTIFIER
1C681		ANNUNCIATORS

DESCRIPTION OF DISCREPANCY

LEGENDS ARE AMBIGUOUS AND DO NOT CLEARLY INDICATE THE STATUS WHEN LIGHT IS GLOWING.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.3.3 B-1,4,7
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

REVIEW BACK PANEL ANNUNCIATOR LEGENDS FOR BREVITY AND SUCCINCTNESS OF MESSAGE. AMBIGUITIES SHOULD BE CORRECTED.

IMPLEMENTATION

THESE COMPONENTS WILL BE COMPARED AGAINST A STANDARD, (COMPATIBLE WITH NR0700), FOR ANNUNCIATORS FOR THE SACR, AND CHANGES WILL BE IMPLEMENTED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/25/82

NO: 224

PANEL NUMBER	:	COMPONENT IDENTIFIER
601		RX LVL PRESS R623A

DESCRIPTION OF DISCREPANCY

THE RANGE BY WHICH A SCALE MUST BE EXPANDED IS PRINTED IN SMALL LETTERS AND CANNOT BE EASILY READ THROUGH METER COVERS.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.2 E
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

MODIFY OR REPLACE METER SCALE TO PROVIDE LARGER SCALE EXPANSION LETTERING.

IMPLEMENTATION

THESE COMPONENTS WILL BE COMPARED AGAINST A STANDARD, (COMPATIBLE WITH NR0700), FOR INDICATORS FOR THE SACR, AND CHANGES WILL BE IMPLEMENTED.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: AL DATE: 03/02/82 NO: 227

PANEL NUMBER :	COMPONENT IDENTIFIER
GENERIC	LIGHTS AND CONTROLS BELOW CSCW TO ESS SWGR CRT WTR MAIN LOOP COND WTR OF 112A ZONE 1 SP WHITE LIGHTS BY SQUARE ROOT EXTRACTORS LIGHTS AND CONTROLS BELOW RM E SWGR CH W SVP

DESCRIPTION OF DISCREPANCY

LABELS ARE MISSING FROM SOME COMPONENTS. DYMOTAPE IS USED ON METERS TO DESIGNATE INSTRUMENT NUMBERS.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.2.2 A
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

ADD LABELS WHERE MISSING. ELIMINATE USE OF DYMOTAPE.

IMPLEMENTATION

LABELS WILL BE ADDED. USE OF DYMOTAPE WILL BE PROHIBITED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/02/82

NO: 230

PANEL NUMBER	:	COMPONENT IDENTIFIER
1C681		GENERIC

DESCRIPTION OF DISCREPANCY

USE OF ABBREVIATIONS AND ACRONYMS IS NOT CONSISTENT ACROSS THE CONTROL ROOM.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.3.3 B
CATEGORY: II

COMMENTS

SURVEY REF: J-651

RECOMMENDATION

ALL CONTROL ROOM LABELS SHOULD BE REVIEWED FOR ABBREVIATION AND ACRONYM CONSISTENCIES. INCONSISTENCIES SHOULD BE RESOLVED.

IMPLEMENTATION

CURRENT DESIGN CHANGE PACKAGES WILL CORRECT ABBREVIATION USAGE.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: AL DATE: 03/25/82 NO: 232

PANEL NUMBER :	COMPONENT IDENTIFIER
GENERIC	601 SUPPRESSION POOL LEVEL 601 RCIC TURBINE SPEED 601 RCIC PUMP SUCT PRESSURE OTHERS THROUGHOUT CONTROL ROOM

DESCRIPTION OF DISCREPANCY

THE TYPE STYLES OF NUMERALS AND LETTERS ON THE METER FACES ARE NOT CONSISTENT.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.3 B-2
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

REVIEW ALL METERS FOR TYPE STYLE CONSISTENCY.

IMPLEMENTATION

THESE COMPONENTS WILL BE COMPARED AGAINST A STANDARD, (COMPATIBLE WITH NR0700), FOR INSTRUMENTS FOR THE SACR, AND CHANGES WILL BE IMPLEMENTED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/25/82

NO: 261

PANEL NUMBER	:	COMPONENT IDENTIFIER
601		AR 15746B

DESCRIPTION OF DISCREPANCY

THE LABEL DOES NOT SUFFICIENTLY IDENTIFY THE PARAMETER RECORDED. IT ONLY DESIGNATES PERCENT FOR ALL THREE PENS.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.4.2 A-1
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

PROVIDE CONVERSION CHART OR CHANGE SCALES.

IMPLEMENTATION

THESE COMPONENTS WILL BE COMPARED AGAINST A STANDARD, (COMPATIBLE WITH NR0700), FOR RECORDERS FOR THE SACR, AND CHANGES WILL BE IMPLEMENTED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/25/82

NO: 281

PANEL NUMBER	:	COMPONENT IDENTIFIER
1C601		MIMIC

DESCRIPTION OF DISCREPANCY

AN ABSTRACT SYMBOL USED IN MIMIC FOR BAROMETRIC CONDENSER IS NOT RECOGNIZABLE BY ITS SHAPE.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.3.4 A
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

ADD LEGEND TO SYMBOL READING "BAROMETRIC CONDENSER".

IMPLEMENTATION

A LEGEND WILL BE ADDED TO THE SYMBOL.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/02/82

NO: 283

PANEL NUMBER	:	COMPONENT IDENTIFIER
SIP		ALL RECORDERS

DESCRIPTION OF DISCREPANCY

SCALES ARE NOT MARKED AS TO WHETHER THEY SHOULD BE EXPANDED OR CONTRACTED (e.g., X10, X100, ETC.). PARAMETER UNITS ARE NOT MARKED.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.2 E
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

MODIFY OR REPLACE SCALE TO PROVIDE SCALE CONVERSION FACTORS AND PARAMETER UNITS.

IMPLEMENTATION

THESE COMPONENTS WILL BE COMPARED AGAINST A STANDARD FOR METERS AND DISPLAYS FOR THE SACR, AND CHANGES WILL BE IMPLEMENTED IF DEEMED NECESSARY.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ATL

DATE: 03/01/82

NO: 300

PANEL NUMBER : COMPONENT IDENTIFIER

TIP

DESCRIPTION OF DISCREPANCY

CONTROLS ARE PLACED BELOW MINIMUM RECOMMENDED HEIGHT AT 12.25 INCHES. DISPLAYS ARE PLACED BELOW RECOMMENDED HEIGHT AT 17 INCHES.

REVIEW SECTION CODE:
1. WORKSPACE

GUIDELINE NO: 6.1.2.5 A-1
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

PROVIDE GUARD TO PREVENT INADVERTENT ACTIVATION OF CONTROLS.

IMPLEMENTATION

COLLARS WILL BE PROVIDED ON THE CONTROLS.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: A

DATE: 03/26/82

NO: 324

PANEL NUMBER : COMPONENT IDENTIFIER

REMOTE SHUTDOWN DISPLAYS

DESCRIPTION OF DISCREPANCY

ACCORDING TO THE OPERATOR, SOME UNMARKED DISPLAYS REQUIRE EXPANSION OR PERCENTAGE IN THE CONVERSION OF UNITS.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.4 A
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

REPLACE OR MODIFY METERS SCALES TO SHOW NECESSARY CONVERSION.

IMPLEMENTATION

THESE COMPONENTS WILL BE COMPARED AGAINST A STANDARD (COMPATIBLE WITH NR0700), FOR INDICATORS FOR THE SACR, AND CHANGES WILL BE IMPLEMENTED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/26/82

NO: 329

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		RHR SW FLOW

DESCRIPTION OF DISCREPANCY

SUCCESSIVE VALUES INDICATED BY UNIT GRADUATIONS ARE NOT GOOD AS DESCRIBED IN 0700 GUIDELINES.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.5 C
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

MODIFY OR REPLACE SCALES TO FOLLOW SUGGESTED NUMERICAL PROGRESSION (1, 5, 10 . . .)

IMPLEMENTATION

THESE COMPONENTS WILL BE COMPARED AGAINST A STANDARD (COMPATIBLE WITH NR0700), FOR INDICATORS FOR THE SACR, AND CHANGES WILL BE IMPLEMENTED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: A

DATE: 03/26/82

NO: 344

PANEL NUMBER : COMPONENT IDENTIFIER

REMOTE SHUTDOWN GENERIC TO PANEL

DESCRIPTION OF DISCREPANCY

MAJOR LABELS ARE NUMERALS RATHER THAN DESCRIPTIVE TEXT.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.1.2 A-1,2
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

REVIEW PANEL LABELS.

IMPLEMENTATION

AN RFM HAS BEEN ISSUED TO INITIATE A COMPLETE PANEL REVIEW.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: SL

DATE: 03/26/82

NO: 349

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		RCIC INSTRUMENTATION TEST RHR - RHR SW - ESW INSTRUMENTATION UPSCALE TEST

DESCRIPTION OF DISCREPANCY

LABELS ARE BELOW TEST BUTTONS RATHER THAN ABOVE.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.2.1 A
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

REVIEW PANEL.

IMPLEMENTATION

AN RFM HAS BEEN ISSUED TO INITIATE A COMPLETE PANEL REVIEW.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/26/82

NO: 350

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		EMERGENCY SERVICE WATER PUMP INDICATORS

DESCRIPTION OF DISCREPANCY

BECAUSE OF RED DEMARCATION, THE RELATION OF THE LABEL TO THE REST OF THE PANEL IS CONFUSING.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.2.1 B
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

DEMARCATION LINES SHOULD BE CONSISTENT.

IMPLEMENTATION

THESE COMPONENTS WILL BE COMPARED AGAINST A STANDARD FOR PANEL DEMARCATION FOR THE SACR, AND CHANGES WILL BE IMPLEMENTED IF DEEMED NECESSARY.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/26/82

NO: 367

PANEL NUMBER : COMPONENT IDENTIFIER

REMOTE SHUTDOWN GENERIC TO PANEL

DESCRIPTION OF DISCREPANCY

SERVICE WATER CONTROLS ARE MIXED WITH RHR.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.1.3 A
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

DEMARCATE OUT, LABEL, OR MIMIC SERVICE WATER CONTROLS.

IMPLEMENTATION

AN RFM HAS BEEN ISSUED TO CORRECT.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: AL DATE: 03/26/82 NO: 369

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		EMERGENCY WATER SERVICE PUMPS

DESCRIPTION OF DISCREPANCY

EMERGENCY WATER SERVICE PUMPS ARRANGEMENT IS CONFUSING AS PRESENTLY DEMARCATED.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.1.3 B
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

REVIEW PANEL.

IMPLEMENTATION

AN RFM HAS BEEN ISSUED TO INITIATE A PANEL REVIEW.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: AL DATE: 03/26/82 NO: 373

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		GENERIC TO PANEL

DESCRIPTION OF DISCREPANCY

COMPONENTS ARE NOT LAID OUT IN A LEFT TO RIGHT, TOP TO BOTTOM, OR NUMERIC SEQUENCE.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.2.2 A
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

DEMARCATION SHOULD BE IMPLEMENTED TO GROUP COMPONENTS.

IMPLEMENTATION

AN RFM HAS BEEN ISSUED TO CORRECT.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/26/82

NO: 375

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		RHR

DESCRIPTION OF DISCREPANCY

MORE THAN FIVE COMPONENTS ARE LAID OUT IN AN UNBROKEN ROW.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.3.2 C
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

DEMARCATE OR USE GROUP LABELING TO GROUP COMPONENTS. DO NOT INTERRUPT STRING OF SIMILAR COMPONENTS.

IMPLEMENTATION

AN RFM HAS BEEN ISSUED TO CORRECT.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/26/82

NO: 376

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		GENERIC TO PANEL

DESCRIPTION OF DISCREPANCY

ESW AND RHR ARE NOT SEPARATED BY DEMARCATION.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.3.2 C2
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

SEPARATE ESW AND RHR BY DEMARCATION.

IMPLEMENTATION

AN RFM HAS BEEN ISSUED TO CORRECT.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: AL DATE: 03/31/82 NO: 431

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		CONT INST GAS CONTROLS

DESCRIPTION OF DISCREPANCY

CONT INST GAS CONTROL IS INTERSPERSED WITH RHR.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.1.1 B
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

REVIEW PANEL.

IMPLEMENTATION

AN RFM HAS BEEN ISSUED TO INITIATE A PANEL REVIEW.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: AL DATE: 06/04/82 NO: 437

PANEL NUMBER : COMPONENT IDENTIFIER

COMPUTER COMPUTER

DESCRIPTION OF DISCREPANCY

RESPONSE TIME FOR A QUERY MAY EXCEED THREE SECONDS.

REVIEW SECTION CODE:
7. COMPUTERS

GUIDELINE NO: 6.7.1.7 B
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

PROVIDE DELAY MESSAGE IF SYSTEM RESPONSE TIME EXCEEDS THREE SECONDS.

IMPLEMENTATION

IF A QUERY RESPONSE MAY EXCEED 3 SECONDS, AN APPROPRIATE PAUSE MESSAGE WILL BE GENERATED TO LINE #48 OF THE CRT IN USE. TO PROVIDE PERIODIC FEEDBACK REGARDING THE SYSTEM'S CONTINUED OPERATION, THE SYSTEM TIME FOR EACH PMS SERVICE FORMAT WILL BE UPDATED DYNAMICALLY.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: BL

DATE: 04/16/82

NO: 449

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		GLASS PLATE OVER CONTROLLERS

DESCRIPTION OF DISCREPANCY

CONTROLLER LABELS ARE MOUNTED ON GLASS THAT COVERS CONTROLLERS. WHEN GLASS PLATE IS TILTED FOR CONTROLLER USE, THE LABELS ARE NOT VISIBLE; THE CONTROLLERS DO NOT HAVE LABELS ON THEM.

REVIEW SECTION CODE:

GUIDELINE NO:

CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

REVIEW PANEL.

IMPLEMENTATION

THE RCIC CONTROLLER IN THE REMOTE SHUTDOWN PANEL WILL BE LABELED ON THE BODY OF THE CONTROLLER. THIS IS IN ADDITION TO THE LABEL PRESENTLY IN PLACE ON THE GLASS COVER FOR THE INDICATOR BAY IN WHICH IT IS INSTALLED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 09/15/82

NO: 462

PANEL NUMBER : COMPONENT IDENTIFIER

INJECTION CONTROL VALVE

DESCRIPTION OF DISCREPANCY

OPERATOR REFERS TO 5108 AS F017.

REVIEW SECTION CODE:
6.

GUIDELINE NO: 6.6.3.3 C
CATEGORY: III

COMMENTS

T.A.

RECOMMENDATION

CHECK NOMENCLATURE IN PROCEDURES FOR CONSISTENT USE OF INSTRUMENT NUMBERS (LABEL/PROCEDURE CORRELATION).

IMPLEMENTATION

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* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: JR

DATE: 05/19/82

NO: 465

PANEL NUMBER	:	COMPONENT IDENTIFIER
601		CONTAINMENT SWITCH SECTION

DESCRIPTION OF DISCREPANCY

THE LAYOUT OF THE SWITCHES DOES NOT FOLLOW THE NORMAL USE SEQUENCE.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.2.1 A
CATEGORY: II

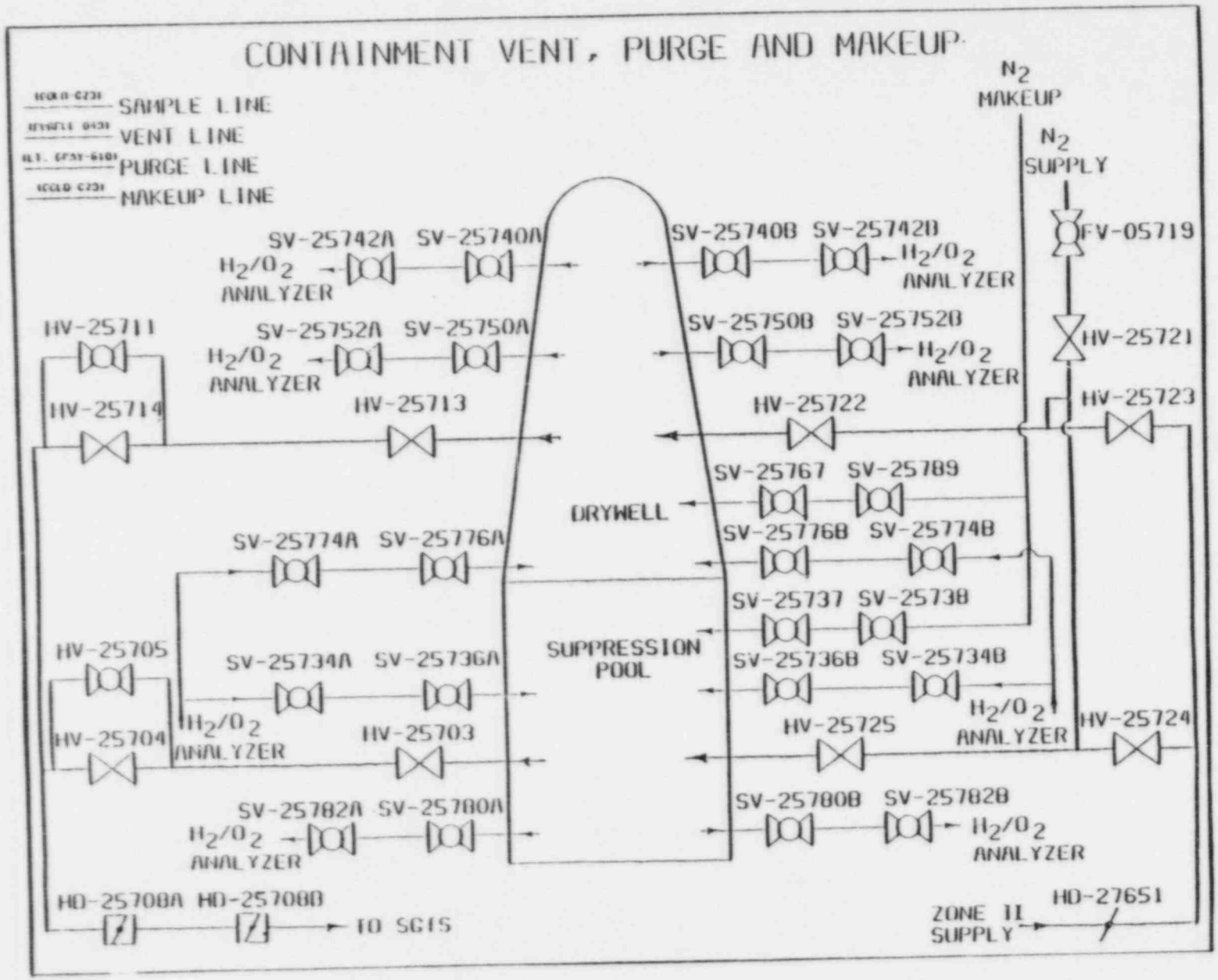
COMMENTS

OPERATORS QUESTIONNAIRE

RECOMMENDATION

IMPLEMENTATION

AN OPERATOR AID, A SCHEMATIC (EXHIBIT I) DEPICTING CONTAINMENT VENT, PURGE, AND MAKEUP VALVES, IS BEING INSTALLED ON THE 601 PANEL. IN CONJUNCTION WITH PROCEDURES, THIS WILL PRESENT AN OVERVIEW TO AID THE OPERATOR MAKE THE PROPER VALVE SELECTION, DEPENDING ON CONDITIONS.



HED #465
EXHIBIT I

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: JR

DATE: 05/19/82

NO: 466

PANEL NUMBER : COMPONENT IDENTIFIER

HVAC SYSTEM

DESCRIPTION OF DISCREPANCY

NOISY VENTILATION SYSTEM.

REVIEW SECTION CODE:
1. WORKSPACE

GUIDELINE NO: 6.1.5.5 D
CATEGORY: II

COMMENTS

OPERATORS QUESTIONNAIRE

RECOMMENDATION

INVESTIGATE POSSIBLE CHANGES TO HVAC SYSTEM TO LOWER HVAC NOISE LEVELS IN THE CONTROL ROOM.

IMPLEMENTATION

A DESIGN CHANGE PACKAGE HAS BEEN INITIATED TO INVESTIGATE REDUCING THE NOISE LEVEL OF THE HVAC SYSTEM, COMPATIBLE WITH 0700 GUIDELINES.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: JR

DATE: 05/19/82

NO: 467

PANEL NUMBER : COMPONENT IDENTIFIER

CONTROL ROOM

DESCRIPTION OF DISCREPANCY

MINIMUM LAYDOWN SPACE
PRINTER NOISE
LIMITED WORK SPACE

REVIEW SECTION CODE:
1. WORKSPACE

GUIDELINE NO: 6.1.2.6
CATEGORY: II

COMMENTS

RECOMMENDATION

INVESTIGATE BEST USE OF AVAILABLE CONTROL ROOM SPACE.

IMPLEMENTATION

AN RFM HAS BEEN ISSUED TO INVESTIGATE. (THIS RFM WILL ALSO COVER THE LAYDOWN SPACE MENTIONED IN HED #176)

3.2 Additional HEDs Resulting from the NRC Audit

3.2.1 Completed Audit HED (1)

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: AL DATE: 03/26/82 NO: 403

PANEL NUMBER	:	COMPONENT IDENTIFIER
601		RCIC TURBINE TRIP

DESCRIPTION OF DISCREPANCY

RCIC TURBINE TRIP IS BLACK INSTEAD OF RED. SOMETIMES TALL COLLARS ARE USED TO DISTINGUISH EMERGENCY CONTROLS.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.1.3 D
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

THIS HED SHOULD BE CATEGORIZED COMPLETED. RCIC TURBINE TRIP CONTROL NOW HAS A RED BUTTON AND A GUARD COLLAR.

3.2.2 Unscheduled Audit HEDs (3)

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: ATL DATE: 03/01/82 NO: 295

PANEL NUMBER	:	COMPONENT IDENTIFIER
650		2021

DESCRIPTION OF DISCREPANCY

CONTROL ACCESS IS IMPEDED BY 2021 ON LOWER BANK OF CONTROLS.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.3.1 A
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

A REQUEST FOR MODIFICATION (RFM) TO BE INITIATED. THIS WILL REQUEST INSTALLATION OF LIGHTING TO OVERCOME SHADOWS ON LABELS CAST FROM 2021 PANEL BOX.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: ATL DATE: 03/02/82 NO: 341

PANEL NUMBER	:	COMPONENT IDENTIFIER
TIP		VALVE CONTROL CHANNEL E

DESCRIPTION OF DISCREPANCY

VALVE CONTROL CHANNEL E LABEL IS BLOCKED BY "MONITOR/FIRE" KEY LOCK SWITCH.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.2.4 C
CATEGORY:

COMMENTS

RECOMMENDATION

IMPLEMENTATION

TIP PANEL LABELING WILL BE REVIEWED UNDER THE NEW LABELING PROCEDURE. TEMPORARY LABELS WILL BE REVIEWED AND CONTROLLED BY THE SAME PROCEDURE.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: AL DATE: 03/26/82 NO: 413

PANEL NUMBER	:	COMPONENT IDENTIFIER
GENERIC		HPCI PP SUCTION PRESS R606 CONTN OR SUPP CHMBR PRESS

DESCRIPTION OF DISCREPANCY

1. HPCI SUCTION PRESS R606 IS NOT ACCURATE AS NEEDED.
2. CONT OR SUPP CHAMBER PRESS NEEDS SETPOINTS.

REVIEW SECTION CODE:
9. C/D INTEGRATION

GUIDELINE NO: 6.9.3.2 A,B
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

1. NO ACTION REQUIRED
2. NO ACTION REQUIRED

IMPLEMENTATION

HPCI PUMP SUCTION PRESSURE-THIS PRESSURE GAUGE HAS A RANGE OF 30 INCHES MERCURY VACCUM TO 85 PSIG PRESSURE, GRADUATED BY 10 INCH INCREMENTS IN THE RANGE 30 INCHES TO 0 INCHES/0 PSIG AND BY 5 PSIG IN THE RANGE 0 TO 85 PSIG.

A CONTROL ROOM OPERATOR STATED (DURING STARTUP TESTING) IN THE DCRDR SURVEY THAT HE FELT THE SUCTION SIDE OF THE GAUGE SHOULD BE GRADUATED IN SMALLER INCREMENTS. THE NPE-MECHANICAL ENGINEERING GROUP WAS ASKED TO REVIEW THE HED RESOLUTION FROM A SYSTEM OPERATIONAL STANDPOINT AND AGREES THAT 5 INCHES OF MERCURY MINOR DIVISIONS MIGHT BE MORE USEFUL, BUT ARE NOT REQUIRED.

(Continued)

THE CURRENT SYSTEM ARRANGEMENT EMPLOYS A LOW PRESSURE SETPOINT SWTICH (PSL) AND A HIGH PRESSURE SETPOINT SWITCH (PSH) TO GOVERN THE RANGE OF ALLOWABLE PUMP SUCTION PRESSURES. THE PSL IS SET AT 15 INCHES OF MERCURY VACUUM AND PROVIDES A TRIP SIGNAL TO THE TURBINE AND INITIATES A CONTROL ROOM ANNUNCIATOR WHEN IT ENERGIZES. THE PSH IS SET AT 70 PSIG AND PROVIDES A SIGNAL TO A CONTROL ROOM ANNUNCIATOR.

IMPLEMENTATION OF A SCALE CHANGE AND METER RECALIBRATION WILL BE INITIATED TO CLOSE OUT THIS ITEM.

3.3 No Action Planned HEDs

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: TREMAINE

DATE: 03/10/82

NO: 43

PANEL NUMBER	:	COMPONENT IDENTIFIER
651		SPEED GOVERNOR VOLTAGE ADJUSTER

DESCRIPTION OF DISCREPANCY

ALTHOUGH OPERATORS QUESTIONED WERE UNFAMILIAR WITH THIS PANEL AND SO WERE UNSURE ABOUT THE FREQUENCY OF USE OF CONTROLS AND DISPLAYS, THOSE DISPLAYS ABOVE THE MAXIMUM HEIGHT ALLOWABLE AND THOSE CONTROLS BELOW THE MINIMUM HEIGHT ALLOWABLE, BOTH OF WHICH COULD BE USED FREQUENTLY, ARE NOT CENTRALLY LOCATED.

REVIEW SECTION CODE:
8. PANEL LAYOUT

GUIDELINE NO: 6.8.2.1 B1
CATEGORY:

COMMENTS

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

THIS HED RESULTED FROM OPERATOR UNFAMILIARITY WITH THE CONTROLS AND RELATED DISPLAYS MENTIONED. THE SPEED GOVERNOR CONTROLS FOR THE MAIN TURBINE ARE CENTRALLY LOCATED AND WOULD ONLY BE USED DURING START-UP OF THE TURBINE (3-4 TIMES PER YEAR). THE VOLTAGE ADJUSTER IS USED TO CHANGE THE OUTPUT VOLTAGE TO COINCIDE WITH THE DESIRED OPERATION OF THE TRANSMISSION SYSTEM. THE VOLTAGE IS ADJUSTED AT NIGHT AND IN THE MORNING. THE CONTROLLER IS CLEARLY MARKED AND WITHIN EASY VIEW OF THE OUTPUT VOLTAGE DISPLAY. ALL CONTROLS ARE WITHIN EASY REACH AND ALL RELATED DISPLAYS PROPERLY LOCATED WITHIN THE PANEL. THEREFORE, NO ACTION IS REQUIRED.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: TREMAINE DATE: 03/10/82 NO: 51

PANEL NUMBER : COMPONENT IDENTIFIER

GENERIC

DESCRIPTION OF DISCREPANCY

METERS DO NOT HAVE ZONE MARKINGS APPLIED.

REVIEW SECTION CODE:
9. C/D INTEGRATION

GUIDELINE NO: 6.5.2.3
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

THE PROJECT TEAM REVIEWED THIS HED AND FOUND THAT "ZONE MARKINGS" WERE INAPPROPRIATE BECAUSE AT DIFFERENT OPERATING CONDITIONS, DIFFERENT NORMAL OPERATING RANGES EXIST. ABNORMAL CONDITIONS ARE INDICATED BY A COLOR CHANGE ON THE PROCESS COMPUTER CRT'S AND A COLOR CHANGE ON THE SPDS COMPUTER CRT'S. THESE EXISTING COLOR CHANGES COULD CAUSE A "CHRISTMAS TREE" EFFECT IF ZONE COLORS WERE ADDED TO METERS.

THE COMPUTERS INTRODUCE ADDITIONAL LOGIC TO THE OPERATOR DISPLAYS; I.E., IF A PUMP IS NOT RUNNING (WITH A FIXED ZONE MARKING) THE ZONE ALARM WOULD BE ACTIVE-LOW DISCHARGE PRESSURE. THE COMPUTER SYSTEMS HAVE LOGIC INCORPORATED INTO THE ALARM POINT, AND PUMP DISCHARGE PRESSURE IS NOT ALARMED IF THE PUMP IS NOT REQUIRED TO BE OPERATING. AN ANALOG METER DISPLAYING PUMP DISCHARGE PRESSURE WITH FIXED ZONE MARKINGS WOULD PRESENT CONTRADICTORY INFORMATION TO THE OPERATOR.

(Continued)

IMPORTANT ZONES WHICH DO NOT CHANGE WITH POWER OPERATION ARE MARKED ON A FEW SELECTED METERS. AN EXAMPLE OF THIS IS THE FUEL ZONE WATER LEVEL METER WHICH HAS TOP-OF-ACTIVE-FUEL NOTED.

DURING THE NRC AUDIT OF THE CONTROL ROOM, A GREASE PENCIL MARKING WAS NOTED ON AN INDICATOR. THE MARK WAS PLACED BY THE OPERATORS AS AN INDICATOR OF "DO NOT EXCEED" BECAUSE OF EQUIPMENT MALFUNCTIONING. THE MARK INDICATED A REDUCED OPERATING ZONE UNTIL THE EQUIPMENT WAS REMOVED FROM SERVICE AND REPAIRS MADE-AN ABNORMAL, BUT TEMPORARY, OPERATING ZONE.

THE COMPUTER POINT COULD HAVE BEEN CHANGED TO REDUCE THE ALARM POINT, BUT SINCE REPAIRS REQUIRED LESS THAN TWO DAYS, THE COMPUTER CHANGE WAS NOT INITIATED.

THE OPERATIONS GROUP HAS INITIATED A FORMAL PROGRAM TO ADDRESS OPERATOR ENHANCEMENTS. THIS PROGRAM HAS BEEN ACTIVATED SINCE THE ORIGINAL DETAILED CONTROL ROOM REVIEW AND HED #51 WAS ORIGINATED. IN ADDITION, DETAILED STANDARDS ARE BEING ISSUED TO ADDRESS SCALES FOR INDICATORS. THE PROGRAM EXISTS TO ADDRESS OPERATOR'S DESIRES FOR ZONE MARKINGS, OR OTHER IDEAS TO ENHANCE THE CONTROL ROOM, AND OTHER AREAS OF THE PLANT.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/24/82

NO: 65

PANEL NUMBER : COMPONENT IDENTIFIER

COMPUTER

DESCRIPTION OF DISCREPANCY

YELLOW IS USED TO DESIGNATE NORMAL, CORRECT STATUS, AND NOT THAT A MARGINAL PARAMETER VALUE EXISTS, AS IT DOES ELSEWHERE IN THE CONTROL ROOM. ON THE ANNUNCIATOR TILES, INDICATES AN ABNORMAL CONDITION IN WHICH A TRIP IS IMMINENT.

REVIEW SECTION CODE:
7. COMPUTERS/CRT

GUIDELINE NO: 6.7.2.7 L3
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

IT IS PP&L'S POSITION THAT NO ACTION IS REQUIRED ON THESE HED'S. IN GENERAL, COLOR MAY BE USED TO DISTINGUISH BETWEEN SIMILAR COMPONENTS, TO GIVE ADDED MEANING TO DISPLAYED INFORMATION, TO ASSOCIATE RELATED INSTRUMENTS, AND TO ATTRACT ATTENTION TO LOW-PROBABILITY OR CRITICAL CONDITIONS, ENHANCING THE RECOGNITION OF THE IMPORTANCE OF A DISPLAY OR INDICATION. WE BELIEVE COLOR HAS BEEN USED CONSISTENTLY WITHIN THE SUSQUEHANNA ADVANCED CONTROL ROOM (ACR) TO ACHIEVE THOSE GOALS.

(Continued)

ADDRESSING SPECIFIC COMMENTS WITHIN THE TER:

1. COLOR IS NOT OVER-USED. WITHIN A GIVEN CONTEXT, COLOR VARIATIONS ARE GENERALLY LIMITED. IN THE CONTEXT WITH THE MOST USE OF COLOR (PROCESS VARIABLES), 18 COLORS ARE USED, BUT THIS IS A CONTEXT (MIMICS) WHERE RECOGNITION OF COLOR MEANING IS NOT AS IMPORTANT AS COLOR DIFFERENTIATION, I.E., SEPARATING VARIOUS TYPES OF PROCESS MIMICS TO MAKE FLOW PATH CLEAR. ON ANY ONE PANEL, GENERALLY LESS THAN 5 COLORS ARE PRESENT ON A SET OF MIMICS.

   VARIOUS STUDIES HAVE BEEN SHOWN THAT EVEN IF COLOR WERE BEING USED TO CONDITION OPERATOR ACTIONS, UP TO 10 COLOR VARIATIONS IN A CONTEXT ARE REALISTICALLY PERCEPTIBLE WITH RELATIVELY LOW ERROR RATES (CHAPANIS & HALSEY, 1956) AND THAT UNDER IDEAL CONDITIONS, AS MANY AS 15-24 VARIATIONS OF HUE CAN BE DISCRIMINATED (WOODSON, 1982; TEICHNER, CHRIST AND CORSO, ONR-CR213-102-4F).

   THE COMMENTS ON MEANINGS WILL BE ANSWERED IN #3, BELOW.

2. OUR COLOR CONVENTIONS ARE COMPATIBLE WITHIN THE PP&L SYSTEM. THERE ARE MANY "POPULATION STEREO-TYPES", NOT JUST ONE, EVEN FOR THE COLORS RED AND GREEN:

   "MEANINGS ASSOCIATED WITH RED AND GREEN COLORS DIFFER, DEPENDING ON PAST EXPERIENCE. PERSONNEL WITH PREVIOUS FOSSIL FUEL PLANT EXPERIENCE TYPICALLY ASSOCIATE AN OPEN/FLOWING STATE WITH RED AND A CLOSED/STOP STATE WITH GREEN, BUT REVERSE ASSOCIATIONS TYPICALLY EXIST FOR PERSONNEL WITH PREVIOUS NAVY EXPERIENCE." (EPRI-NP-3659, 1984).

   THROUGHOUT OUR SYSTEM, THE COLORS RED, GREEN AND AMBER ARE USED CONSISTENTLY, IN CONTEXT, AND OUR PERSONNEL ARE TRAINED THOROUGHLY IN THEIR MEANINGS.

3. THERE IS NO SINGLE "MEANING" TO A COLOR.

   "THE MEANING ASSOCIATED WITH A COLOR MAY CHANGE AS THE CONTEXT CHANGES - PROVIDED THAT THE NUMBER OF CONTEXTS IS KEPT TO A MINIMUM AND EACH IS MUTUALLY EXCLUSIVE AND EASILY DISTINGUISHABLE FROM ALL OTHERS. FOR EXAMPLE, YELLOW OR AMBER MAY BE USED TO DENOTE MARGINAL CONDITIONS REPRESENTED IN DISPLAYED INFORMATION AS WELL AS TO CODE OIL LINES ON MIMICS." (EPRI-NP-3659, 1984)

   THE FACT THAT A HYDROGEN GAS CYLINDER IS CODED RED DOES NOT HAVE TO MEAN THAT IS MORE "DANGEROUS" THAN A CYLINDER OF CHLORINE OR HYDROGEN CYANIDE. THE IMPLEMENTATION IN THE TER COMMENTS IS THAT SOME UNIVERSAL "MEANING" CODING EXISTS WHICH SHOULD OVERRIDE THE USE OF COLOR WITHIN A CONTEXT FOR DIFFERENTIATION. THERE IS NO SUCH STANDARD FOR COLOR IN EXISTENCE.

PP&L HAS AN ON-GOING HUMAN FACTORS PROGRAM THAT IS CONSTANTLY REVIEWING ALL ASPECTS OF HUMAN FACTORS ENGINEERING IN OUR DESIGNS FOR CONTROL PANELS. THE STANDARD FOR USE OF COLORS IS DEFINED IN OUR COLOR MATRIX, WHICH IS PART OF DRAWING J-655, "HUMAN FACTORS STANDARDS FOR LABELING OF CONTROLS, INDICATORS, INSTRUMENTS AND ANNUNCIATORS". THIS IS A "CONSISTENT CONVENTION" APPLIED TO OUR DESIGNS INCLUDING SPDS, AND THE CONVENTION IS COVERED AS PART OF OUR OPERATOR TRAINING.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/19/82

NO: 109

PANEL NUMBER : COMPONENT IDENTIFIER

GENERIC LEGEND PUSHBUTTONS

DESCRIPTION OF DISCREPANCY

BARRIERS HAVE NOT BEEN USED WHEN LEGEND PUSHBUTTONS ARE CONTIGUOUS.

REVIEW SECTION CODE:
4. CONTROLS

GUIDELINE NO: 6.4.3.3 D1
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

LEGEND PUSHBUTTONS DO NOT DIRECTLY CONTROL ANY PLANT EQUIPMENT. THE ONLY TIME THEY ARE PUSHED IS FOR A LEGEND LAMP TEST, TO SELECT ITEMS ON PANELS FOR DISPLAY ON CRT'S, OR TO SELECT CONTROL ROD DRIVES FOR DISPLAY OF INFORMATION AND SUBSEQUENT MOVEMENT BY OTHER CONTROLS.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/19/82

NO: 111

PANEL NUMBER	:	COMPONENT IDENTIFIER
OC 653		GENERIC WITHIN PANEL

DESCRIPTION OF DISCREPANCY

GREEN LIGHTS ON BREAKERS MEAN THAT CONTROL ACTUATION DID NOT PRODUCE THE CORRECT RESULT (I.E. A TRIP).

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.6 C1&2
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

IT IS PP&L'S POSITION THAT NO ACTION IS REQUIRED ON THESE HED'S. IN GENERAL, COLOR MAY BE USED TO DISTINGUISH BETWEEN SIMILAR COMPONENTS, TO GIVE ADDED MEANING TO DISPLAYED INFORMATION, TO ASSOCIATE RELATED INSTRUMENTS, AND TO ATTRACT ATTENTION TO LOW-PROBABILITY OR CRITICAL CONDITIONS, ENHANCING THE RECOGNITION OF THE IMPORTANCE OF A DISPLAY OR INDICATION. WE BELIEVE COLOR HAS BEEN USED CONSISTENTLY WITHIN THE SUSQUEHANNA ADVANCED CONTROL ROOM (ACR) TO ACHIEVE THOSE GOALS.

(Continued)

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/19/82

NO: 112

PANEL NUMBER	:	COMPONENT IDENTIFIER
OC 653		GENERIC

DESCRIPTION OF DISCREPANCY

GREEN, AMBER, WHITE, AND RED EACH HAVE MORE THAN ONE MEANING AND ARE NOT THEREFORE CONSISTENT IN THEIR RESPECTIVE APPLICATIONS.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.6 D1&2
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

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* HUMAN ENGINEERING DISCREPANCY RECORD *

REVIEWER: ST DATE: 02/

PANEL NUMBER : CO

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GUIDELINE NO: 6.5.1.6 C1&2
CATEGORY: IV

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   THE COMMENTS ON MEANINGS WILL BE ANSWERED IN #3, BELOW.

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* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/19/82

NO: 112

PANEL NUMBER : COMPONENT IDENTIFIER

OC 653 GENERIC

DESCRIPTION OF DISCREPANCY

GREEN, AMBER, WHITE, AND RED EACH HAVE MORE THAN ONE MEANING AND ARE NOT THEREFORE CONSISTENT IN THEIR RESPECTIVE APPLICATIONS.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.6 D1&2
CATEGORY: II

COMMENT:

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

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   "MEANINGS ASSOCIATED WITH RED AND GREEN COLORS DIFFER, DEPENDING ON PAST EXPERIENCE. PERSONNEL WITH PREVIOUS FOSSIL FUEL PLANT EXPERIENCE TYPICALLY ASSOCIATE AN OPEN/FLOWING STATE WITH RED AND A CLOSED/STOP STATE WITH GREEN, BUT REVERSE ASSOCIATIONS TYPICALLY EXIST FOR PERSONNEL WITH PREVIOUS NAVY EXPERIENCE." (EPRI-NP-3659, 1984).

   THROUGHOUT OUR SYSTEM, THE COLORS RED, GREEN AND AMBER ARE USED CONSISTENTLY, IN CONTEXT, AND OUR PERSONNEL ARE TRAINED THOROUGHLY IN THEIR MEANINGS.

3. THERE IS NO SINGLE "MEANING" TO A COLOR.

   "THE MEANING ASSOCIATED WITH A COLOR MAY CHANGE AS THE CONTEXT CHANGES - PROVIDED THAT THE NUMBER OF CONTEXTS IS KEPT TO A MINIMUM AND EACH IS MUTUALLY EXCLUSIVE AND EASILY DISTINGUISHABLE FROM ALL OTHERS. FOR EXAMPLE, YELLOW OR AMBER MAY BE USED TO DENOTE MARGINAL CONDITIONS REPRESENTED IN DISPLAYED INFORMATION AS WELL AS TO CODE OIL LINES ON MIMICS." (EPRI-NP-3659, 1984)

   THE FACT THAT A HYDROGEN GAS CYLINDER IS CODED RED DOES NOT HAVE TO MEAN THAT IS MORE "DANGEROUS" THAN A CYLINDER OF CHLORINE OR HYDROGEN CYANIDE. THE IMPLEMENTATION IN THE TER COMMENTS IS THAT SOME UNIVERSAL "MEANING" CODING EXISTS WHICH SHOULD OVERRIDE THE USE OF COLOR WITHIN A CONTEXT FOR DIFFERENTIATION. THERE IS NO SUCH STANDARD FOR COLOR IN EXISTENCE.

PP&L HAS AN ON-GOING HUMAN FACTORS PROGRAM THAT IS CONSTANTLY REVIEWING ALL ASPECTS OF HUMAN FACTORS ENGINEERING IN OUR DESIGNS FOR CONTROL PANELS. THE STANDARD FOR USE OF COLORS IS DEFINED IN OUR COLOR MATRIX, WHICH IS PART OF DRAWING J-655, "HUMAN FACTORS STANDARDS FOR LABELING OF CONTROLS, INDICATORS, INSTRUMENTS AND ANNUNCIATORS". THIS IS A "CONSISTENT CONVENTION" APPLIED TO OUR DESIGNS INCLUDING SPDS, AND THE CONVENTION IS COVERED AS PART OF OUR OPERATOR TRAINING.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/22/82

NO: 121

PANEL NUMBER :	COMPONENT IDENTIFIER
OC 653	MIMIC FOR ELECTRICAL DISTRIBUTION

DESCRIPTION OF DISCREPANCY

MIMIC LINE IS OUT OF KILTER IN THE SECOND PANEL INSERT IN A PORTION OF THE MIMIC CONTAINING MORE THAN 4 MIMIC LINES OF THE SAME COLOR.

REVIEW SECTION CODE:
6. LABELS & AIDS

GUIDELINE NO: 6.6.6.4 X5
CATEGORY:

COMMENTS

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

MIMIC LINES, REPRESENTING ELECTRICAL DISTRIBUTION LINES FROM THE DIESEL GENERATORS, ARE DISTINGUISHABLE BY DIFFERENT SYMBOLS ENGRAVED ON THE MIMICS, AND ARE CONSISTENT WITH S.A.C.R. MIMIC CONVENTIONS.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/25/82

NO: 126

PANEL NUMBER :	COMPONENT IDENTIFIER
1C668	STEAM PACKING EXHAUSTERS

DESCRIPTION OF DISCREPANCY

THE STEAM PACKING EXHAUSTERS GO "OPEN" WITHOUT DIFFICULTY; HOWEVER, IF THESE GO TOO FAR "OPEN", THEN IT IS VERY DIFFICULT, IMPOSSIBLE ACCORDING TO OPERATORS, TO "CLOSE" THEM AGAIN.

REVIEW SECTION CODE:
4. CONTROLS

GUIDELINE NO: 6.4.1.1 A1

CATEGORY:

COMMENTS

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

THIS IS AN OPERATIONAL PROBLEM, NOT A HUMAN FACTORS CONCERN, AND HAS NO SAFETY SIGNIFICANCE. THIS OPERATIONAL PROBLEM WAS ASSOCIATED WITH INITIAL PLANT TESTING AND HAS BEEN RESOLVED BY MAINTENANCE ON THE AFFECTED SYSTEM COMPONENTS.

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: ST DATE: 02/18/82 NO: 157

PANEL NUMBER	:	COMPONENT IDENTIFIER
ANNUN		ANNUNCIATOR WARNING SYSTEM

DESCRIPTION OF DISCREPANCY

AT THIS JUNCTURE, NO FIRST OUT ANNUNCIATOR CAPABILITY HAS BEEN INSTALLED FOR THE RX SYSTEM.

REVIEW SECTION CODE:
3. ANNUNCIATORS

GUIDELINE NO: 6.3.1.3 A1
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

FIRST OUT ANNUNCIATOR CAPABILITY-THE CURRENT SSES ANNUNCIATOR DESIGN HAS NO "FIRST OUT" OR SEQUENCE OF EVENTS CAPABILITY. FIRST OUT CAPABILITY MIGHT BE USED TO "DIAGNOSE" OR IDENTIFY THE CAUSE OF A TRIP OR TRANSIENT.

IN THE SSES CONTROL ROOM, THE DIAGNOSTIC OR "BROAD OVERVIEW" FUNCTIONS ARE VESTED IN THE SHIFT SUPERVISOR (SS) OR SHIFT TECHNICAL ADVISOR (STA) BACKED UP BY THE TECHNICAL SUPPORT CENTER (TSC) AND PLANT STAFF (PS), WHEN ACTIVATED. THE PANEL OPERATORS ARE OPERATING TO SYMPTOM-ORIENTED EMERGENCY OPERATING PROCEDURES WHICH WORK ON THE PRINCIPLE OF "TREATING" SYMPTOMS, NOT DIAGNOSING CAUSES.

(Continued)

THE DIAGNOSTIC FUNCTIONS OF THE SS, STA, PS, AND TSC ARE SUPPORTED BY EXTENSIVE PLANT COMPUTER SYSTEM MONITORING FUNCTIONS, INCLUDING TIME TAGGED CRT ALARMS, WHICH PROVIDE MORE AND BETTER INFORMATION THAN A FIRST OUT ANNUNCIATOR SYSTEM. SPECIFIC DIAGNOSTIC REPORTS AVAILABLE TO THE SS, STA, AND TSC ARE:

1. 167 POINTS (UNIT 1) ARE RECORDED IN A SEQUENCE OF EVENTS LOG MAINTENANCED BY THE BALANCE OF PLANT (BOP) HOST COMPUTER. WHEN ANY ONE OF THESE POINTS CHANGES STATE WITHIN A 4-MILLISECOND RESOLUTION TIME, THE LOG IS INITIATED. WHENEVER 64 CHANGES OF STATE OR 30 SECONDS HAVE ELAPSED, THIS LOG IS PRINTED OUT IN THE CONTROL ROOM. A COPY OF THE CURRENT POINTS IN THE UNIT 1 SEQUENCE OF EVENTS LOG IS ATTACHED. (EXHIBIT I)

2. PLANT COMPUTER HISTORICAL RECORDING IS MAINTAINED CURRENTLY FOR 1084 POINTS OUT OF A TOTAL OF 2,692 PLANT COMPUTER INPUTS, PLUS CONTROL ROD POSITIONS FROM THE NUCLEAR STEAM SUPPLY SYSTEM COMPUTER. POINTS IN THE HISTORICAL LOG ARE RECORDED ON TWO-SECOND INTERVALS. AN ON-LINE HISTORY FILE RETRIEVAL CAN BE REQUESTED FROM THE CONTROL ROOM AND BE EITHER DISPLAYED ON A SELECTED CRT SCREEN OR PRINTED OUT. ALL REPORTED LINES OF POINT INFORMATION INCLUDE THE EVENT TIME, POINT ID, ENGLISH DESCRIPTION AND STATUS ALONG WITH THE DESIRED DATA. THE TYPES OF HISTORICAL INFORMATION AVAILABLE ARE:

   a. ALARMED CONTACT CHANGES

   b. PERIODIC ANALOG INPUT

   c. ALARM ACTIVITY

   d. POINT PARAMETER CHANGES

   e. TRIP/SCRAM/SEQUENCE OF EVENTS (EVENT AND WHEN IT HAPPENED)

   f. SYSTEM RESTARTS

   g. CONTROL ROD HISTORY

3. TRANSIENT MONITORING SYSTEM: EACH UNIT MAINTAINS A SEPARATE TRANSIENT MONITORING COMPUTER SYSTEM SUPPLIED BY GENERAL ELECTRIC (GETARS I). THE GETARS SYSTEM IS A HIGH-SPEED DATA ACQUISITION SYSTEM DEVELOPED FOR START-UP TESTING WHICH HAS BEEN FOUND TO BE AN ASSET FOR OPERATION AFTER THE START-UP PHASE AT SSES. THE SYSTEM MONITORS AND RECORDS ANALOG AND DIGITAL SIGNALS FROM VARIOUS PLANT SYSTEMS. (EXHIBIT II)

   A SUBSET OF THE MONITORED POINTS IS SELECTED FOR TRIP MONITORING AND THE COMPUTER SYSTEM OPERATES IN A "SENTINEL" MODE CONSTANTLY SCANNING THESE POINTS FOR TRIP INDICATIONS. WHEN A TRIP CONDITION IS ESTABLISHED, LIMIT-CHECKING FOR TRIP DETERMINATION CEASES AND DATA RECORDING IS INITIATED. DATA RECORDING CONTINUES FOR APPROXIMATELY TEN MINUTES AFTER A TRIP AND INCLUDES ABOUT 30 SECONDS OF PRE-TRIP DATA. THE CURRENT SCANNING RATE IS ABOUT SIX MILLISECONDS RESOLUTION FOR EACH POINT.

   WHEN DATA RECORDING IS TERMINATED, THE RESULTS ARE AVAILABLE IN THE TSC IN THE FORM OF HARD COPY GRAPHS AND CHARTS OF TIME HISTORY DATA FOR ANY PREDETERMINED POINT IN THE SYSTEM, WITH UP TO TEN CHANNELS OF CONCURRENT INFORMATION DISPLAYED ON ONE GRAPH.

   IT IS ALSO POSSIBLE TO SET UP PLOTS OF ON-LINE REAL TIME DATA ON A CONTINUOUS BASIS WHILE DATA IS BEING CONTINUOUSLY RECORDED TO MAGNETIC TAPE.
   WITH THIS DATA AVAILABLE FOR THE DIAGNOSIS OF SITUATIONS, A "FIRST OUT" ANNUNCIATOR SYSTEM IS REDUNDANT, AND AT VARIANCE WITH SYMPTOM BASED PROCEDURES, WHICH REFLECT THE NEW PHILOSOPHY FOR OPERATOR ACTION.

CHNG	POINT IDENT	IN BD.	PROC	FUNCTION SUMMARY DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	----- STATE DESCRIPTION ----- =0	=1	NORM
	CPZ03	0303	B	FN61C13C	COND PP A ABNORMAL TRIP	1	44	*	NO	TRIPPED	0
	CPZ04	0302	B	FN61C13C	COND PP B ABNORMAL TRIP	1	44	*	NO	TRIPPED	0
	CPZ05	0301	B	FN61C13C	COND PP C ABNORMAL TRIP	1	44	*	NO	TRIPPED	0
	CPZ06	0300	B	FN61C13C	COND PP D ABNORMAL TRIP	1	44	*	NO	TRIPPED	0
	DU380	2627	B		UOB ALARM PAGE FWD	1	31	*	OFF	ON	0
	DU381	2626	B		UOB ALARM PAGE BACK	1	31	*	OFF	ON	0
	DU382	2625	B		UOB ALARM ACKN	1	31	*	OFF	ON	0
	EBZ01	0315	B	FR20C59A	T BUS 0A106-BUS 11A BKR	1	3	*	OPEN	CLOSED	0
	EBZ02	0314	B	FR20C59A	T BUS 0A106-BUS 11B BKR	1	3	*	OPEN	CLOSED	0
	EBZ10	0327	B	FR20C59B	BUS 10-T BUS 0A106 BKR	1	3	*	NORMAL	TRIPPED	0
	EBZ11	0322	B	FR20C59C	T BUS 0A106-0A107 BKR	1	3	*	OPEN	CLOSED	0
	EBZ20	0250	B	FR20C59B	BUS 20-T BUS 0A107 BKR	C	3	*	NORMAL	TRIPPED	0
	EBZ26	0311	B	FR20C620	FDR TO SU BUS 10 UNDERVO	C	3	*	NO	YES	0
	EBZ51	0313	B	FR21C59A	T BUS 0A 107-BUS 2A BKR	C	3	*	OPEN	CLOSED	0
	EBZ52	0312	B	FR21C59A	TIE BUS 0A107-BUS 2B BKR	1	3	*	OPEN	CLOSED	0
	EBZ76	0310	B	FR20C620	FDR TO BUS 20 UNDERVOLT	C	3	*	NO	YES	0

CHNG	POINT IDENT	--ALARM PARAMETERS--- NON-ALRM PT	CAT	AUD	ACK	CHK	------ ALARM CUTOUT ----- COND	STATE	CHK	PROG TRIG #	ENBL	POINT USAGE -- BOP-CALC IN	OUT	COMPOSED POINT	SOE	DIAG #	INTER-CONN
	CPZ03	Y	3	N	N	*	NONE			000		*			*	301-48	
	CPZ04	Y	3	N	N	*	NONE			000		*			*	301-48	
	CPZ05	Y	3	N	N	*	NONE			000		*			*	301-48	
	CPZ06	Y	3	N	N	*	NONE			000		*			*	301-48	
	DU380	Y	3	N	N	*	NONE			000					*		
	DU381	Y	3	N	N	*	NONE			000					*		
	DU382	Y	3	N	N	*	NONE			000					*		
	EBZ01	N	3	N	N		NONE			000					*	301-48	
	EBZ02	N	3	N	N		NONE			000					*	301-48	
	EBZ10	N	3	N	N		NONE			000					*	301-47	
	EBZ11	N	3	N	N		NONE			000					*	301-47	
	EBZ20	N	3	N	N		NONE			000					*	301-47	
	EBZ26	N	3	N	N		NONE			000					*	301-48	
	EBZ51	N	3	N	N		NONE			000					*	301-48	
	EBZ52	N	3	N	N		NONE			000					*	301-48	
	EBZ76	N	3	N	N		NONE			000					*	301-48	

CHNG	POINT IDENT	END DEVICE NUMBER	------ INSTRUMENT ------ MFG	MODEL #	TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	CPZ03	1P 102A				1N0048	C92P639	4	10	9	10				IED02	00003430
	CPZ04	1P 102B				1N0048	C92P639	4	10	11	12				IED02	00003430
	CPZ05	1P 102C				1N0048	C92P639	4	10	13	14				IED02	00003430
	CPZ06	1P 102D				1N0048	C92P639	4	10	15	16				IED02	00003430
	DU380						C92P640	4	1	1	2				ICD12	10001000
	DU381						C92P640	4	1	3	4				ICD12	10001000
	DU382						C92P640	4	1	5	6				ICD12	10001000
	EBZ01	52 10104				1N0048	C92P639	4	9	5	6				IED02	00003430
	EBZ02	52 10204				1N0048	C92P639	4	9	7	8				IED02	00003430
	EBZ10	52 10303				1N0047	C92P639	4	8	1	2				IED02	00003430
	EBZ11	52 10502				1N0047	C92P639	4	8	11	12				IED02	00003430
	EBZ20	52 10403				1N0047	C92P639	4	7	15	16				IED02	00003425
	EBZ26	27 AZX103				1N0048	C92P639	4	9	13	14				IED02	00003430
	EBZ51	52 10204				1N0048	C92P639	4	9	9	10				IED02	00003430
	EBZ52	52 10204				1N0048	C92P639	4	9	11	12				IED02	00003430
	EBZ76	27 1AZX104				1N0048	C92P639	4	9	15	16				IED02	00003430

HED #157
EXHIBIT I

INT IND	I N D X	P R O C	FUNCTION SUMMARY DOC #	ENGLISH IDENTIFICATION	U N I T	SYS #	P R C S	STATE DESCRIPTION =0	=1	NORM
01	0326	B	FR20C240	SU XFMR 10-BUS 10 BKR	1	1	*	NORMAL	TRIPPED	0
02	0325	B	FR20C240	SU SFMR 20-BUS 20 BKR	C	1	*	NORMAL	TRIPPED	0
07	0324	B	FR20C380	AUX XFMR 11-BUS 11A BKR	1	3	*	NORMAL	TRIPPED	0
08	0323	B	FR20C380	AUX XFMR 11-BUS 11B BKR	1	3	*	NORMAL	TRIPPED	0
01	0207	B	FR11B25A	UNIT AUX XFMR DIFF	1	87	*	NORMAL	TRIPPED	0
02	0206	B	FR11B25B	UNIT AUX XFMR GRD DIFF	1	87	*	NORMAL	TRIPPED	0
03	0205	B	FR11B25C	UNIT AUX XFMR PHASE OC	1	87	*	NORMAL	TRIPPED	0
04	0204	B	FR11B25D	UNIT AUX XFMR GRD OVOLT	1	87	*	NORMAL	TRIPPED	0
01	0354	B	FN21A360	RFPT A MASTER TRIP	1	48	*	NO	TRIPPED	0
03	0343	B	FN21A560	RFPT A VACUUM TRIP	1	48	*	NO	TRIPPED	0
04	0353	B	FN21A460	RFPT A ACT THR BRG WEAR	1	48	*	NORMAL	TRIPPED	0
05	0352	B	FN21A470	RFPT A INACT THR BRG	1	48	*	NORMAL	TRIPPED	0
01	0351	B	FN21A360	RFPT B MASTER TRIP	1	48	*	NO	TRIPPED	0
03	0342	B	FN21A560	RFPT B VACUUM TRIP	1	48	*	NO	TRIPPED	0
04	0350	B	FN21A460	RFPT B ACT THR BRG WEAR	1	48	*	NORMAL	TRIPPED	0
05	0347	B	FN21A470	RFPT B INACT THR BRG	1	48	*	NORMAL	TRIPPED	0

INT IND	--ALARM PARAMETERS--- NON-ALRM PT	CAT	AUD	ACK	CHK	ALARM CUTOUT COND	STATE	POINT ID	CHK	PROG TRIG #	ENBL	BOP-CALC IN	BOP-CALC OUT	POINT USAGE -- COMPOSED POINT	SOE	DIAG #	INTER-CONN
01	N	3	N	N		NONE				000		*			*	301-12	
02	N	3	N	N		NONE				000		*			*	301-18	
07	N	3	N	N		NONE				000					*	301-47	
08	N	3	N	N		NONE				000					*	301-47	
01	N	3	N	N		NONE				000					*	301-01	
02	N	3	N	N		NONE				000					*	301-01	
03	N	3	N	N		NONE				000					*	301-01	
04	N	3	N	N		NONE				000					*	301-01	
01	N	3	N	Y		NONE				000				*	*	301-48	
03	N	2	Y	Y		YES	NO	FT101	*	000				*	*	301-48	
04	Y	3	N	N	*	NONE				000				*	*	301-48	
05	Y	3	N	N	*	NONE				000				*	*	301-48	
01	N	3	N	Y		NONE				000				*	*	301-48	
03	N	2	Y	Y		YES	NO	FT201	*	000				*	*	301-48	
04	Y	3	N	N	*	NONE				000				*	*	301-48	
05	Y	3	N	N	*	NONE				000				*	*	301-49	

INT IND	END DEVICE NUMBER	INSTRUMENT MFG	INSTRUMENT MODEL #	INSTRUMENT TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
01	74 10301				1N0047	C92P639	4	8	3	4				IED02	00003430
02	74 A10401				1N0047	C92P639	4	8	5	6				IED02	00003430
07	52 10101				1N0047	C92P639	4	8	7	8				IED02	00003430
08	52 10201				1N0047	C92P639	4	8	9	10				IED02	00003430
01	TAR 3/4				1N0001	C92P639	4	0	1	2				IED02	00003017
02	TAR 3/4				1N0001	C92P639	4	0	3	4				IED02	00003017
03	TAR 5/3				1N0001	C92P639	4	0	5	6				IED02	00003017
04	TAR 5/4				1N0001	C92P639	4	0	7	8				IED02	00003017
01	PSL 12742A				1N0048	C92P639	4	11	7	8				IED02	00001433
03	PSLX 12732A				1N0049	C92P639	4	12	9	10				IED02	00001433
04	PSH 11966A				1N0048	C92P639	4	11	9	10				IED02	00001433
05	PSH 11967A				1N0048	C92P639	4	11	11	12				IED02	00001433
01	PS6 12742B				1N0048	C92P639	4	11	13	14				IED02	00001433
03	PS6X 12732B				1N0049	C92P639	4	12	11	12				IED02	00001433
04	PSH 11966B				1N0048	C92P639	4	11	15	16				IED02	00001433
05	PSH 11967B				1N0049	C92P639	4	12	1	2				IED02	00001433

CHNG	POINT IDENT	IN D. X	PRO C	FUNCTION SUMMARY DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	STATE DESCRIPTION =0	=1	NORM
	FT301	0346	B	FN21A360	RFPT C MASTER TRIP	1	48	*	NO	TRIPPED	0
	FT303	0341	B	FN21A560	RFPT C VACUUM TRIP	1	48	*	NO	TRIPPED	0
	FT304	0345	B	FN21A460	RFPT C ACT THR BRG WEAR	1	48	*	NORMAL	TRIPPED	0
	FT305	0344	B	FN21A470	RFPT C INACT THR BRG	1	48	*	NORMAL	TRIPPED	0
	GEZ02	0243	B	FN51A290	EXCITER DIFFERENTIAL	1	98	*	NORMAL	TRIPPED	0
	GNZ01	0203	B	FN41A55A	MAIN GEN DIFFERENTIAL	1	98	*	NORMAL	TRIPPED	0
	GNZ02	0202	B	FN41A55B	MAIN GEN NEUTRAL OVOLTS	1	98	*	NORMAL	TRIPPED	0
	GNZ03	0201	B	FN41A55C	MAIN GEN LOSS FIELD A	1	98	*	NORMAL	TRIPPED	0
	GNZ04	0200	B	FN41A55D	MAIN GEN UNDER FREQUENCY	1	98	*	NORMAL	TRIPPED	0
	GNZ05	0177	B	FN41A55E	UNIT PRI LOCKOUT A/C	1	98	*	NORMAL	TRIPPED	0
	GNZ07	0176	B	FN41A55F	GEN OUT OF STEP	1	98	*	NORMAL	TRIPPED	0
	GNZ08	0175	B	FN41A55G	MAIN GEN GRD OVERVOLTAGE	1	98	*	NORMAL	TRIPPED	0
	GNZ09	0174	B	FN41A55H	MAIN GEN NEUT OVOLT STRT	1	98	*	NORMAL	TRIPPED	0
	GNZ10	0173	B	FN41A55J	UNIT DIFFERENTIAL	1	87	*	NORMAL	TRIPPED	0
	GNZ11	0172	B	FN41A55K	MAIN GEN LOSS FIELD B	1	98	*	NORMAL	TRIPPED	0
	GNZ12	0171	B	FN41A55L	UNIT BKUP LKOUT B-D	1	98	*	NORMAL	TRIPPED	0

CHNG	POINT IDENT	--ALARM PARAMETERS--- NON-ALRM PT	CAT	AUD	ACK	CHK	ALARM CUTOUT COND	STATE	POINT ID	CHK	PROG TRIG #	ENBL	POINT USAGE -- BOP-CALC IN	OUT	COMPOSED POINT	SOE	DIAG #	INTER-CONN
	FT301	N	3	N	Y		NONE				000				*	*	301-49	
	FT303	N	2	Y	Y		YES	NO	FT301	*	000				*	*	301-49	
	FT304	Y	3	N	N	*	NONE				000				*	*	301-49	
	FT305	Y	3	N	N	*	NONE				000				*	*	301-01	
	GEZ02	N	3	N	N		NONE				000					*	301-08	
	GNZ01	N	3	N	N		YES	NO	NPH03		000					*	301-51	
	GNZ02	N	3	N	N		YES	NO	NPH03		000					*	301-08	
	GNZ03	N	3	N	N		YES	NO	NPH03		000					*	301-01	
	GNZ04	N	3	N	N		YES	NO	NPH03		000					*	301-01	
	GNZ05	N	3	N	N		YES	NO	NPH03		000					*	301-01	
	GNZ07	N	3	N	N		YES	NO	NPH03		000					*	301-01	
	GNZ08	N	3	N	N		YES	NO	NPH03		000					*	301-01	
	GNZ09	N	3	N	N		YES	NO	NPH03		000					*	301-01	
	GNZ10	N	3	N	N		YES	NO	NPH03		000					*	301-01	
	GNZ11	N	3	N	N		YES	NO	NPH03		000					*	301-01	
	GNZ12	N	3	N	N		YES	NO	NPH03		000					*	301-01	

CHNG	POINT IDENT	END DEVICE NUMBER	INSTRUMENT MFG	MODEL #	TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	FT301	PSL 12742C				1M0049	C92P639	4	12	3	4				IEDO2	00001433
	FT303	PSLX 12732C				1M0049	C92P639	4	12	13	14				IEDO2	00001433
	FT304	PSH 11966C				1M0049	C92P639	4	12	5	6				IEDO2	00001433
	FT305	PSH 11967C				1M0049	C92P639	4	12	7	8				IEDO2	00001433
	GEZ02	TAR 1/4				1M0001	C92P639	4	2	9	10				IEDO2	00003422
	GNZ01	TAR 1/1				1M0048	C92P639	4	0	9	10				IEDO2	00003017
	GNZ02	TAR 1/2				1M0001	C92P639	4	0	11	12				IEDO2	00003017
	GNZ03	TAR 1/3				1M0048	C92P639	4	0	13	14				IEDO2	00003017
	GNZ04	TAR1 -5				1M0001	C92P639	4	0	15	16				IEDO2	00003017
	GNZ05	86GA				1M0001	C92P639	4	1	1	2				IEDO2	00003017
	GNZ07	TAR 4/1				1M0001	C92P639	4	1	3	4				IEDO2	00003017
	GNZ08	TAR 4/2				1M0001	C92P639	4	1	5	6				IEDO2	00003017
	GNZ09	TAR 4/3				1M0001	C92P639	4	1	7	8				IEDO2	00003017
	GNZ10	TAR 5/1				1M0001	C92P639	4	1	9	10				IEDO2	00003017
	GNZ11	TAR 5/4				1M0001	C92P639	4	1	11	12				IEDO2	00003017
	GNZ12	86GB				1M0001	C92P639	4	1	13	14				IEDO2	00003017

CHNG	POINT IDENT	IN DX	PR OC	FUNCTION SUMMARY, DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	STATE DESCRIPTION =0	=1	NORM
	GNZ15	0246	B	FN41A55Q	MAIN GEN NEG SEQUENCE	1	98	*	NORMAL	TRIPPED	0
	GNZ18	0245	B	FN41A55R	MAIN GEN VOLT/HERTZ	1	98	*	NORMAL	TRIPPED	0
	GNZ20	0244	B	FN41A55T	MN GEN BKUP VOLT/HZ	1	98	*	NORMAL	TRIPPED	0
	GNZ22	0274	B	FN41A55U	BKUP ANTI-MOTERING RELAY	1	98	*	NORMAL	TRIPPED	0
	GNZ23	0273	B	FN41A55V	GEN SPAN PROTECTION A	1	98	*	NORMAL	TRIPPED	0
	GNZ24	0272	B	FN41A55W	GEN SPAN PROTECTION B	1	98	*	NORMAL	TRIPPED	0
*	GNZ38	0264	B	FN41A430	GEN LOAD UNBALANCE	1	98	*	NO	YES	0
	[illegible]44	0357	B	FN41A390	GEN SYNC BREAKER	1	98	*	NORMAL	TRBLE	0
	GNZ45	0271	B	FN41A500	230KV GEN BKR FAILURE	1	98	*	NO	YES	0
	GNZ46	0270	B		OVERSPEED PROTEC TRIPPED	1	98	*	NORMAL	TRIPPED	0
	GNZ47	0170	B		PRIMARY ANTI-MOTOR RELAY	1	98	*	NORMAL	TRIPPED	0
	GOZ01	0356	B	FN40B120	GEN MN SEAL OIL PUMP	1	95A	*	NORMAL	TRIPPED	0
	GOZ03	0355	B	FN40B10C	GEN EMERG SEAL OIL PP	1	95A	*	NORMAL	TRIPPED	0
	NNQ51	2717	B	C51B330C1	UPSC TRIP APRM CHAN A	1	78D	*	NO	YES	0
	NNQ52	2716	B	C51B330C2	UPSC TRIP APRM CHAN B	1	78D	*	NO	YES	0
	NNQ53	2715	B	C51B330C3	UPSC TRIP APRM CHAN C	1	78D	*	NO	YES	0

CHNG	POINT IDENT	--ALARM PARAMETERS--- NON-ALRM PT	CAT	AUD	ACK	CHK	ALARM CUTOUT COND	STATE	POINT ID	CHK	PROG TRIG #	ENBL	POINT USAGE -- BOP-CALC IN	BOP-CALC OUT	COMPOSED POINT	SOE	DIAG #	INTER-CONN
	GNZ15	N	3	N	N		YES	NO	NPN03		000					*	301-01	
	GNZ18	N	3	N	N		YES	NO	NPN03		000					*	301-01	
	GNZ20	N	3	N	N		YES	NO	NPN03		000					*	301-01	
	GNZ22	N	3	N	N		YES	NO	NPN03		002	*				*	301-02	
	GNZ23	N	3	N	N		NONE				000					*	301-02	
	GNZ24	N	3	N	N		NONE				000					*	301-02	
*	GNZ38	N	3	N	N		YES	NO	NPN03		000					*		
	GNZ44	N	3	N	N		NONE				000		*			*	301-09	
	GNZ45	N	3	N	N		NONE				000					*	301-48	
	GNZ46	N	3	N	N		NONE				000					*	301-02	
	GNZ47	N	3	N	N		NONE				002	*				*		
	GOZ01	N	3	N	N		NONE				000					*	301-08	
	GOZ03	N	3	N	N		NONE				000					*	301-08	
	NNQ51	N	3	Y	Y		YES	YES	NNZ58	*	000					*		
	NNQ52	N	3	Y	Y		YES	YES	NNZ59	*	000					*		
	NNQ53	N	3	Y	Y		YES	YES	NNZ60	*	000					*		

CHNG	POINT IDENT	END DEVICE NUMBER	INSTRUMENT MFG	INSTRUMENT MODEL #	INSTRUMENT TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	GNZ15	TAR 3/5				1N0001	C92P639	4	2	3	4				IED02	00003422
	GNZ18	TAR 2/5				1N0001	C92P639	4	2	5	6				IED02	00003422
	GNZ20	TAR 4/4				1N0001	C92P639	4	2	7	8				IED02	00003422
	GNZ22	TAR 6/1				1N0002	C92P639	4	5	7	8				IED02	00003425
	GNZ23	TAR 6/2				1N0002	C92P639	4	5	9	10				IED02	00003425
	GNZ24	TAR 4/5				1N0002	C92P639	4	5	11	12				IED02	00003425
*	GNZ38						C92P639	4	6	7	8				IED02	00001433
	GNZ44	63 1R101				1N0048	C92P639	4	11	1	2				IED02	00003425
	GNZ45	86 BF65801				1N0002	C92P639	4	5	13	14				IED02	00003425
	GNZ46						C92P639	4	5	15	16				IED02	00003017
	GNZ47						C92P639	4	1	15	16				IED02	00001433
	GOZ01	49X-2				1N0048	C92P639	4	11	3	4				IED02	00001433
	GOZ03	42X				1N0048	C92P639	4	11	5	6				IED02	10003406
	NNQ51	C51B-PS31			PC	C51B-290	C92P640	4	6	1	2				IED02	10003406
	NNQ52	C51B-PS32			PC	C51B-287	C92P640	4	6	3	4				IED02	10003406
	NNQ53	C51B-PS41			PC	C51B289	C92P640	4	6	5	6				IED02	

CHNG	POINT IDENT	IND X	P R C	FUNCTION/ SUMMARY DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	STATE DESCRIPTION =0	=1	NORM
	NNQ54	2714	B	C51B330C4	UPSC TRIP APRM CHAN C	1	78D	*	NO	YES	0
	NNQ55	2713	B	C51B330C5	UPSC TRIP APRM CHAN E	1	78D	*	NO	YES	0
	NNQ56	2712	B	C51B330C6	UPSC TRIP APRM CHAN F	1	78D	*	NO	YES	0
	NNQ58	2643	B	C51B470C1	UPSC THERM TRIP APRM A	1	78D	*	NO	YES	0
	NNQ59	2644	B	C51B470C2	UPSC THERM TRIP APRM B	1	78D	*	NO	YES	0
	NNQ60	2647	B	C51B470C3	UPSC THERM TRIP APRM C	1	78D	*	NO	YES	0
	NNQ61	2646	B	C51B470C4	UPSC THERM TRIP APRM D	1	78D	*	NO	YES	0
	NNQ62	2645	B	C51B470C5	UPSC THERM TRIP APRM E	1	78D	*	NO	YES	0
	NNQ63	2642	B	C51B470C6	UPSC THERM TRIP APRM F	1	78D	*	NO	YES	0
	NNQ51	2707	B	C51A280C1	IRM UPSCL TRIP CHAN A	1	78B	*	NO	YES	0
	NNQ52	2706	B	C51A280C5	IRM UPSCL TRIP CHAN E	1	78B	*	NO	YES	0
	NNQ53	2705	B	C51A280C3	IRM UPSCL TRIP CHAN C	1	78B	*	NO	YES	0
	NNQ54	2704	B	C51A280C7	IRM UPSC TRIP CHAN G	1	78B	*	NO	YES	0
	NNQ55	2703	B	C51A280C2	IRM UPSC TRIP CHAN B	1	78B	*	NO	YES	0
	NNQ56	2702	B	C51A280C6	IRM UPSC TRIP CHAN F	1	78B	*	NO	YES	0
	NNQ57	2701	B	C51A280C4	IRM UPSC TRIP CHAN D	1	78B	*	NO	YES	0

CHNG	POINT IDENT	--ALARM PARAMETERS--- NON-ALRM PT	CAT	AUD	ACK	CHK	ALARM CUTOUT COND	STATE	POINT ID	CHK	PROG TRIG #	ENBL	BOP-CALC IN	BOP-CALC OUT	POINT USAGE -- COMPOSED POINT	SOE	DIAG #	INTER-CONN
	NNQ54	N	3	Y	Y		YES	YES	NNZ61	*	000					*		
	NNQ55	N	3	Y	Y		YES	YES	NNZ62	*	000					*		
	NNQ56	N	3	Y	Y		YES	YES	NNZ63	*	000					*		
	NNQ58	N	1	Y	Y		YES	YES	NNZ58	*	000					*		
	NNQ59	N	1	Y	Y		YES	YES	NNZ59	*	000					*		
	NNQ60	N	1	Y	Y		YES	YES	NNZ60	*	000					*		
	NNQ61	N	1	Y	Y		YES	YES	NNZ61	*	000					*		
	NNQ62	N	1	Y	Y		YES	YES	NNZ62	*	000					*		
	NNQ63	N	1	Y	Y		YES	YES	NNZ63	*	000					*		
	NNQ51	Y	3	N	N	*	NONE				000					*		
	NNQ52	Y	3	N	N	*	NONE				000					*		
	NNQ53	Y	3	N	N	*	NONE				000					*		
	NNQ54	Y	3	N	N	*	NONE				000					*		
	NNQ55	Y	3	N	N	*	NONE				000					*		
	NNQ56	Y	3	N	N	*	NONE				000					*		
	NNQ57	Y	3	N	N	*	NONE				000					*		

CHNG	POINT IDENT	END DEVICE NUMBER	INSTRUMENT MFG	INSTRUMENT MODEL #	INSTRUMENT TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	NNQ54	C51B-PS22			PC	C51B-286	C92P640	4	6	7	8				IEDO2	10003406
	NNQ55	C51B-PS51			PC	C51B-288	C92P640	4	6	9	10				IEDO2	10003406
	NNQ56	C51B-PS12			PC	C51B-285	C92P640	4	6	11	12				IEDO2	10003406
	NNQ58	C51B-PS31				C51B-336	C92P640	4	5	9	10				ICDI2	10003403
	NNQ59	C51B-PS32				C51B-333	C92P640	4	5	7	8				ICDI2	10003403
	NNQ60	C51B-PS41				C51B-335	C92P640	4	5	1	2				ICDI2	10003403
	NNQ61	C51B-PS22				C51B-332	C92P640	4	5	3	4				ICDI2	10003403
	NNQ62	C51B-PS51				C51B-334	C92P640	4	5	5	6				ICDI2	10003403
	NNQ63	C51B-PS12				C51B-331	C92P640	4	5	11	12				IEDO2	10003406
	NNQ51	C51IRMZ2A			DC	C51A-102	C92P640	4	7	1	2				IEDO2	10003406
	NNQ52	C51IRMZ2A			DC	C51A-102	C92P640	4	7	3	4				IEDO2	10003406
	NNQ53	C51IRMZ2C			DC	C51A-103	C92P640	4	7	5	6				IEDO2	10003406
	NNQ54	C51IRMZ2C			DC	C51A-103	C92P640	4	7	7	8				IEDO2	10003406
	NNQ55	C51IRMZ2B			DC	C51A-104	C92P640	4	7	9	10				IEDO2	10003406
	NNQ56	C51IRMZ2B			DC	C51A-104	C92P640	4	7	11	12				IEDO2	10003406
	NNQ57	C51IRMZ2D			DC	C51A-105	C92P640	4	7	13	14				IEDO2	10003406

CHNG	POINT IDENT	IN BOX	PRO DOC	FUNCTION SUMMARY, DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	STATE DESCRIPTION =0	=1	NORM
	NNQ58	2700 B	C51A280C8	IRM UPSC TRIP CHAN H		1	780	*	NO	YES	0
	NPQ51	2677 B	C72AC1501	DSCH VOL HI LVL TRIP A		1	58	*	NO	YES	0
	NPQ52	2676 B	C72AC1502	DSCH VOL HI LVL TRIP B		1	58	*	NO	YES	0
	NPQ53	2675 B	C72AC1503	DSCH VOL HI LVL TRIP A		1	58	*	NO	YES	0
	NPQ54	2674 B	C72AC1504	DSCH VOL HI LVL TRIP B		1	58	*	NO	YES	0
	NPQ55	2673 B	C72AC1509	MSIV NOT FL OPEN TRIP A1		1	58	*	OPEN	NOT OPEN	0
	NPQ56	2672 B	C72AC1510	MSIV NOT FL OPEN TRIP B1		1	58	*	OPEN	NOT OPEN	0
	NPQ57	2671 B	C72AC1511	MSIV NOT FL OPEN TRIP A2		1	58	*	OPEN	NOT OPEN	0
	NPQ58	2670 B	C72AC1512	MSIV NOT FL OPEN TRIP B2		1	58	*	OPEN	NOT OPEN	0
	NPQ59	2747 B	C72AC1513	PRI CONTN TRIP A		1	58	*	NO	YES	0
	NPQ60	2746 B	C72AC1514	PRI CONTN TRIP B		1	58	*	NO	YES	0
	NPQ61	2745 B	C72AC1515	PRI CONTN TRIP A		1	58	*	NO	YES	0
	NPQ62	2744 B	C72AC1516	PRI CONTN TRIP B		1	58	*	NO	YES	0
	NPQ63	2743 B	C72AC1517	RPV HP TRIP A		1	58	*	NO	YES	0
	NPQ64	2742 B	C72AC1518	RPV HP TRIP B		1	58	*	NO	YES	0
	NPQ65	2741 B	C72AC1519	RPV HP TRIP A		1	58	*	NO	YES	0

CHNG	POINT IDENT	--ALARM PARAMETERS-- NON-ALRM PT	CAT	AUD	ACK	CHK	ALARM CUTOUT COND	STATE	POINT ID	CHK	PROG TRIG #	ENBL	POINT USAGE -- BOP-CALC IN	OUT	COMPOSED POINT	SOE	DIAG #	INTER-CONN
	NNQ58	Y	3	N	N	*	NONE				000					*		
	NPQ51	Y	3	N	N	*	NONE				000					*		
	NPQ52	Y	3	N	N	*	NONE				000					*		
	NPQ53	Y	3	N	N	*	NONE				000					*		
	NPQ54	Y	3	N	N	*	NONE				000					*		
	NPQ55	Y	3	N	N	*	NONE				000					*		
	NPQ56	N	3	Y	Y		NONE				000					*		
	NPQ57	Y	3	N	N	*	NONE				000					*		
	NPQ58	N	3	Y	Y		NONE				000					*		
	NPQ59	Y	3	N	N	*	NONE				000					*		
	NPQ60	Y	3	N	N	*	NONE				000					*		
	NPQ61	Y	3	N	N	*	NONE				000					*		
	NPQ62	Y	3	N	N	*	NONE				000					*		
	NPQ63	Y	3	N	N	*	NONE				000					*		
	NPQ64	Y	3	N	N	*	NONE				000					*		
	NPQ65	Y	3	N	N	*	NONE				000					*		

CHNG	POINT IDENT	END DEVICE NUMBER	INSTRUMENT MFG	MODEL #	TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	NNQ58	C51TRH220			DC	C51A-105	C92P640	4	7	15	16				IED02	10003406
	NPQ51	C72-K1A			PC	C72-160	C92P640	4	8	1	2				IED02	10003406
	NPQ52	C72-K1B			PC	C72-303	C92P640	4	8	3	4				IED02	10003406
	NPQ53	C72-K1C			PC	C72-161	C92P640	4	8	5	6				IED02	10003406
	NPQ54	C72-K1D			PC	C72-302	C92P640	4	8	7	8				IED02	10003406
	NPQ55	C72-K3A,E			PC	C72-160	C92P640	4	8	9	10				IED02	10003406
	NPQ56	C72-K3B,F			PC	C72-303	C92P640	4	8	11	12				IED02	10003406
	NPQ57	C72-K3C,G			PC	C72-161	C92P640	4	8	13	14				IED02	10003406
	NPQ58	C72-K3D,H			PC	C72-302	C92P640	4	8	15	16				IED02	10003406
	NPQ59	C72-K4A			PC	C72-160	C92P640	4	9	1	2				IED02	10003411
	NPQ60	C72-K4B			PC	C72-303	C92P640	4	9	3	4				IED02	10003411
	NPQ61	C72-K4C			PC	C72-161	C92P640	4	9	5	6				IED02	10003411
	NPQ62	C72-K4D			PC	C72-302	C92P640	4	9	7	8				IED02	10003411
	NPQ63	C72-K5A			PC	C72-160	C92P640	4	9	9	10				IED02	10003411
	NPQ64	C72-K5B			PC	C72-303	C92P640	4	9	11	12				IED02	10003411
	NPQ65	C72-K5C			PC	C72-161	C92P640	4	9	13	14				IED02	10003411

CHNG	POINT IDENT	IN OM	PR OG	FUNCTION SUMMARY DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	STATE DESCRIPTION =0	=1	NORM
	NPQ66	2740	B	C72AC1520	RPV HP TRIP B	1	58	*	NO	YES	0
	NPQ67	2737	B	C72AC1521	RPV LOW WTR LVL TRIP A	1	58	*	NO	YES	0
	NPQ68	2734	B	C72AC1522	RPV LOW WTR LVL TRIP B	1	58	*	NO	YES	0
	NPQ69	2735	B	C72AC1523	RPV LOW WTR LVL TRIP A	1	58	*	NO	YES	0
	NPQ70	2734	B	C72AC1524	RPV LOW WTR LVL TRIP B	1	58	*	NO	YES	0
	NPQ71	2733	B	C72AC1525	MS LINE HI RAD TRIP A	1	58	*	NO	YES	0
	NPQ72	2732	B	C72AC1526	MS LINE HI RAD TRIP B	1	58	*	NO	YES	0
	NPQ73	2731	B	C72AC1527	MS LINE HI RAD TRIP A	1	58	*	NO	YES	0
	NPQ74	2730	B	C72AC1528	MS LINE HI RAD TRIP B	1	58	*	NO	YES	0
	NPQ75	2727	B	C72AC1529	NM SYS TRIP A	1	58	*	NO	YES	0
	NPQ76	2726	B	C72AC1530	NM SYS TRIP B	1	58	*	NO	YES	0
	NPQ77	2725	B	C72AC1531	NM SYS TRIP A	1	58	*	NO	YES	0
	NPQ78	2724	B	C72AC1532	NM SYS TRIP B	1	58	*	NO	YES	0
	NPQ79	2723	B	C72AC1537	MAN SCRAM TRIP A OR C	1	58	*	NO	YES	0
	NPQ80	2722	B	C72AC1538	MAN SCRAM TRIP B OR D	1	58	*	NO	YES	0
	NPQ81	2721	B	C72AC1539	AUTO SCRAM TRIP A OR C	1	58	*	NO	YES	0

CHNG	POINT IDENT	ALARM PARAMETERS NON-ALRM PT	CAT	AUD	ACK	CHK	ALARM CUTOUT COND	STATE	POINT ID	CHK	PROG TRIG #	EMAIL	POINT USAGE BOP-CALC IN	OUT	COMPOSED POINT	SOE	DIAG #	INTER-CONN
	NPQ66	Y	3	N	N	*	NONE									*		
	NPQ67	Y	3	N	N	*	NONE									*		
	NPQ68	Y	3	N	N	*	NONE									*		
	NPQ69	Y	3	N	N	*	NONE									*		
	NPQ70	Y	3	N	N	*	NONE									*		
	NPQ71	Y	3	N	N	*	NONE									*		
	NPQ72	Y	3	N	N	*	NONE									*		
	NPQ73	Y	3	N	N	*	NONE									*		
	NPQ74	Y	3	N	N	*	NONE									*		
	NPQ75	N	1	Y	Y		YES	NO	NPD01	*	000					*		
	NPQ76	N	1	Y	Y		YES	NO	NPD01	*	000					*		
	NPQ77	N	1	Y	Y		YES	NO	NPD01	*	000					*		
	NPQ78	N	1	Y	Y		YES	NO	NPD01	*	000					*		
	NPQ79	Y	3	N	N	*	NONE				002	*				*		
	NPQ80	Y	3	N	N	*	NONE				002	*				*		
	NPQ81	Y	3	N	N	*	NONE				002	*				*		

CHNG	POINT IDENT	END DEVICE NUMBER	INSTRUMENT MFG	MODEL #	TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	NPQ66	C72-K5D			PC	C72-302	C92P640	4	9	15	16				IED02	10003411
	NPQ67	C72-K6A			PC	C72-160	C92P640	4	10	1	2				IED02	10003411
	NPQ68	C72-K6B			PC	C72-303	C92P640	4	10	3	4				IED02	10003411
	NPQ69	C72-K6C			PC	C72-161	C92P640	4	10	5	6				IED02	10003411
	NPQ70	C72-K6D			PC	C72-302	C92P640	4	10	7	8				IED02	10003411
	NPQ71	C72-K7A			PC	C72-162	C92P640	4	10	9	10				IED02	10003411
	NPQ72	C72-K7B			PC	C72-300	C92P640	4	10	11	12				IED02	10003411
	NPQ73	C72-K7C			PC	C72-163	C92P640	4	10	13	14				IED02	10003411
	NPQ74	C72-K7D			PC	C72-301	C92P640	4	10	15	16				IED02	10003411
	NPQ75	C72-K12AE			PC	C72-162	C92P640	4	11	1	2				IED02	10003411
	NPQ76	C72-K12BF			PC	C72-300	C92P640	4	11	3	4				IED02	10003411
	NPQ77	C72-K12CG			PC	C72-163	C92P640	4	11	5	6				IED02	10003411
	NPQ78	C72-K12DH			PC	C72-301	C92P640	4	11	7	8				IED02	10003411
	NPQ79	C72-K15AC			PC	C72-163	C92P640	4	11	9	10				IED02	10003411
	NPQ80	C72-K15BD			PC	C72-301	C92P640	4	11	11	12				IED02	10003411
	NPQ81	C72-K14ACEG			PC	C72-162	C92P640	4	11	13	14				IED02	10003411

CHNG	POINT IDENT	IN DX	PR OC	FUNCTION SUMMARY DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	STATE DESCRIPTION =0	=1	NORM
	NPQ82	2720	B	C72AC1540	AUTO SCRAM TRIP B OR D	1	58	*	NO	YES	0
	NPQ83	2777	B	C72AC1553	TURB STOP VLV CLS TRIP A	1	58	*	NO	YES	0
	NPQ84	2776	B	C72AC1554	TURB STOP VLV CLS TRIP B	1	58	*	NO	YES	0
	NPQ85	2775	B	C72AC1555	TURB STOP VLV CLS TRIP A	1	58	*	NO	YES	0
	NPQ86	2774	B	C72AC1556	TURB STOP VLV CLS TRIP B	1	58	*	NO	YES	0
	NPQ87	2773	B	C72AC1557	TURB CV FAST CLS TRIP A	1	58	*	NO	YES	0
	NPQ88	2772	B	C72AC1558	TURB CV FAST CLS TRIP B	1	58	*	NO	YES	0
	NPQ89	2771	B	C72AC1559	TURB CV FAST CLS TRIP A	1	58	*	NO	YES	0
	NPQ90	2770	B	C72AC1560	TURB CV FAST CLS TRIP B	1	58	*	NO	YES	0
	NPQ91	2711	B	C72AC1865	RECIR PUM TRIP SYS ATRIP	1	64	*	NO	YES	0
	NPQ92	2710	B	C72AC1866	RECIR PUM TRIP SYS BTRIP	1	64	*	NO	YES	0
	TAZ94	0251	B	FN61D300	VACUUM PUMP	1	43	*	NORMAL	TRIPPED	0
	TBZ02	0261	B	FN32A30C	TURB BYPASS VLV #1	1	82	*	NOT CLSD	CLOSED	0
	TBZ04	0260	B	FN32A30C	TURB BYPASS VLV #2	1	82	*	NOT CLSD	CLOSED	0
	TBZ06	0257	B	FN32A30C	TURB BYPASS VLV #3	1	82	*	NOT CLSD	CLOSED	0
	TBZ08	0256	B	FN32A30C	TURB BYPASS VLV #4	1	82	*	NOT CLSD	CLOSED	0

CHNG	POINT IDENT	ALARM PARAMETERS NON-ALRM PT	CAT	AUD	ACK	CHK	ALARM CUTOUT COND	STATE	POINT ID	CHK	PROG TRIG #	EMBL	POINT USAGE BOP-CALC IN	BOP-CALC OUT	COMPOSED POINT	SOE	DIAG #	INTER-CONN
	NPQ82	Y	3	N	N	*	NONE				002	*				*		
	NPQ83	Y	3	N	N	*	NONE				000					*		
	NPQ84	Y	3	N	N	*	NONE				000					*		
	NPQ85	Y	3	N	N	*	NONE				000					*		
	NPQ86	Y	3	N	N	*	NONE				000					*		
	NPQ87	Y	3	N	N	*	NONE				000					*		
	NPQ88	Y	3	N	N	*	NONE				000					*		
	NPQ89	Y	3	N	N	*	NONE				000					*		
	NPQ90	Y	3	N	N	*	NONE				000					*		
	NPQ91	Y	3	N	N	*	NONE				000					*		
	NPQ92	Y	3	N	N	*	NONE				000					*	301-06	
	TAZ94	Y	3	N	N	*	NONE				000		*		*	*	301-47	
	TBZ02	N	3	Y	Y		NONE				000		*		*	*	301-47	
	TBZ04	N	3	Y	Y		NONE				000		*		*	*	301-47	
	TBZ06	N	3	Y	Y		NONE				000		*		*	*	301-47	
	TBZ08	N	3	Y	Y		NONE											

CHNG	POINT IDENT	END DEVICE NUMBER	INSTRUMENT MFG	MODEL #	TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	NPQ82	C72-K14DDFH			PC	C72-300	C92P640	4	11	15	16				IED02	10003411
	NPQ83	C72-K10A			PC	C72-162	C92P640	4	12	1	2				IED02	10000414
	NPQ84	C72-K10B			PC	C72-300	C92P640	4	12	3	4				IED02	10000414
	NPQ85	C72-K10C			PC	C72-163	C92P640	4	12	5	6				IED02	10000414
	NPQ86	C72-K10D			PC	C72-301	C92P640	4	12	7	8				IED02	10000414
	NPQ87	C72-K8A			PC	C72-162	C92P640	4	12	9	10				IED02	10000414
	NPQ88	C72-K8B			PC	C72-300	C92P640	4	12	11	12				IED02	10000414
	NPQ89	C72-K8C			PC	C72-163	C92P640	4	12	13	14				IED02	10000414
	NPQ90	C72-K8D			PC	C72-301	C92P640	4	12	15	16				IED02	10000414
	NPQ91	C72A-K35AG			PC	C72-002	C92P640	4	6	13	14				IED02	10003406
	NPQ92	C72A-K35AD			PC	C72-002	C92P640	4	6	15	16				IED02	10003406
	TAZ94	74 20210				1H0047	C92P639	4	7	13	14				IED02	00003425
	TBZ02	ZS 10140A2				1H0047	C92P639	4	6	13	14				IED02	00003425
	TBZ04	ZS 10140B2				1H0047	C92P639	4	6	15	16				IED02	00003425
	TBZ06	ZS 10140C2				1H0047	C92P639	4	7	1	2				IED02	00003425
	TBZ08	ZS 10140D2				1H0047	C92P639	4	7	3	4				IED02	00003425

CHNG	POINT IDENT	INDX	PROC	FUNCTIONAL DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	----- STATE DESCRIPTION ----- =0	=1	NORM
	TBZ10	0262	B	FN32A30C	TURB BYPASS VLV #5	1	82	*	NOT CLSD	CLOSED	0
	TCZ06	0255	B	FN32A29C	TURB CONTROL VALVE 1	1	93E-0	*	NOT CLSD	CLOSED	0
	TCZ08	0254	B	FN32A29C	TURB CONTROL VALVE 2	1	93E-0	*	NOT CLSD	CLOSED	0
	TCZ10	0253	B	FN32A29C	TURB CONTROL VALVE 3	1	93E-0	*	NOT CLSD	CLOSED	0
	TCZ12	0252	B	FN32A29C	TURB CONTROL VALVE 4	1	93E-0	*	NOT CLSD	CLOSED	0
	TDZ01	0235	B	FN32A440	TURB MASTER TRIP	1	93E-0	*	NO	TRIPPED	0
	TDZ07	0234	B	FN32A490	TURB OVERSPEED TRIP	1	93E-0	*	NO	TRIPPED	0
	TDZ15	0225	B	FN32A520	TURB BACKUP OSPD TRIP	1	93E-0	*	NO	TRIPPED	0
	TDZ16	0233	B	FN31A11C	TURB EXH HOOD TEMP TRIP	1	93E-0	*	NO	TRIPPED	0
	TDZ17	0224	B	FN32A580	LOSS OF STATOR CLG TRIP	1	93E-0	*	NO	TRIPPED	0
	TDZ18	0232	B	FN32A59A	TURB SHAFT PP DSCH PRESS	1	93E-0	*	NO	TRIPPED	0
	TDZ19	0223	B	FN32A600	TURB THR WEAR OR BRG OIL	1	93E-0	*	NORMAL	TRIPPED	0
	TDZ21	0267	B	FN32A470	TURB EHC 125DC POWER	1	93E-0	*	NORMAL	FAIL	0
	TDZ22	0231	B	FN30F170	TURB HYD PRESS LOW TRIP	1	93E-0	*	NO	TRIPPED	0
	TDZ23	0222	B	FN32A620	TURB VACUUM TRIP	1	93E-0	*	NO	TRIPPED	0
	TDZ24	0230	B	FN32A530	TURB MANUAL TRIP	1	93E-0	*	NORMAL	TRIPPED	0

CHNG	POINT IDENT	--ALARM PARAMETERS--- NON-ALRM PT	CAT	AUD	ACK	CHK	------ ALARM CUTOUT ----- COND	STATE	POINT ID	CHK	PROG TRIG #	ENBL	POINT USAGE -- BOP-CALC IN	OUT	COMPOSED POINT	SOE	DIAG #	INTER-CONN
	TBZ10	N	3	Y	Y		NONE				000		*		*	*	301-47	
	TCZ06	N	3	N	N		NONE				000				*	*	301-47	
	TCZ08	N	3	N	N		NONE				000				*	*	301-47	
	TCZ10	N	3	N	N		NONE				000				*	*	301-47	
	TCZ12	N	3	N	N		NONE				000				*	*	301-47	
	TDZ01	N	3	N	N		NONE				002	*			*	*	301-02	
	TDZ07	N	3	N	N		NONE				000					*	301-02	
	TDZ15	N	3	N	N		NONE				000					*	301-02	
	TDZ16	N	3	N	N		NONE				000					*	301-02	
	TDZ17	N	3	N	N		NONE				000					*	301-02	
	TDZ18	N	3	N	N		NONE				000					*	301-02	
	TDZ19	N	3	N	N		NONE				000					*	301-02	
	TDZ21	N	3	N	N		NONE				000					*	301-47	
	TDZ22	N	3	N	N		NONE				000					*	301-02	
	TDZ23	N	3	N	N		NONE				000					*	301-02	
	TDZ24	N	3	N	N		NONE				002	*				*	301-02	

CHNG	POINT IDENT	END DEVICE NUMBER	------ INSTRUMENT ------ MFG	MODEL #	TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	TBZ10	ZS 10140E2				1N0047	C92P639	4	6	11	12				IED02	00003425
	TCZ06	ZS 10150A1				1N0047	C92P639	4	7	5	6				IED02	00003425
	TCZ08	ZS 10150B1				1N0047	C92P639	4	7	7	8				IED02	00003425
	TCZ10	ZS 10150C3				1N0047	C92P639	4	7	9	10				IED02	00003425
	TCZ12	ZS 10150D1				1N0047	C92P639	4	7	11	12				IED02	00003425
	TDZ01	EHC CABINET	GE			1N0002	C92P639	4	3	5	6				IED02	00003422
	TDZ07	EHC CABINET	GE			1N0002	C92P639	4	3	7	8				IED02	00003422
	TDZ15	EHC CABINET	GE			1N0002	C92P639	4	4	5	6				IED02	00003422
	TDZ16	EHC CABINET	GE			1N0002	C92P639	4	3	9	10				IED02	00003422
	TDZ17	EHC CABINET	GE			1N0002	C92P639	4	4	7	8				IED02	00003422
	TDZ18	EHC CABINET	GE			1N0002	C92P639	4	3	11	12				IED02	00003422
	TDZ19	EHC CABINET	GE			1N0002	C92P639	4	4	9	10				IED02	00003422
	TDZ21	EHC CABINET	GE			1N0047	C92P639	4	6	1	2				IED02	00003425
	TDZ22	EHC CABINET	GE			1N0002	C92P639	4	3	13	14				IED02	00003422
	TDZ23	EHC CABINET	GE			1N0002	C92P639	4	4	11	12				IED02	00003422
	TDZ24	EHC CABINET	GE			1N0002	C92P639	4	3	15	16				IED02	00003422

CHNG	POINT IDENT	IN DX	PR OC	FUNCTION SUMMARY DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	STATE DESCRIPTION =0	=1	NORM
	TDZ35	0227	B	FN30E11C	TURB VIBRATION TRIP	1	93E-0	*	NO	TRIPPED	0
	TDZ36	0221	B	FN32A980	TURB EHC SPD SIGNAL LOST	1	93E-0	*	OK	TRIPPED	0
	TDZ40	0226	B	FN35A130	TURB MSEP HIGH LVL TRIP	1	93E-0	*	NO	TRIPPED	0
	TDZ51	0266	B	FN32A650	TURB EHC POS VOLTS LOST	1	93E-0	*	NO	YES	0
	TDZ52	0265	B	FN32A660	TURB EHC NEG VOLTS LOST	1	93E-0	*	NO	YES	0
	TDZ55	0263	B	FN32A550	TURB QUILL SHAFT	1	93E-0	*	NORMAL	FAIL	0
	HCZ29	0307	B	FN71A210	CIRC HTR PUMP A	1	42	*	NORMAL	TRIPPED	0
	HCZ30	0306	B	FN71A210	CIRC HTR PUMP B	1	42	*	NORMAL	TRIPPED	0
	HCZ31	0305	B	FN71A210	CIRC HTR PUMP C	1	42	*	NORMAL	TRIPPED	0
	HCZ32	0304	B	FN71A210	CIRC HTR PUMP D	1	42	*	NORMAL	TRIPPED	0
	YTZ01	0242	B	FR11A22A	MN XFMR LEAD DIFF	1	87	*	NORMAL	TRIPPED	0
	YTZ02	0241	B	FR11A22A	MN XFMR A DIFF	1	87	*	NORMAL	TRIPPED	0
	YTZ03	0240	B	FR11A22C	MN XFMR A SUDDEN PRESS	1	87	*	NORMAL	TRIPPED	0
	YTZ04	0237	B	FR11A22D	MN XFMR B DIFF	1	87	*	NORMAL	TRIPPED	0
	YTZ05	0236	B	FR11A22E	MN XFMR B SUDDEN PRESS	1	87	*	NORMAL	TRIPPED	0
	YTZ07	0321	B	FR20C620	SU XFMR 10 PRI LKOUT RLY	1	3	*	NORMAL	STARTED	0

CHNG	POINT IDENT	--ALARM PARAMETERS--- NON-ALRM PT	CAT	AUD	ACK	CHK	ALARM CUTOUT COND	STATE	PROG TRIG POINT ID	CHK	#	ENBL	POINT USAGE -- BOP-CALC IN	OUT	COMPOSED POINT	SOE	DIAG #	INTER-CONN
	TDZ35	N	3	N	N		NONE				000					*	301-02	
	TDZ36	N	3	N	N		NONE				000					*	301-02	
	TDZ40	N	3	N	N		NONE				000					*	301-02	
	TDZ51	N	3	N	N		NONE				000					*	301-47	
	TDZ52	N	3	N	N		NONE				000					*	301-47	
	TDZ55	N	3	N	N		NONE				000					*	301-47	
	HCZ29	Y	3	N	N	*	NONE				000					*	301-48	
	HCZ30	Y	3	N	N	*	NONE				000					*	301-48	
	HCZ31	Y	3	N	N	*	NONE				000					*	301-48	
	HCZ32	Y	3	N	N	*	NONE				000					*	301-48	
	YTZ01	N	3	N	N		NONE				000					*	301-01	
	YTZ02	N	3	N	N		NONE				000					*	301-01	
	YTZ03	N	3	N	N		NONE				000					*	301-01	
	YTZ04	N	3	N	N		NONE				000					*	301-02	
	YTZ05	N	3	N	N		NONE				000					*	301-02	
	YTZ07	N	3	N	N		NONE				000					*	301-47	

CHNG	POINT IDENT	END DEVICE NUMBER	INSTRUMENT MFG	MODEL #	TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RUU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	TDZ35	EHC	GE			1M0002	C92P639	4	4	1	2				IEDO2	00003422
	TDZ36	EHC	GE			1M0002	C92P639	4	4	13	14				IEDO2	00003422
	TDZ40	EHC	GE			1M0002	C92P639	4	4	3	4				IEDO2	00003422
	TDZ51	EHC				1M0047	C92P639	4	6	3	4				IEDO2	00003425
	TDZ52	EHC				1M0047	C92P639	4	6	5	6				IEDO2	00003425
	TDZ55	XSX 10165				1M0047	C92P639	4	6	9	10				IEDO2	00003425
	HCZ29	74X 10103				1M0048	C92P639	4	10	1	2				IEDO2	00003430
	HCZ30	74X 10203				1M0048	C92P639	4	10	3	4				IEDO2	00003430
	HCZ31	74X 10105				1M0048	C92P639	4	10	5	6				IEDO2	00003430
	HCZ32	74X 10205				1M0048	C92P639	4	10	7	8				IEDO2	00003430
	YTZ01	TAR 2/1				1M0001	C92P639	4	2	11	12				IEDO2	00003422
	YTZ02	TAR 2/2				1M0001	C92P639	4	2	13	14				IEDO2	00003422
	YTZ03	TAR 3/1				1M0001	C92P639	4	2	15	16				IEDO2	00003422
	YTZ04	TAR 2/3				1M0002	C92P639	4	3	1	2				IEDO2	00003422
	YTZ05	TAR 3/2				1M0002	C92P639	4	3	3	4				IEDO2	00003422
	YTZ07	86A1 10301A				1M0047	C92P639	4	8	13	14				IEDO2	00003430

CHNG	POINT IDENT	IN BOX	PROC	FUNCTION SUMMARY DOC #	ENGLISH IDENTIFICATION	UNIT	SYS #	PRCS	STATE DESCRIPTION =0	=1	NORM
	YTZ08	0320	B	FR20C620	SU XFMR 10 PRI BKUP RLY	1	3	*	NORMAL	STARTED	0
	YTZ30	0225	B	FR11A230	TRF 10 MTR OPER AIR BRKE	1	3	*	CLOSED	OPEN	0
	YTZ31	0276	B	FR11C240	SU XFMR 10 MSGS 1R106	1	3	*	OPEN	CLOSED	0
	YTZ57	0317	B	FR20C620	SU XFMR 20 PRI LKOUT RLY	1	3	*	NORMAL	STARTED	0
	YTZ58	0316	B	FR20C620	SU XFMR 20 PRI BKUP RLY	1	3	*	NORMAL	STARTED	0
	YTZ80	0277	B	FR11A230	TRF 20 MTR OPER AIR BRKE	1	3	*	CLOSED	OPEN	0
	YTZ81	0275	B	FR11C240	SU XFMR 20 MSGS 2R106	1	3	*	OPEN	CLOSED	0

CHNG	POINT IDENT	ALARM PARAMETERS NON-ALRM PT	CAT	AUD	ACK	CHK	ALARM CUTOUT COND	STATE	POINT ID	CHK	PROG TRIG #	ENBL	POINT USAGE BOP-CALC IN	OUT	COMPOSED POINT	SOE	DIAG #	INTER-CONN
	YTZ08	N	3	N	N		NONE				000					*	301-47	
	YTZ30	N	3	N	N		NONE				000					*	301-02	
	YTZ31	N	3	N	N		NONE				000					*	301-02	
	YTZ57	N	3	N	N		NONE				000					*	301-48	
	YTZ58	N	3	N	N		NONE				000					*	301-48	
	YTZ80	N	3	N	N		NONE				000					*	301-02	
	YTZ81	N	3	N	N		NONE				000					*	301-02	

CHNG	POINT IDENT	END DEVICE NUMBER	INSTRUMENT MFG	MODEL #	TYPE	SCHEME CABLE NUMBER	I/O CABINET #	DTA #	TERM BOARD #	D+	D-	RDU #	CONN	CARD SLOT	SIG COND TYPE	SCAN COMMAND WORD
	YTZ08	86A1 10301B				1H0047	C92P639	4	8	15	16				IED02	00003430
	YTZ30	89 10301				1H0002	C92P639	4	4	15	16				IED02	00003422
	YTZ31	89 1R106/A				1H0002	C92P639	4	5	3	4				IED02	00003425
	YTZ57	86A1 10401A				1H0048	C92P639	4	9	1	2				IED02	00003430
	YTZ58	86A1 10401A				1H0048	C92P639	4	9	3	4				IED02	00003430
	YTZ80	89S 10301				1H0002	C92P639	4	5	1	2				IED02	00003425
	YTZ81	89S 2R106/A				1H0002	C92P639	4	5	5	6				IED02	00003425

REV. 0

07/30/84

GETARS I/O LISTING SSES UNIT 1
POINTS REVISED THIS LISTING

THIS #	NAME	ENGLISH DESCRIPTION	CH #	REVISION #	DATE OF REVISION	REVISION DESCRIPTION
1	EVENT	EVENT MARKER	214	0	6/20/84	INITIAL LISTING
2	SCRAM	TOTAL SCRAM	1	0	6/20/84	INITIAL LISTING
3	MTT	MAIN TURBINE TRIP	183	0	6/20/84	INITIAL LISTING
4	MGB	GENERATOR BKR OPEN	184	0	6/20/84	INITIAL LISTING
5	MSCRM	MANUAL SCRAM	4	0	6/20/84	INITIAL LISTING
6	ISOLT	TOTAL ISOLATION	5	0	6/20/84	INITIAL LISTING
7	PLUNB	POWER/LOAD UNBALANCE	185	0	6/20/84	INITIAL LISTING
8	RPT-A	A RECIRC RPT BKR	46	0	6/20/84	INITIAL LISTING
9	RPT-B	B RECIRC RPT BKR	47	0	6/20/84	INITIAL LISTING
10	HPCII	HPCI INITIATION	69	0	6/20/84	INITIAL LISTING
11	RCICI	RCIC INITIATION	52	0	6/20/84	INITIAL LISTING
12	1CBUS	#1C BUS POWER	210	0	6/20/84	INITIAL LISTING
13	1DBUS	#1D BUS POWER	211	0	6/20/84	INITIAL LISTING
14	1EBUS	#1E BUS POWER	212	0	6/20/84	INITIAL LISTING
15	1FBUS	#1F BUS POWER	213	0	6/20/84	INITIAL LISTING
16	SRVI1	RELIEF VLV ABC INITIATE	158	0	6/20/84	INITIAL LISTING
17	SRVI2	RELIEF VLV GJKL INITIATE	159	0	6/20/84	INITIAL LISTING
18	SRVI3	RELIEF VLV DEHFP INITIATE	160	0	6/20/84	INITIAL LISTING
19	SRVI4	RELIEF VLV RSMN INITIATE	161	0	6/20/84	INITIAL LISTING
20	NRDP	NARROW RANGE PRESSURE	208	0	6/20/84	INITIAL LISTING
21	WRDP	WIDE RANGE PRESSURE	209	0	6/20/84	INITIAL LISTING
22	NRHL	NARROW RANGE LEVEL	142	0	6/20/84	INITIAL LISTING
23	WRHL	WIDE RANGE LEVEL	144	0	6/20/84	INITIAL LISTING
24	URHL	UPSET LEVEL	143	0	6/20/84	INITIAL LISTING
25	FWFLO	TOTAL FEEDWATER FLOW	98	0	6/20/84	INITIAL LISTING
26	MSFLO	TOTAL STEAM FLOW	97	0	6/20/84	INITIAL LISTING
27	MWE	GEN GROSS MEGAWATTS OUTPUT	178	0	6/20/84	INITIAL LISTING
28	APRMA	APRM A	8	0	6/20/84	INITIAL LISTING
29	APRMB	APRM B	9	0	6/20/84	INITIAL LISTING
30	FWMCO	FWTR MSTR CTLR OUT	131	0	6/20/84	INITIAL LISTING
31	FWSCO	STARTUP LVL CTLR OUT	130	0	6/20/84	INITIAL LISTING
32	TCFLO	TOTAL CORE FLOW	26	0	6/20/84	INITIAL LISTING
33	RSMCO	MASTER RECIRC CTLR OUT	39	0	6/20/84	INITIAL LISTING
34	MGMAA	A M/G SET M/A STATION OUT	42	0	6/20/84	INITIAL LISTING
35	MGMAB	B M/G SET M/A STATION OUT	43	0	6/20/84	INITIAL LISTING
36	MGSCOA	A M/G SET CTLR OUT	40	0	6/20/84	INITIAL LISTING
37	MGSCOB	B M/G SET CTLR OUT	41	0	6/20/84	INITIAL LISTING
38	MSIA	A INBOARD MSIV POS	145	0	6/20/84	INITIAL LISTING
39	MSIB	B INBOARD MSIV POS	146	0	6/20/84	INITIAL LISTING
40	MSIC	C INBOARD MSIV POS	147	0	6/20/84	INITIAL LISTING
41	MSID	D INBOARD MSIV POS	148	0	6/20/84	INITIAL LISTING
42	MSOA	A OUTBOARD MSIV POS	149	0	6/20/84	INITIAL LISTING
43	MSOB	B OUTBOARD MSIV POS	150	0	6/20/84	INITIAL LISTING
44	MSOC	C OUTBOARD MSIV POS	151	0	6/20/84	INITIAL LISTING
45	MSOD	D OUTBOARD MSIV POS	152	0	6/20/84	INITIAL LISTING
46	FBRBS	FLO BIASED ROD BLK INSERT	24	0	6/20/84	INITIAL LISTING
47	FBSCM	FLO BIASED SCRAM SETPT	25	0	6/20/84	INITIAL LISTING
48	TIPA	A PRESS REG SENSED PRESS	192	0	6/20/84	INITIAL LISTING
49	TIPB	B PRESS REG SENSED PRESS	193	0	6/20/84	INITIAL LISTING
50	PRSPA	A PRESS REG SETPOINT	90	0	6/20/84	INITIAL LISTING
51	PRSPB	B PRESS REG SETPOINT	191	0	6/20/84	INITIAL LISTING
52	PRO	PRESS REGULATOR OUTPUT	188	0	6/20/84	INITIAL LISTING
53	CVAO	CNTL VLV AMPLIFIER OUTPUT	189	0	6/20/84	INITIAL LISTING
54	CVPT	TOTAL CNTL VLV POS	194	0	6/20/84	INITIAL LISTING
55	BPVT	TOTAL BYPASS VLV POS	203	0	6/20/84	INITIAL LISTING
56	RPM	MAIN TURBINE SPEED	181	0	6/20/84	INITIAL LISTING
57	SVP1	STOP VALVE #1 POSITION	199	0	6/20/84	INITIAL LISTING
58	SVP2	STOP VALVE #2 POSITION	200	0	6/20/84	INITIAL LISTING
59	SVP3	STOP VALVE #3 POSITION	201	0	6/20/84	INITIAL LISTING
60	SVP4	STOP VALVE #4 POSITION	202	0	6/20/84	INITIAL LISTING

HED #157
EXHIBIT II

07/30/84

CETARS I/O LISTING SSES UNIT 1
POINTS REVISED THIS LISTING

THIS #	NAME	ENGLISH DESCRIPTION	CH #	REVISION #	DATE OF REVISION	REVISION DESCRIPTION
61	CVP1	CONTROL VALVE #1 POSITION	195	0	6/20/84	INITIAL LISTING
62	CVP2	CONTROL VALVE #2 POSITION	196	0	6/20/84	INITIAL LISTING
63	CVP3	CONTROL VALVE #3 POSITION	197	0	6/20/84	INITIAL LISTING
64	CVP4	CONTROL VALVE #4 POSITION	198	0	6/20/84	INITIAL LISTING
65	BPVP1	#1 BYPASS VALVE POSITION	204	0	6/20/84	INITIAL LISTING
66	BPVP2	#2 BYPASS VALVE POSITION	205	0	6/20/84	INITIAL LISTING
67	LOSET	LOAD SET	186	0	6/20/84	INITIAL LISTING
68	TPSET	TRANSIENT PRESS SETPOINT	187	0	6/20/84	INITIAL LISTING
69	RSDFA	A RECIRC PUMP DRIVE FLOW	32	0	6/20/84	INITIAL LISTING
70	RSDFB	B RECIRC PUMP DRIVE FLOW	33	0	6/20/84	INITIAL LISTING
71	MGSDA	A RECIRC M/G SET SPEED	36	0	6/20/84	INITIAL LISTING
72	MGSDB	B RECIRC M/G SET SPEED	37	0	6/20/84	INITIAL LISTING
73	MGSTA	A M/G SET SCOOP TUBE POS	44	0	6/20/84	INITIAL LISTING
74	MGSTB	B M/G SET SCOOP TUBE POS	45	0	6/20/84	INITIAL LISTING
75	RSLTA	A RECIRC LOOP TEMP	30	0	6/20/84	INITIAL LISTING
76	RSLTB	B RECIRC LOOP TEMP	31	0	6/20/84	INITIAL LISTING
77	HFLX1	HEAT FLUX #1	22	0	6/20/84	INITIAL LISTING
78	HFLX2	HEAT FLUX #2	23	0	6/20/84	INITIAL LISTING
79	APRMC	APRM C	10	0	6/20/84	INITIAL LISTING
80	APRMD	APRM D	11	0	6/20/84	INITIAL LISTING
81	LPRMA	LPRM A	14	0	6/20/84	INITIAL LISTING
82	LPRMB	LPRM B	15	0	6/20/84	INITIAL LISTING
83	LPRMC	LPRM C	16	0	6/20/84	INITIAL LISTING
84	LPRMD	LPRM D	17	0	6/20/84	INITIAL LISTING
85	LPRME	LPRM E	18	0	6/20/84	INITIAL LISTING
86	LPRMF	LPRM F	19	0	6/20/84	INITIAL LISTING
87	LPRM1	LPRM GROUP A	20	0	6/20/84	INITIAL LISTING
88	LPRM2	LPRM GROUP B	21	0	6/20/84	INITIAL LISTING
89	FWPFA	A FEEDWATER PUMP FLOW	105	0	6/20/84	INITIAL LISTING
90	FWPFB	B FEEDWATER PUMP FLOW	106	0	6/20/84	INITIAL LISTING
91	FWPFC	C FEEDWATER PUMP FLOW	107	0	6/20/84	INITIAL LISTING
92	MSLFA	A STEAM LINE FLOW	153	0	6/20/84	INITIAL LISTING
93	MSLFB	B STEAM LINE FLOW	154	0	6/20/84	INITIAL LISTING
94	MSFLC	C STEAM LINE FLOW	155	0	6/20/84	INITIAL LISTING
95	MSFLD	D STEAM LINE FLOW	156	0	6/20/84	INITIAL LISTING
96	CPDP	CORE PLATE DIFF PRES	27	0	6/20/84	INITIAL LISTING
97	TBSF	TURBINE STEAM FLOW	182	0	6/20/84	INITIAL LISTING
98	ADSI	ADS INITIATION	157	0	6/20/84	INITIAL LISTING
99	ALF	AUTO LOAD FOLLOWING	38	0	6/20/84	INITIAL LISTING
100	RSLFA	A RECIRC LOOP FLOW	28	0	6/20/84	INITIAL LISTING
101	RSLFB	B RECIRC PUMP LOOP FLOW	29	0	6/20/84	INITIAL LISTING
102	RSDPA	A RECIRC PUMP DIFF PRES	34	0	6/20/84	INITIAL LISTING
103	RSDPB	B RECIRC PUMP DIFF PRES	35	0	6/20/84	INITIAL LISTING
104	MGFBA	A RECIRC M/G SET B/F BKR	48	0	6/20/84	INITIAL LISTING
105	MGFBB	B RECIRC M/G SET B/F BKR	49	0	6/20/84	INITIAL LISTING
106	MGV-A	A RECIRC M/G SET VOLTAGE	50	0	6/20/84	INITIAL LISTING
107	MGV-B	B RECIRC M/G SET VOLTAGE	51	0	6/20/84	INITIAL LISTING
108	SRVPB	RELIEF VALVE B POS	162	0	6/20/84	INITIAL LISTING
109	SRVPD	RELIEF VALVE D POS	163	0	6/20/84	INITIAL LISTING
110	SRVPF	RELIEF VALVE F POS	164	0	6/20/84	INITIAL LISTING
111	SRVPH	RELIEF VALVE H POS	165	0	6/20/84	INITIAL LISTING
112	SRVPK	RELIEF VALVE K POS	166	0	6/20/84	INITIAL LISTING
113	SRVPL	RELIEF VALVE L POS	167	0	6/20/84	INITIAL LISTING
114	SRVPM	RELIEF VALVE M POS	168	0	6/20/84	INITIAL LISTING
115	SRVPR	RELIEF VALVE R POS	169	0	6/20/84	INITIAL LISTING
116	SRVPA	RELIEF VALVE A POS	170	0	6/20/84	INITIAL LISTING
117	SRVPC	RELIEF VALVE C POS	171	0	6/20/84	INITIAL LISTING
118	SRVPE	RELIEF VALVE E POS	172	0	6/20/84	INITIAL LISTING
119	SRVPG	RELIEF VALVE G POS	173	0	6/20/84	INITIAL LISTING
120	[redacted]	[redacted]	174	0	6/20/84	INITIAL LISTING

07/30/84

GETARS I/O LISTING SSES UNIT 1
POINTS REVISED THIS LISTING

TMS #	NAME	ENGLISH DESCRIPTION	CH #	REVISION #	DATE OF REVISION	REVISION DESCRIPTION
121	SRVPM	RELIEF VALVE M POS	175	0	6/20/84	INITIAL LISTING
122	SRVPP	RELIEF VALVE P POS	176	0	6/20/84	INITIAL LISTING
123	SRVPS	RELIEF VALVE S POS	177	0	6/20/84	INITIAL LISTING
124	FWLTA	A FEEDWATER LINE TEMP	102	0	6/20/84	INITIAL LISTING
125	FWLTB	B FEEDWATER LINE TEMP	103	0	6/20/84	INITIAL LISTING
126	FWLTC	C FEEDWATER LINE TEMP	104	0	6/20/84	INITIAL LISTING
127	MISMA	STM FLO/FEED FLO MISMATCH	96	0	6/20/84	INITIAL LISTING
128	CPDWP	CONDENSATE PP DSCHG PRES	114	0	6/20/84	INITIAL LISTING
129	FWTRA	A FW PUMP TURBINE TRIP	124	0	6/20/84	INITIAL LISTING
130	FWTRB	B FW PUMP TURBINE TRIP	125	0	6/20/84	INITIAL LISTING
131	FWTRC	C FW PUMP TURBINE TRIP	126	0	6/20/84	INITIAL LISTING
132	APRME	APRM E	12	0	6/20/84	INITIAL LISTING
133	APRMF	APRM F	13	0	6/20/84	INITIAL LISTING
134	SCRP	SELECTED CONTROL ROD POS	0	0	6/20/84	INITIAL LISTING
135	HPPDP	HPCI PUMP DISCHARGE PRES	72	0	6/20/84	INITIAL LISTING
136	HPEGM	HPCI TURBINE EGM OUTPUT	82	0	6/20/84	INITIAL LISTING
137	HPRGS	HPCI RAMP GEN SIG/CON OUT	83	0	6/20/84	INITIAL LISTING
138	HPFLO	HPCI PUMP FLOW	70	0	6/20/84	INITIAL LISTING
139	HPCO	HPCI CONTROLLER OUTPUT	81	0	6/20/84	INITIAL LISTING
140	HPSPD	HPCI TURBINE SPEED	71	0	6/20/84	INITIAL LISTING
141	HPVST	HPCI STOP VALVE POSITION	78	0	6/20/84	INITIAL LISTING
142	HPVCO	HPCI CONTROL VALVE POS	79	0	6/20/84	INITIAL LISTING
143	RCPDP	RCIC PUMP DSCHG PRES	56	0	6/20/84	INITIAL LISTING
144	RCEGM	RCIC TURBINE EGM OUTPUT	67	0	6/20/84	INITIAL LISTING
145	RCRGS	RCIC RAMP GEN SIG/CON OUT	68	0	6/20/84	INITIAL LISTING
146	RCFLO	RCIC PUMP FLOW	53	0	6/20/84	INITIAL LISTING
147	RCFCO	RCIC CONTROLLER OUTPUT	65	0	6/20/84	INITIAL LISTING
148	RCTSP	RCIC TURBINE SPEED	54	0	6/20/84	INITIAL LISTING
149	RCVSA	RCIC STEAM ADM VLV POS	61	0	6/20/84	INITIAL LISTING
150	RCVCO	RCIC CONTROL VALVE POS	63	0	6/20/84	INITIAL LISTING
151	VAC-C	A CONDENSER VACUUM	111	0	6/20/84	INITIAL LISTING
152	VAC-B	B CONDENSER VACUUM	112	0	6/20/84	INITIAL LISTING
153	VAC-C	C CONDENSER VACUUM	113	0	6/20/84	INITIAL LISTING
154	FWIAA	A FW TURB BIAS M/A ST OUT	132	0	6/20/84	INITIAL LISTING
155	FWIAB	B FW TURB BIAS M/A ST OUT	133	0	6/20/84	INITIAL LISTING
156	FWIAC	C FW TURB BIAS M/A ST OUT	134	0	6/20/84	INITIAL LISTING
157	ISOLA	CHANNEL A ISOLATION	6	0	6/20/84	INITIAL LISTING
158	ISOLB	CHANNEL B ISOLATION	7	0	6/20/84	INITIAL LISTING
159	SCRMA	CHANNEL A SCRAM	2	0	6/20/84	INITIAL LISTING
160	SCRMB	CHANNEL B SCRAM	3	0	6/20/84	INITIAL LISTING
161	RHL-A	A RHR HX LEVEL	92	0	6/20/84	INITIAL LISTING
162	RHL-B	B RHR HX LEVEL	93	0	6/20/84	INITIAL LISTING
163	RHLCA	A RHR HX LEVEL CTLR OUT	94	0	6/20/84	INITIAL LISTING
164	RHLCB	B RHR HX LEVEL CTLR OUT	95	0	6/20/84	INITIAL LISTING
165	RHP-A	A RHR HX PRESSURE	88	0	6/20/84	INITIAL LISTING
166	RHP-B	B RHR HX PRESSURE	89	0	6/20/84	INITIAL LISTING
167	RHPCA	A RHR HX PRES CONT OP	90	0	6/20/84	INITIAL LISTING
168	RHPCB	B RHR HX PRES CONT OP	91	0	6/20/84	INITIAL LISTING
169	RCPSP	RCIC SUCTION PRESSURE	55	0	6/20/84	INITIAL LISTING
170	RCPSC	RCIC SUCT PRES CTLR OUT	66	0	6/20/84	INITIAL LISTING
171	RHF-A	A RHR SYSTEM FLOW	84	0	6/20/84	INITIAL LISTING
172	RHF-B	B RHR SYSTEM FLOW	85	0	6/20/84	INITIAL LISTING
173	SWLFA	A RHR SERVICE WATER FLOW	86	0	6/20/84	INITIAL LISTING
174	SWFLB	B RHR SERVICE WATER FLOW	87	0	6/20/84	INITIAL LISTING
175	FWPDA	A FW PUMP DISCHARGE PRES	108	0	6/20/84	INITIAL LISTING
176	FWPDB	B FW PUMP DISCHARGE PRES	109	0	6/20/84	INITIAL LISTING
177	FWPDC	C FW PUMP DISCHARGE PRES	110	0	6/20/84	INITIAL LISTING
178	FWTSA	A FW PUMP TURBINE SPEED	120	0	6/20/84	INITIAL LISTING
179	FWTSB	B FW PUMP TURBINE SPEED	121	0	6/20/84	INITIAL LISTING
180	FWTSC	C FW PUMP TURBINE SPEED	122	0	6/20/84	INITIAL LISTING

THIS #	NAME	ENGLISH DESCRIPTION	CH #	REVISION #	DATE OF REVISION	REVISION DESCRIPTION
181	FHCVA	A FH PP TURB CTRL VLV POS	127	0	6/20/84	INITIAL LISTING
182	FHCVB	B FH PP TURB CTRL VLV POS	128	0	6/20/84	INITIAL LISTING
183	FHCVC	C FH PP TURB CTRL VLV POS	129	0	6/20/84	INITIAL LISTING
184	FHFGA	A FH TURB FUN GEN OUT	135	0	6/20/84	INITIAL LISTING
185	FHFGB	B FH TURB FUN GEN OUT	136	0	6/20/84	INITIAL LISTING
186	FHFGC	C FH TURB FUN GEN OUT	137	0	6/20/84	INITIAL LISTING
187	FHLFA	A LOOP FEEDWATER FLOW	99	0	6/20/84	INITIAL LISTING
188	FHLFB	B LOOP FEEDWATER FLOW	100	0	6/20/84	INITIAL LISTING
189	FHLFC	C LOOP FEEDWATER FLOW	101	0	6/20/84	INITIAL LISTING
190	FHTRP	ALL FH PUMP TURBINE TRIP	123	0	6/20/84	INITIAL LISTING
191	FHPSA	FH PUMP SUCT HDR PRESSURE	115	0	6/20/84	INITIAL LISTING
192	BHDT	BOTTOM DRAIN TEMP	206	0	6/20/84	INITIAL LISTING
193	HSLPA	A HN STM PRES HR RLF VLV	215	0	6/20/84	INITIAL LISTING
194	HSLPB	B HN STM PRES HR RLF VLV	216	0	6/20/84	INITIAL LISTING
195	HSLPC	C HN STM PRES HR RLF VLV	217	0	6/20/84	INITIAL LISTING
196	HSLPD	D HN STM PRES HR RLF VLV	218	0	6/20/84	INITIAL LISTING
197	DHP	DRYWELL PRESSURE	207	0	6/20/84	INITIAL LISTING
198	FHMFA	A FH PP MIN FLO CNTL OUT	138	0	6/20/84	INITIAL LISTING
199	FHMFB	B FH PP MIN FLO CNTL OUT	139	0	6/20/84	INITIAL LISTING
200	FHMFC	C FH PP MIN FLO CNTL OUT	140	0	6/20/84	INITIAL LISTING
201	HPVSA	HPCI STM ADMIS VLV POS	77	0	6/20/84	INITIAL LISTING
202	RCVTT	RCIC TRP/THROTTLE VLV POS	62	0	6/20/84	INITIAL LISTING
203	HPVVI	HPCI VESSEL INJEC VLV POS	80	0	6/20/84	INITIAL LISTING
204	RCVVI	RCIC VESSEL INJEC VLV POS	64	0	6/20/84	INITIAL LISTING
205	HPETA	A HPCI STM FLOW DELTA P	75	0	6/20/84	INITIAL LISTING
206	HPETB	B HPCI STM FLOW DELTA P	76	0	6/20/84	INITIAL LISTING
207	HPTIP	HPCI STM SUPPLY PRESSURE	73	0	6/20/84	INITIAL LISTING
208	HPTEP	HPCI TURB EXHAUST PRES	74	0	6/20/84	INITIAL LISTING
209	RCETA	A RCIC STEAM FLOW DELTA P	59	0	6/20/84	INITIAL LISTING
210	RCETB	B RCIC STEAM FLOW DELTA P	60	0	6/20/84	INITIAL LISTING
211	RCTIP	RCIC STEAM SUPPLY PRES	57	0	6/20/84	INITIAL LISTING
212	RCTEP	RCIC TURBINE EXHAUST PRES	58	0	6/20/84	INITIAL LISTING
213	FHVCA	FH FLOW CONTROL VLV A POS	117	0	6/20/84	INITIAL LISTING
214	FHVCB	FH FLOW CONTROL VLV B POS	118	0	6/20/84	INITIAL LISTING
215	FHVCC	FH FLOW CONTROL VLV C POS	119	0	6/20/84	INITIAL LISTING
216	RLSET	REACTOR HTR LVL SETPOINT	141	0	6/20/84	INITIAL LISTING
217	FHVSU	FH STARTUP VLV POS	116	0	6/20/84	INITIAL LISTING
218	CFREQ	GRID FREQUENCY	179	0	6/20/84	INITIAL LISTING
219	GVOLT	GRID VOLTAGE	180	0	6/20/84	INITIAL LISTING
220	CRD01	CRDS 18-03,22-03,26-03,30-03	483	0	6/20/84	INITIAL LISTING
221	CRD02	CRDS 34-03,38-03,42-03,14-07	484	0	6/20/84	INITIAL LISTING
222	CRD03	CRDS 18-07,22-07,26-07,30-07	485	0	6/20/84	INITIAL LISTING
223	CRD04	CRDS 34-07,38-07,42-07,46-07	486	0	6/20/84	INITIAL LISTING
224	CRD05	CRDS 10-11,14-11,18-11,22-11	487	0	6/20/84	INITIAL LISTING
225	CRD06	CRDS 26-11,30-11,34-11,38-11	488	0	6/20/84	INITIAL LISTING
226	CRD07	CRDS 42-11,46-11,50-11, 6-15	489	0	6/20/84	INITIAL LISTING
227	CRD08	CRDS 10-15,14-15,18-15,22-15	490	0	6/20/84	INITIAL LISTING
228	CRD09	CRDS 26-15,30-15,34-15,38-15	491	0	6/20/84	INITIAL LISTING
229	CRD10	CRDS 42-15,46-15,50-15,54-15	492	0	6/20/84	INITIAL LISTING
230	CRD11	CRDS 2-19, 6-19,10-19,14-19	493	0	6/20/84	INITIAL LISTING
231	CRD12	CRDS 18-19,22-19,26-19,30-19	494	0	6/20/84	INITIAL LISTING
232	CRD13	CRDS 34-19,38-19,42-19,46-19	495	0	6/20/84	INITIAL LISTING
233	CRD14	CRDS 50-19,54-19,58-19, 2-23	496	0	6/20/84	INITIAL LISTING
234	CRD15	CRDS 6-23,10-23,14-23,18-23	497	0	6/20/84	INITIAL LISTING
235	CRD16	CRDS 22-23,26-23,30-23,34-23	498	0	6/20/84	INITIAL LISTING
236	CRD17	CRDS 38-23,42-23,46-23,50-23	499	0	6/20/84	INITIAL LISTING
237	CRD18	CRDS 54-23,58-23, 2-27, 6-27	500	0	6/20/84	INITIAL LISTING
238	CRD19	CRDS 10-27,14-27,18-27,22-27	501	0	6/20/84	INITIAL LISTING
239	CRD20	CRDS 26-27,30-27,34-27,38-27	502	0	6/20/84	INITIAL LISTING
[redacted]	[redacted]	[redacted]	503	0	6/20/84	INITIAL LISTING

GETARS I/O LISTING SSES UNIT 1
POINTS REVISED THIS LISTING

THIS #	NAME	ENGLISH DESCRIPTION	CH #	REVISION #	DATE OF REVISION	REVISION DESCRIPTION
241	CRD22	CRDS 58-27, 2-31, 6-31,10-31	504	0	6/20/84	INITIAL LISTING
242	CRD23	CRDS 14-31,18-31,22-31,26-31	505	0	6/20/84	INITIAL LISTING
243	CRD24	CRDS 30-31,34-31,38-31,42-31	506	0	6/20/84	INITIAL LISTING
244	CRD25	CRDS 46-31,50-31,54-31,58-31	507	0	6/20/84	INITIAL LISTING
245	CRD26	CRDS 2-35, 6-35,10-35,14-35	508	0	6/20/84	INITIAL LISTING
246	CRD27	CRDS 18-35,22-35,26-35,30-35	509	0	6/20/84	INITIAL LISTING
247	CRD28	CRDS 34-35,38-35,42-35,46-35	510	0	6/20/84	INITIAL LISTING
248	CRD29	CRDS 50-35,54-35,58-35, 2-39	511	0	6/20/84	INITIAL LISTING
249	CRD30	CRDS 6-39,10-39,14-39,18-39	512	0	6/20/84	INITIAL LISTING
250	CRD31	CRDS 22-39,26-39,30-39,34-39	513	0	6/20/84	INITIAL LISTING
251	CRD32	CRDS 38-39,42-39,46-39,50-39	514	0	6/20/84	INITIAL LISTING
252	CRD33	CRDS 54-39,58-39, 2-43, 6-43	515	0	6/20/84	INITIAL LISTING
253	CRD34	CRDS 10-43,14-43,18-43,22-43	516	0	6/20/84	INITIAL LISTING
254	CRD35	CRDS 26-43,30-43,34-43,38-43	517	0	6/20/84	INITIAL LISTING
255	CRD36	CRDS 42-43,46-43,50-43,54-43	518	0	6/20/84	INITIAL LISTING
256	CRD37	CRDS 58-43, 6-47,10-47,14-47	519	0	6/20/84	INITIAL LISTING
257	CRD38	CRDS 18-47,22-47,26-47,30-47	520	0	6/20/84	INITIAL LISTING
258	CRD39	CRDS 34-47,38-47,42-47,46-47	521	0	6/20/84	INITIAL LISTING
259	CRD40	CRDS 50-47,54-47,10-51,14-51	522	0	6/20/84	INITIAL LISTING
260	CRD41	CRDS 18-51,22-51,26-51,30-51	523	0	6/20/84	INITIAL LISTING
261	CRD42	CRDS 34-51,38-51,42-51,46-51	524	0	6/20/84	INITIAL LISTING
262	CRD43	CRDS 50-51,14-55,18-55,22-55	525	0	6/20/84	INITIAL LISTING
263	CRD44	CRDS 26-55,30-55,34-55,38-55	526	0	6/20/84	INITIAL LISTING
264	CRD45	CRDS 42-55,46-55,18-59,22-59	527	0	6/20/84	INITIAL LISTING
265	CRD46	CRDS 26-59,30-59,34-59,38-59	528	0	6/20/84	INITIAL LISTING
266	CRD47	CRD 42-59, - , - , -	529	0	6/20/84	INITIAL LISTING
267	CRD48	SINGLE ROD SCRAM INITIATION	530	0	6/20/84	INITIAL LISTING
268	SG-1	STRAIN GAUGE BACKUP FOR LR-26	531	0	6/20/84	INITIAL LISTING

* HUMAN ENGINEERING DISCREPANCY RECORD * PLANT: SUSQUEHANNA

REVIEWER: ST DATE: 02/18/82 NO: 166

PANEL NUMBER	:	COMPONENT IDENTIFIER
ANNUN		ANNUNCIATOR WARNING SYSTEM

DESCRIPTION OF DISCREPANCY

ON AR19, AR6, AND AR1 ANNUNCIATOR PANELS, THE NUMBER OF USED ANNUNCIATOR TILES EXCEEDS THE MAXIMUM OR 50 RECOMMENDED.

REVIEW SECTION CODE:
3. ANNUNCIATORS

GUIDELINE NO: 6.3.3.3 D1
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

THE PP&L POSITION IS THAT NO ACTION IS REQUIRED ON THIS HED. THIS HED WAS GENERATED PRIOR TO THE EXISTENCE OF A MATRIX IDENTIFIER GRID ON ALL ANNUNCIATOR MATRICES AND THE EXISTENCE OF ASSOCIATED ALARM RESPONSE PROCEDURES.

WHILE 50 TITLES IS "SUGGESTED" AS A MAXIMUM BY SECTION 6.3.3.3D-1 OF NUREG -0700, THERE IS NO OBJECTIVE STANDARD BY WHICH THE PRESENT ANNUNCIATOR MATRICES CAN BE DETERMINED TO BE INADEQUATE. WITHIN A GIVEN MATRIX, ANNUNCIATORS ARE PLACED GENERALLY ABOVE THE SECTION OF

(Continued)

PANEL CONTROLLING OR AFFECTING THE SYSTEM FOR WHICH THE ANNUNCIATOR ALARMS. THE IDENTIFYING MATRIX LABELING AND ALARM RESPONSE PROCEDURES PROVIDE FOR CORRECT OPERATOR INTERPRETATION OF THE ALARM.

THE EMPHASIS OF THIS LIMIT ON NUMBER OF ANNUNCIATORS IN A GIVEN BLOCK OF ANNUNCIATORS IS FOR PROVIDING FOR "PATTERN RECOGNITION". OUR TRAINING PROGRAM AND PROCEDURES DO NOT RECOGNIZE DIAGNOSIS OF A PROBLEM BY "PATTERN RECOGNITION" OF ANNUNCIATOR LIGHTS. IT IS OUR POSITION THAT PATTERN RECOGNITION IS MORE PRONE TO ERROR THAN OUR PRACTICE OF SYMPTOM-BASED RESPONSES FROM INSTRUMENTS TO EMERGENCY CONDITIONS. ALARM PROCEDURES REQUIRE THE OPERATOR TO READ AND UNDERSTAND ALL ANNUNCIATORS BEFORE ACKNOWLEDGING THEM (FOLLOWING OUR ALARM RESPONSE PROCEDURES).

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: ST

DATE: 02/18/82

NO: 169

PANEL NUMBER	:	COMPONENT IDENTIFIER
ANNUN		ANNUNCIATOR WARNING SYSTEM

DESCRIPTION OF DISCREPANCY

LETTER HEIGHT SUBTENDS A MINIMUM VISUAL ANGLE OF 15 MINUTES AT A VIEWING DISTANCE OF 31.25 INCHES, A DISTANCE NOT ACCOMMODATING A 5TH PERCENTILE FEMALE.

REVIEW SECTION CODE:
3. ANNUNCIATORS

GUIDELINE NO: 6.3.3.5 A-1

CATEGORY:

COMMENTS

RECOMMENDATION

IMPLEMENTATION

THE PP&L POSITION IS THAT THERE IS NO ACTION REQUIRED ON THIS HED. PROCEDURALLY, OPERATORS ARE REQUIRED TO READ ALL ANNUNCIATORS PRIOR TO ACKNOWLEDGEMENT. ON SOME EXTENDED PANELS, A SMALL PERCENTAGE OF ANNUNCIATORS DO NOT MEET READABILITY STANDARDS IF THE OPERATOR IS STANDING AT THE ACKNOWLEDGE CONTROL FOR THOSE ANNUNCIATORS. THIS IS NOT A MAJOR IMPEDIMENT TO OPERATOR FUNCTION AS HE CAN READ THE ANNUNCIATOR FROM A POSITION IN FRONT OF THE PANEL SEGMENT CONTAINING THE CONTROLS WITH WHICH HE WOULD BE EXPECTED TO RESPOND TO THE SITUATION FOR WHICH THE ANNUNCIATOR IS ALARMING, AND THEN STEP DOWN THE PANEL 1 OR 2 STEPS TO REACH THE INSTALLED ACKNOWLEDGE BUTTON.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 02/12/82

NO: 170

PANEL NUMBER	:	COMPONENT IDENTIFIER
1C601		GENERIC

DESCRIPTION OF DISCREPANCY

A MINIMUM SEPARATION OF 50" IS NOT OBSERVED BETWEEN PANEL 601 AND DESK. PERMANENT DESK IS 28" FROM PANEL 668 AND THE TEMPORARY DESK IS 19.5" FROM PANEL 668.

REVIEW SECTION CODE:
1. WORKSPACE

GUIDELINE NO: 6.1.1.3 E1
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

THE ORIGINAL DESK HAS BEEN REMOVED AND REPLACED WITH ONE, DESIGNED BY PP&L TO NUREG-0700 STANDARDS, THAT PROVIDES IN EXCESS OF 50" BETWEEN IT AND PANEL 601. THE TEMPORARY DESK HAS BEEN REMOVED.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/02/82

NO: 199

PANEL NUMBER	:	COMPONENT IDENTIFIER
1C681		RECIRC MODE DMP HD17657A RECIRC MODE DMP HD17602A RECIRC MODE DMP HD17601A

DESCRIPTION OF DISCREPANCY

THE MEANINGS OF COLORS USED IN THE CONTROL ROOM ARE NOT CONSISTENT. GREEN LIGHTS STAND FOR "FAILED" ON THIS PANEL. ON TIP PANEL GREEN LIGHT ON "BALL VALVE CLOSED" IS NORMAL. GREEN ON PANEL 692 IS FOR STATUS TO LOCK AT BREAKER POSITION (HSS 15704B VAC. BKR TEST).

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.6 C
CATEGORY: II

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

IT IS PP&L'S POSITION THAT NO ACTION IS REQUIRED ON THESE HED'S. IN GENERAL, COLOR MAY BE USED TO DISTINGUISH BETWEEN SIMILAR COMPONENTS, TO GIVE ADDED MEANING TO DISPLAYED INFORMATION, TO ASSOCIATE RELATED INSTRUMENTS, AND TO ATTRACT ATTENTION TO LOW-PROBABILITY OR CRITICAL CONDITIONS, ENHANCING THE RECOGNITION OF THE IMPORTANCE OF A DISPLAY OR INDICATION. WE BELIEVE COLOR HAS BEEN USED CONSISTENTLY WITHIN THE SUSQUEHANNA ADVANCED CONTROL ROOM (ACR) TO ACHIEVE THOSE GOALS.

(Continued)

ADDRESSING SPECIFIC COMMENTS WITHIN THE TER:

1. COLOR IS NOT OVER-USED. WITHIN A GIVEN CONTEXT, COLOR VARIATIONS ARE GENERALLY LIMITED. IN THE CONTEXT WITH THE MOST USE OF COLOR (PROCESS VARIABLES), 18 COLORS ARE USED, BUT THIS IS A CONTEXT (MIMICS) WHERE RECOGNITION OF COLOR MEANING IS NOT AS IMPORTANT AS COLOR DIFFERENTIATION, I.E., SEPARATING VARIOUS TYPES OF PROCESS MIMICS TO MAKE FLOW PATH CLEAR. ON ANY ONE PANEL, GENERALLY LESS THAN 5 COLORS ARE PRESENT ON A SET OF MIMICS.

   VARIOUS STUDIES HAVE BEEN SHOWN THAT EVEN IF COLOR WERE BEING USED TO CONDITION OPERATOR ACTIONS, UP TO 10 COLOR VARIATIONS IN A CONTEXT ARE REALISTICALLY PERCEPTIBLE WITH RELATIVELY LOW ERROR RATES (CHAPANIS & HALSEY, 1956) AND THAT UNDER IDEAL CONDITIONS, AS MANY AS 15-24 VARIATIONS OF HUE CAN BE DISCRIMINATED (WOODSON, 1982; TEICHNER, CHRIST AND CORSO, ONR-CR213-102-4F).

   THE COMMENTS ON MEANINGS WILL BE ANSWERED IN #3, BELOW.

2. OUR COLOR CONVENTIONS ARE COMPATIBLE WITHIN THE PP&L SYSTEM. THERE ARE MANY "POPULATION STEREO-TYPES", NOT JUST ONE, EVEN FOR THE COLORS RED AND GREEN:

   "MEANINGS ASSOCIATED WITH RED AND GREEN COLORS DIFFER, DEPENDING ON PAST EXPERIENCE. PERSONNEL WITH PREVIOUS FOSSIL FUEL PLANT EXPERIENCE TYPICALLY ASSOCIATE AN OPEN/FLOWING STATE WITH RED AND A CLOSED/STOP STATE WITH GREEN, BUT REVERSE ASSOCIATIONS TYPICALLY EXIST FOR PERSONNEL WITH PREVIOUS NAVY EXPERIENCE." (EPRI-NP-3659, 1984).

   THROUGHOUT OUR SYSTEM, THE COLORS RED, GREEN AND AMBER ARE USED CONSISTENTLY, IN CONTEXT, AND OUR PERSONNEL ARE TRAINED THOROUGHLY IN THEIR MEANINGS.

3. THERE IS NO SINGLE "MEANING" TO A COLOR.

   "THE MEANING ASSOCIATED WITH A COLOR MAY CHANGE AS THE CONTEXT CHANGES - PROVIDED THAT THE NUMBER OF CONTEXTS IS KEPT TO A MINIMUM AND EACH IS MUTUALLY EXCLUSIVE AND EASILY DISTINGUISHABLE FROM ALL OTHERS. FOR EXAMPLE, YELLOW OR AMBER MAY BE USED TO DENOTE MARGINAL CONDITIONS REPRESENTED IN DISPLAYED INFORMATION AS WELL AS TO CODE OIL LINES ON MIMICS." (EPRI-NP-3659, 1984)

   THE FACT THAT A HYDROGEN GAS CYLINDER IS CODED RED DOES NOT HAVE TO MEAN THAT IS MORE "DANGEROUS" THAN A CYLINDER OF CHLORINE OR HYDROGEN CYANIDE. THE IMPLEMENTATION IN THE TER COMMENTS IS THAT SOME UNIVERSAL "MEANING" CODING EXISTS WHICH SHOULD OVERRIDE THE USE OF COLOR WITHIN A CONTEXT FOR DIFFERENTIATION. THERE IS NO SUCH STANDARD FOR COLOR IN EXISTENCE.

PP&L HAS AN ON-GOING HUMAN FACTORS PROGRAM THAT IS CONSTANTLY REVIEWING ALL ASPECTS OF HUMAN FACTORS ENGINEERING IN OUR DESIGNS FOR CONTROL PANELS. THE STANDARD FOR USE OF COLORS IS DEFINED IN OUR COLOR MATRIX, WHICH IS PART OF DRAWING J-655, "HUMAN FACTORS STANDARDS FOR LABELING OF CONTROLS, INDICATORS, INSTRUMENTS AND ANNUNCIATORS". THIS IS A "CONSISTENT CONVENTION" APPLIED TO OUR DESIGNS INCLUDING SPDS, AND THE CONVENTION IS COVERED AS PART OF OUR OPERATOR TRAINING.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/02/82

NO: 204

PANEL NUMBER :	COMPONENT IDENTIFIER
1C681	PROCEDURES

DESCRIPTION OF DISCREPANCY

PROCEDURES ARE NOT IN PLACE WHICH SHOULD PREVENT INTERCHANGING INDICATING LIGHTS.

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.3.1 C2
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

SHIFT ROUTINE PROCEDURE AD-QA-303 PROVIDES THE FOLLOWING DIRECTION: "TESTABLE INDICATION LIGHTS TESTED AND EVERY INDICATOR PAIR SHOWS AT LEAST ONE LIGHT." THE CONFIGURATION OF INDICATOR LAMPS IS STANDARDIZED AT SSES AND OPERATORS WOULD RECOGNIZE A DEVIATION FROM THE PROPER LOCATION IMMEDIATELY. LAMP COLORS ARE SHOWN ON PLANT DESIGN DRAWINGS AND CANNOT BE MODIFIED WITHOUT A DESIGN CHANGE.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/25/82

NO: 242

PANEL NUMBER : COMPONENT IDENTIFIER

GENERIC

DESCRIPTION OF DISCREPANCY

THE COLOR GREEN ON SOME INDICATING LIGHTS MEANS THAT THE CONTROL HAS TRIPPED. THIS DEVIATES FROM THE TRADITIONAL MEANING OF GREEN AS IN TOLERANCE THE COLOR GREEN ON SOME INDICATING LIGHTS MEANS THE CONTROL HAS TRIPPED. THIS DEVIATES FROM THE TRADITIONAL MEANING OF "IN TOLERANCE."

REVIEW SECTION CODE:
5. DISPLAYS

GUIDELINE NO: 6.5.1.6 C2
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

IT IS PP&L'S POSITION THAT NO ACTION IS REQUIRED ON THESE HED'S. IN GENERAL, COLOR MAY BE USED TO DISTINGUISH BETWEEN SIMILAR COMPONENTS, TO GIVE ADDED MEANING TO DISPLAYED INFORMATION, TO ASSOCIATE RELATED INSTRUMENTS, AND TO ATTRACT ATTENTION TO LOW-PROBABILITY OR CRITICAL CONDITIONS, ENHANCING THE RECOGNITION OF THE IMPORTANCE OF A DISPLAY OR INDICATION. WE BELIEVE COLOR HAS BEEN USED CONSISTENTLY WITHIN THE SUSQUEHANNA ADVANCED CONTROL ROOM (ACR) TO ACHIEVE THOSE GOALS.

(Continued)

ADDRESSING SPECIFIC COMMENTS WITHIN THE TER:

1. COLOR IS NOT OVER-USED. WITHIN A GIVEN CONTEXT, COLOR VARIATIONS ARE GENERALLY LIMITED. IN THE CONTEXT WITH THE MOST USE OF COLOR (PROCESS VARIABLES), 18 COLORS ARE USED, BUT THIS IS A CONTEXT (MIMICS) WHERE RECOGNITION OF COLOR MEANING IS NOT AS IMPORTANT AS COLOR DIFFERENTIATION, I.E., SEPARATING VARIOUS TYPES OF PROCESS MIMICS TO MAKE FLOW PATH CLEAR. ON ANY ONE PANEL, GENERALLY LESS THAN 5 COLORS ARE PRESENT ON A SET OF MIMICS.

   VARIOUS STUDIES HAVE BEEN SHOWN THAT EVEN IF COLOR WERE BEING USED TO CONDITION OPERATOR ACTIONS, UP TO 10 COLOR VARIATIONS IN A CONTEXT ARE REALISTICALLY PERCEPTIBLE WITH RELATIVELY LOW ERROR RATES (CHAPANIS & HALSEY, 1956) AND THAT UNDER IDEAL CONDITIONS, AS MANY AS 15-24 VARIATIONS OF HUE CAN BE DISCRIMINATED (WOODSON, 1982; TEICHNER, CHRIST AND CORSO, ONR-CR213-102-4F).

   THE COMMENTS ON MEANINGS WILL BE ANSWERED IN #3, BELOW.

2. OUR COLOR CONVENTIONS ARE COMPATIBLE WITHIN THE PP&L SYSTEM. THERE ARE MANY "POPULATION STEREO-TYPES", NOT JUST ONE, EVEN FOR THE COLORS RED AND GREEN:

   "MEANINGS ASSOCIATED WITH RED AND GREEN COLORS DIFFER, DEPENDING ON PAST EXPERIENCE. PERSONNEL WITH PREVIOUS FOSSIL FUEL PLANT EXPERIENCE TYPICALLY ASSOCIATE AN OPEN/FLOWING STATE WITH RED AND A CLOSED/STOP STATE WITH GREEN, BUT REVERSE ASSOCIATIONS TYPICALLY EXIST FOR PERSONNEL WITH PREVIOUS NAVY EXPERIENCE." (EPRI-NP-3659, 1984).

   THROUGHOUT OUR SYSTEM, THE COLORS RED, GREEN AND AMBER ARE USED CONSISTENTLY, IN CONTEXT, AND OUR PERSONNEL ARE TRAINED THOROUGHLY IN THEIR MEANINGS.

3. THERE IS NO SINGLE "MEANING" TO A COLOR.

   "THE MEANING ASSOCIATED WITH A COLOR MAY CHANGE AS THE CONTEXT CHANGES - PROVIDED THAT THE NUMBER OF CONTEXTS IS KEPT TO A MINIMUM AND EACH IS MUTUALLY EXCLUSIVE AND EASILY DISTINGUISHABLE FROM ALL OTHERS. FOR EXAMPLE, YELLOW OR AMBER MAY BE USED TO DENOTE MARGINAL CONDITIONS REPRESENTED IN DISPLAYED INFORMATION AS WELL AS TO CODE OIL LINES ON MIMICS." (EPRI-NP-3659, 1984)

   THE FACT THAT A HYDROGEN GAS CYLINDER IS CODED RED DOES NOT HAVE TO MEAN THAT IS MORE "DANGEROUS" THAN A CYLINDER OF CHLORINE OR HYDROGEN CYANIDE. THE IMPLEMENTATION IN THE TER COMMENTS IS THAT SOME UNIVERSAL "MEANING" CODING EXISTS WHICH SHOULD OVERRIDE THE USE OF COLOR WITHIN A CONTEXT FOR DIFFERENTIATION. THERE IS NO SUCH STANDARD FOR COLOR IN EXISTENCE.

PP&L HAS AN ON-GOING HUMAN FACTORS PROGRAM THAT IS CONSTANTLY REVIEWING ALL ASPECTS OF HUMAN FACTORS ENGINEERING IN OUR DESIGNS FOR CONTROL PANELS. THE STANDARD FOR USE OF COLORS IS DEFINED IN OUR COLOR MATRIX, WHICH IS PART OF DRAWING J-655, "HUMAN FACTORS STANDARDS FOR LABELING OF CONTROLS, INDICATORS, INSTRUMENTS AND ANNUNCIATORS". THIS IS A "CONSISTENT CONVENTION" APPLIED TO OUR DESIGNS INCLUDING SPDS, AND THE CONVENTION IS COVERED AS PART OF OUR OPERATOR TRAINING.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/26/82

NO: 298

PANEL NUMBER : COMPONENT IDENTIFIER

REMOTE SHUTDOWN

DESCRIPTION OF DISCREPANCY

SEPARATION BETWEEN THE PANEL AND EQUIPMENT BOXES IS LESS THAN THE 50" RECOMMENDED DISTANCE AND IS MEASURED AT 41". THE SHIFT SUPERVISOR AS WELL AS AN OPERATOR MUST WORK THE PANEL WHILE POSSIBLY WEARING EMERGENCY EQUIPMENT.

REVIEW SECTION CODE:
1. WORKSPACE

GUIDELINE NO: 6.1.1.3 F1
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

MINOR DEVIATION; ACCESSIBILITY IS NOT HINDERED. THE DESIGN BASIS OF THE REMOTE SHUTDOWN PANEL DOES NOT REQUIRE WEARING EMERGENCY EQUIPMENT DURING OPERATION.

* HUMAN ENGINEERING DISCREPANCY RECORD *

PLANT: SUSQUEHANNA

REVIEWER: AL

DATE: 03/26/82

NO: 310

PANEL NUMBER	:	COMPONENT IDENTIFIER
REMOTE SHUTDOWN		RCIC STEAM SUPP SHUTOFF VALVE RCIC CDSR VAC PP DSCH VALVE RHR HEAD SPRAY INBD VALVE RHR HEAD SPRAY SUPPLY VALVE

DESCRIPTION OF DISCREPANCY

IN REMOTE SHUTDOWN, THROTTABLE CONTROLS ARE SHAPE CODED AS HAMMER SWITCHES. THIS IS NOT STRICTLY ADHERED TO IN THE CONTROL ROOM.

REVIEW SECTION CODE:
4. CONTROLS

GUIDELINE NO: 6.4.2.2
CATEGORY: IV

COMMENTS

SURVEY

RECOMMENDATION

NO ACTION REQUIRED

IMPLEMENTATION

CONTROL DIFFERENCES ARE DUE TO DIFFERENT SWITCH DESIGN, WITH DISSIMILAR TORQUE REQUIREMENTS (DIFFERENT DECKS/SWITCH), AND IS NOT A LAPSE IN SHAPE CODING.

4.0 Schedule for HED Resolution

4.0 Schedule for Resolution of HEDs

Discussion - This section of the Supplemental Report to the DCRDR consists of a discussion of the schedule for resolution of the "To Do" HEDs identified in the Susquehanna Unit 1 and Unit 2 Control Rooms.

4.1 HED Implementation Schedule

The Detailed Control Room Design Review (DCRDR) originally identified 468 HEDs requiring resolution. Out of the 468 HEDs, 157 HEDs were identified as requiring correction, and their resolutions were negotiated with the NRC. These remaining HEDs were then evaluated, prioritized, and approved by our Nuclear Work Management Program in order to determine the level of effort necessary for completion.

Out of the 157 HEDs originally identified as requiring correction, 117 have been completed to date with 40 HEDs (remaining "To Do") currently in the implementation process.

In order to ensure timely completion and high visibility, 39 of the 40 HEDs (see Section 4.2 for explanation of the disposition of HED #467) were assembled into similar and more manageable packages (Design Change Packages - DCPs). Incorporation of the HEDs into the DCP package also enhances the ability to track work progress and provides greater assurance that all the changes will be properly documented. A breakdown of the HEDs into the applicable DCPs can be found in Figure 1.

Due to the nature of the work involved in implementing the 39 remaining original "To Do" HEDs, unit outages may be required in order to complete portions of the installations. Based on the scheduled engineer completion dates and the unit outage schedules, the modifications required to resolve these HEDs will be completed by June 1987.

The Implementation Schedule will be front loaded with the HEDs not requiring an outage because we do believe that this work does represent a clear benefit to our operating personnel. Based on this, implementation will be completed as soon as possible.

4.2 HED Implementation Schedule (HEDs #467, #295, #341, #413)

HED #467, "Control Room Laydown Space," and the three post-audit (October 1984) HEDs (#295, #341, #413) are currently being evaluated to determine the level of effort required for completion.

Once the work scope (for all 4 HEDs) is established, it will be prioritized via our Nuclear Work Management Program and a schedule developed. The Implementation Schedule for these four (4) HEDs will be forwarded to the NRC by January 31, 1986.

DCP/HED Breakdown

Unit 1

DCP # 84-3121A

	211
33	227
87	230
184	232
	283

DCP # 84-3121B

97
224
261
281
300

Study

467

DCP # 82-434 (Issued)

344	375
349	376
350	431
367	449
369	324
373	329

DCP # 84-3121C

16
80

DCP # 85-3085A (COMMON)

466

Unit 2

DCP # 84-3122A

	227
33	230
87	232
184	283
211	

DCP # 84-3122B

97
224
261
281
300

Study

467

DCP # 84-3122C

344	375
349	376
350	431
367	449
369	324
373	329

Common

DCP # 85-3085B

	211
33	227
87	230
184	232
	283

Figure 1A

The HEDs listed below do not require physical plant modification to complete (i.e., procedural changes, etc.), therefore, no DCP is required. Changes will be handled directly by Plant Staff (required for both units).

160
462
465

The HEDs listed below require computer software type changes and will be handled via Software Problem Report by the Computer Department.

Software Problem Report SPR)

2	68
4	60
62	437

Figure 1B

5.0 Validation of Emergency Response Elements

Section 5.0 Validation of Emergency Response Elements

The Detailed Control Room Design Review is only one element in an integrated effort within PP&L to upgrade emergency response capability. The plans for this effort were described in PLA-1621, submitted to the NRC April 15, 1983. Important to the integrated effort was a commitment to perform a validation of what PP&L called System 1. System 1 included those elements of emergency response capability revolving around the control room operator and concerned with accident mitigation and prevention (See Figure 1). The control room configuration modifications resulting from resolution of the DCRDR HEDs are one of the elements to be included in the System 1 validation.

Specifically the System 1 validation will be designed to address the following issues with regard to DCRDR HEDs:

- Assurance that the selected design improvements provide correction to the problems identified in the HEDs.

- Assurance that the improvements do not create any new unacceptable HEDs.

- Assurance that the design improvements have been integrated with other upgrades to the emergency response capability.

The methodology utilized for the System 1 validation will be similar to that used by PP&L to validate other elements of emergency response capability. This methodology utilizes the Susquehanna Simulator which has high fidelity with the Susquehanna Unit 1 and Unit 2 control rooms. The operator shift undergoing requalification training is video taped while responding to accident scenarios. Immediately following the taping, the operator shift moves to a classroom and views the tape, with their comments being captured on an audio tape. Trained evaluators perform the actual validation by comparing actual crew performance viewed on the videotapes to predetermined evaluation criteria checklists. This methodology was tested with a trial validation in December 1983, and during SPDS validation in May 1984. It proved to be a valuable and effective technique. The methodology will be utilized again for validation of the upgraded EOPs, as described in Section 2.2.5.4, prior to System 1 validation. The intent is to perform the System 1 validation when all or almost all of the upgrades to System 1 have been implemented in the Susquehanna Simulator. At present only SPDS is implemented in the simulator. However, upgraded EOPs, R.G. 1.97 parameter instrumentation, and DCRDR HED implementation are scheduled in the near future. At present it appears the critical factor in the schedule for System 1 validation is the outcome of the updated Task Analysis described in Section 2.2