SUPPLEMENTAL REPORT
TO THE
DETAILED CONTROL ROOM DESIGN REVIEW
FINAL SUMMARY REPORT

FOR

NINE MILE POINT UNIT 1

Submitted by:

Niagara Mohawk Power Corporation

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NMP:98-558-32-05

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SECTION 1

INTRODUCTION

This report describes the results of the Supplemental Detailed Control Room Design Review (DCRDR) efforts for Nine Mile Point Unit 1 (NMP-1). Included is a description of the follow-on activities that have been completed since the NMP-1 Final Summary Report was submitted. Thirty-four new Human Engineering Observations (HEOs) have been identified as a result of the follow-on activities; these are contained in Appendix A.

The Safety Evaluation Report (SER) for NMP-1 recommends that certain actions be taken to fulfill the DCRDR requirements of Supplement 1 to NUREG-0737. This report addresses each of the NRC findings described in the conclusion section of the SER, as listed in Table 1-1. The appendices to the Technical Evaluation Report (TER) identified HEOs which required clarification or elaboration. In response to the findings of these appendices, the HEOs contained in Appendix B of this report have been revised. Appendix C lists the status of all NMP-1 HEOs resulting from the DCRDR and follow-on activities.

Table 1-1. SER Conclusions Addressed in this Report

CONCLUSIONS FROM SER - ACTIVITIES TO BE COMPLETED	SECTION OF REPORT
Update of the function and task analysis using Revision 2 of the NMP-1 EPGs and comparison of any new or modified display and control requirements identified by this update with the control room inventory.	2.1 Appendix D
Measurement of temperature, humidity, and ventilation in the control room.	2.2
Survey of the instrumentation required to satisfy Reg. Guide 1.97.	2.3
Assessment of HEOs identified by ongoing activities.	3.1 Appendix A
Selection of design improvements for HEOs in the functional fix group and selection of design improvements for significant HEOs identified by ongoing DCRDR activities.	2.4 2.5.3 Appendix A
Verification of function fixes, correction of HEOs identified by ongoing DCRDR activities, and training resolutions for HEOs.	2.5.3 Appendix A
Outline proposed control room changes resulting from the above activities.	Section 2 Appendix A
Outline proposed schedules for implementing those changes.	Section 2 Appendix C
Provide summary justification for those HEOs with safety significance resulting from the above activities to be left uncorrected or partially corrected.	Appendix A
Identify the actual staffing for each activity required to complete the DCRDR.	3.2
Address the staff's concern related to scheduling verification of HEO corrections following implementation.	2.5.2
Provide more definitive descriptions of HEOs and proposed corrective actions or justifications for not correcting those HEOs identified in Appendix A through D of the TER.	Appendix B

SECTION 2

FOLLOW-ON ACTIVITIES

2.1 Function and Task Analysis

The results of the original NMP-1 task analysis were reported in July 1, 1985, as part of the Final Summary Report. The Revision 2 emergency Procedure Guidelines (EPGs) were completed by Operations Engineering, Inc. (OEI) in april 1986. A follow-on analysis was performed to ensure the comprehensiveness of the task analysis. An engineering systems analysis was also performed by NMP-1 Operations as part of the validation of the Emergency Operating Procedures (EOPs). This dual approach to the analysis of the revised procedures provided a thorough evaluation of their impact upon plant operation both from a control room and overall viewpoint. The task analysis, performed by ARD Corporation, provided a comprehensive listing of the detailed operational tasks, instruments, and controls required to execute the procedures, and the systems engineering analysis identified support requirements and overall operator concerns.

2.1.1 Task Analysis Update

The follow-on task analysis with the Revision 2 EPGs was built upon the original task analysis methodology that is described in the Final Summary Report. The format of the Revision 2 EPGs presents each procedure as it appeared in Revision 0, how it appears in Revision 2, and a description of the differences. Where a change in the EPGs was identified, Revision 2 was compared against the task description forms developed in the

original task analysis. Tasks in the Revision 2 EPGs that were not included on the original task description forms were considered to be new tasks. This comparison was performed for all Revision 2 procedures. From this process, 29 new tasks were identified. A complete list of all plant-specific tasks is presented in Appendix D.

The new tasks were examined in the same manner as during the original task analysis. Human factors specialists asked a subject matter expert familiar with NMP-1 operations to describe the action steps required for each task. The control and display requirements for each action step were specified and were then coded on the task analysis form.

A verification was performed to evaluate the availability and suitability of the information and control requirements identified during the task analysis. The verification of the control and display requirements of the new tasks identified in the Revision 2 EPGs was performed in the NMP-1 simulator. No new HEOs were identified from this verification.

2.1.2 Engineering Systems Analysis

The engineering systems analysis was performed by NMP-1 operations personnel to validate the EOPs on a broader, systems basis. Another purpose of this analysis was to identify any system/equipment enhancements that would globally facilitate the operator's response to an emergency. Each task in the final EOPs was examined to identify any operational complications requiring special attention or additional operator action that might otherwise be eliminated. Checks and sample calculations were performed to verify that the parameters stated in the EOPs were consistent with the instrumentation and controls available to the operator and the operational limitations of the various plant systems. The final EOPs were then reviewed to identify any specific concerns that needed to be addressed in operator

training classes. Seven new HEOs, shown in Appendix A, were identified by the engineering systems analysis; these have been given the prefix EA.

2.2 Control Room Temperature and Ventilation

Modifications to the control room ventilation system are scheduled (Modification Request Number 82-90) for the 1990 refueling outage. The proposed changes will enable better control of the control room environment. Temperature, humidity, and air velocity measurements, for normal and emergency operation, will be taken after the completion of the modifications.

2.3 Regulatory Guide 1.97 Modifications

No new instrumentation has been installed at NMP-1 to satisfy Regulatory Guide 1.97 criteria. NMPC submitted a detailed report on their Regulatory Guide 1.97 review; "Response to Section 6 of Supplement 1 to NUREG-0737, Regulatory Guide 1.97 - Application to Emengency Response Facilities", dated April 2, 1984. A response to the NRC's request for further information regarding this report was submitted on October 18, 1985. These reports present data to indicate that the instrumentation in the NMP-1 control room is satisfactory to meet Regulatory Guide 1.97 criteria.

HEOs related to Regulatory Guide 1.97 variables have been identified by DCRDR activities. The following Regulatory Guide 1.97 instrumentation changes have been identified:

- Range of Torus Pressure meter (VER-018)
- Range of Suppression Pool Water Level meter (VER-034)
- Increase Reactor Building Radiation Monitor range and reflash capability (EA-004)

- Corner Room Sump Level alarm (EA-002)
- Additional temperature sensors in Reactor Building (EA-003)

All Regulatory Guide 1.97 criteria will be considered in the selection of the instrumentation to respond to these HEOs. Compliance with Regulatory Guide 1.97 criteria will be fully documented prior to installation of the cited instrumentation.

2.4 Computer Studies

A multi-factored review of the NMP-1 Safety Parameter Display System (SPDS) was completed by Operations Engineering, Incorporated in June 1986. Complete documentation of the SPDS review is provided in "Nine Mile Point Unit No. 1 SPDS Operating Performance Validation Summary Report". This review included observation of SPDS performance throughout a wide range of simulated transient and accident scenarios. No serious deficiencies in the system's design or operation were identified. It was reported that the as-installed SPDS satisfactorily implements the requirements of the NMP-1 SPDS Software Design Specification, and that the system provides a mechanism useful to control room operators for evaluating plant safety status.

A review of colors used on computer displays was performed by ARD in February 1986. The goal of the review was to recommend a consistent pattern of color usage that conforms to other color codes in the control room as well as the guidelines set forth in NUREG-0700, section 6.7; "Computers". All computer displays, including SPDS, were reviewed on-site and color recommendations were specified in detail for each display page. A human factors verification of the changes made to the computer displays as a result of this display color review was performed by ARD in October 1986. It was found that all of the recommendations were implemented and the revised computer displays complied with the

NUREG-0700 criteria. The following HEOs were closed as a result of the modifications made to the computer displays:

COM-026	OCS-247
COM-027	OCS-248
COM-028	SPD-010
COM-029	

2.5 Fix Verification

Verification of the corrective actions taken to resolve HEOs identified during the DCRDR was performed by ARD Corporation. The NMP-1 DCRDR Summary Report included 257 HEOs that were assessed as requiring corrective actions. The purpose of the Fix Verification was to examine the changes made to the control room and other affected areas to ensure that the problems described by the HEOs were resolved. The designation of CLOSED was given to HEOs in which the corrective actions successfully eliminated the discrepancy between control room conditions and accepted human factors principles as specified in NUREG-0700. HEOs in which the human factors concerns were not adequately eliminated were identified as requiring further work. New HEOs were also identified, these are included in Appendix A. They were assessed by a multi-disciplinary assessment team to determine the design improvements which would best resolve each HEO. Two HEOs, which are included in Appendix B, were revised to more adequately describe the implementation.

2.5.1 Method

The Fix Verification was performed by examining the changes made within the control room or by reviewing related documentation. Applicable portions of NUREG-0700, Section 6, served as the criteria to evaluate the adequacy of the corrective actions. The source of the HEO was considered in the evaluation of the fix. Those HEOs identified during the DCRDR validation or task

analysis verification were examined to ensure that operational concerns were addressed. Operators were questioned to obtain their evaluation of the effectiveness of the changes. Several new HEOs resulted from operator comments. The changes resulting from HEOs classified as "Cosmetic" were reviewed by verifying the proper implementation of the Integrated Cosmetic Package (ICP). Some of the HEOs classified as "Functional" could not be verified as a visible control room change. Engineering documentation, operating procedures, or training materials were reviewed to ensure that the stated problem was corrected.

2.5.2 Cosmetic Verification

The DCRDR Summary Report recommends a cosmetic resolution for 167 HEOs; this group includes those with the disposition "Resolved - Complete" and "Resolved - In Progress". The Fix Verification classified 154 of the cosmetic HEOs as closed. The implementation of the ICP addressed most of the cosmetic HEOs. Each Modification Request within the ICP was verified to ensure that it was properly installed. Demarcation lines, mimics, labels, scales, indicator lights, and chart paper were evaluated using the applicable portions of the NUREG-0700 checklist. Some HEOs were resolved by the NMP-1 Human Factors Manual which establishes plant-specific guidelines to ensure that existing human factors conventions are maintained throughout future design changes.

A verification of the cosmetic changes was performed in the NMP-1 simulator prior to implementation in the control room. As reported in the Final Summary Report, the ICP was installed on the simulator control panels and questionnaires regarding the ICP were given to several shifts of operators. Many changes were made to the ICP as a result of the pre-implementation verification of the cosmetic changes. As control room modifications (cosmetic and functional) were finalized, there was an on-going verification process that ensured that the

appropriate representatives from operations, engineering, training, and human factors reviewed proposed modifications.

The verification of cosmetic changes in the control room found some items that require further consideration. These items include HEOs which were not adequately resolved by the ICP, and new HEOs that were identified by the verification checklist and by operator comments regarding the cosmetic changes. Twenty-seven new HEOs were identified during the fix verification process; these have been given an HEO number prefixed by FV to indicate that the Fix Verification is the source of the HEO. The new HEOs are shown in Appendix A. Table 2-1 provides a brief description of all cosmetic HEOs which have not been resolved. All cosmetic HEO fixes are scheduled to be completed by the end of the 1988 refueling outage.

2.5.3 Functional Verification

The DCRDR Summary Report lists 109 HEOs requiring functional resolution; this group includes those with the disposition "Resolved - Complete" and "Resolved - In Progress". Modifications that have been made to the control room, or to procedures or training courses have been verified as complete, and provide the fix to close 94 functional HEOs. Table 2-2 lists the functional HEOs which have not been resolved. The corrective actions needed to resolve these HEOs have been determined and will be implemented according to the schedule listed. Fixes that have been deferred from the 1986 refueling outage have been scheduled to be completed by the end of the 1988 outage. Most of the HEOs designated for a functional fix have been scheduled for implementation during the 1990 outage. Three new HEOs which require complex designs, major expenditures, and involve licensing basis issues have been scheduled to be completed during the 1992 refueling outage.

Table 2-1. Unresolved Cosmetic HEOs

HEO#	DESCRIPTION	SCHEDULE (Refueling Outage)
CS-007	Label controller units	1988
CS-036	Paint pointers on panel N meters	1988
CS-066	Pieces of Reheater mimic	1988
CS-067	Reheater mimic legend lights	1988
FV-001	Labels on two recorders	1988
FV-002	Labels on relays	1988
FV-003	Pen identification label on Intake Water Temp recorder	1988
FV-004	Label on Rx Level LO LO LO meters	1988
FV-005	Switch recorder pen identification labels	1988
FV-006	Turbine Oil Temp label	1988
FV-007	Torus Water Temp A & B labels	1988
FV-008	Remove extra controller labels	1988
FV-009	FW Pump Disch Hdr Temp meter scale	1988
FV-011	Rx Press and Torus Temp remote shutdown panel meter scales	1988
FV-012	Scales on computer trend recorders	1988
FV-013	Scales with divisions of 2.5	1988
FV-014	Kilovolt recorder scale	1988
FV-015	Dual-scale chart recorders that do not have dual-scale paper	1988
FV-017	Modify Human Factors Manual	1988
FV-018	Operating values on two meters	1988
FV-019	Service Water Hdr Press range	1988
FV-020	Seal-in control function coding	1988
FV-021	Directional arrows on Steam Seal mimic	1988
FV-024	Recorders with red pen and black pointers	1988
FV-025	Two meters with 1.6 conversion	1988
FV-027	Legend light on FW Pump 13 FCV	1988
OCS-033	Label on panel A selector switch	1988
OCS-127	Scales with divisions of 2.5	1988
OCS-145	Recirc Flow recorder scale	1988
OCS-172	Scram Solenoid Air Hdr Press recorder chart paper	1988
OCS-174	Intake Tunnel Diff Press recorder chart paper	1988
OCS-178	Kilovolt Recorder chart paper	1988
OCS-179	Drywell Press and Dewpoint recorder chart paper	1988
OCS-180	Circ Water & Disch Press Pump 11 and 12 recorder chart paper	1988
OCS-209	Condenser Water Spray Bypass switch position pointer broken	1988
VER-040	Control handles on DG controls	1988

Table 2-2. Unresolved Functional HEOs

HEO#	DESCRIPTION	SCHEDULE (Refueling Outage)
CS-017	Illegible print on panel B recorders	1988
EA-001	Diesel Generator Start alarm	1990
EA-002	Corner Room Sump Level alarm	1990
EA-003	Add temp sensors in Rx Bldg	1990
EA-004	Increase Rx Bldg radiation monitor range and reflash capability	1990
EA-005	Tailpipe temp and acoustic monitor information	1990
EA-006	HPCI override switch	1992
EA-007	Remove auto initiation of containment sprays	1992
ENV-001	Emergency illumination of RSP	1990
OCS-167	Illegible print on panel B recorders	1988
QS-002	Control room ventilation	1990
QS-003	Control room ventilation	1990
QS-009	Unreliable H_2 and O_2 recorders	1988
QS-023.1	Offgas Preheater nuisance alarm	1990
QS-023.2	Recombiner Low Temp nuisance alarm	1990
QS-023.4	Electric Heater in Recombiner in Service nuisance alarm	1990
QS-023.5	Condenser Small Vacuum Pump nuisance alarm	1988
QS-025	Nuisance alarm on temp recorder	1988
VAL-016	MSIV LO LO Level bypass switch	1990
VAL-025	Cont Vent and Purge bypass switch	1990
VER-018	Range of torus pressure meter	1990
VER-028	Core spray throttle	1992
VER-034	Supp pool water level meter range	1990

SECTION 3
ASSESSMENT AND STAFFING

3.1 Assessment

A multidisciplinary assessment team met at the NMPC Training Center on September 23 and 24 to review the following items:

- New HEOs resulting from the fix verification (FV-001 to FV-027)
- New HEOs resulting from the engineering analysis of the impact of the new EOPs (EA-001 to EA-007)
- Existing HEOs not resolved by the fix verification
- HEOs with a change of disposition as a result of the SER comments

The assessment process was similar to the DCRDR assessment which was described in detail in the NMP-1 Final Summary Report. The following persons participated in the follow-on assessment:

Name	Organization	Discipline
K.B. Thomas	NMPC	Program Manager
J.L. Benson	NMPC	Engineering
Harold Barrett	NMPC	Operations
Dale Goodney	NMPC	Engineering
D.F. Bernfeld	NMPC	Engineering
Paul Mangano	NMPC	Computers
Eric Becker	NMPC	Technical Support
M.L. Schiavone	NMPC	Engineering
J. Kronenbitter	NMPC	Training
Robert Klein	ARD	Human Factors
J. Schilder	OEI	EOPs
L. Wolf	GE	Engineering

3.2 Staffing

The following persons contributed to the NMP-1 follow-on DCRDR activities:

K.B. THOMAS (NMPC) has served as Program Manager since July 1986.

J.L. BENSON (NMPC) served as Program Manager until July 1986. He has continued with the follow-on DCRDR program in an advisory position. Mr. Benson shared a vote with the Program Manager at the follow-on assessment meeting.

D.F. BERNFELD (NMPC), provided engineering support.

H. BARRETT (NMPC), provided operations support.

D. GOODNEY (NMPC), provided engineering support.

P. MANGANO (NMPC), provided support on computer related programs.

D. MATTHEWS (MAC), formerly supervisor of NMPC operations, Mr. Matthews served as the subject matter expert for the follow-on task analysis.

ROBERT KLEIN (ARD), provided human factors support.

J.SCHILDER (OEI), provided support on the revised EOPs and the SPDS program.

APPENDIX A

NEW HEOs

NINE MILE POINT UNIT 1 HEO

HEO#: EA-001

DESCRIPTION:

There is no indication in the control room to notify the operators that the diesel generators have started.

ASSESSMENT/RESOLUTION CATEGORY: Functional - Normal

DISPOSITION; Fix

RISK CATEGORY: Not recorded

EXPLANATION:

Revise the alarm contact to monitor the diesel generator RPM switch to provide an annunciator alarm when the diesel generator is running.

NINE MILE POINT UNIT 1 HEO

HEO#: EA-002

DESCRIPTION:

An alarm for the corner room sump level is needed in the control room. During certain scenarios, an operator may have to enter the reactor building during a potentially dangerous high radiation situation to determine the sump level.

ASSESSMENT/RESOLUTION CATEGORY: Functional - Emergency

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

A reactor building sump level alarm will be installed in the control room.

NINE MILE POINT UNIT 1 HEO

HEO#:EA-003

DESCRIPTION:

There is a need for additional temperature sensors in the reactor building and corresponding meters in the control room. This information is critical and time dependent in the performance of emergency procedures.

ASSESSMENT/RESOLUTION CATEGORY: Functional - Normal

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Install additional reactor building temperature sensors and corresponding control room meters.

NINE MILE POINT UNIT 1 HEO

HEO#: EA-004

DESCRIPTION:

The ranges of the reactor building radiation monitors are not high enough.

ASSESSMENT/RESOLUTION CATEGORY: Functional - Emergency

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Add HI and HI HI reactor building radiation monitor alarms in the control room.

NINE MILE POINT UNIT 1 HEO

HEO#:EA-005

DESCRIPTION:

There is a need for tailpipe temperature and acoustic monitor information in the control room.

ASSESSMENT/RESOLUTION CATEGORY: Functional - Emergency

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Information on tailpipe temperature and acoustic monitors will be added to the control room.

NINE MILE POINT UNIT 1 HEO

HEO#: EA-006

DESCRIPTION:

The capability to override HPCI should be incorporated in the control room to avoid having the operator remotely reset HPCI manually.

ASSESSMENT/RESOLUTION CATEGORY: Functional - Emergency

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

A HPCI override switch will be installed in the control room.

NINE MILE POINT UNIT 1 HEO

HEO#: EA-007

DESCRIPTION:

Under certain accident conditions discussed in the EOPs, automatic initiation of containment sprays could result in a severe pressure reduction transient in the drywell.

RESOLUTION/ASSESSMENT CATEGORY: Functional - Emergency

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

The applicable thermohydraulic conditions in the drywell and calculation techniques are subject to controversy and require further investigation. This feature of the containment spray system is part of the licensing basis for the plant. In order to justify removal of this feature, detailed analysis and NRC approval would be necessary.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-001

DESCRIPTION:

Two recorders on panel B are not properly labeled.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Install appropriate labels on cited recorders.

Panel ID#	Equipment ID#	Equipment Name
B2	520 251	Turbine RPM Recorder
B2	521 257	Red - Control Valve Position Black - Bypass Valve Position

NINE MILE POINT UNIT 1 HEO

HEO#: FV-002

DESCRIPTION:

The cited relays on panel B are not labeled. All other relays on panel B have appropriate labels.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Install appropriate labels on cited relays.

Panel ID#	Equipment ID#	Equipment Name
B2	611 32/1	
B2	611 32/2	
B1	3/1	
B1	3/2	
B1	S/V	
B3	30/1	
B3	30/2	

NINE MILE POINT UNIT 1 HEO

HEO#: FV-003

DESCRIPTION:

The Intake Water Temperature recorder on panel H does not have appropriate labels identifying the functions of recorder pens. The recorder has two scales with two pens on each scale. Separate labels should be made identifying the functions of each scale as follows:

Blue - Plant Intake Water Temp
Red - Plant Disch Water Temp

Blue - Intake Condenser Water Temp
Red - Plant Water Temp Diff

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Install the appropriate labels on the cited recorder.

Panel ID#	Equipment ID#	Equipment Name
H	3H29	Intake Water Temp

NINE MILE POINT UNIT 1 HEO

HEO#: FV-004

DESCRIPTION:

Two Reactor Level LO LO LO meters on panel F are not labeled.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Install the appropriate labels on the cited meters.

Panel ID#	Equipment ID#	Equipment Name
1F1		RX LEVEL LO LO LO (2 meters with same ID#)

NINE MILE POINT UNIT 1 HEO

HEO#: FV-005

DESCRIPTION:

On the cited recorders, the scale for the red pen is above the scale for the black pen, but the label lists the black pen on top. The label should identify the scales as they appear on the recorder.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Replace labels with appropriate labels with pen identification in the same relative position as recorder scales.

Panel ID#	Equipment ID#	Equipment Name
6L9		Red - 11 DWFT Level Black - 11 DWFT Leak Rate
6L10		Red - 12 DWFT Level Black - 12 DWFT Leak Rate
2H4		Red - Off Gas Sys Flow Black - Off Gas Sample Flow
3H11		Red - Dissolved O_2 FW Black - Dissolved O_2 Cond
1F46		Red - (no identifier) Black - Main Steam Conductivity
2F5		Red - Scram Solenoid Air Hdr Press Black - Scram Disch Vol Hld Tank Level
1F14		Red - Total FW Flow Black - Rx Vessel Level

NINE MILE POINT UNIT 1 HEO

HEO#: FV-006

DESCRIPTION:

The label for the Turbine Oil Temperature vertical meter incorrectly states "Turbine 0.1 Temp ^{o}F." The appropriate label should be installed.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Replace meter label with appropriate label.

Panel ID#	Equipment ID#	Equipment Name
1A		Turbine Oil Temp

NINE MILE POINT UNIT 1 HEO

HEO#: FV-007

DESCRIPTION:

The cited meters are labeled "Torus Water Temp Chan A" and "Torus Water Temp Chan B." These are the only references to Channel A and B in the control room, other labels refer to Channel 11 and 12. The cited labels should be changed to be consistent with control room nomenclature.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Normal

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Install appropriate labels.

Panel ID#	Equipment ID#	Equipment Name
K		Torus Water Temp Chan A
K		Torus Water Temp Chan B

NINE MILE POINT UNIT 1 HEO

HEO#: FV-008

DESCRIPTION:

When the Integrated Cosmetic Package was installed, new labels were placed above the cited controllers and the old labels were not removed. The old labels are small and attached directly to the controller; these should be removed.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Remove old labels from cited recorders.

Panel ID#	Equipment ID#	Equipment Name
F		FWP 11 Valve Control
H		FW Recirc to Condenser Flow Control

NINE MILE POINT UNIT 1 HEO

HEO#: FV-009

DESCRIPTION:

The numerical progression for the cited meter scale is as follows:

50, 150, 240, 320, 400

The meter scale should be changed to a more appropriate numerical progression.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Replace cited meter scales with scales with appropriate numerical progressions in accordance with Human Factors Design Manual.

Panel ID#	Equipment ID#	Equipment Name
1F2		FW Pumps Disch Hdr Temp

NINE MILE POINT UNIT 1 HEO

HEO#: FV-010

DESCRIPTION:

The numerical progression of the cited meter scales is as follows:

251, 256, 261, 266, 271, 276

The meter scale should be changed to a more appropriate numerical progression.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Reject

RISK CATEGORY: Not Recorded

EXPLANATION:

The numerical values on the cited meter scales were selected for ease of calibration. There is no operator action that can be taken to vary the level of the water box. The indicator is used to determine if the water box is full or not full.

Panel ID#	Equipment ID#	Equipment Name
3H8		Cond Water Box Lvl North
3H9		Cond Water Box Lvl South

NINE MILE POINT UNIT 1 HEO

HEO#: FV-011

DESCRIPTION:

The scales on the cited remote shutdown panel meters have numerical progressions other than multiples of 1, 2, or 5.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Replace cited meter scales with scales with appropriate numerical progressions in accordance with Human Factors Design Manual.

Panel ID#	Equipment ID#	Equipment Name
RSP		Reactor Pressure
RSP		Torus Temperature

NINE MILE POINT UNIT 1 HEO

HEO#: FV-012

DESCRIPTION:

Computer trend recorders on panel E have too many increments between major scale divisions.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Replace cited recorder scales with scales with appropriate increments between major numerical divisions in accordance with the Human Factors Design Manual.

Panel ID#	Equipment ID#	Equipment Name
E		Computer Trend Recorders

NINE MILE POINT UNIT 1 HEO

HEO#: FV-013

DESCRIPTION:

The cited meters have scale divisions of 2.5. Scales should be changed to have more appropriate scale divisions.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Replace cited meter scales with scales with appropriate divisions in accordance with the Human Factors Design Manual.

Panel ID#	Equipment ID#	Equipment Name
1L3		Turb Bldg Supply Fan 111
1L4		Turb Bldg Supply Fan 112
1L5		Turb Bldg Supply Fan 121
1L6		Turb Bldg Supply Fan 122
6L1	86	Instrument Air Comp 11
6L1	87	Instrument Air Comp 12

NINE MILE POINT UNIT 1 HEO

HEO#: FV-014

DESCRIPTION:

The black pen scale on the Kilovolt recorder has division increment marks missing. They appear to have worn off. The scale should be replaced.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Replace the scale on the cited recorder with an appropriate scale.

Panel ID#	Equipment ID#	Equipment Name
3A		Kilovolt Recorder

NINE MILE POINT UNIT 1 HEO

HEO#: FV-015

DESCRIPTION:

Several dual-pen chart recorders do not have dual-scale chart paper to correspond with the recorder scales. Chart paper needs for each control room recorder should be identified and the proper chart paper ordered and installed.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Identify the dual-scale chart recorders that do not have dual-scale chart paper and supply the appropriate chart paper.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-016

DESCRIPTION:

Unnecessary demarcation lines were installed on panel L as part of the Integrated Cosmetic Package. There are demarcation lines on panel 7L with no components in them.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - System

DISPOSITION: Reject

RISK CATEGORY: Not Recorded

EXPLANATION:

Removal of the unnecessary demarcation lines would create unsightly marks on the panel. The extra lines have no impact upon operations.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-017

DESCRIPTION:

Installation of the new scales as part of the Integrated Cosmetic Package removed some operator aids that were on the old scales. Operators requested that aids such as setpoint markings be added to the new scales.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Modify the Human Factors Design Manual to include guidance that will enable operations personnel to place operator aids on meter scales as needed.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-018

DESCRIPTION:

Operators have commented upon the absence of plant operating values on two meter scales: Steam Chest Pressure and Turbine Oil Temperature. Steam Chest Pressure, under normal conditions is 950 PSI. Turbine Oil Temperature is either 90° F or 110° F, depending on whether it is shut down or running. These specific values are not included as part of the meter scale numerical progression.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Add the desired values to the cited meter scales.

Panel ID#	Equipment ID#	Equipment Name
1A		Turbine Oil Temp
2A14		Steam Chest Pressure

NINE MILE POINT UNIT 1 HEO

HEO#: FV-019

DESCRIPTION:

An operator recommended that the Service Water Header pressure vertical meter scale be changed from 0-200 PSI to 0-150 PSI to allow the instrument to be read with greater accuracy. He stated that the pressure never exceeds 150 PSI and there is no need for the additional range.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Normal

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Replace the meter cited scale with a scale with a range from 0 to 150 psi.

Panel ID#	Equipment ID#	Equipment Name
H		Service Water Header Pressure

NINE MILE POINT UNIT 1 HEO

HEO#: FV-020

DESCRIPTION:

Operators recommended that valves with a seal-in function be coded to designate this function. Color coding, handle type, or labeling could be used to identify seal-in valves.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Control switches will be modified to designate seal-in function valves. This convention will be documented in the NMP-1 Human Factors Manual.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-021

DESCRIPTION:

The Steam Seal mimic on panel A does not have arrows to indicate flow direction.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - System

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Place appropriate directional arrows on the Steam Seal mimic.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-022

DESCRIPTION:

Operators have requested an additional electrical mimic on panel A to detail the feeds of powerboards 13, 14, and 15.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - System

DISPOSITION: Reject

RISK CATEGORY: Not Recorded

EXPLANATION:

There is insufficient space available on panel A to adequately mimic the operation of these powerboards. The panel is already crowded and an additional mimic would increase confusion.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-023

DESCRIPTION:

Scale divisions on some recorder scales are obscured by indicating pointers.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Reject

RISK CATEGORY: Not Recorded

EXPLANATION:

This was reported by calibration technicians who require a very precise indication when calibrating the instrument. Operations reports that the scales are not a problem for them; accurate indications can be obtained from the scales as well as from the chart paper.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-024

DESCRIPTION:

There is a recorder pen on panel H that is red, but the scale pointer is black. This is different from the rest of the control room recorders.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Replace the red pen on the cited recorder with a black pen.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-025

DESCRIPTION:

Two meters on panel A require multiplication by 1.6.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Normal

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

The input to the meters and/or the scales will be modified to eliminate the need to convert the meter reading.

Panel ID#	Equipment Name
A8	NMP-Volney 9 Megawatts
A8	NMP-Volney Megavars

NINE MILE POINT UNIT 1 HEO

HEO#: FV-026

DESCRIPTION:

Non-linear scales create problems for calibration. Scales should be changed to show nonlinearity.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Reject

RISK CATEGORY: Not Recorded

EXPLANATION:

The parameters measured are not non-linear; the scales should not be changed. Calibration technicians can adjust the instrument to show the linear range of the scale.

NINE MILE POINT UNIT 1 HEO

HEO#: FV-027

DESCRIPTION:

Reset legend indicator light above FW Pump 13 FCV does not have a legend.

ASSESSMENT/RESOLUTION CATEGORY: Cosmetic - Individual

DISPOSITION: Fix

RISK CATEGORY: Not Recorded

EXPLANATION:

Install the appropriate legend in the cited legend indicator light.

APPENDIX B

REVISED HEOs

HEO#: COM-004.0

DESCRIPTION:

CONTROL ROOM KEYBOARDS CONTAIN KEYS OTHER THAN THOSE USED BY THE OPERATORS (E.G. THE CET AND DISPLAY BUILDER KEY).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2C

EXPLANATION:

THE FEW COMPUTER FUNCTION KEYS NOT USED BY OPERATIONS ARE USED FOR TESTING BY NUCLEAR PHYSICS PERSONNEL. ACCIDENTAL USE OF THESE KEYS CANNOT ALTER SOFTWARE OR OTHERWISE INTERFERE WITH COMPUTER OPERATION.

VERIFICATION:

HEO#: COM-009.0

DESCRIPTION:

AMBIENT ILLUMINATION CONTRIBUTES MORE THAN 25% TO SCREEN LUMINANCE UNDER NORMAL CONTROL ROOM LIGHTING CONDITIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 1C

EXPLANATION:

THE NEW CTR(S) THAT HAVE BEEN INSTALLED IN THE CONTROL ROOM HAVE NON-GLARE SCREENS. NON-GLARE FILTERS HAVE BEEN INSTALLED ON THE EXISTING DISPLAYS. ALL CRT(S) HAVE BRIGHTNESS CONTROL TO ALLOW OPERATORS TO ADJUST DISPLAY FOR COMFORT. THE PROBLEM OF GLARE ON COMPUTER DISPLAY SCREENS HAS BEEN ELIMINATED.

VERIFICATION:

HEO#: COM-010.0

DESCRIPTION:

THE CONTRAST BETWEEN THE LIGHT CHARACTERS AND THE DARK SCREEN BACKGROUND IS LESS THAN 15:1.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

CONTRAST AND BRIGHTNESS OF CRT(S) IS ADJUSTABLE. OPERATORS ADJUST THE CRT(S) TO PROVIDE THE CLEAREST DISPLAY THAT IS COMFORTABLE TO THEIR EYES. CRT DISPLAYS ARE SHARP AND EASY TO READ.

VERIFICATION:

HEO#: COM-Ø11.Ø

DESCRIPTION:

ALPHA-NUMERIC CHARACTERS HAVE LESS THAN 1Ø RESOLUTION ELEMENTS PER CHARACTER HEIGHT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

RESOLUTION OF THE CRT(S) IS ADEQUATE WHEN CONTRAST, BRIGHTNESS, AMBIENT LIGHTING, AND VIEWING DISTANCE ARE CONSIDERED. CRT(S) ARE ALIGNED ONCE A MONTH TO ENSURE THAT THE DISPLAY RESOLUTION IS SHARP. ALL DISPLAY CHARACTERS APPEAR DISTINCT AND CAN BE READ WITH NO DIFFICULTY.

VERIFICATION:

HEO#: COM-Ø12.Ø

DESCRIPTION:

GRAPHIC LINES CONTAIN LESS THAN THE RECOMMENDED MINIMUM OF 5Ø RESOLUTION ELEMENTS PER INCH (I.E. 45 PIXELS/INCH IN THE VERTICAL DIRECTION).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

RESOLUTION OF THE CRT(S) IS ADEQUATE WHEN CONTRAST, BRIGHTNESS, COLORS, AMBIENT LIGHTING, AND VIEWING DISTANCE ARE CONSIDERED. THE DIFFERENCE BETWEEN 45 AND 5Ø PIXELS/INCH IS BARELY DISCERNABLE AND MAKES NO DIFFERENCE IN DISPLAY CLARITY. ALL DISPLAYS APPEAR SHARP AND CAN BE READ WITH NO DIFFICULTY.

VERIFICATION:

HEO#: COM-013.0

DESCRIPTION:

DOT-MATRIX CHARACTERS ARE BASED ON A 5X5 DOT MATRIX.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE DISPLAYS USE A SINGLE TYPE FONT WHICH MAKES THE 5 X 5 DOT MATRIX CHARACTERS DISTINGUISHABLE FROM ONE ANOTHER, CLEAR, AND EASY TO READ. WITH THE OTHER DISPLAY CHARACTERISTICS OF CONTRAST, BRIGHTNESS, AND RESOLUTION THE DISPLAYS APPEAR SHARP AND EASY TO READ.

VERIFICATION:

HEO#: COM-014.0

DESCRIPTION:

WHEN PRESENTED IN TABULAR FORM, NUMERIC DATA IS RIGHT-JUSTIFIED BUT DECIMAL PLACES ARE NOT ALIGNED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

COLUMNS ON DISPLAY TABLES FILL A DESIGNATED NUMBER OF CHARACTER FIELDS. ALIGNING DECIMAL POINTS WOULD REQUIRE COLUMNS TO BE MUCH WIDER DUE TO THE LARGE RANGE OF VALUES DISPLAYED. LESS DATA WOULD BE DISPLAYED ON EACH DISPLAY BECAUSE EACH COLUMN WOULD HAVE TO RESERVE SO MANY CHARACTER FIELDS. DATA COMPARISONS ARE NOT MADE WITHIN COLUMNS OF DIFFERENT PARAMETERS SO ALIGNED DECIMAL POINTS WOULD NOT HAVE ANY OPERATIONAL BENEFIT.

VERIFICATION:

HEO#: COM-015.0

DESCRIPTION:

PERIODS ARE NOT PLACED AFTER ITEM SELECTION DESIGNATORS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

COMPUTER ITEM SELECTION DESIGNATORS ARE SHOWN TO MATCH THE ITEM SELECTION INPUT ENTRIES. PERIODS ARE NOT USED AS PART OF THE ENTRY SEQUENCE BECAUSE THEY WOULD BE AN EXTRA KEYSTROKE WITH NO DEDICATED MEANING, IT COULD BE A SOURCE OF ERROR. KEEPING THE DESIGNATION AND THE SELECTION INPUT THE SAME IS THE FAVORABLE DISPLAY FORMAT.

VERIFICATION:

HEO#: COM-018.0

DESCRIPTION:

LISTS OF OPTIONS ARE NOT ORGANIZED ACCORDING TO THE PROBABILITY OF SELECTION OF THE ITEMS (I.E. HIGHER PROBABILITY ITEMS ARE NOT PRESENTED FIRST).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

AN OPERATIONAL LOGIC IS USED TO DISPLAY MENU OPTIONS. DISPLAY OPTIONS ARE GROUPED TO HELP OPERATORS LOCATE DISPLAYS ACCORDING TO CERTAIN OPERATIONAL MODES. ORDERING MENU OPTIONS BY SELECTION PROBABILITY WOULD NOT WORK ACROSS ALL OPERATIONAL MODES BECAUSE THE SELECTION PROBABILITY CHANGES FOR EACH MODE OF OPERATION.

VERIFICATION:

HEO#: COM-Ø19.Ø

DESCRIPTION:

EQUIPROBABLE MENU OPTIONS ARE NOT PRESENTED ALPHABETICALLY, WHICH WOULD INCREASE EFFICIENCY IN LOCATING A SPECIFIC OPTION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

AN OPERATIONAL LOGIC IS USED TO DISPLAY MENU OPTIONS. DISPLAYS ARE GROUPED TO HELP OPERATORS LOCATE DISPLAYS ACCORDING TO CERTAIN OPERATIONAL MODES. A FIRST WORD ALPHABETIC LISTING WOULD INCREASE SEARCH TIME.

VERIFICATION:

HEO#: COM-021.0

DESCRIPTION:

THERE IS LITTLE USE MADE OF MESSAGES TO INDICATE IMPORTANT CHANGES IN PLANT STATUS TO THE OPERATOR WHILE VIEWING AN INDIVIDUAL DISPLAY, MENU OR LIST. ALSO, THERE IS INSUFFICIENT USE OF A STRUCTURED PROMPTING SEQUENCE TO GUIDE THE OPERATOR THROUGH THE DISPLAYS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

MESSAGES TO ALERT THE OPERATOR OF IMPORTANT CHANGES IN PLANT STATUS ARE PROVIDED BY ANNUNCIATORS. THE COMPUTER SERVES AS A SECONDARY DATA SOURCE TO THE ANNUNCIATOR SYSTEM AND SPDS. STATUS CHANGES AND ALARM INPUT DATA PRINT OUT ON THE COMPUTER PRINTER.

DISPLAY SELECTION IS A SIMPLE PROCEDURE. A MENU OF DISPLAYS IS AVAILABLE ON A SINGLE FUNCTION KEY. THE SEQUENCE OF DISPLAY USE IS NOT CONSTANT, SO PROMPTING FOR THE NEXT DISPLAY IS NOT APPROPRIATE. SELECTION ALWAYS INVOLVES THE SAME SEQUENCE, A DISPLAY INSTUCTION OR PROMPT WOULD ALWAYS BE THE SAME AND THE ONLY INFORMATION PROVIDED IS WELL KNOWN BY OPERATORS.

VERIFICATION:

HEO#: COM-Ø24.Ø

DESCRIPTION:

WHEN SYSTEM FUNCTIONING REQUIRES THE OPERATOR TO STAND BY, NO PERIODIC FEEDBACK IS PROVIDED TO THE OPERATOR TO INDICATE NORMAL SYSTEM OPERATION AND THE REASON FOR THE DELAY.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2C

EXPLANATION:

THE COMPUTER PRINTER PROVIDES A MESSAGE THAT THE PROGRAM IS IN PROGRESS WHEN THE COMPUTER IS RUNNING A PROGRAM. LONG PROGRAMS ARE PROCESSED IN SECTIONS, THE OPERATOR IS INFORMED WHEN SECTIONS OF THE PROGRAM ARE PROCESSING OR COMPLETE.

VERIFICATION:

HEO#: COM-026.0

DESCRIPTION:

HIGHLIGHTING IS NOT USED FOR DISPLAYED DATA ITEMS OR MESSAGES WHICH MIGHT BE IMPORTANT TO OPERATOR DECISION MAKING.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 2B

EXPLANATION:

A STUDY OF THE USE OF COLOR ON COMPUTER DISPLAYS HAS BEEN CONDUCTED. COLOR CODES FOR DIFFERENT TYPES OF INFORMATION HAVE BEEN ESTABLISHED. COLORS RECOMMENDED FOR CRT USE IN NUREG-0700 HAVE BEEN SELECTED AND DOCUMENTED AS PART OF THE NMP-1 HUMAN FACTORS MANUAL.

VERIFICATION:

HEO#: COM-Ø27.Ø

DESCRIPTION:

COLORS USED ON THE CRT TO CONVEY INFORMATION ARE NOT CONSISTENT IN USE AND MEANING WITH ALL OTHER COLOR CODES IN THE CONTROL ROOM. FOR EXAMPLE, GREEN IS USED TO DENOTE AN ACKNOWLEDGED ALARM, EVEN IF THE POINT IS STILL IN AN ALARM CONDITION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4C

EXPLANATION:

A STUDY ON THE USE OF COLOR ON COMPUTER DISPLAYS HAS BEEN CONDUCTED. COLOR CODES FOR DIFFERENT TYPES OF INFORMATION HAVE BEEN ESTABLISHED. COLORS RECOMMENDED FOR CRT USE IN NUREG-Ø7ØØ HAVE BEEN SELECTED AND DOCUMENTED AS PART OF THE NMP-1 HUMAN FACTORS MANUAL.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

HEO#: COM-028.0

DESCRIPTION:

ONCE COLORS HAVE BEEN ASSIGNED A SPECIFIC USE OR MEANING, OTHER COLORS ARE SOMETIMES USED FOR THE SAME PURPOSE (E.G. CYAN AND WHITE ARE USED INTERCHANGEABLY FOR DATA AND COLUMN HEADINGS).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4C

EXPLANATION:

A STUDY ON THE USE OF COLOR ON COMPUTER DISPLAYS HAS BEEN CONDUCTED. COLOR CODES FOR DIFFERENT TYPES OF INFORMATION HAVE BEEN ESTABLISHED. COLORS RECOMMENDED FOR CRT USE IN NUREG-0700 HAVE BEEN SELECTED AND DOCUMENTED AS PART OF THE NMP-1 HUMAN FACTORS MANUAL.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

HEO#: COM-029.0

DESCRIPTION:

THE COLORS RED, GREEN, AND YELLOW ARE NOT ALWAYS USED IN ACCORDANCE WITH PLANT CONVENTIONS AND POPULATION EXPECTATIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4C

EXPLANATION:

A STUDY ON THE USE OF COLOR ON COMPUTER DISPLAYS HAS BEEN CONDUCTED. COLOR CODES FOR DIFFERENT TYPES OF INFORMATION HAVE BEEN ESTABLISHED. COLORS RECOMMENDED FOR CRT USE IN NUREG-0700 HAVE BEEN SELECTED AND DOCUMENTED AS PART OF THE NMP-1 HUMAN FACTORS MANUAL.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

HEO#: COM-030.0

DESCRIPTION:

PRINTER SPEEDS ARE LESS THAN 300 LINES PER MINUTE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

DATA TO BE PRINTED IS STORED IN A SPOOL FILE UNTIL THE PRINTER IS AVAILABLE. NO DATA IS LOST WHEN THE PRINTER LAGS BEHIND THE PROCESSOR. THE PRINT SPEED IS SUFFICIENT TO PROVIDE ALL PROCESSED INFORMATION IN A TIMELY MANNER. TIME CRITICAL ALARM INFORMATION IS PROVIDED ON ANNUNCIATOR TILES AND DEDICATED DISPLAYS. THESE WOULD BE CONSULTED BEFORE THE COMPUTER PRINTOUT.

VERIFICATION:

HEO#: CS-003.0

DESCRIPTION:

NAMEPLATES OR POINT IDENTIFICATION INFORMATION IS PRESENTED ON THE LOWER RECORDER WINDOW, BLOCKING SOME OF THE TRENDED INFORMATION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

LABELS OBSCURE ONLY A SMALL PORTION OF THE TREND INFORMATION, THE MOST RECENT DATA IS EASILY VISIBLE. THE OBSCURED INFORMATION IS AVAILABLE TO THE OPERATOR BY OPENING THE DOOR OF THE RECORDER. LONG TERM TREND INFORMATION IS TYPICALLY OBTAINED BY REMOVING THE CHART PAPER AND EXAMINING THE DATA THAT HAS OCCURRED OVER TIME.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
J		CONDSR CIR WTR PUMP PR
J		CONSR IN/DISCH TNL ^T
B		TURBINE TEMPERATURES RECORDER
K		ALL RECORDERS
G		d TEMP 30' TO 100'
E		DRYWELL -TORUS PSID RECORDER
G		90' TWR WD RECORDER
E		EJECTOR COND FLOW RECORDER
H		ALL RECORDERS
E		TORUS-ATMOS PSID RECORDER
G		200' TWR-200' LEV-WD
L		ALL RECORDERS
G		d TEMP 30' TO 200'
J		DRYWELL RAD
G		SELECTABLE WD
G		ABS TEMP-30' LEV
E		OFF-GAS TEMP RECORDER
G		200' TWR- 200' LEV-WS
B		GENERATOR INLET/OUTLET CONDUCTIVITY RECORDER
J		INLET/DISCH TNL ^T
G		SELECTABLE WS
G		90' TWR WS RECORDER
E		OFF-GAS CHILLER DISCH TEMP RECORDER
F		ALL RECORDERS
A		ALL RECORDERS

HEO#: CS-009.0

DESCRIPTION:

ASSOCIATION OF FEEDBACK INDICATION TO RELATED CONTROLS IS NOT READILY APPARENT THROUGH LABELING; MIMICS; DEMARCATION; OR POSITION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 2A

EXPLANATION:

DEMARCATION LINES HAVE BEEN INSTALLED ON PANEL "K" TO ENHANCE THE ASSOCIATION BETWEEN CORE SPRAY CONTROLS AND DISPLAYS. LABELING HAS BEEN REVIEWED AND CHANGES MADE AS PART OF THE INTEGRATED COSMETIC PACKAGE TO ENSURE THAT INDICATORS PROVIDING CONTROL ACTION FEEDBACK ARE APPROPRIATELY LABELED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
4K4-2		CORE SPRAY 122 HDR PRESS
4K1-2		CORE SPRAY 111 HDR PRESS
4K2-2		CORE SPRAY 121 HDR PRESS
4K20		CORE SPRAY DISCHARGE IV 122 CONTROL
4K4-3		CORE SPRAY TOP PUMP 122
4K1-3		CORE SPRAY TOP PUMP 111
4K2-3		CORE SPRAY TOP PUMP 121
4K3-1		CORE SPRAY PUMP 112 AMPS
4K4-1		CORE SPRAY PUMP 122 AMPS
4K1-1		CORE SPRAY PUMP 111 AMPS
4K19		CORE SPRAY DISCHARGE IV 121 CONTROL
4K3-3		CORE SPRAY TOP PUMP 112
4K3-2		CORE SPRAY 112 HDR PRESS
4K18		CORE SPRAY DISCHARGE IV 112 CONTROL
4K2-1		CORE SPRAY PUMP 121 AMPS
4K17		CORE SPRAY DISCHARGE IV 111 CONTROL

HEO#: CS-Ø11.Ø

DESCRIPTION:

INDICATORS ARE DIFFICULT TO READ BECAUSE TEMPORARY SCALES ARE ON THE METER FACES.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PERMANENT SCALES FOR THE FACE-PLATES OF THE CITED INDICATORS HAVE BEEN INSTALLED. THE EXISTING RANGES OF THE SCALES WERE MAINTAINED. SCALES WERE DESIGNED IN ACCORDANCE WITH NMP-1 HUMAN FACTORS MANUAL GUIDELINES.

VERIFICATION:
METERS HAVE BEEN PROVIDED WITH APPROPRIATE NEW PLATES WHICH HAVE BEEN FOUND TO BE ADEQUATE DURING VERIFICATION TESTING ON THE SIMULATOR.

Panel ID #	Equipment ID #	Equipment Name
E		OFF GAS TEMP
2H13-1		CHILLER 11 OFF GAS TEMP
2H13-2		CHILLER 12 OFF GAS TEMP
E		OFF GAS CHILLER DISCH TEMP
2H13-3		CHILLER 13 OFF GAS TEMP
2H4		OFF GAS SYS FLOW
2H14-2		OFF GAS DILUTED TEMP

HEO#: CS-013.0

DESCRIPTION:

COMPONENTS HAVE GE LOGO ON SCALE FACES. THESE DO NOT APPEAR TO INTERFERE WITH READING OF DISPLAY.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE LOGOS ON THE DISPLAY FACES DO NOT INTERFERE WITH THE DISPLAY NUMERALS, GRADUATIONS OR THE DISPLAY POINTER. THE SYMBOL ON THE DISPLAYS ARE SMALL AND PLACED THERE BY THE MANUFACTURER FOR IDENTIFICATION, THEY ARE NOT DISTRACTING AND HAVE NO EFFECT ON OPERATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
F		IRMS (ALL)
F		FW VALVE SEQ COMP. MOD.
F		SRMS (ALL)

HEO#: CS-Ø17.Ø

DESCRIPTION:

THE NUMBERS FROM THESE IMPACT RECORDERS ARE NOT READABLE, THE TRANSFORMER COOLERS HAVE NO INDICATION OF CHANNEL POINTS BEING DISPLAYED (LABEL FOR INDICATED POINTS.).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 5E

EXPLANATION:

THE CITED RECORDERS ARE TO BE REPLACED WITH NEW RECORDERS, THESE WILL BE APPROPRIATELY LABELED.

VERIFICATION:
ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
B		TRANSFORMER 1 COOLERS RECORDER
B		TURBINE TEMP RECORDER
B		HYD COOLER GAS TEMP RECORDER

HEO#: CS-Ø36.Ø

DESCRIPTION:

POINTERS ON METERS ARE DIFFICULT TO DISTINGUISH FROM BACKGROUND NAME. POINTERS ARE VERY THIN AND BLACK, THE BACKGROUND WRITING IS BLACK AND THE POINTER IS DIFFICULT TO PICK UP.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: 1D

EXPLANATION:

POINTERS ON THE N PANEL METERS WILL BE PAINTED RED TO CONTRAST WITH BACKGROUND WRITING.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
N		GENERIC

HEO#: CS-Ø42.Ø

DESCRIPTION:

THE POST LOCA VENT VLVS LABELS ARE LOCATED TO THE OUTSIDE OF THE VLV LEGEND LIGHT AND ARE NOT READILY ASSOCIATED WITH THEM.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: 2D

EXPLANATION:

MIMIC LINES HAVE BEEN ADDED TO THE PRIMARY CONTAINMENT MIMIC TO CONNECT THE POST LOCA VENT VALVE LABELS TO THE ASSOCIATED LEGEND LIGHTS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
F		PRIMARY CONTAINMENT ISOLATION MIMIC

HEO#: CS-045.0

DESCRIPTION:

THE HANDLES OF THESE COMPONENTS ARE LOCATED ON THE BOTTOM ROW OF THE PANEL AND IN THE LINE OF TRAFFIC BUT ARE NOT GUARDED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

PANEL "F" IS NOT IN THE LINE OF TRAFFIC FOR ANYONE BUT OPERATIONS PERSONNEL. ADMINISTRATIVE STEPS HAVE BEEN TAKEN TO REDUCE THE TRAFFIC INTO THE CONTROL ROOM. THESE COMPONENTS ARE NOT SAFETY RELATED AND THE CONTROL HANDLE TYPE IS NOT SUSCEPTABLE TO INADVERTANT ACTUATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
1F25		RX SAMPLE RETURN IV
1F26		RX SAMPLE RETURN IV

HEO#: CS-051.0

DESCRIPTION:

COMPONENT HANDLE IS NOT PROTECTED AND IT IS LOCATED ON BOTTOM ROW SUSCEPTIBLE TO INADVERTENT ACTUATION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THIS IS A NON SAFETY RELATED CONTROL WITH A SPRING RETURN TO NEUTRAL FEATURE THAT WILL STOP MOVEMENT OF THE GATE. THERE IS NO OPERATIONAL HISTORY OF INADVERTANT ACTUATION. ADMINISTRATIVE STEPS HAVE BEEN TAKEN TO REDUCE TRAFFIC INTO THE CONTROL ROOM.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
1H32		SCREEN HOUSE TEMPERING GATE

HEO#: CS-Ø53.Ø

DESCRIPTION:

MEANING OF 1 GREEN AND 2 RED COLORED LIGHTS IS UNCLEAR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THE THREE LIGHTS MONITOR THE FUNCTION OF TWO VALVES. WHEN ONE VALVE IS OPEN, ONE RED INDICATOR LIGHT IS LIT. WHEN BOTH VALVES ARE OPEN, BOTH RED LIGHTS ARE LIT. THE GREEN LIGHT IS LIT ONLY WHEN BOTH VALVES ARE CLOSED. THIS COLOR CONVENTION FOR VALVE POSITION INDICATOR LIGHTS IS DOCUMENTED IN THE NMP-1 HUMAN FACTORS MANUAL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
5L16		CONT VENT TO EMER VENTIL SYS IV 121
5L17		CONT VENT TO EMER VENTIL SYS IV 122

HEO#: CS-Ø57.Ø

DESCRIPTION:

FLOW METERS ARE NOT ADJACENT TO ONE ANOTHER FOR EASY COMPARISONS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

COMPARISON BETWEEN CONTAINMENT 11 AND CONTAINMENT 12 FLOW IS NOT A USEFUL COMPARISON. THE FLOW METERS FOR EACH CHANNEL ARE LOCATED ADJACENT TO OTHER PARAMETERS OF THE SAME CHANNEL TO FACILITATE THE NECESSARY ASSOCIATIONS THAT MUST BE MADE WITHIN CHANNELS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
5L18-2		CONTAINMENT #12 FLOW
5L18-1		CONTAINMENT #11 FLOW

HEO#: ENV-ØØ1.Ø

DESCRIPTION:

THE ILLUMINATION LEVEL AT THE REMOTE SHUTDOWN PANEL #12 IS BELOW THE MINIMUM RECOMMENDED LIGHTING LEVEL FOR EMERGENCY OPERATING LIGHTING OF 1Ø FC. LEVEL READING WAS 9 FC. RECOMMENDED ILLUMINATION LEVEL IS 3Ø FC.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 2C

EXPLANATION:

THE EMERGENCY LIGHTING AT THE REMOTE SHUTDOWN PANELS WILL BE ANALYZED DURING THE NEXT OUTAGE TO DETERMINE THE STEPS REQUIRED TO PROVIDE ADEQUATE EMERGENCY LIGHTING. MEASUREMENTS WILL BE TAKEN TO DETERMINE IF ADDITIONAL LIGHTS ARE REQUIRED OR IF RE-DIRECTING EXISTING LIGHTS WILL ALLEVIATE THE PROBLEM.

VERIFICATION:

HEO#: ENV-002.0

DESCRIPTION:

BACKGROUND NOISE LEVELS AT REMOTE SHUTDOWN PANEL #12 EXCEED MAXIMUM RECOMMENDED LEVELS OF 65 db(A). THE LEVEL WAS MEASURED AT 93 db(A).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE GUIDELINE OF 65 DBA IS RECOMMENDED FOR OPERATOR COMFORT AND COMMUNICATION IN A CONTINUOUSLY MANNED AREA. THE OSHA PERMISSIBLE NOISE EXPOSURE GUIDELINE ALLOWS EXPOSURE OF UP TO FOUR HOURS AT 95 DBA. PERSONNEL MONITOR THE REMOTE SHUTDOWN PANEL FOR A SHORT PERIOD OF TIME, AND TYPICALLY NO MORE THAN FOUR HOURS AT A TIME. THE REMOTE SHUTDOWN PANEL IS DESIGNATED TO BE MANNED WHEN THE PLANT IS SHUTDOWN, AT WHICH TIME THE NOISE LEVEL IS DRASTICALLY REDUCED.

VERIFICATION:

HEO#: ENV-ØØ3.Ø

DESCRIPTION:

SEVERAL CONTROL HANDLES ON FIRE PANEL WERE FOUND TO BE CRACKED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 3B

EXPLANATION:

CRACKED OR BROKEN CONTROL SWITCHES ON THE FIRE PANEL HAVE BEEN REPLACED WITH THE APPROPRIATE SWITCHES.

VERIFICATION:

HEO#: FP-002.0

DESCRIPTION:

ZONE GROUPINGS WITHIN THE MAJOR AREAS OF THE FIRE PANEL ARE NOT ENHANCED BY DEMARCATION, SUMMARY LABELING, SPACING, COLOR SHADING, OR OTHER APPROPRIATE TECHNIQUES.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: INVALID

RISK CATEGORY: 1C

EXPLANATION:

THERE ARE DEMARCATION LINES AND HIERARCHIAL LABELS SEPARATING AND IDENTIFYING SYSTEMS ON THE FIRE PANEL. FURTHER DEMARCATION ON THE FIRE PANEL WOULD CREATE CLUTTER.

VERIFICATION:

HEO#: FP-004.0

DESCRIPTION:

CONTROLS FOR THE EXTINGUISHING SYSTEMS ON THE FIRE PANEL ARE SOMETIMES DIFFICULT TO ACCURATELY POSITION. THIS IS IMPORTANT IN CHANGING POSITION FROM "ALARM ONLY" TO "AUTO" WHERE AN OVERSHOOT COULD RESULT IN DISCHARGING THE SYSTEM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 4B

EXPLANATION:

THE POTENTIAL OVERSHOOT OF THE FIRE PANEL SWITCHES WAS CLOSELY EXAMINED AND NO EVIDENCE COULD BE FOUND TO SUPPORT THE ASSERTION OF THE PROBLEM. THERE HAVE BEEN NO INCIDENTS OF INADVERTANT SYSTEM DISCHARGE. THE FIRE PANEL SWITCHES IN THE SIMULATOR, WHICH ARE THE SAME SWITCH TYPE, WERE TESTED AND NO DIFFICULTY IN POSITIONING THE SWITCHES WAS DETECTED.

VERIFICATION:

HEO#: FP-005.0

DESCRIPTION:

A METHOD TO CUT OUT ALARM SIGNALS FROM OUT OF SERVICE DETECTORS IS NOT PROVIDED RESULTING IN NUMEROUS FALSE ALARMS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 4E

EXPLANATION:

THE ALARM CONDITIONS ARE BEING EXAMINED TO ELIMINATE FALSE ALARMS FROM OUT OF SERVICE FIRE DETECTORS.

VERIFICATION:
VERIFY COMPLETION.

HEO#: FP-006.0

DESCRIPTION:

TROUBLE ALARM FOR FIRE PANEL DOOR OPEN IS A NUISANCE ALARM AND IS NOT EFFECTIVE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 4E

EXPLANATION:

THE DOOR OPEN ANNUNCIATOR HAS BEEN REMOVED FROM THE FIRE PANEL. THIS ALARM WAS NOT A SAFETY REQUIREMENT AND PROVED TO BE ONLY A NUISANCE ALARM. THE SOURCE OF THE ALARM AND THE ANNUNCIATOR TILE WERE REMOVED.

VERIFICATION:

RE.7

90.8

HEO#: FP-ØØ7.Ø

DESCRIPTION:

NOT ALL LAMPS ARE PROVIDED WITH A LAMP TEST.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

A LAMP TEST HAS BEEN PROVIDED FOR LIGHTS THAT PROVIDE NO OTHER INDICATION OF LIGHT BULB STATUS. LIGHTS THAT OPERATE AS A PAIR (OPEN-CLOSE/ON-OFF) DO NOT REQUIRE LAMP TEST CAPABILITY BECAUSE ONE OF THE LIGHTS SHOULD ALWAYS BE LIT. IF BOTH LIGHTS ARE EXTINGUISHED IT INDICATES THAT A BULB HAS BURNED OUT.

VERIFICATION:
ELABORATE ON ASSESSMENT.

HEO#: FP-008.0

DESCRIPTION:

AN AID IS NOT PROVIDED TO SHOW WHICH LAMPS ARE CHECKED UNDER LAMP TEST.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 3E

EXPLANATION:

A LAMP TEST HAS BEEN PROVIDED FOR LIGHTS THAT PROVIDE NO OTHER INDICATION OF LIGHT BULB STATUS. LIGHTS THAT OPERATE AS A PAIR (OPEN-CLOSE/ON-OFF) DO NOT REQUIRE LAMP TEST CAPABILITY BECAUSE ONE OF THE LIGHTS SHOULD ALWAYS BE LIT. IF BOTH LIGHTS ARE EXTINGUISHED IT INDICATES THAT A BULB HAS BURNED OUT.

VERIFICATION:
EA.9

HEO#: OCS-Ø19.Ø

DESCRIPTION:

THE MAIN STEAM ISOLATION VLV CONTROLS ON PANEL F HAVE RED, GREEN, YELLOW, AND WHITE LIGHTS. NO INDICATION OF THE MEANING OF THESE LIGHTS IS PROVIDED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE GREEEN LIGHT INDICATES THAT THE MSIV IS CLOSED. THE WHITE LIGHT INDICATES THAT THE VALVE CONTROL IS IN A TEST CONDITION. THE YELLOW LIGHT INDICATES THE STATUS OF THE VALVE TEST AND THE RED LIGHT INDICATES THAT THE VALVE IS OPEN. THE MEANING OF THESE INDICATOR LIGHTS IS DOCUMENTED IN THE HF DESIGN MANUAL AS A PLANT CONVENTION.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

Panel ID #	Equipment ID #	Equipment Name
F		MAIN STEAM ISOLATION VLV CONTROLS

HEO#: OCS-Ø22.Ø

DESCRIPTION:

THE MEANING OF THE YELLOW INDICATOR ON THE TURNING GEAR CONTROL ON PANEL A1 IS NOT APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE YELLOW LIGHT ABOVE THE TURNING GEAR CONTROL INDICATES THAT THE CLUTCH IS ENGAGED WHEN LIT. A PLANT-SPECIFIC CONVENTION FOR THE MEANING OF COLORED INDICATOR LIGHTS HAS BEEN ESTABLISHED IN THE NMP-1 HUMAN FACTORS MANUAL AND THIS LIGHT IS IN ACCORDANCE WITH THAT CONVENTION.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

Panel ID #	Equipment ID #	Equipment Name
A1		TURNING GEAR CONTROL

HEO#: OCS-023.0

DESCRIPTION:

THE MEANING OF THE YELLOW INDICATOR ON THE STOP VLV 13 BYPASS CONTROL ON PANEL A2 IS NOT APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE YELLOW LIGHT ABOVE THE STOP VALVE 13 BYPASS CONTROL INDICATES THAT THE CLUTCH IS ENGAGED WHEN LIT. A PLANT-SPECIFIC CONVENTION FOR THE MEANING OF COLORED INDICATOR LIGHTS HAS BEEN ESTABLISHED IN THE NMP-1 HUMAN FACTORS MANUAL AND THIS LIGHT IS IN ACCORDANCE WITH THAT CONVENTION.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

Panel ID #	Equipment ID #	Equipment Name
A2		STOP VLV 13 BYPASS CONTROL

HEO#: OCS-024.0

DESCRIPTION:

THE MEANING OF THE YELLOW-RED-YELLOW INDICATOR SEQUENCE FOR THE LOAD LIMIT CONTROLLER ON PANEL A2 IS NOT APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE COLOR OF THE LIGHTS FOR THE LOAD LIMIT CONTROLLER HAS BEEN CHANGED AND A COLOR STANDARD FOR INDICATOR LIGHTS HAS BEEN ESTABLISHED IN THE NMP-1 HUMAN FACTORS MANUAL. THE LOAD LIMIT CONTROLLER NOW HAS TWO WHITE LIGHTS AND ONE YELLOW LIGHT. THE WHITE LIGHTS INDICATE AN EQUIPMENT MODE SELECTION, (LOW SPEED STOP AND HIGH SPEED STOP), AND THE YELLOW LIGHT INDICATES A LATCHED CONDITION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A2		LOAD LIMIT CONTROLLER

HEO#: OCS-033.0

DESCRIPTION:

THE CONTROL ABOVE THE RECLOSING SELECTOR R915 ON PANEL A6 HAS NO LABEL.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: 3D

EXPLANATION:

A NEW LABEL WILL BE INSTALLED FOR THE SELECTOR SWITCH ON PANEL A6.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A6		RECLOSING SELECTOR R915

HEO#: OCS-037.0

DESCRIPTION:

THE CHILLER SYSTEMS BYPASS CONTROL ON PANEL H, IS NOT SPECIFIED AS A VALVE.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE FUNCTION OF THIS CONTROL IS CLEARLY INDICATED THROUGH LABEL, POSITION AND CONTROL TYPE. THE LABEL DOES NOT STATE THE WORD "VALVE", BUT THAT IS NOT NECESSARY WHEN ALL OTHER CONTEXTUAL INDICATIONS PROVIDE SPECIFIC INFORMATION ON THE COMPONENT FUNCTION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		CHILLER SYS BYPASS
H		VLV

HEO#: OCS-038.0

DESCRIPTION:

THE CONTROL, "CLEANUP SELECTOR CONDENSER WASTE", ON PANEL K IS UNCLEAR WITH RESPECT TO THE FUNCTION OF THIS COMPONENT.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE FUNCTION OF THIS CONTROL IS CLEARLY INDICATED THROUGH LABEL, POSITION AND CONTROL TYPE. THE LABEL STATES "SELECTOR" WHICH DESCRIBES THE FUNCTION OF THE COMPONENT, THIS IS FURTHER SUPPORTED BY THE CONTROL POSITIONS ON THE SWITCH.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K		CLEANUP SELECTOR CONDENSER WASTE

HEO#: OCS-039.0

DESCRIPTION:

IT IS NOT CLEAR WHAT THE YELLOW LIGHT ON PANEL H1 REFERS TO. SOME COMPONENT LABELS DO NOT CLEARLY DESCRIBE THE FUNCTION OF THE ASSOCIATED DEVICE.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE YELLOW LIGHT ABOVE THE SCREENHOUSE TEMPERING GATE INDICATES THAT THE CLUTCH IS ENGAGED WHEN LIT. A PLANT-SPECIFIC CONVENTION FOR THE MEANING OF COLORED INDICATOR LIGHTS HAS BEEN ESTABLISHED IN THE NMP-1 HUMAN FACTORS MANUAL AND THIS LIGHT IS IN ACCORDANCE WITH THAT CONVENTION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H1		TROUBLE LIGHT-SCREEN HOUSE TEMPERING GATE

HEO#: OCS-040.0

DESCRIPTION:

"RECIRC PUMPS COOL WATER ISOLATION " ON PANEL H DOES NOT SPECIFY THAT IT IS A VALVE CONTROL.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE FUNCTION OF THIS CONTROL IS CLEARLY INDICATED THROUGH LABEL, POSITION AND CONTROL TYPE. THE LABEL DOES NOT STATE THE WORD "VALVE", BUT THAT IS NOT NECESSARY WHEN ALL OTHER CONTEXTUAL INDICATIONS PROVIDE SPECIFIC INFORMATION ON THE COMPONENT FUNCTION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		RECIRC PUMPS COOL WTR ISOLATION
H		VLV CONTROLS

HEO#: OCS-062.0

DESCRIPTION:

PLACEMENT OF LABELS IS INCONSISTENT, LABELS APPEAR UNDER METERS ON PANEL A, BUT ABOVE CORRESPONDING METERS ON PANEL E.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

LABELS ARE PLACED TO ENSURE VISIBILITY AND ASSOCIATION WITH THE RELATED COMPONENTS. A CONVENTION FOR LABEL PLACEMENT HAS BEEN ESTABLISHED IN THE HUMAN FACTORS MANUAL. THE CONVENTION DIRECTS LABELS TO BE PLACED BELOW COMPONENTS ON VERTICAL PANELS ABOVE EYE LEVEL. THE COMPONENTS ON PANEL E ARE BELOW EYE LEVEL AND THE LABELS ARE APPROPRIATELY PLACED ABOVE COMPONENTS. EVERY LABEL HAS BEEN REVIEWED TO ENSURE THAT IT CAN BE SEEN AND THAT IT IS OBVIOUS WHICH COMPONENT IT REFERS TO.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A		METERS

HEO#: OCS-Ø63.Ø

DESCRIPTION:

THE LABEL FOR THE RECIRC MASTER CONTROL ON PANEL E IS LOCATED CLOSELY BETWEEN TWO CONTROLLERS. ASSOCIATION IS NOT READILY APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: 3A

EXPLANATION:

THE LABEL FOR THE RECIRCULATION MASTER CONTROL WAS MOVED TO BE IN ACCORDANCE WITH THE LABEL PLACEMENT CONVENTION ESTABLISHED IN THE HUMAN FACTORS MANUAL. THE LABEL IS PLACED BELOW THE CONTROLLER TO SHOW MORE CLEARLY WHICH COMPONENT IT IS ASSOCIATED WITH.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E	1E4 1E5	RECIRCULATION MASTER CONTROL

[illegible]

HEO#: OCS-070.0

DESCRIPTION:

DRYWELL PRESSURE INDICATORS (SCALES 0-1 AND 0-75) ARE IN PSI WHERE PSIG SHOULD BE USED FOR CLARITY.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THE ABBREVIATIONS PSI AND PSIG ARE SYNONOMOUS AT NMP-1. IF AN INDICATOR MEASURES PSIA OR PSID IT IS ALWAYS SPECIFIED AS SUCH.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
L		DRYWELL PRESSURE INDICATORS

HEO#: OCS-071.0

DESCRIPTION:

TORUS AREA LEAKAGE ON PANEL K IS SCALED IN ELEVATION. THE INDICATOR IS NOT SCALED IN UNITS WHICH DIRECTLY RELATE TO SYSTEM OPERATION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

THE TORUS AREA LEAKAGE IS MEASURED IN FEET ELEVATION. THIS METER IS USED FOR COMPARISON WITH OTHER SCALES INDICATING THE SAME UNITS. THE ABSOLUTE LEVEL OF LEAKAGE, (OBTAINED BY SUBTRACTING 198 FROM INDICATED VALUE), IS NOT AS IMPORTANT AS THE RELATIONSHIP OF THIS SCALE WITH OTHER RELATED PARAMETERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K	3K40	TORUS AREA LEAKAGE

HEO#: OCS-Ø72.Ø

DESCRIPTION:

THE CONTAINMENT SPRAY FLOW, CORE SPRAY FLOW, AND WASTE FLOW INDICATORS ARE SCALED IN LBM/HR.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THE PLANT WAS DESIGNED AND BUILT FOR FLOW METERS TO MEASURE IN LB/HR. THIS IS CONSISTENT WITH OPERATOR TRAINING AND PROCEDURES. VARIOUS FLOW INDICATORS ARE COMPARED WITH ONE ANOTHER, THEREFORE THEY MUST INDICATE IN THE SAME UNITS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K		CORE SPRAY FLOW
K		WASTE FLOW
K		SPRAY FLOW

HEO#: OCS-Ø74.Ø

DESCRIPTION:

CONTROLLER INDICATOR FOR CLEANUP SYSTEM FLOW DOES NOT SPECIFY UNIT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THE METER ON THIS CONTROLLER HAS A RANGE FROM Ø-1ØØ, THIS SCALE INDICATES UNITS OF PERCENT DEMAND. THERE ARE SEVERAL CONTROLLERS IN THE CONTROL ROOM WITH IDENTICAL Ø-1ØØ FEEDBACK METERS, THE UNITS ARE ALWAYS PERCENT DEMNAND. THIS IS A BASIC ASPECT OF THE OPERATION OF THESE INSTRUMENTS THAT IS COVERED IN TRAINING AND KNOWN BY ALL OPERATORS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K	6K15	CLEANUP SYSTEM FLOW

HEO#: OCS-Ø87.Ø

DESCRIPTION:

MULTI-SCALED METERS MAY HAVE INNER SCALE NUMERALS OBSCURED BY POINTERS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THESE ARE GENERAL ELECTRIC CIRCULAR ELECTRICAL METERS USED THROUGHOUT THE NUCLEAR INDUSTRY. NO GRADUATION MARKS ARE OBSCURED AND AT MOST, ONE NUMBER CAN BE OBSCURED. BY USING THE REST OF THE NUMBERS ON THE SCALE IT IS EASY TO TELL WHAT THE SCALE IS INDICATING.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A6		MULTI-SCALE METERS

HEO#: OCS-Ø88.Ø

DESCRIPTION:

ELECTRICAL METER POINTERS SOMETIMES OBSCURE SCALE NUMERALS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THESE ARE GENERAL ELECTRIC CIRCULAR ELECTRICAL METERS USED THROUGHOUT THE NUCLEAR INDUSTRY. NUMERALS ARE LARGE BLACK NUMBERS JUST INSIDE THE GRADUATION MARKS. AT MOST, ONE NUMBER CAN BE OBSCURED. BY USING THE REST OF THE NUMBERS ON THE SCALE IT IS EASY TO TELL WHAT THE SCALE IS INDICATING.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		ELECTRICAL METER POINTERS

HEO#: OCS-095.0

DESCRIPTION:

TORUS AND DRYWELL PRESSURE INDICATORS AND RECORDERS ARE NOT VISUALLY ALIGNED TO FACILITATE COMPARATIVE READING.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

TORUS AND DRYWELL PRESSURE COMPARISONS ARE USED WITHIN THE OPERATING PRESSURE RANGES. THERE ARE ADJACENT METERS FOR THIS PURPOSE ON PANEL K. BEYOND THE OPERATING RANGES ANY COMPARISONS BECOME MEANINGLESS. TORUS PRESSURE IS A REDUNDANT INDICATION AND CAN'T BE EFFECTED BY OPERATIONAL PROCEDURES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K		TORUS AND DRYWELL INDICATORS
L		TORUS AND DRYWELL INDICATORS

HEO#: OCS-096.0

DESCRIPTION:

VLV POSITION METER "STOP VLV 13 BYPASS" APPARENTLY IS NOT MARKED WITH SUBDIVISIONS WHICH ARE CONSISTENT WITH THE ACCURACY NEEDED BY THE OPERATOR. GREASE PENCIL MARKINGS HAVE BEEN ADDED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE STOP VALVE 13 BYPASS VALVE POSITION METER SHOWS THE RELATIVE POSITION OF THE VALVE WITH THE SCALE MARKINGS "OPEN" AND "CLOSED" MORE SCALE DIVISIONS WOULD NOT PROVIDE MORE INFORMATION OR IMPROVE ACCURACY OF READING. THE GREASE PENCIL MARKS NOTED ON THE SCALES ARE USED BY OPERATORS TO PROVIDE INFORMAL REFERENCE INFORMATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A2	219	STOP VLV 13 BYPASS

HEO#: OCS-152.Ø

DESCRIPTION:

THE GENERATOR A-C MEGAWATTS ARE SCALED WITH SUBDIVISIONS OTHER THAN MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THIS IS A STANDARD GENERAL ELECTRIC METER, COMMON TO ALL BWR PLANTS. THE NEGATIVE TRANSFER EFFECT OF CHANGING THE SCALE OUTWEIGHS ANY POSSIBLE BENIFIT OF DIFFERENT NUMERICAL PROGRESSIONS. THIS INSTRUMENT IS NOT USED TO DETERMINE LICENSE LIMIT. THERE ARE OTHER REDUNDANT INDICATORS IN THE CONTROL ROOM.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		GENERATOR A-C MEGAWATTS

HEO#: OCS-153.Ø

DESCRIPTION:

THE IRM/APRM RECORDERS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1;2;OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

OPERATORS ARE VERY ACCUSTOMED TO THESE RECORDER INDICATIONS AND A CHANGE WOULD PRESENT NEGATIVE TRANSFER PROBLEMS TO THE OPERATORS. THIS METER INDICATION IS READ IN CONJUNCTION WITH IRM/APRM RANGE SWITCHES. DURING STARTUP OR SHUTDOWN THE OPERATOR RANGES UP/DOWN WITH THE SWITCH IN A RELATIVE SPOT ON THE INDICATOR SO AS NOT TO EXCEED THE ROD BLOCK AND REACTOR SCRAM SETPOINTS COMING OFF THE UPPER RANGES OF THE METER. ACCURATE POWER READINGS DURING THESE OPERATIONS ARE NOT CRITICAL AND ARE BASED MORE ON THE POSITION OF THE RANGE SWITCH THAN THE QUICKLY CHANGING METER INDICATION. AT FULL POWER, THE METER READINGS DO NOT FLUXUATE GREATLY AND ARE EASILY OBTAINED BY THE CURRENT DESIGN. THESE RECORDERS WITH THE EXISTING SCALE, ARE STANDARD EQUIPMENT FOR ALL GENERAL ELECTRIC BWR PLANTS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		IRM/APRM RECORDERS

HEO#: OCS-160.0

DESCRIPTION:

THE CIRCULAR METERS FOR INCOMING AND RUNNING A-C VOLTS; GENERATOR CYCLES; PB 16 AND 17 A-C VOLTS; ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THE READINGS FROM THESE METERS ARE USED TO COMPARE THE INCOMING VOLTS TO THE RUNNING AC VOLTS FOR A MATCH. THE OPERATOR IS NOT CONCERNED WITH THE ACTUAL VALUES BUT WITH THE RELATIVE POSITIONS OF THE TWO POINTERS. BOTH SETS OF METERS UTILIZE THE SAME SCALE SO THAT THE COMPARISON IS EASILY PERFORMED. THESE ARE INDUSTRY STANDARD GENERAL ELECTRIC METERS. THE ADVERSE EFFECT OF NEGATIVE TRANSFER WOULD OUTWEIGH ANY BENIFIT OF CHANGING THESE METER SCALES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A5		INDICATORS
A5		P B 17 VOLTS
A4		P B 16 VOLTS
A4		RUNNING A-C VOLTS
A5		GENERATOR CYCLES
A5		RUNNING A-C VOLTS
A4		INCOMING A-C VOLTS
A4		GENERATOR CYCLES
A5		INCOMING A-C VOLTS

HEO#: OCS-161.Ø

DESCRIPTION:

THE 115 KV BUS AC KILOVOLTS AND CYCLES; OSW-NMP1 AND NMP-FITZ4 AC KILOVOLTS; ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 4D

EXPLANATION:

THE READINGS OF THESE METERS WILL BE AT 115 KV OR AT ZERO. SPECIFIC VALUES ARE NOT READ. THESE ARE INDUSTRY STANDARD GENERAL ELECTRIC METERS. THE ADVERSE EFFECT OF NEGATIVE TRANSFER WOULD OUTWEIGH ANY BENIFIT OF CHANGING THESE METER SCALES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A8		115 KV BUS A-C KILOVOLTS
A8		NMP-FITZ 4
A8		OSW-NMP1

HEO#: OCS-162.0

DESCRIPTION:

THE LPRM-APRM AUX PERCENT POWER METER ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1;2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THESE METERS ARE USED ONLY FOR CALIBRATION AND TESTING OF APRM(S) AND LPRM(S). THERE ARE FRONT PANEL METERS THAT PROVIDE OPERATIONAL INFORMATION. THE COMPUTER ALSO PROVIDES CALIBRATED APRM AND LPRM DATA THROUGH ON-DEMAND PROGRAMS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
G		LPRM-APRM AUX PERCENT POWER METER

HEO#: OCS-167.Ø

DESCRIPTION:

PRINTED CHANNEL NUMBERS ARE NOT EASILY READ ON THE CHART RECORDERS OF PANEL B. THE MULTI-CHANNEL TEMPERATURE ON PANEL B2 IS MOST ESPECIALLY CROWDED AND UNREADABLE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 5E

EXPLANATION:

THE CITED RECORDERS ARE TO BE REPLACED WITH NEW RECORDERS, THESE WILL BE APPROPRIATELY LABELED.

VERIFICATION:
ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
B		CHART RECORDERS

HEO#: OCS-168.0

DESCRIPTION:

TORUS AND DRYWELL PRESSURE RECORDER HAS SCALES 0-1.0 AND 0-2; CHART PAPER IS 0-100.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

MAINTAINING THE CHART PAPER SCALE AT 0-100 ALLOWS THE FLEXIBILITY TO USE THIS RECORDER AS A COMPUTER TREND RECORDER IF NEEDED. THE EXISTING PAPER PROVIDES THE CAPABILITY TO USE THIS RECORDER AS A BACKUP TO OTHER DEDICATED INSTRUMENTATION IN A FORM THAT DOES NOT REQUIRE CONVERSION. THE EXISTING SCALE PROVIDES THE NEEDED VALUE READINGS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		TORUS AND DRYWELL PRESSURE RECORDER

[illegible]

HEO#: OCS-169.0

DESCRIPTION:

OFF-GAS AND EJECTOR CONDENSER RECORDER HAS SCALES 0-15 AND 0-300; CHART PAPER IS 0-100.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1A

EXPLANATION:

MAINTAINING THE CHART PAPER SCALE AT 0-100 ALLOWS THE FLEXIBILITY TO USE THIS RECORDER AS A COMPUTER TREND RECORDER IF NEEDED. THE EXISTING PAPER PROVIDES THE CAPABILITY TO USE THIS RECORDER AS A BACKUP TO OTHER DEDICATED INSTRUMENTATION IN A FORM THAT DOES NOT REQUIRE CONVERSION. THE EXISTING SCALE PROVIDES THE NEEDED VALUE READINGS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		OFF-GAS AND EJECTOR CONDENSER RECORDER

HEO#: OCS-174.0

DESCRIPTION:

INTAKE TUNNEL DIFFERENTIAL PRESSURE RECORDER HAS SCALES 0-30 AND 0-100; CHART PAPER IS 0-100.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: 1B

EXPLANATION:

NEW CHART PAPER, WITH SAME RANGE AND DIVISIONS AS THE RECORDER SCALES WILL BE PROVIDED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
LH		INTAKE TUNNEL DIFFERENTIAL PRESSURE RECORDER

HEO#: OCS-179.0

DESCRIPTION:

DRYWELL PRESSURE AND DEWPOINT RECORDER IS A TWO POINT RECORDER WITH SCALES OF 0 TO 7.5 (DRYWELL PRESSURE) AND 0 TO 200 (DEWPOINT). THE CHART PAPER ON THE RECORDER HAS ONE SCALE OF 0 TO 100.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE CHART PAPER WILL BE REPLACED WITH DUAL SCALE PAPER TO MATCH THE RECORDER SCALES.

VERIFICATION:
NO VERIFICATION WAS PERFORMED. CONSISTENCY BETWEEN SCALE AND CHART PAPER IS KNOWN TO BE HELPFUL.

Panel ID #	Equipment ID #	Equipment Name
J		DRYWELL PRESSURE AND DEWPOINT RECORDER

HEO#: OCS-183.Ø

DESCRIPTION:

RECORDER MARKINGS ON THE WESTRONICS RECORDER ARE NOT DISTINCTIVE IN COLOR.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THIS RECORDER IS ACTUALLY TWO DUAL PEN RECORDERS. THERE IS A RED AND BLACK PEN ON THE LEFT SIDE OF THE RECORDER AND A RED AND A BLACK PEN ON THE RIGHT SIDE OF THE RECORDER. THERE ARE TWO DISTINCT AND SEPARATED SCALES ON THE RECORDER AND ON THE CHART PAPER. THE PARAMETER BEING MEASURED ON EACH OF THE SCALES IS LABELED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		WESTRONIC RECORDER

HEO#: OCS-191.Ø

DESCRIPTION:

GREEN INDICATING LIGHTS APPEAR DIM ON MANY PANELS. DIFFERENCES IN INTENSITY ARE APPARENTLY DUE TO A VARIATION IN PIGMENT DENSITY IN THE LENSES.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THERE IS NO OPERATIONAL DISTINCTION BETWEEN BRIGHT LIGHTS AND DIM LIGHTS. THERE ARE SOME DIFFERENCES IN INTESITY OF INDICATOR LIGHTS BUT IN EVERY INSTANCE IT IS EASY TO DISTINGUISH AN ILLUMINATED LIGHT FROM ONE THAT IS NOT ILLUMINATED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		INDICATING LIGHTS

[illegible]

HEO#: OCS-205.0

DESCRIPTION:

THE TORUS N2 MAKEUP SELECT ON PANEL L DOES NOT CLEARLY INDICATE THE CLOSE POSITION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THIS SPRING RETURN SELECTOR SWITCH CONTROLS TWO VALVES. MOVEMENT TO THE RIGHT OR LEFT OPENS ONE OF THE VALVES. EACH OF THESE SWITCH POSITIONS IS LABELED "OPEN". THE INDICATOR LIGHTS ABOVE THE SWITCH CLEARLY INDICATE WHICH VALVES ARE OPEN OR CLOSED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
L	3L14	TORUS N2 MAKE-UP SELECT

[illegible]

HEO#: OCS-206.0

DESCRIPTION:

THE DRYWELL N2 MAKEUP SELECT ON PANEL L DOES NOT CLEARLY INDICATE THE CLOSE POSITION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THIS SPRING RETURN SELECTOR SWITCH CONTROLS TWO VALVES. MOVEMENT TO THE RIGHT OR LEFT OPENS ONE OF THE VALVES. EACH OF THESE SWITCH POSITIONS IS LABELED "OPEN". THE INDICATOR LIGHTS ABOVE THE SWITCH CLEARLY INDICATE WHICH VALVES ARE OPEN OR CLOSED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
L	4L19	DRYWELL N2 MAKE-UP SELECT

HEO#: OCS-207.0

DESCRIPTION:

THE DIFFERENTIAL PRESSURE SYSTEM DISCHARGE ROUTE ON PANEL L DOES NOT CLEARLY INDICATE THE CLOSE POSITION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THIS SPRING RETURN SWITCH CONTROLS BOTH DISCHARGE CHANNELS. VALVE POSITIONS ARE CLEARLY INDICATED BY STATUS LIGHTS. THE DIFFERENTIAL PRESSURE SYSTEM IS NOT USED FOR OPERATION. IT REMAINS IN THE CONTOL ROOM FOR USE DURING SURVEILLANCE TESTING.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
L	4L33	DIFFERENTIAL PRESS SYS DISCHARGE ROUTE

HEO#: OCS-208.0

DESCRIPTION:

THE N2 STORAGE TANK 12 ROUTE ON PANEL L DOES NOT CLEARLY INDICATE THE CLOSE POSITION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THIS SPRING RETURN SELECTOR SWITCH CONTROLS TWO VALVES. MOVEMENT TO THE LEFT OR RIGHT OPENS ONE OF THE VALVES. EACH OF THESE SWITCH POSITIONS IS LABELED "OPEN". THE INDICATOR LIGHTS ABOVE THE SWITCH CLEARLY INDICATE WHICH VALVES ARE OPEN OR CLOSED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
L	3L33	N2 STORAGE TANK 12 ROUTE

HEO#: OCS-209.0

DESCRIPTION:

THE CONDENSER WATER SPRAY BYPASS SW DOES NOT CLEARLY INDICATE POSITION; THE POINTER IS BROKEN OFF.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: 2B

EXPLANATION:

A NEW SWITCH, OR SWITCH POINTER WILL BE PROVIDED TO CLEARLY INDICATE SWITCH POSITION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A2	361	CONDENSER WATER SPRAY BYPASS SWITCH

HEO#: OCS-212.Ø

DESCRIPTION:

THE SHAPES OF SOME SWITCH KNOBS CAUSE THE OBSTRUCTION OF POSITION LABELS UNLESS THE OPERATOR IS DIRECTLY ATOP THE CONTROLS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

SWITCH POSITION LABELS FOR CONTROLS WITH OBLONG HANDLES ARE ENGRAVED WHITE LETTERS PLACED AROUND THE PERIMETER OF THE BLACK SWITCHPLATE. THERE IS A WHITE POINTER THAT CLEARLY INDICATES THE SELECTED POSITION WITHOUT OBSCURING THE LETTERING. THE CONFIGURATION OF THE LARGE CONTROL HANDLE WITH THE POINTER AND ENGRAVED SWITCH POSITIONS IS A GOOD SELECTION DEVICE FOR ITS OPERATIONAL FUNCTION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		OBLONG HANDLES
ALL		SWITCH KNOB

HEO#: OCS-219.0

DESCRIPTION:

ANNUNCIATORS ARE GENERALLY GROUPED BY SPECIFIC SYSTEM WITHIN AN ANNUNCIATOR BOX. IN SOME CASES HOWEVER, SEEMINGLY UNRELATED ANNUNCIATORS ARE MIXED WITHIN A BOX. AN EXAMPLE OF THIS IS WINDOW H2-25, CONCENTRATOR ELECTRIC BOILER.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 4E

EXPLANATION:

THIS ANNUNCIATOR REFERS TO A SPECIFIC PIECE OF EQUIPMENT WITH RELATED INSTRUMENTATION ON PANEL H. ITS PRESENT LOCATION IS THE MOST APPROPRIATE PLACEMENT OF THIS ANNUNCIATOR TILE.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
H2		ANNUNCIATOR WINDOW H2-25

HEO#: OCS-230.0

DESCRIPTION:

THERE ARE INSTANCES OF ANNUNCIATOR WINDOWS WHICH DO NOT CLEARLY DEFINE THE INTENT OF THE ALARM.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 4B

EXPLANATION:

ALL CRITICAL PARAMETER ANNUNCIATORS ARE SINGLE INPUT ANNUNCIATORS THAT CLEARLY ALERT THE OPERATOR TO THE SOURCE OF THE ALARM. MULTIPLE-INPUT ANNUNCIATORS FOR OTHER PARAMETERS ARE A NECESSITY DUE TO THE NUMBER AND VARIETY OF ALARM INPUTS. THESE MULTIPLE-INPUT ANNUNCIATORS ALERT THE OPERATOR TO THE SYSTEM IN ALARM AND ENABLES THE OPERATOR TO DETERMINE MORE SPECIFIC DETAILS ON THE ALARM. SETPOINT INFORMATION FOR MANY MULTIPLE-INPUT ANNUNCIATORS IS AVAILABLE ON THE COMPUTER AND THE ANNUNCIATOR PROCEDURE BOOK PROVIDES INFORMATION ON DEDICATED INSTRUMENTATION TO MONITOR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A	A1-26	
L	L1-16	
L	L1-10	
K	K3-32	
K	K3-27	
L	L1-12	
K	K3-29	
F	F1-22	
A	A2-21	
H	H1-16	
H	H1-24	
H	H1-29	
H	H1-3	
L	L1=23	
H	H2-31	
L	L1-9	
L	L1-29	
H	H1-32	
L	L1-26/25	
H	H2-20	
L	L1-24	
L	L1-18	

HEO#: OCS-231.Ø

DESCRIPTION:

THERE ARE INSTANCES OF ANNUNCIATOR WINDOWS WHICH DO NOT PROVIDE SETPOINTS FOR PARAMETERS WITH MULTIPLE TRIP LEVELS ON PANELS F,H,AND L.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THERE IS NO WAY TO FIT A SYSTEM IDENTIFIER, THE NATURE OF THE TROUBLE, AND ALL ALARM SETPOINT INFORMATION ON A 2 X 3 INCH ANNUNCIATOR TILE WITHOUT CREATING ENORMOUS CLUTTER. ALARM SETPOINT INFORMATION IS PRINTED BY THE COMPUTER TO IDENTIFY THE PARAMETER IN ALARM WHEN MULTIPLE INPUT ALARMS ARE ACTUATED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		ANNUNCIATOR WINDOWS
F		ANNUNCIATOR WINDOWS
L		ANNUNCIATOR WINDOWS

HEO#: OCS-232.Ø

DESCRIPTION:

THERE ARE MANY MULTIPLE INPUT ANNUNCIATOR WINDOWS. EXAMPLES ARE: (L1-28) DRYWELL TORUS TEMP HIGH/COOLING FAN TRIP VIB, L1-7 INST AIR COMP 11-12-13 TRIP. THERE ARE OTHER MULTIPLE INPUT ANNUNCIATORS WITH SPECIFIC MULTIPLE CONDITIONS OR PARAMETERS. EXAMPLES ARE HIGH/LOW, OR LEVEL/PRESS/TEMP/.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

MULTIPLE INPUT ANNUNCIATORS ARE UNAVOIDABLE BECAUSE OF THE NUMBER OF POSSIBLE ALARM CONDITIONS AND THE LIMITED NUMBER OF ANNUNCIATOR WINDOWS. THESE ALARMS ALERT THE OPERATOR OF THE SYSTEM IN AN ALARM CONDITION. MORE SPECIFIC INFORMATION CAN BE OBTAINED FROM THE COMPUTER PRINTOUT OF ALARM SETPOINTS AND FROM DEDICATED INSTRUMENTATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		MULTIPLE CHOICE TYPE WINDOWS

HEO#: OCS-233.Ø

DESCRIPTION:

HIGH PRIORITY ANNUNCIATOR WINDOWS ON PANEL F HAVE BOTH A RED BORDER AROUND THE WINDOW AND ILLUMINATE BY A RED COLORED BULB. HOWEVER; THIS PRACTICE HAS NOT BEEN UTILIZED ELSEWHERE IN THE CONTROL ROOM.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

ONLY A FEW CAREFULLY SELECTED ANNUNCIATOR WINDOWS ARE HIGHLIGHTED WITH A RED BORDER AND LIGHT TO INDICATE A HIGH PRIORITY. THIS IS A DELIBERATE DESIGN TO ENHANCE THE ATTENTION-GETTING PROPERTY OF THESE ANNUNCIATOR TILES. THIS IS DOCUMENTED AS A STATION CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A		ANNUNCIATOR WINDOWS
H		ANNUNCIATOR WINDOWS
K		ANNUNCIATOR WINDOWS
L		ANNUNCIATOR WINDOWS

HEO#: OCS-246.Ø

DESCRIPTION:

THE COMPUTER SYSTEM UTILIZED IS NOT IMMEDIATELY AVAILABLE AFTER POWER TRANSIENTS. AUTOMATIC REINITIALIZATION OCCURS WITHIN 1Ø MINUTES; OTHERWISE REINITIALIZATION MUST BE PERFORMED FROM THE COMPUTER ROOM. ALSO; MEMORY IS VOLATILE AND MUST BE RELOADED FROM DISC.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE COMPUTER IS ON A MAINTENANCE GENERATOR THAT MAINTAINS POWER DURING TRANSIENTS. IT HAS AUTO START WHICH REINITIALIZES THE SYSTEM WHEN POWER IS RETURNED. THE COMPUTER HAS A NON-VOLATILE MEMORY, SO NO MEMORY IS LOST UPON LOSS OF POWER.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		COMPUTER SYSTEM

HEO#: OCS-247.Ø

DESCRIPTION:

COLORS USED ON CRT DISPLAYS ARE NOT CONSISTENT WITH COLOR STANDARDS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4C

EXPLANATION:

A STUDY ON THE USE OF COLOR ON COMPUTER DISPLAYS HAS BEEN CONDUCTED. COLOR CODES FOR DIFFERENT TYPES OF INFORMATION HAVE BEEN ESTABLISHED. COLORS RECOMMENDED FOR CRT USE IN NUREG-Ø7ØØ HAVE BEEN SELECTED AND DOCUMENTED AS PART OF THE NMP-1 HUMAN FACTORS MANUAL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		CRT DISPLAY

HEO#: OCS-248.0

DESCRIPTION:

THE LOSS OF PRIMARY COLOR GUN SHOULD NOT CAUSE LOSS OF OR CHANGE IN THE DISPLAY. THE CRT'S ARE NOT COMPLETELY COLOR CODED SUCH THAT DISPLAYED INFORMATION IS SECURE. THE LOSS OF GREEN OR YELLOW WOULD CAUSE A CHANGE IN THE DISPLAY MEANING.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4C

EXPLANATION:

A STUDY ON THE USE OF COLOR ON COMPUTER DISPLAYS HAS BEEN CONDUCTED. COLOR CODES FOR DIFFERENT TYPES OF INFORMATION HAVE BEEN ESTABLISHED. COLORS RECOMMENDED FOR CRT USE IN NUREG-0700 HAVE BEEN SELECTED AND DOCUMENTED AS PART OF THE NMP-1 HUMAN FACTORS MANUAL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		CRT DISPLAY

HEO#: OCS-249.Ø

DESCRIPTION:

THERE IS NO EXPLICIT INDICATION GIVEN TO THE COMPUTER USER THAT THE SYSTEM IS OPERATIONAL AND THAT DATA IS BEING UPDATED ON A PERIODIC BASIS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE COMPUTER PRINTER PROVIDES A MESSAGE THAT THE PROGRAM IS IN PROGRESS WHEN THE COMPUTER IS RUNNING A PROGRAM. LONG PROGRAMS ARE PROCESSED IN SECTIONS, THE OPERATOR IS INFORMED WHEN SECTIONS OF THE PROGRAM ARE PROCESSING OR COMPLETE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		COMPUTER

HEO#: OCS-250.0

DESCRIPTION:

A PERIODIC REVIEW OF COMPUTER OUTPUT SHOULD BE MADE TO DETERMINE THE USEFULNESS OF PRINTED INFORMATION; TOO MUCH INFORMATION DURING A TRANSIENT COULD BE DETRIMENTAL TO THE OPERATOR. CURRENTLY, NO PROCEDURE EXISTS TO PERFORM SUCH A REVIEW.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: 2C

EXPLANATION:

A REVIEW OF COMPUTER OUTPUT HAS BEEN PERFORMED. ALARM INFORMATION IS NOW PRINTED IN RED AND ALL OTHER DATA PRINTED IN BLACK TO HELP THE OPERATOR INTERPRET THE PRINTOUT. DATA IS PRINTED IN A SIMPLE ONE LINE FORMAT. ALL DATA PRINTED BY THE COMPUTER IS NEEDED FOR CERTAIN CONDITIONS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		COMPUTER

HEO#: OCS-251.Ø

DESCRIPTION:

COMPUTER PRINTOUT IS SOMEWHAT DENSE. A REVIEW OF OUTPUT OR POSSIBLE REFORMATTING MAY BE IN ORDER.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: 2C

EXPLANATION:

A REVIEW OF COMPUTER OUTPUT HAS BEEN PERFORMED. ALARM INFORMATION IS NOW PRINTED IN RED AND ALL OTHER DATA PRINTED IN BLACK TO HELP THE OPERATOR INTERPRET THE PRINTOUT. DATA IS PRINTED IN A SIMPLE ONE LINE FORMAT. ALL DATA PRINTED BY THE COMPUTER IS NEEDED FOR CERTAIN CONDITIONS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		COMPUTER

HEO#: OCS-268.Ø

DESCRIPTION:

NORMALLY EXPECTED RESULTS ARE NOT GIVEN (SUCH AS VLV POSITIONS; FLOW RATES; ETC.) IN THE PROCEDURES.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

PROCEDURES SUPPLY ALL INFORMATION NEEDED TO SAFELY OPERATE THE PLANT. EOPS AND EPGS HAVE BEEN RECENTLY REVISED AND REVIEWED TO IDENTIFY WHAT FEEDBACK IS RELEVANT TO EACH TASK AND ENSURE THAT THE OPERATOR IS INFORMED OF THE EXPECTED RESULTS OF OPERATIONAL TASKS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		PROCEDURES

HEO#: OCS-275.Ø

DESCRIPTION:

AUDIBLE SIGNALS ARE NOT PRIORITIZED; ONLY THE FIRE ALARM IS OF DIFFERENT AND DISTINGUISHABLE TYPE.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS A SPEAKER AND A DIFFERENT AUDIBLE ALARM TONE AT EACH PANEL. THIS ENABLES THE OPERATOR TO LOCALIZE AND DISCRIMINATE THE SOURCE OF EACH ALARM. THERE ARE ALSO DISTINCT STATION AND FIRE ALARMS.

VERIFICATION:

HEO#: QS-002.0

DESCRIPTION:

CONTROL ROOM EMERGENCY VENT TESTS DURING THE SUMMER MONTHS CAUSE UNCOMFORTABLY HIGH TEMPERATURES IN THE CONTROL ROOM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

MODIFICATIONS WILL BE MADE TO THE CONTROL ROOM VENTILATION SYSTEM TO IMPROVE TEMPERATURE REGULATION.

VERIFICATION:

HEO#: QS-003.0

DESCRIPTION:

THERE ARE POOR AIR QUALITY CONTROLS IN THE CONTROL ROOM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

MODIFICATIONS WILL BE MADE TO THE CONTROL ROOM VENTILATION SYSTEM TO IMPROVE TEMPERATURE REGULATION.

VERIFICATION:

HEO#: QS-004.0

DESCRIPTION:

A TROUBLE ALARM ACKNOWLEDGE SWITCH FOR THE MAIN FIRE PANEL IS NEEDED TO ALLOW CONTROL OF NUSIANCE ALARMS WITHOUT MASKING VALID FIRE ALARMS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

THE CAPABILITY TO SILENCE FIRE PANEL ALARMS FROM THE ANNUNCIATOR ACKNOWLEDGE STATION ON PANEL "E" HAS BEEN INCORPORATED. IF THERE IS A PROBLEM WITH A NUISANCE ALARM THE OPERATOR CAN SILENCE THE ALARM WITHOUT LEAVING THE CENTRAL PLANT OPERATION WORKSTATION. NUISANCE ALARMS HAVE BEEN REDUCED BY ELIMINATING DOOR ALARMS.

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

VERIFY COMPLETION.

HEO#: QS-006.0

DESCRIPTION:

INDICATION OF RELATIVE SPEED OF #13 FEEDWATER SHAFT PUMP IS NEEDED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

AN INDICATION OF RELATIVE SPEED OF THE #13 FEEDWATER SHAFT PUMP IS AVAILABLE ON A DIGITAL INDICATOR. A STATUS LIGHT THAT ILLUMINATES WHEN THE FEEDWATER SHAFT PUMP IS SYNCHRONOUS WITH THE TURBINE SHAFT IS ALSO AVAILABLE. THE DIGITAL INDICATOR OF RELATIVE SPEED HAS BEEN REMOVED FOR MAINTENANCE AND WILL BE RETURNED TO SERVICE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		METER FOR RELATIVE SPEED OF #13 FEEDWATER SHAFT PUMP.

HEO#: QS-008.0

DESCRIPTION:

DRYWELL WATER LEAK RATE RECORDER IS DIFFICULT TO MAINTAIN.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

MAINTENANCE OF THE DRYWELL WATER LEAK RATE RECORDER IS NOT AN OPERATIONAL PROBLEM. THE RECORDER IS ON A FRONT PANEL AND PRESENTS NO ACCESS DIFFICULTY, IT IS MAINTAINED WITHIN REASONABLE TIME CONSTRAINTS. THIS RECORDER BEING OUT OF SERVICE PRESENTS NO SAFETY PROBLEM; THERE ARE ANNUNCIATORS FOR THESE PARAMETERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		DRYWELL WATER LEAK RATE RECORDER FOR EQUIPMENT DRAIN TANK #11 AND #12.

HEO#: QS-013.0

DESCRIPTION:

THIS CHART RECORDER IS NOT READILY ACCESSIBLE, SO IT IS DIFFICULT TO CHANGE THE CHART PAPER IN IT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE LAKE TEMPERATURE AND PLANT IN/OUT TEMPERATURE IS LOCATED ON A BACK PANEL TO BE NEAR SIMILAR INDICATIONS AND BECAUSE IT HAS A VERY LOW OPERATIONAL PRIORITY. THE PLACEMENT OF THE RECORDER IS BASED UPON OPERATIONAL NEED. PLACEMENT DOES NOT PREVENT CHANGING THE CHART PAPER.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		CHART RECORDER FOR LAKE TEMPERATURE AND PLANT IN AND OUT TEMPERATURE.

HEO#: QS-016.0

DESCRIPTION:

THE OPERATOR HAS TO LEAVE THE PRIMARY WORK AREA TO DETERMINE WHICH ARM OR CAM CAUSED AN ALARM CONDITION. THIRTY ARMS FEED INTO ONE ANNUNCIATOR AND SEVERAL CAMS FEED INTO ANOTHER ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 3A

EXPLANATION:

MONITORING OF ARMS AND CAMS ALARMS HAS BEEN MODIFIED. THEY ARE NOW MONITORED IN THE FOLOWING WAYS:
1) ALARM IDENTIFICATION IS PRINTED BY THE COMPUTER.
2) DEDICATED OPERATOR IN RSSB MONITORING ARMS.
3) MONITOR EQUIPMENT BEHIND PANEL "K".
THESE CONTINGENCIES ENSURE THAT THE OPERATOR RECEIVES THE INFORMATION NEEDED TO MONITOR PLANT SAFETY AND IS PREPARED TO PERFORM REQUIRED CONTROL ACTIONS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		AREA RADIATION MONITORS
		CONTINUOUS AIR MONITORS

HEO#: QS-Ø16.1

DESCRIPTION:

THE OPERATOR HAS TO LEAVE THE PRIMARY WORK AREA TO DETERMINE WHICH ARM OR CAM CAUSED AN ALARM CONDITION. THIRTY ARMS FEED INTO ONE ANNUNCIATOR AND SEVERAL CAMS FEED INTO ANOTHER ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 3A

EXPLANATION:

ARMS AND CAMS ALARMS ARE MONITORED IN THE FOLLOWING WAYS:
1) ALARM IDENTIFICATION IS PRINTED BY THE COMPUTER.
2) DEDICATED OPERATOR IN RSSB MONITORING ARMS.
3) MONITOR EQUIPMENT BEHIND PANEL "K".
THESE CONTINGENCIES ENSURE THAT THE OPERATOR RECEIVES THE INFORMATION NEEDED TO MONITOR PLANT SAFETY AND IS PREPARED TO PERFORM REQUIRED CONTROL ACTIONS.

VERIFICATION:
VERIFY COMPLETION.

HEO#: QS-Ø17.Ø

DESCRIPTION:

SWITCHES ON THE FIRE PANEL ARE VERY SENSITIVE. WHEN MOVING SWITCHES TO THE ON LINE (ARMED) POSITION, AFTER HAVING THE SYSTEM OFF LINE FOR MAINTENANCE, THERE IS THE POSSIBILITY OF TURNING THE SWITCH TOO FAR AND DISCHARGING WATER OR CARDOX.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 4B

EXPLANATION:

THE POTENTIAL OVERSHOOT OF THE FIRE PANEL SWTICHES WAS CLOSELY EXAMINED AND NO EVIDENCE COULD BE FOUND TO SUPPORT THE ASSERTION OF THE PROBLEM. THERE HAVE BEEN NO INCIDENTS OF INADVERTANT SYSTEM DISCHARGE. THE FIRE PANEL SWITCHES IN THE SIMULATOR, WHICH ARE THE SAME SWITCH TYPE, WERE TESTED AND NO DIFFICULTY IN POSITIONING THE SWITCHES WAS DETECTED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		FIRE PANEL CONTROLS

HEO#: QS-021.0

DESCRIPTION:

THE GUARD HOUSE IN TROUBLE ALARM COULD BE DELETED IF SECURITY STATION REMAINS IN THE CONTROL ROOM. SECURITY PROCEDURE PRESENTLY REQUIRES THIS ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 1C

EXPLANATION:

THIS ANNUNCIATOR HAS BEEN REMOVED FROM THE CONTROL ROOM. THE SECURITY STATION IS NOW LOCATED AT THE SECONDARY CONTROL STATION WHICH HAS THE GUARD HOUSE IN TROUBLE ALARM.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A-1		ANNUNCIATOR FOR "GUARD HOUSE IN TROUBLE"

HEO#: QS-Ø22.Ø

DESCRIPTION:

MANY FIRE PANEL ALARMS HAVE MULTIPLE INPUTS. THERE IS NO INFORMATION AVAILABLE IN THE CONTROL ROOM AS TO WHICH INPUT TRIGGERED AN ALARM. OPERATORS (FIRE DEPT) HAVE TO GO TO VARIOUS LOCATIONS AROUND THE PLANT TO DETERMINE THE SOURCE OF AN ALARM. ON SEVERAL OCCASIONS THEY HAVE BEEN UNABLE TO DETERMINE THE SOURCE OF THE ALARM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THE FIRE PANEL PROVIDES THE LOCAL FIRE PANEL FROM WHICH THE ALARM WAS GENERATED. THERE ARE TOO MANY ALARM POINTS TO PROVIDE ALL ALARMS AT THE CONTROL ROOM FIRE PANEL, THEREFORE LOCAL FIRE PANEL ALARMS ARE USED. THE ALARM DOES PROVIDE THE LOCAL FIRE PANEL WHERE THE SOURCE OF THE ALARM CAN BE DETERMINED. A TRAINING PROGRAM DEDICATED TO THE OPERATION OF THE FIRE PANEL HAS BEEN IMPLEMENTED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		FIRE PANEL ANNUNCIATOR

HEO#: QS-023.1

DESCRIPTION:

NUISANCE ALARMS OCCUR FOR THE OFF GAS PREHEATER ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

MODIFICATION REQUESTS HAVE BEEN SUBMITTED TO MAKE NECESSARY CHANGES TO ELIMINATE NUISANCE ALARMS.

VERIFICATION:
VERIFY COMPLETION.

HEO#: QS-023.2

DESCRIPTION:

NUISANCE ALARMS OCCUR FOR THE RECOMBINER LOW TEMPERATURE ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

MODIFICATION REQUESTS HAVE BEEN SUBMITTED TO MAKE NECESSARY CHANGES TO ELIMINATE NUISANCE ALARMS.

VERIFICATION:
VERIFY COMPLETION.

HEO#: QS-023.3

DESCRIPTION:

NUISANCE ALARMS OCCUR FOR THE SEAL WATER OFF NORMAL FOR OFF GAS VACUUM PUMP ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

MODIFICATION REQUESTS HAVE BEEN SUBMITTED TO MAKE NECESSARY CHANGES TO ELIMINATE NUISANCE ALARMS.

VERIFICATION:
VERIFY COMPLETION.

HEO#: QS-023.4

DESCRIPTION:

NUISANCE ALARMS OCCUR FOR THE ELECTRIC HEATER ON RECOMBINER IN SERVICE ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

MODIFICATION REQUESTS HAVE BEEN SUBMITTED TO MAKE NECESSARY CHANGES TO ELIMINATE NUISANCE ALARMS.

VERIFICATION:
VERIFY COMPLETION.

HEO#: QS-Ø23.5

DESCRIPTION:

NUISANCE ALARMS OCCUR FOR THE CONDENSER SMALL VACUUM PUMPS (PIGLETS) ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

MODIFICATION REQUESTS HAVE BEEN SUBMITTED TO MAKE NECESSARY CHANGES TO ELIMINATE ALARMS.

VERIFICATION:
VERIFY COMPLETION.

HEO#: QS-Ø25.Ø

DESCRIPTION:

THERE IS A TEMPERATURE POINT RECORDER ON PANEL B3 THAT GOES OVER THE ALARM POINT BEFORE PRINTING A TEMPERATURE BELOW THE ALARM SET POINT. THIS CAUSES A SPURIOUS ALARM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS RECORDER WILL BE REPLACED. THE NEW RECORDERS WILL CORRECT THE PROBLEM OF SPURIOUS ALARMS. AN INTERIM FIX TO PREVENT SPURIOUS ALARMS WHILE WAITING FOR THE NEW RECORDERS IS BEING INVESTIGATED BY THE INSTRUMENTATION AND CONTROL DEPARTMENT.

VERIFICATION:
ELABORATE ON ASSESSMENT.

HEO#: QS-026.0

DESCRIPTION:

SEVERAL ANNUNCIATORS WITH MULTIPLE INPUTS SHOULD BE SPLIT INTO SINGLE INPUT ALARMS OR PROVISION SHOULD BE MADE ON THE COMPUTER TO INFORM THE OPERATOR AS TO WHICH INPUT TRIGGERED THE ALARM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

ALL CRITICAL PARAMETER ANNUNCIATORS ARE SINGLE INPUT ANNUNCIATORS THAT CLEARLY ALERT THE OPERATOR TO THE SOURCE OF THE ALARM. MULTIPLE-INPUT ANNUNCIATORS FOR OTHER PARAMETERS ARE A NECESSITY DUE TO THE NUMBER AND VARIETY OF ALARM INPUTS. THESE MULTIPLE-INPUT ANNUNCIATORS ALERT THE OPERATOR TO THE SYSTEM IN ALARM AND ENABLES THE OPERATOR TO DETERMINE MORE SPECIFIC DETAILS ON THE ALARM. SETPOINT INFORMATION FOR MANY MULTIPLE-INPUT ANNUNCIATORS IS AVAILABLE ON THE COMPUTER AND THE ANNUNCIATOR PROCEDURE BOOK PROVIDES INFORMATION ON DEDICATED INSTRUMENTATION TO MONITOR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		OFF GAS CHILLER #11 12 13
		OFF NORMAL TURBINE BUILDING FLOOR DRAIN 11-18 LVL HI. REACTOR BUILDING FLOOR DRAIN 11-12. SUMP 11-14 HIGH

HEO#: QS-028.0

DESCRIPTION:

OPERATORS HAVE TROUBLE GETTING ACCESS TO THE PAGING SYSTEM. THE PROCEDURE (APN 19.4.2) WHICH WAS ESTABLISHED TO DEDICATE CHANNEL 2 OF THE HEAR HERE SYSTEM FOR OPERATOR USE IS NOT ADHERED TO. DESIGN CHANGES SHOULD BE MADE TO ENSURE THAT THE CONTROL ROOM HAS A DEDICATED CHANNEL. PROPER USE OF CHANNEL 2 SHOULD BE EMPHASIZED IN GET AND CONTRACTOR TRAINING.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4E

EXPLANATION:

A MEMO HAS BEEN SENT TO TRAINING REQUESTING THAT THE PROCEDURE DEDICATING GAITRONICS CHANNEL 2 TO OPERATIONS BE EMPHASIZED TO ALL PERSONNEL IN TRAINING.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		GAITRONICS SYSTEM

HEO#: QS-029.0

DESCRIPTION:

THERE ARE A NUMBER OF PLACES IN THE PLANT WHERE OPERATORS GO THAT ARE NOT COVERED BY THE EXISTING GAITRONICS SYSTEM. THIS SOMETIMES MAKES IT DIFFICULT TO PERFORM CONTROL ACTIONS THAT REQUIRE COORDINATION BETWEEN THE CONTROL ROOM AND THE OPERATOR IN THE PLANT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1E

EXPLANATION:

MOST AREAS OF THE PLANT HAVE ACCESS TO THE GAITRONICS SYSTEM. IF AN OPERATOR GOES TO AN AREA WHERE IT IS INCONVENIENT TO USE THE GAITRONICS SYSTEM, THEN THERE ARE RADIOS THAT CAN BE USED TO MAINTAIN CONTACT WITH THE CONTROL ROOM OR OTHER REQUIRED PLANT AREAS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		GAITRONICS SYSTEM

HEO#: QS-030.0

DESCRIPTION:

RADIATION MONITOR COUNTS CAN RUN HIGH ENOUGH THAT WHEN DISPLAYED ON THE COMPUTER THEY ARE AT THEIR UPPER LIMIT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

THIS HEO WAS GENERATED BASED UPON DATA COLLECTED ON THE SIMULATOR COMPUTER SYSTEM. THE COMPUTER DISPLAY IN THE CONTROL ROOM HAS ADEQUATE RADIATION MONITOR RANGE FOR ALL OPERATIONAL CONDITIONS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		PLANT COMPUTER/SPDS

HEO#: QS-035.0

DESCRIPTION:

CR SUPPLIES (FUSES, BULBS, CHART PAPER, INK) ARE NOT ALWAYS RESTOCKED AND THEREFORE, ARE NOT ALWAYS AVAILABLE WHEN PEOPLE NEED THEM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THERE ARE PROCEDURES IN PLACE TO UPDATE AND MAINTAIN THE INVENTORY OF CONTROL ROOM SUPPLIES. OPERATIONS ORDERS FUSES, BULBS, CHART PAPER, AND INK FAR ENOUGH IN ADVANCE TO AVOID RUNNING OUT.

VERIFICATION:

HEO#: SPD-001.0

DESCRIPTION:

THE METHOD CURRENTLY USED FOR CALLING UP DIFFERENT DISPLAYS IS UNNECESSARILY COMPLICATED. THE OPERATOR MUST INPUT DISPLAY NUMBERS WHICH DO NOT LOGICALLY REFLECT THE CONTENT OF THE DISPLAY.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 1E

EXPLANATION:

SPDS EMPLOYS AN INTEGRATED SYSTEM OF DISPLAY SELECTION. THERE IS A DEDICATED FUNCTION KEY ON THE KEYBOARD THAT PRESENTS THE DISPLAY MENU ON THE SCREEN WHEN PRESSED. THE MENU SHOWS THE NAME AND INPUT NUMBER OF EACH AVAILABLE SPDS DISPLAY. EACH NAME LOGICALLY REFLECTS THE CONTENT OF THE DISPLAY. THE OPERATOR ENTERS THE INPUT NUMBER FROM THE MENU AT THE KEYBOARD. WITHOUT AN INTEGRATED MENU SYSTEM, THE KEYBOARD WOULD HAVE TO HAVE A DEDICATED FUNCTION KEY FOR EACH DISPLAY.

VERIFICATION:

HEO#: SPD-005.0

DESCRIPTION:

PATTERN AND/OR CODING TECHNIQUES (COLOR, LIMIT MARKS) HAVE NOT BEEN USED TO EFFECTIVELY AID THE OPERATOR IN DETECTING AND DIAGNOSING UNSAFE OPERATING CONDITIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE DESIGN OF THE SPDS INCORPORATES COLOR CODING AND GRAPHICALLY INDICATES UNSAFE OPERATING RANGES. COLORS RECOMMENDED BY NUREG-0700 FOR USE ON CRT DISPLAYS WERE USED AS SPECIFIED IN THE NMP-1 HUMAN FACTORS MANUAL. OPERATING RANGES ARE SHOWN GRAPHICALLY BY HISTOGRAMS THAT CONTAIN MARKS TO IDENTIFY SETPOINTS AND ALARM POINTS.

VERIFICATION:
VERIFY COMPLETION.

HEO#: SPD-ØØ6.Ø

DESCRIPTION:

THE CURRENT UPDATE PERIOD OF DISPLAYS IS 3Ø SEC. NUREG Ø835 RECOMMENDS A DELAY OF NO GREATER THAN 2 SEC FROM WHEN THE SIGNAL IS SAMPLED TO WHEN IT IS DISPLAYED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THE SPDS COMPUTER, SENSORS, AND INTERFACE CANNOT ACCOMODATE A TWO SECOND UPDATE PERIOD. A CHANGE IN ANY SPDS MONITORED PARAMETER IS UPDATED IN FIVE SECONDS. THIS UPDATE TIME ENABLES OPERATORS TO RESPOND TO ABNORMAL CONDITIONS WITHIN SAFE TIME LIMITS.

VERIFICATION:

HEO#: SPD-010.0

DESCRIPTION:

PAGE DESIGNATORS ARE INCLUDED ON THE TOP LEVEL AND LOWER LEVEL DISPLAYS. THE PAGE NUMBERS DO NOT REFLECT A LOGICAL ORDERING OF THE DISPLAYS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 1C

EXPLANATION:

THE SPDS VIDEO GRAPHICS DISPLAY MENU LISTS THE DISPLAYS FOR SELECTION BY PAGE NUMBER. WHEN A DISPLAY IS SELECTED THE PAGE NUMBERS OF SECONDARY DISPLAYS ARE LISTED AT THE BOTTOM OF THE DISPLAY SCREEN TO FACILITATE ALTERNATE DISPLAY SELECTION.

VERIFICATION:

HEO#: VAL-003.0

DESCRIPTION:

TO RESET REACTOR TRIP THE OPERATOR MUST ACTUATE THE SCRAM DISCHARGE VOLUME HIGH LEVEL BYPASSES ON PANEL F AND ALSO THE REACTOR TRIP RESET ON PANEL E.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

RESETTING THE REACTOR TRIP IS NOT MEANT TO BE AN INSTANTANEOUS OPERATION, BUT A DELIBERATE PROCESS. THE SCRAM DISCHARGE BYPASSES ARE PROPERLY LOCATED IN THE VICINITY OF THEIR RELATED CONTROLS AND DISPLAYS. UPON ACTUATING THE BYPASS AT PANEL "F", THE OPERATOR WOULD GO TO THE CENTRAL OPERATING STATION AT PANEL "E", WHERE HE WOULD PERFORM THE RESET OPERATION AS WELL AS OTHER CONTROL AND MONITORING FUNCTIONS ASSOCIATED WITH RESETTING THE REACTOR TRIP.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
F		SCRAM DISCHARGE VOL HIGH LEVEL BYPASS
E		REACTOR TRIP RESET
F		SCRAM DISCHARGE VOL HIGH LEVEL BYPASS

HEO#: VAL-004.0

DESCRIPTION:

OPERATORS ARE NOT ABLE TO ACKNOWLEDGE OR SILENCE ALARMS FROM ANY PANEL EXCEPT THE ONE STATION AT PANEL E.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

THE NMP-1 CONTROL ROOM HAS BEEN DESIGNED FOR CENTRALIZED CONTROL FROM PANEL "E". AT THIS CENTRAL WORK STATION ALL OF THE MOST IMPORTANT SAFETY RELATED COMPONENTS ARE IN FRONT OF THE OPERATOR AND ARE READILY AVAILABLE. DISTINCTIVE ANNUNCIATOR TONES AND SPEAKER LOCATIONS INFORM THE OPERATOR OF THE PANEL ORIGINATING THE ALARM. HAVING ALL ANNUNCIATORS SILENCED FROM PANEL "E" MAINTAINS CONSISTENCY OF THIS OPERATIONAL PHILOSOPHY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		HORNS SILENCE
E		ANNUNCIATOR SILENCE

HEO#: VAL-005.0

DESCRIPTION:

IN EMERGENCY SITUATIONS THE OPERATOR MUST ADJUST REACTOR REJECT FLOW AT PANEL K IN AN ATTEMPT TO ESTABLISH LEVEL WHILE OTHER LEVEL CONTROLLING OPERATIONS ARE CONDUCTED AT PANEL F.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

REJECT FLOW IS USED WITH THE CLEANUP SYSTEM AND IS LOCATED WITH THOSE CONTROLS ON PANEL "K". EMERGENCY PROCEDURES THAT REQUIRE REJECT FLOW ADJUSTMENT WHILE CONTROLLING LEVEL AT PANEL "F" CAN BE PERFORMED BY A SINGLE OPERATOR IF TWO ARE NOT AVAILABLE, AS WAS CONFIRMED DURING THE VALIDATION. THE LOCATION OF THIS CONTROL IS MOST APPROPRIATE FOR ITS FUNCTION.

VERIFICATION:

HEO#: VAL-ØØ7.Ø

DESCRIPTION:

IN A FAILURE TO SCRAM ACCIDENT THE OPERATOR MAY HAVE TO LEAVE THE PRIMARY CONTROL AREA TO ATTEMPT TO SCRAM THE REACTOR FROM THE SCRAM TEST PANEL ON PANEL M.

ASSESSMENT/RESOLUTION CATEGORY: UNCATEGORIZED

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE SCRAM TEST TOGGLE SWITCHES ARE AVAILABLE IN THE CONTROL ROOM ON BACK PANEL "M". THESE SWITCHES ARE USED TO TEST THE SCRAM CHANNEL SIGNALS, THEY ARE ALSO USED AS A LAST RESORT IN A FAILURE TO SCRAM SITUATION. THIS IS A DESIRABLE LOCATION FOR TEST SWITCHES; NOT CLUTTERING THE FRONT PANELS BUT STILL WITHIN ACCESS WHEN NEEDED.

VERIFICATION:

HEO#: VAL-008.0

DESCRIPTION:

THE HPCI ANNUNCIATOR IS ON PANEL F4 WHILE THE HPCI PMPS AND EQUIP ARE ON PANEL F1.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3B

EXPLANATION:

ALL ANNUNCIATORS ARE ACKNOWLEDGED FROM THE CENTRAL OPERATING STATION AT PANEL "E", LOCATED DIRECTLY IN FRONT OF THE CITED ANNUNCIATOR ON PANEL "F". ONCE THE ANNUNCIATOR HAS BEEN READ AND ACKNOWLEDGED THERE IS NO NEED FOR THE OPERATOR TO MONITOR THE ANNUNCIATOR TILE. THE HPSI CONTROLS AND ANNUNCIATOR ARE BOTH LOCATED ON PANEL "F" SO THE OPERATORS ATTENTION IS DIRECTED TO THE PROPER AREA OF THE CONTROL ROOM.

VERIFICATION:

HEO#: VAL-009.0

DESCRIPTION:

WHEN INITIATING PRIMARY CONTAINMENT ISOLATION THE MSIVS ARE ISOLATED ON PANEL F WHILE THE OTHER EQUIPMENT FOR PRIMARY CONTAINMENT ISOLATION (SDC AND CU) IS LOCATED ON PANEL K.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

PRIMARY CONTAINMENT ISOLATION IS INITIATED FROM PANEL "E" AND IS MONITORED AT THE CONTAINMENT MIMIC ON PANEL "F", DIRECTLY IN FRONT OF THE PANEL "E" OPERATOR. OTHER OPERATIONAL SCENARIOS WHICH CALL FOR THE OPERATION OF CLEANUP (CU) AND SHUTDOWN COOLING (SDC) EQUIPMENT ON PANEL "K", WHILE CONTROLLING AND MONITORING FUNCTIONS ON PANEL "F", ARE POSSIBLE. CU AND SDC ARE DISTINCT SYSTEMS. THEIR CONTROLS AND DISPLAYS ARE IN THE PROPER LOCATION FOR ACCOMPLISHING THEIR SYSTEM FUNCTIONS. THEIR LOCATION ON THE FRONT CONTROL PANELS IS ACCEPTABLE FOR ACCOMPLISHING EMERGENCY FUNCTIONS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K		CU RETURN IV 11
K		CU RETURN IV 1
K		SDC SYSTEM IN IV 11
K		SDC SYSTEM IN IV 12
K		SDC SYSTEM OUT IV 1
K		CU RETURN IV 12
F		MAIN STM ISOL VLV 121
F		MAIN STM ISOL VLV 112
F		MAIN STM ISOL VLV 122
F		MAIN STM ISOL VLV 122

HEO#: VAL-Ø16.Ø

DESCRIPTION:

OPERATOR MUST INSTALL JUMPERS TO BYPASS RPS LOGIC TO OPEN MSIVS TO REESTABLISH THE MAIN CONDENSERS AS A HEAT SINK. A BYPASS SW MAY BE NEEDED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 1C

EXPLANATION:

A SWITCH WILL BE INSTALLED IN THE CONTROL ROOM TO BYPASS THE MSIV INTERLOCKS.

VERIFICATION:

HEO#: VAL-020.0

DESCRIPTION:

CAPABILITY TO CLOSE HCU ACCUMULATOR CHARGING WATER HEADER VLV 301-64 IS NOT AVAILABLE FROM THE CR. THIS TASK IS ACCOMPLISHED UNDER EMERGENCY CONDITIONS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE ARE SEVERAL ALTERNATIVE TASKS THAT CAN BE ACCOMPLISHED FROM WITHIN THE CONTROL ROOM THAT WILL PERFORM THE FUNCTION INTENDED BY THE CITED TASK. SEVERAL OPTIONS ARE AVAILABLE TO THE OPERATOR, THE OPTION SELECTED IS BASED UPON EXISTING CONDITIONS. WHEN CONTROL ROOM FUNCTIONS ARE OPERATIONAL, ONE OF THE CONTROL ROOM BASED TASKS IS PERFORMED. IN THE EVENT THAT CONTROL ROOM FUNCTIONS ARE NOT AVAILABLE, THEN IT IS DESIRABLE TO HAVE BACKUP FUNCTIONS AT LOCAL CONTROL PANELS.

VERIFICATION:

HEO#: VAL-Ø21.Ø

DESCRIPTION:

CAPABILITY TO DIRECT EFF/VENT FROM CRD WITHDRAW LINE VENT TO A CONTAINED RADWASTE TANK IS NOT AVAILABLE FROM THE CONTROL ROOM.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE ARE SEVERAL METHODS THAT ARE AVAILABLE AND USED IN THE CONTROL ROOM TO PERFORM THIS FUNCTION. THE STATED TASK IS A BACKUP FUNCTION AND THE CAPABILITY TO PERFORM IT DIRECTLY IS AVAILABLE OUTSIDE OF THE CONTROL ROOM.

VERIFICATION:

HEO#: VAL-023.0

DESCRIPTION:

CAPABILITY TO LINE-UP THE FIRE SYSTEM USING N1-OP-16 IS NOT AVAILABLE FROM THE CONTROL ROOM. THIS TASK IS ACCOMPLISHED DURING AN EMERGENCY CONDITION.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS PROCEDURE IS A LAST RESORT FIRE PROTECTION MEASURE. THE PROCEDURE REQUIRES THE DIESEL PUMP TO BE PHYSICALLY CONNECTED TO FEEDWATER BY INSTALLING A SPOOL PIECE IN THE PLANT. THERE ARE SEVERAL FIRE PROTECTION MEASURES THAT ARE PERFORMED WITHIN THE CONTROL ROOM BEFORE RESORTING TO THIS CONTINGENCY.

VERIFICATION:

[illegible]

HEO#: VAL-Ø25.Ø

DESCRIPTION:

OPERATORS MUST USE JUMPERS TO BYPASS THE REACTOR LOW LEVEL RELAYS IN ORDER TO OVERRIDE ISOLATION SIGNALS. A BYPASS SW MAY BE APPROPRIATE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 1C

EXPLANATION:

A BYPASS SWITCH FOR THE CONTAINMENT VENT AND PURGE ISOLATION WILL BE INSTALLED.

VERIFICATION:

HEO#: VER-008.0

DESCRIPTION:

THE STATED PARAMETERS WERE LISTED AS NEEDING TREND INFO IN ORDER TO PERFORM THE ASSOCIATED TASK. NO DEDICATED RECORDERS ARE AVAILABLE IN THE CR WITH THIS INFO.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

THERE IS A DEDICATED TREND RECORDER FOR STACK GAS MONITORING ON PANEL E. THE OPERATOR CAN ESTABLISH TREND DATA FOR THE OTHER CITED PARAMETERS BY USING THE COMPUTER TREND RECORDERS. THESE RECORDERS RESPOND TO THE NEED FOR TREND INFORMATION OF A SPECIALIZED PARAMETER TO PERFORM CERTAIN TASKS. THERE ARE ALSO DEDICATED METERS THAT MEASURE THESE PARAMETERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		RECIRC PUMP SUCTION TEMPERATURE
		RPV WATER TEMP
		STACK MONITOR
		TORUS PRESSURE

HEO#: VER-Ø11.Ø

DESCRIPTION:

TANK LEVEL UNITS, RANGES AND DIVISIONS WERE NOT SUITABLE WITH RESPECT TO LISTED TASK REQUIREMENTS. UNITS WERE ALSO PROVIDED IN % GALLONS, AND FEET FOR INDICATORS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

NEW SCALES HAVE BEEN PROVIDED FOR THE LIQUID POISON TANK LEVEL AND MAKEUP TANK LEVEL INDICATORS. THE RANGE, DIVISIONS AND UNITS WERE SELECTED TO ENSURE COMPATIBILITY WITH ALL APPLICATIONS IDENTIFIED IN THE TASK ANALYSIS.

VERIFICATION:
A SEPARATE ENGINEERING REVIEW TEAM WILL INVESTIGATE THE ADEQUACY OF THE STATED COSMETIC CHANGES UPON INSTALLATION ON THE SIMULATOR CONTROL PANELS.

Panel ID #	Equipment ID #	Equipment Name
K		LIQUID POISON TANK LEVEL
K		MAKEUP TANK LEVEL

HEO#: VER-Ø17.Ø

DESCRIPTION:

THE PRIMARY CONTAINMENT WATER LEVEL IS LISTED IN THE TASK REQUIREMENTS IN FEET WITH 1 FT DIVISIONS. ASSOCIATED METER INDICATIONS ARE IN INCHES WITH 25 INCH DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

PRIMARY CONTAINMENT WATER LEVEL IS PROVIDED IN INCHES TO BE CONSISTENT WITH ALL OTHER REACTOR VESSEL INSTRUMENTATION WHICH MEASURE IN INCHES. EOPS AND TRAINING SPECIFY REACTOR VESSEL LEVEL IN INCHES FROM AN INSTRUMENT ZERO REFERENCE. THE DIVISIONS WERE DETERMINED TO BE APPROPRIATE BASED ON THE RANGE OF THE SCALE AND THE ACCURACY REQUIRED FOR THE TASK. THE PRESENT RANGE OF THE SCALE COULD NOT ACCOMODATE FINER SCALE DIVISIONS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		PRIMARY CONTAINMENT WATER LEVEL
		SUPPRESSION POOL WATER LEVEL

HEO#: VER-Ø18.Ø

DESCRIPTION:

TORUS PRESSURE RANGES OF UP TO 4Ø PSI WERE DETERMINED TO BE NEEDED IN THE TASK ANALYSIS WHEREAS THE METER INDICATIONS PROVIDE A RANGE OF Ø-4 PSI.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 3A

EXPLANATION:

THE RANGE OF THE TORUS PRESSURE INDICATOR WILL BE INCREASED TO A RANGE ADEQUATE TO PROVIDE THE NECESSARY INFORMATION FOR ALL OPERATING CONDITIONS.

VERIFICATION:

HEO#: VER-Ø19.Ø

DESCRIPTION:

DIVISIONS FOR THE BOOSTER HDR PRESS ARE LISTED AS 2.Ø PSI IN THE TASK REQUIREMENTS WHEREAS THE METER PROVIDES DIVISIONS OF 1Ø.Ø PSI. ALSO CONDENSATE HDR PRESS IS LISTED AS 2 PSI WHILE METER IS IN 5 PSI.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

DIVISIONS FOR THESE METERS HAVE BEEN FOUND TO BE ADEQUATE BASED UPON THE RANGE OF THE SCALE AND THE LEVEL OF ACCURACY NEEDED FOR THE TASK. TO INCREASE THE NUMBER OF SCALE INCREMENTS, ONE OF THE FOLLOWING WOULD BE NECESSARY: THE RANGE OF THE SCALE DECREASED, HIGH AND LOW RANGE SCALES PROVIDED, OR THE SCALE CROWDED WITH TWICE AS MANY GRADUATION MARKS. THE LEVEL OF ACCURACY NEEDED FROM THESE DISPLAYS DOES NOT WARRENT A CHANGE IN DIVISIONS.

VERIFICATION:

HEO#: VER-020.0

DESCRIPTION:

THE DIVISIONS FOR THE CORE SPRAY FLOW AND FEEDWATER FLOW ARE LISTED IN THE TASK REQUIREMENTS AS 0.1 X 10**6 WHILE THE METER DIVISIONS ARE 5.0 X 10**4 LB/HR. THE RANGES ARE ALSO LISTED AS UNSUITABLE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

THE DIVISIONS ON THE METERS ARE TWICE AS FINE AS THOSE RECOMMENDED IN THE TASK ANALYSIS. THESE DIVISIONS PROVIDE THE REQUIRED LEVEL OF ACCURACY. THE RANGE OF THE METERS COVERS THE ENTIRE USEFUL RANGE OF FEEDWATER AND CORE SPRAY VALUES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
	1F5-3	FEEDWATER FLOW
K	4K3-2	CORE SPRAY FLOW

HEO#: VER-Ø23.Ø

DESCRIPTION:

IN TASK REQUIREMENTS THE POWER OPERATED RELIEF VLVS ARE LISTED AS CLOSED POSITION WHEREAS THE VLV POSITIONS ARE AUTO AND OPEN.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TASK REQUIREMENT TO VERIFY THE POWER OPERATED RELIEF VALVE CLOSED IS ACCOMPLISHED BY OBSERVING THE GREEN INDICATOR LIGHT LIT. THIS VALVE SHOULD NOT BE LABELED "CLOSE" BECAUSE IT DOES NOT HAVE A MANUAL CLOSE FUNCTION. THE VALVE CLOSES AUTOMATICALLY, ILLUMINATING THE GREEN INDICATOR LIGHT, UNDER CERTAIN OPERATING CONDITIONS. PLACING THE SWITCH TO THE "AUTO" POSITION PLACES THE VALVE IN AN AUTOMATIC MODE, IT DOES NOT NECESSARILY CLOSE THE VALVE.

VERIFICATION:

HEO#: VER-Ø25.Ø

DESCRIPTION:

THE SCRAM TEST TOGGLE SWITCHES ARE LISTED AS UNAVAILABLE IN THE VERIFICATION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2C

EXPLANATION:

THE SCRAM TEST TOGGLE SWITCHES ARE AVAILABLE IN THE CONTROL ROOM ON BACK PANEL M. THESE SWITCHES ARE USED TO TEST THE SCRAM CHANNEL SIGNALS, THEY ARE ALSO USED AS A LAST RESORT IN A FAILURE TO SCRAM ACCIDENT. THIS IS A DESIRABLE LOCATION FOR TEST SWITCHES; NOT CLUTTERING THE FRONT PANELS BUT STILL WITHIN ACCESS WHEN NEEDED.

VERIFICATION:

HEO#: VER-028.0

DESCRIPTION:

THE CORE SPRAY DISCHARGE VLV IS LISTED AS THROTTLEABLE IN TASK ANALYSIS BUT IS NOT. ALSO THE CONTAINMENT SPRAY TEST TO TORUS FCV IS LISTED AS THROTTLEABLE AND IS NOT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 2A

EXPLANATION:

THROTTLING CAPABILITY WILL BE INCORPORATED INTO CONTROL OF CORE SPRAY ISOLATION VALVES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
3K39-1		CONTAINMENT SPRAY TEST TO TORUS FCV
4K5-1		CORE SPRAY DISCHARGE IV 111
4K7-1		CORE SPRAY DISCHARGE IV 121
4K6-1		CORE SPRAY DISCHARGE IV 112
4K8-1		CORE SPRAY DISCHARGE IV 122

HEO#: VER-030.0

DESCRIPTION:

DIVISIONS FOR RPV PRESSURE WERE REQUESTED IN FINER INCREMENTS THAN ACTUAL METER DIVISIONS (REQUESTED 1.0 PSI, METER PROVIDES 40 PSI).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE ONLY TIME AN OPERATOR MAY NEED FINER INCREMENTS OF RPV PRESSURE IS DURING TRANSIENT OPERATION. AT THIS TIME, TREND INFORMATION IS THE MOST USEFUL AND THIS PARAMETER IS DISPLAYED ON ONE OF THE COMPUTER TREND RECORDERS WHICH CAN BE PROGRAMMED TO PROVIDE THE LEVEL OF PRECISION DESIRED BY THE OPERATOR. DURING NORMAL OPERATION A SCALE WITH DIVISIONS OF 1.0 PSI COULD NOT ACCOMODATE THE DESIRED RANGE.

VERIFICATION:

HEO#: VER-Ø34.Ø

DESCRIPTION:

RANGES FOR THE SUPPRESSION POOL WATER LEVEL WERE FOUND TO BE UNSUITABLE IN THE VERIFICATION (REQUESTED Ø-15 FT, METER PROVIDES 1.25-13.75 FT).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE SUPPRESSION POOL WATER LEVEL RANGE WILL BE EXTENDED TO MAKE THE OPERATING RANGE OF THE SYSTEM MORE FLEXIBLE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		SUPPRESSION POOL WTR LVL

HEO#: VER-Ø35.Ø

DESCRIPTION:

DIVISIONS FOR THE DRYWELL PRESSURE WERE FOUND TO BE UNSUITABLE IN THE VERIFICATION (1Ø PSI INCREMENTS IN LIEU OF 5).

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

DIVISIONS OF 1Ø PSI FOR THE DRYWELL PRESSURE INDICATOR ARE APPROPRIATE. THIS DETERMINATION IS MADE BY CONSIDERING THAT THIS IS A WIDE RANGE INDICATION, THE PRECISION OF THE INPUT DEVICE, AND THE NEEDED OPERATIONAL ACCURACY FOR THE TASKS PERFORMED WITH THIS INSTRUMENT. NARROW RANGE INDICATION AND COMPUTER DISPLAY ARE AVAILABLE WHEN GREATER ACCURACY IS DESIRED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		DRYWELL PRESSURE

HEO#: VER-Ø36.Ø

DESCRIPTION:

RANGES AND UNITS FOR THE SRMS WERE FOUND TO BE UNSUITABLE IN THE VERIFICATION. UNITS ARE LISTED AS % AND CPS, RANGES WERE Ø.1 X 1Ø**6 - 1 X 1Ø**6 IN LIEU OF Ø - 1 X 1Ø**6.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE RANGES FOR THE SRMS PRESENT THE ACCURATE RANGE OF MEASUREMENT. SINCE THE LOW POWER LEVELS BELOW Ø.1 X 1Ø**-6 ARE NOT RELIABLY DETECTABLE, THEY SHOULD NOT BE DISPLAYED. MEASUREMENTS FOR CPS AND PERCENT ARE AVAILABLE IN THE CONTROL ROOM.

VERIFICATION:
MD

Panel ID #	Equipment ID #	Equipment Name
		SRMS

HEO#: VER-039.0

DESCRIPTION:

SOME FLOW METER UNITS ARE REQUESTED IN % IN THE TASK ANALYSIS DATA BUT THE CORRESPONDING DISPLAYS ARE IN LB/HR. RANGES FOR FEEDWATER FLOW ARE LISTED AS UNSUITABLE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE PLANT IS DESIGNED FOR THE FEEDWATER FLOW METER TO MEASURE IN LB/HR. THIS IS CONSISTENT WITH OPERATOR TRAINING AND PROCEDURES. FEEDWATER FLOW MUST BE COMPARED WITH STEAM FLOW WHICH IS ALSO MEASURED IN LB/HR. THE RANGE OF THE METER COVERS THE ENTIRE USEFUL RANGE OF FEEDWATER FLOW VALUES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		FEEDWATER FLOW

HEO#: VER-041.0

DESCRIPTION:

DIVISIONS FOR THE CONTROL ROD DRIVE WATER PRESS ARE PROVIDED IN 10 PSI WHICH THE VERIFICATION LISTS AS A REQUIREMENT OF 5 PSI.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 3C

EXPLANATION:

DIVISIONS OF 10 PSI FOR THE CONTROL ROD DRIVE WATER PRESSURE INDICATOR ARE APPROPRIATE. THIS DETERMINATION WAS MADE BY CONSIDERING THE PRECISION OF THE INPUT DEVICE, THE RANGE OF THE SCALE AND THE NEEDED OPERATIONAL ACCURACY FOR TASKS PERFORMED WITH THIS INSTRUMENT.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		DRIVE WTR PRESS

HEO#: VRR-002.0

DESCRIPTION:

TWO METERS ON PANEL F THAT WERE COLORBANDED PRIOR TO IMPLEMENTATION OF THE COSMETIC PACKAGE HAVE VERY WIDE COLORBANDS (RED,YELLOW,AND GREEN). THE INDICATOR POINTERS ARE COLORED RED AND ARE DIFFICULT TO SEE AGAINST THE RED COLORBAND.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE COLOR OF THE POINTERS ON THE REACTOR LEVEL METERS HAS BEEN CHANGED FROM RED TO WHITE. THE WHITE POINTER CONTRASTS WELL WITH THE BLACK BACKGROUND OF THE METER AND WITH THE RED, GREEN AND YELLOW COLORBANDS ON THE SCALE.

VERIFICATION:
A SEPARATE ENGINEERING REVIEW TEAM WILL INVESTIGATE THE ADEQUACY OF THE STATED COSMETIC CHANGES UPON INSTALLATION ON THE SIMULATOR CONTROL PANELS.

Panel ID #	Equipment ID #	Equipment Name
F		RX LEVEL CH 11
F		RX LEVEL CH 12

APPENDIX C

HEO STATUS LIST

HEO STATUS LIST

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
COM-001	FUNCTIONAL		FIX/CLOSED	
COM-002	FUNCTIONAL		REJECT	
COM-003	FUNCTIONAL		REJECT	
COM-004	FUNCTIONAL	1	REJECT	
COM-005	FUNCTIONAL		INVALID	
COM-006	FUNCTIONAL		INVALID	
COM-007	FUNCTIONAL		FIX/CLOSED	
COM-008	FUNCTIONAL		FIX/CLOSED	
COM-009	FUNCTIONAL	1	FIX/CLOSED	
COM-010	FUNCTIONAL	1	REJECT	
COM-011	FUNCTIONAL	1	REJECT	
COM-012	FUNCTIONAL	1	REJECT	
COM-013	FUNCTIONAL	1	REJECT	
COM-014	FUNCTIONAL	1	REJECT	
COM-015	FUNCTIONAL	1	INVALID	
COM-016	FUNCTIONAL		REJECT	
COM-017	FUNCTIONAL		REJECT	
COM-018	FUNCTIONAL	1	REJECT	
COM-019	FUNCTIONAL	1	REJECT	
COM-020	FUNCTIOANL		REJECT	
COM-021	FUNCTIONAL	1	REJECT	
COM-022	FUNCTIONAL		FIX/CLOSED	
COM-023	FUNCTIONAL		INVALID	
COM-024	FUNCTIONAL	1	REJECT	
COM-025	INVALID		INVALID	
COM-026	FUNCTIONAL	1	FIX/CLOSED	
COM-027	FUNCTIONAL	1	FIX/CLOSED	
COM-028	FUNCTIONAL	1	FIX/CLOSED	
COM-029	FUNCTIONAL	1	FIX/CLOSED	
COM-030	FUNCTIONAL	1	REJECT	
CS-001	COSMETIC		FIX/CLOSED	
CS-002	FUNCTIONAL		REJECT	
CS-003	COSMETIC	1	REJECT	
CS-004	COSMETIC		FIX/CLOSED	
CS-005	FUNCTIONAL		FIX/CLOSED	
CS-006	INVALID		INVALID	
CS-007	COSMETIC		FIX/OPEN	1988 Refuel Outage
CS-008	FUNCTIONAL		REJECT	
CS-009	FUNCTIONAL	1	FIX/CLOSED	
CS-010	COSMETIC		FIX/CLOSED	
CS-011	COSMETIC	1	FIX/CLOSED	
CS-012	INVALID		INVALID	
CS-013	INVALID	1	INVALID	
CS-014	FUNCTIONAL		REJECT	
CS-015	COSMETIC		REJECT	
CS-016	FUNCTIONAL		REJECT	
CS-017	FUNCTIONAL	1	FIX/OPEN	1988 Refuel Outage
CS-018	FUNCTIONAL		FIX/CLOSED	
CS-019	FUNCTIONAL		FIX/CLOSED	

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
CS-020	INVALID		INVALID	
CS-021	FUNCTIONAL		REJECT	
CS-022	INVALID		INVALID	
CS-023	FUNCTIONAL		REJECT	
CS-024	FUNCTIONAL		REJECT	
CS-025	COSMETIC		FIX/CLOSED	
CS-026	FUNCTIONAL		FIX/CLOSED	
CS-027	COSMETIC		FIX/CLOSED	
CS-028	COSMETIC		FIX/CLOSED	
CS-029	COSMETIC		INVALID	
CS-030	COSMETIC		FIX/CLOSED	
CS-031	COSMETIC		FIX/CLOSED	
CS-032	FUNCTIONAL		REJECT	
CS-033	FUNCTIONAL		FIX/CLOSED	
CS-034	COSMETIC		REJECT	
CS-035	FUNCTIONAL		FIX/CLOSED	
CS-036	COSMETIC	1	FIX/OPEN	1988 Refuel Outage
CS-037	FUNCTIONAL		REJECT	
CS-038	COSMETIC		REJECT	
CS-039	COSMETIC		FIX/CLOSED	
CS-040	COSMETIC		FIX/CLOSED	
CS-041	COSMETIC		FIX/CLOSED	
CS-042	COSMETIC	1	FIX/CLOSED	
CS-043	COSMETIC		FIX/CLOSED	
CS-044	COSMETIC		FIX/CLOSED	
CS-045	COSMETIC	1	REJECT	
CS-046	FUNCTIONAL		REJECT	
CS-047	COSMETIC		REJECT	
CS-048	COSMETIC		FIX/CLOSED	
CS-049	COSMETIC		FIX/CLOSED	
CS-050	COSMETIC		FIX/CLOSED	
CS-051	COSMETIC	1	REJECT	
CS-052	COSMETIC		FIX/CLOSED	
CS-053	FUNCTIONAL	1	REJECT	
CS-054	FUNCTIONAL		REJECT	
CS-055	COSMETIC		FIX/CLOSED	
CS-056	INVALID		INVALID	
CS-057	INVALID	1	INVALID	
CS-058	COSMETIC		FIX/CLOSED	
CS-059	COSMETIC		FIX/CLOSED	
CS-060	COSMETIC		FIX/CLOSED	
CS-061	COSMETIC		FIX/CLOSED	
CS-062	INVALID		INVALID	
CS-063	FUNCTIONAL		REJECT	
CS-064	FUNCTIONAL		INVALID	
CS-065	COSMETIC		FIX/CLOSED	
CS-066	COSMETIC		FIX/OPEN	1988 Refuel Outage
CS-067	COSMETIC		FIX/OPEN	1988 Refuel Outage
CS-068	FUNCTIONAL		REJECT	
EA-001	FUNCTIONAL		FIX/OPEN	1990 Refuel Outage
EA-002	FUNCTIONAL		FIX/OPEN	1990 Refuel Outage

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
EA-003	FUNCTIONAL		FIX/OPEN	1990 Refuel Outage
EA-004	FUNCTIONAL		FIX/OPEN	1990 Refuel Outage
EA-005	FUNCTIONAL		FIX/OPEN	1990 Refuel Outage
EA-006	FUNCTIONAL		FIX/OPEN	1992 Refuel Outage
EA-007	FUNCTIONAL		FIX/OPEN	1992 Refuel Outage
ENV-001	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
ENV-002	FUNCTIONAL	1	REJECT	
ENV-003	FUNCTIONAL	1	FIX/CLOSED	
ENV-004	FUNCTIONAL		FIX/CLOSED	
FP-001	FUNCTIONAL		FIX/CLOSED	
FP-002	COSMETIC	1	INVALID	
FP-003	FUNCTIONAL		FIX/CLOSED	
FP-004	FUNCTIONAL	1	REJECT	
FP-005	FUNCTIONAL	1	FIX/CLOSED	
FP-006	FUNCTIONAL	1	FIX/CLOSED	
FP-007	FUNCTIONAL	1	FIX/CLOSED	
FP-008	FUNCTIONAL	1	FIX/CLOSED	
FP-009	FUNCTIONAL		FIX/CLOSED	
FV-001	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-002	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-003	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-004	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-005	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-006	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-007	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-008	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-009	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-010	COSMETIC		REJECT	
FV-011	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-012	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-013	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-014	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-015	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-016	COSMETIC		REJECT	
FV-017	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-018	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-019	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-020	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-021	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-022	COSMETIC		REJECT	
FV-023	COSMETIC		REJECT	
FV-024	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-025	COSMETIC		FIX/OPEN	1988 Refuel Outage
FV-026	COSMETIC		REJECT	
FV-027	COSMETIC		FIX/OPEN	1988 Refuel Outage
HR-001	INVALID		INVALID	
HR-002	FUNCTIONAL		FIX/CLOSED	

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
OCS-001	FUNCTIONAL		REJECT	
OCS-002	FUNCTIONAL		REJECT	
OCS-003	FUNCTIONAL		REJECT	
OCS-004	INVALID		INVALID	
OCS-005	FUNCTIONAL		FIX/CLOSED	
OCS-005.1	COSMETIC		FIX/CLOSED	
OCS-005.2	COSMETIC		FIX/CLOSED	
OCS-005.3	COSMETIC		FIX/CLOSED	
OCS-005.4	COSMETIC		FIX/CLOSED	
OCS-005.5	COSMETIC		FIX/CLOSED	
OCS-005.6	COSMETIC		FIX/CLOSED	
OCS-005.7	COSMETIC		FIX/CLOSED	
OCS-005.8	COSMETIC		REJECT	
OCS-006	COSMETIC		FIX/CLOSED	
OCS-006.2	COSMETIC		FIX/CLOSED	
OCS-007	COSMETIC		FIX/CLOSED	
OCS-008	COSMETIC		FIX/CLOSED	
OCS-009	COSMETIC		FIX/CLOSED	
OCS-010	FUNCTIONAL		REJECT	
OCS-011	COSMETIC		FIX/CLOSED	
OCS-012	COSMETIC		FIX/CLOSED	
OCS-013	FUNCTIONAL		REJECT	
OCS-014	COSMETIC		FIX/CLOSED	
OCS-015	FUNCTIONAL		FIX/CLOSED	
OSC-016	COSMETIC		FIX/CLOSED	
OCS-017	COSMETIC		FIX/CLOSED	
OCS-018	COSMETIC		FIX/CLOSED	
OCS-019	COSMETIC	1	FIX/CLOSED	
OCS-020	COSMETIC		FIX/CLOSED	
OCS-021	FUNCTIONAL		FIX/CLOSED	
OCS-022	COSMETIC	1	FIX/CLOSED	
OCS-023	COSMETIC	1	FIX/CLOSED	
OCS-024	COSMETIC	1	FIX/CLOSED	
OCS-025	COSMETIC		FIX/CLOSED	
OCS-026	COSMETIC		FIX/CLOSED	
OCS-027	COSMETIC		FIX/CLOSED	
OCS-028	COSMETIC		FIX/CLOSED	
OCS-029	COSMETIC		FIX/CLOSED	
OCS-030	COSMETIC		FIX/CLOSED	
OCS-031	COSMETIC		FIX/CLOSED	
OCS-032	COSMETIC		FIX/CLOSED	
OCS-033	COSMETIC	1	FIX/OPEN	1988 Refuel Outage
OCS-034	COSMETIC		FIX/CLOSED	
OCS-035	COSMETIC		FIX/CLOSED	
OCS-036	COSMETIC		FIX/CLOSED	
OCS-037	INVALID	1	INVALID	
OCS-038	INVALID	1	INVALID	
OCS-039	COSMETIC	1	FIX/CLOSED	
OCS-040	INVALID	1	INVALID	
OCS-041	COSMETIC		FIX/CLOSED	
OCS-042	COSMETIC		FIX/CLOSED	
OCS-043	COSMETIC		FIX/CLOSED	
OCS-044	COSMETIC		FIX/CLOSED	

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
OCS-045	COSMETIC		FIX/CLOSED	
OCS-046	COSMETIC		FIX/CLOSED	
OCS-047	COSMETIC		FIX/CLOSED	
OCS-048	COSMETIC		FIX/CLOSED	
OCS-049	COSMETIC		FIX/CLOSED	
OCS-050	COSMETIC		FIX/CLOSED	
OCS-051	COSMETIC		REJECT	
OCS-052	COSMETIC		REJECT	
OCS-053	COSMETIC		FIX/CLOSED	
OCS-054	INVALID		INVALID	
OCS-055	COSMETIC		FIX/CLOSED	
OCS-056	COSMETIC		REJECT	
OCS-057	INVALID		INVALID	
OCS-058.1	COSMETIC		FIX/CLOSED	
OCS-058.2	FUNCTIONAL		REJECT	
OCS-059	COSMETIC		FIX/CLOSED	
OCS-060	COSMETIC		REJECT	
OCS-061	COSMETIC		REJECT	
OCS-062	COSMETIC	1	REJECT	
OCS-063	COSMETIC	1	FIX/CLOSED	
OCS-064	FUNCTIONAL		FIX/CLOSED	
OCS-065	FUNCTIONAL		FIX/CLOSED	
OCS-066	FUNCTIONAL		FIX/CLOSED	
OCS-067	FUNCTIONAL		FIX/CLOSED	
OCS-068	COSMETIC		FIX/CLOSED	
OCS-069	COSMETIC		FIX/CLOSED	
OCS-070	COSMETIC	1	REJECT	
OCS-071	COSMETIC	1	REJECT	
OCS-072	COSMETIC	1	REJECT	
OCS-073	COSMETIC		FIX/CLOSED	
OCS-074	COSMETIC	1	REJECT	
OCS-075	COSMETIC		FIX/CLOSED	
OCS-076	COSMETIC		FIX/CLOSED	
OCS-077	INVALID		INVALID	
OCS-078	INVALID		INVALID	
OCS-079	INVALID		INVALID	
OCS-080	INVALID		INVALID	
OCS-081	COSMETIC		REJECT	
OCS-082	COSMETIC		FIX/CLOSED	
OCS-083	COSMETIC		FIX/CLOSED	
OCS-083.1	COSMETIC		FIX/CLOSED	
OCS-084	COSMETIC		REJECT	
OCS-085	COSMETIC		FIX/CLOSED	
OCS-086	COSMETIC		REJECT	
OCS-087	COSMETIC	1	REJECT	
OCS-088	COSMETIC	1	REJECT	
OCS-089	FUNCTIONAL		FIX/CLOSED	
OCS-090	FUNCTIONAL		FIX/CLOSED	
OCS-091	FUNCTIONAL		FIX/CLOSED	
OCS-092	FUNCTIONAL		FIX/CLOSED	
OCS-093	FUNCTIONAL		FIX/CLOSED	
OCS-094	COSMETIC		REJECT	
OCS-095	FUNCTIONAL	1	REJECT	

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
OCS-096	COSMETIC	1	REJECT	
OCS-097	COSMETIC		FIX/CLOSED	
OCS-098	COSMETIC		FIX/CLOSED	
OCS-099	COSMETIC		FIX/CLOSED	
OCS-100	COSMETIC		FIX/CLOSED	
OCS-101	COSMETIC		FIX/CLOSED	
OCS-102	COSMETIC		FIX/CLOSED	
OCS-103	COSMETIC		FIX/CLOSED	
OCS-104	COSMETIC		FIX/CLOSED	
OCS-105	COSMETIC		FIX/CLOSED	
OCS-106	COSMETIC		FIX/CLOSED	
OCS-107	COSMETIC		FIX/CLOSED	
OCS-108	COSMETIC		FIX/CLOSED	
OCS-109	COSMETIC		REJECT	
OCS-110	COSMETIC		FIX/CLOSED	
OCS-111	COSMETIC		FIX/CLOSED	
OCS-112	COSMETIC		FIX/CLOSED	
OCS-113	COSMETIC		FIX/CLOSED	
OCS-114	COSMETIC		FIX/CLOSED	
OCS-115	COSMETIC		FIX/CLOSED	
OCS-116	COSMETIC		FIX/CLOSED	
OCS-117	COSMETIC		REJECT	
OCS-118	COSMETIC		FIX/CLOSED	
OCS-119	COSMETIC		REJECT	
OCS-120	COSMETIC		FIX/CLOSED	
OCS-121	COSMETIC		REJECT	
OCS-122	COSMETIC		REJECT	
OCS-123	COSMETIC		REJECT	
OCS-124	COSMETIC		REJECT	
OCS-125	COSMETIC		REJECT	
OCS-126	COSMETIC		FIX/CLOSED	
OCS-127	COSMETIC		FIX/OPEN	1988 Refuel Outage
OCS-128	COSMETIC		FIX/CLOSED	
OCS-129	COSMETIC		FIX/CLOSED	
OCS-130	COSMETIC		FIX/CLOSED	
OCS-131	COSMETIC		FIX/CLOSED	
OCS-132	COSMETIC		FIX/CLOSED	
OCS-133	COSMETIC		FIX/CLOSED	
OCS-134	COSMETIC		FIX/CLOSED	
OCS-135	COSMETIC		FIX/CLOSED	
OCS-136	COSMETIC		FIX/CLOSED	
OCS-137	COSMETIC		FIX/CLOSED	
OCS-138	COSMETIC		FIX/CLOSED	
OCS-139	COSMETIC		FIX/CLOSED	
OCS-140	COSMETIC		FIX/CLOSED	
OCS-141	COSMETIC		FIX/CLOSED	
OCS-142	COSMETIC		FIX/CLOSED	
OCS-143	COSMETIC		FIX/CLOSED	
OCS-144	COSMETIC		FIX/CLOSED	
OCS-145	COSMETIC		FIX/OPEN	1988 Refuel Outage
OCS-146	COSMETIC		FIX/CLOSED	
OCS-147	COSMETIC		FIX/CLOSED	

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
OCS-148	COSMETIC		FIX/CLOSED	
OCS-149	COSMETIC		FIX/CLOSED	
OCS-150	COSMETIC		FIX/CLOSED	
OCS-151	COSMETIC		FIX/CLOSED	
OCS-152	COSMETIC	1	REJECT	
OCS-153	COSMETIC	1	REJECT	
OCS-154	COSMETIC		FIX/CLOSED	
OCS-155	COSMETIC		FIX/CLOSED	
OCS-156	COSMETIC		FIX/CLOSED	
OCS-157	COSMETIC		FIX/CLOSED	
OCS-158	COSMETIC		FIX/CLOSED	
OCS-159	COSMETIC		FIX/CLOSED	
OCS-160	COSMETIC	1	REJECT	
OCS-161	COSMETIC	1	REJECT	
OCS-162	COSMETIC	1	REJECT	
OCS-163	COSMETIC		FIX/CLOSED	
OCS-164	INVALID		INVALID	
OCS-165	FUNCTIONAL		REJECT	
OCS-166	FUNCTIONAL		REJECT	
OCS-167	FUNCTIONAL	1	FIX/OPEN	1988 Refuel Outage
OCS-168	COSMETIC	1	REJECT	
OCS-169	COSMETIC	1	REJECT	
OCS-170	COSMETIC		REJECT	
OCS-171	COSMETIC		FIX/CLOSED	
OCS-172	COSMETIC		FIX/OPEN	1988 Refuel Outage
OCS-173	INVALID		INVALID	
OCS-174	COSMETIC	1	FIX/OPEN	1988 Refuel Outage
OCS-175	COSMETIC		FIX/CLOSED	
OCS-176	COSMETIC		REJECT	
OCS-177	COSMETIC		REJECT	
OCS-178	COSMETIC		FIX/OPEN	1988 Refuel Outage
OCS-179	COSMETIC	1	FIX/OPEN	1988 Refuel Outage
OCS-180	COSMETIC		FIX/OPEN	1988 Refuel Outage
OCS-181	FUNCTIONAL		REJECT	
OCS-182	COSMETIC		FIX/CLOSED	
OCS-183	COSMETIC	1	REJECT	
OCS-184	FUNCTIONAL		REJECT	
OCS-185	FUNCTIONAL		REJECT	
OCS-186	FUNCTIONAL		REJECT	
OCS-187	FUNCTIONAL		REJECT	
OCS-188	FUNCTIONAL		REJECT	
OCS-189	INVALID		INVALID	
OCS-190	COSMETIC		REJECT	
OCS-191	COSMETIC	1	REJECT	
OCS-192	COSMETIC		REJECT	
OCS-193	COSMETIC		REJECT	
OCS-194	COSMETIC		INVALID	
OCS-195	FUNCTIONAL		FIX/CLOSED	
OCS-196	COSMETIC		REJECT	
OCS-197	COSMETIC		REJECT	
OCS-198	COSMETIC		REJECT	
OCS-199	INVALID		INVALID	

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
OCS-200	FUNCTIONAL		FIX/CLOSED	
OCS-201	FUNCTIONAL		FIX/CLOSED	
OCS-202	FUNCTIONAL		FIX/CLOSED	
OCS-203	FUNCTIONAL		FIX/CLOSED	
OCS-204	FUNCTIONAL		REJECT	
OCS-205	COSMETIC	1	REJECT	
OCS-206	COSMETIC	1	REJECT	
OCS-207	COSMETIC	1	REJECT	
OCS-208	COSMETIC	1	REJECT	
OCS-209	COSMETIC	1	FIX/OPEN	1988 Refuel Outage
OCS-210	FUNCTIONAL		REJECT	
OCS-211	COSMETIC		FIX/CLOSED	
OCS-212	COSMETIC	1	REJECT	
OCS-213	INVALID		INVALID	
OCS-214	INVALID		INVALID	
OCS-215	INVALID		INVALID	
OCS-216	COSMETIC		FIX/CLOSED	
OCS-217	INVALID		INVALID	
OCS-218	INVALID		INVALID	
OCS-219	FUNCTIONAL	1	REJECT	
OCS-220	FUNCTIONAL		REJECT	
OCS-221	FUNCTIONAL		REJECT	
OCS-222	FUNCTIONAL		REJECT	
OCS-223	FUNCTIONAL		REJECT	
OCS-224	FUNCTIONAL		REJECT	
OCS-225	FUNCTIONAL		REJECT	
OCS-226	COSMETIC		FIX/CLOSED	
OCS-227	COSMETIC		FIX/CLOSED	
OCS-227.1	COSMETIC		FIX/CLOSED	
OCS-228	COSMETIC		FIX/CLOSED	
OCS-229	FUNCTIONAL		FIX/CLOSED	
OCS-230	COSMETIC	1	REJECT	
OCS-231	FUNCTIONAL	1	REJECT	
OCS-232	FUNCTIONAL	1	REJECT	
OCS-233	COSMETIC	1	REJECT	
OCS-234	FUNCTIONAL		FIX/CLOSED	
OCS-235	FUNCTIONAL		REJECT	
OCS-236	FUNCTIONAL		REJECT	
OCS-237	FUNCTIONAL		REJECT	
OCS-238	FUNCTIONAL		REJECT	
OCS-239	FUNCTIONAL		REJECT	
OCS-240	FUNCTIONAL		FIX/CLOSED	
OCS-241	FUNCTIONAL		REJECT	
OCS-242	FUNCTIONAL		INVALID	
OCS-243	FUNCTIONAL		FIX/CLOSED	
OCS-244	FUNCTIONAL		FIX/CLOSED	
OCS-245	FUNCTIONAL		FIX/CLOSED	
OCS-246	INVALID	1	INVALID	
OCS-247	FUNCTIONAL	1	FIX/CLOSED	
OCS-248	FUNCTIONAL	1	FIX/CLOSED	
OCS-249	INVALID	1	INVALID	
OCS-250	COSMETIC	1	FIX/CLOSED	

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
OCS-251	COSMETIC	1	FIX/CLOSED	
OCS-252	FUNCTIONAL		FIX/CLOSED	
OCS-253	FUNCTIONAL		REJECT	
OCS-254	FUNCTIONAL		FIX/CLOSED	
OCS-255	FUNCTIONAL		FIX/CLOSED	
OCS-256	FUNCTIONAL		FIX/CLOSED	
OCS-257	FUNCTIONAL		FIX/CLOSED	
OCS-258	FUNCTIONAL		FIX/CLOSED	
OCS-259	FUNCTIONAL		FIX/CLOSED	
OCS-260	FUNCTIONAL		FIX/CLOSED	
OCS-261	FUNCTIONAL		FIX/CLOSED	
OCS-262	FUNCTIONAL		FIX/CLOSED	
OCS-263	FUNCTIONAL		FIX/CLOSED	
OCS-264	FUNCTIONAL		FIX/CLOSED	
OCS-265	FUNCTIONAL		FIX/CLOSED	
OCS-266	FUNCTIONAL		FIX/CLOSED	
OCS-267	FUNCTIONAL		FIX/CLOSED	
OCS-268	FUNCTIONAL	1	INVALID	
OCS-269	FUNCTIONAL		REJECT	
OCS-270	INVALID		INVALID	
OCS-271	FUNCTIONAL		FIX/CLOSED	
OCS-272	FUNCTIONAL		FIX/CLOSED	
OCS-273	FUNCTIONAL		FIX/CLOSED	
OCS-274	FUNCTIONAL		FIX/CLOSED	
OCS-275	INVALID	1	INVALID	
OCS-276	COSMETIC		INVALID	
OCS-277	FUNCTIONAL		FIX/CLOSED	
OCS-278	FUNCTIONAL		REJECT	
OCS-279	FUNCTIONAL		FIX/CLOSED	
OCS-280	FUNCTIONAL		INVALID	
QS-001	FUNCTIONAL		FIX/CLOSED	
QS-002	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
QS-003	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
QS-004	FUNCTIONAL	1	FIX/CLOSED	
QS-005	FUNCTIONAL		REJECT	
QS-006	FUNCTIONAL	1	REJECT	
QS-007	FUNCTIONAL		FIX/CLOSED	
QS-008	FUNCTIONAL	1	REJECT	
QS-009	FUNCTIONAL		FIX/OPEN	1988 Refuel Outage
QS-010	FUNCTIONAL		REJECT	
QS-011	INVALID		INVALID	
QS-012	FUNCTIONAL		REJECT	
QS-013	FUNCTIONAL	1	REJECT	
QS-014	COSMETIC		FIX/CLOSED	
QS-015	INVALID		INVALID	
QS-016	FUNCTIONAL	1	FIX/CLOSED	
QS-16.1	FUNCTIONAL	1	FIX/CLOSED	
QS-017	FUNCTIONAL	1	REJECT	
QS-018	FUNCTIONAL		FIX/CLOSED	
QS-019	FUNCTIONAL		FIX/CLOSED	
QS-020	Number not used			
QS-021	FUNCTIONAL	1	FIX/CLOSED	

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
QS-022	FUNCTIONAL	1	REJECT	
QS-023.1	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
QS-023.2	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
QS-023.3	FUNCTIONAL	1	FIX/CLOSED	
QS-023.4	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
QS-023.5	FUNCTIONAL	1	FIX/OPEN	1988 Refuel Outage
QS-024	FUNCTIONAL		FIX/CLOSED	
QS-025	FUNCTIONAL	1	FIX/OPEN	1988 Refuel Outage
QS-026	FUNCTIONAL	1	REJECT	
QS-027	FUNCTIONAL		FIX/CLOSED	
QS-028	FUNCTIONAL	1	FIX/CLOSED	
QS-029	FUNCTIONAL	1	REJECT	
QS-030	FUNCTIONAL	1	REJECT	
QS-031	FUNCTIONAL		FIX/CLOSED	
QS-032	FUNCTIONAL		FIX/CLOSED	
QS-033	FUNCTIONAL		FIX/CLOSED	
QS-034	FUNCTIONAL		FIX/CLOSED	
QS-035	FUNCTIONAL	1	REJECT	
QS-036	INVALID		INVALID	
QS-037	FUNCTIONAL		FIX/CLOSED	
SPD-001	FUNCTIONAL	1	REJECT	
SPD-002	INVALID		INVALID	
SPD-003	INVALID		INVALID	
SPD-004	INVALID		INVALID	
SPD-005	FUNCTIONAL	1	FIX/CLOSED	
SPD-006	FUNCTIONAL	1	REJECT	
SPD-007	FUNCTIONAL		FIX/CLOSED	
SPD-008	INVALID		INVALID	
SPD-009	INVALID		INVALID	
SPD-010	FUNCTIONAL	1	FIX/CLOSED	
SPD-011	FUNCTIONAL		FIX/CLOSED	
SPD-012	FUNCTIONAL		FIX/CLOSED	
SPD-013	FUNCTIONAL		REJECT	
SPD-014	FUNCTIONAL		FIX/CLOSED	
TA-001	COSMETIC		FIX/CLOSED	
TA-002	INVALID		INVALID	
VAL-001	FUNCTIONAL		REJECT	
VAL-002	FUNCTIONAL		FIX/CLOSED	
VAL-003	INVALID	1	INVALID	
VAL-004	FUNCTIONAL	1	REJECT	
VAL-005	FUNCTIONAL	1	REJECT	
VAL-006	FUNCTIONAL		REJECT	
VAL-007	INVALID	1	INVALID	
VAL-008	FUNCTIONAL	1	REJECT	
VAL-009	INVALID	1	INVALID	
VAL-010	FUNCTIONAL		REJECT	
VAL-011	FUNCTIONAL		REJECT	
VAL-012	FUNCTIONAL		REJECT	

HEO NUMBER	CATEGORY	REV	STATUS	SCHEDULE
VAL-013	INVALID		INVALID	
VAL-014	FUNCTIONAL		REJECT	
VAL-015.1	INVALID		INVALID	
VAL-015.2	INVALID		INVALID	
VAL-016	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
VAL-017	INVALID		INVALID	
VAL-018	INVALID		INVALID	
VAL-019	INVALID		INVALID	
VAL-020	INVALID	1	INVALID	
VAL-021	INVALID	1	INVALID	
VAL-022	COSMETIC		FIX/CLOSED	
VAL-023	INVALID	1	INVALID	
VAL-024	INVALID		INVALID	
VAL-025	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
VER-001	INVALID		INVALID	
VER-002	FUNCTIONAL		REJECT	
VER-003	INVALID		INVALID	
VER-004	INVALID		INVALID	
VER-005	FUNCTIONAL		FIX/CLOSED	
VER-006	INVALID		INVALID	
VER-007	INVALID		INVALID	
VER-008	FUNCTIONAL	1	REJECT	
VER-009	INVALID		INVALID	
VER-010	COSMETIC		FIX/CLOSED	
VER-011	COSMETIC	1	FIX/CLOSED	
VER-012	INVALID		INVALID	
VER-013	FUNCTIONAL		REJECT	
VER-014	FUNCTIONAL		REJECT	
VER-015	FUNCTIONAL		REJECT	
VER-016	INVALID		INVALID	
VER-017	FUNCTIONAL	1	REJECT	
VER-018	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
VER-019	COSMETIC	1	REJECT	
VER-020	FUNCTIONAL	1	REJECT	
VER-021	FUNCTIONAL		REJECT	
VER-022	INVALID		INVALID	
VER-023	INVALID	1	INVALID	
VER-024	FUNCTIONAL		REJECT	
VER-025	FUNCTIONAL	1	REJECT	
VER-026	FUNCTIONAL		FIX/CLOSED	
VER-027	INVALID		INVALID	
VER-028	FUNCTIONAL	1	FIX/OPEN	1992 Refuel Outage
VER-029	INVALID		INVALID	
VER-030	FUNCTIONAL	1	REJECT	
VER-031	INVALID		INVALID	
VER-032	INVALID		INVALID	
VER-033	INVALID		INVALID	

HEQ NUMBER	CATEGORY	REV	STATUS	SCHEDULE
VER-034	FUNCTIONAL	1	FIX/OPEN	1990 Refuel Outage
VER-035	INVALID	1	INVALID	
VER-036	INVALID	1	INVALID	
VER-037	INVALID		INVALID	
VER-038	INVALID		INVALID	
VER-039	FUNCTIONAL	1	REJECT	
VER-040	COSMETIC		FIX/OPEN	1988 Refuel Outage
VER-041	COSMETIC	1	REJECT	
VER-042	FUNCTIONAL		REJECT	
VRR-001	FUNCTIONAL		FIX/CLOSED	
VRR-002	COSMETIC	1	FIX/CLOSED	
VRR-003	FUNCTIONAL		FIX/CLOSED	

APPENDIX D
LIST OF TASKS

The EPG procedure number is shown in the left margin. A unique task number is shown to the left of each task. New tasks identified in the Revision 2 EPGs are designated with an asterisk (*) next to the task number.

Due to the revision of the EPGs, many task numbers have been changed from the original numbering of the task statements. The original task numbers are shown in parentheses to the right of each task. When new Revision 2 tasks are repeated, they are designated in parentheses to the right of the task with the label NEW and a task number.

REACTOR PRESSURE VESSEL CONTROL

	1.1	Identify RPV water level below +53". (1.1)
	1.2	Identify RPV pressure above 1080 psig. (1.2)
	1.3	Identify drywell pressure above 3.5 psig. (1.3)
	1.4	Determine condition which requires reactor scram when reactor power is greater than 6% or unable to be determined. (1.5)
RC-1	1.5	Verify reactor scram. (1.6)
RC/L-1	1.6	Verify status of reactor vessel isolation in order to control RPV water level. (1.7)
	1.7	Initiate reactor vessel isolation. (1.8)
	1.8	Verify status of ECCS in order to control RPV water level. (1.9)
	1.9	Initiate ECCS actuation. (1.10)
	1.10	Determine if RPV water level cannot be determined. (1.12)
	1.11	Determine if any control rod is not inserted to position 00. (1.72)
RC/L-2	1.12	Restore and maintain RPV water level between +53" and +95" with one or more of the following systems: condensate/feedwater (1110-0 psig), CRD (1110-0 psig). (1.14)
	1.13	Restore and maintain RPV water level using the core spray (maintain pump flow less than core spray pump NPSH limit and core spray vortex limit). (5.6)
	1.14	Maintain RPV water level using fire system. (10.20)
	1.15	Maintain RPV water level using containment spray raw water valved to core spray. (10.19)
	1.16*	Maintain RPV water level using liquid poison (test tank).
	1.17*	Maintain RPV water level using liquid poison (boron tank).
	1.18	Reset ADS timer. (1.15)
	1.19	Determine status of RPV level control. (1.16)
	1.20	Determine if alternate cooldown is required. (1.17)

RC/P	1.21	Rapidly depressurize the RPV with the main turbine bypass valves. (1.18)
	1.22	Determine if emergency RPV depressurization is required. (1.19)
	1.23	Determine if RPV flooding is required. (1.20)
	1.24	Determine status of SRVs. (1.21)
RC/P-1	1.25	Initiate EC. (1.22)
	1.26	Manually open SRVs until reactor pressure drops to 965 psig. (1.23)
	1.27	Check suppression pool temp. - heat capacity limit. (1.24)
	1.28	Check suppression pool water level - suppression pool load limit (maintain RPV pressure below the limit). (1.25)
	1.29	Determine whether steam cooling is required. (1.26)
	1.30	Determine whether boron injection is required. (1.27)
	1.31	Observe main condenser available. (1.28)
	1.32	Observe no indication of gross fuel failure or steam line break. (1.29)
	1.33	Open MSIVs to reestablish the main condenser as a heat sink. (1.30)
	1.34*	Bypass the low RPV water level MSIV isolation interlocks to reestablish the main condenser as a heat sink.
RC/P-2	1.35	Control RPV pressure below 1080 psig using main turbine bypass valves. (1.31)
	1.36	Maintain RPV pressure control using EC. (1.32)
	1.37	Maintain RPV pressure control using ERVs when suppression pool water is greater than 58 ft. (1.33)
	1.38	Maintain RPV pressure control using main steam line drains. (1.34)
	1.39	Maintain RPV pressure control using RWCU (recirculation mode). (1.35)
	1.40*	Maintain RPV pressure control using RWCU (blowdown mode).
	1.41	Verify reactor is not shut down. (1.36)

RC/P-3	1.42	Repressurize the RPV and initiate cooldown (when either: rods inserted, 458.1 pounds of boron injected, or reactor shutdown and no boron injected). (1.37)
RC/P-4	1.43	Initiate shutdown cooling system. (1.38)
	1.44	Determine need for further cooldown. (1.39)
	1.45	Determine if alternate shutdown cooling is required. (1.40)
RC/P-5	1.46	Proceed to cold shutdown OP 43 startup and shutdown procedure (when control rods inserted and 458.1 pounds of boron injected). (1.41)
RC/Q	1.47	Terminate boron injection. (1.42)
RC/Q-1	1.48	Confirm reactor mode switch in shutdown. (1.43)
RC/Q-2	1.49	Initiate recirculation flow runback to minimum (if main turbine generator is on line). (1.44)
RC/Q-3	1.50	Trip recirculation pumps (if reactor power above 6%). (1.45)
RC/Q-4	1.51	Determine whether boron injection is required. (1.46)
	1.52*	Inject 458.1 pounds of boron into RPV with liquid poison.
	1.53	Prevent automatic initiation of ADS. (1.48)
RC/Q-4.1	1.54	Confirm automatic isolation of RWCU. (1.50)
RC/Q-4.2	1.55*	Inject 458.1 pounds of boron into RPV using CRD.
RC/Q-4.3	1.56	Enter scram procedure. (1.51)
RC/Q-5	1.57	Identify and respond to a scram valve not open. (1.52)
RC/Q-5.1	1.58	Identify and respond to control rods not moving inward. (1.53)
RC/Q-5.2	1.59	Reset reactor scram. (1.54)
	1.60	Start all CRD pumps. (1.55)
	1.61	Observe CRD pumps not started (go to step RC/Q-5.5.4). (1.56)
	1.62	Close HCU accumulator charging water header valve 301-69. (1.57)
	1.63	Rapidly insert control rods manually until reactor scram can be reset. (1.58)

	1.64	Reset reactor scram. (1.59)
	1.65	Open HCU accumulator charging water header valve 301-69. (1.60)
RC/Q-5.3	1.66	Determine if scram discharge volume vent and drain valves are open (drain the scram discharge volume). (1.61)
	1.67*	Determine if the scram discharge volume is drained.
	1.68	Initiate a manual reactor scram. (1.62)
	1.69	Verify control rods moved inward. (1.63)
	1.70	Reset reactor scram. (1.64)
	1.71	Open scram discharge volume vent and drain valves. (1.65)
RC/Q-5.4	1.72	Individually open scram test switches for control rods not inserted beyond position 00. (1.66)
	1.73	Identify and respond to control rod not moving inward (close scram test switch). (1.67)
	1.74	Reset reactor scram. (1.68)
RC/Q-5.5	1.75	Start all CRD pumps. (1.69)
	1.76	Close HCU accumulator charging water header valve 301-69. (1.70)
	1.77	Rapidly insert control rods manually beyond position 00. (1.71)
	1.78	Identify and respond to a control rod not inserted beyond position 00. (1.72)
	1.79	Direct effluent from CRD withdraw line vent valve to contained radwaste drain. (1.73)
	1.80	Observe control rod not moving inward and close CRD withdraw line vent valve. (1.74)

PRIMARY CONTAINMENT CONTROL

	2.1	Observe suppression pool temperature is greater than 80°F. (2.1)
	2.2	Observe drywell temperature above 110°F. (2.2)
	2.3	Observe drywell pressure above 3.5 psig. (2.3)
	2.4*	Observe torus water level above 11.5 feet (max level referred to bottom of torus, max level LCO).
	2.5*	Observe torus water level below 10 feet (min level LCO).
	2.6*	Determine if containment hydrogen concentration is above 3.2% (high hydrogen alarm setpoint).
	2.7	Determine if containment sprays have been initiated. (2.8)
	2.8*	Lock-out all containment spray pumps.
SP/T-1	2.9	Observe suppression pool (torus) temperature is greater than 80°F. (2.7)
	2.10	Operate available suppression (torus) pool cooling. (2.8)
SP/T-2	2.11	Observe suppression pool temperature is 110°F. (2.9)
	2.12	Scram the reactor. (2.10)
SP/T-3	2.13	Observe suppression pool (torus) temp not maintained below the heat capacity temp limit. (2.11)
	2.14	Maintain RPV pressure below heat capacity temperature limit. (2.12)
	2.15	Enter RPV control guideline procedure at RC-1 and execute concurrently. (2.13)
DW/T-1	2.16	Observe drywell temperature is greater than 160°F. (2.14)
	2.17	Operate available drywell cooling. (2.15)
	2.18	Determine that drywell temp and pressure are within containment spray initiation limits. (2.18)
DW/T-2	2.19	Observe drywell temperature is less than 301°F and increasing (max temp at which ADS is qualified). (2.19)
	2.20	Shutdown recirculation pumps. (2.20)

	2.21	Shutdown drywell cooling fans. (2.21)
	2.22	Initiate containment sprays. (2.22)
	2.23	Determine if drywell pressure drops below 3.5 psig. (2.3)
	2.24	Terminate containment sprays. (New 2.8)
	2.25	Observe drywell pressure when drywell temp is greater than 301°F. Go to RPV control guideline procedure at step RC-1 and execute concurrently with this procedure. (2.23)
PC/P-1	2.26	Observe temp in space being evacuated less than 212°F. (2.24)
	2.27	Operate EVS per EVS and drywell purge operating procedures. (2.25)
	2.28	Determine if containment sprays have been initiated. (2.8)
	2.29	Determine if drywell pressure drops below 3.5 psig. (2.3)
	2.30	Terminate containment sprays. (New 2.8)
PC/P-2	2.31	Observe suppression (torus) chamber pressure. (2.26)
	2.32	Observe drywell temp and pressure within containment spray initiation limits. (2.18)
	2.33	Shutdown recirculation pumps. (2.28)
	2.34	Shutdown drywell cooling fans. (2.29)
	2.35	Initiate containment sprays. (2.30)
PC/P-3	2.36	Observe (torus) suppression chamber pressure above pressure suppression pressure. Go to emergency RPV depressurization. (2.31)
PC/P-4	2.37	Observe suppression chamber (torus) pressure above primary containment pressure limit. (2.38)
	2.38	Vent the drywell in accordance with procedure for containment venting to reduce and maintain pressure below primary containment pressure limit. (2.39)
	2.39*	Vent the drywell by defeating isolation interlocks.
SP/L-1	2.40	Maintain torus water level between 11.5 ft. and 10 ft. per S-SP-2, "Liquid Grab Sample-Local Sample Point", prior to discharging water. (New 2.4)

SP/L-2	2.41	Observe torus water level below 10 ft. (New 2.5)
	2.42	Maintain suppression pool (torus) water level above heat capacity level limit. (2.42)
	2.43	Observe suppression pool (torus) water level below heat capacity limit, go to RPV control guideline at step RC-1 and execute it concurrently with the procedure. (2.43)
SP/L-3	2.44	Observe torus water level above 11.5 feet. (New 2.4)
SP/L-3.1	2.45	Maintain suppression pool (torus) water level below suppression pool water torus load limit. (2.45)
	2.46	Observe suppression pool (torus) water level above suppression pool (torus) load limit. (2.46)
	2.47	Maintain RPV pressure below the limit. (2.47)
	2.48	Go to RPV control guideline procedure at step RC-1 and execute concurrently with this procedure. (2.48).
	2.49	Observe RPV pressure below suppression pool (torus) load limit. (2.49)
	2.50	Verify adequate core cooling is assured. (2.50)
	2.51	Terminate injection into the RPV from sources external to primary containment. (Do not use boron injection system or CRD.) (2.51)
	2.52	Go to emergency RPV depressurization procedure. (2.52)
SP/L-3.2	2.53*	Observe drywell water level reaching -60 in. (max primary containment water level limit).
	2.54	Terminate injection into RPV from sources external to primary containment (regardless of adequate core cooling). (2.55)
PC/H	2.55*	Monitor the availability of the hydrogen or oxygen monitoring system.
PC/H-1.1	2.56*	Sample the drywell and torus for hydrogen and oxygen in accordance with N1-PSP-13 (Sampling and analysis of reactor water in containment gas using the PASS).
	2.57	Determine drywell and torus hydrogen concentrations to below/above 6%. (New 2.6)
	2.58*	Determine drywell and torus oxygen concentrations to below/above 5%.
	2.59	Go to emergency RPV depressurization procedure. (2.52)

	2.60	Enter the procedure developed from the RPV control guideline at step RC-1 and execute it concurrently with this procedure. (2.48)
	2.61*	Vent and purge the drywell in accordance with steps PC/H-2.1 through PC/H-2.2 (the procedure for drywell venting).
	2.62	Determine whether the site radioactivity release rate reaches the site release rate LCO. (4.1)
	2.63*	Isolate the drywell vent and purge.
	2.64	Sample the drywell and torus for hydrogen and oxygen in accordance with N1-PSP-13 (Sampling and analysis of reactor water in containment gas using the PASS). (New 2.56)
PC/H-1.2	2.65	Vent the drywell in accordance with procedure for containment venting. (2.39)
PC/H-1.3	2.66	Determine drywell and torus oxygen concentrations to below/above 5%. (New 2.58)
	2.67*	Initiate and maximize the drywell nitrogen purge flow.
	2.68	Initiate and maximize the drywell air purge flow. (New 2.61)
	2.69	Determine drywell and torus hydrogen concentrations to below/above 6%. (New 2.6)
PC/H-2	2.70	Determine drywell and torus oxygen concentrations to below/above 5%. (New 2.58)
	2.71	Go to emergency RPV depressurization procedure. (2.52)
	2.72	Enter the procedure developed from the RPV control guideline at step RC-1 and execute it concurrently with this procedure. (2.48)
	2.73	Vent and purge the drywell in accordance with steps PC/H-2.1 through PC/H-2.2 (the procedure for drywell venting). (New 2.61)
	2.74	Vent and purge the drywell by defeating isolation interlocks. (New 2.39)
	2.75*	Restore and maintain drywell and torus hydrogen concentrations below 6%.
	2.76*	Restore and maintain drywell and torus oxygen concentrations below 5%.

	2.77	Determine if containment sprays have been initiated. (2.8)
	2.78	Determine if drywell pressure drops below 3.5 psig. (2.3)
	2.79	Terminate drywell spray. (New 2.8)
PC/H-2.1	2.80	Vent the drywell in accordance with procedure for containment venting. (2.39)
PC/H-2.2	2.81	Initiate and maximize the drywell nitrogen purge flow. (New 2.67)
PC/H-2.3	2.82	Determine if drywell temp and pressure are within containment spray initiation limits. (2.18)
	2.83	Shutdown recirculation pumps. (2.20)
	2.84	Shutdown drywell cooling fans. (2.21)
	2.85	Initiate containment sprays. (2.22)

SECONDARY CONTAINMENT CONTROL

3.1 Observe differential pressure is greater than or equal to 0.0" of water. (3.1)

3.2 Observe area temperature is greater than high temperature alarm setpoint. (3.2)

3.3 Observe RB HVAC exhaust radiation level is greater than 5 mr/hr. (3.3)

3.4 Observe area radiation level is greater than high radiation level alarm setpoint. (3.4)

3.5 Observe floor drain sump water level is greater than high water level alarm setpoint. (3.5)

3.6* Observe area water level above the maximum normal operating water level.

3.7 Confirm or manually initiate isolation of reactor building HVAC. (3.6)

3.8 Confirm or manually initiate EVS. (3.7)

3.9 Observe RB HVAC isolates. (3.8)

3.10 Observe RB HVAC exhaust radiation level is less than 5 mr/hr. (3.9)

3.11 Restart RB HVAC. (3.10)

SC/T-1 3.12 Operate available area coolers. (3.11)

SC/T-2 3.13 Observe RB HVAC exhaust radiation level is less than 5 mr/hr. (3.12)

3.14 Operate available RB HVAC. (3.13)

SC/T-3 3.15 Observe area temperature is greater than high temperature alarm setpoint. (3.14)

3.16 Isolate all systems discharging into area except systems required to shut down reactor, ensure adequate core cooling or suppress a fire. (3.15)

SC/T-4 3.17 Observe primary system discharging into reactor building or observe a fire in secondary containment cannot be suppressed, and any high temperature alarm setpoint cannot be restored and maintained below its temp setpoint. (3.16)

3.18 Go to emergency RPV control guideline procedures step RC-1. (3.17)

SC/T-5	3.19	Observe a primary system discharging into the reactor building and the area high temperature alarm setpoint cannot be restored and maintained in more than one area below its setpoint. (3.18)
	3.20	Go to the emergency RPV depressurization procedure. (3.19)
SC/R-1	3.21	Observe area radiation level is greater than high radiation level alarm setpoint. (3.20)
	3.22	Isolate all systems that are discharging into area except HVAC required to shut down the reactor, assure adequate core cooling, suppress working fire. (3.21)
SC/R-2	3.23	Observe primary system discharging into reactor building and the area high radiation level alarm setpoint cannot be restored and maintained below its setpoint. (3.22)
	3.24	Go to RPV Control Guideline step RC-1 and execute concurrently. (3.23)
SC/R-3	3.25	Observe emergency system discharging into the reactor building and the area high radiation level alarm setpoint cannot be restored and maintained in more than one area below the setpoint. (3.24)
	3.26	Go to Emergency RPV depressurization procedure. (3.25)
SC/L-1	3.27	Observe floor drain sump water level is greater than high water level alarm setpoint. (3.27)
	3.28	Operate available sump pumps to restore and maintain below high water level alarm setpoint. (3.28)
	3.29	Observe floor drain sump cannot be maintained below high level setpoint. (3.29)
	3.30	Observe any area water level cannot be maintained below its maximum normal operating water level. (New 3.6)
	3.31	Isolate systems discharging water to sump or area except systems required to shut down reactor, assure adequate core cooling, or suppress working fire. (3.30)
SC/L-2	3.32	Observe primary system discharging into reactor building where any area water level is reaching its maximum safe operating water level. (3.32)
	3.33	Enter RRV Control Guideline Procedure Step RC-1. (3.31)
SC/L-3	3.34	Observe primary system discharging into reactor building where more than one area water level exceeds its maximum safe operating water level. (3.32)
	3.35	Go to emergency RPV depressurization procedure. (3.33)

RADIOACTIVE RELEASE CONTROL

4.1 Observe offsite radioactivity release above alert release rate. (4.1)

4.2 Isolate all primary systems discharging into areas outside primary and secondary containments. (4.2)

4.3 Observe radioactivity release rate requiring a general emergency. (4.3)

4.4 Observe a primary system discharging into areas outside primary and secondary containments. (4.4)

4.5 Go to emergency depressurization guideline. (4.5)

LEVEL RESTORATION

	5.1	Determine if any rod is not inserted to position 00. (1.72)
	5.2	Observe if RPV water level cannot be determined. (5.2)
C1-1	5.3	Initiate EC. (5.4)
C1-2	5.4	Line up and start pumps for condensate and feedwater. (5.5)
	5.5	Line up and start pumps for LPCS-LOOP #11. (5.6)
	5.6	Line up and start pumps for LPCS - LOOP #12. (5.7)
	5.7	Line up containment spray raw water valved to core spray. (5.8)
	5.8	Line up fire system. (5.9)
	5.9*	Line up liquid poison (test tank).
	5.10*	Line up liquid poison (boron tank).
C1-3	5.11	Monitor RPV pressure and water level. (5.10)
	5.12	Observe RPV water level drops below -10". (5.11)
	5.13	Stop automatic initiation of ADS. (5.12)
C1-4	5.14	Observe RPV water level increasing and RPV pressure high. Go to RPV Control Procedure Step RC/L. (5.13)
C1-5	5.15	Observe RPV water level increasing and RPV pressure low. Go to RPV Control Procedure Step RC/L. (5.14)
	5.16	Observe HPCI not operating. (1.14)
C1-6	5.17	Observe RPV water level decreasing and RPV pressure high or intermediate. (5.15)
	5.18	Observe HPCI or CRD is not operating. (1.14)
	5.19	Restart whichever is not operating. (1.55, 1.14, 1.69)
	5.20	Observe no injection system lined up for injection with at least one pump running. (5.16)
	5.21	Start pumps in alternate injection subsystems which are lined up for injection. (5.17)
	5.22	Observe RPV water level is less than -86.0 inches. (5.18)

5.23 Observe no system injection subsystem or alternate injection subsystem is lined up with at least one pump running. (5.19)

5.24 Start steam cooling. (5.20)

5.25 Go to the emergency RPV depressurization procedure. (5.21)

5.26 Observe RPV water level increasing or RPV drops below 327 psig. (5.22)

C1-7 5.27 Observe RPV water level decreasing and RPV pressure low. (5.23)

5.28 Line up pumps for injection, start pumps, increase injection flow to the maximum with all alternate injection subsystems. (5.26)

5.29 Go to emergency RPV depressurization procedure. (5.27)

5.30 Observe RPV water level is less than -86.0 inches. (5.18)

5.31 Go to primary containment flooding contingency.

EMERGENCY RPV DEPRESSURIZATION

C2-1	6.1	Observe all injection into RPV except from boron systems and CRD has been terminated or prevented. (6.2)
	6.2	Determine number of control rods inserted to position 00 (maximum subcritical banked withdrawal position). (1.72)
C2-1.1	6.3*	Determine if a high drywell pressure ECCS initiation signal exists (3.5 psig initiates signal).
	6.4*	Prevent injection from those core spray pumps not required to assure adequate core cooling.
C2-1.2	6.5	Initiate EC. (6.4)
C2-1.3	6.6	Observe suppression pool water level is greater than 5.8 feet. (6.5)
	6.7	Open all ADS valves. (6.6)
	6.8	Observe any ADS valves not opened and open ERVs until three valves are open. (6.7)
C2-1.4	6.9	Observe less than 3 ERVs are open. (6.8)
	6.10	Observe RPV pressure is greater than or equal to 50 psig above suppression chamber pressure. (6.9)
	6.11*	Observe RPV pressure is at least 1 psig above torus pressure.
	6.12	Rapidly depressurize the RPV using the main condenser. (6.10)
	6.13	Rapidly depressurize the RPV using main steam line drains. (6.11)
	6.14	Rapidly depressurize the RPV using the head vent. (6.12)
	6.15	Rapidly depressurize the RPV using the EC side vent. (6.13)
	6.16*	Defeat isolation interlocks, if necessary, to rapidly depressurize the RPV.
	6.17	Determine RPV water level. (6.14)
	6.18	Go to RPV flooding procedure.
C2-2	6.19	Go to RPV control guideline procedure at step RC/P-3. (6.16)

STEAM COOLING

C3-1	7.1	Confirm initiation of EC. (7.1)
	7.2	Determine whether emergency RPV depressurization is required. (7.2)
	7.3	Observe RPV water level cannot be determined. (7.7)
	7.4	Determine whether any system, injection subsystem, or alternate injection subsystem is lined up for injection with at least one pump running. (7.3)
	7.5	Go to Emergency RPV depressurization procedure. (7.4)
	7.6	Determine EC cannot be initiated. (7.5)
C3-1.1	7.7	Observe RPV water level is less than -188 inches. (7.6)
	7.8	Open one ERV. (7.8)
C3-1.2	7.9	Observe RPV pressure is less than 700 psig. (7.9)
	7.10	Go to emergency RPV depressurization procedures. (7.10)

CORE COOLING WITHOUT LEVEL RESTORATION CONTINGENCY (C-4)

Deleted from Revision 2 EPGs - Tasks 8.1 - 8.8.

ALTERNATE SHUTDOWN COOLING CONTINGENCY (C-5)

Deleted from Revision 2 EPGs - Tasks 9.1 - 9.17

RPV FLOODING

C4-1.2 10.1 Determine if 3 SRVs can be opened. (10.1)

10.2 Close MSIVs. (10.3)

10.3 Close main steam line drain valves. (10.4)

10.4 Close emergency condenser steam line isolation valves. (10.5)

C4-1 10.5 Determine if any control valve is not inserted beyond position 00. (10.6)

10.6 Stop all injection into the RPV except for boron injection systems and CRD. (10.7)

10.7 Monitor RPV until pressure is less than minimum alternate RPV flooding pressure. (10.8)

10.8 Determine if no SRV can be opened. (10.9)

10.9 Determine if RPV water level is available and RPV flooding is not required. Enter procedure developed from contingency 5 and RPV control guideline at step RC/P-4. (10.10)

C4-1.3 10.10 Increase injection to RPV using motor driven feedwater pumps. (10.11)

10.11* Increase injection by defeating high RPV water level isolation interlocks.

10.12 Increase injection to RPV using condensate pumps. (10.13)

10.13 Increase injection to RPV using CRD. (10.14)

10.14 Observe 1 SRV open and RPV pressure above minimum alternate RPV flooding pressure. (10.15)

10.15 Observe all SRVs closed. (10.16)

10.16 Observe RPV pressure below minimum alternate RPV flooding pressure. (10.17)

10.17 Increase injection to the RPV using containment spray raw water valved to core spray. (10.19)

10.18 Increase injection RPV using fire system. (10.20)

10.19 Increase injection into the RPV using core spray. (1.14, 5.6)

C4-1.4	10.20	Observe at least one SRV open. (10.21)
	10.21	Observe RPV pressure is above the minimum alternate RPV flooding pressure. (10.22)
	10.22	Throttle injection to maintain at least one SRV open and RPV pressure above the minimum alternate RPV flooding pressure. (10.23)
C4-1.5	10.23	Observe all control rods inserted beyond position 00. (10.24)
C4-2	10.24	Observe 3 ERVs can be opened on a feedwater pump is available for injection. (10.11)
	10.25	Close MSIVs. (9.3)
	10.26	Close main steam line drain valves. (9.4)
	10.27	Close EC steam line isolation valves. (9.5)
C4-3.1	10.28	Increase injection to the RPV using motor driven feedwater pumps. (10.28)
	10.29	Increase injection by defeating high RPV water level isolation interlocks. (New 10.11)
	10.30	Increase injection to the RPV using core spray. (1.14, 5.6)
	10.31	Increase injection to the RPV using condensate pumps. (10.31)
	10.32	Increase injection to the RPV using CRD. (10.32)
	10.33	Increase spray injection to the RPV using containment spray raw water valved to core spray. (10.33)
	10.34	Increase injection to the RPV using fire system. (10.34)
C4-3.2	10.35	Observe at least 3 SRVs open. (10.35)
	10.36	Observe RPV pressure is not decreasing and is at least 72.9 psig above torus pressure. (10.36)
	10.37	Throttle injection maintain at least 3 SRVs open and RPV pressure at least 72.9 psig above torus pressure. (10.37)
C4-4	10.38	Observe temperature at cold reference leg instrument vertical runs is below 212°F. (10.48)
	10.39	Observe RPV water level instrumentation is available. (10.49)
	10.40	Observe RPV is filled. (10.50)

10.41 Observe RPV pressure is at least 72.9 psig above torus pressure. (10.52)

10.42 Terminate injection to the RPV. (10.53)

10.43 Reduce RPV water level. (10.54)

10.44 Observe RPV water level indication is not available. (10.55)

10.45 Within the maximum core uncovery time limit after beginning termination of injection in the RPV, go to step C4-3.1. (10.56)

C4-5 10.46 Go to RPV control guideline procedure at RC/L and RC/P-4 and execute concurrently. (10.57)

LEVEL/POWER CONTROL

C5-1

11.1 Observe reactor power is greater than 6% or cannot be determined. (11.1)

11.2 Observe suppression pool temperature is greater than 100°F. (11.2)

11.3 Observe an SRV open or opens. (11.3)

11.4 Observe drywell pressure is greater than 3.5 psig. (11.4)

11.5 Observe any MSIV open. (1.30)

11.6 Bypass low RPV water level MSIV isolation interlocks. (New 1.34)

11.7 Stop all injection to the RPV except from boron injection systems and CRD to lower RV level irrespective of any consequent reactor power oscillations. (11.5)

11.8 Observe reactor power drops less than 6%. (11.6)

11.9 RPV water level is -86. inches. (11.7)

11.10 Observe all SRVs are closed and drywell pressure is less than 3.5 psig. (11.8)

11.11 Stop lowering RPV water level. (11.9)

11.12 Determine if emergency RPV depressurization is required, go to Step C5-2.1. (11.10)

C5-2

11.13 Observe RPV level achieved in Step C5-1. (11.11)

11.14 Observe RPV level between +53 inches and +95 inches. (11.12)

11.15 Maintain RPV water level using condensate/feedwater. (11.13)

11.16 Maintain RPV water level using CRD. (11.14)

11.17 Maintain RPV water level is greater than 86.0 inches. (11.15)

11.18 Observe RPV water level is less than -86.0 inches, go to emergency RPV depressurization procedure. (11.16)

C5-2.1

11.19 Stop injection with RPV except from boron injection systems and CRD. (11.17)

11.20 Observe RPV pressure is less than minimum alternate RPV flooding pressure. (11.18)

11.21 Observe SRVs cannot be opened. (11.19)

C5-2.2 11.22 Increase injection into RPV using condensate/feedwater. (11.20)

11.23 Increase injection into RPV using CRD. (11.27)

11.24 Observe RPV water level is greater than -86.0 inches. (11.28)

11.25 Increase injection to RPV using liquid poison LPCS (test tank) boron tank. (New 1.16)

11.26 Increase injection into RPV using liquid poison (boron tank). (New 1.17)

11.27 Increase injection to RPV using containment spray raw water valved to core spray. (11.30)

11.28 Increase injection to RPV using fire system. (11.31)

11.29 Observe reactor power increase, go to step C5-1. (11.32)

C5-3 11.30 Observe 271.4 pounds of boron injected to RPV. (11.33)

11.31 Maintain RPV water level between +53 inches and +95 inches. (11.35)

11.32 Observe RPV level is less than +53 inches. (11.36)

11.33 Observe RPV water level is greater than -86.0 inches. (11.37)

11.34 Observe RPV water level is less than -86.0 inches, go to emergency RPV depressurization procedure, step C5-2.1. (11.38)

11.35 When procedure for cooldown to cold shutdown is entered from Step RC/P-5, proceed to cold shutdown in accordance with procedure for cooldown to cold shutdown. (11.40)

PRIMARY CONTAINMENT FLOODING

12.1 Determine if drywell temperature and pressure are within the containment spray initiation limits. (2.18)

12.2 Shutdown recirculation pumps and drywell cooling fans. (2.20)

12.3 Shutdown drywell cooling fans. (2.21)

12.4 Line up containment spray raw water to containment spray. (2.22)

12.5 Start containment spray raw water pumps and increase flow to maximum. (2.8)

12.6 Determine if drywell pressure below 3.5 psig. (2.3)

12.7 Terminate containment spray. (New 2.8)

12.8 Line up containment spray raw water for injection into the RPV. (5.8)

12.9 Start containment spray raw water pumps and increase flow to maximum. (2.8)

12.10 Determine if drywell water level reaches -60 inches (max primary containment water level limit). (New 2.53)

12.11 Terminate injection into the RPV and drywell from sources external to the primary containment (irrespective of whether there is adequate core cooling). (8.6)