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October 13, 1993

William J. Cahill, Jr.
Group Vice President

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES) - UNIT 2
DOCKET NO. 50-446
SAFETY PARAMETER DISPLAY SYSTEM (SPDS) AVAILABILITY TEST

REF: TU Electric Letter logged TXX-93140 from W. J. Cahill, Jr. to
NRC dated March 22, 1993.

Gentlemen:

TU Electric hereby submits a copy of the Engineering Report "SPDS
Availability Test Report" ER-IC-020.

TU Electric committed to performing a thirty day availability test via
referenced letter to quantify SPDS availability, and that sixty days after
the successful completion of the SPDS availability test, a test report would
be made available to the NRC. This Engineering Report demonstrates that the
99% availability goal has been achieved.

If you have any questions contact Mr. Jose* D. Rodriguez at (214) 812-8674.

Sincerely,

William J. Cahill, Jr.
William J. Cahill, Jr.

140022

By: *Roger D. Walker*
Roger D. Walker
Manager of Regulatory Affairs

JDR/
Enclosure

c - Mr. J. L. Milhoan, Region IV c/o
Resident Inspectors, CPSES (2) c/o
Mr. T. A. Bergman, NRR w/enclosure

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TU ELECTRIC
COMANCHE PEAK STEAM ELECTRIC STATION

ENGINEERING REPORT

SPDS AVAILABILITY TEST REPORT

ER - IC - 020

REVISION 0

OCTOBER 6, 1993

Prepared By : Glen Holden Charles D Holden 10/6/93

Reviewed By : J. G. Amos J. G. Amos 10/6/93

Approved By : Dale L Walling Dale Walling 10-6-93

ABSTRACT

Comanche Peak Steam Electric Station (CPSES) has demonstrated that 99% availability of the Unit 2 Safety Parameter Display System (SPDS) was maintained during a continuous 30 day (720 hour) period thus fulfilling the commitment to the Nuclear Regulatory Commission (NRC) as specified in the Safety Evaluation Report (SER) Supplement 22 Section 22.

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ATTACHMENTS

Attachment A	-	PPT-TP-93B-12 Availability Test Summary
Attachment B	-	STA-622 "Administrative Control of the ERF and PCS Computer" Procedure
Attachment C	-	CPSES Unit 2 PCS Status Log
Attachment D	-	Discrepancy Forms
Attachment E	-	PPT-TP-93B-12 Availability Test Log
Attachment F	-	PPT-TP-93B-12 "Plant Computer System Availability Test " (without attachments)
Attachment G	-	Plant Computer System Work Order Listing
Attachment H	-	Abbreviations and Acronyms

INTRODUCTION

This report has been issued to demonstrate 99% availability of the Unit 2 Safety Parameter Display System (SPDS). After evaluation of PPT-TP-93B-12 test data sheets, test results, test logs, test summary, Instrumentation and Controls (I&C) Maintenance Departments' downtime logs and operator inputs, the SPDS was found to be available 99.002% of the 720 hour test period.

This report provides a history of the regulatory commitment for achieving and maintaining a goal of 99% availability, a description of the design methods used for meeting the 99% availability goal, a discussion of programs which can provide data for a long term continuous availability evaluation, and the test evaluation.

AVAILABILITY COMMITMENT

In Amendment 27 to the CPSES FSAR, CPSES committed to the intent of NUREG 0696 "Functional Criteria for Emergency Response Facilities". As part of that commitment, they sought to provide the Safety Parameter Display System (SPDS) displays to the Control Room, TSC and EOF. With the commitment for the SPDS displays as used in the control room, came the requirement to design the displays with an availability goal of 99% during operation of the plant and, at least, 80% during cold shutdown.

NUREG 0737 Supplement 1, paragraphs 4.1a and 4.1b, require that the SPDS must aid operators in rapid, reliable determination of plant safety status. As reported in SSER 12 CPSES committed to a program consisting of;

- 1) software configuration control,
- 2) quality assurance plan,
- 3) factory acceptance tests,
- 4) site acceptance tests, and
- 5) verification and validation tests.

All parts of the program were designed to meet the intent of providing reliable hardware, software and data to the operators and other users of the SPDS. The only remaining commitment on CPSES Unit 1 regarding reliability was to perform a 30 day availability test per the following excerpt from SSER 22 page 22-7:

In its SPDS safety analysis report submitted on July 31, 1989, the applicant committed to perform a 30 day availability test during low-power testing and

maintenance of downtime information. In a letter dated September 19, 1989, the applicant committed to perform the test within 60 days after fuel loading, and make the test report available to the staff within 60 days of successful completion of the test. These commitments were sufficient to close the availability issue as described in SSER 12.

Based upon the declining availability of vendor support for obsolete ERFCS software, decrease in number of vendors to support hardware needs and obsolescence of computer equipment (especially graphic display terminals), a new PCS was installed that integrated the old ERFCS and the old P2500 Plant Computer Systems.

TU Electric, the applicant, committed to complete the Unit 2 SPDS Availability Test according to the same milestones and criteria followed for CPSES Unit 1. The completion of this Availability Test Report completes the commitments described in SSER 22.

DESIGN FOR AVAILABILITY

The design goal for the CPSES SPDS system availability was to be greater than or equal to 99% during operation. The following design features and programs have been implemented to assure a greater potential of achieving and maintaining the SPDS availability goal.

Each unit's PCS/SPDS (SPDS is a subset of the PCS is designed in a redundant, dual computer configuration such that the failure of a single major component will not cause the PCS to be unavailable. In addition to redundant CPUs, other design features that enhance availability are;

- 1) Industry standard commercial components are acquired from reputable vendors where possible,
- 2) Uninterruptible power supplies provide all CPU power,
- 3) The environment in the computer room is strictly controlled by redundant HVAC,
- 4) All data which is recorded on the primary CPU disk drives are periodically transferred to storage on the backup CPU, and
- 5) Multiple or dual display units in each Emergency Facility are connected to a common redundant token ring network which allows access to either CPU (Primary or Backup).

Each CPU's software is designed to drive the SPDS displays, although only one will control the displays at any given time. The software is designed to drive the backup CPU to take charge in the event of a failure of the primary CPU (known as failover).

Certain portions of SPDS displays are dynamically updated and thus a failure to update the displays cannot go unnoticed for a prolonged period of time. This design feature, along with other maintenance and problem reporting procedures, is relied upon for failure indication and documentation. If a display (SDS terminal) fails to receive the date and time, the date and time field will be filled with the message "TIME NOT UPDATING". This message will flash in red until communications are reestablished.

The CPUs monitor all equipment status and provide pertinent information via computer status screen about the following;

- 1) CPUs,
- 2) disks,
- 3) display terminals (PCS and SPDS),
- 4) printers,
- 5) communication links, and
- 6) data acquisition equipment.

In addition to these preventive and diagnostic design measures, CPSES has also implemented administrative measures which are necessary to maintain PCS/SPDS availability and reliability at its highest possible level. STA-622, Revision 1 "Administrative Control of the ERF and PCS Computer" was placed into effect on April 6, 1990. This procedure describes the administrative responsibilities associated with the operation, calibration and maintenance of the Unit 1 Emergency Response Facility (ERF) Computer and the Plant Computer System.

THE AVAILABILITY TEST

Test Participants

The Engineering Performance and Test (P&T) Group were responsible for;

- 1) preparing the test,
- 2) collecting the test data,
- 3) reporting any problems found during the test,
- 4) maintaining a test log,
- 5) compiling a test data package, and
- 6) summarizing the test results at the conclusion of the test.

All phases of this activity were completed prior to generation of this report.

The OPS Instrumentation and Controls (I&C) Maintenance Group is responsible under STA-622, for;

- 1) controlling access to the computer consoles and other PCS computer equipment located in the Computer Rooms and the Cables Spreading Rooms,

- 2) monitoring the status of the PCS computer and notifying the System Engineer (Plant Engineering) of any problems identified,
- 3) notifying the shift supervisor of any activities or problems that would adversely affect the proper operation or availability of the PCS computer,
- 4) repairing computer system hardware failures,
- 5) maintaining a system logbook containing sufficient information about system operation and history to allow unusual or undesirable events to be analyzed,
- 6) performing preventive maintenance on the PCS computer, and
- 7) maintaining the bases for changes to the coefficients in the database for non-SPDS and non-RG 1.97 computer points.

In addition to these responsibilities called out in STA-622 and referenced by the test PPT-TP-93B-12, OPS I&C Maintenance was responsible for providing a copy of the OPS I&C Maintenance PCS computer system logbook to be attached to the test data package.

Control Room personnel and other individuals could report problems to OPS I&C Maintenance via established trouble reporting methods such as work requests, Technical Evaluation (TE) forms or Operations Notification and Evaluation (ONE) forms. Per STA-422 the OPS Plant Engineering PCS System Engineer was responsible for evaluating problems reported via TE and ONE forms. The PCS System Engineer, at times, forwarded these reporting forms to Engineering for resolution and disposition.

All results from the test were copied to Design Engineering for evaluation. All TE and ONE forms, initiated during the test, were forwarded to the Design Engineering PCS responsible engineer for resolution and disposition.

The Test Process

A copy of PPT-TP-93B-12 Revision 0 "Plant Computer System Availability Test" is included in this report as Attachment A. Within the test the SPDS was considered unavailable, if;

- 1) the display parameters were not regularly updating,
- 2) the time on the display was not updating and the terminal was flashing the message "TIME NOT UPDATING",
- 3) the critical SPDS screens as determined by Design Engineering were not accessible,
- 4) The "SPDS Parameter Failure" message was displayed on any of the SPDS display screens,
- 5) all of the Satellite Display Stations located in any given Emergency Response Facility (TSC, EOF or Control Room) are unable to display the critical SPDS screens,
- 6) OPS I&C Maintenance took the PCS out of service, or
- 7) problems, which effected the items 1 through 5 above, were reported to OPS I&C Maintenance.

The total time of any problem which met the above criteria was designated as downtime. The ratio of the uptime (duration of the test minus downtime) to the duration of the test period all multiplied by 100% would be the SPDS Availability. The following equation represents SPDS Availability for the test spanning 30 days:

$$\frac{(\text{30 days X 24 hours}) - \text{downtime}}{\text{30 days X 24 hours}} \times 100\% = \text{SPDS AVAILABILITY}$$

The Test was initiated by performing an initial data collection to validate that all SPDS screens satisfied the test criteria as described above. The 720 hour clock was started upon completion of this prerequisite data collection on April 6, 1993.

The Test Results

The Availability Test Log and Availability Test Summary in Attachments A and E cover the entire test period from the first declaration of test until the signature signifying conclusion of the availability test.

During the outset of the testing, the system was still somewhat unstable due to some known communications problems which were quite difficult to resolve. Also enhancements and troubleshooting were still being requested to assure an adequate support system for the operators in the Control Room. During this period the test consisted of the following failed attempts:

- 1) The test started on 4/6/93 at 07:45. On 4/7/93 the computer monitors were down for three hours due to problems which occurred during Primary Plant Performance displays installation. The test was halted.
- 2) The test was reinitiated on 4/8/93 at 10:00. On 4/11/93, the EOF monitors were down for 10 hours due to Token Ring Network problems. Downtime exceeded allowed duration.
- 3) a. The test was again initiated on 4/12/93 at 9:00. On 4/13/93 at 12:00, the test was suspended until multiple network and front-end problems were resolved.
b. The test was resumed on 4/27/93 at 8:40 after replacing a bad connector which was affecting the network communications. The test ran for 15 days and 5 hours during which 5 hours and 25 minutes of downtime due to multiple multiplexer failures, CPU failovers and MMI Executive lockups was accrued. On 5/13/93 all three monitors in the TSC locked up for 2 (two) hours forcing test failure. Testing was halted until the problem was resolved.

On 7/5/93 at 10:00 the test was again restarted. The following summary is based on the 30 day time period during which the data was collected for the availability calculation provided in this report.

JULY 8 Multiplexers 2G (ERF) and 2H (ERF) failed for approximately 2 minutes resulting in a failover from the Primary CPU to the Backup CPU.

REFERENCE: Attachment E, "Availability Test Log", Pages 23 and 24

Attachment G, "Plant Computer System Work Order Listing", Page 2

AVAILABILITY: Multiplexers 2G and 2H are both ERF multiplexers. The failure of both plus the failover of the Primary CPU constitutes a loss of key parameter data.

DOWNTIME: 2 minutes

JULY 9 Cabinet 02 Demultiplexer MCB Bad Logic Board underwent troubleshooting and rework.

REFERENCE: Attachment G, "Plant Computer System Work Order Listing", Page 2

AVAILABILITY: No impact, non ERF multiplexer loss.

DOWNTIME: 0 minutes

JULY 10 Multiplexers 2G (ERF) and 2H (ERF) failed due to microprocessor communication problems. The loss of the multiplexers caused the Primary CPU to failover to the Backup CPU.

REFERENCE: Attachment E, "Availability Test Log", Page 24

AVAILABILITY: Multiplexers 2G and 2H are both ERF multiplexers. The failure of both plus the failover of the Primary CPU constitutes a loss of key parameter data.

DOWNTIME: 3 minutes

JULY 14 An unrelated function (to SPDS) was "stuck" in active mode and could not be deactivated. Other Performance and Test tests required the Tabular Log function to be working. Operations I&C Maintenance manually failed the Primary CPU over to the Backup CPU to clear the problem. Also multiplexer 2A (non-ERF) failed.

REFERENCE: Attachment C, "CPSES Unit 2 PCS Status Log", Page 3
Attachment G, "Plant Computer System Work Order Listing", Page 2
Attachment E, "Availability Test Log", Page 26
AVAILABILITY: Manual failovers of the Primary CPU to the Backup CPU impacts downtime.
The failure of Multiplexer 2A has no impact on SPDS data collection.
DOWNTIME: 3 minutes

JULY 15 Multiplexers 2A (non-ERF) and 2F (non-ERF) failed.

REFERENCE: Attachment E, "Availability Test Log", Page 27
AVAILABILITY: Multiplexers 2A and 2F are both non-ERF multiplexers. The failure of either or both has no impact on ERF/SPDS data collection.
DOWNTIME: 0 minutes

JULY 16 Multiplexer 2I (ERF) failed and returned to processing and failed and returned to processing before stabilizing.

REFERENCE: Attachment E, "Availability Test Log", Pages 28 and 29
AVAILABILITY: Although the redundant design of ERF multiplexers prevents loss of key parameter data, degraded service of ERF inputs were experienced.
DOWNTIME: 5 minutes

JULY 18 Multiplexer 2I (ERF) failed and returned to processing and failed and returned to processing before stabilizing.

REFERENCE: Attachment E, "Availability Test Log", Page 31
AVAILABILITY: Although the redundant design of ERF multiplexers prevents loss of key parameter data, degraded service of ERF inputs were experienced.
DOWNTIME: 3 minutes

JULY 21 The Primary CPU failed over to the Backup CPU.

REFERENCE: Attachment E, "Availability Test Log", Page 34
AVAILABILITY: All CPU failovers will impact ERF/SPDS data collection.
DOWNTIME: 9 minutes

JULY 23 The Man Machine Executive routine MEXECZ, the driver for all Satellite Display Stations (SDSs), locked up rendering all SDSs inaccessible for 15 minutes. Later, during the day, the token ring network was taken down causing the EOF SDSs to go offline for 2 (two) hours. MEXECZ locked-up again causing the SDSs to be inaccessible for 1 hour and 27 minutes.

REFERENCE: Attachment E, "Availability Test Log", Pages 36 and 37
Attachment C, "CPSES Unit 2 PCS Status Log", Pages 3 through 6
AVAILABILITY: Failure of the Man Machine Executive or the Token Ring prevented viewing SDS displays at either of the TSC or ERF SDSs.
DOWNTIME: 3 hours and 42 minutes

JULY 25 The token ring network went down causing the EOF SDSs to go offline for 27 minutes, 41 minutes and 1 hour 46 minutes.

REFERENCE: Attachment E, "Availability Test Log", Pages 39 and 40
AVAILABILITY: Failure of the Token Ring prevented viewing SDS displays at either of the TSC or ERF SDSs.
DOWNTIME: 2 hours and 54 minutes

JULY 26 Multiplexer 2G (ERF) failed for approximately 3 minutes resulting in a failover from the Primary CPU to the Backup CPU.

REFERENCE: Attachment E, "Availability Test Log", Page 40
Attachment C, "CPSES Unit 2 PCS Status Log", Page 7
AVAILABILITY: Multiplexer 2G is an ERF multiplexer. The failure plus the failover of the Primary CPU constitutes a loss of key parameter data.
DOWNTIME: 3 minutes

JULY 27 The Data Acquisition Front-end application failed causing a CPU failover. Multiplexer 2I (ERF) failed for 2 seconds. The Man Machine Executive failed causing a loss of communications with the SDSs for 1 minute.

REFERENCE: Attachment E, "Availability Test Log", Page 40
AVAILABILITY: Failure of the Data Acquisition Front-end and Multiplexer 2I caused loss of key parameter data. The failure of MEXECZ caused the loss of capability to review data at the EOF or TSC SDSs.
DOWNTIME: 3 minutes

JULY 28 Three System failovers which were planned in anticipation of plant 100% Trip testing caused a Holdtime for 3 hours. No other failures were observed.

REFERENCE: Attachment E, "Availability Test Log", Page 41
Attachment G, "Plant Computer System Work Order Listing", Page 3
AVAILABILITY: All time was considered Hold time.
DOWNTIME: 0 minutes

AUGUST 1 Multiplexer 2I (ERF) failed for approximately 3 minutes resulting in a failover from the Primary CPU to the Backup CPU.

REFERENCE: Attachment E, "Availability Test Log", Page 44
AVAILABILITY: Multiplexer 2I is an ERF multiplexer. The failure plus the failover of the Primary CPU constitutes a loss of key parameter data.
DOWNTIME: 3 minutes

AUGUST 2 A planned maintenance effort forced a failover of the Primary CPU to the Backup CPU. All time was recorded as Hold time.

REFERENCE: Attachment E, "Availability Test Log", Page 44
Attachment G, "Plant Computer System Work Order Listing", Page 3
AVAILABILITY: All time was Hold time.
DOWNTIME: 0 minutes

AUGUST 3 The Man Machine Executive failed causing the OPS I&C Maintenance to execute a manual failover. Loss of MEXECZ affects the EOF and TSC SDSSs.

REFERENCE: Attachment E, "Availability Test Log",
Page 44
AVAILABILITY: Loss of MEXECZ prevents viewing of the
SPDS displays at the EOF or TSC SDSSs.
DOWNTIME: 1 minute

As a final note, review of the test logs will reveal that there were two recurrent types of incidents which were not summarized in the above summary. As both of these issues were of no impact to the SPDS availability but did occur frequently and were recorded in the test log, the following explanation is being provided.

- 1) The Backup CPU at times would drop off for 1 (one) to 4 (four) seconds. This in itself would not impact the availability of the SPDS unless the Backup was required for a failover. It has since been determined that the Backup CPU is not actually down and would be available if a failover was required.
- 2) The inability to collect a hard copy of the status screen is not a detriment to the availability of the SPDS. The hard copy of the status screen was being used to confirm the viewing of the status screen by test personnel. The test log, Attachment E, contains the verification by test personnel.

The Availability Calculation

From the summary presented in the Test Results section Downtime was determined to be 7 (seven) hours and 11 (eleven) minutes. The following table summarizes the dates and the actual downtimes.

TABLE OF DOWNTIMES

Date	Cause of Failure	Downtime
July 8, 1993	ERF Multiplexer Failure	2 min
July 10, 1993	ERF Multiplexer Failure Automatic CPU Failover	3 min
July 14, 1993	Manual CPU Failover	3 min
July 16, 1993	ERF Multiplexer Failure	5 min
July 18, 1993	ERF Multiplexer Failure	3 min
July 21, 1993	Automatic CPU Failover	9 min
July 23, 1993	Loss of SPDS Display	3 hr 42 min
July 25, 1993	Loss of SPDS Display	2 hr 54 min
July 26, 1993	ERF Multiplexer Failure Automatic CPU Failover	3 min
July 27, 1993	ERF Multiplexer Failure Automatic CPU Failover Loss of ERF Display	3 min
August 1, 1993	ERF Multiplexer Failure Automatic CPU Failover	3 min
August 3, 1993	Loss of SPDS Display	1 min
<hr/> Total Downtime		7 hr 11 min

Using the method of calculating "% Availability" as described earlier in this report, we find the availability to :

$$\frac{\text{DURATION OF THE TEST} - \text{DOWNTIME}}{\text{DURATION OF THE TEST}} \times 100\% = \text{SPDS AVAILABILITY}$$

$$\frac{720:00 - 7:11}{720:00} \times 100\% = 99.002\%$$

CONCLUSIONS AND RECOMMENDATIONS

The test was completed successfully and the calculated availability exceeded the goal of 99%. The system was operating correctly and maintenance issues had been resolved. After the 30 day availability test's results have been analyzed, Engineering concludes that :

1. The system is operating as designed; and
2. The redundant design features of the computers and the display terminals reduced "SPDS unavailability" and were a key factor in limiting the amount of downtime when there was a fatal error.

The SPDS Availability Test was conducted under a controlled reporting environment established by PPT-TP-93B-12, which was specifically written for the collection of SPDS Availability data. No programmatic weaknesses for resolution of problems were observed and the system was relied upon to such a degree by Operations that problems were quickly noticed and identified to Maintenance or testing personnel.

As a continuing resolve to maintain the 99% availability goal Design Engineering recommends that the following steps be taken:

1. Continue to monitor the Plant Computer System/network interface,
2. Continue to monitor all system failures, if any, and
3. Continue to monitor the system performance.

ATTACHMENT A

PPT-TP-93B-12 TEST SUMMARY

TEST SUMMARY

PPT-TP-93B-12

Plant Process Computer Availability Test

1.0 OBJECTIVES

The objective of this procedure is to provide Engineering data which will satisfy the availability criteria for the Safety Parameter Display System as stated in the FSAR Response to the NRC Action Plan Developed as a Result of the TMI-2 Accident.

2.0 STATEMENT OF CRITERIA AND RESULTS ACHIEVED

2.1 Acceptance Criteria

None

2.2 Review Criteria

2.2.1 Design Engineering (Computer Group) has received the test data and determined that the SPDS system is to be considered 99% "Available" for a 720 hour (30 day) duration.

Results: Design Engineering has calculated the SPDS System availability at 99.002% based on 7 hours and 11 minutes down time during a 720 hour duration.

3.0 PERFORMANCE SUMMARY

The test started on 4/6/93 at 07:45. On 4/7/93 the computer monitors were down for three hours due to problems which occurred during Primary Plant Performance displays installation. Design Engineering determined that since the test was only one day old that the test should be restarted.

The test was restarted on 4/8/93 at 10:00. On 4/11/93, the EOF Monitors were down for 10 hours due to Token Ring Network problems. This event caused the test to fail.

The test was restarted on 4/12/93 at 09:00. On 4/13/93 at 12:00, Design Engineering decided to suspend the test until the multiple network and front-end problems could be analyzed and resolved. A bad connector was found and reworked and Design Engineering determined that the test could be restarted.

The test was restarted on 4/27/93 at 08:40. The test ran for 15 days and 5 hours. During this duration, 5 hours and 25 minutes of down time was accrued. The down time was due to multiple multiplexor failures, two failovers due to multiplexor failures, and twice the man-machine executive locked up. Also, 16 hours and 3 minutes of hold time was accrued due to seven planned failovers and two planned maintenance periods to install Design Modifications. On 5/13/93, a problem was discovered that the monitors would lock up when a certain sequence of displays were requested. The three monitors in the TSC were down due to this problem for two hours. This event failed the test. Design Engineering suspended the test until this problem, documented on ONE Form 93-1052, was resolved.

On 7/5/93 at 10:00 the test was restarted. The test ran for 720 hours and was completed on 8/4/93 at 13:05. Seven hours and eleven minutes of down time was accrued due to the following failures:

- 14 Multiplexor failures
- 10 System failovers
- 5 Man-machine executive failures
- 4 Token-Ring Network failures

There was also three hours and five minutes of hold time due to planned maintenance and installation of Design Modifications. Design engineering Determined that the availability criteria had been met.

4.0 OPEN ITEMS AND ADDITIONAL TESTING/RETESTING RECOMMENDED

None

5.0 ATTACHMENTS TO THE TEST SUMMARY

5.1 PPT-TP-93B-12

Prepared By: _____ Date: _____

Reviewed By: _____ Date: _____

ATTACHMENT B

ADMINISTRATIVE CONTROL OF THE ERF AND PCS COMPUTER

CPSES PROCEDURE CHANGE FORM

SECTION I

DATE 3-19-93 PREPARER SURINDER GILL EXT. 6267
(PRINT NAME)

PCN STA-622-R02-1
TITLE ADMINISTRATIVE CONTROL OF THE ERF AND PCS COMPUTER

CHANGED PAGE NO(s) 3 AND 4 ADDED PAGES 3.1 AND 4.1

CHANGE JUSTIFICATION: 1) MAINTENANCE NEED FLEXIBILITY TO CHANGE THE COEFFICIENTS DURING LOOP CALIBRATION TO FINE TUNE THE SYSTEM.
2) OPERATIONS NEED TO CHANGE ALARM LIMITS TO PREVENT UNNECESSARY ALARMS DURING VARIOUS PLANT MODES AND CHANGING SYSTEM CONDITIONS.

PREPARER (Signature/Date) [Signature] 3/19/93
If change is editorial, THEN circle or mark "YES". YES
Editorial changes, as limited by STA-205, Attachment B.B, do not require Technical Review or Safety Evaluation Screen.

TECHNICAL REVIEWER: Carl Ponder Carl Ponder
(Printed Name and Signature)
Date: 3-25-93 EXT. 5642

SECTION II

PROCEDURE CHANGE INTERIM APPROVAL

If the change does not change the intent of the procedure and the change must be incorporated immediately, then complete this section; otherwise, route in accordance with Section III for review and approval.

QUALIFIED REVIEWER: _____
(Printed Name and Signature)

Date: _____ EXT. _____

SHIFT or UNIT SUPERVISOR: _____
(Printed Name and Signature)

Date: _____ EXT. _____

REMARKS _____

SECTION III

PROCEDURE CHANGE APPROVAL

REVIEW ORGANIZATION	APPROVED (Yes/No)	QUALIFIED REVIEWER (Init/Date)

TRAINING REQUIRED: YES ___ NO X IF YES, THEN SPECIFY: _____

SORC Meeting No. and Date (If Applicable) 53-39 Per taken with Joe Donahue 3-26-93/HMO 3-26-93

APPROVED BY: [Signature] DATE: 3/26/93
(Signature) (Print name if not approval authority and change is editorial)

COMANCHE PEAK STEAM ELECTRIC STATION
STATION ADMINISTRATION MANUAL

QUALITY-RELATED

ADMINISTRATIVE CONTROL OF THE ERF AND PCS COMPUTER

PROCEDURE NO. STA-622

REVISION NO. 2

SORC MEETING NO. 92-121 DATE 11-06-92

EFFECTIVE DATE: 2/22/93

MAJOR REVISION

PREPARED BY: (Print) SURINDER GILL EXT. 6267

TECHNICAL REVIEW BY: (Print) CARL POWDOYER EXT. 5642

APPROVED BY: *A. Allen* DATE: 2/8/93
VICE PRESIDENT, NUCLEAR OPERATIONS

CPSES STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-622
ADMINISTRATIVE CONTROL OF THE ERF AND PCS COMPUTER	REVISION NO. 2	PAGE 2 OF 5
<p>1.0 <u>PURPOSE</u></p> <p>This procedure describes the administrative responsibilities associated with the operation, calibration and maintenance of the Unit 1 Emergency Response Facility (ERF) Computer and the Unit 2 Plant Computer System (PCS).</p> <p>2.0 <u>APPLICABILITY</u></p> <p>This procedure applies to the Design Engineering, System Engineering, Maintenance and Operations Departments whose integrated services are required to operate, calibrate and maintain the Unit 1 ERF and Unit 2 PCS Computers under all modes of operation.</p> <p>3.0 <u>REFERENCES</u></p> <p>3.1 STA-302, "Station Records"</p> <p>3.2 STA-716, "Design Modification Process"</p> <p>3.3 M1-2951 thru M1-2965, M2-2900, M2-2901, Computer I/O lists</p> <p>3.4 EPP-201, "Assessment of Emergency Action Levels, Emergency Classification and Plan Activation"</p> <p>3.5 ODA-301, "Operating Logs"</p> <p>3.6 STA-606, "Work Requests and Work Orders"</p> <p>3.7 DBD-EE-055, "Emergency Response Facility Computer System"</p> <p>3.8 EEE-2.28-01, "Plant Computer Configuration and Media Control Plan"</p> <p>4.0 <u>DEFINITIONS/ACRONYMS</u></p> <p>4.1 <u>ERF Computer</u></p> <p>This term refers to the system which supplies Safety Parameter Displays and displays of plant conditions to the Control Room, Technical Support Center (TSC) and Emergency Operations Facility (EOF). In Unit 1 this system is composed of PRIME 750 computer systems, Validyne Engineering data acquisition equipment and Chromatics display equipment. In Unit 2 ERF functions are performed by integrated Plant Computer System (PCS).</p> <p>5.0 <u>RESPONSIBILITIES</u></p> <p>5.1 <u>I&C Manager</u></p> <p>5.1.1 Responsible for controlling access to the programmer, system and maintenance consoles and the ERF and PCS Computer equipment cabinets located in the Unit 1 & 2 Computer Rooms and Cables Spreading Rooms of the Control Building.</p>		

CPSES STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-622
ADMINISTRATIVE CONTROL OF THE ERF AND PCS COMPUTER	REVISION NO. 2	PAGE 3 OF 5
<p>5.1.2 Responsible for monitoring the status of the ERF and PCS Computers and notifying System Engineering of any problems identified.</p> <p>5.1.3 Responsible for notifying the shift supervisor of any activities or problems that would adversely affect the proper operation or availability of the Unit 1 ERF and Unit 2 PCS Computers.</p> <p>5.1.4 Responsible for repairing computer system hardware failures.</p> <p>5.1.5 Responsible for performing preventive maintenance on the ERF and PCS Computer.</p> <p>5.1.6 Responsible for maintaining the bases for changes to the coefficients in the database for non-SPDS and non-RG 1.97 computer points. #1 3/19/93</p> <p>5.2 <u>Manager, DEO</u></p> <p>5.2.1 Responsible for maintaining administrative and configuration control of the ERF and PCS Computers software and database.</p> <p>5.2.2 Responsible for establishing user access control to ERF and PCS Computer files.</p> <p>5.2.3 Responsible for administering the performance of testing, as required, to verify software changes and ensure modifications do not adversely affect ERF and PCS Computers' performance.</p> <p>5.3 <u>Manager, Operations</u></p> <p>5.3.1 Responsible for ensuring that a check of Safety Parameter Display System (SPDS) is performed at least once per shift and logged in accordance with OWI-104.</p> <p>5.3.2 Ensure that ERF supports Emergency Response Guidelines.</p> <p>5.3.3 Responsible for maintaining the bases for changes to the alarm limits in the database for non-SPDS and non-RG 1.97 computer points. #1 3/19/93</p> <p>5.4 <u>Manager, System Engineering</u></p> <p>5.4.1 Responsible for reviewing modifications to the ERF and PCS Computers before implementation.</p> <p>5.4.2 Responsible for maintaining this procedure current.</p>		

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<p>6.0 <u>INSTRUCTIONS</u></p> <p>6.1 <u>Control of ERF and PCS Computer Database Updates</u></p> <p>6.1.1 DEO should maintain a current listing of the ERF and PCS Computers I/O List (Reference 3.3).</p> <p>6.1.2 Database updates to the ERF and PCS Computer I/O Lists should be processed through System Engineering.</p> <p>6.1.3 Database updates should be implemented by DEO in accordance with References 3.2, 3.6 and 3.8.</p> <p>11 629 3/26/93</p>		

CPSES STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-622
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<p>6.1.4 Reactor Engineering constants can be changed in accordance with Reference 3.8.</p> <p>6.1.5 The database coefficients for non-SPDS and non-RG 1.97 computer points can be changed by I&C Maintenance in accordance with Reference 3.8.</p> <p>6.1.6 The database alarm limits for non-SPDS and non-RG 1.97 computer points can be changed by Operations in accordance with Reference 3.8.</p> <p>6.2 <u>Operation of the ERF and PCS Computers</u></p> <p>6.2.1 I&C should maintain a system logbook containing sufficient information about system operation and history to allow unusual or undesirable events to be analyzed. Following are examples of entries in the logbook that should be made:</p> <ul style="list-style-type: none"> • Preventative or corrective work order maintenance on the ERF and PCS computers. • Unusual system status or indication. • Administrative functions that are performed (e.g., history update, disk clean, system backup). • Changes to the database as a result of a Design Modification. • ERF or PCS equipment that is out of service or is operating in a limiting condition. <p>6.2.2 Shift Operations should perform a check of the SPDS at least once per shift in accordance with OWI-104. If during the check of the CRT display of the SPDS any abnormal conditions exist, Operations should contact I&C and initiate work in accordance with STA-606.</p> <p>6.2.3 As required, I&C should copy the accumulated Daily Historical Files from the disks to a magnetic tape for permanent record storage.</p> <p>6.2.4 I&C should keep all periods of unavailability to a minimum and restore the ERF or PCS Computer to an operational status, as needed.</p> <p>6.2.5 Shift Operations should contact Emergency Planning per EPP-201 when required.</p>		

#1
3/19/93

CPSES STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-622
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6.3 Revisions to ERF Computer Software

- 6.3.1 Any revision to the design controlled ERF or PCS Computer Software should be treated as a station modification and shall be processed in accordance with Procedure STA-716.
- 6.3.2 DEO should modify and test the software per Design Modification instructions.
- 6.3.3 After successful DM implementation and testing DEO should backup the system and send a copy to the DCC.

CPSSES STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-622
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<p>7.0 <u>FIGURES</u></p> <p>None</p> <p>8.0 <u>ATTACHMENTS/FORMS</u></p> <p>None</p> <p>9.0 <u>RECORDS</u></p> <p>When completed, the following forms, reports, or other documents generated in response to this procedure shall be dispositioned in accordance with STA-302, "Station Records".</p> <ul style="list-style-type: none">* Daily historical files (magnetic tapes)* System backup (magnetic tapes, disks, or optical media)		

ATTACHMENT C

CPSES UNIT 2 PCS STATUS LOG

~~1/1/93~~
~~0771~~
~~...~~

~~...~~

NOT
✓

~~1/1/93~~
~~2117~~
~~...~~

~~...~~

7/4/93
7/3/

7/4/93 "As Found" "B" Primary "A" BACKUP. Miscellaneous Alarms
on NSRBW0202 Rod to Rod Deviation caused
By C0046, C0047 & C0051 changing from correct
VALUE to 252 and BACK again. Could find no
HARDWARE Problem. Restarted Rod BANK UPDATE to
CORRECT VALUE. Problem still exists. ^{7/4/93} Sent MAIL to
Engineering to notify them of possible software problem

On 7/4/93

7/5/93 "As Found" "A" Primary NO BACKUP PMS NOT Running
in "B". Restarted "B" Backup it is "BACKUP"
"As Left" "A" Primary "B" BACKUP MXT began FAILING
but Recovered and continued to Run. Then that "A" Failed and Recovered
and continued to Run.

On 7/5/93

54

7/14/93 "As Found" A PRI B BACKUP TAB Log 18, 19, 20
07:34 stuck in Active mode not ABLE to Deactivate or Activate
them. Needed for ^{had 1/24/93} P+T Test New! Failed over system to
"B" Reset Penalty min + RBANKS. Verified N. ALARMS
Verified TAB Log OKAY. A BACKUP B PRI
11-07.

7/23/93 NOTICED SDS' IN IGC SHOP WERE
0924 DOWN AND DISCOVERED MEXCE2 WAS NOT
RUNNING. ENTERED "EX MEXCE2" AND
ALL TERMINALS WERE RETURNED. STOP
PROCESS IN COMPUTER ROOM THAT STARTED
MEXCE2 AND PERFORMED AN "C CON: MEXCE2"
AT WHICH TIME MEXCE2 WOULD NOT RUN.
FAILED SYSTEM-OVER BY TYPING "PMS ON
THE PRIMARY SYSTEM (A). SYSTEM AND
MEXCE2 APPEAR TO BE RUNNING PROPERLY.
END

RAB

7/23/93 ITOS WOULD NOT COME BACK ALLOWED
1355 SAGE TO ENTER SYSTEM FOR SYSTEM
ENGINEER. THEY CLEARED PROBLEM UP.
SDINCE205 WAS IN RUST STATE.
TO CLEAR THIS UP ON YOUR OWN →

7/21/93 DO A 34 DEV MBA. START AT
1355 BOTTOM OF LIST AND DO THIS...
CONT "COPY MBA#1: T1. IF THIS TAKES
A LONG ^{TIME TO RESPOND} DO A "CONTROL-Y" AND ^{TRY} ~~DO~~ 7/23/93
THE NEXT ^{UP} ONE ^{ON THE LIST} UNTIL THE TERMINAL
RESPONDS TO THE COPY COMMAND. OH
YA, IN ORDER TO FIND OUT IF AN
SDRIVER IS IN RWST STATE
DI A "SH SYS" COMMAND & LOOK
AT COLUMN 3. R. GRANTHALE
SAID THERE IS AN EASIER WAY TO FIND OUT
WHICH MBA (MAILBOX) CORRESPONDS TO
WHICH SDS. BUT, FOR NOW THIS IS
THE BEST WE CAN DO

7/23/93 LOST ALL REMOTE SDS'S. CONTACTED
1555 [REDACTED] ZORRIT EDEN. HE STATED THAT
HE KNEW OF THE PROBLEM AND WAS WORKING
ON IT. TIKEN RING HAS FAILED
AGAIN RAB

56

7/23/93 HAVE BEEN NOTIFIED BY ROBERT
1604 EDEN AND HE STATED THAT IT
WOULD BE DOWN FOR ~~THE~~ 2 DAYS
5 PM FRIDAY 7/23/93 ^{MB 7/23/93} TO 7 AM MONDAY
7/24/93

RAB

7/23/93 WAS NOTIFIED BY TELECOM E. STAN
1700 BURNETT THAT WHATEVER ^{WAS} ~~THAT~~ DOWN
^{MB 7/23/93}
WAS NOW BACK. ATTEMPTED TO
CDAL TTIO E II ^(EOF). CDAL LOCKED ON TO
10 AND TTD4 AND PROBABLY THE
REST OF THEM ARE NOW "THEIR NOT
UPDATING". FINALLY THIS CONDITION
TIMED-OUT. CDAL RETURNED TO
^{RAB 7/23/93} ~~NOT~~ NORMAL FOR LOCAL TERMINALS
BUT NOT FOR THE REMOTE ONES.

RAB

7/23/93 RESTARTED MKXECZ AND ALL
1541 TERMINALS RETURNED TO NORMAL.

RMS

7/23/93 FOUND TTY DOWN W/ TIME NOT UPDATING.
2201 CDAL WOULD RESET IT BUT IF MM I
WAS EVER EXITED THE SDS WOULD
NOT RETURN WITHOUT CDALAS W/ IT
THE REST OF THE MACHINES. RESTARTED
MKXECZ AND THIS DID NOT HELP.

FAILED THE SYSTEM OVER AND THIS
WAS SUCCESSFUL. NOW D2A1
ON CPU-A (STATUS DISPLAY) IS RED.
SH DAY/FULL ON D2A1: ^{FOR SYSTEM A} SHOWS 1 ERROR
IN THE "ERROR COUNT". THIS IS THE
ONLY REASON WHY I CAN THINK I COULD
BE RED. "WHO" & "WH" APPEAR TO BE
NORMAL AND ERROR COUNT IS NOT IN-
CREASING AT ALL. WILL LEAVE MES-
SAGE FOR J. S. MITCHELL TO ANALYZE
ON MONDAY 7/26/93

RMS

27 July 93 Failover 26 July 1829 Mux A still Bad B Primary standalone
Mux G Failed ~ 1825, Mux A Failed 1827, G Returned 1828, Failover 1829
Mux A Returned ~ 1835, ~ 0745 Returned A System Back in
Normal operation Primary/Back

8/1/93 "As Found" A Primary B PMs Running with no Process
11:50 showing under W.M. A & Mux's down to BACKUP. Killed
PMs on BACKUP system and Restarted. "As Left"
System A Primary B BACKUP. OBSERVED multiple
Mux Failures in HISTORY FILE prior to B Failure.

8/3/93 "As Found" B Primary & BACKUP B system unable
12:30 to keep terminals on line. FAILED to ^{8/3/93} ~~B~~ A system
Down time approx 1 min.

8/4/93 ^{8/3/93} Although occurred due to Mux Failure, "As Left"
4:32 B Primary A BACKUP. Mux H STATUS on BACKUP
System "WOK" this will not Recover until FAILOVER
occurs. But should not affect operation in 8/4/93

3/5/93 "AS Found" "A" Primary "B" Not Running Anything under PMS.
15:27 Log on ^{12:45} ~~to~~ ^{to} "A" occurred at 07:54
^{12:45} ~~to~~ ^{to} this AM. PMS "B" SYSTEM System Running as BACKUP.
12:45 3/5/93

[illegible]

ATTACHMENT D

DISCREPANCY FORMS

ONE Form		ONE 93-1434	
Unit 2	System PLANT Computer	Tag No. TEX-PCCOP-00	Level 832
Discovery Date & Time 21 July 93 / 0800	Immediate Action Taken WRITE ONE FORM		
TU ELECTRIC	Related Documents PLANT Computer System CPES-I-2036 R0 Functional Requirements		
ORIGINATOR	Condition Description and Comments SDS # TT02 exited into the DOS Mode automatically, (exit to DOS command NOT issued). The DOS command used to Return the monitor to the SDS mode "SDS" at the T:\ prompt does not work. The following error message is displayed "ERROR: EMS create Handle (\$88)". The DOS command line was over written on the POWER V Display.		
Originator Name (Print) GEORGE M. HOLMARD	Signature <i>[Signature]</i>	Date/Time 21 July 93 / 0830	Dept. POT
<input type="checkbox"/> Operability Affected <input type="checkbox"/> Reportable (Explain) <input type="checkbox"/> Plant Incident <input type="checkbox"/> Conditional Release		Ext. 6792	
SHIFT SUPERVISOR REVIEW	Comments		
Shift Supervisor/Date/Time JCHawley 7/26/93 1200		<input type="checkbox"/> Continued <input checked="" type="checkbox"/> None of the above	
WORK CONTROL CENTER REVIEW	<input type="checkbox"/> Reportable per _____ <input checked="" type="checkbox"/> Not Reportable		
	<input type="checkbox"/> (A) Work per STA-506	<input type="checkbox"/> (G) Other (Describe below)	
	<input type="checkbox"/> (B) Resolve Deficiency per STA-422, Attachment B.A	<input type="checkbox"/> (H) Perform Quick Technical Evaluation. See STA-422, Attachment B.F	
	<input type="checkbox"/> (C) Resolve Quality Assurance Deficiency per STA-422, Attachment B.B	<input type="checkbox"/> (I) Perform Technical Evaluation per STA-504	
	<input type="checkbox"/> (D) Process Conditional Release per STA-422, Attachment B.C	<input type="checkbox"/> (J) Perform HPES per STA-422, Attachment B.G	
	<input checked="" type="checkbox"/> (E) Affects Design/Engineering Resolution Required per STA-422, Attachment B.D	<input type="checkbox"/> (K) Manager's Trend System. No Further Action Required.	
	<input type="checkbox"/> (F) Resolve Plant Incident per STA-422, Attachment B.E	<input type="checkbox"/> (L) Noted. Further Action Not Required. (Justify Below)	
Comments			
<input type="checkbox"/> Continued			
Responsible Manager W. A. Smith	Responsible Org. ENR-EEF	Due Date 8/22/93	STA-421-1 Page 1 of 1 Rev. 3
Reviewer Name (Print) D. Davis	Signature <i>[Signature]</i>	Date 7/22/93	

ONE Form		ONE 93 - 1438	
Unit E	System Plant Computer	Tag No. TCX-PCOP-00	Level 322
Discovery Date & Time 21 July 93 16:19 hrs		Immediate Action Taken None ONE FORM	
Related Documents PPT-TP-93B-12			
ORIGINATOR	Condition Description and Comments Prior to the Computer failover that occurred @ 0930 hrs 21 July 93, as recorded in the SED, something happened to disrupt/jumble the SED log. See attached video copies of SED logs. This may be linked to whatever caused the failover.		
<input type="checkbox"/> Continued			
Originator Name (Print) Garry M Howard		Signature/Date/Time <i>[Signature]</i> 21 July 93 16:38	Dept. P.T
		Ext. 6792	
SHIFT SUPERVISOR REVIEW	<input type="checkbox"/> Operability Affected <input type="checkbox"/> Reportable (Explain) <input type="checkbox"/> Plant Incident <input type="checkbox"/> Conditional Release		
	Comments <div style="height: 50px;"></div>		
<input type="checkbox"/> Continued			
Shift Supervisor/Date/Time DC 8/1/93 7:21-03		<input checked="" type="checkbox"/> None of the above	
WORK CONTROL CENTER REVIEW	<input type="checkbox"/> Reportable per _____ <input checked="" type="checkbox"/> Not Reportable		
	<input type="checkbox"/> (A) Work per STA-606	<input type="checkbox"/> (C) Other (Describe below)	
	<input type="checkbox"/> (B) Resolve Deficiency per STA-422, Attachment 8.A	<input type="checkbox"/> (D) Perform Quick Technical Evaluation See STA-422, Attachment 8.F	
	<input type="checkbox"/> (C) Resolve Quality Assurance Deficiency per STA-422, Attachment 8.B	<input type="checkbox"/> (E) Perform Technical Evaluations per STA-504	
	<input type="checkbox"/> (D) Process Conditional Release per STA-422, Attachment 8.C	<input type="checkbox"/> (F) Perform HPES per STA-422, Attachment 8.G	
	<input checked="" type="checkbox"/> (E) Affects Design/Engineering Resolution Required per STA-422, Attachment 8.D	<input type="checkbox"/> (G) Manager's Trend System No Further Action Required	
	<input type="checkbox"/> (F) Resolve Plant Incident per STA-422, Attachment 8.E	<input type="checkbox"/> (H) None - Further Action Not Required (Justify Below)	
	Comments <div style="height: 50px;"></div>		
<input type="checkbox"/> Continued			
Responsible Manager WALLIN		Responsible Org. ENDB-EE** CNR-EECT/IC	Due Date 8/22/93
Reviewer Name (Print) D. Davis		Signature <i>[Signature]</i>	Date 7/22/93
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TU ELECTRIC		ONE Form		ONE 95 - 1453	
Unit	2	System	PLANT Computer	Tag No.	TCX-PCLOCP.00
Level	RSE	Blkg.	Control	Room	172
Discovery Date & Time		Immediate Action Taken			
23 July 93 15 40		WROTE ONE FORM			
Related Documents		CPES-I-2056			
ORIGINATOR	Condition Description and Comments The Plant Computer SDS will not Return to SDS MODE when given the proper command while in DOS. The "Time NOT UPDATING" comes up when the SDS attempts to Return to SDS mode.				
Originator Name (Print)		Signature		Date/Time	
George Howard		[Signature]		7/24/93	
Dept.		P&T		Ext. 679	
SHIFT SUPERVISOR REVIEW	<input type="checkbox"/> Operability Affected <input type="checkbox"/> Reportable (Explain) <input type="checkbox"/> Plant Incident <input type="checkbox"/> Conditional Release				
	Comments				
Shift Supervisor Date/Time		7-24-93 0112			<input checked="" type="checkbox"/> None of the above
WORK CONTROL CENTER REVIEW	<input type="checkbox"/> Reportable per _____ <input checked="" type="checkbox"/> Not Reportable				
	<input type="checkbox"/> (A) Work per STA-606 <input type="checkbox"/> (G) Other (Describe below)				
	<input type="checkbox"/> (B) Resolve Deficiency per STA-422, Attachment 8.A <input type="checkbox"/> (H) Perform Quick Technical Evaluation See STA-422, Attachment 8.F				
	<input type="checkbox"/> (C) Resolve Quality Assurance Deficiency per STA-422, Attachment 8.B <input type="checkbox"/> (I) Perform Technical Evaluation per STA-604				
	<input type="checkbox"/> (D) Process Conditional Release per STA-422, Attachment 8.C <input type="checkbox"/> (J) Perform HPES per STA-422, Attachment 8.G				
	<input checked="" type="checkbox"/> (E) Affects Design/Engineering Resolution Required per STA-422, Attachment 8.D <input type="checkbox"/> (K) Manager's Trend System No Further Action Required				
	<input type="checkbox"/> (F) Resolve Plant Incident per STA-422, Attachment 8.E <input type="checkbox"/> (L) Noted - Further Action Not Required (Justify Below)				
	Comment: REF FX 93-1434 DOCUMENTS A SIMILAR PROBLEM. ENCL. RESOLVE SITUATION.				
Responsible Manager		Responsible Org.		Due Date	
W. A. [Signature]		ENDIS - EESAK		8/26/93	
Reviewer Name (Print)		Signature		Date	
D. L. Davis		[Signature]		7/26/93	
				STA-421-1 Page 1 of 1 Rev. 3	

ATTACHMENT E

PPT-TP-93B-12
AVAILABILITY TEST LOG

TEST LOG

Procedure No.: APT-TP-93B-12 Rev. 0

Page 1 of

DATE	TIME	REMARKS
3/5/93	12:00	SIGNING IN THE TEST LOG AS TEST LEADER. MB. [Signature] Reviewed Reference and found no change in design which affected the test.
4/5/93 <small>now 4/5/93</small>	13:00 14:00	Received permission from OPS to start process. Briefed operators that test would take thirty days and would have no impact on the plant operations. would be just adjusting the conditions.
4/5/93 <small>now 4/5/93</small>	15:27	Finished making hard copies of sketches for prerequisites. Will get up with engineering and confirm that the thirty day clock is ready to start. Signing out of test log MB. [Signature]
4/5/93 <small>now 4/6/93</small>	07:45	Shown displays displays to design engineering and received concurrence to start the 30 day clock. (Design Engineer: Glen Holden) 30 day clock start time 4/6/93 07:45:00 <small>now 4/6/93</small> TEST LEADER MB. [Signature]
4/6/93	08:05	USS signed step 8.1 will start gathering of data.
4/6/93	08:15	will perform step 8.2 from TT02 TSC

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Rev. 0

TEST LOG

Procedure No.: PPT-TP-43B-12 Rev. 0

Page 2 of

DATE	TIME	REMARKS
4/6/93	08:24	Completed step 8.2 will perform test this afternoon afternoon
4/6/93	08:30	Life Log Entry: The computer setup is currently B computer - Primary A computer - Backup
4/6/93	15:10	Performing step 8.2 and 8.3 from terminal T107 in Control Room
4/6/93	15:17	Connection step 8.3 will be performed from T105 in Control Room
4/6/93	15:36	Reviewed SED. Computer and processes started up. No impact on availability as of yet. Will observe tomorrow, afternoon
4/7/93	08:47	Will begin step 8.2 on T103 in the TSC. Computer failed over last night due to installation of database changes for LP Turbine CAS no time no impact on availability. Failovers will occur today for installation of PPP software changes. will run up times this afternoon. Primary CPU = A Backup CPU = B
4/7/93	08:55	Finished 8.2. Everything OK. will try again this afternoon. Test leader this morning is Mark Winkler afternoon

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TEST LOG

Procedure No.: PPT-TP-438-12 Rev. 0

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DATE	TIME	REMARKS
4/7/93	13:45	WILL VERIFY SDS SCREENS (E2) USING TERMINAL TT10 IN THE EDF. MASS
4/7/93	13:41	SCREENS ARE OPERATIONAL IN THE EDF WILL PURCHASE 8.3.1 IN THE COMPUTER ROOM TO ACQUIRE THE ARCHIVE REPORT.
4/7/93	15:52	ARRIVED IN COMPUTER ROOM TO FIND THAT ALL TERMINALS ARE DOWN. ITC WAS IN PROCESS OF INSTALLING A MODIFICATION TO THE PRIMARY PLANT PERFORMANCE MODULE WHICH INCLUDED ADDING DISPLAYS. THE SDS SDS'S ARE ALL DOWN BUT THE COMPUTER IS UP. UNABLE TO DETERMINE WHEN THE DISPLAYS WERE DOWN AT THIS TIME.
4/7/93	16:25	SDS'S STILL DOWN. UNABLE TO DETERMINE WHEN THEY WILL BE RESTORED. WILL DETERMINE DAMAGE TOMORROW. SIGNING OUT OF TEST LOG MASS
4/8/93	10:00	SIGNING INTO TEST LOG MASS REVIEWED ITC COMPUTER MAINTENANCE LOG. THE SDS'S WERE BROUGHT UP AROUND 17:00 4/7/93. THE SDS'S WERE DOWN FOR ABOUT 3 HOURS. THE PROBLEM WAS RELATED TO THE

TEST LOG

Procedure No.: PPT-TP-93B-12 Rev. 0


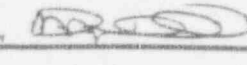
Page 4 of

DATE	TIME	REMARKS
		PPP DESIGN MOD INSTALLATION AND A IBM BRIDGE HANGING L2 ON THE NETWORK THERE WAS ALSO A FAILOVER OF THE SYSTEM AT 18:00 4/6/93, 0819 4/7/93, 16:41 4/7/93 AND 16:43 4/7/93. TALKED TO ENGINEERING (GLEN HOLDEN). DECIDED THAT SINCE THE FAILURES YESTERDAY WERE CAUSED BY MOOS AND THE TEST IS ONLY ONE DAY OLD, WE DECIDED TO RESTART THE TEST FROM DAY 0. OFFICIAL TEST START 4/8/93 10:00:00.
4/8/93	10:15	WILL PERFORM STEP 8.2 ON T102 IN TSC
4/8/93	10:30	COMPLETE 8.2 WILL TRY AGAIN THIS AFTERNOON
4/8/93	15:20	WILL PERFORM STEP 8.2 AND 8.3 ON T101 IN TSC.
4/8/93	15:36	FINISHED 8.2 AND 8.3. REVIEWED SEN AND OBSERVED NO MESSAGES OF FAILURE. SIGNING OUT OF TEST LOG. <i>[Signature]</i>
4/9/93	09:41	SIGNING INTO THE TEST LOG <i>[Signature]</i> COMPUTER IS STILL RUNNING A-PRAMPREV B-BACKUP WILL PERFORM STEP 8.2 FROM T101 TSC.
4/9/93	09:50	COMPLETED 8.2 WILL CONTINUE WITH TEST THIS AFTERNOON.

OFFICIAL

TEST LOG

Procedure No.: AP-TP-43-12 Rev. 0 Page 5 of

DATE	TIME	REMARKS
4/9/93	15:26	Performing 8.2 AND 8.3 ON T102 IN TSC.
4/9/93	15:43	FINISHED 8.2 AND 8.3. REVIEWING THE DISPLAY SECTION ABOUT ALARMS AND THE MAINTENANCE MANUALS HAS DISCOVERED THE FOLLOWING- DOWN TIME: A) 15:03 - 15:12 PLANNED OUTAGE TO ENTER NECESSARY CHANGES FOR CALORIMETRICS (DATABASE RECONVERSION). THIS WILL BE CONSIDERED HOLD TIME P.R. ENGINEERING (GLEN HODGEN) B) 10:41 - 10:56 ALL TERMINALS STOPPED UPDATING DATA DUE TO THE MAN-MACHINE PROCESS, MEXCELZ, LOCKED UP. T+C RESTARTED THE PROCESS AT 10:56. HOWEVER 15 MINUTES OF DOWN TIME IS ACCUMULATED. AT THIS TIME EVERYTHING IS RUNNING WITH A-PRIMARY B-BACKUP. SIGNING OFF OF TEST LOG 
4/10/93	11:00	SIGNING IN TEST LOG -  Performing 8.2 ON T101 IN TSC.
4/10/93	14:45	Performing 8.2 AND 8.3 ON T102 IN TSC
4/10/93	15:06	COMPLETED 8.2 AND 8.3 EXCEPT FOR HANDCOPY OF STATUS. WHILE PREPARING REPORT ON TERMINALS

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TEST LOG

Procedure No.

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PAT-TP-33B-N

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DATE	TIME	REMARKS
		THE SYSTEM FAILED OVER TO B. IT APPEARS DUE TO AFRONTIER IT APPEARS THAT AT 14:56 MUX B, D, E DIED. AT 14:56 MUX A DIED WITH THE COMPUTER 14:58 THE COMPUTER COMPLETED IT SPINUP WILL ACCOUNT FOR 2 MINUTE OF DOWN TIME. SIGNING OUT ^{WAS 4/10/93} OF TEST LOGS. B Primary Admin WAS 4/10/93
4/11/93	0730	Signing in test procedure to continue data collection in accordance with instruction in section 8.2.
	0756	Completed Data Sheet 1 IAW steps 8.2.1, 8.2.2, and 8.2.3. Step 8.3 will be executed later this afternoon IAW a pre determined time schedule
	1435	Boris performing D.S. #1 section 8.2
	1449	Section 8.2 complete
	1450	Entered Section 8.3
	1505	Section 8.3 completed. The Video Copier in the TCS failed to produce an output. Observed required data from Video Copier in the Computer Room.

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TEST LOG

Procedure No.: PPT-TP-938-12 Rev. 6

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DATE	TIME	REMARKS
4/12/03	09113	SIGNING IN - TEST LOG REVIEWED
		REVIEWED PREVIOUS LOG SINCE 4/10/03 16:00
		FOUND THAT THE SYSTEM FAILED OVER AT 19:50:00 ON
		4/11/03. WILL CHECK MAINTENANCE LOGS TO
		DETERMINE CAUSE AND TIME DURATION. WILL
		PERFORM SECTION 8.2 IN T101 AND T102.
4/12/03	10:00	SECTION 8.2 PERFORMED. REVIEW OF TEST
		LOG SHOWED SYSTEM FAILED OVER DUE
		TO NETWORK PROBLEMS. FAILURE ^{DID NOT} ^{MONITOR} ^{4/11/03}
		RESOLVE PROBLEMS WITH TERMINALS. HAD
		TO RESET THE DAMPERS WHICH ARE
		HOOKED TO THE NETWORK TO RESOLVE
		THE SDS PROBLEMS. IT LOOKS AS THOUGH
		SDS TERMINALS WERE INDETERMINATE AT
		4/11/03 19:16 AND BECAME AVAILABLE AT
		20:03. HOWEVER, THEY WERE MADE
		AVAILABLE BY REMOVING THE NETWORK.
		THE PROBLEM WITH THIS IS THAT THE
		EOF TERMINALS, T110 AND T111 ^{T111 NOT} ^{4/11/03} ARE
		ON THE NETWORK. THE NETWORK WAS NOT
		RESTARTED UNTIL 4/12/03 06:00. THIS
		IS 10 HOURS AND 19 MINUTES OF Downtime
		FOR THE EOF WHICH IS BEYOND THE TIME

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Date	Time	REMARKS
		Limit. Will Relay This Information To Design Engineering.
4/12/03	14:00	Have Not Heard From Design Engineering (Glen Holman). Will Perform 8.2 and 8.3 From TIO7 in the Control Room. A - Primary B - Backup
4/12/03	14:30	Completed 8.2 and 8.3. Could not receive Handover of status due to the signal in the Control Room and TSC are out of sync and the signal in the EOP is offline. All terminals were displayed as green. Will wait to hear from Design Engineering if I should continue with test. Operators log showed that no failures occurred over the last 5 hours, signing out w/ Test Log <u> </u>
4/13/03	09:23	Signing into Test Log <u> </u> Travelled to Design Engineering (Glen Holman) and they have decided to start the test over. Start time 4/12/03 09:00. Will perform 8.2 on TIO3 in TSC A - Primary B - Backup
4/13/03	09:30	Completed 8.2.

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Date	Time	REMARKS
4/13/93	12:00	DUE TO FAILURES OF THE SITE NETWORK CAUSING THE SYSTEM TO CRASH (LOG ENTRY 4/12/93 10:00 AND 4/9/93 10:00) AND THE TIMEPLEX LOCKING UP CAUSING THE SYSTEM TO CRASH (LOG ENTRY 4/10/93 15:06) ENGINEERING HAS DECIDED TO PLACE THE TEST ON HOLD TIME SO TROUBLESHOOTING OF THESE PROBLEMS CAN TAKE PLACE. ENGINEERING WILL INFORM PAT WHEN TEST CAN START AGAIN. BOTH FAILURE SCENARIOS WILL BE ON ^{new} one FORMS. ONE FORMS ARE BEING PROCESSED AND DO NOT HAVE NUMBERS AT THIS TIME. SIGNING OUT OF TEST LOG. <i>[Signature]</i>
4/27/93	0840	Signing into Test Log. <i>AC Sullivan</i> GE Sullivan Design Engineering has directed P&T to restart
4/27/93	0901	the test. Completed Data Sheet 1 from the TSC SDS TT02
4/27/93	1631	Completed Data Sheet 1
4/27/93	1648	Completed Data Sheet 2 & 1. Signing out of Test Log. <i>AC Sullivan</i>
4/28/93	0920	Signing into Test Log. <i>AC Sullivan</i>

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Date	Time	REMARKS
4/26/93	0742	Completed Data Sheet 1
		Review of System Event Display indicates
		4/27/93 10:24:56 Backup Down 4 sec.
		4/27/93 10:16:04 Backup Down 38 sec
4/28/93	1708	Completed Data Sheet 1 from TSC T102
4/28/93	1825	Completed Data Sheet 2 from TSC T102 and
		Computer Rm T104.
4/28/93	1852	Signing out of Test Log. <i>MC Sullivan</i>
4/29/93	0900	Signing into Test Log. <i>MC Sullivan</i>
4/29/93	0930	Completed Data Sheet 1 from TSC T102
4/29/93	1743	Completed Data Sheet 1 from TSC T102
4/29/93	1815	Completed Data Sheet 2 from T104
		Review of System Event Display indicates
		4/29/93 14:40:12 Backup Down 2 min 38 sec
4/29/93	1855	Signing out of Test Log. <i>MC Sullivan</i>
4/30/93	0930	Signing into Test Log. <i>MC Sullivan</i>
4/30/93	1020	Completed Data Sheet 1 from T102
4/30/93	1720	Completed Data Sheet 1 from T102
4/30/93	1745	Completed Data Sheet 2 from T102 and T104.
4/30/93	1755	Signing out of Test Log. <i>MC Sullivan</i>
5/1/93	0805	Signing into Test Log. <i>MC Sullivan</i>
5/1/93	0827	Completed Data Sheet 1 from T102
5/1/93	1705	Completed Data Sheet 1 from T102

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Date	Time	REMARKS
5/1/93	1327	Completed Data Sheet 2. The max Record Time available in the Archive File was 4/30/93 1701; it should have been 5/1/93 1201. Completed step 8.3.3. Signed out of Test Log. H.E. Hall
5/1/93	1219	Signed into TEST Log G.M. Howard
	1231	Section 8.2 completed
	1647	Reperformed steps 8.2.1, 8.2.2, & 8.2.3
	1650	In the middle of SDS verification, the SDS screen exited to the DOS mode automatically. The message "Floating Point error: Domain abnormal program termination" came up on screen. It was observed that just prior to this happening, the message "Activating Change of State Processor LRSOEZ" occurred on the VT-terminal. The SDS screen did not disappear the DOS prompt was written over the SDS displays. Normal attempts to return to the SDS mode failed. Performed Reboot of system to return to SDS mode. <u>5/2/93</u>

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Date	Time	REMARKS
5/2/93	1704	Performing SPAS displays Section 8.2
	1711	All SPAS displays verified
	1725	Section 8.2 complete. Erratic behavior exhibited ^{5/2/93} by the Page Forward Touch Screen Area. The computer would accept the command but would not execute the function reliably. Obtained Video Hard Copies & Printout.
5/3/93	09:15	SIGNING INTO TEST LOG AS TEST USER MR. [Signature] WILL PERFORM DS.7 AND TIO3
5/3/93	09:40	COMPLETED DATA SHEET 1.
5/3/93	11:00	FINISHED REVIEWING OPERATORS LOG STARTING ON 4/27/93 TO CATCH UP ON DOWN TIME SINCE I HAVE BEEN GONE. OBSERVED THE FOLLOWING: ON APRIL 29, MANUAL FAILURES WERE PERFORMED AT 14:27:16 AND 14:40:05 TO IMPLEMENT DCN'S. TOTAL HOLD TIME: 4 MINS. ON APRIL 30, A FAILURE DUE TO DAFFRONZ STOPPING CAUSED THE SYSTEM TO BE DOWN FOR 1 MIN AT 17:12:02. ON MAY 1, MANUAL FAILURES WERE PERFORMED AT 14:56:12, 15:53:35, AND 16:01:53 TO IMPLEMENT DCN'S. TOTAL

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Date	Time	REMARKS
		HOLD TIME: 3 mins
		TOTAL TIME - HOLD: 7 mins
		Down 1 mins
		5 PLANNED FAILURES 1 UNPLANNED FAILURE
5/3/93	14:55	STARTING D.S. 1 AND D.S. 2 ON TIO1
5/3/93	15:45	COMPLETED D.S.1 AND D.S.2. MADE
		PRINTOUT FROM 30-APR 17:01 TO
		3-MAY 14:01 TO COLLECT DATA MISSED
		PER. LOG ENTRY 5/1/93 13:27. REVIEWED
		SYSTEM EVENT LOG NOTHING TO REPORT.
		SIGNING OUT OF TEST LOG AT 14:00
5/4/93	08:40	SIGNING INTO TEST LOG AT 14:00
		STARTING D.S.1 ON TIO2 AT 14:00
5/4/93	08:53	COMPLETED D.S.1 AT 14:00
5/4/93	14:55	STARTING D.S.1 AND D.S.2 ON TIO3
5/4/93	15:25	COMPLETED D.S.1 AND D.S.2
5/4/93	16:20	WHILE REVIEWING THE SYSTEM EVENT LOG
		IT WAS NOTICED THAT TIO2 WAS DOWN. AT
		ABOUT 14:00, IT WAS NOTICED THAT THE MAN-
		MACHINE PROCESS MEXECLZ HAD STOPPED.
		RESTARTED MEXECLZ AND ALL TERMINALS
		RETURNED. TERMINALS DOWN TIME 10 mins.
		THE SAME FAILURE MODE OCCURRED AT 14:00

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Date	Time	REMARKS
		AT 10:17:27 IN 5/4/93. MEXCELZ WAS
		RESET AND TERMINALS RETURNED AT
		10:20. DOWN TIME: 10 MINUTES. ALSO
		OBSERVED FROM THE SYSTEM EVENT DISPLAY
		THAT A MANUAL FAILOVER OCCURRED ON
		MAY 3 AT 16:12:10 AND 16:19:14 TO
		INSTALL DEN'S. HOLD TIME: 2 MINUTES
		AT 23:32:30 ON MAY 3 THE SYSTEM
		FAILOVER DUE TO DAPPENDZ STOPPING.
		DOWN TIME: 1 MINUTE. ALSO THE
		REACTOR TRIPPED ON MAY 4 02:52:41 AND
		THE PLANT IS IN MODE 3. b COMPUTER'S
		PRIMARY 5 MINIS TIME. IN SUMMARY
		HOLD TIME: 9 MINS
		DOWN TIME: 22 MINS
		7 PLANNED FAILOVERS 2 UNPLANNED
		2 MCCI PROCESS STOPPAGE
		SIGNING OUT OF TEST LOG. XXXXXXXXXX
5/5/93	09:50	SIGNING IN TEST LOG XXXXXXXXXX
		STARTING D.S. 1 AND T103
5/5/93	10:05	COMPLETION D.S. 1.
5/5/93	16:29	STARTING D.S. 1 AND D.S. 2 ON T103.
5/5/93	16:43	COMPLETION D.S. 1 AND D.S. 2. REVIEWED

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Date	Time	REMARKS
		System Event Display: no problems
		SIGNING OUT OF TEST LOG <i>HE Sullivan</i>
5/6/93	1400	Signing into Test Log. <i>HE Sullivan</i>
5/6/93	1420	Completed Data Sheet 1 from TT01
		Review of System Event Display indicates
		5/6/93 07:48:07 manual Failover
		12:30:00 Back to Operation
5/6/93	1800	Signing out of Test Log. <i>HE Sullivan</i>
5/7/93	0700	Signing into Test Log. <i>HE Sullivan</i>
		Due to problems with installation of a minor
		Mod last night the computer was down from
		18:47:18 until 06:00:00 (Hold Time), this
		prevented performance of D.S. 1 & 2 last night.
5/7/93	0940	Completed Data Sheet 1 from TT02
5/7/93	1542	Completed Data Sheet 1 from TT04
5/7/93	1601	Completed step P.3.3 (SED) Hold Time as noted
		above in 0700 entry.
5/7/93	1630	Completed Data Sheet 2
5/7/93	1750	Signing out of Test Log. <i>HE Sullivan</i>
5/8/93	0900	Signing into Test Log. <i>HE Sullivan</i>
5/8/93	0925	Completed Data Sheet 1 from TT02
		System Event Display is cluttered with multiple
		entries "Change of State Processor LR50EZ" and

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Date	Time	REMARKS
5/6/93	1745 CONT	"VIDEO CAMERA VC31" coming OFF & ON-LINE every few minutes. These items make the SED less useful in looking down true system events of significance and should be corrected.
5/8/93	1601	Completed Data Sheet 1 from TT04 SED review. MUX2A Failure 1307 @ 10:49
5/8/93	1620	Completed Data Sheet 2 from TT02
5/8/93	1630	Signing out of Test Log. Mr. Johnson
5/8/93	10:15	Signing into Test Log. Mr. Johnson
5/8/93	10:30	Completion D.S. 1 from TT05.
5/8/93	13:10	STARTING D.S. 142 from TT03
5/8/93	13:25	Completed D.S. 142. REVIEWED THE SYSTEM EVENT LOG. NOTICE THAT THE ADJANCIES FOR 26 AND 27 HAVE BEEN GOING DOWN RANDOMLY FOR ABOUT A FIVE SECOND PERIOD EVEN SINCE THE FIBRINIC BRIDGES BEEN INSTALLED ON 7 MAY 24:00 TOTAL DOWNTIME 2 mins. THIS IS TRUE FOR THE OTHER MUXES ALSO. THIS IS OCCURRING FOR ALL OF THE OTHER MUXES. HOWEVER THE ADJANCENCY COMES BACK BEFORE THE SIPSMS SOFTWARE TIMEOUT AND CREATES A SPDS PARAMETER FAIL MESSAGE AND CAUSE THE MUX TO FAIL. (SEE NEXT PAGE)

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Date	Time	REMARKS
		TOTALS: FLARE TIME 12 DAYS 5 HOURS
		DOWN HOLD TIME: 16 HOURS 3 MINUTES
		Down Time: 24 MINUTES
		2 UNPLANNED FAILURES
		2 MINOR FAILURES
		7 PLANNED FAILURES, 2 MAJOR MAINTENANCE
		ISSUES, MANY PROBLEMS FOR MIX 21, 26 AND
		SIGNING OUT OF TEST LOG MADE
5/6/43	08:33	SIGNING IN TEST LOG MADE
		Performing D.S. 1 on T102.
5/6/43	08:45	COMPLETED D.S. 1 on T102
5/6/43	14:30	Performing D.S. 1 and D.S. 2 on T101
5/6/43	14:53	COMPLETED D.S. 1 and D.S. 2. REVIEWED
		OPERATED LOG AND D-S. 1 MIX 26 AND 21
		FAILED (ADDITIONAL - DOWN) 5 TIMES FOR A TOTAL
		OF 25 SECS DUE TO FIBER OPTICS CABLES OUT.
		LOGGING OUT OF TEST LOG MADE
5/11/43	06:45	SIGNING INTO TEST LOG MADE
		STARTING D.S. 1 on T103.
5/11/43	07:00	COMPLETED D.S. 1
5/11/43	16:15	UNABLE TO COMPLETE D.S. 1 and D.S. 2
		THIS AFTERNOON DUE TO COMPUTER FAILURE.
		THE TWO VENDOR WENT TO FLAVES WOT

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now 5/11/03
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Date	Time	REMARKS
		AND LOOK AT THE FIBRONICS BRIDGES
		AND DURING THE ACTIVITY THE SYSTEM
		STOPPED AND TOOK ^{now 5/11/03} CAN NOT BE BROUGHT
		BACK. TOMORROW, I WILL REVIEW THE
		SYSTEM EVENT LOG TALK TO IJC, AND
		REVIEW THE SDS HISTORY TO DETERMINE
		HOW LONG THE SYSTEM WAS DOWN.
		SIGNING OUT OF TEST LOG AT 09:10
5/14/03	09:10	SIGNING INTO TEST LOG AT 09:10
		PERFORMING D.S. 1 ON T101.
5/14/03	09:30	COMPLETION D.S. 1. TALKED TO IJC
		AND REVIEWED THE SYSTEM EVENT LOG.
		MACHINE WAS DOWN FROM 12:00 - 17:00
		FOR 5 HOURS OF DOWN TIME. WILL GET
		PRINTOUT OF SDS HISTORY THIS AFTERNOON
5/12/03	14:45	IN EUP AT T110 TO PREPARE D.S. 1 AND D.S. 2
5/12/03	14:55	COMPLETION D.S. 1 - CREATING PRINTOUT FROM
		5/10/03 14:00 TO MAKEUP FOR COMPUTER BEING
		DOWN FOR 58 ^{now 5/14/03} SDS HISTORY. REVIEWED SET ^{FOR 5/14/03}
		5/10/03 14:00 TO PRESENT. 26 + 21 WENT DOWN
		13 TIMES AT 5 SECS EACH TIME FOR TOTAL OF
		1 MIN 5 SEC DOWN TIME ^{now 5/14/03} TO 16:15 IN ADDITION TO
		FAILURE DESCRIBED IN 5/11/03 16:15.

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Date	Time	REMARKS
		TOTAL DOWN TIME IS NOW 5 HOURS 25 mins 30 secs
		REST RUN FOR 15 DAYS STARTS
		DOWN TIME = 16 HOURS 3 mins
		Also, ^{COPIER machine} THE VIDEO RECORD WOULD NOT
		WORK UP IN THE EFF. THEREFORE, THE STATUS
		SCREEN CAN NOT BE REASONED. THE
		SCREEN DISPLAYED THAT ALL TERMINALS
		IN THE EMERGENCY FACILITIES WERE UP
		AND OPERATING WILL WRITE A WORK REQUEST
		FOR ITC TO TRAVEL SHOOT VIDEO ^{COPIER machine} RECORD
		SIGNING OUT OF THE TEST LOG MADE
5/13	09:30	SIGNING TEST LOG MADE
		Informing D-S. 1 on TTU2
5/13	15:30	DISCOVERED A PROBLEM WITH THE SPOS TRAINS.
		IF DURING A DISPLAY OF AN SPOS TRAIN, A GROUP
		DISPLAY WAS CALLED UP AND THEN RETURNED
		TO THE SPOS TRAINS BY USE OF THE TOUCH-POSS,
		FAULTY DATA WOULD BE DISPLAYED (ALL ZEROS) AND
		EVENTUALLY THE SDS WILL LOCK UP AND EXIT
		MMI WITH A "FIRMWARE ERROR: Damage"
		MESSAGE. THIS OCCURRED ON ALL THREE
		SDS'S IN THE TSC. A WORK FORM WAS
		WRITTEN TO IDENTIFY THE PROBLEM. IT

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Date	Time	REMARKS
		TWO HOURS TO BRING BACK THE SDS'S, WE HAR FAILED THE AVAILABILITY TEST. WE WILL RESTART THE TEST WHEN ENGINEERING HAS A FEEL FOR THE PROBLEM. THIS PROBLEM COULD CAUSE THE SPDS DATA TO NOT BE AVAILABLE IN THE EMERGENCY FACILITIES OR WORSE GIVE MISLEADING DATA. DATA SHEET 1 AND 2 WERE NOT FINISHED FOR THIS DAY DUE TO THE PROBLEM. ALL SDS'S ARE WORKING NOW. SIGNING OUT OF TEST LOG REMOVED .
7/5/93	10:00	MOST OF THE AVAILABILITY PROBLEMS HAVE BEEN RESOLVED. THE SPDS TRENDS FAILURE WAS FIXED BY SDS SOFTWARE BY MM 93-330 AND DOW 6180. THE SYSTEM FOLLOWERS ARE ^{WAS} HAVE BEEN REVIEWED TO APPROXIMATELY ONE MONTH. THE MAX FAILURES HAVE BEEN REDUCED BY IMPLEMENTING DOW 6335 AND DOW 6344. WILL RESTART THE TEST FROM DAY 1 WITH ZERO DOWNTIME. THE PLANT IS IN MODE 2 AT 3% POWER HOLDING FOR A PROBLEM IN THE SECONDARY SIDE. REVIEWED THE STATUS SECTION AND ALL SDS'S IN THE EMERGENCY FACILITIES ARE OPERATIONAL. ENGINEERING HAS GIVEN APPROVAL TO START NOTATION OPERATIONS. REMOVED

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Date	Time	REMARKS
7/5/93	10:03	Will Perform DS. 7.1 on TT02
7/5/93	10:10	Completed DS. 7.1
7/5/93	13:00	Will Perform D.S. 7.1 on TT02 for Stevenson
7/5/93	13:30	Completed D.S. 7.1 and 7.2. Reviewed operator log. no further action out of Test Log. WAS
7/6/93	0848	Obtained operations permission to perform section 8 of the test. Beginning section 8.2. D
	1428	Begin second daily performance of D DS 1 Att 10.1 D
	1427	Completed DS. 1 Att 10.1 D
	1456	Completed DS. 2 Att 10.2 D
7/7/93	1000	Begin Performing DS. 1 Att 10.1
	1208	Completed DS. 1 Att 10.1 on TT04 D
	1418	Begin Performing DS. 1 Att 10.1 D
	1426 1426	Completed DS. 1 Att 10.1 on TT04 D
	1430	Begin Performing DS. 2 Att 10.2 D
	1454	Completed DS. 2 Att 10.2 D
	1500	Step 8.3.3 Completed D
7/8/93	0700	Begin Performing DS. 1 Att 10.1 D
	0708	Completed DS. 1 Att 10.1 D
	1528	Begin Performing DS. 1 Att 10.1 D
	1536	Completed DS. 1 Att 10.1 D

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Date	Time	REMARKS
7/8/93	1230	Begin Performance D2C A++ 02 <u>FE</u>
	1551	^{Begin Performance} Completed Performance of DS 2 A++ 10.2 <u>FE</u>
	1553	Review of the SED indicates that the Primary CPU (A) failed over @ 15:16:45.05 Failover processing was completed @ 15:16:54.35
7/9/93	1044	Begin Performance of DS 1 A++ 10.1
	1051	Completed DS 1 A++ 10.1
	1432	Begin Performance of DS 1 A++ 10.1
	1447	Completed DS 1 A++ 10.1
	1459	Begin Performance of DS 2 A++ 10.2
	1507	Completed DS 2 A++ 10.2
	1516	SED Review Complete. No loss of availability events recorded. <u>FE</u>
7/10/93	08:17	Signing in Test Log noted
		Begin Performance of DS 1 on TT02
7/10/93	08:30	Completed DS 1 on TT02
7/11/93	14:15	Starting D.S. 1 on TT10 in CDF
7/10/93	14:20	Starting D.S. 2 on TT10 in EVF
	14:25	Reviewing the SED notice that at 5:31:56 muxes G++H FAILED.
		At 5:33:14 System B Failed over to System A due to difference driving.

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Date	Time	REMARKS
		THIS RESUMED IN THREE MINUTES OF DOWNTIME. ALSO NOTICED ON JUL-8-93 MUX G+H FAILED AT 15:14:36 BEFORE THE SYSTEM FAILOVER FOR A TOTAL DOWN TIME OF 2 MINUTES. SO THE STATS FOR THE FIRST WEEK ARE
		TOTAL TIME: 124 HOURS
		DOWNTIME: 5 MINUTES
		MUX FAILURES (G+H) = 4
		FAILOVER: 2
Mon 7/13/93	14:40	SIGNING OUT OF TEST LOG MASS
7/11/93	1049	Preparing to perform DS. 1 ATT 10.1
	1100	Completed DS. 1 ATT 10.1
	1535	Begin Performance of DS. 1 ATT 10.1
	1547	Completed DS. 1 ATT 10.1
	1550	Begin Performance of DS. 2 ATT 10.2
	1558	Completed DS. 2 ATT 10.2
	1602	Completed reviewing SED. Today's events completely filled SED Log all 42 pages. Must reset pointer for events prior to 04:05:58.92 11 July 93. (D)

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Date	Time	REMARKS
7/12/93	16:43	Begin Performance of DS 1 AT 10.1 <i>JS</i>
	16:59	Completed DS 1 AT 10.1 <i>JS</i>
	14:53	Begin Performance of DS 1 AT 10.1 <i>JS</i>
	14:59	Completed DS 1 AT 10.1 <i>JS</i>
	15:02	Begin Performance of DS 2 AT 10.2 <i>JS</i>
	15:09	Completed DS 2 AT 10.2 <i>JS</i>
	15:15	Unable to review 24hrs of SED data. Current file only goes back to 11:01 AM on 7/12/93. Excessive amount of changing state processes, alarms, and Red Critical Alarms d/1 42 pages of SED file consumed by those events. No failure logged in events available for review. <i>JS</i>
7/12/93	10:40	SIGNING INTO TEST LOG <i>JS</i>
		STARTING DS 1 ON TT02
7/12/93	10:46	COMPLETION DS 1
7/12/93	18:45	STARTING DS 1 ON TT02 IN EOF
7/12/93	18:47	COMPLETION DS 1 STARTING DS 2
7/12/93	18:50	ACQUIRED STATUS PAGE AND SOS PRINTOUTS
		Reviewed OPERATOR LOG for 24 Hour Period From 7/12/93. saw no events.
		Reviewed SED for 24 Hour Period
		SIGNING OUT OF TEST LOG <i>JS</i>

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Date	Time	REMARKS
7/14/93	0630	Signing in TEST Log, Begin DS. 1 ATT 10.1 <u> </u>
	0640	Completed DS. 1 ATT 10.1 <u> </u>
	1614	Begin DS. 1 ATT 10.1 <u> </u>
	1622	Completed DS. 1 ATT 10.1 <u> </u>
	1629	Begin DS. 2 ATT 10.2 <u> </u>
	1635	Completed DS. 2 ATT 10.2 <u> </u>
	1640	SED REVIEW: Unable to Review SED for entire 24 hr period. Log only goes back to 07:39:50.88 on 14 July 93. Max 24 failed from 14:09:41.44 to 14:10:50.44. No input on test. I & C performed system failure @ ~ 07:39 this morning to re initialize Tabular Log Function. TEST input to be evaluated. <u> </u>
7/15/93	0820	Begin Performance of DS. 1 ATT 10.1
	0829	Completed DS. 1 ATT 10.1
	0833	Performed SED Review in an attempt to capture 24 hrs worth of DATA. File is logged back to 14 July 93 19:16:39.14. Will perform SED Twice Daily, in and out 7/15/93 <u> </u>
	1557	Perform DS 1 ATT 10.1 <u> </u>
	1600	Completed DS 1 ATT 10.1 <u> </u>
	1601	Begin Performance of DS 2 ATT 10.2

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Date	Time	REMARKS
7/15/93	1606	Completed DS. 2 ATT 10.2
	1619	SED Review performed. Noted failures on Max 2A and Max 2F nonimpact test. Review went back to 0800hrs 15 July 93. This yields a review window of ≈ 21 hrs. Will instruct night shift to perform SED Review for the time period of ^{15 July} 1600 - ^{16 July} 0800hrs. This overlap will ensure that 24 hrs of events have been reviewed for system failures. (D)
7-16-93/	0226	SED review performed for the time period of 16:00:58.64 on 7-15-93 through 02:24:24.89 on 7-16-93. No system failures observed. Rich Darnell
	1009	George Hovorn Signing in Test Log: Begin Performance of DS. 1 ATT 10.1
	1020	Completed DS. 1 ATT 10.1
	1023	Performed SED Review for time period of 02:00 hrs 7/16/93 to 10:23 hrs 7/16/93 (D)
	1553	Begin Performance of DS 1 ATT 10.1
	1559	Completed DS 1 ATT 10.1
	1559	Begin Performance of DS2 ATT 10.2
	1607	Completed DS 2 ATT 10.2 (D)

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TEST LOG

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Date / Time	REMARKS
7-17-93 / 0108	SED review performed for the time period of 11:20:18:89 on 7-16-93 through 01:06:22:15 on 7-17-93. Noted following system failures:
	MUX 2I failed at 20:28:47:85, cleared at 20:29:51:85, failed again same time cleared at 20:33:52:15
	MUX 2A failed at 20:30:43:15 and cleared at 20:31:52:15. Rich Darnell
LATE Log Entry	On 7/16/93 @ 1632 hrs the SED Review for the time period 10:00:14:89 thru 16:30:07:15 on 16 July 93 was completed. Two events of interest were logged (1) @ 15:11:09:89 the system went from Primary with Backup to Primary Stand Alone and returned to Primary with Backup @ 15:11:11:89.
	(2) @ 11:41:05:89 The Remote System changed state OLD STATE = Running New State = Down. The Remote System returned running @ 11:41:07:89. <i>PD</i>

TEST LOG

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Date	Time	REMARKS
7/17/93	0815	Begin Performance of DS 1A+10.1
	0823	Completed DS 1A+10.1
	0825	SED Review from 0800hrs to 0830hrs
		on 17 July 93. (1) Lost Backup Computer
		@ 02:11:08:15 Backup Computer Back
		on line @ 02:11:10:15. (2) Lost Backup
		Computer @ 01:41:20:15 Backup Computer
		back on line @ 01:41:31:15. No other
		items of interest during this time
		period. TS
7/17/93	14:15	MDR Performance DS1 on TT02
7/17/93	14:40	Completion DS1 and DS2. Review SED.
		Found that MUX I was down for 5 minutes
		knowing two failures. Times were
		20:28:58 JUL 16, 1993 and
		21:39:17 JUL 16, 1993. TEST HAS
		RUN FOR ^{DS} 288 HOURS signing out
		of TEST LOG. MDR
		NOTE ENTRIES: COULD NOT ACQUIRE STATUS
		SCREEN HAND COPY HAS ALL COLOR COPYERS
		ARE OUT-OF-SERVICE. STATUS SCREEN
		DISPLAYS ALL COMPONENT IN GREEN EXCEPT
		TT12 (Development) and TT15 (Data) MDR

TEST LOG

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Date	Time	REMARKS
7/18/93	0130	Reviewed SED for the time period of 14:40 on 7/17/93 through 0130:30 on 7/18/93. No system failures observed. <i>Paula J. Davis</i>
7/18/93	0600	Reviewed SED for the time period ^{B 11/11/93} 01:30:30 on 7/17/93 through 05:56:38 on 7/18/93. No system failures observed. <i>Paula J. Davis</i>
1043		Begin Performance of DS. 1 ATT 10.1
1054		Completed DS. 1 ATT 10.1
1055		SED Review: @ 10:11:06.65 on 18 July 93 Backup Computer went Down. Backup Computer came back online @ 10:11:07.65 18 July 93. No system failures between 05:56:38 and ^{B 11/11/93} 11:00:22.65 hrs. <i>D</i>
1433		Begin Performance of DS. 1 ATT 10.1 <i>B</i>
1442		Completed DS. 1 ATT 10.1 <i>B</i>
1443		Begin Performance of DS. 2 ATT 10.2 <i>B</i>
		Unable to obtain hard copy of Status Screen
		All V.C.s are inoperable. All components are functioning (seen) except TT12 (CPE) and TT18 (Dallas). <i>B</i>

TEST LOG

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Date	Time	REMARKS
7/12/93	1449	Completed ATZ A++ 10.2
	153	SED REVIEW: No Max 2 Success Failures
		Logged since LAST SED Review ID
7-19-93	0222	SED review performed for the time period
		15:00:19.91 on 7-18-93 through
		02:17:02.16. Backup computer went
		down at 15:41:11.19 and was back on
		line at 15:41:13.91. Max 2I experienced
		two failures during a three minute
		period beginning at 22:22:49.91 and ending
		at 22:25:52.91. Rich Hamble
7-19-93	0734	Begin Performance of DS. 1 A++ 10.1
	1742	Completed DS. 1 A++ 10.1
	1744	SED Review: No Success or Max
		failures between 02:12:02 and
		02:45:05 ID
	1621	Begin Performance of DS. 1 A++ 10.1
	1629	Completed DS. 1 A++ 10.1
	1639	Begin DS. 2 A++ 10.2
	1634	Completed DS. 2 A++ 10.2. Unable
		to obtain Hard Copy. All video cameras
		INOP. All components online except
		TI 12 and TI 14 ID

TEST LOG

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Date	Time	REMARKS
7/10/93	1646	SED Review: No Major System Failures Logged Since Last SED Review.
7-10-93	0222	SED review performed for the time period 16:46:07.41 on 7-19-93 through 02:20:16.41 on 7-20-93. No system or Max failures observed. Rich Humble
1030		Begin Performance of DS 1 A++ 10.1
1035		Completed DS 1 A++ 10.1
1040		SED Review: (1) Lost Backup Computer @ 07:35:01.66, Backup Computer Backup Line to 07:35:10.66 (2) Lost Backup Computer @ 07:25:02.66, Backup Computer on line @ 07:25:12.66 (3) Lost Backup Computer @ 07:19:59.66, Backup Computer on line @ 07:20:10.66. No other events (System or Max Failures) Logged since previous SED Review.
1116		Begin Performance of DS 1 A++ 10.1
1125		Completed DS 1 A++ 10.1
		Begin Performance of DS 2 A++ 10.2. No Video Copier Available. All components operable except TT-121 PCY.

TEST LOG

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Date	Time	REMARKS
7/2/93	1633	Completed DS 3 Att 10.2
	1641	SED Review No Mux in System
		Failures observed since SED
		Review
7-21-93	0223	SED review performed for the time period
		16:40:29.66 on 7-20-93 through
		02:19:51.92. Backup computer went
		down at 00:00:22.92 and was back
		on line at 00:00:24.92. No system or
		Mux failures observed. Rich Donald
	0727	Begin Performance of DS 1 Att 10.1
	0735	Completed DS 1 Att 10.1
	0737	SED Review No Mux in System
		Failures Logged Since 02:19:51.92
	1547	Begin Performance of DS 1 Att 10.1
	1557	Completed DS 1 Att 10.1
	1558	All video copiers inoperable is unable
		to obtain hard copy of status screen.
		All components on screen are green
		except TT 12, TT 13, TT 18, and DIA 1
	1605	Completed DS 2 Att 10.2

TEST LOG

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Date	Time	REMARKS
7/21/93	1610	SED Review: ① PCS Lost Backup Computer @ 10:51:01.04; Backup Computer returned to service @ 10:51:10.04
		② Lost Backup Computer @ 10:46:31.04, Backup Computer Return to Service @ 10:46:32.04
		③ Lost Backup Computer @ 10:41:08.04 Backup Return to Service @ 10:45:55.04
		④ Lost Backup Computer @ 09:39:55.04 Backup RTS @ 09:41:40.04
CRITICAL LOG ENTRY		⑤ Computer Failover @ 09:30:41.14 Failover complete @ 09:30:40.34, 9.20 seconds of availability lost.
	1637	Repaired Video Copies. Obtained hard copy of status display.
	1638	Wrote ONE Form to document Loss of Data in SED Log Prior to Failover.
7/22/93	0213	SED Review: NO MAX OR SYSTEM Failures Logged since last SED Review
	1126	SED Review: Lost Backup Computer @ 08:32:20.29, Backup Computer Rtn to Service @ 08:32:20.29 No other System or Mux failures since last Review. ②

TEST LOG

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Date / Time	REMARKS
7/22/93 1130	Begin DS1 APT 10.1
1139	Completed DS1 APT 10.1
1500	Begin DS1 APT 10.1
1521	Completed DS1 APT 10.1
1536	Begin DS2 APT 10.2
1535	Completed DS2 APT 10.2
1536	SEP Review: Backup Complete
	Down @ 13:02:05.39, Returned
	to Service @ 13:02:06:29 Backup
	Computer went Down @ 12:02:22.29
	and Returned to Service @ 12:02:23.29
	No other system or MUX failures
	Since last SEP Review
7-23-93/0249	SEP Review performed for the time period
	14:26:38.29 on 7-22-93 through
	02:43:26.29 on 7-23-93. Backup
	computer went down at 22:02:33.29 and
	was back up at 22:02:34.29. No other
	system or MUX failures observed.
	Full Backup
1038	Begin DS1 APT 10.1
1048	Completed DS1 APT 10.1
1056	SEP Review: ITC is in a full backup due to

System Problem @ 09:24:26.39
Full backup complete @ 09:24:35.99
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TEST LOG

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Date	Time	REMARKS
7/23/93	1502	Begin DS. 1 Att 10.1
	1510	Completed DS 1 Att 10.1
	1552	SED Review: Backup Computer Dropped off line @ 15:29:56.39 and Returned to Service @ 15:30:09.39 Unable to Review SED Log for Time Interval 10:56 → 12:45. SED Log Full. No Failures in MUX Failures Logged in Recorded events between 17:45 → ^{17:21:00} 16:00. Note: Backup Computer Down again @ 15:59:54.39 Returned @ 16:00:08.29.
	1602	Unable to log onto TEXU2A or TEXU2B to perform DS. 2 Att 10.2 @ this time.
7-24-93	0225	SED review performed for the time period 16:00:07.49 on 7-23-93 through 02:22:09.55 on 7-24-93. Unable to review data for time period 16:45 to 21:20. Backup computer went down at 21:21:04.95 and returned at 21:24:00.55. No other system of MUX failures observed. Rich Darnell

Procedure No.: PPT-TP-43B-12 TEST LOG Rev. 0

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Date	Time	REMARKS
7/24/93	10:15	SEALING IN TEST LOG MADE
	11:40	Performing DS1 on T102
7/24/93	12:14:30	Performing DS1 on T102
	14:45	Performing DS2 on T102. WILL CREATE HISTOGRAM PRINTOUT FROM 7/22/93 14:00 SINCE YESTERDAY PRINTOUT COULD NOT BE ACQUIRED.
7/24/93	15:00	REVIEWED SED AND OPERATOR LOGS SINCE 00:00:00 7/23/93. FOLLOWING EVENTS WERE FOUND. 1) AT 09:09:38 THE MAIN MACHINE EXECUTIVE MEXELZ LOCKED-UP AND NO SDS WOULD WORK. HAD TO PERFORM FAILOVER TO FIX THE PROBLEM. DOWNTIME: 15 MINUTES. 2) AT 15:35:19 THE TOKEN RING NETWORK went down. EBF COULD NOT ACQUIRE DATA. MS STATED IT WOULD BE DOWN UNTIL 7:00 AM MONDAY. THEY HOWEVER ACQUIRED TEMPORARY MEANS TO KEEP THE SDS TERMINALS UP. TFX CAME UP AT 17:35:00 AFTER MEXELZ WAS RESTARTED BECAUSE ALL TERMINALS WERE LOCKED UP DOWNTIME 2 HOURS. 3) AT 21:14:33 MEXELZ LOCKED ALL THE TERMINALS

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Date / Time	REMARKS
	Again. A Failover Had To Be Performed
	SDS'S WERE UP AT 21:21:04. Down
	Time 1 hour 27 minutes. Late
	NOTE: The Failover on 7/21 at 09:39
	THE EVENT STARTED AT 09:21:16 WITH
	MEXCZ FAILURE. Total Down Time
	WAS 9 MINUTES NOT 9 SECS.
	IN SUMMARY: 464 on 7/21/93
	Total Run Time: 560 Hours
	Down Time: 4 Hours 7 min
	MUX FAILURES: 9
	Failover: 6
	MEXCZ FAILURE: 3
	Network Down (Token Ring) 1
7/25/93 0206	Reviewed SED for the time period of
	14:59:39 on 7/24/93 through
	02:09:14 on 7/25/93. No system
	failures were observed. Review Done
1039	George Hansen signing in TEST Log. Begin
	performance, Data Sheet 1 At 10.1
1045	Completed D.S. 1 At 10.1
1048	SED Review: No Max a System failures Logged between
	02:09:14 hrs and 10:47:52.80 hrs.

TEST LOG

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Date	Time	REMARKS
7/24/93	1902	Begin Performance of DS 1 A++ IC.1
	1911	Completed DS1 A++ IC.1
	1911	Begin Performance of DS2 A++ IC.2
	1917	SED Review: No Mux or System Failures Logged since last SED Review.
		Category Entry for 1915 hrs 25 July 93.
		Completed DS. 2 A++ IC.2
7-26-93	0219	SED review performed for the time period of 19:16:09 on 7-25-93 through 02:17:47 on 7-26-93. No system or Mux failures observed. Rich Dumble
7/26/93	07:45	Signing into Test Log ADSSD
		Performing DS 1 on TT02.
7/26/93	09:00	Completed DS1
7/26/93	15:00	Performing DS1 and DS2 on TT02.
7/26/93	15:30	unable to Acquire Waveform of STAN station due to no available waveforms on SDS TT12 and TT18 and Run.
		Reviewed the SED and Operator Log and discussed the following failures:
		1) 7/25 11:02 to 11:29 Took Line Down TT09 and TT10 and Total Time: 27 min
		2) 7/25 13:03 to 13:44 Took Line Down TT09

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Date / Time	REMARKS
	TT10 Down TOTAL TIME: 41 min
	3) 1/25 1526 TO 1712 Taken Ring Down TT10
	and TT10 Down TOTAL TIME: 1 NR 4h min.
	Remains out of Test Log.
7-27-93/0247	No entries on screen for time period between 08:03:48 and 18:25:15 for July 26th. SED review performed for the time period of 18:25:15 on 7-26-93 through 02:33:19 on 7-27-93. MUX 26 failure at 18:25:15 and returned at 18:25:57. MUX 2A and primary system failure at 18:27:16 and 18:28:06 respectively. MUX 2A returned at 18:31:23. Primary backup without backup computer at 18:28:16. No other failures observed. Rich Darnblu
7-27-93/0628	"Late entry" should have been made on 7-27-93 @ 0247. 25% of pages for SED were from July 23, 1993 (10 of the 42 pages). Contained data that was unavailable per test log entry 7-24-93 @ 0225. Rich Darnblu

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Date / Time	REMARKS
7/27/93 09:45	Performing Performing DS1 on T107
7/27/93 09:58	Completed DS1.
7/27/93 15:00	Performing DS1 and DS2 on T102.
15:45	Completed DS1 and DS2.
	Reviewed T102 SED AND OPERATOR LOG
	AND FOUND THE FOLLOWING EVENTS.
	1) 7/26/93 18:25:07 ^{max} 26 FAILED
	WHICH CAUSED A FAILURE
	RECOVERED AT 18:28:16 Down: 3 minutes
	2) 7/27/93 13:50:18 system FAILURE
	DUE TO AFRAND8 FAILING
	Down Time: 2 minutes
	3) 7/27/93 max 2 I FAILED AT 15:12:40
	Down Time: 2 seconds
	4) 7/27/93 15:15:00 MEXC7 FAILURE, UNO
	TO BE RESET Down Time: 1 minute
	ENDING OUT OF TEST LOG
7-28-93/0307	No entries on screen (SED) for the time
	period between 14:00:18 and 17:43:17
	for 7-27-93. SED review performed for
	time period between 17:43:17 HP R067-28-93
	on 7-27-93 through 02:59:31 on
	7-28-93, MUX 2A failed at 17:43:17

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Date	Time	REMARKS
		and recovered at 17:44:17. MUX 2B failed at 17:45:18 and recovered at 17:45:44. No SED entries observed for the following time periods: Between 17:45:44 & 20:09:34 Between 20:09:36 & 21:17:34 Between 21:28:06 & 22:24:09 At 22:25:27 went from Backup System to Primary system without Backup System. Backup System returned at 22:53:00. No other system or Mux failures observed. Rich Mambili
7/28/93	09:15	AD Performing DS1
7/28/93	09:30	Completed DS1
7/28/93	14:30	Performing DS1 and DS2
7/28/93	15:00	Completed DS1 and DS2. Reviewed SED and OPERATORS LOGS from 7/27/93 16:00 To 7/28/93 15:00. From 20:00 to 23:00 THERE WAS 3 FAILURES DUE TO MANIPULATIONS BY ITC AND ENGINEERS TO PREPARE FOR THE 100% TRIP. THIS WAS PLANNED AND SHALL BE MARKED AS THREE HOURS HOLD TIME, NO OTHER EVENTS. AD

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Date	Time	REMARKS
7-29-93	0700	Performed SED review for the time period 15:01:26 on 7-28-93 through 05:52:00 on 7-29-93. No system or mux failures observed. Rich Dumble
7/29/93	09:00	Performed Performing DS1
7/29/93	09:30	Completion DS1.
7/29/93	15:00	Performing DS1 and DS2
7/29/93	15:30	Completion DS1 and DS2. Reviewed SED and operator log and viewed the following events: MUX I FAILED AT 4:05:06 7/29/93 for two seconds. MUX 6 FAILED AT 05:11:22 7/29/93 for one second. Signing out of TEST LOG. Rich Dumble
7/30/93	08:30	Performed Performing DS1
7/30/93	08:45	Completion DS1.
7/30/93	15:15	Performing DS1 and DS2. Hardware would not work.
7/30/93	15:50	Completion DS1 and DS2. Reviewed SED and operator log. NO EVENTS WHICH IMPACTED AVAILABILITY. also ^{on 7/30/93} ALSO, COLOR CIPHERS WOULD NOT WORK STATUS SCREEN SHOWS EVERYTHING GREEN EXCEPT FOR T1/2. Signing out of TEST LOG. Rich Dumble

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Date	Time	REMARKS
7/31/93	09:30	MDA/DRV 2 remaining DS1
7/31/93	09:45	Completed DS1
7/31/93	11:30	Performing DS1 and DS2
7/31/93	14:00	Completed DS1 and DS2. Indicators would not work. On status screen all is green except for TT12. Reviewed SED and Operator Logs. Viewed no events. UNICAL 1-00:00 IMPACT Availability. Significant part of test is skipped (circled)
8/2/93	1300	Begin Performance of DS1 + 10.1
	1310	Completed DS1 + 10.1
	1311	SED Review. Log Reviewed back to 23:40:35.15 No Mux or System Failure Logged. ID
	1540	Begin Performance of DS1 + DS2
		Hard Copy of Status Screen Unavailable. All Video Cameras Inoperable. All system components indicate ^{8/2/93} green except TT12, TT-18, and DIA. Archival Printer obtained for Time Period between 7/31/93 @ 1400 to 8/2/93 @ 1540hrs. No System or Mux Failures since last SED review. (circled)

TEST LOG

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Date	Time	REMARKS
8/3/93	11:23	Begin DS1 A++ 101
	11:33	Completed DS1 1011 P.1
	11:36	SEP Review: Log only goes back to 09:48:15.45. Many SDS Losses Logged No Failover Logged but may have occurred prior to 09:48:15.45. Need to have Mark Winkle block Review Operators Log.
8/3/93	14:30	Performing DS1 and DS2
8/3/93	14:30	Completed DS1 and DS2. Reviewed OPERATORS LOG AND FOUND THE FOLLOWING EVENTS SINCE 7/21/93 14:00:
		8/1 11:19:48 Mux I went Down WHICH CAUSED A FAILOVER WHICH COMPLETED AT 11:22:48. Down Time: 3min
		8/2 16:11:48 manual Failover occurred DUE TO Planned Maintenance. SYSTEM WAS UP AT 16:16:00 Hold Time: 5min
		8/3 12:16:00 a manual failover occurred TO CLEAR UP A MUXCZ Problem WHICH CAUSED VARIOUS SDS'S TO come Down Down Time: one minute
		TOTALS ARE AS FOLLOWS:

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Date	Time	REMARKS
		Total Time: 29 days 4 hrs
		Dawn Time: 7 hrs 11 min
		Mux Failures: 14
		Failures: 10
		Muxes: 5
		Network: 4
		Hold Time: 3 hr 5 min
8/4/03	05:00	AA Performed DS1
8/4/03	05:15	Completed DS1.
8/4/03	13:45	to Performing DS1 and DS2
8/4/03	14:00	Completed DS1. HAS I was signing off on the hardware noticed a SPDS Parameter Failure on the trend display.
8/4/03	15:00	Discovered that ITC maintenance was working on Power Supplies in cabinet H. Dropped a screw in the HV Power Supply. Had to power down which caused Mux H to fail and the system to fail over. Continued with DS2.
8/4/03	15:30	Completed DS2. Reviewed Operator Log to 1305 to today. Found no events which would impact Availability signing off of Test Log AA .

TEST LOG

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[illegible]

ATTACHMENT F

PPT-TP-93B-12
PLANT COMPUTER SYSTEM AVAILABILITY TEST

COMANCHE PEAK STEAM ELECTRIC STATION

UNIT 2

TESTING MANUAL

QUALITY RELATED

C364

PLANT PROCESS COMPUTER
AVAILABILITY TEST

PROCEDURE NO. PPT-TP-93B-12

REVISION NO. 0

TRG MEETING NO. 93-013 DATE: 2/25/93

EFFECTIVE DATE: 3/2/93

EXPIRATION DATE: 9/1/93

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PREPARED BY: (PRINT) MARK A. WINKELBLECH EXT. 7975

TECHNICAL REVIEW BY: (PRINT) MICHAEL CARRERA EXT. 5940

APPROVED BY: MW [Signature] DATE: 2/27/93
MAINTENANCE ENGINEERING MANAGER

CPSES TESTING MANUAL	UNIT 2	PROCEDURE NO. PPT-TP-93B-12
PLANT PROCESS COMPUTER AVAILABILITY TEST	REVISION NO. 0	PAGE 2 OF 31

1.0 PURPOSE

The purpose of this procedure is to provide Engineering Data which will satisfy the availability criteria for the Safety Parameter Display System as stated in the FSAR response to the NRC Action Plan Developed as a Result of the TMI-2 accident. This testing is outlined by commitment #23164.

2.0 ACCEPTANCE AND REVIEW CRITERIA

2.1 Acceptance Criteria

None

2.2 Review Criteria

2.2.1 Design Engineering (Computer Group) has received the test data and determined the SPDS system to be considered 99% "AVAILABLE" for a 720 hour (30 day) duration.

MAW / 5/16/93
INITIAL DATE

3.0 DEFINITIONS AND ACRONYMS

3.1 Definitions

- SPDS Availability - calculated by using the following formula:

$$\text{Availability} = \frac{720 - \text{Down Time (Total Hours)}}{720} \times 100\%$$

- Down Time - Any length of time the data system is unavailable. Down Time occurs whenever the following criteria for successful operation are not satisfied:

- 1) The Plant Computer CPU is processing as determined by verifying that display parameters and the Time (located in the upper right hand corner of each SDS) are continuously updating.
- 2) Ability to access the critical SPDS screens.
- 3) "SPDS Parameter Failure" is not displayed on any of the critical screens.
- 4) At least one of the Satellite Display Stations located in each of the Emergency Response Facilities is able to display the critical SPDS screens. The SDS configuration for the emergency response facilities is shown on the status display as follows:

Control Room: TT05, TT06, TT07, TT08, TT09

TSC : TT01, TT02, TT03
EOF : TT10, TT11

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CPSSES TESTING MANUAL	UNIT 2	PROCEDURE NO. PPT-TP-93B-12
PLANT PROCESS COMPUTER AVAILABILITY TEST	REVISION NO. 0	PAGE 3 OF 31

- Critical SPDS screens - SPDS display which will be used to determine availability. They are listed below with their associated turn on code.

<u>CATEGORY</u>	<u>DISPLAY</u>	<u>TOC</u>
TOP LEVEL	OPERATION	OPER
ERG SUM	LOCA/LOSC SGTR SG ISOL FOLDOUT	LOCA SGTR SGISOL FOLDOUT
RVLIS	DISPLAY	RVLISD
SPDS TRENDS		
RCS TRENDS	RCS PRESS TEMP LOOP 1 & 2 TEMP LOOP 3 & 4 TEMP	RCS PTMP L12T L34T
SG TRENDS	MSL PRESS SG NR LVL SG WR LVL STM FLOW FW FLOW AFW FLOW	MSL SGNRL SGWRL STMF FWF AFWF
CONTAINMENT PARAMETER TRENDS	LPR HHT	LPR HHT
OTHER TRENDS	NIS RAD MON TANK LVLS	NIS RADM TANK

- Hold Time - Contingencies, such as Software Modifications or Plant in Mode 5 or 6, may occur that causes the system to be down, but at the same time are not considered downtime for the purpose of ensuring system availability. During such periods of "Hold Time", the 720 hour availability clock will be stopped until the Hold Time period ends at which time the clock will restart.

3.2 ACRONYMS

- SDS - Satellite Display Station
- TOC - Turn On Code
- PC - Plant Computer
- TSC - Technical Support Center

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CPSES TESTING MANUAL	UNIT 2	PROCEDURE NO. PPT-TP-93B-12
PLANT PROCESS COMPUTER AVAILABILITY TEST	REVISION NO. 0	PAGE 4 OF 31
<ul style="list-style-type: none"> * EOF - Emergency Offsite Facility * SPDS - Safety Parameter Display System * ERF - Emergency Response Facilities * ERFCS - Emergency Response Facilities Computer System * MMI - Man - Machine Interface 		
4.0 <u>REFERENCES</u>		
4.1 Performance References		
None		
4.2 Development References		
4.2.1 Drawings		
None		
4.2.2 Technical Documents		
<ul style="list-style-type: none"> * FSAR - Response to the NRC Action Plan Developed As a Result of the TMI-2 Accident, Section III.A.1.2 Response V, SAFETY PARAMETER DISPLAY SYSTEM. * CPES-I-2024, Rev. 0, Plant Process Computer System * CPES-I-2036, Rev. 0, Plant Computer System Functional Requirements * Commitment tracking #23164 - Perform a 30 day availability test to quantify SPDS availability. 		
5.0 <u>PRECAUTIONS LIMITATIONS NOTES</u>		
5.1 Precautions		
None		
5.2 Limitations		
None		
5.3 Notes		
5.3.1 All printouts produced by this procedure shall be identified with its associated step number and retained as supporting documentation.		

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CPSES TESTING MANUAL	UNIT 2	PROCEDURE NO. PPT-TP-03B-12
PLANT PROCESS COMPUTER AVAILABILITY TEST	REVISION NO. 0	PAGE 5 OF 31

- 5.3.2 To activate functions, the use of turn-on-codes (TOC) are used. This procedure will identify the turn-on code that will be used to complete the tasks. By typing in the code or touching the block displayed on the screen which contains the turn-on code, the function will activate. If an SDS will not accept a turn-on code due to the present screen which is displayed the "CANCEL" key may be used to return to the turn-on code cursor.
- 5.3.3 To get a Hard Copy of Group Display or Group Tabular Trends, Press both "CTRL and F20" on the SDS keyboard at the same time. The Hard Copy will be produced on Video Copier assigned to the SDS.
- 5.3.4 The following test method will be used to retrieve data to determine availability of the Plant Computer System. Prior to entering Section 8.0 and starting the 30 day clock, a prerequisite must be satisfied in that all SPDS screens will be validated against the definition of Down Time. Once this prerequisite is satisfied the clock will start. The SPDS screens will be evaluated twice every 24 hours. An archive file will be produced once every 24 hours identifying system status. The System Event Messages will be reviewed every day for system and process failures. Each SPDS screen evaluation and System Status will be forwarded to Design Engineering (Computer Group) for evaluation. Upon failures and Down Time, Design Engineering will Determine Impact on availability and impact on the 30 day clock. Restart of the 30 day clock from day 1 or resume from the point of failure is the responsibility of Design Engineering. Upon successful accumulation of data for a 30 day period and an availability of 99% or greater (as determined by Design Engineering), the test will be terminated.
- 5.3.5 The SPDS screens will be evaluated on one SDS only. Verification of the SDS status throughout the Plant Computer system will verify the availability of the SPDS screens to each Emergency Response Facilities.

6.0 PREREQUISITES

- [SS]6.1 The shift supervisor or Unit 2 supervisor has been briefed on the scope of testing to be performed, including the applicable Precautions, Limitations and Notes (Section 5.0), and has granted permission to perform the prerequisite steps which affect Plant Conditions.

NW , 4/5/93
SHIFT SUPV. DATE

- 6.2 The applicable active clearances have been reviewed. None of the outstanding items will prevent conduct of this test nor invalidate test results upon restoration.

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NW , 4/5/93
INITIAL DATE

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- 6.3 The Temporary Modification Log has been reviewed and found not to preclude the satisfactory conduct of this test.

mm / 4/5/93
INITIAL DATE

- 6.4 The Plant is in Mode 1, 2, 3 or 4.

mm / 4/5/93
INITIAL DATE

- 6.5 From an SDS, Select each SPDS screen as shown in Figures 1 through 21 and perform the following:

- a) Verify each screen is updating the time and displayed parameters.
- b) Verify each screen is free of "SPDS Parameter Failure" messages.
- c) Acquire a hardcopy printout of each screen.

- 6.6 From an SDS, acquire a hardcopy printout of the STATUS screen.

mm / 4/5/93
INITIAL DATE

- 6.7 From the system console, print out the response to the command WH to determine all required Computer processes are operable.

mm / 4/5/93
INITIAL DATE

- 6.8 Allow Design Engineering (Computer Group) to evaluate the SPDS screens and STATUS hardcopy printouts and receive concurrence that the 30 day availability clock may be started.

mm / 4/5/93
INITIAL DATE

7.0 TEST EQUIPMENT

None

8.0 INSTRUCTIONS

- [SS] 8.1 The Shift Supervisor has been notified of the completion of the applicable prerequisites and has granted permission to conduct this test.

mm / 4/6/93
SHIFT SUPV. DATE

NOTE: Data acquisition will continue until notice to terminate data collection from Design Engineering has been received.

- 8.2 Acquire the following data twice every 24 hour period and forward the documentation to Design Engineering for the duration of the availability 30 day period:

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CPSES TESTING MANUAL	UNIT 2	PROCEDURE NO. PPT-TP-93B-12
PLANT PROCESS COMPUTER AVAILABILITY TEST	REVISION NO. 0	PAGE 7 OF 31

- 8.2.1 Display each critical SPDS screen listed on Data Sheet 1. Signify completion on Data Sheet 1.
- 8.2.2 Verify each screen is updating the time and displayed parameters. Signify completion on Data Sheet 1.
- 8.2.3 Verify each screen is not displaying a "SPDS Parameter Failure" message. Signify completion on Data Sheet 1.
- 8.3 Acquire the following data once every 24 hour period and forward the documentation to Design Engineering for the duration of the availability 30 day period:
- 8.3.1 Acquire a hard copy printout of the "STATUS" display. Signify completion on Data Sheet 2.
- 8.3.2 Acquire an archival printout for the following system addresses: Signify completion on Data Sheet 2:
- 8.3.2.1 SYS200 MMI STATUS OF SDS TT01
- 8.3.2.2 SYS201 MMI STATUS OF SDS TT02
- 8.3.2.3 SYS202 MMI STATUS OF SDS TT03
- 8.3.2.4 SYS204 MMI STATUS OF SDS TT04
- 8.3.2.5 SYS205 MMI STATUS OF SDS TT06
- 8.3.2.6 SYS206 MMI STATUS OF SDS TT07
- 8.3.2.7 SYS207 MMI STATUS OF SDS TT08
- 8.3.2.8 SYS208 MMI STATUS OF SDS TT09
- 8.3.2.9 SYS209 MMI STATUS OF SDS TT10
- 8.3.2.10 SYS210 MMI STATUS OF SDS TT11
- 8.3.3 Activate turn-on-code SED and review the display for any System Event Messages which identifies system or process failures which occurred in the previous 24 hour time period.
- 9.0 RESTORATION
- 9.1 The Shift Supervisor has been notified of the successful completion of this test.

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[Signature] 8-16-93
SHIFT SUPV. DATE

CPSES TESTING MANUAL	UNIT 2	PROCEDURE NO. PPT-TP-93B-12
PLANT PROCESS COMPUTER AVAILABILITY TEST	REVISION NO. 0	PAGE 8 OF 31

10.0 ATTACHMENTS/FORMS

- ATTACHMENT 10.1 - DATA SHEET 10.1, SPDS LOG DATA SHEET
- ATTACHMENT 10.2 - DATA SHEET 10.2, STATUS LOG DATA SHEET
- ATTACHMENT 10.3 - FIGURE 1, SPDS DISPLAY: TOP LVL - OPERATION
- ATTACHMENT 10.4 - FIGURE 2, SPDS DISPLAY: ERG SUM - LOCA/LOSC
- ATTACHMENT 10.5 - FIGURE 3, SPDS DISPLAY: ERG SUM - SGTR
- ATTACHMENT 10.6 - FIGURE 4, SPDS DISPLAY: ERG SUM - SG ISOL
- ATTACHMENT 10.7 - FIGURE 5, SPDS DISPLAY: ERG SUM - FOLDOUT
- ATTACHMENT 10.8 - FIGURE 6, SPDS DISPLAY: RVLIS - DISPLAY
- ATTACHMENT 10.9 - FIGURE 7, SPDS DISPLAY: RCS TRENDS - RCS
- ATTACHMENT 10.10 - FIGURE 8, SPDS DISPLAY: RCS TRENDS - PRESS TEMP
- ATTACHMENT 10.11 - FIGURE 9, SPDS DISPLAY: RCS TRENDS - LOOP 1&2 TEMP
- ATTACHMENT 10.12 - FIGURE 10, SPDS DISPLAY: RCS TRENDS - LOOP 3&4 TEMP
- ATTACHMENT 10.13 - FIGURE 11, SPDS DISPLAY: SG TRENDS - MSL PRESS
- ATTACHMENT 10.14 - FIGURE 12, SPDS DISPLAY: SG TRENDS - SG NR LVL
- ATTACHMENT 10.15 - FIGURE 13, SPDS DISPLAY: SG TRENDS - SG WR LVL
- ATTACHMENT 10.16 - FIGURE 14, SPDS DISPLAY: SG TRENDS - STM FLOW
- ATTACHMENT 10.17 - FIGURE 15, SPDS DISPLAY: SG TRENDS - FW FLOW
- ATTACHMENT 10.18 - FIGURE 16, SPDS DISPLAY: SG TRENDS - AFW FLOW
- ATTACHMENT 10.19 - FIGURE 17, SPDS DISPLAY: CONTAINMENT PARAMETER TRENDS - LPR
- ATTACHMENT 10.20 - FIGURE 18, SPDS DISPLAY: CONTAINMENT PARAMETER TRENDS - HMT
- ATTACHMENT 10.21 - FIGURE 19, SPDS DISPLAY: OTHER TRENDS - NIS
- ATTACHMENT 10.22 - FIGURE 20, SPDS DISPLAY: OTHER TRENDS - RAD MON
- ATTACHMENT 10.23 - FIGURE 21, SPDS DISPLAY: OTHER TRENDS - TANK LVLS

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ATTACHMENT G

PLANT COMPUTER SYSTEM WORK ORDER LISTING

PRG: LCZ-02PC
DATE: 1993-09-07
TIME: 15:09:57
ATTN: ROB BISHOP

PLANT RELIABILITY - AN INTEGRATED SYSTEM FOR MANAGEMENT
UNIT 2 SYSTEM PC WORK ORDERS COMPLETED BETWEEN 7/1 AND 8/8/1993
FOR INFORMATION ONLY ***

AR/NO NUMBER	UNIT	SYS	ET	ST	TAG NUMBER	DESCRIPTION	STATUS	REQUIREMENTS	LOCATION	PROBLEM SUMMARY	WORK SUMMARY	IMP REV
2-93-049804-00	CP2	PC	C	NA	ICX-PCDCP-00	PLANT COMPUTER SYSTEM MAIN FRAME CA	REINVT 2-00			INIT DOC/INIT DCC NO.		
ENDB-EEIF										TARG DT:1993-07-02		IMP REV OF
CM PRI:3 CLR:N	UN:16	SY:EI	TR:EI	EQ:OU	MS:	DJRNAT:00020	STAT:CLOSED			ADJ SDO:1993-07-03		TX TIL THERMAL AT 100 PCW WORK WEEK:2808
CLN:	BL:CB	EL:0830	RM:K-136	AVAL:2PM		W3 LUC:AVCC				AC CUMP:1993-07-20		IMPLEMENT UCN 93-6625
						PLNR:CLARKE				AC CUMP:1993-07-03		COMMENT:TRANS 9300220
										SEN DT:1993-07-02		AC2/UCN -93-00IMP REV: 0/ -
1-93-045460-00	CPX	PC	C	NA	CPX-PCUACP-11	EMERGENCY RESPONSE FACILITY REMOTE				TARG DT:1993-04-30		AT RISK TO CORRECT
PMIC-PMIC										ADJ SDO:1993-07-07		REWORK CARD WIKING
CM PRI:5 CLR:N	UN:15	SY:EI	TR:EI	EQ:EI	MS:VI	DJRNAT:00040	STAT:CLOSED			STAT DT:1993-07-26		COMMENT:TRANS 9300228
CLN:	BL:IB	EL:0893	RM:2-283	AVAL:2PM		W3 LUC:AVCC				AC CUMP:1993-07-08		AC CUMP:1993-07-08
						PLNR:ABJRENI				SEN DT:1993-04-30		ARI/93-045460
												IMP REV:Y / 1993-05-03
1-93-046457-00	CP2	PC	C	NA	ICX-PCDCP-02AR	PLANT COMPUTER UNIT 2 CAB 02 DEMJLT				TARG DT:1993-05-28		MCB BAD LOGIC BOARD
145840										ADJ SDO:1993-07-06		TRUGLES300T/REWORK
PMIC-PMIC										STAT DT:1993-07-29		COMMENT:TRANS 9300229
CM PRI:4 CLR:N	UN:15	SY:EI	TR:EI	EQ:OU	MS:VI	DJRNAT:00080	STAT:CLOSED			AC CUMP:1993-07-09		AC CUMP:1993-07-09
CLN:	BL:CB	EL:0830	RM:K-136	AVAL:2PM		W3 LUC:AVCC				SEN DT:1993-05-14		ARI/93-045457
						PLNR:4315551						IMP REV:Y / 1993-05-18
1-93-048615-00	CP2	PC	C	NA	CP2-PCDCP-10	PLANT COMPUTER SYSTEM NETWORK INTER				TARG DT:1993-07-11		IMPLEMENT UCA 100534 R/S
123895										ADJ SDO:1993-07-13		IMPLEMENT UCA 100534
PMIC-PMIC										STAT DT:1993-07-28		COMMENT:TRANS 9300231
CM PRI:4 CLR:N	UN:16	SY:EI	TR:EI	EQ:OU	MS:VI	DJRNAT:00100	STAT:CLOSED			AC CUMP:1993-07-14		AC CUMP:1993-07-14
CLN:	BL:CB	EL:0830	RM:K-136	AVAL:2PM		W3 LUC:AVCC				SEN DT:1993-06-16		ARI/93-048615
						PLNR:03151E1						IMP REV:Y / 1993-06-30
2-93-050193-20	CP2	PC	C	NA	CP2 SUB 0000000000	PLANT COMPUTERS (UNIT 2)				TARG DT:1993-07-18		SPDS RCS PRESSURE/TEMP
PMIC-PMIC										ADJ SDO:1993-07-22		IMPLEMENT UCN
CM PRI:5 CLR:N	UN:16	SY:IN	TR:IN	EQ:IN	MS:VI	DJRNAT:00080	STAT:CLOSED			STAT DT:1993-08-03		COMMENT:TRANS 9300237
CLN:	BL:CB	EL:0830	RM:K-136	AVAL:2PM		W3 LUC:AVCC				AC CUMP:1993-07-20		AC CUMP:1993-07-20
						PLNR:08WELLS2				SEN DT:1993-07-09		AC2/UCN -93-00IMP REV:Y0/ 1993-07-14
2-93-050204-30	CP2	PC	C	NA	CP2 SUB 0000000000	PLANT COMPUTERS (UNIT 2)				TARG DT:1993-07-18		SOFTWARE & DATABASE CHANG
PMIC-PMIC										ADJ SDO:1993-07-22		IMPLEMENT UCN
CM PRI:5 CLR:N	UN:16	SY:IN	TR:IN	EQ:IN	MS:VI	DJRNAT:00080	STAT:CLOSED			STAT DT:1993-08-03		COMMENT:TRANS 9300237
CLN:	BL:CB	EL:0830	RM:K-136	AVAL:2PM		W3 LUC:AVCC				AC CUMP:1993-07-20		AC CUMP:1993-07-20
						PLNR:08WELLS2				SEN DT:1993-07-09		AC2/UCN -93-00IMP REV:Y0/ 1993-07-14
3-93-303889-01	CP2	PC	C	NA	ICX-PCDCP-09	PLANT COMPUTER SYS. UNIT 2 TEND P2				TARG DT:1993-07-25		CLEAN AND INSPECT
FREQ: 00182										ADJ SDO:1993-07-29		CLEAN AND INSPECT
PMIC-PMIC										STAT DT:1993-08-03		COMMENT:TRANS 9300240
CM PRI:5 CLR:N	UN:16	SY:IN	TR:IN	EQ:OU	MS:	DJRNAT:00020	STAT:CLOSED			AC CUMP:1993-07-27		AC CUMP:1993-07-27
CLN:	BL:CB	EL:0830	RM:K-135	AVAL:PM-CUVV	PLNR:SPJSTUV1	W3 LUC:AVCC				SEN DT:1993-05-18		PH/303888
												IMP REV:Y / 1993-06-15
3-93-303889-01	CP2	PC	C	NA	ICX-PCDCP-10	PLANT COMPUTER SYS. UNIT 2 LUG P1V				TARG DT:1993-07-01		CLEAN AND INSPECT
FREQ: 00182										ADJ SDO:1993-07-30		CLEAN AND INSPECT
PMIC-PMIC										STAT DT:1993-08-03		COMMENT:TRANS 9300240
CM PRI:5 CLR:N	UN:15	SY:IN	TR:IN	EQ:OU	MS:	DJRNAT:00020	STAT:CLOSED			AC CUMP:1993-07-27		AC CUMP:1993-07-27
CLN:	BL:CB	EL:0830	RM:K-135	AVAL:PM-CUVV	PLNR:SPJSTUV1	W3 LUC:AVCC				SEN DT:1993-05-18		PH/303888
												IMP REV:Y / 1993-06-15
2-93-050204-30	CP2	PC	C	NA	CP2 SUB 0000000000	PLANT COMPUTERS (UNIT 2)				TARG DT:1993-07-18		SPDS RCS PRESSURE/TEMP
PMIC-PMIC										ADJ SDO:1993-07-22		IMPLEMENT UCN
CM PRI:5 CLR:N	UN:16	SY:IN	TR:IN	EQ:IN	MS:VI	DJRNAT:00080	STAT:CLOSED			STAT DT:1993-08-03		COMMENT:TRANS 9300237
CLN:	BL:CB	EL:0830	RM:K-136	AVAL:2PM		W3 LUC:AVCC				AC CUMP:1993-07-20		AC CUMP:1993-07-20
						PLNR:08WELLS2				SEN DT:1993-07-09		AC2/UCN -93-00IMP REV:Y0/ 1993-07-14
3-93-303889-01	CP2	PC	C	NA	ICX-PCDCP-09	PLANT COMPUTER SYS. UNIT 2 TEND P2				TARG DT:1993-07-25		CLEAN AND INSPECT
FREQ: 00182										ADJ SDO:1993-07-29		CLEAN AND INSPECT
PMIC-PMIC										STAT DT:1993-08-03		COMMENT:TRANS 9300240
CM PRI:5 CLR:N	UN:16	SY:IN	TR:IN	EQ:OU	MS:	DJRNAT:00020	STAT:CLOSED			AC CUMP:1993-07-27		AC CUMP:1993-07-27
CLN:	BL:CB	EL:0830	RM:K-135	AVAL:PM-CUVV	PLNR:SPJSTUV1	W3 LUC:AVCC				SEN DT:1993-05-18		PH/303888
												IMP REV:Y / 1993-06-15
2-93-050193-20	CP2	PC	C	NA	CP2 SUB 0000000000	PLANT COMPUTERS (UNIT 2)				TARG DT:1993-07-18		SPDS RCS PRESSURE/TEMP
PMIC-PMIC										ADJ SDO:1993-07-22		IMPLEMENT UCN
CM PRI:5 CLR:N	UN:16	SY:IN	TR:IN	EQ:IN	MS:VI	DJRNAT:00080	STAT:CLOSED			STAT DT:1993-08-03		COMMENT:TRANS 9300237
CLN:	BL:CB	EL:0830	RM:K-136	AVAL:2PM		W3 LUC:AVCC				AC CUMP:1993-07-20		AC CUMP:1993-07-20
						PLNR:08WELLS2				SEN DT:1993-07-09		AC2/UCN -93-00IMP REV:Y0/ 1993-07-14
3-93-303889-01	CP2	PC	C	NA	ICX-PCDCP-09	PLANT COMPUTER SYS. UNIT 2 TEND P2				TARG DT:1993-07-25		CLEAN AND INSPECT
FREQ: 00182										ADJ SDO:1993-07-29		CLEAN AND INSPECT
PMIC-PMIC										STAT DT:1993-08-03		COMMENT:TRANS 9300240
CM PRI:5 CLR:N	UN:16	SY:IN	TR:IN	EQ:OU	MS:	DJRNAT:00020	STAT:CLOSED			AC CUMP:1993-07-27		AC CUMP:1993-07-27
CLN:	BL:CB	EL:0830	RM:K-135	AVAL:PM-CUVV	PLNR:SPJSTUV1	W3 LUC:AVCC				SEN DT:1993-05-18		PH/303888
												IMP REV:Y / 1993-06-15

PROC: LC22-02PC
DATE: 1993-09-07
TIME: 15:09:57
ATTN: ROR BISHOP

PLANT RELIABILITY - AN INTEGRATED SYSTEM FOR MANAGEMENT
UNIT 2 SYSTEM PC WORK ORDERS COMPLETED BETWEEN 7/1 AND 8/15/1993
*** FOR INFORMATION ONLY ***

AR/NO NUMBER	UNIT	SYS	ST	TAG	NUMBER	DESCRIPTION	STATUS	REQUIRE	LOCATION	PROBLEM SUMMARY	INIT	DATE	TIME	WORK	WEEK	PREMIS
1-93-046334-00	CP2	PC	C	NA	PCDCP-00	EMERGENCY RESPONSE FACILITY REMOTE	MS:NI	AVAIL:2PM	PLANT	INIT DGC/INIT DGC NO.	1-93-046334	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
PMIC-PMIC	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	PROBLEM SUMMARY	1-93-046334	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CM PRI:5 CLR:N	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	WORK SUMMARY	1-93-046334	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CLN:	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	INIT DGC/INIT DGC NO.	1-93-046334	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
1-93-046842-00	CP2	PC	C	NA	PCDCP-00	EMERGENCY RESPONSE FACILITY REMOTE	MS:NI	AVAIL:2PM	PLANT	INIT DGC/INIT DGC NO.	1-93-046842	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
PMIC-PMIC	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	PROBLEM SUMMARY	1-93-046842	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CM PRI:5 CLR:N	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	WORK SUMMARY	1-93-046842	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CLN:	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	INIT DGC/INIT DGC NO.	1-93-046842	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
1-93-047126-00	CP2	PC	C	NA	PCDCP-00	EMERGENCY RESPONSE FACILITY REMOTE	MS:NI	AVAIL:2PM	PLANT	INIT DGC/INIT DGC NO.	1-93-047126	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
PMIC-PMIC	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	PROBLEM SUMMARY	1-93-047126	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CM PRI:5 CLR:N	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	WORK SUMMARY	1-93-047126	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CLN:	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	INIT DGC/INIT DGC NO.	1-93-047126	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
1-93-315747-01	CP2	PC	C	NA	PCDCP-00	EMERGENCY RESPONSE FACILITY REMOTE	MS:NI	AVAIL:2PM	PLANT	INIT DGC/INIT DGC NO.	1-93-315747	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
FREQ: 00182	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	PROBLEM SUMMARY	1-93-315747	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
PMIC-PMIC	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	WORK SUMMARY	1-93-315747	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CM PRI:5 CLR:Y	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	INIT DGC/INIT DGC NO.	1-93-315747	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CLN:	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	PROBLEM SUMMARY	1-93-315747	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
1-93-040877-00	CP2	PC	C	NA	PCDCP-00	EMERGENCY RESPONSE FACILITY REMOTE	MS:NI	AVAIL:2PM	PLANT	INIT DGC/INIT DGC NO.	1-93-040877	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
EPT-ET**	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	PROBLEM SUMMARY	1-93-040877	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
GG PRI:5 CLR:N	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	WORK SUMMARY	1-93-040877	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CLN:	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	INIT DGC/INIT DGC NO.	1-93-040877	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
1-93-043643-00	CP2	PC	C	NA	PCDCP-00	EMERGENCY RESPONSE FACILITY REMOTE	MS:NI	AVAIL:2PM	PLANT	INIT DGC/INIT DGC NO.	1-93-043643	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
PMIC-PMIC	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	PROBLEM SUMMARY	1-93-043643	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CM PRI:5 CLR:N	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	WORK SUMMARY	1-93-043643	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CLN:	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	INIT DGC/INIT DGC NO.	1-93-043643	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
1-93-043997-00	CP2	PC	C	NA	PCDCP-00	EMERGENCY RESPONSE FACILITY REMOTE	MS:NI	AVAIL:2PM	PLANT	INIT DGC/INIT DGC NO.	1-93-043997	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
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GG PRI:5 CLR:N	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	WORK SUMMARY	1-93-043997	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CLN:	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	INIT DGC/INIT DGC NO.	1-93-043997	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
1-93-052445-00	CP2	PC	C	NA	PCDCP-00	EMERGENCY RESPONSE FACILITY REMOTE	MS:NI	AVAIL:2PM	PLANT	INIT DGC/INIT DGC NO.	1-93-052445	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
PMIC-PMIC	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	PROBLEM SUMMARY	1-93-052445	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CM PRI:5 CLR:N	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	WORK SUMMARY	1-93-052445	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CLN:	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	INIT DGC/INIT DGC NO.	1-93-052445	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
1-93-052445-00	CP2	PC	C	NA	PCDCP-00	EMERGENCY RESPONSE FACILITY REMOTE	MS:NI	AVAIL:2PM	PLANT	INIT DGC/INIT DGC NO.	1-93-052445	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
PMIC-PMIC	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	PROBLEM SUMMARY	1-93-052445	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CM PRI:5 CLR:N	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	WORK SUMMARY	1-93-052445	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14
CLN:	UN:15	SV:EI	TR:EI	EQ:EI	MS:NI	AVAIL:2PM	PLANT	PLANT	PLANT	INIT DGC/INIT DGC NO.	1-93-052445	1993-06-14	15:09:57	1993-06-14	1993-06-14	1993-06-14

ATTACHMENT H

ABBREVIATIONS AND ACRONYMS

CPSES	-	Comanche Peak Steam Electric Station
CPU	-	Central Processing Unit
EOF	-	Emergency Operations Facility
ERF	-	Emergency Response Facility
ERFCS	-	Emergency Response Facility Computer System
FSAR	-	Final Safety Analysis Report
I&C	-	Instrumentation & Controls
MMI	-	Man-Machine Interface
Mux	-	Multiplexer
NRC	-	Nuclear Regulatory Commission
ONE	-	Operational Notification and Evaluation
OPS	-	Operations
P&T	-	Performance and Test
PCS	-	Plant Computer System
PMS	-	Plant Monitoring System
PPT	-	Performance and Test Procedure
PRI	-	Primary
RG	-	Regulatory Guide
SAIC	-	Science Applications Incorporated, Corporation
SDS	-	Satellite Display Station
SED	-	System Event Display
SER	-	Safety Evaluation Report

SPDS	-	Safety Parameter Display System
SSER	-	Supplement to the Safety Evaluation Report
STA	-	Station Administrative Procedure
TAB	-	Tabular
TE	-	Technical Evaluation
Telecomm	-	Telecommunications
TMI	-	Three Mile Island
TSC	-	Technical Support Center
V&V	-	Verification and Validation