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SUBJECT: Forwards "Final Summary Rept for DCRDR of Nine Mile Point Unit 1," per 841212 ltr & NRC 841226 reply.Rept represents completion of program commitments back to 830930 program plan.Rept includes results of NRC review/audit sessions.

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July 1, 1985

Director of Nuclear Reactor Regulation
Attention: Mr. Domenic B. Vassallo, Chief
Operating Reactor Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Subject: Final Summary Report for the Detailed Control Room Design Review of Nine Mile Point Unit 1

Dear Mr. Vassallo:

Pursuant to our letter of December 12, 1984 on the same subject and your subsequent agreement in your December 26, 1984 letter, enclosed is Niagara Mohawk Power Corporation's Final Summary Report for the Detailed Control Room Design Review of Nine Mile Point Unit 1. This represents completion of program commitments made in our December 12th letter and other NRC communications reaching back to our Program Plan of September 30, 1983.

An appropriate resolution of currently identified Human Engineering Observations derived from the program has been determined and committed. Design detailing and scheduling of fixes is substantially complete although some further follow-on work of this type is required in a few cases to finalize the design. There are some further verification/validation steps and other program activities which interact with the Detailed Control Room Design Review. These activities have been identified, structured and are in progress. When these are completed in the near future, a few changes may result but they are not expected to be of a substantial nature.

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Likewise, we have had three major review/audit sessions with members of the NRC's staff in August 1984, November 1984 and May 1985. The agreements made and questions answered as a result of these sessions have been included in the attached report.

In summary, we believe that the program is substantially complete or well-defined, and that sufficient detailing is contained in this Final Summary Report to allow the NRC to adequately review and approve our Detailed Control Room Design Review Program.

Sincerely,

NIAGARA MOHAWK POWER CORPORATION

CVMangan
C. V. Mangan
Vice President
Nuclear Engineering and Licensing

JLB/bd

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NINE MILE POINT UNIT 1
DETAILED CONTROL ROOM DESIGN REVIEW
FINAL SUMMARY REPORT

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Nine Mile Point Unit 1

Detailed Control Room Design Review

Final Summary Report

1.0 Introduction

Several special inquiry groups were established by the Nuclear Regulatory Commission (NRC) to investigate the cause and consequences of the accident at Three Mile Island Unit 2 (TMI-2). It became evident during these investigations that human error contributed to the accident.

The conclusion reached from the Human Factors part of these investigations was that the human errors were substantially due to equipment design, information presentation, and operator training, all of which did not reflect standard human engineering principles and practices. The results of this study were documented in NUREG/CR-1270, "Human Factors Evaluation of Control Room Design and Operator Performance at Three Mile Island Unit 2 (Volumes 1, 2 and 3).

Following this review and the assessment of other inquiry groups, the NRC recommended that a Human Factors review be performed on nuclear power plant control rooms. This guidance was documented in NUREG-0660, "NRC Action Plan Developed As a Result of the TMI-2 Accident"; NUREG-0694, "TMI Related Requirements for New Operating Licensees"; and NUREG-0737, "Clarification of TMI Action Plan Requirements."

Operating reactor licensees and applicants for operating licenses were requested to perform a Detailed Control Room Design Review (DCRDR) to assess and evaluate the control room workspace, instrumentation, controls, environment, and other equipment from a Human Factors engineering perspective in accordance with Task I.D.1 of NUREG-0660. This process takes into account both system demands and operator capabilities and identifies, assesses, recommends and implements control room design recommendations and/or modifications that will correct inadequate or unacceptable items.

Niagara Mohawk Power Corporation (NMPC) carried out this program on Nine Mile Point Unit 1 (NMP-1) in two major phases. The initial phase I was an early Human Factors review under the auspices of the Boiling Water Reactor (BWR) Owners Group in accordance with the methodology they developed for conducting control room design reviews, as described in their program documentation. (See NEDC 30285, "BWR Owners Group Control Room Design Review Program.) This was done on an initial set of 16 BWR plants with a team consisting of Operations representatives from the participating utilities, Engineering expertise from GE, and lead by prominent Human Factors experts.

This initial review was completed on NMP-1 in July 1981, the resulting Human Engineering Observations (HEO's) were compiled, and a general assessment was carried out which verified that there were no severe problems requiring immediate resolution. These results were published in NMPC's Summary Report and Program Plan of September 30, 1983, along with NMPC's outline for Phase II to complete the Detailed Control Room Design Review (DCRDR) Program.

Although remedial actions proceeded on some of the HEO's in the interim because of on-going plant modification programs for other reasons, the HEO's themselves were "banked" until this final phase of the overall program was ready to be initiated in response to the follow-on NRC guidance provided in NUREG-0737, Supplement 1.

Advanced Resource Development (ARD) Corporation was hired in the spring of 1984 to provide the Human Factors expertise and had past DCRDR experience which could be used to help NMPC carry out the final phase of their program. The intent was to carry out a well-developed Human Factors review which appropriately melded-in the initial phase results on a mutually consistent basis. Final phase program activities were generally based on the NRC's guidance provided in NUREG-0700, "Guidelines for Control Room Design Reviews", but judgment was applied as needed to fit the NMP-1 situation. For instance, the BWR Owner's Group checklist was used in the initial phase and its supplement was used in the final phase.

The organization and program processes are described in Section 3.0 of this report, the details of the program review/analysis activities are covered in Section 4.0, and Section 5.0 describes the program results, including the assessment/resolution and follow-on activities.

The purpose of this report is to provide sufficient basis and detail information about the program, particularly the scope and schedule of changes that will be made to the NMP-1 control room and the rationale for not making changes, to demonstrate that a comprehensive and appropriate Human Factors review was carried out. Specifically, the end result is expected to satisfy Task Action Item I.D.1 from NUREG-0660 and all of the follow-on NRC guidance documents, which should allow NRC approval of the NMP-1 DCRDR Program on that basis.

2.0 Executive Summary

Niagara Mohawk's response to the requirement for a Human Factors based Detail Control Room Design Review was guided by the program structure/task detailing in NUREG-700 "Guidelines for Control Room Design Reviews," and NUREG-0801 "Evaluation Criteria for Detailed Control Room Design Review." However, Niagara Mohawk did not want to just meet an NRC "de facto" mandate. Specifically, in the case of NMP-1, the original design was based on engineering studies in the early 1960's that detailed human/operability considerations which were precursers to the present day structured Human Factors formulas. The result was a control room which 15 years of operating experience proved had a minimum of Human Factor based difficulty.

Nevertheless, Human Factor related changes were made as the potential for significant improvements came to light. For example, the advantages of having all reactor water level monitors zeroed to the same point was a clear cut improvement that came out of the post-TMI reviews which NMPC instituted. Similarly, when the first formalized program for a Human Factors review of the Control Room was detailed by a BWR Owner's Group, NMP-1 was among the first group of plants to be looked at in 1981.

Although the results of this earlier phase of the Human Factors review were generally favorable and there were some unusually complimentary comments for a plant this old, roughly half of the total number of Human Engineering Observations (HEO's) came out of it. These were reviewed to be sure that there were no substantial problems (there were none) and a fuller assessment/resolution of these was left to the final phase of the DCRDR program, recently completed and reported herein.

Again, however, when the HEO Assessment/Resolution Team began their deliberations concerning all HEO's from both major phases of the program, a number of the HEO's from the first phase had been or were being resolved with a fix of some kind for other reasons. Thus, a separate category of "Resolved" HEO's was created and action on these shifted to verification that the fix was effective, as outlined in Section 5.3.

Similarly, while the NRC's requirements/guidance (or acceptable alternates) do a thorough job with the physically oriented aspects of Human Factors concerns, they do not directly address the mental/decision making aspects of plant operation.* NMPC is considering these aspects with a long range R & D program involving modeling/investigation of operators' cognitive processes and possible enhancement applications as either training aides or as direct support to analysis/decision-making activities in reactor operation. These possibilities are directly related to programs being carried out by other R & D organizations in the NRC and EPRI. Collaborative arrangements are now being worked out with these programs for mutual benefit. However, the scope and content of these activities are beyond the purview of this report.

* This distinction has been clearly identified by some Human Factors researchers and is supported by empirical data. They define "slips" as unintentional physical mistakes where the operator has made the right decision but moved a control or done something else incorrectly, on an inadvertent basis. An "error" is a wrong decision but the correct appropriate physical action is taken in support of this wrong decision. The current Human Factors program mandated by the NRC only addresses this latter problem in an indirect way.

To carry out the details of this NRC mandated Human Factors review and be sure that the two major phases of the program (which were carried out three years apart and by different people) were appropriately melded together, NMPC hired a well-known consultant with substantial Human Factors experience, ARD Corporation (see Appendix A for a summary of their experience). In addition, it was recognized that many of the Human Factors judgments being made would involve "degrees of concern," that there were other Human Factor developments and criteria that could be pertinent, and that the experience and understanding of the Human Factors consultant would be an important ingredient to the detailed decisions made during the program.

Because of this comprehensive approach, NMPC believes that all Human Factors aspects have been or are being adequately addressed. The result has been a combination of specific equipment changes, and the development of Human Factor based operating logic bases for the current arrangements. The overall conclusion is that the NMP1 DCRDR Program has been effective and worthwhile.

The specifics of the program and the details of the results are contained in the following body of the report; however, the overall character of the program and a succinct summary of the results can be seen in Figure 5.4-1 and Tables 5.1-1, 5.3-2 and E-1.

Figure 5.4-1 is a relational diagram and time line which is referred to in Section 5.4 to illustrate the program interaction activities, some of which are in progress. This demonstrates the comprehensiveness of the DCRDR program, as well as showing the potential influences on the human factors resolutions coming out of it. Discernable from this diagram are the following key or overall characteristics:

- The program was carried out over a long time span, compared to most other licensing activities, thus allowing for evolutionary adjustments in details and schedule changes. The result is an up-to-date program which should have resolution of most, if not all, potential concerns and key aspects already incorporated both in content and schedule.

- Three general groups of activities can be seen (indicated by vertical two-headed arrows) where there were highly inter-related tasks, many iterations, and many common considerations involved in the task activities. By the issuance date of this report, agreement had been reached about fix mechanisms (as represented by the HEO compilation in Appendix D) and Operations and Engineering personnel are now working on the completion of design details. Many changes have already been instituted and most others will be completed by the end of the spring 1986 refueling outage.

- Interactions with the Emergency Operating Procedures (EOP's), Safety Parameter Display System (SPDS), and R.G. 1.97 (in descending order of potential effect) and fix verifications are important to particular details of the DCRDR and these activities are continuing. Verification activities on the Integrated Cosmetics Package (ICP) in the form of operator feedback was of most importance, and most of the appropriate adjustments from this feedback have been carried out.

Table 5.1-1 provides a compilation and categorization that came out of the Assesment/Resolution of the 530 HEO's derived from the review/analysis activities. Table 5.3-2 lists fix details for those that fall into the Functional Fix category, and Table E-1 is a compilation of HEO's resolved with Cosmetic Fixes. Key or overall aspects from these are:

- There are no major changes or "rebuilding" projects required to obtain a control room that provides a reasonable Human Factors environment.

- Neither were there many long range systems or hardware oriented functional fixes required, and the few that were identified, fit readily into existing programs. Good examples are the recorder refurbishment program, which was already in progress based on maintenance feedback and the possible expansion of the Gaitronics communications system already being studied based on earlier operator feedback.

- Thus, the major focus of the majority of fixes coming out of this DCRDR program is the Integrated Cosmetic Package (ICP) of demarcation/mimic lines, new labels, indicator and other color enhancements, scale and chart paper changes, annunciator tile relettering and switch handle changes. These fit in well with most of the functional fixes to provide an overall enhancement of the control room. The result should make operation easier and more clear cut, particularly for those less experienced and during stressful situations.

Finally, a Human Factors Design Manual has been drafted and will be finalized following verification activities, in order to maintain consistent Human Factors design conventions in the future. This will be incorporated into NMPC's Engineering Procedures and used the same way as other design standards, such as those issued by ASME & IEEE, are used today.

The details supporting these overall observations/conclusions, including a description of the structure and operation of the program are included in the following sections. Detailed data compilations are included in the Appendices. Included is a complete listing and categorization of all HEO's in Appendix D. This provides a compilation of NMPC's explicit fix commitments, which must be carried out to complete the DCRDR program.

3.0 Program Management

3.1 Staffing

A Program Manager was appointed within the Nuclear Technology Department of NMPC with the responsibility to establish and meet the program's objectives based on the NRC's regulatory requirements and guidelines. In the line organization, he reports administratively to the Lead Licensing Engineer but has access to all of the Niagara Mohawk resources needed to carry out the following program activities:

- Plan and administer all of the Detailed Control Room Design Review (DCRDR) program details.
- Obtain appropriate resources and priorities to perform work within the schedules established.
- Coordinate specific tasks, including both inhouse and consultant work.
- Integrate the DCRDR program with other regulatory activities, particularly those contained in Suppl. 1 of NUREG-0737.
- Write and publish required/appropriate reports of status and progress, both externally and internally. This includes summary reports to the NRC.
- Obtain management attention/action as needed to resolve problems or issues.
- Maintain technical cognizance outside Niagara Mohawk to be sure that "state-of-the-art" thinking is incorporated as the program progresses.

- Establish and maintain an appropriate documentation, filing and database management system in order to ensure adequate traceability and auditability. (This includes both for the NRC and within the context of Niagara Mohawk procedures.)

This Program Manager was selected based on his past experience and performance, not only as a Program Manager but also as a Licensing Engineer and considering his background of human factors and systems understanding. His resume is included in Appendix A.

There are several key parts of the program requiring a combination of specific experience, understanding and inputs from Design Engineering and Operation, as well. Teams were needed with a sufficient diversity of these backgrounds to carry out particular program tasks adequately, such as the Task Analysis in the Review/Analysis Phase and the resolution of identified Human Engineering Observations (HEO's) in the Assessment/Resolution Phase. Team members were carefully selected based on the depth of their experience with Instrumentation & Control (I&C) design in the control room and control room operating experience. Resumes's for those who participated most heavily are also included in Appendix A.

In addition, the Task Analysis & Validation tasks in the Review/Analysis Phase were carried out in conjunction with Requalification Training for the operating shifts at the NMP-1 simulator. Thus, they could participate as well as become familiar with the new symptomatic Emergency Procedure Guides, which are the common technical basis for the new Emergency Operating Procedures

and the Task Analysis of this program. During the HEO Assessment/Resolution Phase, various shift operators also participated about 50% of the time (as their work schedules allowed), and the current results were reviewed with each of the shifts during their Requalification Training week. The operators' collective inputs were considered most seriously since they know the control room in more detail than anyone else and are able to point out problems (and identify where Human Factor concerns may be nonproblems) that affect them most prominently during operation. Example resume's of some of the operators who participated are also included in Appendix A.

Finally, Advanced Resource Development, a consulting firm with substantial Human Factors experience and several contracts conducting DCRDR's in the nuclear industry, was hired to perform many of the program task activities and to collect the data needed for the program. They had established an efficient system for obtaining the data in the form needed to carry out computer assisted listings and comparisons that resulted in HEO's. Their depth of Human Factors experience was also particularly valuable in the Assessment/Resolution Phase in judging the seriousness of the HEO's involved and in identifying candidate resolution mechanisms. Resumes of those from ARD directly involved in these activities and a summary of ARD's related DCDR experience is also included in Appendix A.

This same Program Team was used throughout the Review/Analysis and Assessment/Resolution Phase of the program except that different shift operators participated depending upon their availability.

3.2 Program Structure & Processes

The program was generally conducted along the lines and with the tasks described in Suppl. 1 to NUREG-0737 and NUREG-0700. Methodology and thinking developed under the auspices of the Boiling Water Reactor Owners Group was also used. These two sets of bases were used in an integrated fashion as described in Niagara Mohawk's Summary Program Plan for the Detailed Control Room Design Review, dated September 30, 1983. Four program phases were established as described below. The structure of these program phases are first itemized or diagramed in terms of the goals or tasks established for them. Next, the process used to carry them out is described.

3.2.1 Structural Outline of Program Phases

3.2.1.1 Planning:

- Establish DCRDR strategy, bases and goals
- Determine resource requirements and schedules
- Establish needed interactions with other programs and organizations, external & internal
- Lay out work tasks & approaches

3.2.1.2 Review & Compilations

- See Figure 3.2-1 & 5.4-1

3.2.1.3 Assessment and Implementation:

- See Figure 3.2-1 & 5.4-1

3.2.1.4 Reporting:

- Summary Program Report to the NRC
- Final Summary Report to the NRC
- Internal status and progress reports
- Interactional meetings
- NRC & internal audits

3.2.2 <u>Process Summary in Carrying Out Structural Details</u>

3.2.2.1 Planning: Although the initial planning was completed with the Summary Program Report submitted to the NRC, further adjustments and developements continued. For instance, the NRC's thinking became more clearly defined in some areas (e.g. about the basis for the Task Analysis approach), the Human Factors contractor was hired and they came to the program with the benefit of learning from recent DCRDR's at other plants, and impacts from other program activities continued to shape details of this program (e.g. a R.G. 1.97 submittal was prepared, SPDS design/ implementation work was proceeding, specific NMP-1 EPG's were prepared, etc.). The schedule was also delayed by the extended startup from the spring 1984 refueling outage and the need for operator input for this program. As of the issuance of this Final Summary Report, however, the overall status of the program is close to that envisioned when the Summary Program Report was submitted nearly 21 months ago.

Currently, the focus of planning has shifted to the design/analysis/operating details associated with the implementation of fixes and completion of the interaction activities. This is being done more within the established organizational procedures rather than using the matrix team approach from the earlier parts of the program.

3.2.2.2 Review & Compilations: The review process was divided into two major phases. The first phase was carried out in 1981 by a BWROG sponsored team of utility representatives and Human Factors specialists. They utilized a Human Factors checklist that had been developed by a special committee of the BWROG. However, no Verification or Validation activities were carried out and a formal Assessment/Resolution of the resulting Human Engineering Observations (HEO's) was deferred until after completion of the final phase of the review carried out in the summer/fall of 1984. The HEO's were assessed informally, however, to be sure that there were no glaring problems. (There were none.)

The initial review phase activities were described in the Summary Program Report and subsequently accepted for consideration by the NRC, conditional upon further satisfactory detailing and completion of the entire program. This is described in the NRC's comment letter of February 22, 1984 concerning NMPC's Summary Program Report. Although the NRC accepted the BWROG's methodology, there were conditions attached, including the need to use a supplementary checklist. When the final review phase was conducted, the following strategy was used:

- The review of the original control room inventory was completed with the supplemental checklist.
- The complete checklist was used to review the new control room Instrumentation & Controls. (This included everything installed since the July 1981 completion of the initial phase.)
- The two approaches were melded together to be sure that there would be no differences in the bases for the HEO's that resulted.
- Because of subsequent issuance of the NRC's checklist in NUREG-0700, anything new or different that might be considered further was brought up.

This strategy was carried out successfully, and in the follow-on Assessment/ Resolution process, no discontinuities or problems resulted because of the two different review phases.

ARD carried out the details of the Review/Analysis phase processes expeditiously using the forms and procedures they had developed based on their past experience. The team of representatives described in Section 3.1 was used when judgement calls were required and supporting technical details were needed (e.g. design information, EPG appendix discussion, scenario sequence details, etc.). The team was also used in a formal fashion for the Task Analysis details and particular members were used in the Walkthru/Talkthru activities. With the exception of the Task Analysis, all activities and data collection was carried out at the NMP-1 site. Both the new NMP-1 simulator and the actual control room were used heavily as was appropriate to get the best, most accurate data. The Task Analysis was carried out in the old Training Center in Oswego in order to remove the existing control room instrumentation from the context as much as possible.

The broader context of BWR operation under differing conditions and product lines was also brought up frequently in the Task Analysis, per the background and diversity of the Review Team members. For instance, one of the operations representatives was from NMP-2, had experience with the Fitzpatrick Plant, and is now preparing NMP-2 Emergency Operating Procedures.

Shift operators were used extensively in the review activities as sources of information, making judgements on instrumentation needs in the Task Analysis and in orientation about equipment and system operating details. This participation had dual benefits in readying Operations personnel for the new symptom based Emergency Operating Procedures and in spurring informative reactions to the Assessment/Resolution process.

3.2.2.3 Assessment and Implementation: The Assessment/ Resolution process was carried out in a circular and iterative fashion over a relative short span of time (about one month) in the Technical Support Center (where the Control Room TV scanner is available) and in the Control Room itself. All of the previously generated HEO's were considered during this time span, and the same

team was used throughout, although there were individual changes, occasionally. This was the same team used in the Review/Analysis activities. Thus, this group became a Program Team used to carry out all consensus making activities for the program. Some additional HEO's were generated later as follow-on reviews and verifications proceeded, and the same group was used for the Assessment/Resolution of these. (Resumes for members of this Program Team are contained in Appendix A.)

This team approach helped to maintain continuity in the program thinking/objectives involved and enhanced consistency in the judgments being made. Although there were some judgment bases already attached to each HEO in the form of the Human Factors based Evaluation Product developed by the BWR Owners' Group, each HEO was initially considered on an independent basis to avoid prior bias. HEOs were also grouped and categorized, initially, so that any synergisms could be determined and their overall or holistic characteristics could be considered.

Since Assessment/Resolution was the key task in determining the outcome of the DCRDR, a separate section, 5.2, has been written to detail the steps carried out in the process.

Shift operator participation in the Assessment/Resolution activities had to be limited to those that could be spared from shift duties. However, the Program Manager made special status presentations to each shift during their Requalification Training to solicit all operator's ideas and understanding for this crucial part of the program. Also, one of the conference rooms at the site was dedicated to this phase of the program. Process summaries and status sheets were posted on the walls, and everyone was invited to come in when they had time or on back shifts, to keep current and pass on suggestions.

This Operations involvement has resulted in their heavy participation in the implementation activities. Verifications, so far, have been productive in identifying other and related concerns, which have been iterated through the Assessment/Resolution process.

Implementation and verification activities are being carried out through the normal procedures and processes in the Engineering and Operations organizations. This is being coordinated by the Program Manager. As design details are firmed up for the identified fixes, the day-to-day activities are being turned over to a Project Engineer who will be responsible for their execution. Similarly, the Program Manager will follow through with interactional activities but others will take care of the details coming out of them. For example, the Training Department will revise their Requalification Training Program for familiarizing the operators with the fixes being instituted.

3.2.2.4 Reporting: This is included in the next section with an expanded scope.

3.3 Schedule and Management Reviews/Reports

Although the endpoint remained the same, the schedule of program details and individual tasks varied somewhat from the Summary Program Plan submittal. There was little opportunity to carry out the originally scheduled activities involving plant operators during the spring and early summer of 1984 until the plant was successfully started up from its refueling outage. After the plant was operating stably, this resource was readily available and was used extensively, as described in previous sections. Thus, the earlier tasks in the review phase of the program did not start until June. Once started, however, activities proceeded smoothly and there were few schedule problems. The later tasks in the Review/Analysis Phase and the Assessment/Resolution Phase were particularly expeditious. By the end of 1984, implementation/verification program details had been worked out and detailed interactional activities scheduled with other programs. During the first half of 1985, the Integrated Cosmetics Package Verification activities had essentially been completed, as scheduled, and interactional work was in full swing. A rough, non-scaled time-line of the program is shown in Figure 5.4-1.

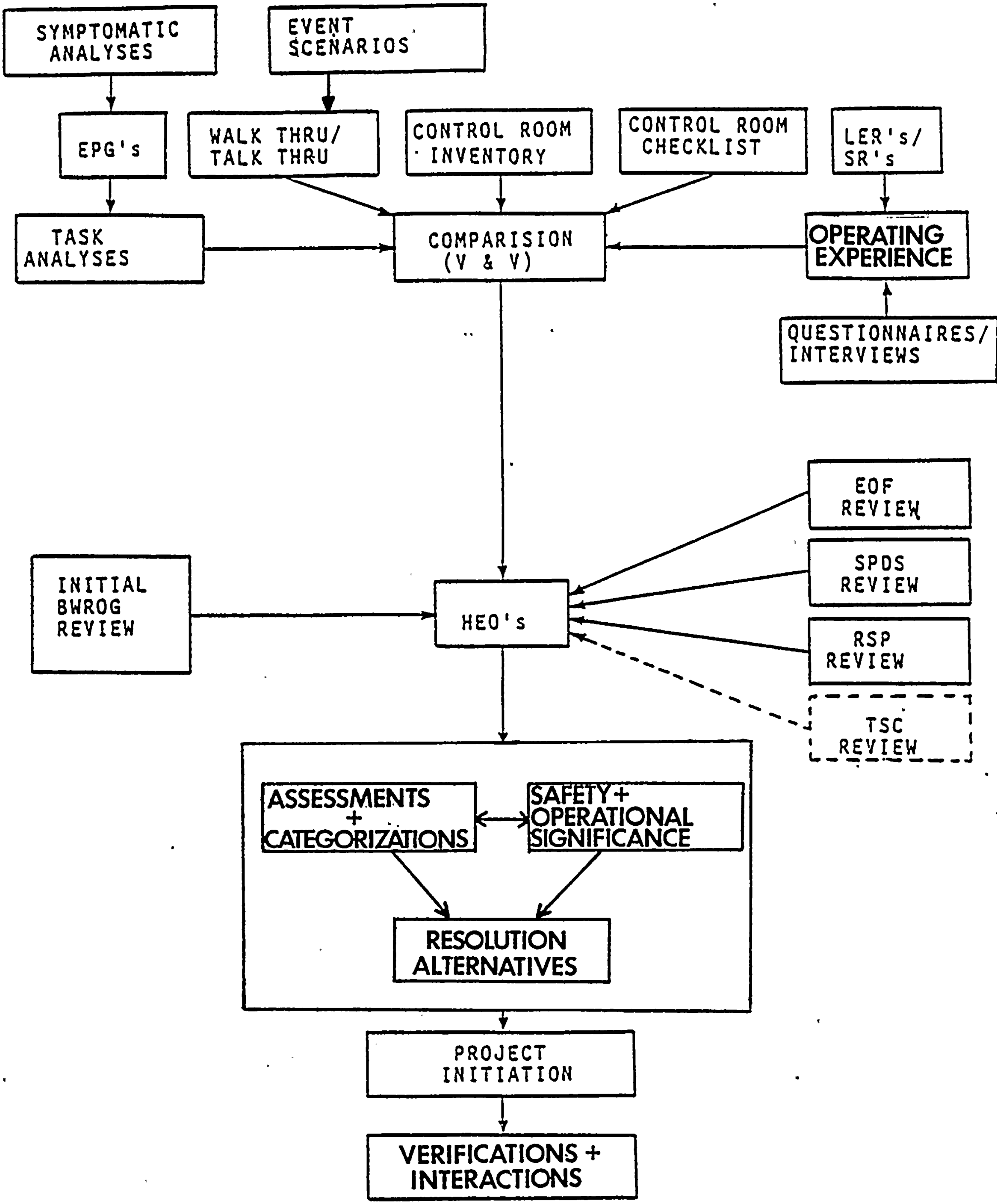
Management reviews and status reporting occurred at 1-2 month invervals during the year between mid-1984 and mid-1985 as significant goals or milestones were reached. Niagara Mohawk management was closely informed and provided direction during this period both orally and with status report replies. Program adjustments were made, as needed to keep programmatic activities flowing smoothly and without conflicts with other organizational activities.

Both Engineering and Operations management participated in a dry run of the program status/basis presentation to the NRC in mid-August and fine tuned it prior to the actual presentation. The NRC audit late in November, 1984, led to some programmatic adjustments in response to the concerns raised; and the NMPC management involved also decided upon a delay in the Final Summary Report submittal to be sure that it contained enough to allow an NRC SER to be written without supplements. Likewise, early steps in the implementation/verification activities consisted of NMPC management reviews to develop consensus thinking about approaches and priorities.

Section 3 has provided the overall description about the program workings and how they were carried out. Sections 4 & 5 below contain descriptions about individual tasks, the methodologies used to carry them out, samples of data obtained, and details about the results of the program, including follow-on and interactional activities.

Figure 3.2-1

DCRDR PROGRAM TASKS/ELEMENTS



4.0 PROGRAM TASKS

This section of the final report describes the following tasks that comprise the NMP-1 CRDR program review phase:

- Operator Survey
- Historical Document Review
- Task Analysis
- Control Room Inventory
- Control Room Survey
- Verification of Task Performance Capability
- Validation of Control Room Function
- SPDS Review
- EOF Review
- Human Factors Manual Development

Each of these DCRDR tasks generated HEOs. The source of these HEOs can be identified by the prefix on the HEO identifying number. The following HEO prefixes are used:

CS	Checklist Survey
COM	Computer Survey
ENV	Environmental Study
FP	Fire Panel Study
HR	Historical Review
OCS	Original Checklist Survey
QS	Questionnaire Survey
SPD	SPDS Study
TA	Task Analysis
VAL	Validation
VER	Verification
VRR	Resolution Verification

4.1 OPERATOR SURVEY

4.1.1 Objectives and Approach

As part of the Control Room Design Review (CRDR) for the Nine Mile Point station, Niagara Mohawk Power Company (NMPC) has conducted a survey of the plant operators for Unit 1.

Questionnaires were developed and distributed to all licensed operators for self-administration. Each of the nine topic areas suggested in NUREG-0700 was addressed. The questionnaire was presented in a multiple-choice format combined with open-ended questions designed to solicit operator comments. Both positive and negative aspects of the control room and both emergency and non-emergency operating conditions were addressed. Ambiguities in the written responses to the self-administered questionnaire were further addressed in follow-up interviews conducted by human factors personnel on-site.

Nineteen operators responded to the self-administered questionnaire. Their backgrounds spanned an appropriate range of experience and positions at the plant. The multiple-choice responses revealed, in general, favorable attitudes about the control room. The responses to the questions did not reveal a majority of strong negative concerns on any single question. Nonetheless, a number of valuable suggestions and comments were elicited by many questionnaire items.

These written comments were sorted into positive and negative features of the control room, and each was compiled with respect to the number of respondents mentioning that issue, possible corrective actions that were suggested by the operators for the negative features, and the disposition of that issue with respect to the CRDR process. Some concerns were defined well enough to be written as Human Engineering Observations (HEOs), while others were redundant with HEOs found during other phases of the CRDR; still others were more appropriately viewed as general information for the consideration of NMPC management.

The HEOs identified during the Operator Survey were entered into a computerized data base management system, along with the HEOs found during other phases of the Nine Mile Point Unit 1 CRDR.

The objective of the operator survey in the context of the CRDR was to obtain special, pertinent knowledge that operating personnel possess regarding control room system features which they have experienced and/or observed in the course of preparing for operations or in the operations themselves. As one of the foundation processes of the CRDR, the operator survey provided information that guided the human factors specialists during the other investigative phases of the CRDR (namely the checklist survey, verification, and validation processes). Aside from this primary function, it also provided an avenue for plant management to gather general information about the plant operators' perceptions and opinions of control room design and procedures.

The respondents were encouraged to identify both positive and negative features of the control room. The negative items were, as appropriate, written as HEOs, noted to be redundant with HEOs already identified in other phases of the CRDR, noted

to be invalid from a human factors perspective, or presented as general reference information. The positive items, also presented for reference, suggest control room features that should not be compromised in the course of correcting other HEOs.

An effort was made to present all comments and suggestions made by the operators, even though not all of the negative comments were determined to be valid HEOs. The determination as to which problems qualified as HEOs was based in part on the Human Factors Specialist's understanding of the principles of human factors engineering and in part on information collected from operations personnel during follow-up interviews.

Although emphasis is placed on emergency-related design features during the control room review, the operators were encouraged to consider all modes of plant operation in formulating their responses. They followed this charge, and identified a number of non-emergency control room features that deserve consideration.

It was expected that the findings reported here would, to some extent, overlap with those resulting from other phases of the CRDR. This redundancy will serve as one indication of the severity of identified problems. Another indication of severity is the number of operators who mentioned a particular problem. Nevertheless, a strength of the Operator Survey is that it gives individual operators the opportunity to apply their unique backgrounds and experiences to the control room review process. Therefore, the possible importance of concerns that were voiced by only one or two respondents was not overlooked.

4.1.2 Methods

4.1.2.1 Construction of the Self-Administered Questionnaire

The self-administered questionnaire was structured to address the following nine areas, as suggested in NUREG-0700:

- Workspace Layout and Environment
- Panel Design
- Annunciator Warning System
- Communications
- Process Computers
- Maintenance Procedures
- Operating Procedures
- Staffing and Job Design
- Training

A draft questionnaire was prepared by ARD personnel. NMPC members of the review team reviewed this draft and provided suggestions which were incorporated by ARD personnel in the final questionnaire. The resulting questionnaire, with accompanying explanatory materials, was then distributed to the operators. A copy of the distribution packet is shown in Appendix A.

Each question was posed in a multiple-choice format, to encourage the response of operators who might not have been inclined to provide written comments for each item. In addition, open-ended questions for each item encouraged the operators to describe in detail the specifics upon which their multiple-choice responses were based. The operators were frequently reminded to consider all modes of plant operation, including start-up, hot standby, full power, and reduced power, in addition to possible abnormal or emergency operating conditions. Opinions regarding both positive and negative

design features of the control room were solicited. Each respondent was also asked to fill out a separate sheet detailing his background, level of experience, and current status at NMPC.

4.1.2.2 Distribution of the Self-Administered Questionnaire

These questionnaires were distributed to operators, based on a list supplied by NMPC. The participants included all licensed operating personnel at Nine Mile Point Unit 1. The operators were given several weeks to fill out the self-administered questionnaire and to return it by mail to ARD in a self-addressed, stamped envelope that had been provided. Confidentiality was assured by assigning each questionnaire a number. The list of potential respondents and corresponding numbers was kept in confidence.

4.1.2.3 Analysis of Responses to the Self-Administered Questionnaire

Human factors personnel logged the nineteen questionnaires that were returned and tallied the demographic information and multiple-choice responses. Written responses were compiled for each question and then summarized. Responses which addressed the same issue were condensed into a summary statement of the concern, with an associated count of the frequency with which that concern had been mentioned. In the few instances in which a concern was addressed by different respondents under different questionnaire items, the responses were pooled under the question which elicited the highest incidence of that response. Ambiguities in the written comments were noted.

The multiple-choice responses and the written comments were examined with an eye towards areas of particular concern to the operators and the extent to which a consensus emerged on each item.

4.1.2.4 Follow-up Interviews

The objective of the follow-up interviews was to clarify ambiguities in an individual's written responses to the self-administered questionnaire. Human factors personnel determined the questions and issues to be addressed during the follow-up interviews, based on the analysis of responses to the self-administered questionnaire.

ARD supplied NMPC with a list of the operators with whom a follow-up interview was desired, and NMPC developed a schedule for the interviews to take place on-site. Interviews were conducted with eight of the operators who responded to the previous questionnaire. Confidentiality of operator's responses was maintained both during the interview process and in the notes taken during the interviews.

4.1.2.5 Integration of Interview Data with Self-Administered Questionnaire Responses

The information compiled previously from the self-administered questionnaires was enhanced based on notes taken by the interviewer during the follow-up interviews. Ambiguities noted previously were resolved and, where appropriate, specifics such as system or component names were added. The table of issues which had been started previously was then updated. Finally, a recommended action for the review team was determined for each issue of concern. These were classified into the following categories:

1. Problems that were sufficiently well defined and valid, from a human factors perspective, were written as HEOs, unless it was apparent that they had already been identified during some other phase of the CRDR (Checklist Survey, Verification, Validation).

2. Problems that had already been written as HEOs were noted as such.

3. Suggestions made by the operators which, because they violated sound human factors engineering practices, would not be advisable, were noted separately.

4. Negative comments of a more general nature, but nonetheless expressing valid concerns, were noted for management's reference.

4.1.3 Findings

4.1.3.1 Survey Response

Nineteen operators, or fifty-nine percent of the personnel to whom the self-administered questionnaire was distributed, contributed to the Operator Survey. Of these, eight operators participated in follow-up interviews. The respondents included Shift Supervisors, Chief Shift Operators, Nuclear Operators, Auxiliary Operators, and Operations management personnel. The demographics of the group of operators responding are summarized in Table 4.1.1. The respondents reflect a representative sample in terms of operating experience and positions in the plant. In addition to their commercial nuclear experience, most of these people had been involved in the Navy nuclear program prior to joining the commercial nuclear industry.

Most of the respondents addressed all of the multiple-choice items on the self-administered questionnaire, and most people also included written comments on at least some of the questions. All the respondents conveyed a cooperative and forthcoming attitude, both in their written responses to the self-administered questionnaire and in their contributions during the follow-up interviews.

TABLE 4.1.1 PERSONNEL SURVEY SUMMARY FORM

NINE MILE POINT UNIT 1

POPULATION DEMOGRAPHICS AND STATISTICS

Group	NUMBER OF RESPONDENTS	MEAN STATISTICS: Height	Age	Total Yrs Nuclear Oper Exp.	Total Yrs Control Board Oper Exp.	#Yrs RO	#Yrs SRO
Reactor Operator	11	71.45"	32.91	7.45	3.11	5.23	0
Senior Reactor Operator	4	68.25"	48.75	15.00	2.00	4.50	10.33
Overall	19*	70.60"	37.13	9.47	2.88	5.03	2.21

* Four respondents chose not to provide demographic information

4.1.3.2 Overview of Findings

The findings from the operator survey are presented in the following format. First, for each of the nine topic areas covered, a brief summary overview is offered. Second, a histogram is presented of the multiple-choice responses to the questions in that section. Third, a table of design issues that were mentioned in the operators' written comments to each question in this section of the questionnaire is presented, along with a tally of the number of people mentioning each concern and the action recommended to the review team. (Positive comments are listed first under each question.) This table also lists any recommended actions that the operators explicitly provided for the negative features identified in the topic area, and the number of people who mentioned each such corrective action. An "R" in the VALUE column signifies that the comment is a recommendation concerning the issue stated immediately above. Figure 4.1.1 provides a key to assist in interpreting Table 4.1-2 presented in Section 4.1.3.3.

4.1.3.2.1 Multiple-Choice Responses

The multiple-choices were structured such that the first alternative (a) represented a positive statement (no problems, excellent), the second (b) represented slight problems (only 1 or 2 problem areas, adequate), the third (c) represented significant problems (several problem areas), and the fourth (d) represented the most negative choice (many problem areas).

In general, the multiple-choice responses reflected a relatively positive view of the control room design by the operators. Without exception, the most frequent response to each question was an (a) or (b). There were, of course, differing amounts of spread (reflecting degree of consensus) to the responses, but for no question, did more than 50% of the responses fall in the (c) and (d) choices.

Question number corresponds to question number found in self-administered questionnaire.

QUESTION NUMBER A.3. Are there any controls that are hard to reach or indicators that are difficult to read?

Number of operators who commented on this issue.

First two positions reflect question number and succeeding positions represent a sequential number assigned to the responses to this question.

N if this is a negative comment; P if this is a positive comment; R if this is a recommendation concerning the issue immediately above.

Paraphrase of operator response to questionnaire or interview.

FREQUENCY	CODE	VALUE	COMMENT	ACTION
1	B6.6	N	Three turbine/generator chart recorders on back panels are difficult to read	CK
		R	They should be replaced by recorders that have a visual point display like the ones on panels A1 and A2.	

Code represents disposition of the response:

HEO = written up as an HEO based on information from the Operator Survey (if this item is encompassed under an HEO associated with the response to another item reference to that item is made in parentheses)

CK = already identified as an HEO during the the Checklist Survey

R = for general reference only

I = invalid from a human factors perspective

Figure 4.1.1 Key for Comment Table

Despite these overall positive findings, it should be noted that a few negative features were identified under a number of questions. Furthermore, the negative responses were distributed over the operators, and therefore cannot be attributed to the opinions of a few.

4.1.3.2.2 Specific Comments and Suggestions

The summary tables included herein contain a number of comments on the part of the operators, some of more concern than others. The Operator Survey presents the opportunity for the plant operators to voice their opinions on a wide range of station design features and procedures. Therefore, in addition to serving the more narrowly defined function of this survey in the context of the CRDR, it can be viewed more broadly as a source of information to the plant management about the perceptions and morale of the operators. In this spirit, an effort has been made to present not only comments and suggestions that are potential HEOs, but also those which seemed like valid concerns.

The frequency counts given in the summary tables represent responses listed either on the self-administered questionnaire or in the follow-up interviews. It should be emphasized that issues with a low frequency of response were not discounted as unimportant. Some respondents, because of their extensive experience, recognized problems that less experienced operators cannot recognize; therefore, it was useful to take into account some comments with a low frequency count.

4.1.3.3 Findings Organized by Topic Area

4.1.3.3.1 Workspace Layout and Environment

The first four questions in this section examined communications, air quality, lighting, and maneuverability in

the control room. Overall, voice communication in the control room was considered good, with the exception being the noise caused by non-operating personnel in the control room and the presence of the security station (guards, radios, typer). The air quality was also considered good as long as the air conditioner was runnning. The problems that were identified concerned high temperatures in the control room when the emergency ventilation system is used during the summer months and the need for better control of air quality from the control room. Lighting received no comments and was considered adequate. Regarding operators' ability to maneuver in the control room, the security station was also cited as being an obstruction to movement.

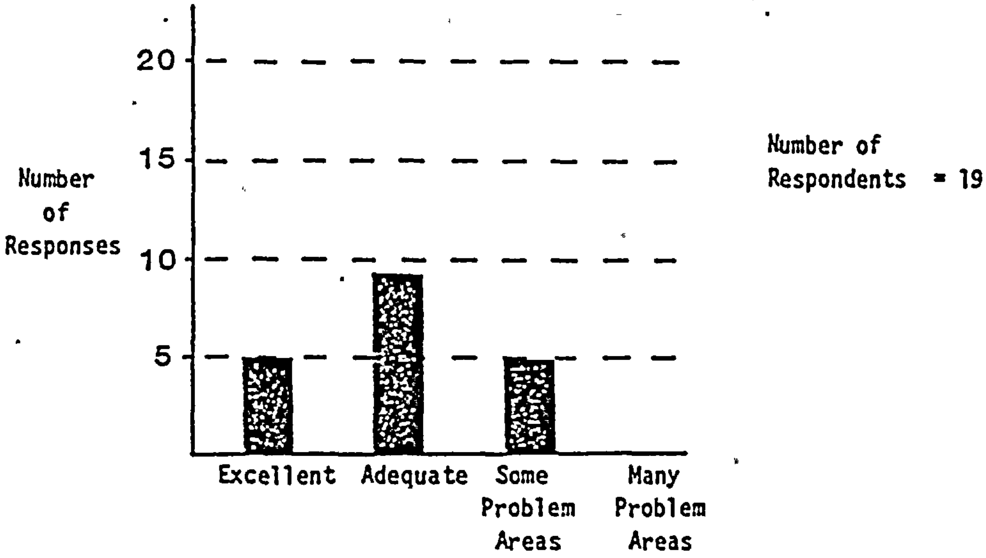
The last four questions in this section involved the availability and usefulness of instrumentation and controls in the control room. Much of the concern expressed by operators regarded annunciator acknowledge buttons and stations. Acknowledging fire panel alarms, most of which are spurious, requires considerable operator time, because they must go to the fire panel to acknowledge these alarms. Separating fire panel trouble alarms from actual fire alarms and allowing them to be acknowledged separately was one suggestion to help alleviate this situation.

The operators identified the need for several indicators which they felt would improve control room operations. They also identified a few extraneous controls and displays that could be deleted in order to free up space on the control panels for more useful instrumentation.

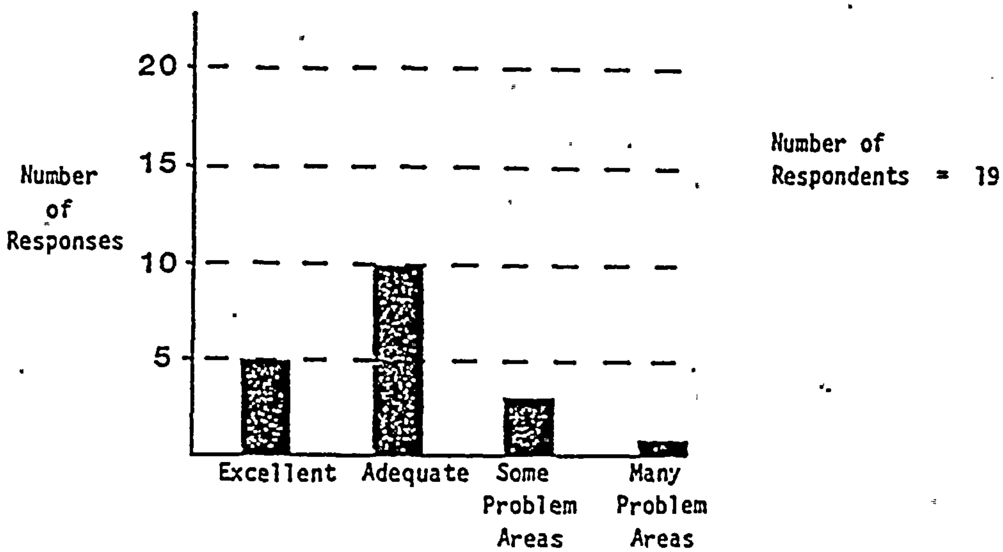
TABLE 4.1-2 COMMENT TABLE

A. Workspace Layout and Environment

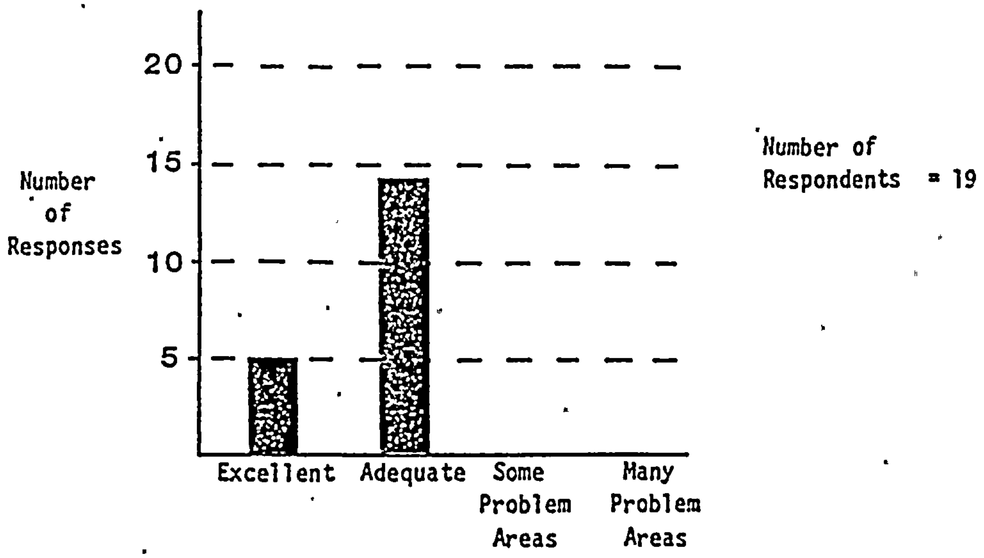
A.1. How would you characterize the capability for direct voice communication between perso in the main control room?



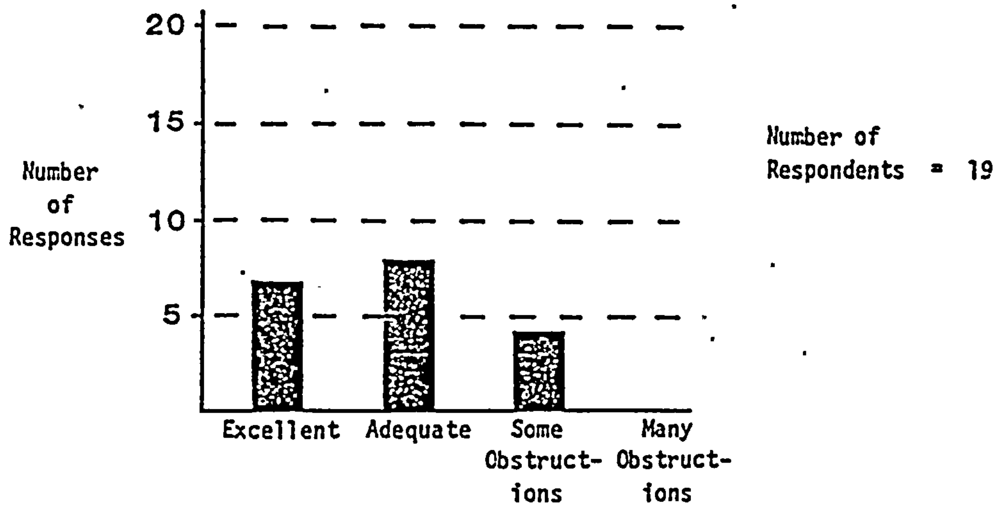
A.2. Air quality (temperature, humidity, ventilation) in the control room is:



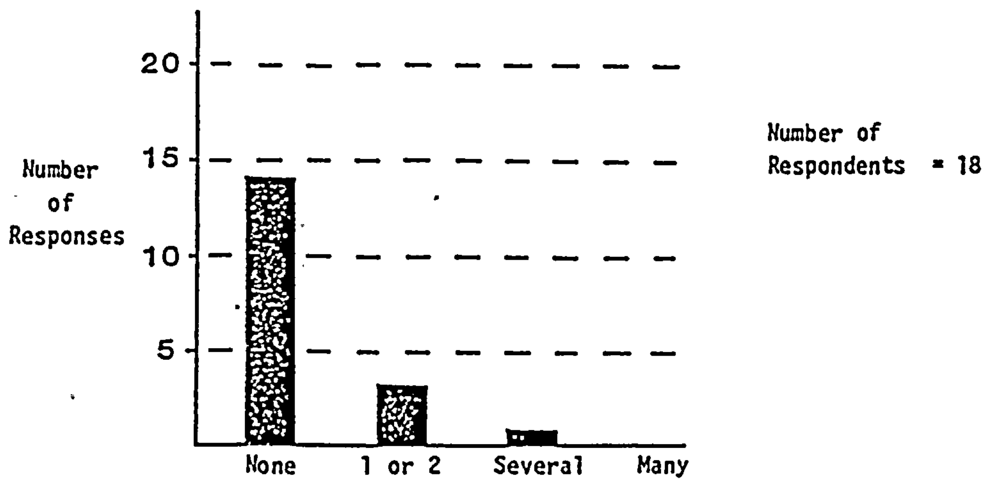
A.3. Lighting in the control room (illumination, glare, reflections) is:



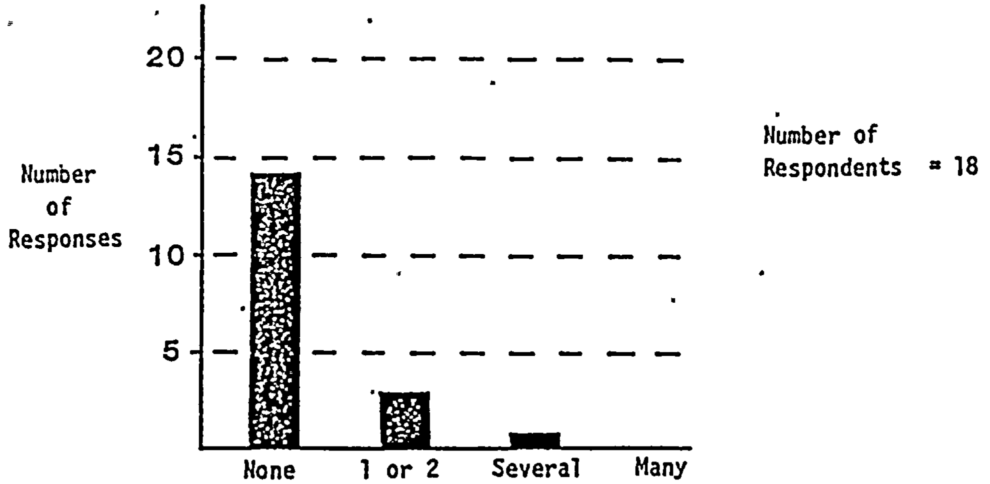
A.4. Operator's ability to move around the control room in an unobstructed manner is:



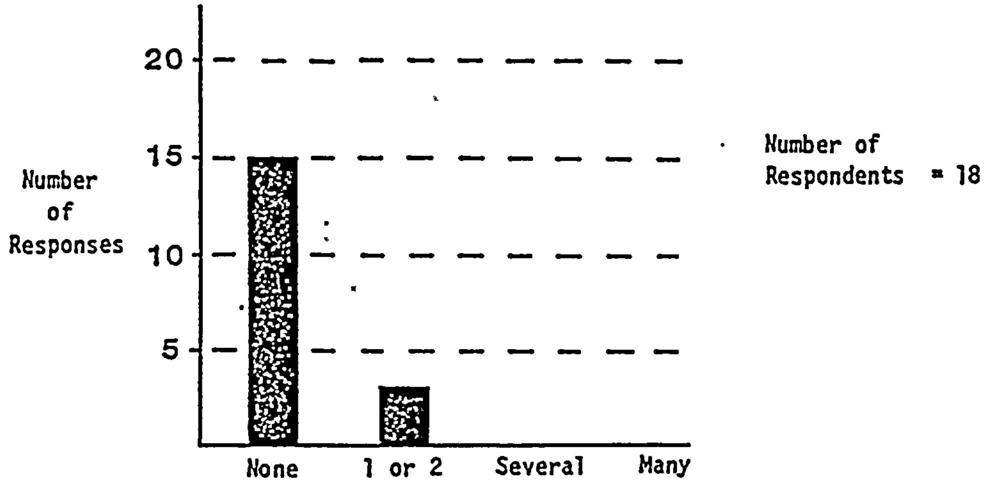
A.5. Are additional controls needed in the control room?



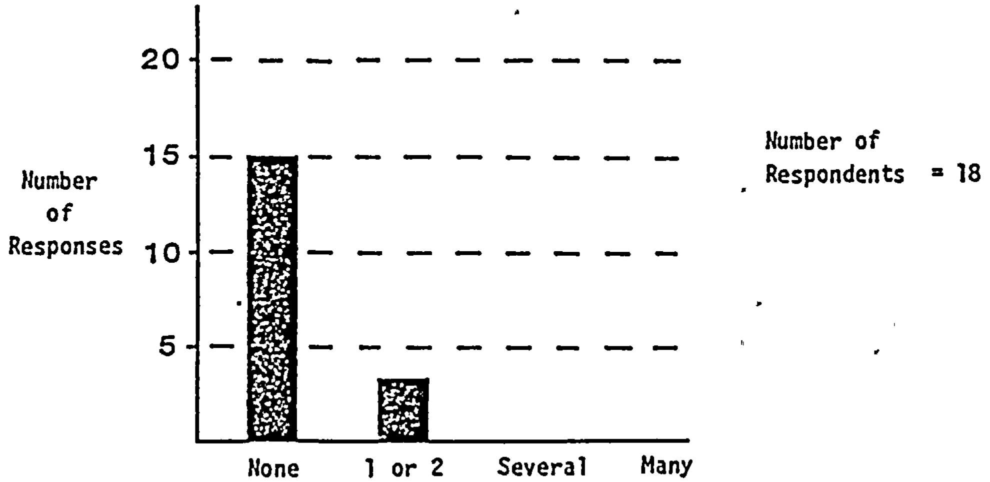
A.6. Are any of the controls that are presently in the control room unnecessary?



A.7. Are additional indicators (i.e. meters, status lights, chart recorders) needed in the control room?



A.8. Are any of the indicators that are presently in the control room unnecessary?



QUESTION NUMBER A.1. How would you characterize the capability for direct voice communication between personnel in the main control room?

Frequency	Code	Value	Comment	Action
		N	Voice communication in the CR is impeded by noise which results from:	
3	A1.1		- unnecessary personnel (department assistants and other support personnel crowd the CR, particularly during morning hours)	R
4	A1.2		- security guards	HEO
3	A1.3		- security radios	HEO (with item A1.2)
1	A1.4		- security typer	HEO (with item A1.2 and others)

QUESTION NUMBER A.2. Air quality (temperature, humidity, ventilation) in the control room is:

Frequency	Code	Value	Comment	Action
1	A2.1	P	Air quality in the control room is adequate as long as the air conditioner is running.	R
1	A2.2	N	Panels are sometimes missing in the walls and ceilings.	R
2	A2.3	N	Control room emergency vent tests during the summer make it warm in the control room.	HEO
1	A2.4	N	Supply and return ducts need cleaning.	R
2	A2.5	N	There are poor air quality controls in the control room.	HEO

QUESTION NUMBER A.3. Lighting in the control room (illumination, glare, reflections) is:

Frequency Code Value	Comment	Action
	No responses.	

QUESTION NUMBER A.4. Operator's ability to move around the control room in an unobstructed manner is:

Frequency	Code	Value	Comment	Action
7	A4.1	N	Guard station and excess people interfere with operator movement.	HEO (with item A1.2 and others)
1	A4.2	N	Chairs, procedures files, and tables interfere with movement around the control room.	R

QUESTION NUMBER A.5. Are additional controls needed in the control room?

Frequency	Code	Value	Comment	Action
2	A5.1	P	Controls on the main control boards are fine for plant operation.	R
1	A5.2	P	Electrical panel is well designed.	R
2	A5.3	N	Acknowledging fire panel alarms takes operator away from the main control panel.	I
2		R	Annunciator acknowledge stations for fire panel annunciators should be incorporated in master annunciator acknowledge station on panel E.	
1	A5.4	N	Acknowledge buttons are needed at each panel to allow operators to acknowledge annunciators without leaving their work station.	CK
1	A5.5	N	A master silence button is needed to silence annunciators without making tiles solid and clearing targets. One button is used to silence and acknowledge (i.e. makes a flashing alarm tile go solid) annunciators. When the alarm condition clears, the tile reflashes dim and the same button is used to clear the alarm (i.e. tile goes dark). If a new alarm comes in as another clears, there is the possibility that the operator will hit the button to clear the alarm and not notice the new alarm	CK
1	A5.6	N	A trouble alarm on/off switch for the main fire panel is needed to allow control of nuisance alarms without masking fire alarms.	HEO

QUESTION NUMBER A.6. Are any of the controls that are presently in the control room unnecessary?

Frequency	Code	Value	Comment	Action
1	A6.1	N.	Security guards and their phones are unnecessary since they are not used in any mode of plant operation.	HEO (with item A1.2 and others)
1	A6.2	N	New controls are being added all the time even if they aren't wanted.	R

QUESTION NUMBER A.7. Are additional indicators (i.e., meters, status lights, chart recorders) needed in the control room?

Frequency	Code	Value	Comment	Action
1	A7.1	P	The digital readouts that have been added recently are well designed and a great help to the operator.	R
1	A7.2	P	Panels "E" and "F" are well-designed with the exception of recent feedwater modifications.	R
1	A7.3	P	Most systems are well designed.	R
1	A7.4	N	A temperature meter for the non-regenerative heat exchanger outlet temperature to clean-up is needed. When shutdown, the operators use clean-up to control shutdown temperature. When starting up the unit, have to throttle the valve and need a meter to indicate temperature. At present, this temperature information is available only on the computer.	HEO
1		R	A good place to put this meter would be the K panel.	
1	A7.5	N	Indication of relative speed of #13 feedwater shaft pump is needed.	HEO

QUESTION NUMBER A.8. Are any of the indicators that are presently in the control room unnecessary?

Frequency	Code	Value	Comment	Action
1	A8.1	N	Gate alarm windows which are located on the left side of the E panel are extraneous since they are no longer wired to indicate when gates to high radiation areas have been opened. These indications are taking up valuable space on the E panel that could be allocated to more useful indications or controls.	HEO
1	A8.2	N	Some instruments have been removed from the control room, e.g. (#13 shaft pump relative speed indicator, turbine acceleration meter)	R
1	A8.3	N	Some instruments are difficult to maintain, e.g. drywell water leak rate recorder for equipment drain tank #11 and #12)	HEO
1	A8.4	N	Some instruments give unreliable readings (mainsteam radiation monitors, H_2 and O_2 recorders of CAD system #11 and #12 turbine speed indication by A7 panel, radiation level readings of "F" panel.	HEO
1	A8.5	N	The concentrator electric boiler #11 annunciator is extraneous since the boiler is no longer used.	HEO
1	A8.6	N	The "Guard House in Trouble" alarm could be deleted from A-1 if the security station remains in the control room. (with item A8.3)	HEO
1	A8.7	N	One of the annunciator tiles on H-2 is blank and could be used for something useful.	R

4.1.3.3.2 Panel Design

Questions posed under panel design included evaluation of the following areas: automatic versus manual controls, throttleable controls, functional grouping (control/display relationships), control/display accessibility, and ease of use. There were very few problems identified here. In general, the present panel layouts seem to be viewed favorably by the operators.

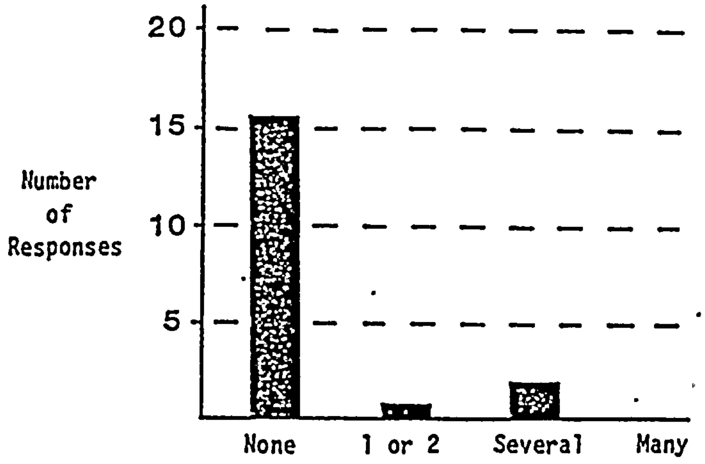
A hardware problem was noted with the cleanup system low flow pressure control valves, in that they don't always stay in the position selected by the operators. This problem illustrates the relationship between hardware design, maintainability, and human factors. Even though the problem stems from a design or maintenance flaw, it requires the operators to devote a significant amount of time and attention to controlling this system.

Several annunciators that are located some distance from the displays and controls to which they relate were noted. Problems with accessing several indicators, either because of their height on the panels or their placement on a back panel, were noted. If additional space becomes available on the front panels, by virtue of deleting existing equipment which is not operational, it may be possible to provide more detailed indications of the area radiation monitors and continuous air monitors on the front panels.

Several controls were noted as being prone to accidental activation. The problems here include the proximity on the panels of controls that, at a glance, are difficult to distinguish from one another, controls located low on the panels that could be inadvertently actuated by passers-by, and the sensitivity (i.e., lack of tactile feedback to operators) of the switches on the fire panel.

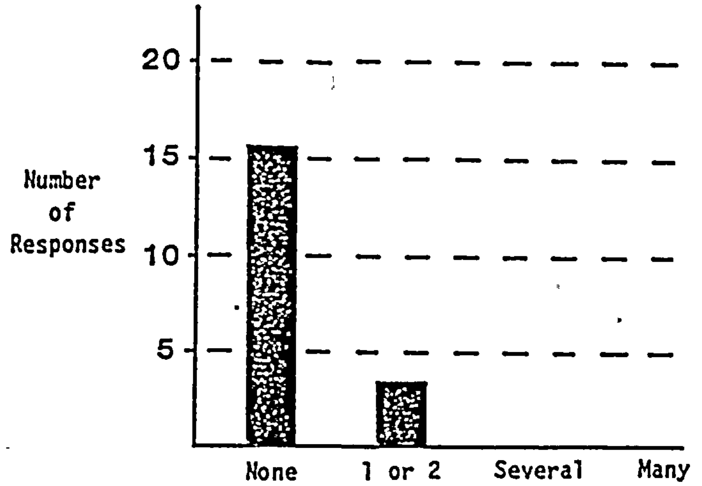
B. Panel Design

B.1. Are there any control device(s) which should be operated manually instead of automatically or vice versa?



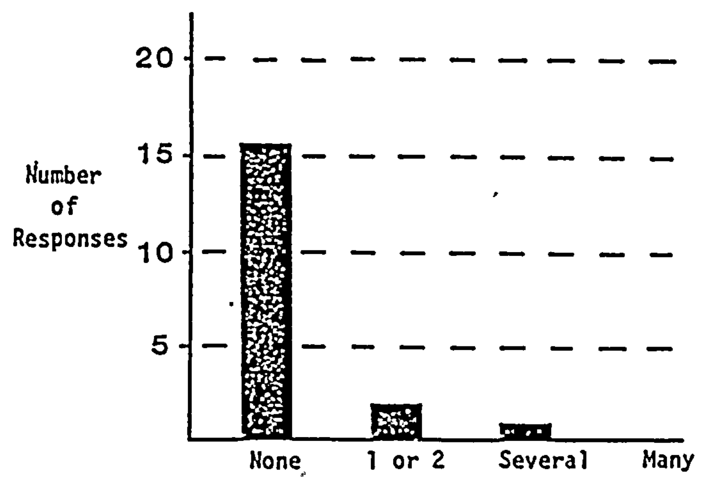
Number of Respondents = 19

B.2. Are there any throttleable valve(s) that would unnecessarily restrict your time to respond should an emergency situation occur?



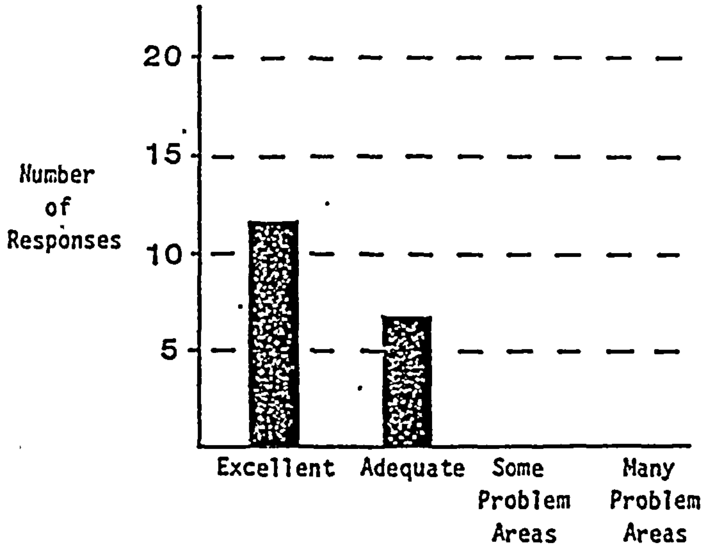
Number of Respondents = 19

B.3. Are there any system(s) in which controls or indicators are not placed in functional groups?



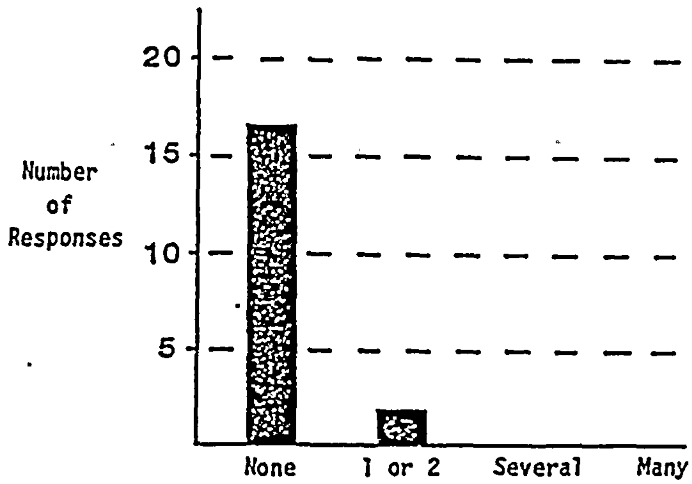
Number of Respondents = 19

B.4. The layout of the control equipment on the panels is:



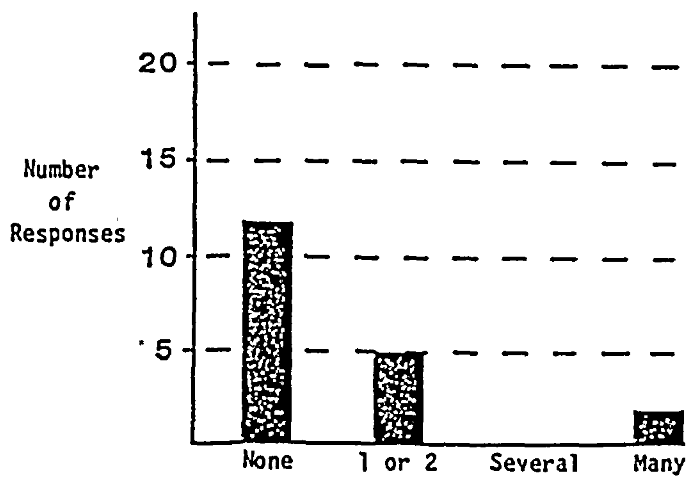
Number of Respondents = 19

B.5. Are there areas on the main control boards where your use of a control is hindered because of other, nearby equipment?



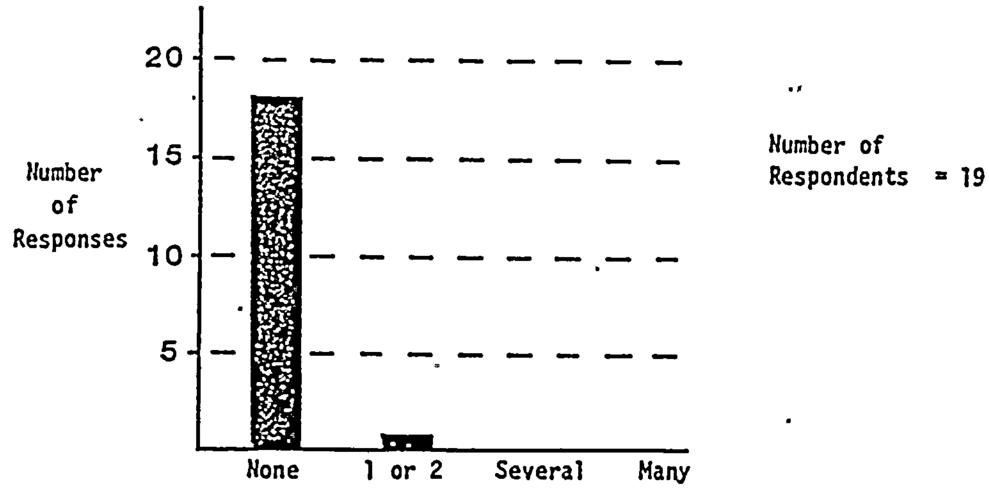
Number of Respondents = 19

B.6. Are there any controls that are hard to reach or indicators that are difficult to read?

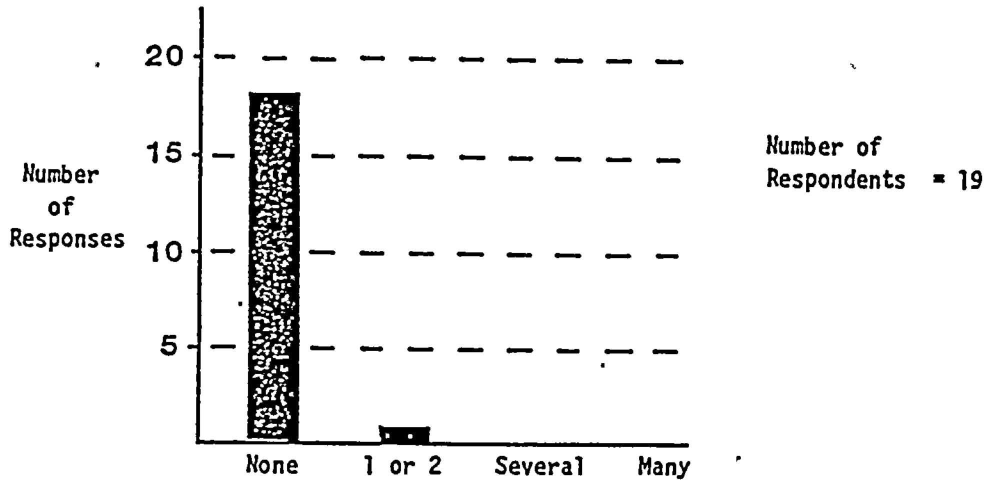


Number of Respondents = 19

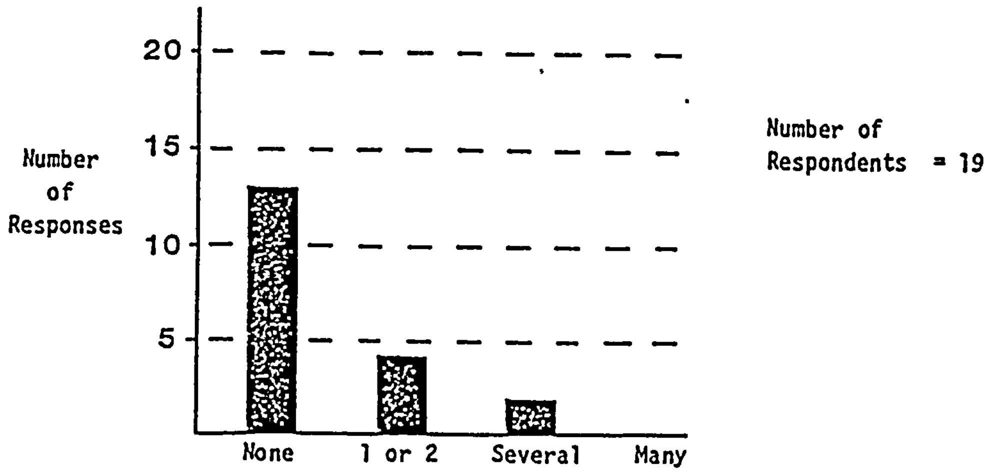
B.7. Are there any control(s) or indicators on back panels that should be on front panels, or vice-versa?



B.8. Are there any system(s) in the control room which you feel are difficult or confusing to operate?



B.9. Are there any controls located in the control room that you feel are prone to be accidently activated?



QUESTION NUMBER B.1. Are there any control device(s) which should be operated manually instead of automatically or vice-versa?

Frequency	Code	Value	Comment	Action
1	B1.1	P	Most systems have a choice between automatic and manual operations. The operator, therefore, can decide when manual operation is necessary.	R
1	B1.2	N	Some controls should be operated in the manual mode since the automatic mode has been shown to be inadequate.	R

QUESTION NUMBER B.2. Are there any throttleable valve(s) that would unncessarily restrict your time to respond should an emergency situation occur?

Frequency	Code	Value	Comment	Action
1	B2.1	N	The cleanup system low flow pressure control valves present problems during certain modes of operation because the valve may not stay in the position set manually by the operator; this is a hardware problem, but it ties up the operators unnecessarily.	HEO
1	B2.2	N	Operation of the feedwater system is complex and when only one operator is available, it may preclude him from addressing other operations. (Note -- However, control room staffing is such that more than one operator should always be available)	I

QUESTION NUMBER B.3. Are there any system(s) which controls or indicators are not placed in functional groups?

Frequency	Code	Value	Comment	Action
1	B3.1	P	The cleanup, core spray, containment spray, feedwater, reactor recirc pumps and CRD systems are well designed.	R
1	B3.2	P	Emergency ventilation, cleanup, and feedwater systems are well designed for operations.	R
2	B3.3	P	Functional groupings for all systems are effective.	R
1	B3.4	N	Drywell water leak detection annunciator (above H panel) is not located near the chart recorders (on L panel).	HEO
3	B3.5	N	Off-gas system annunciators (above L panel) are not located near system controls (on H panel)	CK

QUESTION NUMBER B.4. The layout of the control equipment on the panels is:

Frequency	Code	Value	Comment	Action
1	B4.1	P	Flight panel has a good layout.	R
2	B4.2	P	Most systems are well laid out.	R

QUESTION NUMBER B.5. Are there areas on the main control boards where your use of a control is hindered because of other, nearby equipment?

Frequency	Code	Value	Comment	Action
1	B5.1	N	Core spray and containment spray instrumentation is crowded on the control board.	I
1	B5.2	N	Security station hinders use of controls.	HEO (with item A1.2 and others)

QUESTION NUMBER B.6. Are there any controls that are hard to reach or indicators that are difficult to read?

Frequency	Code	Value	Comment	Action
1	B6.1	N	The chart recorder which monitors lake temperature and plant in and out temperature on panel H is inaccessible. This makes it difficult to change paper in the recorder.	HEO
7	B6.2	N	The letter size on some annunciators is too small and the stroke width is disproportionally wide. This apparently occurred due to a mistake in ordering a batch of tiles that were recently reengraved.	HEO
1	B6.3	N	All controls that are more than five feet from floor are difficult to reach.	CK
1	B6.4	N	Indicators which are high up on control boards are difficult to read.	CK
1		R	Should be tipped downward for ease of reading.	
1	B6.5	N	Some chart recorders are hard to reach.	HEO
1	B6.6	N	Three turbine/generator chart recorders on back panels are difficult to read.	CK
		R	They should be replaced by recorders that have a visual point display like the ones on A1 and A2.	

QUESTION NUMBER B.7. Are there any controls or indicators on back panels that should be on front panels, or vice-versa?

Frequency	Code	Value	Comment	Action
1	B7.1	N	There is one annunciator on the main control boards for 30 area radiation monitors (ARMs) and one annunciator for several continuous air monitors (CAMs). Therefore, the operator has to go behind the main control panels to determine which ARM or CAM caused an alarm.	HEO
		R	These indications should be on the front panel as well as on the computer.	

QUESTION NUMBER B.8. Are there any system(s) in the control room which you feel are difficult or confusing to operate?

Frequency	Code	Value	Comment	Action
3	B8.1	P	All systems are placed well.	R
1	B8.2	P	The reactor recirculation system is particularly well designed.	R

QUESTION NUMBER B.9. Are there any controls located in the control room that you feel are prone to be accidentally activated?

Frequency	Code	Value	Comment	Action
2	B9.1	P	Accidental activation can be prevented if people are careful and unnecessary people are kept out of the control room.	R
1	B9.2	N	The emergency hydrogen dump valve is prone to accidental activation.	
2	B9.3	N	Switches on fire panel are very sensitive, so when moving switches to an on-line ("armed") position (after having the system off-line for maintenance) it is easy to turn the switch too far and discharge water or cardox.	HEO
1	B9.4	N	Controls which are located low on the panel may be bumped by a passerby's knees.	HEO
1	B9.5	N	The condenser vac breakers and the drywell vent to condenser controls can be accidentally activated.	HEO
1		R	A key lock on the lower right switch for the reactor building emergency vent would discourage accidental dumping of the drywell/torus.	

4.1.3.3.3 Annunciator System

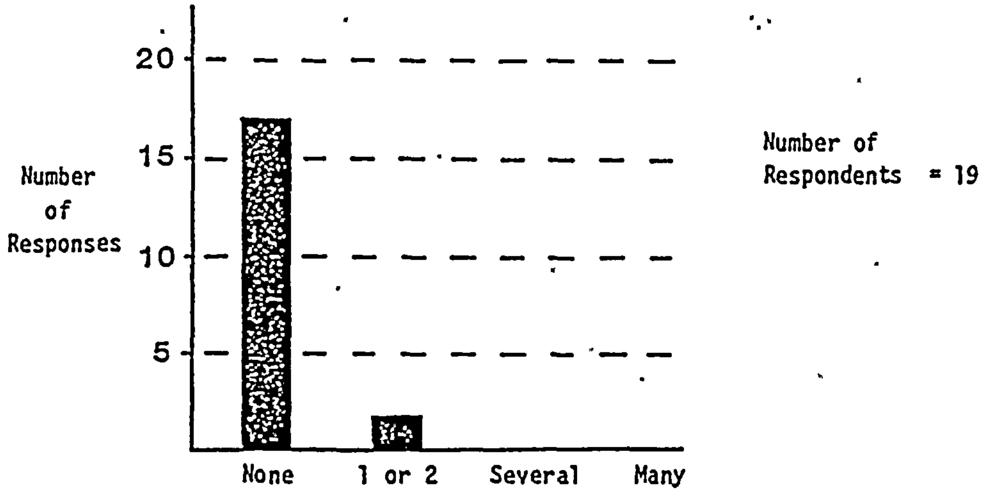
Questions regarding the annunciator system examined the appropriateness of alarm setpoints, clarity of alarm messages, and methods for determining the cause of alarms. Responses here were generally very positive.

Numerous operators noted the difficulty of reading some of the present alarm tiles, for which the lettering is too small and the stroke width too wide. The same problems (security guards and equipment, other non-operating personnel) cited previously as impairing communications in the control room were mentioned here as making it difficult to hear annunciator signals.

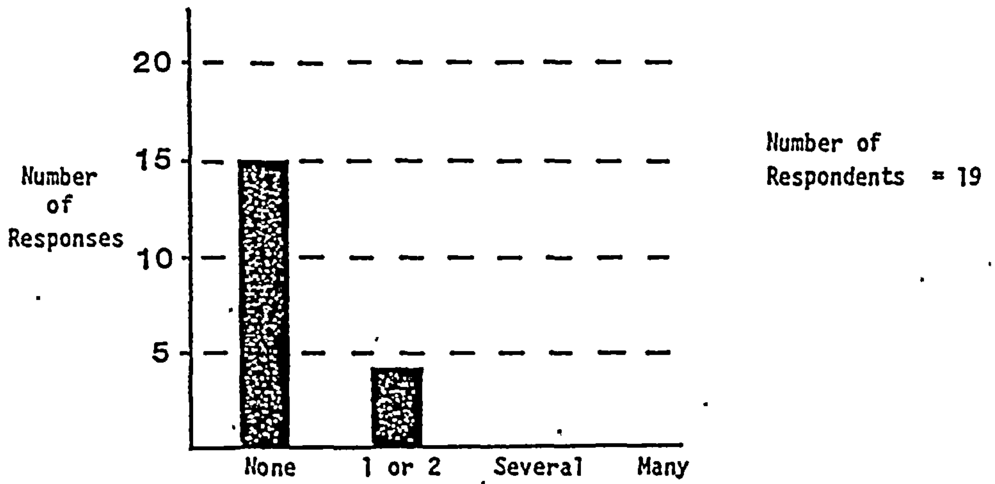
Some nuisance alarms were identified. These included alarms with inappropriate setpoints, multiple input alarms for which there is no readily apparent indication of which input caused the alarm, and several alarms which are spurious due to hardware problems.

C. <u>Annunciator System</u>

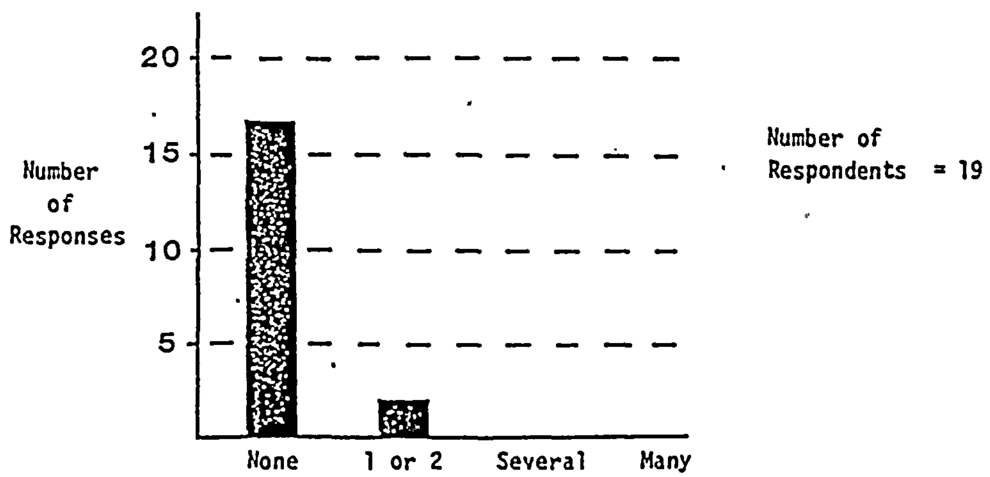
C.1. Are there any areas in the control room where background noise levels interface with annunciator auditory signals?



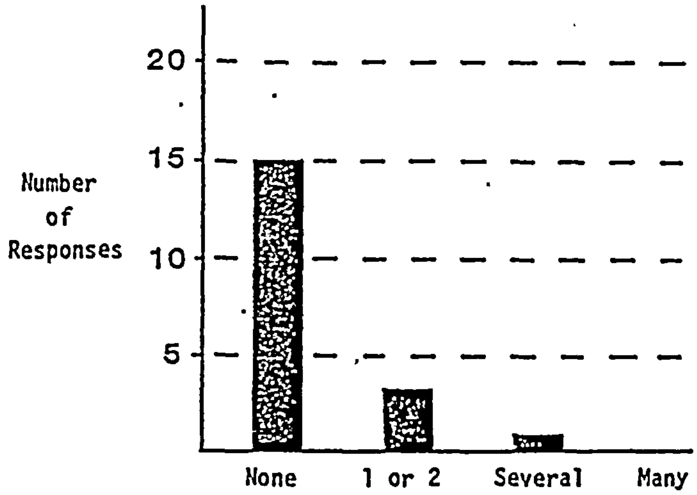
C.2. Have you experienced or can you conceive of situations in which the annunciator warning system was ineffective in helping, or might have actually hindered, operators' response to a system problem?



C.3. Are there any alarm windows that have an inappropriate setpoint?

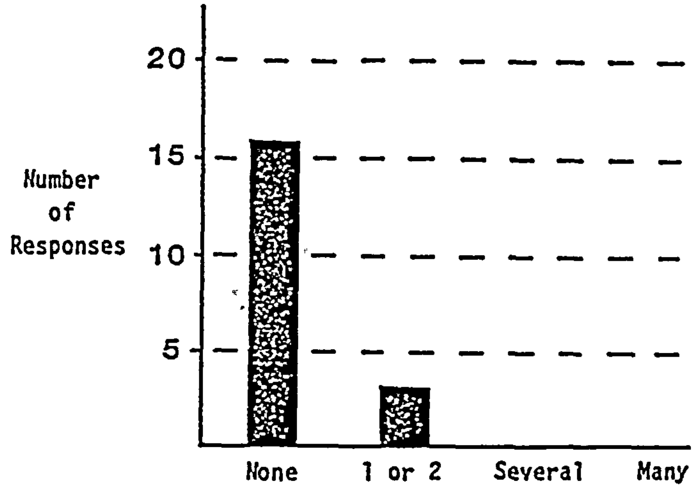


C.4. Are there alarms with multiple inputs for which there are no devices (e.g. printers) from which the operator can determine the cause of the alarm?



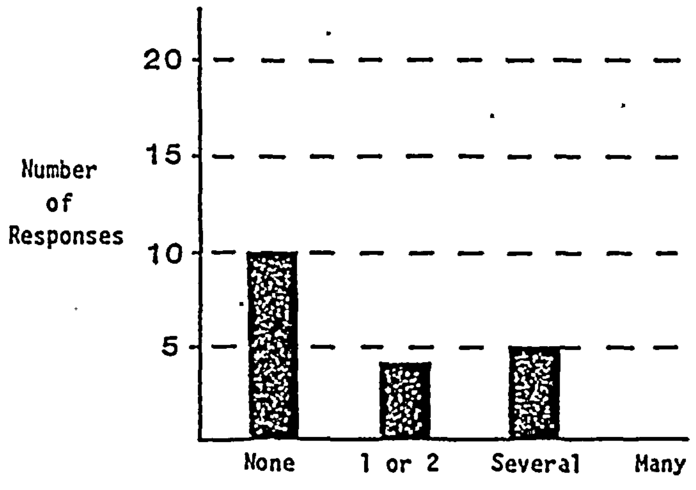
Number of Respondents = 19

C.5. Are there any single input alarms (e.g. "nuisance alarms") that could be eliminated or combined into multiple input alarms?



Number of Respondents = 19

C.6. Are there any alarm windows in the main control room with engravings that are confusing or difficult to understand?



Number of Respondents = 19

QUESTION NUMBER C.1. Are there any areas in the control room where background noise levels interfere with annunciator auditory signals?

Frequency	Code	Value	Comment	Action
1	C1.1	N	The security typer noise interferes with the operators ability to hear annunciators.	HEO (with item A1.2 and others)
2	C1.2	N	The security radio interferes with the operators' ability to hear annunciators	HEO (with item A1.2 and others)

QUESTION NUMBER C.2. Have you experienced or can you conceive of situations in which the annunciator warning system was ineffective in helping or might have actually hindered operators' response to a system problem?

Frequency	Code	Value	Comment	Action
1	C2.1	N	Numerous nuisance and false trouble alarms exist on the fire panel. The cause of the false alarms is not always clear. Invalid alarms may occur as often as every few minutes.	HEO
1	C2.2	N	Many fire panel alarms have multiple inputs. The operator has to go to various locations around the plant to determine the source of the problem. On several occasions they have been unable to determine the source of the alarm.	HEO
1	C2.3	N	Alarm annunciators usually come on unnecessarily while putting the system in service. This event may occur on one of the small vacuum pumps (piglets) that take suction on the circulation water and water boxes.	HEO

QUESTION NUMBER C.3. Are there any alarm windows that have an inappropriate setpoint?

Frequency	Code	Value	Comment	Action
1	C3.1	N	The containment hydrogen monitoring system causes a spurious alarm. The system is self-calibrating and the alarm comes from the sensor that is triggered by the reading on the meter. When the system calibrates itself (every 15 minutes or so), the meter displays an inappropriate (and spurious) value, and the alarm is triggered.	HEO
1		R	Need a mechanism that defeats the alarm when the instrument is in calibration mode.	
1	C3.2	N	Recombiner and off gas alarms occur for systems that are out of service.	HEO
1	C3.3	N	There is a temperature point on either the B2 or B3 panel that goes over the alarm point on the recorder before printing a temperature below the alarm set point. An annunciator alarm then comes on with this occurrence.	HEO

QUESTION NUMBER C.4. Are there alarms with multiple inputs for which there are no devices (e.g., printers) from which the operator can determine the cause of the alarm?

Frequency	Code	Value	Comment	Action
1	C4.1	N	The following annunciators should be split into single inputs: OFF GAS CHILLER 11, 12 & 13 OFF NORMAL TURB BLDG FLOOR DRAIN 11-18 LEVEL HIGH RX BLDG FLOOR DRAIN 11-12 SUMP 11-14 HIGH. (for the former ones, have to go to local panel in the off-gas building to determine cause; for the latter three types, have to go into reactor building to check each sump)	HEO (also see HEO 232)
1		R	A computer printout of which sump is high would be useful since at present operator has to go to other buildings to check out cause of alarm.	
1	C4.2	N	The computer may be used to determine input to multiple input alarms. However, it is not always reliable.	R

QUESTION NUMBER C.5. Are there any single input alarms (e.g., "nuisance alarms") that could be eliminated or combined into multiple input alarms?

Frequency Code Value	Comment	Action
	No responses	

QUESTION NUMBER C.6. Are there any alarm windows in the main control room with engravings that are confusing or difficult to understand?

Frequency	Code	Value	Comment	Action
1	C6.1	P	None of the alarm windows are difficult to understand when you are looking directly at them.	R

(Note -- In response to this item, a number of operators mentioned the problem with reading some alarm tiles due to their small lettering and wide stroke widths. Because this problem was also mentioned under several other questions, these responses have been pooled under item B6.2)

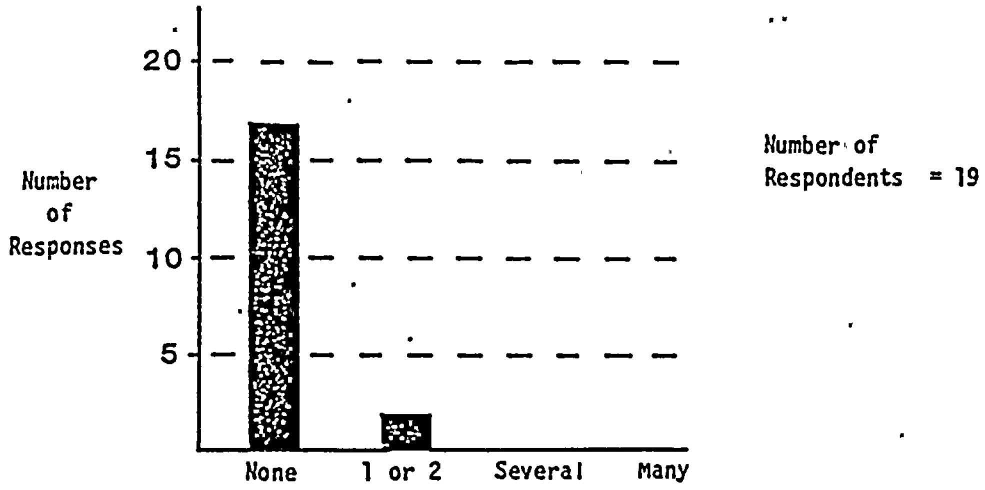
4.1.3.3.4 Communications

The communications section of the questionnaire examined the availability and suitability of communication systems in the control room as well as other plant locations. Overall, the communications systems were judged by operators to be good. A number of respondents felt strongly that operators needed better access to the Gaitronics paging system. NMPC has procedurally established channel 2 of the "hear-here" system as being dedicated for operator use, but this procedure is not followed consistently by other personnel working in the plant. Consequently operators sometimes have to wait to get access to the pager when they need it. A design change that would ensure a dedicated channel for the control room was suggested.

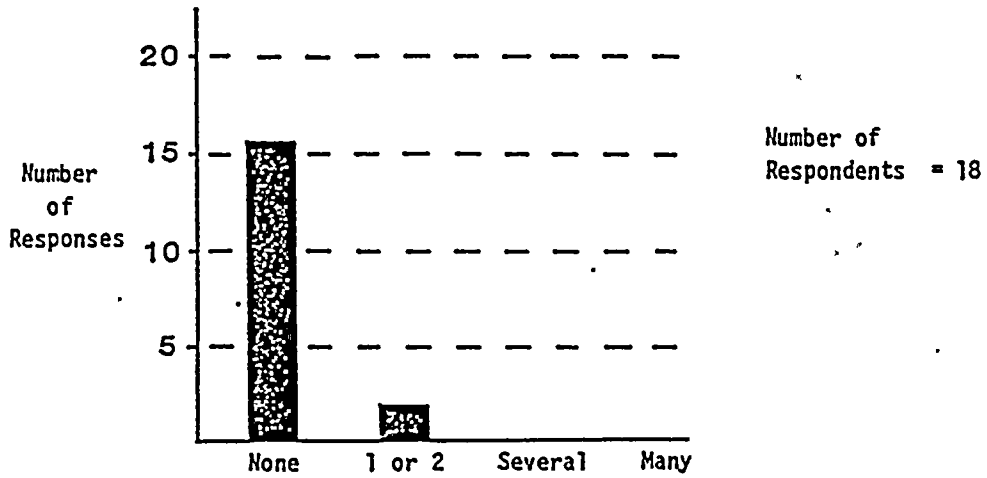
There were also problems noted regarding the maintenance of the Gaitronics and the need for additional speakers and "hear-here" stations in certain plant locations.

D. Communications

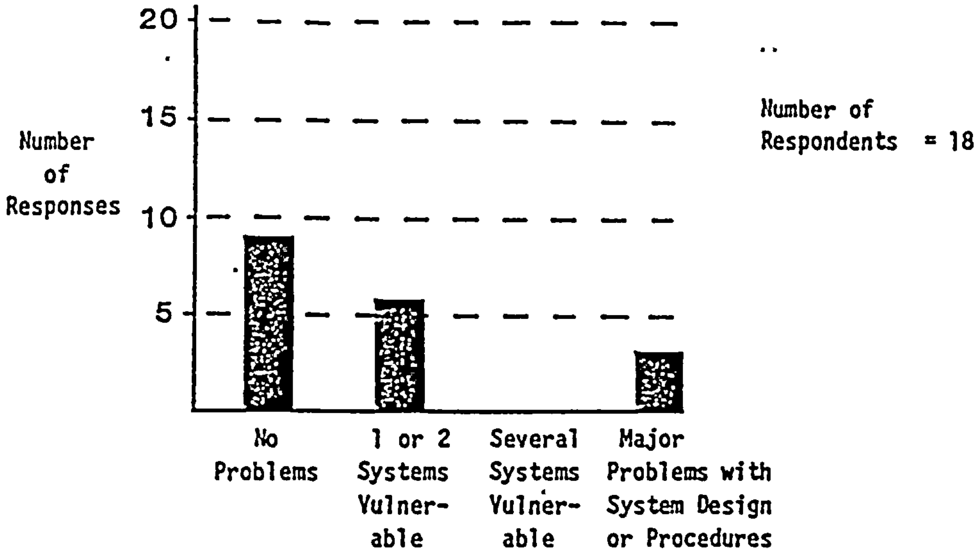
D.1. Are there any auditory signal(s) presented in the control room, other than annunciator alarms, which are confusing?



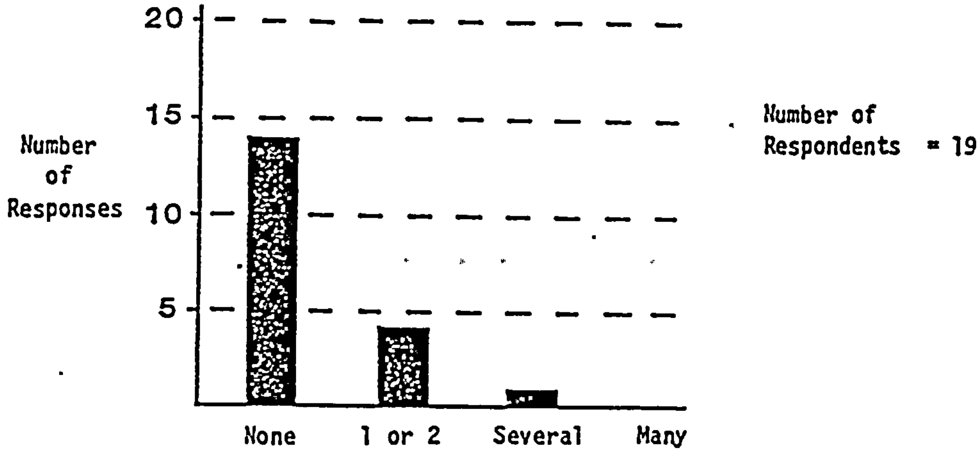
D.2. Are there area(s) in the control room where messages presented over the paging system can not be heard clearly?



D.3. Given present plant communication systems and procedures for their use, is it likely that the use of communication systems by non-operating personnel could interfere with control room use of the system?



D.4. Are there any equipment problems with the communications systems that could prevent or interfere with an operators' ability to communicate with individuals in other areas?



QUESTION NUMBER D.1. Are there any auditory signal(s) presented in the control room other than the annunciator alarms, which are confusing?

Frequency	Code Value	Comment	Action
1	D1.1	The fire panel is too complex.	R

QUESTION NUMBER D.2. Are there area(s) in the control room where messages presented over the paging system cannot be heard clearly?

Frequency	Code	Value	Comment	Action
1	D2.1	N	Page messages are difficult to hear when standing at the back panel.	HEO
1	D2.2	N	Soft-spoken individuals cannot be heard.	R

QUESTION NUMBER D.3. Given present plant communication systems and procedures for their use, is it likely that the use of communication systems by non-operating personnel could interfere with control room use of the system?

Frequency	Code	Value	Comment	Action
1	D3.1	N	The headset system needs to be expanded to create more channels in order to accommodate extensive surveillance schedules which result during outages.	R
7	D3.2	N	APN 19, 4.2 is not stressed during training. APN 19, 4.2 concerns dedicating the use of channel 2 on the hear-here Gaitronics system to Operations.	HEO
1		R	There should be one channel for operations use only.	
3		R	Dedicated use of channel 2 should be stressed during GET and contractor training.	
1		R	Add more channels on the Gaitronics system.	
1	D3.3	N	Firemen and security personnel tie up the communications system.	R

QUESTION NUMBER D.4. Are there any equipment problems with the communication systems that could prevent or interfere with an operators' ability to communicate with individuals in other areas?

Frequency	Code	Value	Comment	Action
2	D4.1	N	Poor maintenance of the Gaitronics can interfere with one's ability to communicate with other areas.	R
1	D4.2	N	Some high-noise areas in the plant hinder communications.	R
1	D4.3	N	There are a number of places in the plant where operators have to walk a distance in order to get to a hear-here. This can impede operations if a control room operator has to communicate with the operator in the plant, e.g. to have the operator in the plant check if appropriate equipment responded to a control actuation from the control room.	HEO
1		R	Suggested locations for additional hear-heres include the southwest and northeast corners of the reactor building above the 261 ft. elevation and in the turbine building along the row of feedwater pumps across from the sentry area.	

4.1.3.3.5 Computer-generated Information

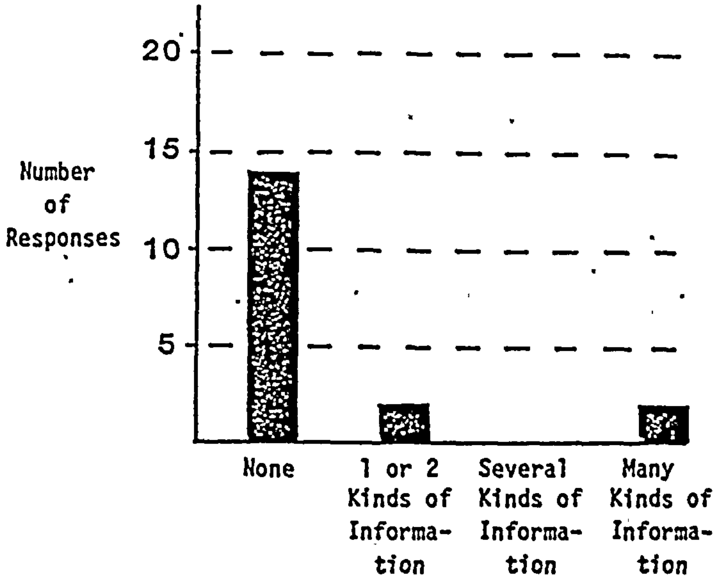
Operators were asked several questions regarding the availability and clarity of information presented on control room CRTs and printers. Several significant problems surfaced here, although the majority of operators again responded favorably.

The operators like the Large Value Displays that have recently been implemented, but there were suggestions for locating them in front of operators' usual workstations, so that they don't have to turn away from the control panels in order to view these CRTs. Operators expressed some confusion in understanding the meaning of labels engraved on the keyboards. Abbreviations and symbols are not used consistently here, and they don't correspond to standard abbreviations and terms that are used elsewhere in the control room. The operators also find it difficult to determine the codes by which computer "points" are requested for display. The manual that documents which code corresponds to which point is not well-organized and operators feel that they waste a lot of time looking up this documentation.

A problem on which several people expressed critical opinions is the information that is printed on the log typer. Operators have difficulty in quickly extracting alarm information from these print-outs, even though alarms print in a larger type than non-alarm information. Particularly after a trip, the operators find little use for much of the information that is printed, and consequently they find it difficult to extract the information they do need in order to determine the cause of the trip. Some operators expressed a preference for a printer that highlights alarm information in red ink.

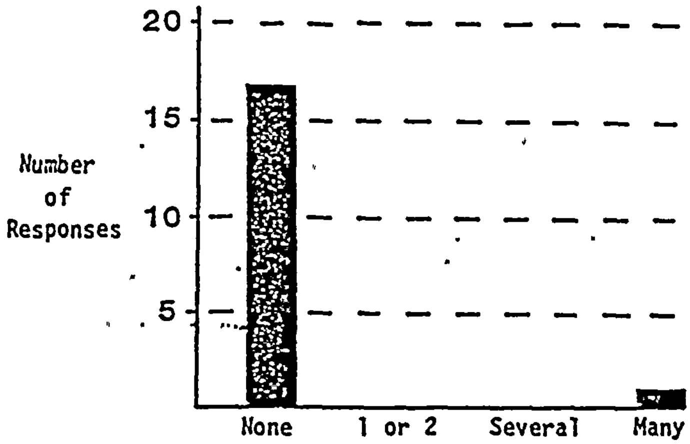
E. Computer-Generated Information (i.e. process computer, SPDS)

E.1. Is there any information or calculations not presently provided on a computer-generated display that would be more useful if it were available in that form?



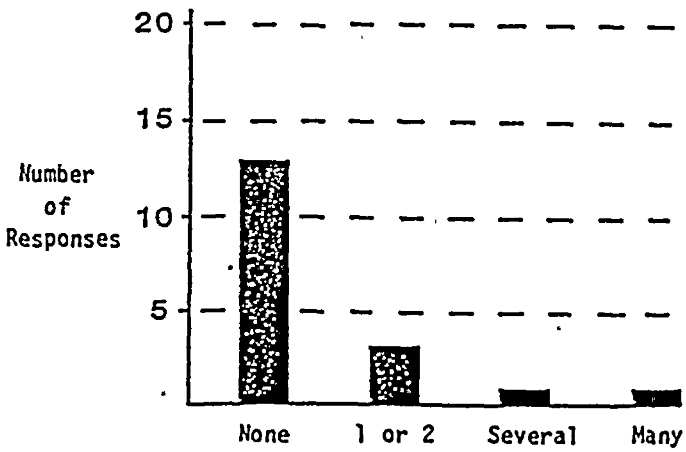
Number of Respondents = 18

E.2. Is there any information presently available on CRTs that would be more useful if it was presented in another form?



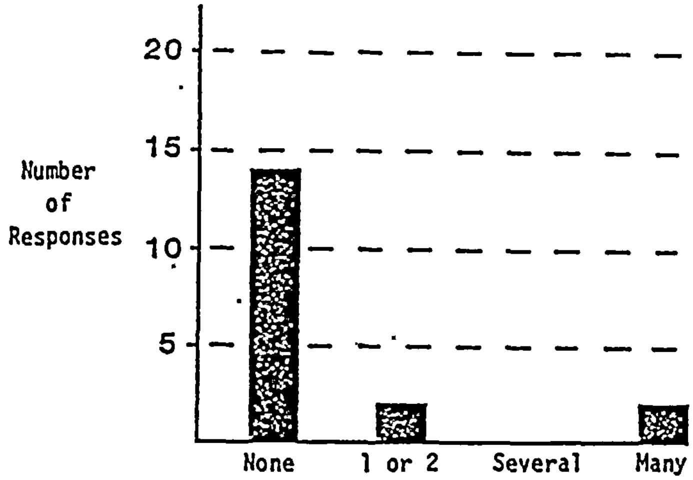
Number of Respondents = 18

E.3. Do you know of any words or symbols used on the computer displays that are difficult to understand or interpret?



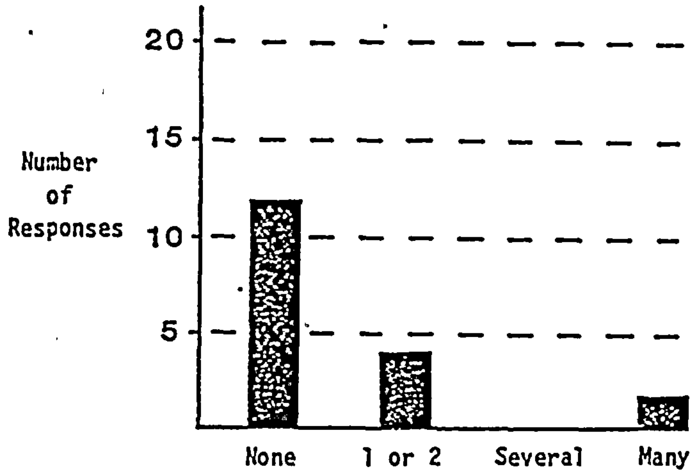
Number of Respondents = 18

E.4. Are there any CRTs located in the control room which are difficult to use because of their placement in the room?



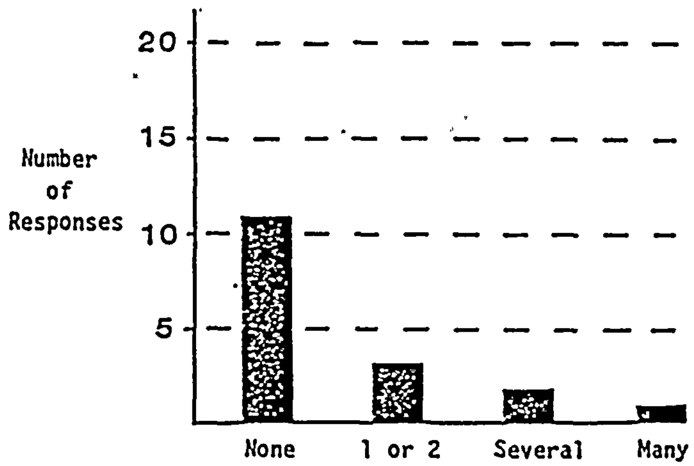
Number of Respondents = 18

E.5. Is any of the information presented on the computer printer not useful to control room operations?



Number of Respondents = 18

E.6. Are there any computer system procedures which are difficult to understand?



Number of Respondents = 17

QUESTION NUMBER E.1. Is there any information or calculations not presently provided on a computer-generated display that would be more useful if it were available in that form?

Frequency	Code	Value	Comment	Action
2	E1.1	P	The Large Value Displays (LVDs) on the CRTs are particularly useful. They are easy to read from a distance, and the operator can display any computer point he wants. Four LVDs also can appear at the same time on the CRT screen. Several digital displays are capable of displaying any number of selectable sensor values.	R

QUESTION NUMBER E.2. Is there any information presently available on CRTs that would be more useful if it were presented in another form?

Frequency Code Value	Comment	Action
	No responses.	

QUESTION NUMBER E.3. Do you know of any words or symbols used on the computer displays that are difficult to understand or interpret?

Frequency	Code	Value	Comment	Action
1	E3.1	N	Large numbers, such as radiation monitor counts, have at times run into the high or low limits when displayed by the operator.	HEO
1	E3.2	N	CRTs are difficult to read.	CK
2	E3.3	N	Information and symbols engraved on the keyboard are often abbreviated, with the meaning, in some cases, unclear and the symbols inconsistent. Also the abbreviations are not consistent with those used elsewhere in the control room.	HEO

QUESTION NUMBER E.4. Are there any CRTs located in the control room which are difficult to use because of their placement in the room?

Frequency	Code	Value	Comment	Action
3	E4.1	N	Operators have to turn around in order to look at CRTs.	HEO
1		R	CRTs should be incorporated in panels	
2		R	CRTs should be located in front of operators.	

QUESTION NUMBER E.5. Is any of the information presented on the computer printer not useful to control room operations?

Frequency	Code	Value	Comment	Action
3	E5.1	N	Alarming points on the printout from the log typer are hard to distinguish from non-alarm data. After a trip, it is difficult for operators to determine from this computer printout what caused the unit to trip. Alarms now print in larger type than non-alarm information, but if alarms come in in the the middle of a demand print-out, it is difficult to extract information that operators need.	HEO
2		R	Alarming points should be printed in red ink (previously had a printer that did this. Operators liked it.).	
1	E5.2	N	Some of the data printed out after a trip is superfluous.	HEO (with item E5.1)

QUESTION NUMBER E.6. Are there any computer system procedures which are difficult to understand?

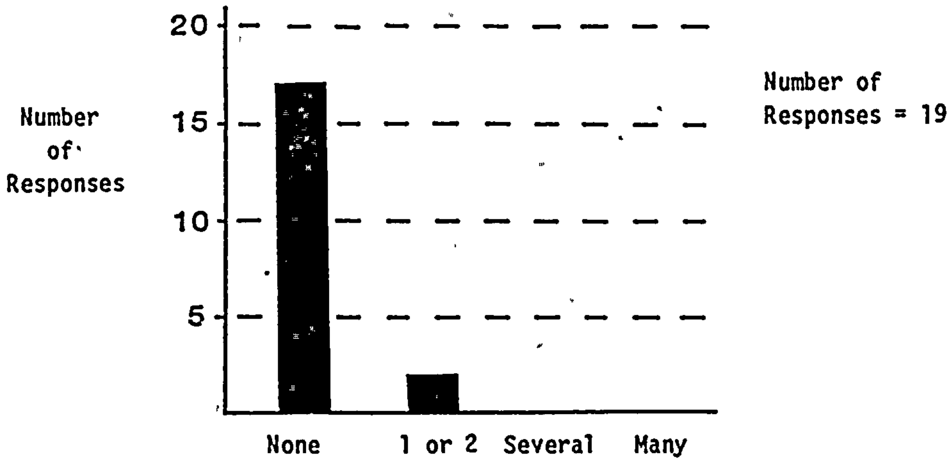
Frequency	Code	Value	Comment	Action
4	E6.1	N	The computer is not reliable because it is in a "down" status much of the time.	R
2	E6.2	N	Documentation for the letter and 3-number code by which the operator calls up computer "points" on the plant computer is not well-organized. There is a manual in which the operators look up where in the plant the sensor corresponding to the "point" is located. However, the manual is not organized in an orderly and consistent manner. Therefore, if an operator does not know or remember a specific code, he can lose a great deal of time in searching for the proper information.	HEO

4.1.3.3.6 Maintenance Procedures

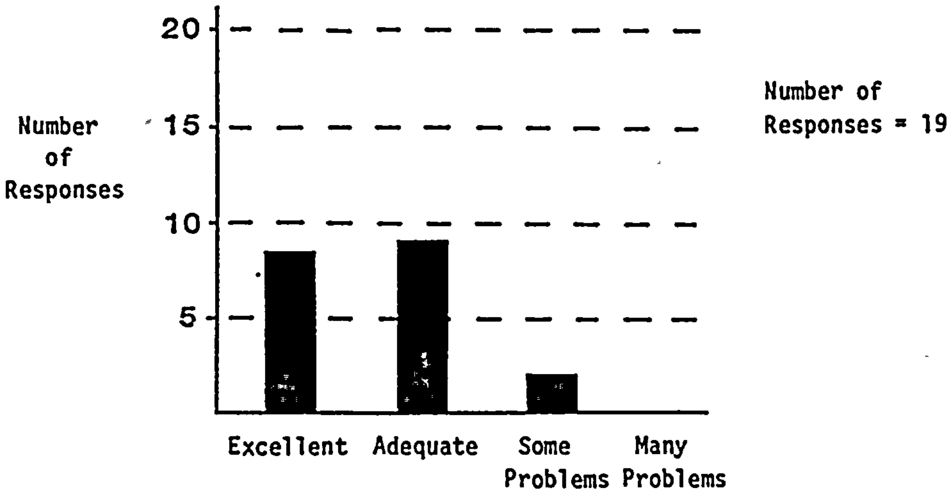
Operators were asked to respond to questions regarding the adequacy of maintenance procedures and the maintenance of control room instrumentation. Overall, maintenance was viewed favorably. There was some dissatisfaction with the restocking and organization of control room supplies (chart paper, ink, bulbs, fuses).

F. Maintenance Procedures

F.1. Are there any maintenance procedures that could contribute to an operational problem?



F.2. How would you characterize current procedures and availability of supplies for replacing equipment such as fuses, bulbs, ink, chart paper, etc.?



QUESTION NUMBER F.1. Are there any maintenance procedures that would contribute to an operational problem?

Frequency	Code	Value	Comment	Action
1	F1.1	P	Maintenance procedures are not a problem if maintenance personnel work along with the control room.	R
1	F1.2	N	The rad protection system and its procedures are a hindrance because the amount of time to perform necessary operations is increased. Suits, gloves and masks must be worn during this period.	R

QUESTION NUMBER F.2. How would you characterize current procedures and availability of supplies for replacing equipment such as fuses, bulbs, ink, chart paper, etc.?

Frequency	Code	Value	Comment	Action
1	F2.1	P	Work requests are handled in a timely manner.	R
2	F2.2	P	Excellent due to the flexibilty caused by operators ordering equipment whenever needed.	R
1	F2.3	N	Replacement of chart recorder is difficult since these materials are not well organized.	R
1	F2.4	N	Control room supplies are not restocked.	HEO

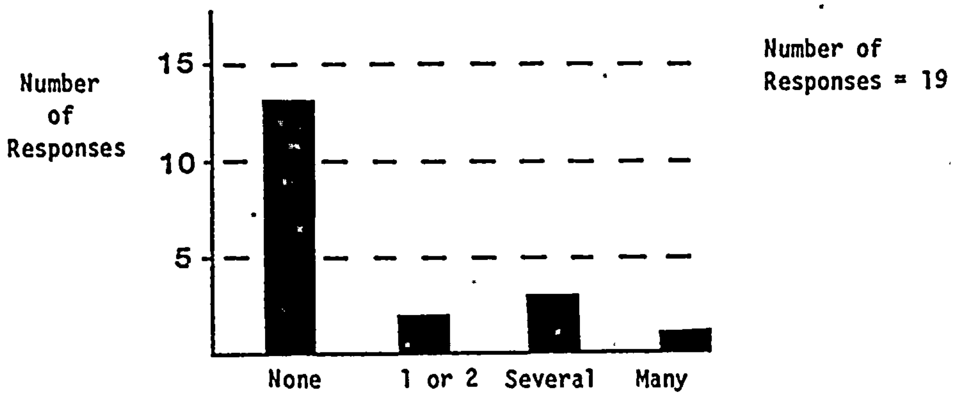
4.1.3.3.7 Procedures

Several questions were posed regarding the clarity and usefulness of procedures and other job performance aids. For the most part, operating procedures, including the emergency operating procedures, were judged to be adequate. Several problems were noted, however, including one procedure (fuel pool filter procedure) that is outdated.

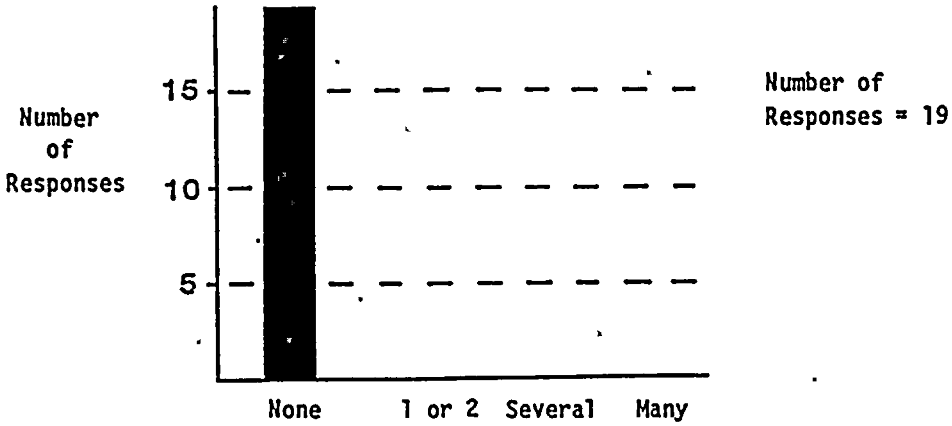
Shift turnover paperwork came in for harsh criticism. A number of operators felt that the information required by INPO was excessive and redundant with other forms they fill out. They also questioned the usefulness of this information.

G. Procedures

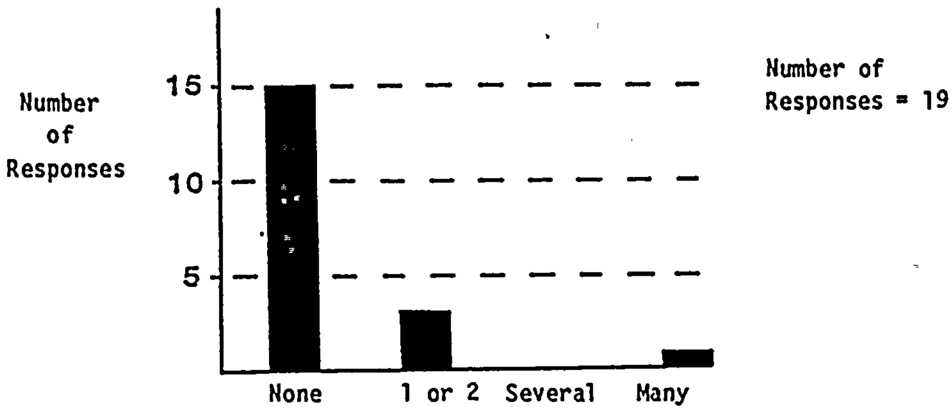
G.1. Are there any procedure(s) which are unclear or difficult to use?



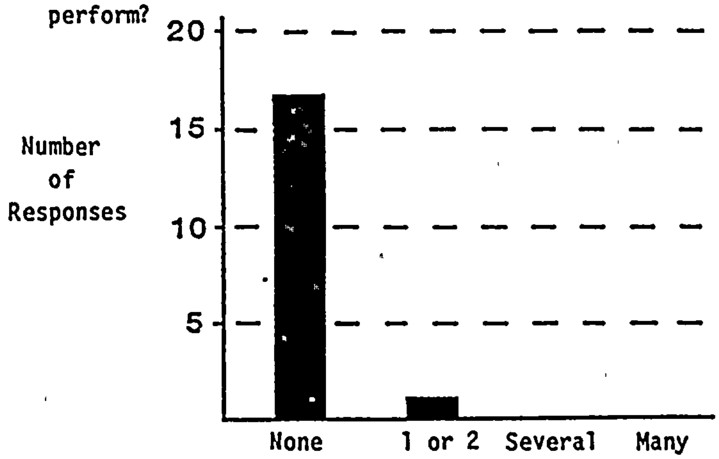
G.2. Are there any operator aids, such as tables/checklists/status boards etc. which could be redesigned to improve usefulness?



G.3. Are there any manual log(s) that you feel are difficult to update or maintain?



G.4. Are there any mathematical calculation(s) that are time consuming and/or difficult to perform?



Number of Responses = 19

QUESTION NUMBER G.1. Are there any procedure(s) which are unclear or difficult to use?

Frequency	Code	Value	Comment	Action
1	G1.1	P	EPPs and EAPs are well written and easy to use.	R
1	G1.2	P	OP-43 (start-up procedure) is effective since it accurately reflects what the operators do.	R
1	G1.3	P	SOPs (emergency procedures) are effective.	R
1	G1.4	N	Special operating procedures immediate actions should be standardized. Sometimes steps for reactor scram are embedded in the procedure and sometimes they are not.	R
1	G1.5	N	OP-6 (Fuel pool filter) procedure is incomplete and inaccurate. Valves have been added to the plant system that are not part of the original procedures for the system. Thus a modified (and undocumented) version of the existing procedure is presently performed by the operators.	HEO
1	G1.6	N	SOP-1, a major accident, spends most of time putting turbine on turning gear. Reactor should get more attention.	R

QUESTION NUMBER G.2. Are there any operator aids, such as tables/checklists/status boards, etc. which could be redesigned to improve their usefulness?

Frequency	Code	Value	Comment	Action
1	G2.1	P	Operator aids such as stickers and tags used in the control room are particularly helpful.	R

QUESTION NUMBER G.3. Are there any manual log(s) that you feel are difficult to update or maintain?

Frequency	Code	Value	Comment	Action
1	G3.1	N	INPO turnover checklists for plant operators are not effective.	R
4	G3.2	N	The shift turnover sheet is not effective and is redundant with the log book.	R
2	G3.3	N	Breach permits/OR's for fire systems require too much work.	R

QUESTION NUMBER G.4. Are there any mathematical calculation(s) that are time consuming and/or difficult to perform?

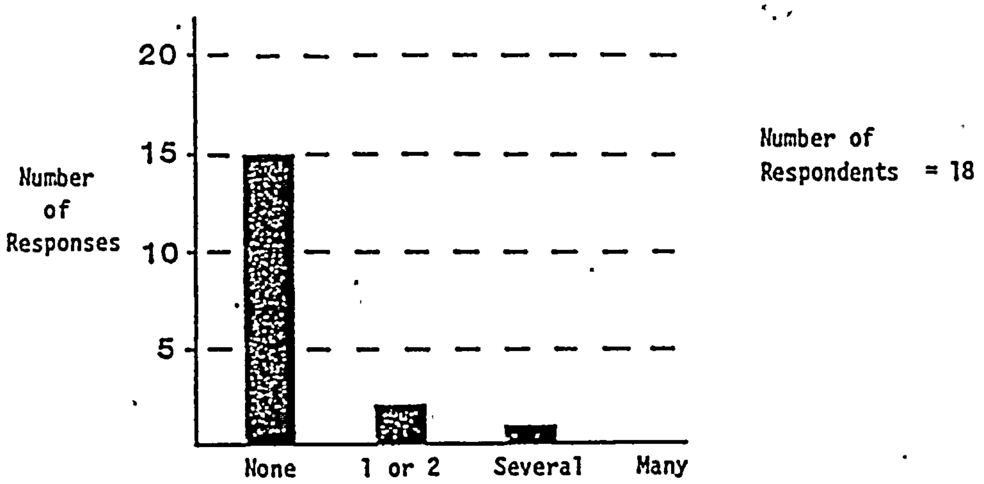
Frequency	Code	Value	Comment	Action
1	G4.1	N	A hand calculator would be useful for performing mathematical calculations.	R

4.1.3.3.8 Staffing and Job Design

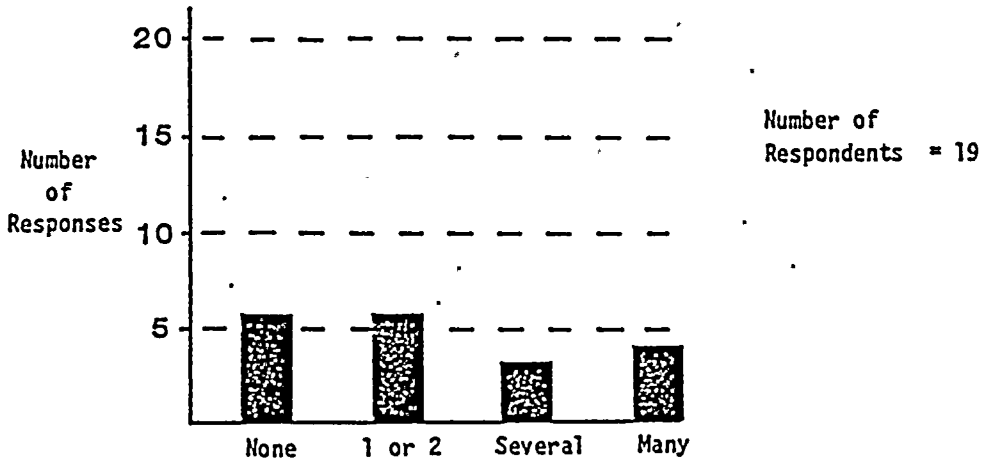
Respondents were asked to evaluate control room staffing and delegation of responsibilities. Many operators commented on the crowding of the control room by non-operating personnel -- management, maintenance, technicians, tour groups, security -- and the distractions caused by unnecessary traffic through the control room. They felt that some of this traffic could be eliminated by directives from management, and by allowing operators to take some surveillance readings that they used to take but which are now performed by technicians. The operators appeared to be quite comfortable with the present staffing of the control room by operations personnel.

H. Staffing and Job Design

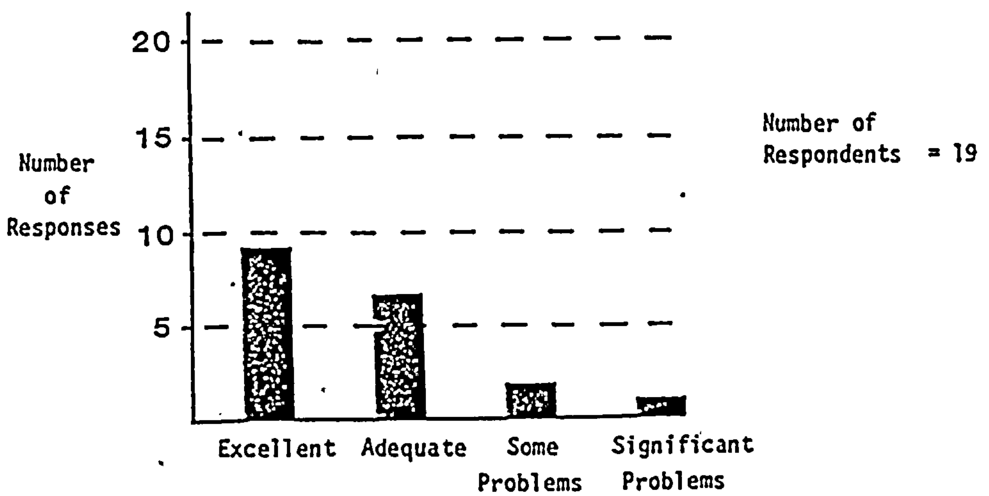
H.1. Are there any job duties which are presently performed by others in which you feel control room personnel should be more directly involved, or vice versa?



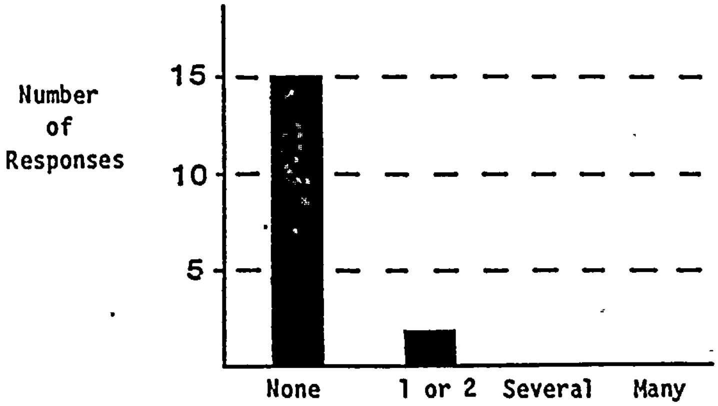
H.2. Are there any recurring distractions, in the form of unnecessary personnel, traffic, etc. that could interfere with your duties?



H.3. Does the shift turnover process work effectively?



H.4. Have you experienced or can you conceive of situations in which the operating crew staffing structure could adversely affect control room operations?



Number of Responses = 17

QUESTION NUMBER H.1. Are there any job duties which are presently performed by others in which you feel control room personnel should be more directly involved, or vice-versa?

Frequency	Code	Value	Comment	Action
1	H1.1	N	Operators previously took readings for radiation protection. Now radiation protection personnel take the readings, resulting in more people in the control room.	R

QUESTION NUMBER H.2. Are there any recurring distractions, in the form of unnecessary personnel, traffic, etc., that could interfere with your duties?

Frequency	Code	Value	Comment	Action
9	H2.1	N	Non-operating personnel distract operators The following were identified as problems:	R
3			-- guards	
3			-- traffic through control room to I&C shop	
1			-- security radios	
1			-- training that takes place in control room	
2			-- management, health physics, chemical control personnel	
1			-- tour groups	
1	H2.2	N	Fire panel II false alarms are distracting.	HEO (with item C2.1)
1	H2.3	N	Horse play on the hear-here system is distracting.	R
1	H2.4	N	Due to non-operations traffic in the control room, the restrooms are often occupied by non-operations personnel.	R

QUESTION NUMBER H.3. Does the shift turnover process work effectively?

Frequency Code Value	Comment	Action
	No responses.	

QUESTION NUMBER H.4. Have you experienced or can you conceive of situations in which the operating crew staffing structure could adversely affect control room operations?

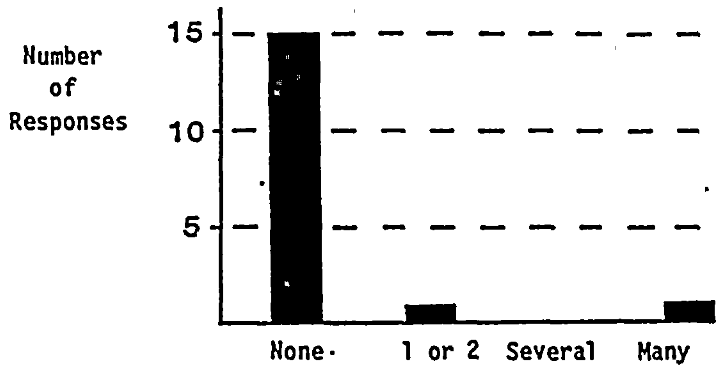
Frequency	Code	Value	Comment	Action
1	H4.1	N	The Shift Technical Advisor (STA) is not needed.	R
1	H4.2	N	An SRO is not needed in the Control Room at all times. His presence has a negative effect.	R

4.1.3.3.9 Training

Operators were asked in which areas more training is needed. There were no negative comments here and, for the most part, the multiple-choice responses reflected favorable attitudes towards existing training for emergency procedures.

I. Training

I.1. Are there any potential emergency situation(s) for which you feel you have not received enough training?



Number of Responses = 17

QUESTION NUMBER I.1. Are there any potential emergency situation(s) for which you feel you have not received enough training?

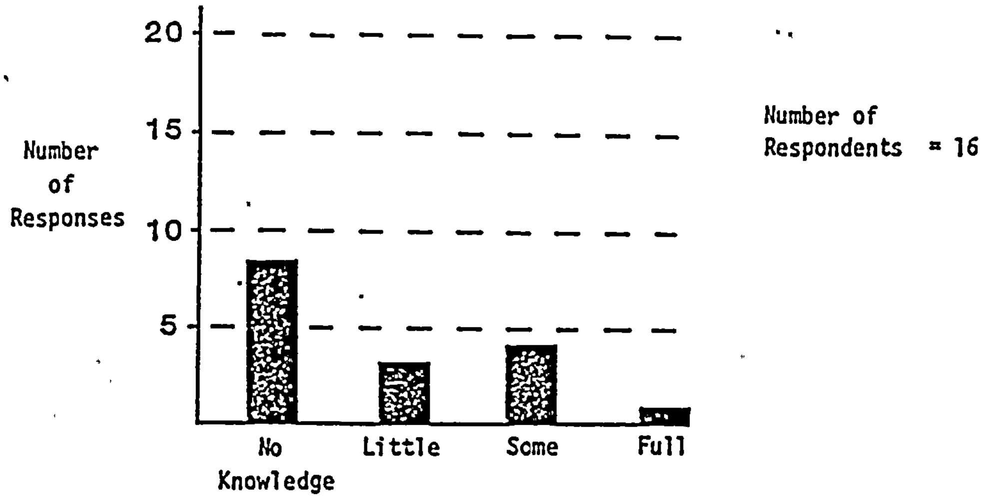
Frequency	Code	Value	Comment	Action
1	I1.1	P	Training for site drills - Procedure for Unusual Event through General Evacuation has been very helpful.	R

4.1.3.3.10 Operator Aids

Operators were asked for an opinion regarding their knowledge of the SPDS system and for general comments regarding improvements that would make their job easier. Several operators felt that additional training and experience with the SPDS was needed, although this did not seem to be viewed as a major problem. In response to the request for general comments, some of the issues raised previously were reiterated.

J. Operator Aids

J.1. How much knowledge do you have of the Nine Mile Point Unit 1 SPDS design and operation?



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QUESTION NUMBER J.1. How much knowledge do you have of the Nine Mile Point Unit 1 SPDS design and operation?

Frequency	Code	Value	Comment	Action
1	J1.1	N	SPDS should be designed by operators, not engineers	R

QUESTION NUMBER J.2. What parameters, inputs, opertor aids, or other information would assist you in performing operations during the following conditions?

Frequency	Code	Value	Comment	Action
2	J2.1	P	All parameter displays and inputs help in the performance of one's duties.	R
1	J2.2	N	Get rid of non-essential personnel during start/shutdown and abnormal operations.	R
1	J2.3	N	Major problem is overcorrection which may result in someone getting hurt someday.	R
1	J2.4	N	Procedures, computer programs, and instructions are needed for startup and shutdown. In addition, emergency procedures are needed for abnormal operations.	R

4.2 HISTORICAL REVIEW

4.2.1 Introduction

The objective of the Historical Document Review was to identify problems previously encountered involving control room operations and to investigate the potential enhancements to the control room which could significantly reduce or minimize the potential for human error.

In the nuclear power industry, human error can combine with poor design features and lead to unacceptable consequences. Fortunately, in the industry, instances of past human performance error and equipment/design arrangement problems are documented in plant and industry records and can be used as a database for recommending design improvements. This section presents the results of a review of several such documents to identify areas of potential human performance problems at Niagara Mohawk Power Corporation's Nine Mile Point Unit 1 (NMP-1). It also reports on the previous review of industry records conducted by the BWR Owner's Group (BWROG) in July 1981.

The documents investigated for the historical document review were:

- Licensee Event Reports (LERs) for NMP-1
- Scram Reports for NMP-1
- Selected LERs, SOERs, and SERs found to be significant to BWR plants and DCRDR application

4.2.2 Methodology

4.2.2.1 Selection of Historical Reports

LERs are an industry-wide source. LER information is stored in an NRC computerized database and includes all Reportable Occurrences (ROs) to the Nuclear Regulatory Commission. Licensees are required to submit these reports to comply with federal regulations. All LERs from 1981, 1982, and 1983 were reviewed. The second in-house source included scram reports from these years. The BWROG conducted a previous design review which included the same documents from previous years. The results of this review are reported in Section 4.2.4.

The human factors personnel, with the assistance of NMP-1 plant personnel, obtained copies of the applicable LERs and NMP-1 scram reports. These reports were then sorted by date and probable applicability.

All reports were then screened to determine if they described and documented a control room problem using the following criteria:

- Equipment referenced (valve/pump controls, displays, indicators, etc.) must be in the physical confines of the control room

- Procedure steps referenced must be accomplished within the physical confines of the control room

- Personnel error referenced must have occurred in the control room on equipment in the control room, or entailed a deviation from procedures that should be accomplished in the control room.

Finally, each report was screened to determine whether the incident had human factors implications or not. Reports that meet these criteria have been included in Appendix B.

4.2.2.2 Report Review and Analysis

For every report that cleared the initial screening, a Problem Analysis Report (PAR) was compiled. The two-page PAR, shown in Figure 4.2.1, was used to record pertinent information. The PAR constitutes the primary document for this aspect of the DCRDR process. In addition, when the recommendations generated entailed panel alterations, panel enhancements, training revisions or additions, operating procedure modifications and/or administrative procedure modifications, the apparent fundamental problem and its recommended corrective action was recorded, by the HFS, as a Human Engineering Observation (HEO) on an HEO form.

In addition to the NMP-1 LERs and scram reports, significant LERs, SOERs, and SERs which were found in a previous review to be applicable to a similar BWR design to NMP-1 (Dresden), were also investigated. These documents were screened from the INPO database using the same criteria and procedure as used for the NMP-1 review. These reports were screened again for applicability to NMP-1 and the reports that met the criteria have been included in Appendix B.

4.2.3 Results

LERs and Scram reports for NMP-1, screened according to the criteria mentioned earlier, are shown graphically in a two-by-two matrix in Tables 4.2.1 and 4.2.2. Of the 117 LERs reviewed, 12 met the criteria as occurring inside the control room. Of these 12, there were 7 reports which involved human factors considerations. For each of these reports, a PAR was filled out and included in Appendix B. Of the seven reports,

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): ______________________________

Report Type and Number: ______________________________

Station: ______________________________ Unit: ________

Event Date: ____________________ Operating Status: __________

Circumstances and Events Leading to the Problem: ____________

____

____

Nature of the Problem: ____

____

____

Steps Taken to Correct or Alleviate the Problem: ____________

____

____

Outcome: ____

____

____

Corrective Measures Undertaken: ________________________________

____

____

Human Performance Problems Associated With Event: ____________

____

____

FIGURE 4.2.1

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes __________ No __________
(If no, end form here.)

In Which Areas: ______________________________

____

____

Corrective Actions Taken: ______________________________

____

____

Unresolved Discrepancies: ______________________________
(If none, end form here.)

____

____

HED Number: __________

FIGURE 4.2.1 (continued)

	INSIDE CONTROL ROOM	OUTSIDE CONTROL ROOM	
HFE-RELATED	7	19	26
NON HFE-RELATED	5	86	91
	12	105	117

TABLE 4.2.1 CLASSIFICATION OF LERs

	INSIDE CONTROL ROOM	OUTSIDE CONTROL ROOM	
HFE-RELATED	0	0	0
NON HFE-RELATED	1	4	5
	1	4	5

TABLE 4.2.2 CLASSIFICATION OF SCRAM REPORTS

only one was determined to be a potential recurring problem and was recommended as an Human Engineering Observation (HEO) to be investigated further.

There were 5 unit Scram reports filed since July, 1981. Of the 5 Scram reports only 1 incident was inside the control room. This incident may be similar to another transient that the BWROG investigated. This problem was recorded on PAR-8 from the BWROG investigation results.

From the Dresden Historical Document review, 8 LERs were identified which were both inside the control room and involving human factors issues. These LERs were investigated for their potential significance to NMP-1. None of the 8 were defined as HEOs as a result of the investigation. Similarly, of the 263 SERs/SOERs reviewed in the Dresden study, 4 were found to meet the screening criteria, and none resulted in HEOs for NMP-1 DCRDR consideration. PARs 9 through 20 describe the problems, conditions, and corrective actions resulting from the investigations of the 12 LERs, SERs, and SOERs from this review which were applicable to NMP-1.

The following problems were responsible for many of the events found in the other 105 reports that were reviewed: .

- Equipment failure (wires crossed, improper connections)
- Equipment not positioned correctly
- Alarm malfunction
- Incorrect breaker alignment
- Inaccurate or incorrect calibration
- Use of non-qualified equipment
- Installation of improper spare parts
- Failure to properly follow a procedure
- Inadequate (deficient or inconsistent) procedure
- Misinterpretation of procedure or instructions

- Inadequate training (especially with new employees)
- Lack of administrative controls
- Inadequate monitoring
- Failure to complete surveillance tests on time
- Missed samples
- Acceptance criteria of procedure not met
- Exceeding Technical Specification limits
- Improperly completed records
- Fire protection deficiencies (removal of fire barriers, etc.)
- Actions/errors by contractors or maintenance personnel, and inadequate maintenance

4.2.4 BWROG LER Analysis

Plant LERs and scram reports for the years 1981, 1980, and 1979 were examined by the BWROG survey team to identify possible human factors design considerations which could have contributed to operator error.

One scram report dated July 26, 1980, was reported in the summary and has been described in PAR-8. This problem was also identified as a potential human factors problem and an HEO was written for NMPC consideration in the Assessment Process. Since the 1981 LERs were reviewed by both groups, the BWROG also reported the LER 81-05 described in PAR-1.

4.2.5 Conclusion

The Historical Review of documents for NMP-1 revealed 2 HEOs which were added to the HEO database for DCRDR consideration. These sources revealed only 7 incidents that were both inside the control room and related to human factors concerns, using the criterion defined previously. Problems with procedures were especially evident since 5 of the 7 reports involved

procedures, either directly or indirectly. None of the generic industry documents reviewed were considered problematic enough to merit an HEO. Those HEOs related to the historical review are prefixed HR.

4.3 TASK ANALYSIS

Advanced Resource Development (ARD) Corporation performed an operator task analysis identification as part of the Detailed Control Room Design Review (DCRDR). This activity was designed to comply with the guidance outlined in NUREG-0700, "Guidelines for Control Room Design Reviews".

Operator task identification and analysis entailed the identification and documentation of tasks for emergency events. The NMP-1 plant specific Emergency Procedure Guideline derived from the Boiling Water Reactor Owner's Group (BWROG) Emergency Procedure Guidelines (EPGs) were used to identify the operator tasks to be analyzed. These are the same guidelines that were used as the starting point for the preparation of the NMP-1 Emergency Operating Procedures (EOPs). A validation step will be carried out at the back end of both the EOP and DCRDR programs to be sure that the described task analysis covered all task requirements as described in the EOPs, which are still under preparation. This validation step is described in Section 5.4.3.

The purpose of this section is to explain and document the approach employed for the task analysis phase of the DCRDR.

4.3.1 Task Analysis Methodology

The BWROG EPGs provided a functional analysis that identified generic information and control needs. The plant-specific EPGs used during the task analysis provided detailed information on

operator response during transients and accidents. All steps and contingencies represented in the EPGs were analyzed resulting in a list of plant-specific tasks for the accomplishment of all branches of the guidelines.

4.3.2 Identification of Operator Tasks

A task description form was completed for each section of the EPGs and the contingencies identifying:

- Operator tasks to be accomplished
- Corresponding procedure step numbers of identified tasks
- Unique task numbers for future analysis

The Task Description Form in Table 4.3.1 depicts the hierarchical relationship between the EPG system-oriented steps and the defined operator tasks for Primary Containment Control, for example.

4.3.3 Identification of Operator Actions or Subtasks

For each task identified in the Task Description Form, a Task Analysis Form, depicted in Figure 4.3.1, was completed by a human factors specialist working with NMP-1 reactor operators, senior reactor operators, nuclear design engineers, nuclear systems engineer, and nuclear trainer outside of the control room. The purpose of the Task Analysis Form was to identify the information and control needs for task performance and provide a template of operator activities in the task for use in validation efforts. A single task was generally comprised of several subtasks or action steps.

Each action step was separately analyzed with respect to its purpose in accomplishing the higher order task and the information and control needs for performing the subtask

Table 4.3.1

TASK DESCRIPTION FORM

Page 1 of 4

Date ______________

Analyst ___________

Procedure Section: Primary Containment Control Guideline

Task Number	Operator Task
	1. Observe suppression pool temperature greater than 80° F.
	2. Observe drywell temperature above 135° F.
	3. Observe drywell pressure above 3.5 psig.
	4. Observe suppression pool water level greater than 4'6".
	5. Observe suppression pool water level below 3'0".
SPIT	6. Monitor and control suppression pool temperature.
SPIT-1	6. Close all SORVS.
SPIT-2	7. Observe suppression pool temperature greater than 80° F.
	8. Operate available suppression pool cooling.
SPIT-3	9. Observe suppression pool temperature = 110° F.
	10. Scram the reactor.
SPIT-4	11. Observe suppression pool temperature not maintained below the heat capacity temperature limit.
	12. Maintain RPV pressure below the heat capacity temperature limit.
	13. Enter RPV Control Guideline procedure at Step RC-1 and execute concurrently.
DW/TM	14. Monitor and control drywell temperature.
DW/T-1	14. Observe drywell temperature greater than 135° F.
	15. Operate available drywell cooling.
DW/T-2	16. Observe drywell temp. at 330 ft. equals RPV saturation temp.
	17. Enter RPV control guideline procedure at Step RC-1

Table 4.3.1 (continued)

TASK DESCRIPTION FORM

Date ______________

Analyst ___________

Procedure Section: Primary Containment Control Guideline

Task Number	Operator Task
DW/T-3	18. Observe suppression chamber temperature and drywell pressure are below the drywell spray initiation Pressure Limit*.
	19. Observe drywell pressure less than 301° F and increasing*.
	20. Shutdown recirculation pumps*.
	21. Shutdown drywell cooling fans*.
	22. Initiate drywell sprays*.
	23. Observe drywell pressure greater than 301° F go to RPV Control Guideline procedure at Step RC-1 and execute concurrently with this procedure.
PC/P	Monitor and control primary containment pressure.
PC/P-1	24. Observe temperature in space being evacuated less than 212° F.
	25. Operate EVS per N1-OP-9 "Drywell and Torus Inerting and Venting Procedure", Sections G and H.
PC/P-2	26. Observe suppression chamber greater than later.
	27. Observe suppression chamber temperature and drywell pressure are below the Drywell Spray Initiation Pressure Limit.
	28. Shutdown reciculation pumps and drywells.
	29. Shutdown drywell cooling fans.
	30. Initiate drywell sprays.
PC/P-3	31. Observe suppression chamber pressure above Pressure Suppression Pressure, go to Emergency Depressurization procedure.

Table 4.3.1 (continued)

TASK DESCRIPTION FORM

Page 3 of 4

Date ______

Analyst ______

Procedure Section: Primary Containment Control Guideline

Task Number	Operator Task
	32. Observe suppression chamber pressure above Primary Containment Design Pressure.
PC/P-5	33. Observe suppression chamber pressure above Primary Containment Pressure Limit.
	34. Observe suppression chamber temperature and drywell pressure are below the Drywell Spray Initiation Pressure Limit.
	35. Shutdown recirculation fans.
	36. Shutdown drywell cooling fans.
	37. Initiate drywell sprays.
PC/P-6	38. Observe suppression chamber pressure above Primary Containment Pressure Limit.
	39. Vent primary containment per N1-OP-9 "Drywell and Torus Inerting and Venting Procedure" Sections G and H to maintain pressure below Primary Containment Pressure Limit.
SP/L	Monitor and control suppression pool water level
SP/L-1	40. Maintain suppression pool water level between 4'6" and 3" per N1-PSP-13 "Past Sampling Procedure".
SP/L-2	41. Observe suppression pool water level less than 3'.
	42. Maintain suppression pool water level above Heat Capacity Level Limit.
	43. Observe suppression pool water level below klest capacity level limit, go

Table 4.3.1 (continued)

TASK DESCRIPTION FORM

Page 4 of 4

Date

Analyst

Procedure Section: Primary Containment Control Guideline

Task Number	Operator Task
	RPV Control Guideline at Step RC-1 and execute it concurrently with this procedure.
SP/L-3	44. Observe pool water level above 4'6".
SP/L-4	45. Maintain suppression pool water level below Suppression Pool Load Limit.
	46. Observe suppresion pool water level above Suppression pool Load Limit.
	47. Maintain RPV pressure below the limit.
	48. Go to RPV Control Guideline procedure at Step RC-1 and execute concurrently with this procedure.
	49. Observe RPV pressure above Suppression Pool Load Limit.
	50. Verify adequate core cooling is assured.
	51. Terminate injection into the RPV from sources external to Primary Containment. (Do not use boron injection system or CRD).
	52. Go to Emergency RPV depressurization procedure.
SP/L3.2	53. Observe suppression pool water level less than 100.5 ft.
	54. Verify adequate core cooling is assured.
	55. Terminate injection into the RPV from sources external to Primary Containment except for boron injection systems and CRD.
	56. Observe Primary containment water level equals 100.5 ft.
	57. Terminate injection into RPV from sources external to Primary Containment (irregardless of adequate core cooling).

Condition ☐

Same as: ________ Task Number

Page ____ of ____

Date ________

Analyst ________

________ EPG Number ________ EPG Section

Alt. to: ________ Task Number

________ Task Number ________ Task Title

ACTION STEP	OP	VERB	OBJECT													OTHER PERFORMANCE REQUIREMENTS	EXIT OR COMMENTS
			CONTROL					INDICATOR/FEEDBACK									
			EQUIPMENT	POSITION	ID	TYPE	OTHER	EQUIPMENT	TYPE	STATE	ID	UNITS	RANGE	DIV	OTHER		

VERB KEY
- 1.1 OBSERVES
- 2.1 COMPARES
- 2.2 CALCULATES
- 3.1 PUSH
- 3.2 TURN
- 3.3 LOCK-OUT
- 3.4 TOUCH
- 3.5 ADJUSTS
- 3.6 TYPES
- 3.7 PULL
- 4.1 INFORMS
- 4.2 REQUESTS
- 4.3 RECEIVES

CONTROL TYPE KEY
- J J HANDLE
- JS JOYSTICK
- K KEY OPERATOR
- LP LEGEND PUSHBUTTON
- NP NON-LEGEND PUSHBUTTON
- R ROCKER SWITCH
- RS ROTARY SWITCH
- S SLIDE SWITCH
- T T HANDLE
- TG TOGGLE SWITCH
- TW THUMBWHEEL
- TS TOUCHSCREEN
- KB KEYBOARD
- C CONTROLLER

CONTROL MODE
- D DISCRETE
- C CONTINUOUS

CONTROL OTHER KEY
- SR SPRING RETURN
- T THROTTLE
- B BACKLIT

DISPLAY TYPE KEY
- A ANNUNCIATOR
- C DRUM COUNTER
- EC ELECTRONIC COUNTER
- M METER
- R RECORDER
- GM MIMIC
- D DIGITAL DISPLAY
- CSL CONTROL STATUS LIGHT
- LL LEGEND LIGHT
- NL NON LEGEND LIGHT
- CRT CATHODE RAY TUBE
- G GRAPHIC

Figure 4.3.1. Task Analysis Instrumentation Requirement Form

activities. The subtask nomenclature was recorded as a part of the activity description with the use of a verb lexicon, generic equipment description, and a separate column for other performance requirements. The elements of the form are arranged so that the description of the task activity represents a declarative statement (i.e., similar to a sentence). The "OP" column (referring to operator) provides the "WHO" or the subject of the sentence. This is followed by a column entitled "VERB" describing the action of the task. Finally, the equipment or object of the task action was described. A separate column entitled "OTHER PERFORMANCE REQUIREMENTS" was provided for description of operator activities other than control and display actions. The last column of the form entitled "EXIT OR COMMENTS" was employed to record pertinent comments of the analyst or subject-matter experts relating to information and control needs for task performance.

4.3.4 Specification of Information and Control Needs

Characteristics of the information and control needs for performing each action step within the task were recorded on the Task Analysis Form. The information collected to describe the control needs for operator tasks included:

- Equipment - The name of the plant equipment involved in the control action noting the required type of control equipment (e.g., pump, isolation valve, governor valve, etc.)

- Position - The control position name which corresponds to the escutcheon label (e.g., ON, RUN, CLOSED, AUTO)

- ID - A unique identifier derived from the panel location of the control

- Type - The required or desired type of control to suit

the nature of the control action (A key at the bottom of the form provided the most common types.)

- Other - Other descriptive features or characteristics necessary or desirable for the control action

- Type of Feedback - The type of feedback indication provided to assure the operator that the desired control action was initiated or established (e.g., control status lights)

- Feedback State - The state of the indication for display of control feedback (e.g., color of control status lights)

The information needs for the operator task were described in terms of the following categories of characteristics:

- Equipment - The name of the plant equipment involved in the feedback noting the parameter measured (status, flow, pressure)

- Type - The required or desired type of display to suit the nature of the information need (e.g., recorder, annunciator, graphic plot, etc.)

- State - The state of the parameter which is pertinent to the task accomplishment (e.g., L.T. 500 psig, At Low Level Limit, Lit, etc.)

- ID - A unique identifier derived from the panel location of the indicator

- Units - The units needed for the parameter display in order to accomplish the task without the need for conversion

- Range - The range of parameter values required for the accomplishment of the particular task under investigation

- Divisions - The required precision of the parameter value display in terms of the smallest scale division

- Other - Other descriptive features or characteristics desirable or necessary for display of the information requirement

4.3.5 Task Analysis Results

Data collection efforts took place at the NMP-1 Training Center. After an in-process audit by the Nuclear Regulatory Commission, the task analysis documentation, data, and results were reviewed to supply additional information needs in the form of feedback of control actuations. The needed indicator characteristics to support the operator's feedback tasks were also added. Table 4.3.2 provides the task numbers and action steps which were affected and the added indications supplied for control feedback. The effort successfully determined the appropriate operator tasks for accomplishment of the EPG guideline steps and the operator information and control needs to perform those tasks.

The Task Analysis data constitute a specification of operator needs to accomplish the operator functions. This specification was used as a foundation reference point to verify the availability and suitability of control room instrumentation, to provide a context within which to survey the control room, and to provide a base of understanding on which to assess human engineering discrepancies.

TABLE 4.3.2 LIST OF TASKS AUGMENTED DURING REVIEW

TASK NO.	ACTION STEP	ADDED INDICATION
2.6	3	TORUS WATER TEMP
2.8	4	CONTAINMENT SPRAY PUMP AMPS
		CONTAINMENT SPRAY PUMP FLOW
		CONTAINMENT SPRAY PUMP PRESSURE
2.45	4	CONTAINMENT SPRAY PUMP AMPS
		CONTAINMENT SPRAY PUMP FLOW
		CONTAINMENT SPRAY PUMP PRESSURE
2.51	2	FEEDWATER FLOW
	4	CONTAINMENT SPRAY RAW WTR FLOW
2.55	2	FEEDWATER FLOW
	4	CONTAINMENT SPRAY RAW WTR FLOW
2.57	2	FEEDWATER FLOW
	4	CONTAINMENT SPRAY RAW WTR FLOW
	8	LIQUID POISON HDR PRESS
3.6	5	CONTAINMENT VENT FLOW
3.8	5	CONTAINMENT VENT FLOW
3.10	5	CONTAINMENT VENT FLOW
3.13	5	CONTAINMENT VENT FLOW
6.2	1	FEEDWATER FLOW
6.2	2	CORE SPRAY FLOW
6.2	3	CONTAINMENT SPRAY FLOW
6.3	5	RPV PRESSURE
6.11	5	RPV PRESSURE
6.12	1	RPV PRESSURE

4.4 CONTROL ROOM INVENTORY

A complete list of control room indicators, controls and controllers was compiled to assist the DCRDR. All operator work areas, including the control boards, peripheral consoles, back panels, and desks were included. Using previous data compiled by NMPC Engineering, the inventory was converted to the desired format by a Human Factors Specialist, with assistance from NMPC Operations when necessary, for the verification task. Schematic drawings, equipment lists and specifications were used to facilitate the initial inventory conversion process. The result of this effort was a preliminary computerized inventory data base suitable in format to support data collection needs for the task analysis and the later analysis of information and control requirements.

Instrumentation was divided into four categories: indicators, controls, controllers and annunciators. To maintain the distinctions among types of instruments, four separate inventory forms were constructed.

4.4.1 Indicators

For each indicator the following information was recorded:

- Panel
- Instrument Number
- System Name
- Parameter Measured
  - flow
  - pressure
  - level
  - temperature
  - volume

- Label Name
- Type of Indicator

  A - Annunciator

  DC - Drum-type Counter

  EC - Electronic Counter

  M - Meter

  D - Digital Display

  R - Recorder

  LL - Legend Light

  NL - Non-legend Light
- Equipment Manufacturer Name
- Manufacturer Model Number
- Range
  - 0 to 300
  - 20 to 100, etc.
- Divisions
  - 10's
  - 5's, etc.
- Units
  - psig
  - lbs
  - inches, etc.
- Scale Markings
  - operating band
  - specific value
  - multiplier
- Pens
  - red
  - blue
- Number of points recorded (for multiple-point recorders)
- Other Labels (labels associated with instrument)

4.4.2 Controls

For each control, the following information was compiled in the inventory:

- Panel
- Instrument Number
- System Name
- Parameter Measured
  - flow
  - pressure
  - level
  - temperature
  - volume
- Label Name
- Type of Control
  - J - J-handle
  - JS - Joy Stick
  - K - Key-operated switch
  - LP - Legend pushbutton
  - NP - Non-legend pushbutton
  - RS - Rotary switch
  - SS - Slide switch
  - TH - T-handle
  - TG - Toggle switch
  - TW - Thumbwheel
- Manufacturer Name
- Manufacturer Model Number
- Mode of Control
  - Continuous
  - Discrete
  - Spring Return
  - Throttle
  - Automatic
  - Manual
  - Pull to lock

- Positions
  - Close
  - Auto
  - Open, etc.
- Control Status Lights
  - green
  - red
  - amber
- Backlit Legends
- Other Labels (labels associated with instrument)

4.4.3 Controllers

The following data were compiled on each Controller:

- Panel
- Instrument Number
- System Name
- Parameter Measured
  - flow
  - pressure
  - level
  - temperature
  - volume
- Label Name
- Manufacturer Name
- Manufacturer Model Number
- Type of Indicator

  DC - Drum-type Counter

  EC - Electronic Counter

  M - Meter

  R - Recorder

  LL - Legend Light

  NL - Non-legend Light

- Range
  - 0-5
  - 1-100, etc.
- Divisions
  - 10's
  - 5's, etc.
- Units
  - psig
  - lbs
  - inches, etc.
- Controls
  - auto/man
  - setpoint
  - parameter

o Type of Control

  J - J-handle
  JS - Joy Stick
  K - Key-operated switch
  LP - Legend pushbutton
  NP - Non-legend pushbutton
  RS - Rotary switch
  SS - Slide switch
  TH - T-handle
  TG - Toggle switch
  TW - Thumbwheel

- Position
  - start, stop
  - trip
  - close, open
- Scale Markings
  - operating band
  - specific value
  - multiplier
- Other labels (labels associated with instrument)

4.4.4 Annunciators

A special annunciator inventory was established and verified from a listing of the NMP-1 annunciators. Using this inventory and a printout of the annunciator requirements established in the task analysis, annunciator availability and appropriateness were verified. The following data were compiled for each annunciator tile:

- Panel
- Box Number
- Matrix Location Designation within the Box
- Legend

4.4.5 Inventory Verification

The inventory was verified by a panel-by-panel, top-to-bottom approach. Missing data and components were added to the data as the data base was compared to the control room instrumentation.

4.5 CONTROL ROOM SURVEY

As part of the NRC task actions following the TMI-2 accident (Item I.D.1, NUREG-0660, May 1980; January 1983), the NRC required all licensees and applicants for operating licenses to conduct a Detailed Control Room Design Review (DCRDR). To meet the intent of the DCRDR, Niagara Mohawk Power Corporation (NMPC) conducted a human engineering review of the Nine Mile Point Unit 1 (NMP-1) control room in July, 1981, based upon the criteria and guidance in the "BWR Owner's Group Control Room Design Review and Draft Evaluation Criteria".

To supplement that work, and to consider the guidance contained in NUREG-0700 "Guidelines for Control Room Design Reviews", NMPC conducted a supplemental control room survey.

4.5.1 Purpose

The objective of the original BWROG survey was to identify potential human engineering discrepancies to accepted human engineering principles. The review consisted of an evaluation of panel layout and design, instrumentation and hardware, annunciator, computers, procedures, environment and training. The original survey was conducted in July, 1981. The purpose of the supplemental control room review was to:

- Assess control room instrumentation using the BWROG Supplemental checklist provided to augment Revision 1 of the BWROG Control Room Survey Program.

- Review modifications to the control room made since July 1981 based on applicable criteria within the original and supplemental BWROG checklists.

- Assess the remote shutdown panel using the updated BWROG checklists.

The supplemental review of the Nine Mile Point Unit 1 control room was conducted during the final phase of the DCRDR in the summer of 1984.

4.5.2 Scope

The items listed in the BWROG supplemental checklists were drawn from human engineering guidelines in NUREG-0700 and verified through experience of Owners Group Survey teams.

Major sections of the supplemental checklists are identified by letters corresponding to section designations used in the original checklists. In order to differentiate between the two numbering systems, an "S" prefix was assigned to each supplement item. The sections of the original BWROG checklist are:

A. Panel Layout and Design
B. Instrumentation and Hardware
C. Annunciators
D. Computers
E. Procedures
F. Control Room Environment
G. Maintenance and Surveillance

Sections A, B and C of both original and supplemental sheets were completed for each panel containing controls and displays normally operated by control room operators. The remaining sections applied to the entire control room and, therefore,

were completed only once. Sections A and B were completed for the remote shutdown panel. Since the remote shutdown panels at NMP-1 do not contain annunciators, section C was not completed during the review of this panel. Applicable items from all sections including the supplementary criteria were used to assess modifications to the control room made since July 1981. The criteria and results for the review of control room modifications are discussed in paragraph 4.5.4 of this report.

4.5.3 Supplement Checklist Survey

The supplemental control room survey of the Nine Mile Point Unit 1 control room consisted of two phases. The first phase involved a checklist survey of supplemental items to the original BWROG survey. The checklist used for this review was the BWROG Control Room Survey Supplement (Appendix C). This survey considered the extent to which human performance characteristics are considered within the control room. The survey was performed at NMP-1 in the summer of 1984. At that time, Human Engineering Observations (HEOs) were identified for all noncompliant items and described on HEO forms (Figure 4.5.1). In addition, a photograph log was developed in order to supplement the HEO documentation.

The second phase of the control room survey consisted of assessing the remote shutdown panels and modifications to the NMP-1 control room since July 1981, based on the full BWROG Control Room Survey criteria.

4.5.4 Review of CR Modifications

The latest available revisions to the panel design and layout drawings were examined to identify the control room panel modifications for review. Based upon the type of component involved and the nature of the change, applicable survey

Figure 4.5.1

NINE MILE POINT - 1
CONTROL ROOM HUMAN ENGINEERING OBSERVATION RECORD

Originator: Date: No.: Page __ of ___

Source of HED:

Panel ID#	Equipment ID#	Equipment Name

Guideline Ref.: ____________________ Photo Log #: ____________________

Description of Discrepancy

Comments/Recommendations

sections from the original BWROG checklist were identified for the survey criteria. Table 4.5.1 provides a listing of the control room instrumentation which were involved in modifications to the NMP-1 control room since 1981. For each panel component listed, the table also provides the applicable BWROG survey sections which were used for the review criteria. A separate checklist comprised of the specific survey sections was completed for each component and non-compliant items were described on HEO forms.

Table 4.5.1
Review of CR Modifications

PANEL	COMPONENT	NAME	TYPE	APPLICABLE SURVEY SECTIONS
F		EMERG COND VENT MIMIMC	MIMIC & LIGHTS	A2, A4, A5, B4,
F		PRI CONT VENTING MIMIC	MIMIC & LIGHTS	A2, A4, A5, B4,
F	IF33	FW RECIRC TO COND	SWITCH	A3, A5, B5
F	3F25 3F26	REACTOR SAMPLE RETURN ISOL VLV 63-04 & . 63-05	SWITCH	A3, A5, B5
F	IF S5 IF 56	FW PUMP 11 & 12 HI LVL TRIP BYPASS	SWITCH	A3, A5, B5
F	IF 53 IF 54	FWP 11 & 12 BYPASS VALUES	CONTROLLER	A3, A5, B1
H	4H2-6	FW RECIRC TO CODE NSER FLOW CONTROL	CONTROLLER	A3, A5, B1
H	IH 32	SCREEN HOUSE TEMPERING GATE	SWITCH	A3, A5, B5,
L	5L 15	DRYWELL PRESS TORUS LEVEL CHLS 11 & 12	RECORDER	A3, A4, A5, B3
K	2K 35 2K 36	EMERG COND VENT ISOL VLVS 112 & 122	SWITCH	A3, A5, B5
E	1E 86 1E 87	FW CH 11 & 12 INST RESET TO NORMAL	PUSHBUTTON	A3, A5, B5
N		REHEATER MIMIC	MIMIC	A2, A4, A5, 1
E	1E 88	FW RETURN TO NORMAL		
L	5L18-1	CONT VENT TO EMERG VENT IL #11 FLOW	INDICATOR	A3, A5, B2
L	5L17	CONT VENT TO EMERG VENT IL SY ISOL VLV 121 & 122	SWITCH	A3, A5, B5

Table 4.5.1
Review of CR Modifications (continued)

PANEL	COMPONENT	NAME	TYPE	APPLICABLE SURVEY SECTIONS
L	5L16	CONT VENT TO EMERG VENT IL SY ISOL VLV 121 & 122	SWITCH	A3, A5, B5
L	5L18-2	CON VENT TO EMERG VENTIL #12 FLOW	INDICATOR	A3, A5, B2
	5L18-3	TORUS & DRYWELL N_2 FILL PRESS	INDICATOR	A3, A5, B2

4.5.4.1 BWROG Rating Methodology

The Potential for Error (PE) rating is a predetermined number ranging from one to three which indicates the relative importance of that item with respect to the potential for causing or contributing to operator error. A "3" indicates high potential for operator error, "2" indicates moderate potential and "1" indicates low potential.

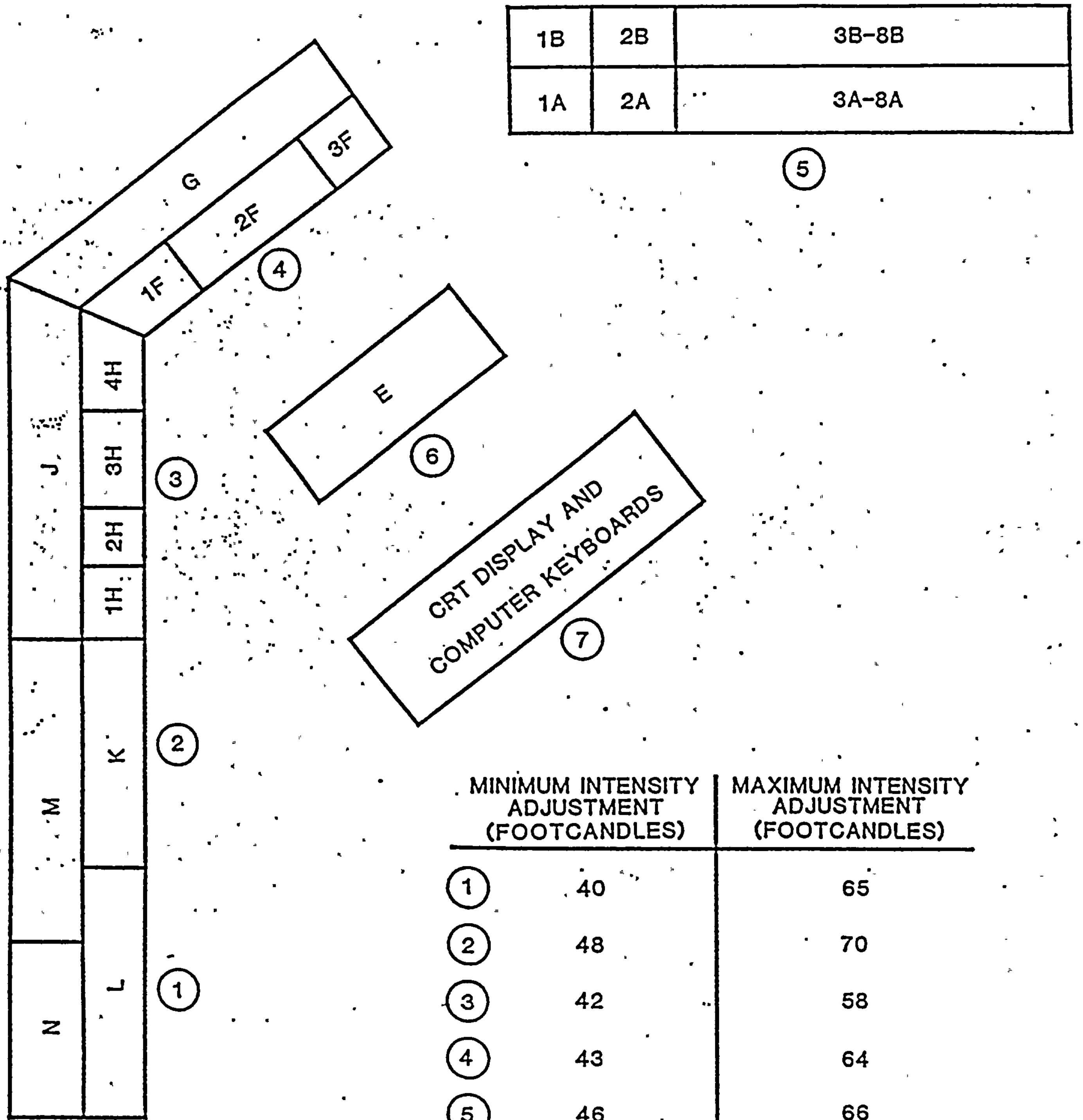
The Compliance Factor (CF) rating indicates the degree of compliance wherein "4" indicates no compliance, "3" indicates somewhat compliance, "2" indicates mostly compliance, "1" indicates full compliance and "0" indicates the criteria being considered is not applicable to the specific equipment in question. As checklist items were evaluated, the team member actually doing the evaluation indicated the relative degree of compliance by circling the applicable number.

The Evaluation Product (EP) is the product of the degree of compliance times the potential for operator error. This product provided an initial screening to determine if the consideration of corrective action is justified.

4.5.4.2 Environmental Measures

The original survey effort conducted an illumination study and an auditory survey. Whereas the annunciator signal intensities did not meet the BWROG survey criteria of 20db above background, the signals did meet the criteria of NUREG-0700 of 10db above background. General lighting and noise levels were within appropriate standards.

To assess Control Room Environment Supplement item SF 2.1, illumination levels in the control room were surveyed. Figure 4.5.2 provides the location of the data sample points (1 thru 7) and the results of the survey. Since the lights at the NMP



	MINIMUM INTENSITY ADJUSTMENT (FOOTCANDLES)	MAXIMUM INTENSITY ADJUSTMENT (FOOTCANDLES)
1	40	65
2	48	70
3	42	58
4	43	64
5	46	66
6	45	62
7	42	61

FIGURE 4.5.2 ILLUMINATION SURVEY RESULTS

control room are adjustable, two readings were recorded providing the range of illumination levels at the specific sample points in the control room. The sample points in question for item SF 2.1 are data points 6 and 7 where operator desks are located. At these points, the range of illumination intensity varied from approximately 45 to 62 footcandles.

Illumination levels were uniform across sample points ($\pm$ 7 f.c.) and shadowing was eliminated on panels and work surfaces. There was a certain amount of glare present on the meter faces which is reported for corrective consideration on HEO CS-21.

4.5.5 <u>Control Room Survey Efforts in Response to NRC Audit Results</u>

During an in-progress audit conducted at NMP-1 late in 1984, the Nuclear Regulatory Commission suggested several improvements to the NMP-1 control room surveys. These comments involved the following items:

- Control Room Environmental Surveys - The survey lacked a specific evaluation of the control room temperature/humidity ranges, air velocity and air movement.

- Remote Shutdown Panel Environmental Surveys - The survey lacked any evaluation of the remote shutdown panel environment.

- Annunciators - The survey results did not adequately address annunciators.

- Communications - The survey results did not adequately address communications.

- Emergency Equipment - The survey results did not adequately address emergency equipment.

In response to the NRC's concerns, NMPC and ARD reassessed previous efforts addressing the areas identified by the NRC. The areas of annunciators, emergency equipment and communications were sufficiently addressed in the BWROG Supplemental Survey which was applied in the summer of 1984. It was decided however, that some environmental measures were needed for both the remote shutdown panels and the control room. The following surveys were taken for the remote shutdown panel survey:

- Lighting
- Sound
- Temperature/Humidity
- Air Velocity

For the control room, temperature/humidity and air velocity surveys were conducted. A similar survey will be conducted in July, 1985, to evaluate the environmental conditions during hot weather and using emergency ventilation.

In both survey areas the temperature/humidity and air velocity measures were within acceptable standards. Lighting and noise for the remote shutdown panels were found to be outside of the NUREG-0700 acceptance criteria and were doucumented on HEOs ENV-1 and ENV-2.

4.5.6 Fire Panel Study

As an outcome of the assessment effort and previously identified HEOs, a fire panel study was conducted to identify specific discrepancies to accepted human engineering criteria and enhancement recommendations to resolve potential problems. The study was conducted early in February, 1985.

4.5.6.1 Organization of Panel Elements

The fire system is a combination of foam water, CO_2, sprinkler, deluge water, preaction water, and halon systems which are dispersed in separate fire zones throughout the plant. The fire panel is organized according to major boundaries (i.e. buildings) and within the boundaries into fire zones. The major fire boundaries are:

1. Turbine Island
2. Turbine Perimeter
3. Control Complex
4. Reactor Building
5. Screenhouse
6. Radwaste
7. Off gas
8. Yard
9. Administration Building

Components of the fire systems which are common to a fire zone are grouped on the fire panel. Components which have no groupings (e.g., a zone which is protected by a sprinkler system only) are located together directly under the major boundary name and can be easily identified by the lack of an integrated control.

Annunciator panels are located at the top of the fire panel and are comprised of three types: fire alarms, trouble alarms, and system status tiles.

4.5.6.2 Fire Panel Controls

Manual actuation switches have a number of different positions depending upon the type of system, component, and control function.

4.5.6.3 Fire Panel Status Boxes

The legend lights located within the fire panel are arranged in "zone boxes" with boxes representing the fully automatic functions associated with the zone. In some instances, there are multiple boxes representing the fire zone components. In these cases, the boxes are adjacent above or to the side and the detector zone or area numbers are repeated followed by suffixes differentiating the locations within the zone. The legends consist of the name and elevation of the major boundary, the zone name, and the coded detector designation.

4.5.6.4 Fire Panel Coding and Abbreviations

The extinguishing systems located within a zone are represented by the status boxes (auto initiate) and control boxes (auto/man initiate). The information on these components indicates the name and number of the detector which has signaled, the type of extinguishing systems associated with the zone, and the type of logic associated with the actuation of the extinguishing system. The following coded abbreviations are used to provide the detector and zone information:

Type of System

C - Carbon Dioxide
FW - Form Water
H - Halon
Sp - Sprinkler
WD - Water, deluge
WP - Water, Preaction

System Actuation Logic

D - Detection Only
DX - Detection, Crosszone
DA - Detection, Automatic

4.5.6.5 Fire Panel Color Coding

The annunciator tiles are color coded to identify their type. Red tiles identify a fire alarm, yellow tiles identify a trouble alarm, and white tiles are used to provide system status information.

Control positions are backlighted on the Fire Panel and are color coded according to the following control functions:

POSITION	COLOR
Stop	Green
Start	Red
Close	Green
Open	Red
Alarm Only	Yellow
Discharge	Red
Reset	Green
Smoke Purge	Red
Normal	Green
Bypass	Red

The legend lights in the "zone box" are color coded red if the system is an extinguishing system which automatically actuates and has no manual or crosszone control functions. The red light indicates that the system has actuated and should be accompanied with a red fire alarm at the appropriate annunciator tile. All other legend lights are white.

Yellow dots indicating the fire system components required by Tech Specs. have been applied to the appropriate "zone boxes".

In addition to the index coding scheme, a color scheme has been developed to aid in the identification of the type of fire system. The rims about the components within a zone are color coded to provide the system type:

Red - CO_2 System
Black - Foam Water
White - Deluge Water
Chrome - Halon
Grey - Water Preaction, Sprinkler, or Detection Only

The one meter on the fire panel indicating Main Fire Header Pressure is color coded for the following pressure ranges:

Red - Low Pressure (out of tolerance)

Amber - Low Pressure (marginal)

Green - Operating band

Amber - High Pressure (marginal)

Some panel controls also present a message for feedback of control actuation. These legends are backlit and color coded as follows:

Header Press - Red

Discharge - Red

4.5.6.6 Human Factors Analysis

Although the Fire panel is organized by major boundaries and zones within boundaries, the identities of component groups representing a specific zone could be enhanced. For example,

zone 113 components consist of 3 controls in a horizontal row with a legend box over the center control box. Zone 101 consists of 2 controls and 2 legend boxes oriented in a vertical column. While there are layout conventions which mandate these patterns, it nevertheless contributes to the operator's confusion with the panel.

The operators were concerned with the durability of the controls used for the fire panel. Approximately 12 out of 62 control knobs were cracked making operation of the control very difficult and potentially hazardous in that the slack provided by the loose fit could contribute to an "overshoot" by the operator in switching positions. This could result in the discharging of the extinguishing system.

Control position names and position sequences are consistent with the uses and positions within the main control panels. In theory, the fire panel should operate on a "green board" concept whereby all lights lit on the board should be green or white. Any yellow lights would indicate trouble or out of position switches, and red would indicate initiated systems.

Color coding is used extensively on the fire panel. Although the colors red and green are used often in the coloring scheme, their unique meanings are limited to two or three contexts which are consistent with their color meanings on the main control panels.

The fire panel presents a large amount of information some of which may not be necessary for the control room operator to respond to fire alarms. The information presented is pertinent to the operation of the panel and may prove to be very useful under fire emergency conditions.

Contributing to the operator's dissatisfaction with the panel

design is the lack of training and familiarization with the design and operation of the panel.

4.5.6.7 Fire Panel Review Results

There were nine HEOs resulting from the fire panel review indicating a lack of demarcation lines and summary labeling and other specific control and display problems. Fire panel HEOs are prefixed by FP.

4.6 VERIFICATION OF TASK PERFORMANCE CAPABILITIES

The Verification of Task Performance Capabilities task completed the task analysis and inventory efforts. In this task, the information and control needs and their needed characteristics identified in the task analysis effort were compared to the corresponding control room inventory components and characteristics to verify the availability and suitability of control room equipment to support operator task performance.

4.6.1 Verification Process

Because the inventory was organized into four component types, there were separate verifications performed for controls, indicators, controllers, and annunciators. In addition, there were also verifications performed for back panel and other control room equipment whose characteristics were omitted or not fully described in the NMP-1 inventory data base. Where the inventory and task analysis data bases were compatable, the verification process was automated (i.e., a computerized matching of corresponding data fields).

For both the automated and manual verification checks, the mechanics were the same; for each information control, and characteristic need identified in the task analysis, corresponding control room equipment and characteristics were verified to be available and suitable. If a need was found to be either unavailable or unsuitable, a Human Engineering Observation (HEO) was generated to further investigate a potential discrepancy.

4.6.2 The Verification of Control Capability

For controls other than process controllers, the verification process was a simple matching of the appropriate data fields. In this process, the following verification checks were performed:

- Availability - If the needed control did not have a corresponding control in the inventory, an availability mismatch message appeared in the verification printout.

- Control Mode of Operation - If the specified discrete or continuous control capability did not match the inventory control mode characteristic, a control mode mismatch message appeared in the verification printout.

- Discrete Control Setting - If the needed control position did not have a corresponding position match in the inventory, a discrete control setting mismatch appeared in the verification printout.

- Control Status Light - If the control need specified a control status light as needed feed back information, the corresponding control inventory characteristics were checked for a matching light color. If a match was not found, the control status light mismatch message appeared in the verification printout.

- Control Type - If the specified control type did not match the corresponding inventory type, a control type mismatch message appeared in the verification printout.

4.6.3 Verification of Information Capability

For information needs which were represented by control room hardware other than CRT displays (i.e., indicators), the verification process was a matching of appropriate data fields.

For the indicator verification, the following verification checks were performed:

- Availability - If the needed instrument did not have a corresponding indicator in the inventory, an availability mismatch message appeared in the verification printout.

- Display Type - If the specified type of display (e.g., meter, recorder, etc.) did not match the corresponding indicator type, a type mismatch message appeared in the verification printout.

- Units - If the specified units of display as determined in the task analysis did not match the units of the corresponding indicator, a units mismatch message appeared in the verification printout.

- Range - If the specified range of parameter display as determined in the task analysis was not encompassed by the range of the corresponding indicator, a range mismatch message appeared in the verification printout.

- Divisions - If the divisions of the corresponding indicator did not match or exceed the specified division or precision of parameter display as determined in the task analysis did not match , a divisions mismatch message appeared in the verification printout.

4.6.4 Verification of Process Controller Capability

The verification of controller availability and suitability was performed manually due to a incompatibility between the controller inventory and the formatting of task needs in the task analysis data base. The needs and identification information were identified and recorded using the same process employed for the control and indicator records, however, the formatting of this information in the data base prevented an automatic check of availability and suitability.

In order to provide an auditable trail of the process, an unavailability message appeared on the printout, thereby generating a Human Engineering Observation. To resolve the verification HEOs generated for controllers, a manual verification of the following was performed, as applicable:

- Availability
- Control Type(s)
- Display Type(s)
- Display Unit(s)
- Display Range(s)
- Display Division(s)
- Control Mode
- Discrete Control Setting

These checks involved manually verifying the items previously described in the controls and indicators sections.

4.6.5 Verification of Annunciator Capability

The verification of annunciator availability and suitability was performed manually due to the incompatibility between the annunciator inventory and the formatting of task needs in the

task analysis data base. As with the controllers, an unavailability message appeared on the verification printout when an annunciator need was indicated. An HEO was generated requiring manual verification of the annunciator availability and legend content to meet the required need.

4.6.6 Verification of Other Equipment Capability

When a need was identified in the task analysis data base and a corresponding ID number was not available as in the case of back panel equipment or a corresponding ID number was not present in the inventory listing, an unavailability message appeared in the verification printout. This generated an HEO which required a manual verification of the availability of CR equipment to supply the need and the suitability of the equipment's characteristics to meet the identified needs of the task.

4.6.7 Verification Results

There were 42 HEOs which resulted from the verification task indicating either unavailable equipment, unsuitable characteristics, or inventory/task analysis data base incompatibility. Verification HEOs can be identified by the VER in the HEO number.

4.7 VALIDATION OF CONTROL ROOM FUNCTIONS

The methodology for the Nine Mile Point Unit 1 validation employed the techniques of simulator walk-through and talk-through. Four selected events were taped and analyzed at the NMP-1 simulator using the walk-through approach. Tasks identified in the NMP-1 task analysis effort were analyzed at the simulator control panels using the talk-through approach. The criteria described in Table 4.7.1 were applied in both validation approaches.

4.7.1 Objective

The objective of the validation review was to determine if the functions allocated to the control room operating crew can be accomplished effectively within both the structure of the established emergency procedures and the design of the control room.

4.7.2 Simulator Walk-Throughs

Simulator walk-throughs were conducted at the NMP-1 simulator early in the fall of 1984. Event simulations were conducted in real time with the full system response of the plant simulation in effect.

4.7.2.1 Event Selection

Since the upgraded EOPs based upon the plant-specific EPGs had

Table 4.7.1 Validation Criteria

CONTROLS

Availability - Controls needed to perform critical emergency tasks are available in the CR without the operator leaving the primary operating area.

Usability - Each control is easily adjusted with the required level of precision.

Type - Each control is the type normally expected by the operator.

Inadvertent Actuation - Control actuation will not result in inadvertent actuation of an adjacent control.

Redundancy - Duplication of controls will not occur unless there is a specified reason.

Simultaneous Actuation - Simultaneous actuation of adjacent controls (where required) possible.

Feedback - For each control action, there is a positive feedback that the action was initiated.

DISPLAYS

Unavailable Information - Information needed to perform critical emergency tasks are available in the CR without the operator leaving the primary operating area.

Obscured - Controls and displays are located so that displays are not obscured during task performance.

Suitability - Information is presented in the form needed by the operator (i.e., appropriate units, range, and divisions)

Related Displays Location - When information between two or more displays must be compared, are the displays located in close proximity to one another?

Redundancy - Redundancy of information is minimized.

Table 4.7.1 Validation Criteria (continued)

CONTROL/DISPLAY RELATIONSHIPS

C/O location - A visual display monitored during control manipulation is located close enough to the operator to allow easy reading without parallax from a normal operating posture.

Lag Time - No lag time exists between system condition change and display indicator.

Task Grouping - Controls and displays used to accomplish a task sequence are logically grouped in a common panel area.

Minimize Operator Movements - Panel elements are assigned to work stations to minimize operator movements.

PROCEDURE

Consistent Nomenclature - Nomenclature used in the procedure is consistent with the terminology used in the CR labeling and the vernacular of the operators.

Sequence - The sequence of an operator action in response to the initiating event is the same as that outlined in the procedure with the net results of achieving the goals as stated in the purpose of the procedure.

TASK PERFORMANCE

Leave Primary Area - While continuous monitoring of instruments is critical, operators do not have to leave the primary operating area.

Appropriate Manning/Task Assignments - Control room manning and task assignments ensures complete and timely coverage of controls, displays, and other equipment during the simulation of the event. .

Excessive Workload - Operators can cope with the variety and time sequence of the tasks needed to be accomplished in the mitigation of the event.

Obstructions to Traffic Flow - Operators are able to access any work station without having to overcome obstacles such as tripping hazards, poorly positioned file cabinets or storage racks, maintenance equipment, etc.

Minimize Operator Movements - The layout of the control room is efficient in that operator movements are minimized within the actions of carrying out tasks and in transitioning between related tasks.

not been implemented, events for the DCRDR validation walk-throughs were selected from the special operating procedures currently in place for dealing with emergency conditions. The selection was based on the substantial exercising of the four major sections of the EPGs that these event-based procedures carried out and encompassed the tasks identified in the task analysis effort. Based on these criteria, the following events were selected for the walk-through validation:

- Small LOCA Inside Containment
- High Activity in Condenser Off-Gas
- Reactor Failure to Scram
- Main Steam Line Break Outside Drywell

Table 4.7.2 shows the sections of the EPGs which are exercised by each of the selected events.

4.7.2.2 <u>Simulator Walk-Through Approach</u>

Simulator walk-throughs were performed according to the following procedural steps:

1. The simulator instructor programmed the event for validation and obtained the appropriate procedure(s). A trained operating crew consisting of two reactor operators reviewed the procedure(s) for the event selected.

2. Video tape equipment were set up and tested to verify that the video and audio components functioned properly. Two cameras and recorders were used to document the event simulation walk-through. The cameras were positioned at a distance from the work stations to ensure an unobstructed view of each station. This allowed for the monitoring of head movement and action response. A camera was available for each reactor operator.

Table 4.7.2. Selected Events Showing EPG Sections Exercised

Scenario	Reactor Pressure Vessel	Primary Containment Control	Secondary Containment Control	Radioactivity Release Control
Small LOCA Inside Containment	X	X	X	
High Activity in Condenser Off-Gas	X		X	X
Reactor Failure to Scram	X			
MSL Break Outside Containment	X			X

3. The simulator instructor and the human factors specialist assembled and briefed the participating control room personnel on the purpose and specific objectives of the event simulation for video tape walk-throughs and on the walk-through procedure. Any assumptions about the operating situation were specified to the operators during the briefing.

4. The event simulation walk-through was begun. To facilitate the simulation fidelity, the human factors specialist did not accompany the operator to take observational notes. Procedures were available to the operating crew for reference but procedural steps were not called out. During the event simulation, a voice-over narration by one of the NMP-1 operations trainers was recorded on the video tape. The narration conveyed what was transpiring and what the operator(s) were performing and why. Specifically, the narrator recorded the following information during the event simulation:

   - Actions operators were taking
   - Direction of action movement
   - Display/indicator to which the operators referred, to identify the system response to actions taken
   - System response to actions taken

5. At a cue from the operating crew performing the event simulation, the event was terminated. The video tape operator, at that point, removed the tape from the recorder and logged in:
   - The event taped
   - The date of taping
   - The time of taping
   - Any unusual circumstances surrounding the taping
   - The counter reading from the video tape recorder

6. Within two weeks of the taping, the human factors specialist who conducted the validation processes viewed the video tape and evaluated the operator performance versus the control board/control room design criteria, specified earlier, for each step of the procedure(s) being used for the event under consideration. A Validation Review Worksheet was used to record the human factors specialist's evaluation of each procedure step.

4.7.3 Simulator Talk-Throughs

In the talk-through validation effort, an operator demonstrated to the human factors specialist the operator tasks and equipment responses for each of the four selected events and all tasks identified in the NMP-1 task analysis effort. Talk-throughs were conducted at the Nine Mile Point Unit 1 simulator early in the fall of 1984.

4.7.3.1 Event Scenario Tasks and the NMP-1 EPG Task Data Base

A talk-through was conducted for each of the four selected validation scenarios. A good representation of the EPG tasks described in the task analysis data base were included in the selected scenarios. The tasks from the EPG data base represented in each of the four selected events are listed in Tables 4.7-3, 4.7-4, 4.7-5, and 4.7-6. All tasks not represented in the selected events were validated using the same technique employed for the scenario talk-throughs.

Table 4.7-7 provides the listing of all EPG tasks and the manner in which they were investigated in the talk-through validation. In Table 4.7-7, tasks which list a reference task in the Reference Task column are either equivalent tasks to the reference task or exercise the same equipment as the reference task.

Table 4.7-3

Tasks Represented in LOCA Inside Drywell

Task No.	Task Title
1.3	Identify Drywell Pressure Above 3.5 PSIG
3.26	Observe Suppression Chamber Pressure Limit
1.9	Verify Status of ECCS Actuation
1.10	Initiate ECCS Actuation
2.28	Shutdown Recirculation Pumps
1.7	Verify Reactor Vessel and Primary Containment Isolation
1.8	Initiate Reactor Vessel Isolation
2.2	Observe Drywell Temperature Above 135°F
2.22	Initiate Drywell Sprays
1.19	Determine if Emergency RPV Depressurization is Required
1.6	Verify Reactor Scram
1.16	Determine Status of RPV Level Control
1.13	Determine if RPV Flooding is Required
1.14	Restore and Maintain RPV Level Between 53" and 95"
1.23	Manually Open SRVs
1.24	Check Suppression Pool Temp Below Limit
2.8	Operate Available Suppression Pool Cooling
2.30	Initiate Drywell Sprays
1.38	Initiate Shutdown Cooling System

Table 4.7-4

Tasks Represented in High Activity in Condenser Off-Gas

Task No.	Task Title
3.2	Observe Area Temperature High Temp Alarm Setpoint
4.1	Observe Offsite Rad/Activity Release Above Alert
3.16	Observe a Primary System Discharge into an Area and the High Temp Alarm
3.15	Isolate all Systems Discharging into High Temp Area Except Systems Required for Shutdown

Table 4.7-5

Tasks Represented in Failure of Reactor to Scram

Task No.	Task Title
1.11	Determine if Boron Injection is Required
1.5	Determine Condition Which Requires Reactor Scram
1.42	Terminate Boron Injection
1.43	Confirm Reactor Mode Switch in Shutdown
1.45	Trip Recirculation Pumps
1.58	Rapidly Insert Control Rods Manually Until Reactor Scram is Reset
1.62	Initiate a Manual Reactor Scram
1.63	Verify Control Rods Move Inward
1.54	Reset Reactor Scram
1.53	Identify and Respond to Control Rods Not Moving Inward
1.52	Identify and Respond to a Scram Valve Not Open
1.66	Individually Open Scram Test Switches for Control Rods Not Inserted
1.65	Open Scram Discharge Volume Vent and Drain Valves
1.47	Inject Boron into RPV
1.12	Determine if RPV Water Level Cannot be Determined
2.19	Observe Drywell Temp 301°F and Increasing
2.21	Shutdown Drywell Cooling Fans
2.22	Initiate Drywell Sprays
1.38	Initiate Shutdown Cooling

Table 4.7-6

Tasks Represented in Main Steam Line Break Outside Containment

Task No.	Task Title
1.4	Determine Need for MSIV Isolation
3.2	Observe Area Temp High Temp Alarm Setpoint
3.3	Observe RB HVAC Exhaust Radiation Level 5 MR/HR
3.4	Observe Area Radiation Lvl High Rad Level Alarm Setpoint
3.5	Observe Floor Drain Sump Water Level Setpoint
1.1	Identify RPV Water Level Below 53"
3.8	Observe RB HVAC Isolates
3.7	Confirm or Manually Initiate EVS
1.7	Verify Reactor Vessel and Primary Containment Isolation
1.5	Determine Condition Which Requires Reactor Scram
1.9	Verify Status of ECCS Actuation
1.6	Verify Reactor Scram
1.8	Initiate Reactor Vessel Isolation
1.16	Determine Status of RPV Level Control
1.14	Restore and Maintain RPV Level Between 53" and 95"
1.19	Determine if Emergency RPV Depressurization is Required
1.23	Manually Open SRVs
1.10	Initiate ECCS Acutation
1.24	Check Suppression Pool Temp Below Limit
2.8	Operate Available Suppression Pool Cooling
2.30	Initiate Drywell Sprays
1.38	Initiate Shutdown Cooling

Table 4.7-7

Task No.	Represented in Event Scenario: Table 2	Table 3	Table 4	Table 5	Not Represented in Event Scenario: Reference Task	Task Talk-Through
1.1				X		
1.2						X
1.3	X					
1.4				X		
1.5			X	X		
1.6	X			X		
1.7	X			X		
1.8	X			X		
1.9	X			X		
1.10	X			X		
1.11			X			
1.12			X			
1.13	X					
1.14	X			X		
1.15						X
1.16	X			X		
1.17						X
1.18						X
1.19	X			X		
1.20						X
1.21					1.7	
1.22						X
1.23	X			X		
1.24	X			X		
1.25						X
1.26						X
1.27					1.11	
1.28						X
1.29						X

Table 4.7-7 (continued)

	Represented in Event Scenario				Not Represented in Event Scenario	
Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
1.30						X
1.31						X
1.32						X
1.33						X
1.34						X
1.35						X
1.36						X
1.37						X
1.38	X		X	X		
1.39					1.38	
1.40					1.38	
1.41						X
1.42			X			
1.43			X			
1.44						X
1.45			X			
1.46					1.11	
1.47			X			
1.48						X
1.49						X
1.50					1.47	
1.51						X
1.52			X			
1.53			X			
1.54			X			
1.55					1.10	
1.56					1.10	
1.57						X

Table 4.7-7 (continued)

	Represented in Event Scenario				Not Represented in Event Scenario	
Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
1.58			X			
1.59					1.54	
1.60					1.54	
1.61						X
1.62			X			
1.63			X			
1.64					1.54	
1.65			X			
1.66			X			
1.67						X
1.68					1.57	
1.69					1.55	
1.70					1.55	
1.71					1.58	
1.72					1.63	
1.73						X
1.74						X
2.1					1.24	
2.2	X					
2.3					1.3	
2.4						X
2.5					2.41	
2.6					1.38	
2.7					1.24	
2.8	X			X		
2.9					1.24	
2.10					1.43	
2.11					2.1	

Table 4.7-7 (continued)

	Represented in Event Scenario				Not Represented in Event Scenario	
Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
2.12						X
2.13						X
2.14					2.19	
2.15						X
2.16						X
2.17						X
2.18						X
2.19			X			
2.20					1.45	
2.21			X			
2.22	X		X			
2.23					2.19	
2.24						X
2.25						X
2.26						X
2.27						X
2.28	X					
2.29						X
2.30	X			X		
2.31					2.27	
2.32					2.31	
2.33					2.31	
2.34					2.27	
2.35					2.20	
2.36					2.29	
2.37					2.22	
2.38					2.32	
2.39						X

Table 4.7-7 (continued)

	Represented in Event Scenario				Not Represented in Event Scenario	
Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
2.40						X
2.41					2.40	
2.42						X
2.43					2.41	
2.44					2.41	
2.45						X
2.46					2.45	
2.47						X
2.48						X
2.49					2.47	
2.50						X
2.51						X
2.52						X
2.53					2.41	
2.54					2.50	
2.55					2.51	
2.56						X
2.57					2.51	
3.1						X
3.2		X		X		
3.3				X		
3.4				X		
3.5				X		
3.6					3.8	
3.7				X		
3.8				X		
3.9					3.3	
3.10						X

Table 4.7-7 (continued)

Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
	Represented in Event Scenario				Not Represented in Event Scenario	
3.11						X
3.12					3.3	
3.13					3.10	
3.14					3.2	
3.15		X				
3.16		X				
3.17						X
3.18					3.16	
3.19						X
3.20					3.2	
3.21					3.15	
3.22					3.16	
3.23						X
3.24					3.16	
3.25						X
3.26	X					X
3.27						X
3.28						X
3.29						X
3.30						X
3.31						X
3.32						X
4.1		X				
4.2					3.15	
4.3					4.1	
4.4						X
4.5						X
5.1					1.11	

Table 4.7-7 (continued)

Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
	Represented in Event Scenario				Not Represented in Event Scenario	
5.2					1.12	
5.3					1.13	
5.4					1.22	
5.5					1.14	
5.6					1.14	
5.7					1.14	
5.8						X
5.9						X
5.10					1.2	
5.11					1.14	
5.12					1.48	
5.13					1.2	
5.14					5.13	
5.15					5.13	
5.16					1.14	
5.17					1.14	
5.18					5.13	
5.19					1.14	
5.20						X
5.21						X
5.22					1.14	
5.23					5.13	
5.24					5.13	
5.25					1.14	
5.26					5.13	
5.27						X
5.28					5.13	
5.29						X

Table 4.7-7 (continued)

	Represented in Event Scenario				Not Represented in Event Scenario	
Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
6.1					1.12	
6.2						X
6.3					1.12	
6.4					1.22	
6.5					1.24	
6.6					1.38	
6.7					1.38	
6.8					6.7	
6.9						X
6.10						X
6.11						X
6.12						X
6.13						X
6.14					1.13	
6.15						X
6.16						X
7.1					6.4	
7.2					1.19	
7.3					1.14	
7.4						X
7.5						X
7.6					1.14	
7.7					5.2	
7.8					1.38	
7.9					1.14	
7.10						X
8.1					6.6	
8.2					6.7	

Table 4.7-7 (continued)

	Represented in Event Scenario				Not Represented in Event Scenario	
Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
8.3						X
8.4					2.8	
8.5					1.14	
8.6					1.14	
8.7					1.14	
8.8						X
9.1					2.8	
9.2						X
9.3					1.8	
9.4						X
9.5						X
9.6						X
9.7						X
9.8					8.3	
9.9						X
9.10						X
9.11					8.3	
9.12					9.10	
9.13					1.38	
9.14					1.38	
9.15						X
9.16						X
9.17						X
10.1					1.38	
10.2					1.14	
10.3					1.8	
10.4					9.5	
10.5					1.10	

Table 4.7-7 (continued)

Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
	Represented in Event Scenario				Not Represented in Event Scenario	
10.6					1.6	
10.7					1.14	
10.8					1.2	
10.9					1.38	
10.10					1.12	
10.11					1.14	
10.12					1.14	
10.13					1.14	
10.14					1.14	
10.15					1.14	
10.16					1.7	
10.17					1.2	
10.18					1.14	
10.19					1.14	
10.20						X
10.21					1.7	
10.22					1.2	
10.23					1.14	
10.24					1.6	
10.25					1.6	
10.26					1.47	
10.27					1.12	
10.28					1.14	
10.29					1.14	
10.30					1.14	
10.31					1.14	
10.32					1.14	
10.33					1.14	

Table 4.7-7 (continued)

	Represented in Event Scenario				Not Represented in Event Scenario	
Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
10.34						X
10.35					1.6	
10.36					1.2	
10.37					1.14	
10.38					1.12	
10.39					1.14	
10.40					1.14	
10.41					1.14	
10.42					1.14	
10.43					1.14	
10.44					1.14	
10.45					1.34	
10.46					1.12	
10.47					1.14	
10.48						X
10.49					1.14	
10.50						X
10.51					1.14	
10.52					1.2	
10.53					1.14	
10.54					1.14	
10.55					1.12	
10.56						X
11.1					1.11	
11.2					1.24	
11.3					1.38	
11.4					1.3	
11.5					1.14	

Table 4.7-7 (concluded)

	Represented in Event Scenario				Not Represented in Event Scenario	
Task No.	Table 2	Table 3	Table 4	Table 5	Reference Task	Task Talk-Through
11.6					1.6	
11.7					1.14	
11.8					1.3,1.7	
11.9					1.14	
11.10					1.19	
11.12					1.14	
11.13					1.14	
11.14					1.14	
11.15					1.14	
11.16					1.14	
11.17					1.14	
11.18					1.2	
11.19					1.23	
11.20					1.24	
11.21					1.14	
11.22					1.14	
11.23					1.14	
11.24					1.14	
11.25						X
11.26					1.6	
11.27					1.47	
11.28					1.6	
11.29					1.14	
11.30					1.14	
11.31					1.14	
11.32					1.14	
11.33					1.40	
11.34						X

4.7.3.2 Simulator Talk-Through Approach

The talk-through examined the operator actions in response to the event starting with the initiating cue(s) and including each immediate and subsequent operator action. Specific plant equipment and operator decisions involved in each task were identified as the operator described the actions from the applicable simulator work station. The goal of the talk-through was for the validation team members to become acquainted with the four
selected events and to assess the availability and suitability of control room equipment and layout to support the operator's needs in performing emergency tasks.

During the talk-through, questions were raised by the human factors specialist concerning the operator needs and equipment characteristics. In addition, the human factors specialist evaluated the operator performance versus the control board/control room design criteria described in Table 4.7-1 for each action of the task under consideration. The Validation Review Worksheet in Figure 4.7-1 was used to record evaluation observations.

Figure 4.7.1 Validation Review Worksheet

OBSERVATIONS FROM VALIDATION
WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or
Procedure: ______________ ______________________________
Number Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description

4.7.4 VALIDATION RESULTS

The comments recorded on the Validation Review Worksheet were cross-checked against the HEOs documented in previous review processes of the DCRDR. A comment not previously addressed by existing HEOs represented a new observation and was reported as such. The Validation Review Worksheets for the NMP-1 Control Room Validation follow. From this review, 26 new HEOs were identified for NMPC consideration during the Assessment/ Resolution Phase of the DCRDR.

VALIDATION REVIEW WORKSHEETS

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or Procedure: N1-SOP-26 (Number) — High Activity Reactor Coolant or Off-Gas (Title)

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X		C1.1	04:50 06:52	Leave Primary Area	The operator must refer to instrumentation located on back panels for area radiation monitoring.
X		B2.2		Consistent Nomenclature	The procedure refers to "Air Ejector Off-Gas Discharge" while the control board equipment is entitled "Off-Gas to Stack Isolation Valve".
	X		13:52	Task Grouping	To reset reactor trip, the operator actuates the "Scram Discharge Volume High Level Bypasses" on Panel F and also the "Reactor Trip Reset" on Panel E.
	X		20:10	Availability	Operators are not able to silence or acknowledge alarms from any panel except the one station at Panel E.
	X		17:27 17:46	Task Grouping	Operator adjusts reactor reject flow in attempt to establish level at Panel K while other level controlling operations are conducted at Panel F.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or Procedure: N1-SOP-32 (Number) — Failure of Reactor to Scram (Title)

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X		5.a		Consistent Nomenclature	The procedure refers to "Stand-by Liquid Control System" whereas the control board equipment refers to the system as "Liquid Poison".
	X		03:20	Leave Primary Area	The operator leaves the primary control area to attempt to scram the reactor from the scram test panel on Panel M.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or Procedure: N1-SOP-29 (Number) — Pipe Break Inside Drywell (Title)

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X		C-3.a		Task Grouping	To reset reactor trip, the operator must actuate the "Scram Discharge Volume High Level Bypasses" on Panel F and also actuate "Reactor Trip Reset" on Panel E.
X		B-2.e		Control/Display Location	The HPCI annunciator is on Panel F4 while the HPCI pumps and equipment are on Panel F1.
X		B-2.c		Task Grouping	When initiating Primary Containment Isolation, the MSIVs are isolated on Panel F while the other equipment for Primary Containment Isolation (SDC and CU) are located on Panel K.
X		D-4.c		Consistent Nomenclature	The procedure refers to "Suppression Pool Temperatures" whereas the control board equipment is entitled "Torus Water Temp".
X		D-4.d		Consistent Nomenclature	The procedure refers to "Containment Pressure" while the control board equipment is entitled "Drywell and Torus" pressures.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: N1-SOP-29 — Pipe Break Inside Drywell

Number — Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X		D-4.f		Unavailable Information	The procedure calls for a specific cooldown rate of 100°F/hr which is identified using RCP temperature. There is no dedicated trend recorder for this purpose. The operators can put RCP temp on the computer point trend recorder which is the current means of monitoring RCP temperature trend.
X		A-1.1.a		C/D Location	The annunciator entitled "High Drywell Press" is located on Panel K2. The appropriate ranged meter (0-4psi) for Drywell Pressure for response action to this annunciator is located on Panel L.
X		B-2.c		Usability	The valves for "Reactor R Pump Suction" and "Reactor R Pump Discharge" have to be held in the close position for about 2 minutes while valve shuts.
X		C-3.e		Task Grouping	The reset switch for the Feedwater Pump Logic which is used in order to take manual control of feedwater for level control is located on Panel E while the level controlling operation is performed at Panel F.
X		C-3.e		Inadvertent Actuation	For the operator to hit the Feedwater Pump logic reset switch when controlling reactor level, the operator typically reaches over the vertical section of Panel E in lieu of walking around in order to stay close to Panel F. This action increases the potential for inadvertent actuation of controls on Panel E.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: N1-SOP-29 (Number) — Pipe Break Inside Drywell (Title)

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
	X		05:40	Leave Primary Area	Operator had to leave primary area to respond to CAM alarm.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: N1-SOP-30 — Pipe Break Outside Primary Containment

Number — Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
	X		02:40	Inadvertent Actuation	Operator reaches over E Panel vertical section to hit HPCI reset while monitoring level at F Panel.
	X		02:40	Task Grouping	Operator resets HPCI at E Panel while HPCI equipment and level control is located on F Panel.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: 1.30 — Open MSIVs to Reestablish the Main Condensers as a Heat Sink

Number — Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X				Usability	Operator must install jumpers to bypass RPS logic to perform this task. A bypass switch may be needed.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: 1.31 — Control RPV Pressure Below 1090 PSIG Using Main Turbine Bypass

Number — Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X				Appropriate Manning/Task Assignments	This task requires two people due to the layout of the control panels. One person must monitor steam flow and feed flow on Panel F2 while the second opens bypass valves on Panel A1.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: 1.32 — Maintain RPV Pressure Control Using EC

Number — Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X				Feedback and Task Grouping	Operator does not have appropriate feedback of RPV pressure at K panel when opening Condensate Return valves.

OBSERVATIONS FROM VALIDATION
WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or
Procedure: 1.35 — Maintain RPV Pressure Control Using RWCU

Number — Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X				Feedback and Task Grouping	Operator does not have appropriate feedback of RPV pressure at K panel when increasing Reactor Water Cleanup flow.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: 1.57 — Close HCU Accumulator Charging Water Header Valve 301-69

Number — Title

TT	WT	Proc Step	Tape Elapsed. Time	Criteria Topic	Observation Description
X				Availability	Capability to perform this task is not available from the control room.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or Procedure: 1.73 — Direct EFF/VENT from CRD Withdraw Line Vent to a Contained Radwaste Tank

Number	Title
1.73	Direct EFF/VENT from CRD Withdraw Line Vent to a Contained Radwaste Tank

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X				Availability	Capability to perform this task is not available from the control room.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: 2.16 — Observe Drywell Temp at 330 Ft Equals RPV Saturation Temp

Number — Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X				Unavailable Information	The labels on the drywell temp meters do not refer to which meter(s) would provide the reading at this level. Labels do not refer to any levels.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: 5.9 — Line-up Fire System Using N1-OP-16

Number — Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X				Availability	Capability to perform this line-up is not available from the control room.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or Procedure: 6.12 (Number) — Rapidly Depressurize the RPV Using the Head Vent (Title)

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X				Usability	Operator must hold open/close the RPV head vent valve for about 2 minutes while the valve travels open/shut.

OBSERVATIONS FROM VALIDATION

WALK-THROUGHS (WT) AND TALK-THROUGHS (TT)

Task or

Procedure: 6.13 . Rapidly Depressurize the RPV Using the EC Tube Slide Vent

Number Title

TT	WT	Proc Step	Tape Elapsed Time	Criteria Topic	Observation Description
X				Availability	Operators must use jumpers to bypass the reactor low level relays in order to override isolation signals. A bypass switch may be appropriate.

4.8 SAFETY PARAMETER DISPLAY REVIEW

The human factors specialists evaluated the Safety Parameter Display System (SPDS) installed in the Nine Mile Point Unit 1 control room for compliance with accepted human factors criteria. The purpose of this display generation section is to ensure that future displays are consistent with accepted human factors criteria as well as with plant conventions.

Plant-specific display generation focuses on the following general areas in user-system interface design:

a. Display Planning and Design Process. This area addresses the factors to be considered in determining: what types of information are to be displayed; what decisions users must make; and what appropriate data presentation techniques should be used.

b. Interactive Devices. This area provides guidance in determining what types of input devices (keyboard, function keys, touch-sensitive screen, trackball, joystick) are appropriate for various tasks in which the operator must request information or select displays.

c. User-system Dialogues. This area addresses considerations in such areas as: data entry and edit; menu construction; alarm messages; error messages; and logical display linkage.

d. Static Display Information. This area addresses placement, size and color of information such as display titles, time, date and other display information which does not represent plant parameter values.

e. Graphic Presentation. This area provides guidance in the design of display formats which incorporate graphic presentation techniques (e.g., bar/column charts, mimic diagrams, pressure-temperature trend plots, etc.) as opposed to tabular presentation techniques with respect to such issues as: composition, density, coding (color, shape, blink) and color usage.

f. Tabular Presentation. This area provides guidance similar to that provided for graphic presentations but geared to the presentation of data in tabular format and addresses such issues as: logical grouping of data, spacing between logical groups, value update rates, labels and character size.

g. Standard Usage. This area will delineate standards for abbreviations, symbols and color.

Plant-specific display generation was used to generate an SPDS evaluation checklist. This checklist was compared to appropriate NRC guidance documents (e.g., NUREG-0835, NUREG-0696) to ensure that the use of the checklist meets or exceeds the intent of these NRC guidance documents with respect to human factors principles.

4.8.1 Safety Parameter Display Review Results

The SPDS displays were examined and, with the aid of an operator, the criteria for display content and CRT characteristics were

applied. When the display criteria were not met, an HEO was prepared for consideration. Fourteen HEOs were written; these are identified by the HEO prefix SPD.

4.9 REVIEW OF EMERGENCY OPERATIONS FACILITY

The human factors specialists reviewed the Nine Mile Point Unit 1 Emergency Operations Facility (EOF) for conformance to appropriate human engineering criteria. This review took into account the guidance offered by NUREG-0696, "Functional Criteria for Emergency Response Facilities", and NUREG-0835, "Human Factor Acceptance Criteria for the Safety Parameter Display System". The human factors criteria referred to were drawn from NUREG-0700, "Guidelines for Control Room Design Reviews"; appropriate military standards and specifications (e.g., MIL-STD 1472C, "Human Engineering Design Criteria for Military System Equipment and Facilities") and from the leading textbooks on human factors. By conducting this optional activity in the same time period as the DCRDR, it was possible to maximally integrate the human factors oriented response activities from the DCRDR.

The review included the following activities:

a. Review of workspace layout and workstation consoles with respect to anthropometric considerations and staffing. This activity was accomplished with reference to the Nine Mile Point Unit 1 Emergency Plan and as-built drawings.

b. Review of procedures and communications links among the personnel staffing each facility, as well as communications between appropriate personnel in the EOF and control room. This activity involved

interviews of NMPC staff, review of appropriate documentation, and/or observation of an emergency drill.

c. Review of CRT display formats and any other instrumentation to evaluate compliance with human factors standards and compatibility with symbology, labeling and abbreviations used in the control room.

4.9.1 Emergency Operations Facility Review Results

Due to the current constructions activities, no HEOs were generated but comments were passed on to NMPC.

4.10 HUMAN FACTORS MANUAL FOR FUTURE DESIGN CHANGE

In carrying out the DCRDR described in this report, considerable time and attention has been given to the design of workspace, layout, labeling, conventions, annunciators, visual displays and controls in order to meet established human factors guidelines. The result has been a considerable number of changes of widely varying types. When engineering changes or modifications are proposed in the future, it will be important to NMPC to insure that the changes equally conform to these guidelines and that the conventions established from this DCRDR program are maintained. A human factors manual was therefore developed for use when modifications are made to Niagara Mohawk Power Corporation's Nine Mile Point 1 nuclear power plant control room.

The manual is being written for the use of NMPC's Nuclear Engineering Department and is being incorporated in NMPC's Engineering Procedures as a referenced design standard to be used in a similar fashion to an ASME code. Within the Nuclear Engineering Department responsibility for design modifications in the control room fall under the electrical and mechanical sections. The electrical section has responsibility for panels A and B in the control room and all other panels are the responsibility of the mechanical section. Final designs will also go through an established approval process, which includes the supervisor of operations.

Maintenance of this Human Factors Design Manual will be the responsibility of the Nuclear Engineering Department, including periodic updating of the information and appropriate distribution.

Included in this human factors manual, for example, are streamlined checklists for each section to facilitate identification of the appropriate human factors principles to be considered. It also includes all of the special and particular codes and conventions that were developed for use in the NMP-1 control room, such as the anti-clockwise turbine-generator controls and distinctive control handles. The manual's Table of Contents with a brief description of the content, and user's needs by major sections is provided in Table 4-10-1.

Table 4.10-1

TABLE OF CONTENTS OF

HUMAN FACTORS DESIGN MANUAL

TABLE 4.10-1 (continued)

SECTION	PAGE

TABLE 4.10-1 (continued)

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SECTION

5.0 PROGRAM FINDINGS

5.1 Overall HEO Characterization

Out of the Review/Analysis processes described in Section 4.0, and the follow-on review and verification activities described in Sections 5.3 & 5.4, so far, came 530 HEO's which went through the Assessment/Resolution process. They are all listed and described in Appendix D including the categories used to group them, various grading distinctions and a summary statement of the Assessment/Resolution Team's disposition for each one. This listing reflects snapshot in the time line of program activities when the Integrated Cosmetics Package verification process on the simulator had been completed and appropriate changes incorporated by the Assessment/Resolution Team. None of the HEO's (including those from the initial phase of the DCRDR Program carried out in 1981) involved any substantial safety considerations and most of them were either cosmetic in nature or involved fixes that did not require substantial design/equipment changes.

This is not too surprising in view of the continuing program of review and changes that NMP-1 has gone through over its design/operating lifetime of over 20 years. The Control Room was originally designed by Niagara Mohawk in the 1960's with the assistance of substantial mock-ups and design studies that were precursors to the formal specific Human Factors guidelines that were developed recently. During the early days of operation as observations were made or problems came to light, changes were made accordingly. Thus, the changes made as a result of this DCRDR program are viewed more as enhancements reflecting recent state-of-the-art developments rather than fundamental changes or rearrangements.

Thus, most of the fixes involve cosmetic changes which will assist operators (most particularly newer operators) to see the relational aspects of the systems/equipment in operation (i.e. it could improve their mental model of plant operation), increases the margin to possible slips (i.e. errors in carrying out intended actions) and allows for a better integration of overall plant intelligence. About 135 HEO's were resolved in this way.

Function fixes included all other types of fixes that were developed. These included equipment changes, procedural changes, etc. Also included were a few Functional Fixes that will require further analysis and determination of more specific corrective mechanisms to resolve. An example is the Control Room H&V system where there was a possible marginal environmental condition during hot summer weather. One hundred thirty-three HEO's were resolved in this way.

Details concerning the development of fixes are contained in Section 5.3.

As described in Section 3.0, the DCRDR program was carried out in two phases, with the initial phase conducted in conjunction with a BWROG team in 1981 and the final phase conducted recently using the Human Factors expertise of ARD Corp. Although the older resulting HEO's were held for completion of the Review/Analysis portion of the final phase of the DCRDR program, plant modifications were carried out (sometimes because of other program needs) which resulted in fixing the discrepancy involved. Thus, some HEO's could immediately be classified as "Resolved" (either

completed or in progress) and they were moved into the "fix verification" category relative to further DCRDR program action. There were 82 HEO's that fell into this category.

Some portions of the Review/Analysis activities in the DCRDR program were carried out by Human Factor specialists or others who, while generally knowledgeable about nuclear power plants, did not understand the specific NMP-1 system/equipment logic operating details. Thus, some of the HEO's could be classified as "Invalid" because the original rationale for their initial determination was not correct. This was determined in the Assessment/Resolution process described in more detail in Section 5.2. This determination was also reiterated in a separate session at the end of the Assessment/Resolution process and it got further review by other Human Factor specialists at ARD's home office later, as follow-on activities with HEO's proceeded. Thus, sufficient iterations and independent reviews were conducted to ensure that no valid Human Factors considerations were overlooked. Ninety-six HEO's fell into this category.

The final category was "Rejects," which numbered 177, and constituted about 1/3 of all HEO's. These received the bulk of the attention in the Assessment/Resolution Team deliberations because of the possibility of missing something significant. At least one iteration on each HEO so categorized was carried out by the Assessment/Resolution Team. The key to this determination was the HEO's safety and operational significance, and the team eventually reached a consensus position on each one. Anything that was considered significant was fixed in some way and a good rationale using a predetermined set of judgement criteria was developed for those not fixed (i.e. "Rejected").

Later, the key determination about safety significance was independently assessed by one of the ARD Human Factors specialists working on Nine Mile Point Unit 2. This independent assessment was considered by the team, appropriate changes were incorporated, and the final HEO compilation in Appendix D reflects these changes. In general, those that had been given a higher significance rating in the independent assessment were considered more carefully and soime were "fixed." Rejection of the others was based on a further elaboration of the Human Factors problem involved and an additional or stronger basis for rejection was determined.

A summary of the HEO characterization described above is contained in Table 5.1-1 and a more detailed compilation is contained in the front part of Appendix D.

Minor changes to this compilation are possible as the program proceeds through the rest of the verification and validation activities, but these changes will not be substantial. A final enumeration will probably not be available until the end of the spring 1986 refueling outage, when almost all of the fixes will have been installed.

More details concerning the process and factors used to make the distinctions characterized above are contained in the next section.

Table 5.1-1

Summary HEO Characterization

Resolved		
In-Progress		38
Completed		44
Fix		
Cosmetic		133
Functional		42
Invalid		
Categorized		12
Uncategorized		84
Rejected		
Cosmetic		63
Functional		114
	Total	530

5.2 Assessment Resolution Process

The following is a chronological itemization of steps that the Assessment/Resolution Team went through in considering each of the HEO's that were generated from the previous Review/Analysis tasks described in Section 4.0. They include all of the activities characterized in the Assessment/Resolution box in Figure 3.2-1, which illustrates the hierarchy and relationships between the various tasks in the DCRDR Program. The determinations made and the tools/approaches used to make each of these determinations is also summarized in each of these steps.

The team members who carried out the determinations were the same as those who carried out the Task Analysis described in Section 4.3, with the exception that different operators were present at different points in the activities (This arrangement was described in more detail in Section 3.2).

5.2.1 An introduction and description of the HEO was provided by the Human Factors specialist. (Why is this a concern, degree of seriousness, past experience, Human Factors potential for errors, theoretical basis, etc.)

5.2.2 A review of the equipment context and details was carried out. (Role of the particular piece of equipment in control room activities, discussion of I&C characteristics, ergonomic aspects, practical/local potential for errors, etc.)

5.2.3. The HEO category was determined. (Functional consideration, subject to cosmetic type resolution, already resolved, or an invalid listing - not really an HEO because the reviewer/analyst had not really understood the way the piece of equipment worked or the operational context involved.)

At this point, the Assessment/Resolution Team stopped any further deliberations and went on to the next HEO. The purpose of this was to separate judgement/decision activities leading to the consideration of fix details from an overall understanding of the character and categorization of all HEO's. It gave the team a good picture of the whole situation and allowed for consideration of more general goals that could be used as targets when consideration of individual fixes proceeded. An example was application of an Integrated Costmetic Package on the simulator as a verification step. The following steps show the logistical flow for the second and major phase, which was not started until the above-described first phase was completed on all HEO's. Note that no legitimate HEO's were rejected up to this point.

5.2.4 The first two steps above were reiterated to bring out more detail and to allow for new considerations. (Particularly, item 2 was looked at in detail, including visits to the control room or use of the control room TV scanner in the Technical Support Center.)

5.2.5 The potential impact on the plant's safety posture was discussed by the Review Team's Licensing member. (Safety analysis relationship, Tech Spec basis thinking, NRC attitude, PRA related considerations, etc.)

At this point, all of the information had been generated from which quantified safety significance risk categories could be derived. They were not explicitly listed at the time in the initial Assessment/Resolution but were recorded later, based on the information from steps 1, 2, 4 & 5. The criteria used for quantifying these safety significance risk categories are contained in Table 5.2-1. They also formed the basis for rejecting HEO's that were not considered significant enough to fix.

Although reiteration of the above considerations continued to occur, occasionally, when needed at various steps below as the team dealt with individual HEO's, the major deliberations from here on focused on fix details.

5.2.6 Plant operator considerations were described by the Operation's representative, (Procedural/operating practice problems, if any, negative transfer considerations, personal differences, relation to past plant experience, etc.)

5.2.7 Other aspects by other representatives were brought up (design concerns, technical support programs, training effects, licensing details, etc.).

5.2.8 A listing of potential fixes was made and pros and cons were discussed using appropriate decision/distinction tools that had been specially developed for use by the Assessment/Resolution Team. These special tools are summarized in Tables 5.2-2, 3 & 4.

5.2.9 Voting and judgement trade-offs were carried out until a final fix was agreed upon for each HEO by all representatives present. In no cases was this done with any less than four members, including at least 1 Operations representative and at least the Humans Factors specialist and Systems/Licensing representative. (However, in some cases, further reviews were decided upon because of the lack of sufficient information/detail.) It became clear at this point that all cosmetic fixes should be generalized into conventions and applied to the entire control room for purposes of consistency and coherence. This became the Integrated Cosmetic Package described in Section 5.3.

5.2.10 All previously rejected HEO's were reconsidered. (This was to be sure they were adequately considered, initially, and to see if they should be fit in with other HEO's being fixed, for consistency and coherence.)

5.2.11 A general sense of priority/urgency was also obtained from the representatives when the final fix was determined. This was later translated into specific modification/study schedules in plant and engineering management reviews with the DCRDR Program Manager. In the case of Functional Fixes, this schedule was published for internal review by all appropriate personnel (including Assessment/Resolution Team members) and comments resolved before the final modification package was started through the formal plant modifications procedure. The results of this activity are described in more detail in Section 5.3.

5.2.12 Following the further reviews referenced in step 10. above and additional activities in response to NRC concerns expressed in their late November 1984 audit, all steps above were repeated for the newly resulting HEO's. Other iterations through the above steps also occurred at various stages of the verification activities as feedback was obtained and new considerations came to light. These verification activities are described in Section 5.3.

5.2.13 Other potential fix verification mechanisms were introduced by the Human Factors specialist and Program Manager in a later session and agreements reached with the Review Team on appropriate approaches.

5.2.14 Likewise, necessary interactions and validations with other programs (principally with the EOP and SPDS activities) were established and agreed to with the Assessment/Resolution Team after fixes had been determined. These are described in Section 5.4.

A special voting/fix alternative ranking methodology had also been developed for use by the Assessment/Resolution Team in case of judgement difficulties and conflicts. This was not needed, however, and consensus agreements were reached in all cases after sufficient information had been obtained or analyses carried out so that the best overall solution was readily apparent. This took considerable time and several iterations, in some cases. The best example of this was the floppy phone cords hanging down on the vertical sections of several of the main panels. It was originally determined to be significant and many fix possibilities were brought up by various members. However, no resolution was finally deemed possible without creating other equally significant potential problems.

Pertinent results of the determinations/distinctions made in this assessment resolution process are described in the next section, 5.3.

Table 5.2-1

NMP-1 DETAILED CONTROL ROOM DESIGN REVIEW

HEO ASSESSMENT/RESOLUTION TOOLS

Safety Significance/Risk Categories for HEO's

Range of No. Ratings	Safety Significance Category	Description
7 - 9	Substantial -	Definite or likely probability of adverse consequences involving one of the events listed below.
4 - 6	Significant -	Foreseeable or possible consequences involving one of the events listed below but it is arguable amongst experts or people experienced with the operational and safety aspects involved.
1 -3	Insignificant -	All agree that there is very little likelihood of significant consequences (i.e. that need to be considered) involving any of the events listed below.

Potential emergency or unexpected events with potential consequences (related to or type of)

A. Radioactivity control problems or unusual transient conditions

B. Equipment/system parameters beyond normal constraints

C. Personnel activities or limitations beyond normal bounds or expectations

D. Operating procedures/training/maintenance procedures do not cover

E. Undue drain or strain on overall resources available

Table 5.2-2

NMP-1 DETAILED CONTROL ROOM DESIGN REVIEW

HEO ASSESSMENT/RESOLUTION TOOLS

Human Factors Considerations for Proposed HEO Fixes

1. Operator fatigue (Physical or Mental).
2. Operator confusion.
3. Operator discomfort.
4. Risk of injury to control room personnel.
5. Increase in mental workload.
6. Distractions.
7. Ability to see or read accurately.
8. Ability to hear correctly.
9. Ability to communicate with others (either inside or outside the control room).
10. Ability to manipulate controls correctly.
11. Delay of necessary feedback to the operator.
12. Positive feedback about control tasks.
13. Violates control room conventions or practices.
14. Violates nuclear industry conventions.
15. Violates population stereotypes.
16. Use of self-training, temporary labels, "cheaters," "helper" controls, compensatory body movements, etc.
17. Degree of stress.
18. Inadvertent activation or deactivation of controls.
19. Synergy of errors.
20. Concurrence of tasks.
21. Degree of emergency use.
22. Involves violation of a technical specification, or the unavailability of safety-related equipment, or involves controls or displays that are part of an engineered safety function.

Table 5.2-3

NMP-1 DETAILED CONTROL ROOM DESIGN REVIEW

HEO ASSESSMENT/RESOLUTION TOOLS

Interactional Impact Considerations for Proposed HEO Fixes

1. Description:

   What are the negative impacts of the various proposed fixes to the operation of the plant under normal conditions, leading to a choice of the best fix for each HED.

2. Criteria/Definition:

   Consider possible negative interactions with specific plant operational aspects, such as:

   a. Equipment operability

   b. Systems/parameter interdependency

   c. Safety analyses/bases

   d. Operating procedures/experience/training

   e. Organizational structure and personnel practices

   f. Cognitive processes in running plant

   g. Other programs, processes, etc.

3. Rankings:

   Rate the degree and seriousness of these interactions with fixes in place, compared to those currently existing with a particular HED.

Table 5.2-4

NMP-1 DETAILED CONTROL ROOM DESIGN REVIEW

HEO ASSESSMENT/RESOLUTION TOOLS

Risk vs. Impact Considerations for Proposed HEO Fixes

1. Description:

What benefits will be gained from the various proposed HED fixes in terms of the reduction of risk, compared to the cost of making the fixes in terms of the impact of implementing them.

2. Criteria/Definition:

a. For proposed fixes, consider possible errors (probabilities) and their associated negative potential consequences defined in general ways, such as:

1) Radioactivity control problems or unusual transient conditions

2) Equipment/systems parameters beyond normal constraints

3) Personnel activities or limitations beyond normal bounds or expectations

4) Operating procedures/training does not cover

5) Undue drain on organizational resources

b. For proposed fixes, consider involvement/difficulty in carrying them out, as defined in a general way, such as:

1) Amount and type of equipment affected

2) Degree of systems/process changes

3) Physical difficulties in making change

4) Amount and involvement of manpower

5) Time required

6) Organizational impact (priorities and resources)

7) Procedural/training complications

3. Rankings:

Rate the amount of risk reduction associated with operation with fixes in place compared to current operation. Rate the impact of making the fixes in terms of the difficulties/involvement in carrying them out. Determine from these the best ratio of risk reduction benefit to cost in carrying out the fix.

5.3 Corrective Actions and Verifications

5.3.1 Modification/Strategy:

Based on the results of the Assessment/Resolution Process described in Section 5.2 above, HEO's to be resolved with fixes were divided into two major packages for follow-on scheduling, verification, etc. The intent was to establish blocks of activities that could be carried through the rest of the DCRDR program and plant modification processes in a consistent and contiguous fashion.

On that basis, fixes that could be tried out on the simulator initially were put into an Integrated Cosmetics Package (ICP) described in Section 5.3.2. This covered a majority of the cosmetic HEO's. There were two basic purposes for this. First, it gave everyone, particularly the operators, an opportunity to review the fix details for accuracy in intent and reasonableness in application.

Second, the package could be viewed for overall appearance and consistency (including all I&C in the Control Room) and feedback obtained about the usefulness of this package. This integrated Cosmetics Package verification process was formalized, and was completed just prior to the time this report was written. The pictures and compilations referred to in the following Section 5.3.2 reflect adjustments made to the simulator in response to the results of the verification.

As also described in Section 5.3.2 below, adjustments to the Integrated Cosmetics Package for application to the Control Room will also be needed because of differences between the simulator and the Control Room. Once these adjustments have been made and final specifications detailed, actual cosmetic changes to the Control Room will be carried out via the established plant modification procedures. Much, if not all, of these changes will be done during plant operation between now and the spring 1986 refueling outage. Of course, those changes that might disrupt plant operation will be installed in the Control Room during the outage. This will also incude fixes for a few HEO's that were cosmetic in nature but not included in the verification on the simulator because it was not appropriate or helpful to do so. (e.g. Changes in recorder chart paper to improve scal markings and cosmetics on the Remote Shutdown Panels, are good examples.

There were 42 functional fixes in the second major block that resolved the remaining HEO's, including 19 equipment changes/adjustments, 10 programmatic/study activities and 13 involving training/informational/procedural changes. These require some follow-on design/analytical/administrative work before they can be instituted, and verification on these is best conducted in conjunction with QC, engineering review and other fix completion activities This is described in more detail in Section 5.3.3. These fixes have been collected into one modification package, and they are now proceeding through the

established procedural steps associated with plant modifications or administrative changes. Most will be completed before or during the 1986 refueling outage as described in more detail in Section 5.3.3.

A third category of 82 HEO's involving corrective actions are those that have already been fixed or the fix was in progress when the Assessment/Resolution Team reviewed them. The basis and reasons for this grouping of HEO's were described in section 5.1, and they are listed together as "Resolved" in one section of the HEO compilation in Appendix D. Verification of these will be carried out, later, in conjunction with the verification of Functional Fixes and using the same verification methods. However, this set of verifications will be completed prior to the beginning of the outage and in time for remedial adjustments, if needed.

There may be a few unusual situations developed or cases where further review, analysis or programmatic activity of some kind will require completion of the fix beyond the spring 1986 outage. Any such situations will be identified either in the verification or plant modification processes described above. At the moment, the only ones falling into this category are so identified in Table 5.3-2.

The relationship and timing of these fix and verification processes, as they fit into the overall program and interact, is described in more detail in Section 5.4.

5.3.2 Integrated Cosmetic Package

5.3.2.1 Development of Integrated Cosmetic Package

As characterized in section 5.3.1, the fixes determined from the Assessment/Resolution process were divided into two basic packages (beyond the package of "Resolved" HEOs which had previously been or are now in the process of being corrected). The first package, called the Integrated Cosmetic Package (ICP), is detailed in this section and the second package, called the Functional Fix package, is detailed in section 5.3.3. The Assessment/Resolution Team deemed it important to verify the ICP on the simulator before putting it on the panels in the control room. This was because of the interactive and holistic nature of the individual fixes as they affected the overall ICP. What follows is a description of the ICP, how it was applied to the simulator, and the results of the verification that was carried out on it. Appendix E contains the compilation of details comprising the ICP in the form of tables, figures, and photographs and they are based on the results of this verification.

The NMP-1 ICP is a series of changes to enhance the appearance of the control panels. Cosmetic changes are those which alter operational aids; these include enhancements to the appearance of the control panels to assist the operator in determining component location and status. The ICP does not modify system operation, only the information on the control panels presented to the operators to assist in performance of their assigned duties. Table E-1 in Appendix E lists the HEOs that are addressed by the NMP-1 ICP and the cosmetic changes that were implemented to resolve the HEOs. The specifications used to construct labels, etc. and to implement each detail are contained in a package that was previously described to the NRC but is not included in this report because of its bulk. A comprehensive summary of the results including photographs of the ICP as it is currently installed on the simulator, are included in Appendix E. Each photograph is backed with a listing of HEOs shown by that photograph so the reader has a complete cross-reference of cosmetic fixes, planned or in-progress, which can be viewed in the physical context in which they will exist. This also provides a holistic picture of the control room as it will look when all changes are

completed. The simulator is about 2 years behind the control room on modifications and the exact placement of changes may vary somewhat to accomodate these modifications. There are other minor control room to simulator differences that might also affect exact placement or execution details; however, the verification of the change itself has been completed as described in section 5.3.2.5 and will be carried out on the control room for each HEO. The ICP details can be grouped into functional categories and applied in common, as follows:

5.3.2.1.1 System Demarcation Lines & System/Subsystem Labeling

These are lines that were placed on the control panels to distinguish separate operational systems and subsystems. System and Subsystem labels were also added to aid this distinction and to reduce wording on component labeling with a hierarchial logic arrangement. Demarcation lines facilitate location of components because they break large control panels into smaller groups of functionally related components. Figures E-1 through E-4 show the placement of system demarcation lines.

5.3.2.1.2 Component Labeling

These are included in the ICP to strive for consistency, comprehensiveness and accuracy of component labels. When component labels within a control room are of different sizes or different type fonts, they can be distracting to the operator. Components without labels are a source of possible operator confusion. Table E-2 lists the component labels that were included in the ICP and the HEO to which they respond.

5.3.2.1.3 Indicator Scale Replacement

Indicator scales were replaced when the scale failed to meet checklist guidelines and when it was important to plant operations to obtain a value reading from the indicator. Indicator scale replacement corrects many HEOs identified for indicators not having the optimum numerical progression or not having the optimum major, intermediate, and minor graduation marking scheme. Table E-3 lists the indicator scales included in the ICP and the HEO numbers to which they respond.

5.3.2.1.4 Indicator Scale Range Marking

Indicator scales were marked to identify a parameter state when the scale failed to meet the checklist guidelines and when the indicator was infrequently needed to provide a specific value. Indicator scale range marking, called colorbanding, was also applied to indicators with appropriate scales, but where operators stated a preference for certain parameter range values. During preparation of the ICP, discussions were held with operations personnel to determine the proper range to be colorbanded on the designated indicator. Colorbanding consisted of placing green transparent tape over a specific range of scale values to indicate a normal operating range.

5.3.2.1.5 System Mimics

These serve to aid the operator in understanding system flow path and valve status. The mimics that were included in the ICP already existed in the control room but were incomplete or were drawn on the control panel in grease pencil. The following mimics were included as part of the ICP:

- Electrical system - Completed the mimic lines connect- ing R1012 and R1013 with 4.16KV lines on panel A.
- Emergency Condenser System - Provided permanent mimic of the system showing flow and valve relationships on panel K.
- Vent to Main Steam Isolation.Valves and Blocking Valves - Provided permanent mimic of system showing flow and valve relationships on panel K.
- Primary Containment Isolation - Completed mimic lines to unconnected legend lights on Panel F.
- Core spray system - Provided permanent mimic for the system showing flow and valve relationships on Panel K.
- Torus and Drywell N_2 Ventilation and Purge Valves - Provided a permanent mimic showing flow and valve relationships on Panel L.

- Reheater Condenser - Restored the mimic lines that have been displaced from the permanent mimic already on Panel J.

5.3.2.1.6 Control Handles

Shape coding of control handles can provide a cue to the operator regarding the type of control operation. A control handle convention was established in the Human Factors Design Manual. Control handles that were not in accordance with the guidelines set forth in the Human Factors Design Manual were replaced. Table E-4 lists the control handles included in the ICP.

5.3.2.1.7 Indicator Light Color

A standard for indicator light color was established in the Human Factors Design Manual. Indicator lights that were not in compliance with the guidelines set forth in the Human Factors Design Manual were changed. Table E-5 lists the indicator lights included in the ICP.

5.3.2.1.8 Recorder Chart Paper

Several HEOs were resolved by changing the chart paper in recorders to match the recorder indicator scales. These cosmetic changes were not included as part of the simulator verification study because operator feedback was not needed to demonstrate that the fix was effective.

5.3.2.2 Scope of Verification Program

A verification investigation of the ICP was performed at the NMP-1 simulator. The changes specified in the ICP were installed on the simulator control panels to verify that the proposed cosmetic changes were comprehensive, accurate, and that the changes did not create any new problems.

Two shifts of operators going through requalification training at the simulator provided specific data and feedback for the verification. Each shift spent one afternoon in the NMP-1 simulator. The operators were given some time to walk about the simulator and discuss the cosmetic changes among themselves. The purpose of the verification was explained to the operators.

The crew was then given three different simulated failure scenarios to resolve. This was done to familiarize the operators with the extent of the cosmetic changes to the control panels and their effects to the operation of the plant. After the completion of the scenarios, the operators were asked to fill out a questionnaire. Appropriate sections of the checklist survey applicable to the ICP were completed in the simulator to identify any new problems. Several situations not related to the ICP were also identified by the operators and are described below.

5.3.2.3 Summary of Verification Results

Twelve operator questionnaire responses were compiled and are reported below. One operator chose not to respond at all and one operator completed only item #20. Of the remaining ten operators, not all answered every item. As shown in Table 5.3.2-1, the questionnaire consisted of 14 multiple-choice questions and 6 open-ended questions to allow the operators to elaborate on their responses. The questionnaire included four items regarding flow path mimics, four items on demarcation lines, four items on labeling, five items concerning indicator scale replacement and colorbanding, one item on control handles, and two items on the overall effectiveness of the cosmetic changes to the simulator control panels. A summary of the operators responses to each of the questions is contained in Table 5.3.-1.

The data obtained from the verification questionnaire was inconclusive. About half of the operators questioned stated that the cosmetic changes to the simulator represented an improve- ment and about half stated that it was not an improvement. In many cases, the operators approved or disapproved of the entire ICP; every item on the questionnaire was given a positive response or every item received a negative response. In only a few instances did the operators like some of the cosmetic changes and dislike others. The responses to the open-ended questions of those not in favor of the cosmetic changes indicate that they opposed any change to the control room. "Leave as was" or "Leave as they are at Nine Mile I" were responses to every open-ended question on two different questionnaires; in these cases the ICP was not fairly examined for any possible benefit but was given a blanket rejection as unwanted change.

Specific comments on the groupings of cosmetics are summarized below, together with the approach developed by the Assessment/ Resolution Team to resolve the comments. A description of the follow-on verification activities which resulted in consensus agreement on the ICP, is contained in section 5.3.2.5.

5.3.2.3.1 System Demarcation Lines

Specific changes to the panel L demarcation lines were recommended. The operators stated that some of the lines dividing subsystems cluttered the control panel. It was recommended that the demarcation lines for the Containment Air Vent/Purge subsystem and the Containment Nitrogen Vent/Purge subsystem be eliminated. When the verification was performed, the demarcation lines were made by 1/4-inch black tape because it was immediately available. These lines were later changed to 3/8-inch dark brown lines which will contrast well with the control panels and will be distinguishable from the black mimic lines. This is expected to take care of the concern about clutter.

5.3.2.3.2 System and Subsystem Labels

System and subsystem labeling was applied to the simulator control panels in conjunction with the demarcation lines as part of the ICP. Based on the verification results and subsequent meetings with NMP-1 Operations personnel the system and subsystem labels have been eliminated because they added unnecessary clutter. They were found to be inappropriate, given the geometry of the control panel layout and the content of the component labels. Thus, system and subsystem labels were eliminated from the ICP.

5.3.2.3.3 Component Labels

In most cases, the operators did not notice the changes to add missing component labels or to make wording/locations consistent. The ICP was constructed on the labeling needs of the actual NMP-1 control room which in some instances is different from the labeling needs of the simulator. The addition of system and subsystem labels created redundancy in the wording in the existing component labels. It was decided that the reduction in clutter of extra labels was more worthwhile than a reduction in component labeling, so system and subsystem labels were eliminated.

5.3.2.3.4 Indicator Scale Replacement

The operators did not notice most of the scales that were re- placed and found no problems with the ranges of the new scales or of the graduation scheme selected.

5.3.2.3.5 Indicator Scale Range Marking

Colorbanding received the most operator comment of any ICP item. Several operators objected to any colorbanding. They stated that the colorbands, as they were placed, will not be in a proper operating range under all operational conditions and all meter calibrations. They expressed the concern that they could be held accountable for any indicator not within a green band when the meter may actually be in the proper range. After a further review, it was decided that an appropriate colorband could not be affixed that would bve accurate under all conditions. Thus, the fixes for all HEO's in this category were changed to take care of the Human Factors concern with scale revisions, and additional colorbanding or other forms for highlighting deviations from normal conditions as an extra aide, will be investigated separately, later.

5.3.2.3.6 Flow Path Mimics

The flow path mimics that were added to the control panels only provided a permanent form of what is already drawn onto the NMP-1 control panel with grease pencil. The ICP electrical system mimic and reheater mimic on the simulator are already complete and in their proper configuration, and matching modifications on the control room are all that is needed. The Primary Containment Isolation mimic cannot be fixed without creating other Human Factors problems so appropriate labeling will be used instead. Thus, these fixes were verified independent of the ICP.

5.3.2.3.7 Control Handles

In most cases, the operators did not notice the change to the control handles. No specific changes to placement of control handles were recommended.

5.3.2.3.8 Indicator Light Color

The operators made no comment regarding the changes to indicator light color. No specific changes were recommended.

5.3.2.4 Additional Verification Findings

The verification activities presented an additional opportunity to the operators to identify other control room problems not part of the ICP. By working with the ICP, the operators obtained a feeling for the nature of the enhancements that could be made to the control room. As a result, the following additional observations were collected during the verification process:

- The control handle switch positions for EM Vent Loop 11 and 12 Inlet BV are labeled "OPEN-AUTO-OPEN".

  Although it is clear to the operators from their training which valve opens when the control is moved left or right, the usual move is to the left. In this case, system convention will be enforced and the control will be switched to make the usual move to the right. (Appropriate labeling will also be supplied).

- Protective covers were recommended and will be provided for the following recessed pushbuttons:

Reactor Trip 11 and 12	E Panel
Drywell Isolation 11 and 12	E Panel
Unit Emergency Trip	E Panel
Unit Emergency Trip	A Panel
Vacuum Trip 2	A Panel

  It was said that occasionally these buttons have been pushed inadvertently.

- There are two reactor water level meters (Rx Chan 11 and 12) on Panel F which were colorbanded red, yellow, and green prior to incorporation of the ICP. These meters have red pointers which are difficult to see when indicating in the range of the large red colorband. This was not noticed in the control room because the red banding was very light and the red pointer was very dark. However, the pointers on these indicators will be changed to white, per the established convention and for maximum contrast.

5.3.2.5 Verification Completion

The remaining shifts and operations management reviewed the ICP on the simulator after the initial two shifts went through the review and questionnaire activities described in the preceeding sections. Reactions continued to vary, which confirmed the initial results. Because of this, there were considerable follow-on activities by the Assessment/Resolution Team and Operations personnel to resolve the comments obtained during the verification activities. Some of the details of this were described in the preceeding sections. Iterative review of the ICP on the simulator was carried out with selected (the most experienced) operators. In some cases, needed adjustments were simple; (e.g., moving a demarcation line to a better position); in other cases, considerable discussion ensued and various human factor trade-offs were considered (e.g., adjustments to the primary containment isolation mimic).
The end result was a consensus understanding/agreement about the type and scope of each fix to be applied and with the exact execution details to be completed later, in a few cases. For example, label sizes/placements might be adjusted, but a label will be used. The listings and photographs contained in Appendix E reflect this status.

5.3.3 Functional Fixes:

The results of the Assessment/Resolution Team deliberations are summarized in Table 5.3-2, including a priority determination that reflects the team's collective thinking about the urgency of the particular situation involved. Other information is also displayed in the table as it was developed later for those handling modification details. (This table was attached to the Plant Modification Request). Verification and fix categories were added for the information and assistance of those reviewing this report.

As will be noted from a review of the tables, some of the fixes involve specific details that can be carried out directly and others involve further review, analysis or programmatic activity of some kind. The intent is to complete those in the latter category where possible by the spring 1986 outage but this will not be firm until the final design details have been worked out. These possibilities are reflected by the wording in the table.

Verification of Functional Fixes in these cases will be carried out over a significant span of time, as the fixes proceed and after they are completed. Verification mechanisms will consist of a check-off that the work has been completed, a human factors review that the fix was effective, or a query to NMP1 operations that their original concern was reasonably resolved. No synergistic effects need be considered, contrary to the verification review being carried out for the cosmetic fixes. These verification mechanisms have also been categorized, coded, and listed on Table 5.3-2. They will be carried out by the DCRDR Program Manager or Project Engineer with the assistance of the Human Factors specialists and Operations representatives used in this program, if needed. However, it will be a separate and independent check from the activities of the Designer/Engineer actually making the change.

Table 5.3.-1
Operator Response to ICP Verification Questionnaire

o Flow Path Mimics

1. Do the flow path mimics on the simulator control panels help in locating controls and in visualizing system status?

	Very Helpful	Helpful	Not Helpful	Confusing
Number of Operator Responses	1	4	4	0

2. With the addition of new mimics to the simulator, are there any systems or functional groups of controls that still need flow path mimics?

	Several	1 or 2	None
Number of Operator Responses:	1	0	7

3. Do you feel that the flow path mimics on the control panels will aid in the training of new operators?

	Very Helpful	Helpful	Not Helpful	Add Confusion
Number of Operator Responses:	3	3	2	0

4. Do you have any comments on the detail, accuracy, or presentation of the flow path mimics on the simulator control panels?

Operator Responses:

- Leave as it was.
- Leave mimics as they are at Nine Mile 1.
- Helpful but needs re-designing.
- Inaccurate-cluttered-confusing.
- Flow path mimics should be color coded for each individual system and should be coordinated with the systems in the plant.

Table 5.3.-1 (continued)

o Demarcation Lines

5. Do the system demarcation lines on the simulator control panels help in system identification and location of functional groups of components?

	Very Helpful	Helpful	Not Helpful	Add Confusion
Number of Operator Responses:	2	2	4	1

6. Are there any more systems or functional groups of controls which would be aided by demarcation lines?

	Several	1 or 2	None
Number of Operator Responses:	0	1	6

7. Do you feel that the system and functional group demarcation lines will aid in training new operators?

	Very Helpful	Helpful	Not Helpful	Add Confusion
Number of Operator Responses:	3	2	2	1

8. Do you have any comments on the detail, accuracy, or presentation of the system demarcation lines on the simulator control panels?

Operator Responses:

- Some demarcation lines need changing; Containment IV and Nitrogen Pump back and makeup area. (L Panel)
- L Panel too cluttered. Box off containment IVs and include DW/torus check valves with other containment vacuum breakers.
- Leave demarcation lines as they are at Nine Mile #1.
- Leave as was.

o Labeling

9. Does the system and subsystem labeling on the simulator control panels aid in the identification and location of functional groups of components?

	Helpful	Not Helpful	Did Not Notice	Adds Clutter
Number of Operator Responses:	4	0	0	4

Table 5.3.-1 (continued)

10. Some component labels have been replaced and others have been added to enhance the consistency and completeness of the control room labeling. Are these new labels helpful?

	Helpful	Not Helpful	Did Not Notice	Adds Clutter
Number of Operator Responses:	3	1	1	3

11. Do you feel that the system and subsystem and component labeling on the simulator control panels will aid in the training of new operators?

	Very Helpful	Helpful	Not Helpful	Add Confusion
Number of Operator Responses:	4	3	1	1

12. Do you have any comments on the detail, accuracy, or presentation of the labeling on the simulator control panels?

Operator Responses:

- Leave as was.
- Leave labeling as it is at Nine Mile #1.
- Needs some more work.
- Nitrogen Supply 11 and Nitrogen Supply 12 should be removed. (Panel L).
- Nitrogen Supply 11 and 12 nomenclature should be removed. Could be very confusing to new operators.
- Labels should be readable from at least 10 feet without increasing the size of the labels. The system labels should not be white or quite so large.

o Indicator Scale Replacement and Colorbanding

13. The scales on several indicators on the simulator control panels have been replaced to provide a more appropriate numerical progression or graduation scheme. Do you feel these new scales will be helpful in obtaining value readings?

	Helpful	Not Helpful	Did Not Notice
Number of Operator Responses:	2	3	4

Table 5.3.-1 (continued)

14. Color bands have been added to several display scales on the simulator control panels to indicate normal or unsafe operating ranges. Are these color bands helpful in obtaining the needed information from these displays?

	Helpful	Not Helpful	Did Not Notice	Confusing
Number of Operator Responses:	4	3	0	2

15. Do you feel that the new indicator scales and color bands on the simulator control panels will be helpful in training new operators?

	Very Helpful	Helpful	Not Helpful	Add Confusion
Number of Operator Responses:	3	1	2	2

16. Are there any more indicator scales that require replacement or color bands?

	Several	1 or 2	None
Number of Operator Responses:	3	1	5

17. Do you have any comments on the detail, accuracy, or presentation of the new indicator scales and indicator color bands that have been added to the simulator control panels?

Operator Responses:

- I have not had sufficient time to check each and every scale for changes.
- You are removing any thought process.
- Need some work.
- Green on condenser vacuum at wrong level.
- Replace indicator scales only after discussion with CSOs. Remove all new color bands. Leave them as they are at Nine Mile #1.
- Leave as was.
- Should have an operator list the individual scales and where each color band should be, some of the new ones in the simulator are wrong.

o Control Handles

18. The handles on some controls have been changed for consistency of control handle with function. Is the new control handle convention helpful?

	Helpful	Not Helpful	Did Not Notice
Number of Operator Responses:	2	2	5

o Overall Evaluation

19. Do you feel that the changes made to the simulator provide an overall improvement to the control panels?

Operator Responses:

- No (3 times)
- Yes (4 times)
- Not for experienced operators.
- Minor - changes to help the control room operators have not been made.

  Overall yes - system labeling signs are too big.

20. Do you feel that these changes should be implemented in the NMP-1 control room?

Operator Responses:

- No (4 times)
- Yes (2 times)
- Yes - when all corrections have been made.
- Some
- The system mimic lines, demarcation lines, and colorbands are helpful. Color coding of system components and mimics would be very helpful to the proper operation of the plant.
- No. Try improving the view of the CSO. He now has a confined view of the control room, not an overall view. You need more than four hours to improve this.
- At this time I can't see where these additions are helpful.

Table 5.3-2

NMP-1 Detailed Control Room Design Review
Functional Fix Details

HEO No.	Description of Problem or Fix	Priority	Follow-on Action or Fix	Outage Required	Schedule	Cognizance	Verif. Cat.	Fix Cat.
QS-033	Alarm printout from PC not sufficiently distinctive - change back to red	Hi	Buy and install a red/ black terminent printer.	No	Complete by spring '86 outage	Spadafore & Meyers aware and pursuing	QO	E
COM-01	Abbreviations too cryptic on point ID descriptions from PC	Lo	Establish convention with HF manual that will be consistent with plant wide use, including PC	No	Complete by spring '86 outage	Bernfeld on HF manual and Meyers on changes (if any)	VC	T
COM-07	Some alpha-numeric characters hard to read on CRT's from PC	Lo	Increase frequency to obtain full resolution	No	Complete by spring '86 outage	Meyers to pursue	Re	E
COM-27, 28 & 29	CRT color use not consistent with color meanings in CR	Med	Change colors on CRT's to be consistent (use HF manual as convention	No	Complete by spring '86 outage	Bernfeld on HF manual and Meyers on color changes	Re	T
SPDS-12	Parameter abbreviations in overview display are terse	Lo	Same as COM-01 above	No	Complete by spring '86 outage	Bernfeld on HF manual and Murney on changes (if any)	Re	T
FP-01	Training on use and operation of fire panel is inadequate	Hi	Establish program and carry out	No	Complete by spring '86 outage	Ken Sweet on operation and Randy Seifried on training	QO	T
FP-03	Several cracked control knobs and too weak, in general (Also see FP-04)	Hi	Replace cracked ones. Obtain stronger replacement for all	No*	Complete by spring '88 outage	Bernfeld on design and Sweet on operation	VC/QO	E

* May need temporary Tech Spec change to accommodate fix work

Verification Category Key:
- Redo HF review = Re
- Query operators = QO
- Elaborate on assessment = EA
- Verify completion = VC

Fix Category Key:
- Equipment changes/adjustments = E
- Programs/studies = P
- Training/informational/procedural = T

Table 5.3-2 (cont'd)

NMP-1 Detailed Control Room Design Review
Functional Fix Details

HEO No.	Description of Problem or Fix	Priority	Follow-on Action or Fix	Outage Required	Schedule	Cognizance	Verif. Cat.	Fix Cat.
QS-025	Annoyance alarms occur on temp. recorders on B-2 & B-3 panels	Med	Make appropriate change, in conjunction with CS-17 & OCS-167 (some already done)	No	Complete by spring '88	Taylor for site	VC	P
CS-035	No way to diagnose failed bulbs at RSP's	Lo	Add suppl of bulbs at stations (Supplements/ Surveillance Procedure No. to check bulbs at regular intervals)	No	Complete by 10/85	Matthews arrange for	VC	E
OCS-219	Inoperative annunciator window for concentration electric boiler	Lo	Remove	No	Complete by spring '86	Bernfeld for design & Lampman for site	VC	E
QS-007	Inoperative gate alarm windows on E panel	Lo	Remove	Yes (to fill in panel)	Complete by spring '88 outage	Bernfeld for design & Barrett for site	VC	E
VAC-2	Nomenclature in procedure not match control board, for air ejector off-gas discharge	Lo	Change procedure	No	Complete by 7/85	Matthews arrange for	VC	T
QS-016.01 (Add on)	The original QS-016 HEO concerned the many ARM's feeding into a common annunciator on the frontpanel, which required an operator to investigate the source of the problem on back (ARM) panels. This was judged to be appropriate and the HEO was rejected. However, the new RSSB facility ARM's need to be connected to the front and back panels in the same manner to maintain a consistent operational logic.	Med	Connect RSSB ARM alarm annunciator to front panel common annunciator for all ARM's.	Yes	Complete by spring '86	Wolken & Gasser aware and handling	VC	E

Table 5.3-2 (cont'd)

NMP-1 Detailed Control Room Design Review
Functional Fix Details

HEO No.	Description of Problem or Fix	Priority	Follow-on Action or Fix	Outage Required	Schedule	Cognizance	Verif. Cat.	Fix Cat.
VRR-001	Reactor Scram, Emergency (Turbine) Trip, & Drywell Isolation buttons on E & A-1 panels subject to inadvertent actuation.	Hi	Install protective covers requiring a separate deliberate (but quick) action before buttons can be pushed.	No?	Complete by spring '86 outage	Bernfeld on Design & Goodney for Projects	VC	E
VRR-003	Normal or usual operation of Emergency Ventilation control on L panel is to left from center and functions are not clear.	Med	Roll leads to have normal operation to right and cooling to left. Also relabel from "open - auto" open" to "cool-auto-open" (after rolling leads)	Yes?	Complete by spring '86 outage	Bernfeld on Design & Goodney for Projects	VC	E
OCS-195	Single indicating lights are used for the Analog Trip System Trouble lights on F panel, making a failed bulb indistinguishable from a normal condition.	Med	Investigate and make a change to fix	Yes	Complete by spring '86 outage	Finnerty on Design & Goodney on Projects	Re/VC	E
QS-004	Many Fire Panel nuisance annunciators are distracting operators (also see FP-05)	Med	Wire annunciator acknowledge button in parallel with current panel acknowledge button or eliminate nuisance alarms.	Yes	Complete by spring '88 outage	Sweet on Design and Goodney on Projects	Re/VC	E
HR-002 OCS-089 thru 092	Turbine and generator controls operate in the anti-clockwise direction (e.g. raise to left)		Establish convention with different handles and training and be sure all such controls operate the same - also put in HF manual	No	Complete by spring '86 outage	Goodney on convention and Bernfeld on HF manual	Re/VC	E/T

Table 5.3-2 (cont'd)

NMP-1 Detailed Control Room Design Review
Functional Fix Details

HEO No.	Description of Problem or Fix	Priority	Follow-on Action or Fix	Outage Required	Schedule	Cognizance	Verif. Cat.	Fix Cat.
FP-04	Some controls on fire panel hard to position accurately - overshoot can result in discharging system (Also see FP-03)	Hi	Change handle to reduce chance of error	No*	Complete by spring '88 outage	Bernfeld on design and Sweet on operation	EA	E
FP-05	Numerous false alarm signals from out-of-service detectors (Also see QS-004)	Med	Investigate, determine alternatives, and make best change to correct	?*	Complete by spring '88 outage	Bernfeld on design and Sweet on operation	VC	P
FP-06	"Fire panel door open" alarm is a nuisance and not effective	Med	Investigate, determine alternatives, and make best change to correct	No	Complete by spring '86 outage	Bernfeld on design and Sweet on operation	Re/QO	P
FP-07 & 08	Not all lamps have lamp test	Lo	Investigate ways to fix and, if not practical, have consistent pattern established and well-identified	?*	Complete by spring '86 outage	Bernfeld on design and Sweet on operation	EA	P
FP-09	Diesel fire pump control not consistent with fire panel convention and is confusing	Hi	Review and fix, in conjunction with FP-03 & 04. Include operation in training, in conjunction with FP-01	No?*	Complete by spring '86 outage	Bernfeld on design and Sweet on operation Also, Siefried on training	EA	P
ENV-04	Drywell water leak detection sys. annunciator false alarms, frequently. Also, recorder gives "noisy" indication that makes it difficult to see trend (particularly when sump is empty)	Med	Investigate, determine alternatives, and make best change to correct	Yes?	Complete by spring '86 outage if fix not difficult	Bernfeld for design design and Barrett for site	EA/QO	P
OCS-21	Remove six scam discharge volume acoustic monitor lights	Lo	None needed - lights are inoperative	Yes (to fill holes)	Complete by spring '86 outage	Barrett for site	VC	E

Table 5.3-2 (cont'd)

NMP-1 Detailed Control Room Design Review
Functional Fix Details

HEO No.	Description of Problem or Fix	Priority	Follow-on Action or Fix	Outage Required	Schedule	Cognizance	Verif. Cat.	Fix Cat.
OCS-243	Possible misplacement when changing annunciator windows	Med	Incorporate in training replace only one at a time	No	Complete by 10/85	Siefried for Training	VC	T
QS-028	Modify paging system so operators have better access to it (too much interference, now)	Med	Conduct study to determine best solution (probably increase to 5 channels) then make changes	No	Complete by spring '86 outage, if possible. If not, firm by '88	Eastham for projects & Matthews for operations	EA/QO	P
QS-027	Hard to hear paging in back panel area (communication there was essential ingredient of "reject" rationales on other HEO's)	Med	Add speaker in back panel area (do in conjunction with QS-028 & other work on paging system?)	No	Complete by spring '86 outage, if possible. If not, firm by '88	Eastham for projects & Matthews for operations	Re	E
QS-009 QS-024	Containment H_2 & O_2 monitors/recorders alarm upon calibration	Med	Investigate, determine alternatives, and make best change to correct	Yes?	Complete by spring '86 outage	Bernfeld for design & Taylor for site	VC	E
QS-023	Piglet monitors alarm when putting them in service	Lo	Investigate, determine alternatives, and make best change to correct	Yes?	Complete by spring '88	Bernfeld for design & Taylor for site	VC	E
QS-019	Put key lock switch on drywell vent to condenser control	Hi	None needed - simple change with standard switch	Yes	Complete by spring '86 outage	Bernfeld for design & Matthews for operations	VC	E
CS-17 OCS-167	Recorders need refurbishment and upgrading	Med	General maintenance program being applied to this - needs to be completed	Yes (for some)	Complete by spring '88 outage	Taylor for site	EA	P

5.4 Follow-ons, Iterations, and Interaction Activities

5.4.1 Overall Relational Diagram

Figure 5.4-1 provides a relational view of the major DCRDR distinctions and activities, together with a rough time line indication for the flow of activities. This provides the best and most succinct overall picture of the program, including how and when the major parts interact. Of course, there are details within and between the major boxes that do not fit within the boundaries implied by this diagram, and further explanation is needed as to the nature/details of the relationships shown. The following discussion is intended to fill these gaps as well as to provide a clearer picture of the current status of these activities (as of the date of this report).

5.4.2 Review/Analysis Activities

As described in considerable detail in Section 4.0, this portion of the program has been completed, including follow-ons resulting from NRC audit activities initiated in late November, 1984. What remains is any potential new task Review/Analysis activities involving different I&C considerations that might come out of the EOP/SPDS validation activities occurring in the August/September 1985 time period. (An outline of how these differences would be determined is provided in 5.4.3.) Any such differences would be carried through the Review/Analysis verification and validation process and any resulting HEO's would be carried through the Assessment/Resolution process the same way that others were. The intent will be to fold any resulting fixes into current fix activities and schedules, if feasible, particularly if they are cosmetic in nature.

Likewise, any changes or differences resulting from the NRC's review of NMPC's Regulatory Guide 1.97 submittal and subsequent interactions would be handled in the same way. However, the schedule for this review and any potential resulting future adjustments is not clear.

5.4.3 Task Analysis Δ's from EOP/SPDS Validation

As described in Section 4.3, the Task Analysis step in the Review/Analysis phase of the program derived from the NMP-1 specific Emergency Procedure Guidelines that are being used for preparation of the NMP-1 Emergency Operating Procedures. The purpose of this was to be sure that all operator actions taken based on a generic symptomatic approach to plant abnormalities would be picked up in the DCRDR Task Analysis and have the same comprehensive technical basis as that used for the preparation of the Emergency Operating Procedures. However, the NMP-1 Emergency Operating Procedures are currently under preparation and will not be completed until the fall of 1985. Besides internal comments from NMP-1 Operations, final revisions will derive from changes to the Emergency Procedure Guidelines being developed under auspices of the BWR Owners Group. Thus, a final validation step will consist of the following:

- Preparation of a list of changes in steps between Rev. 0 (the original) and Rev. 1 (final version as of the end of 1985) of the NMP-1 Emergency Procedure Guidelines. This will be documented by Operations Engineering, Inc., the contractor who was hired by Niagara Mohawk to prepare the NMP-1 Emergency Operating Procedures.

- These changes will be reviewed against the task description steps derived from the Task Analysis as described in Section 4.3. This will be done by Advanced Resource Development Corp., the same contractor who carried out the Human Factors aspects of the program described herein.

- Any differences in task description steps will be examined for differences in the details of the operator actions or subtasks which could lead to different Instrument/Control needs. If there are any, a post hoc session of the DCRDR Review/Analysis Team will be convened to review these differences and define the needs. This will be done in essentially the same fashion as was described in Section 4.3 above.

- Similarly, any newly identified needs will be carried through the verification and validation processes described in Sections 4.6 and 4.7 above in order to determine whether there are any resulting HEO's. Any resulting HEO's will also be carried through the rest of the established program processes in order to determine any needed fixes or bases for rejection.

Of course, the scheduling of any fixes derived from this activity, including verification and other needed supporting organizational activities, will have to await the completion of this validation step. Because of the proximity of this validation step to the planned spring 1986 refueling outage, any substantial resulting corrective actions might not be completed by the end of the outage. However, because of the thoroughness of the current review, no further fixes are foreseeable at the present time.

5.4.4 HEO Assessment/Resolution Process

The initial HEO Assessment/Resolution activities have also been completed, and the details of the techniques used are described in Section 5.2. This includes additional reviews from follow-on Review/Analysis iterations and quantification of safety significance determinations in response to concerns expressed in the NRC audit of late November 1984. In addition, in response to further NRC concerns expressed in review meetings of 8 & 9 May 1985, an independent safety significance determination was carried out by one of ARD's Human Factors specialists not previously associated with the NMP-1 DCRDR. This specialist has nuclear power plant experience, however, and is leading some of the activities on the NMP-2 DCRDR. This independent determination was done on all "reject" category HEO's using the same criteria but without reference to the original safety significance rankings. There were 24 differences in the significant direction (i.e. Those whose rating changed from "insignificant" to "significant"). These were reconsidered by

the Assessment/Resolution Team and either fixes determined or an explanation provided about the further considerations discussed and reasons why they remained in the "reject" category. In about half (14) cases, the team disagreed with the rating change because of the particularities of NMP-1 operation. The HEO listings in Appendix D reflect the results of this reiteration.

Likewise, changes from the Integrated Cosmetics Package verification process (described in more detail in section 5.3.2) were handled in the same way. That is, the comments of the operators were considered by the Assessment/Resolution Team and changes were made, accordingly. In some cases, accomodating changes were made and in other cases, the original reasons for the change were elaborated. The compilations and pictures shown in Appendix E reflect the results of this iteration. There could be further Assessment/Resolution iterations needed later, as further follow-on verifications are completed. These will also be handled the same way, but are not expected to have a substantial impact on overall program results.

5.4.5 Training

Operator training for changes incorporated by this DCRDR program have been and will continue to occur at several points in the program. For fixes that were previously instituted (in the "Resolved-Completed" category), training proceeded in the normal fashion for all plant or procedural changes that occur in the course of operation. This is done through NMP-1's regular Operator Requalification Training cycle.

Operator Requalification Training is conducted in cycles of five (5) week duration. Each cycle is comprised of a new body of information to be presented to each of the five training shifts in their respective training week. Operator Requalification is continuous and ongoing, broken as required to accommodate outages, and to administer the annual requalification exam. This training is based on the requirements of 10CFR55, and presented in accordance with NMP-1's established procedures, as set forth in APN-10B, "NRC Licensed Operator Retraining."

Plant modifications are incorporated into the Operator Requalification Training program through mechanisms established in NMP-1's "Plant Modification Procedure," AP-6. This requires Training Department personnel to be brought into the modification process at the planning/scheduling meetings required in the procedure. Based on the scoping/design information obtained in these meetings, training programs are detailed as needed. Sign-off that these training programs are ready and scheduled are also contained in the Plant Modification procedure as a closeout item.

During the course of the DCRDR program, operators from each shift have been involved in various tasks and the Program Manager conducted information/update sessions on several occasions. Copies of program status reports were also distributed to each shift when they were issued, including the Functional Fix and Integrated Cosmetics Packages. Thus, the NMP-1 operators have had considerable exposure to the rationale

and basis for the changes being made. Furthermore, as described in Section 5.3.2, the operators carried out scenarios with the Integrated Cosmetics Package on the simulator and provided direct feedback to the Assessment/Resolution Team about the details of the fixes. Other direct feedback was obtained from selected operators on Functional Fixes and other aspects of the HEO considerations. Thus, training in the sense of familiarization has already been well started.

The Integrated Cosmetics Package will remain on the simulator. Formal training of fix details will start this fall, after the Integrated Cosmetics Package has been adjusted for specific application to the Control Room (as described previously in Section 5.3.2) and it has been made an official Plant Modification package. Although not covered by the DCRDR program, it should be noted that the EOP/SPDS training will also be going on concurrently with the Integrated Cosmetics Package on the simulator this fall. Thus, these programs will merge by the time of the spring 1986 outage completion activities and the completion of this combined training.

Training for fixes that are carried out during the spring 1986 outage and beyond will be conducted in conjunction with Operator Requalification Training as described above.

5.4.6 Human Factors Design Manual:

Based on the results of the initial assessment/resolution process and the fix mechanisms developed by the team, a set of codes and conventions emerged, as well as fixes. These were used as the basic building blocks for a Human Factors Design manual. As the verification processes described in section 5.3 proceeded, changes that resulted were incorporated into this manual. This is particularly important with the Integrated Cosmetics Package because of the need for consistency in the fix applications (including consistency with these things not being fixed), and the synergistic effects between the individual applications involved.

A few more changes to the Human Factors Design Manual may occur as the Integrated Cosmetics Package is installed on the Control Room and other verification activities proceed. Also, the manual is now proceeding through the engineering review/comment process like other engineering procedures.

When the manual is incorporated into the NMP-1 Engineering Procedures as a reference standard, it will be treated like an ASME and other standards, with provisions for regular revisions as needed.

Thus, the Human Factors Design Manual is expected to become the long range standard reference for all future Control Room I&C changes and it will maintain conventions to be applied for all future changes. (An outline of the content of the Human Factors Design Manual and the basis/methods used in developing it, is contained in Section 4.10.)

During the current transition period, while the DCRDR program activities are being carried out and the Human Factors Design manual is being established, the Design Engineering representative from the Review/Assessment Team used during the DCRDR program is screening all modifications scheduled for the spring 1986 outage. He will be sure that all Human Factors conventions being established by the DCRDR program and the resulting Human Factors Design Manual are met.

HED Source Index
Sorted on Disposition, Resoulution

Disposition	Resolution Category	Source/HED
1 RESOLVED (IN PROGRESS)	Ø1 COSMETIC-INDIVIDUAL	OCS-Ø27.Ø
		OCS-Ø49.Ø
		OCS-Ø82.Ø
	Ø3 FUNCTIONAL-NORMAL	COM-ØØ8.Ø
		COM-Ø22.Ø
		CS-ØØ5.Ø
		CS-Ø18.Ø
		OCS-Ø15.Ø
		OCS-Ø65.Ø
		OCS-2ØØ.Ø
		OCS-2Ø1.Ø
		OCS-2Ø2.Ø
		OCS-2Ø3.Ø
		OCS-234.Ø
		OCS-277.Ø
		QS-Ø18.Ø
		QS-Ø31.Ø
		QS-Ø32.Ø
		QS-Ø34.Ø
		SPD-ØØ5.Ø
		SPD-ØØ7.Ø
	Ø4 FUNCTIONAL-EMERGENCY	OCS-256.Ø
		OCS-257.Ø
		OCS-258.Ø
		OCS-259.Ø
		OCS-26Ø.Ø
		OCS-261.Ø
		OCS-262.Ø
		OCS-263.Ø
		OCS-264.Ø
		OCS-265.Ø
		OCS-266.Ø
		OCS-267.Ø
		OCS-271.Ø
		OCS-273.Ø
		SPD-Ø11.Ø
		SPD-Ø14.Ø
		VER-ØØ5.Ø
2 RESOLVED (COMPLETED)	Ø1 COSMETIC-INDIVIDUAL	CS-Ø27.Ø
		OCS-Ø12.Ø
		OCS-Ø26.Ø
		OCS-Ø28.Ø
		OCS-Ø35.Ø
		OCS-Ø41.Ø
		OCS-Ø42.Ø
		OCS-Ø43.Ø
		OCS-Ø44.Ø
		OCS-Ø45.Ø

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Disposition	Resolution Category	Source/HED
2 RESOLVED (COMPLETED)	01 COSMETIC-INDIVIDUAL	OCS-046.0
		OCS-047.0
		OCS-048.0
		OCS-050.0
		OCS-069.0
		OCS-085.0
		OCS-171.0
		OCS-182.0
		OCS-216.0
		OCS-227.0
		OCS-227.1
		OCS-228.0
		TA-001.0
	03 FUNCTIONAL-NORMAL	CS-019.0
		CS-026.0
		OCS-005.0
		OCS-064.0
		OCS-066.0
		OCS-067.0
		OCS-229.0
		OCS-240.0
		OCS-244.0
		OCS-245.0
		OCS-252.0
		OCS-254.0
		OCS-255.0
		OCS-272.0
		OCS-274.0
		OCS-279.0
		QS-001.0
		QS-037.0
	04 FUNCTIONAL-EMERGENCY	CS-033.0
		OCS-093.0
		VER-026.0
3 FIX	01 COSMETIC-INDIVIDUAL	CS-004.0
		CS-007.0
		CS-011.0
		CS-025.0
		CS-030.0
		CS-039.0
		CS-049.0
		CS-058.0
		CS-061.0
		CS-065.0
		CS-067.0
		OCS-007.0
		OCS-018.0
		OCS-019.0

HED Source Index
Sorted on Disposition, Resoulution

Disposition		Resolution Category	Source/HED
3 FIX	Ø1	COSMETIC-INDIVIDUAL	OCS-Ø2Ø.Ø
			OCS-Ø22.Ø
			OCS-Ø23.Ø
			OCS-Ø24.Ø
			OCS-Ø25.Ø
			OCS-Ø29.Ø
			OCS-Ø3Ø.Ø
			OCS-Ø31.Ø
			OCS-Ø34.Ø
			OCS-Ø36.Ø
			OCS-Ø39.Ø
			OCS-Ø58.1
			OCS-Ø73.Ø
			OCS-Ø75.Ø
			OCS-Ø76.Ø
			OCS-Ø83.1
			OCS-Ø97.Ø
			OCS-Ø98.Ø
			OCS-Ø99.Ø
			OCS-1ØØ.Ø
			OCS-1Ø1.Ø
			OCS-1Ø2.Ø
			OCS-1Ø3.Ø
			OCS-1Ø4.Ø
			OCS-1Ø5.Ø
			OCS-1Ø6.Ø
			OCS-1Ø7.Ø
			OCS-1Ø8.Ø
			OCS-11Ø.Ø
			OCS-111.Ø
			OCS-112.Ø
			OCS-113.Ø
			OCS-114.Ø
			OCS-115.Ø
			OCS-116.Ø
			OCS-118.Ø
			OCS-12Ø.Ø
			OCS-126.Ø
			OCS-138.Ø
			OCS-163.Ø
			OCS-172.Ø
			OCS-175.Ø
			OCS-178.Ø
			OCS-179.Ø
			OCS-18Ø.Ø
			QS-Ø14.Ø
			VAL-Ø22.Ø
			VER-Ø11.Ø
			VRR-ØØ2.Ø
	Ø2	COSMETIC-PANEL/SYSTEM	CS-ØØ1.Ø

HED Source Index
Sorted on Disposition, Resoulution

Disposition		Resolution Category	Source/HED
3 FIX	Ø2	COSMETIC-PANEL/SYSTEM	CS-Ø1Ø.Ø
			CS-Ø28.Ø
			CS-Ø31.Ø
			CS-Ø4Ø.Ø
			CS-Ø41.Ø
			CS-Ø43.Ø
			CS-Ø44.Ø
			CS-Ø48.Ø
			CS-Ø5Ø.Ø
			CS-Ø52.Ø
			CS-Ø55.Ø
			CS-Ø59.Ø
			CS-Ø6Ø.Ø
			CS-Ø66.Ø
			OCS-ØØ5.1
			OCS-ØØ5.2
			OCS-ØØ5.3
			OCS-ØØ5.4
			OCS-ØØ5.5
			OCS-ØØ5.6
			OCS-ØØ5.7
			OCS-ØØ6.Ø
			OCS-ØØ6.2
			OCS-ØØ8.Ø
			OCS-ØØ9.Ø
			OCS-Ø11.Ø
			OCS-Ø14.Ø
			OCS-Ø16.Ø
			OCS-Ø17.Ø
			OCS-Ø32.Ø
			OCS-Ø53.Ø
			OCS-Ø55.Ø
			OCS-Ø59.Ø
			OCS-Ø68.Ø
			OCS-Ø83.Ø
			OCS-127.Ø
			OCS-128.Ø
			OCS-129.Ø
			OCS-13Ø.Ø
			OCS-131.Ø
			OCS-132.Ø
			OCS-133.Ø
			OCS-134.Ø
			OCS-135.Ø
			OCS-136.Ø
			OCS-137.Ø
			OCS-139.Ø
			OCS-14Ø.Ø
			OCS-141.Ø
			OCS-142.Ø
			OCS-143.Ø

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Sorted on Disposition, Resoulution

Disposition	Resolution Category	Source/HED
3 FIX	Ø2 COSMETIC-PANEL/SYSTEM	OCS-144.Ø
		OCS-145.Ø
		OCS-146.Ø
		OCS-147.Ø
		OCS-148.Ø
		OCS-149.Ø
		OCS-15Ø.Ø
		OCS-151.Ø
		OCS-154.Ø
		OCS-155.Ø
		OCS-156.Ø
		OCS-157.Ø
		OCS-158.Ø
		OCS-159.Ø
		OCS-211.Ø
		OCS-226.Ø
		VER-Ø1Ø.Ø
		VER-Ø4Ø.Ø
	Ø3 FUNCTIONAL-NORMAL	COM-ØØ7.Ø
		COM-Ø27.Ø
		COM-Ø28.Ø
		COM-Ø29.Ø
		CS-Ø17.Ø
		FP-ØØ3.Ø
		FP-ØØ4.Ø
		HR-ØØ2.Ø
		OCS-Ø21.Ø
		OCS-Ø89.Ø
		OCS-Ø9Ø.Ø
		OCS-Ø91.Ø
		OCS-Ø92.Ø
		OCS-167.Ø
		OCS-219.Ø
		OCS-243.Ø
		QS-ØØ4.Ø
		QS-ØØ7.Ø
		QS-ØØ9.Ø
		QS-Ø16.1
		QS-Ø19.Ø
		QS-Ø23.Ø
		QS-Ø24.Ø
		QS-Ø25.Ø
		QS-Ø27.Ø
		QS-Ø28.Ø
		QS-Ø33.Ø
		VAL-ØØ2.Ø
		VRR-ØØ3.Ø
	Ø4 FUNCTIONAL-EMERGENCY	COM-ØØ1.Ø
		CS-Ø35.Ø

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Sorted on Disposition, Resoulution

Disposition	Resolution Category	Source/HED
3 FIX	04 FUNCTIONAL-EMERGENCY	ENV-004.0
		FP-001.0
		FP-005.0
		FP-006.0
		FP-007.0
		FP-008.0
		FP-009.0
		OCS-195.0
		QS-017.0
		SPD-012.0
		VRR-001.0
4 INVALID	01 COSMETIC-INDIVIDUAL	CS-029.0
		OCS-194.0
		OCS-276.0
	02 COSMETIC-PANEL/SYSTEM	OCS-212.0
	03 FUNCTIONAL-NORMAL	COM-005.0
		COM-006.0
		COM-015.0
		COM-023.0
		OCS-242.0
		OCS-280.0
	04 FUNCTIONAL-EMERGENCY	CS-064.0
		OCS-268.0
	06 INVALID	COM-025.0
		CS-006.0
		CS-012.0
		CS-013.0
		CS-020.0
		CS-022.0
		CS-056.0
		CS-057.0
		CS-062.0
		HR-001.0
		OCS-004.0
		OCS-033.0
		OCS-037.0
		OCS-038.0
		OCS-040.0
		OCS-054.0
		OCS-057.0
		OCS-070.0
		OCS-077.0
		OCS-078.0
		OCS-079.0
		OCS-080.0
		OCS-164.0

HED Source Index
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Disposition	Resolution Category	Source/HED
4 INVALID	Ø6 INVALID	OCS-173.Ø
		OCS-189.Ø
		OCS-199.Ø
		OCS-212.1
		OCS-213.Ø
		OCS-214.Ø
		OCS-215.Ø
		OCS-217.Ø
		OCS-218.Ø
		OCS-246.Ø
		OCS-247.Ø
		OCS-248.Ø
		OCS-249.Ø
		OCS-25Ø.Ø
		OCS-251.Ø
		OCS-27Ø.Ø
		OCS-275.Ø
		QS-ØØ2.Ø
		QS-ØØ3.Ø
		QS-Ø11.Ø
		QS-Ø15.Ø
		QS-Ø36.Ø
		SPD-ØØ2.Ø
		SPD-ØØ3.Ø
		SPD-ØØ4.Ø
		SPD-ØØ8.Ø
		SPD-ØØ9.Ø
		TA-ØØ2.Ø
		VAL-ØØ3.Ø
		VAL-ØØ7.Ø
		VAL-ØØ9.Ø
		VAL-Ø13.Ø
		VAL-Ø15.1
		VAL-Ø15.2
		VAL-Ø17.Ø
		VAL-Ø18.Ø
		VAL-Ø19.Ø
		VAL-Ø2Ø.Ø
		VAL-Ø21.Ø
		VAL-Ø23.Ø
		VAL-Ø24.Ø
		VER-ØØ1.Ø
		VER-ØØ3.Ø
		VER-ØØ4.Ø
		VER-ØØ6.Ø
		VER-ØØ7.Ø
		VER-ØØ9.Ø
		VER-Ø12.Ø
		VER-Ø16.Ø
		VER-Ø22.Ø
		VER-Ø23.Ø

HED Source Index
Sorted on Disposition, Resoulution

Disposition	Resolution Category	Source/HED
4 INVALID	Ø6 INVALID	VER-Ø27.Ø
		VER-Ø29.Ø
		VER-Ø31.Ø
		VER-Ø32.Ø
		VER-Ø33.Ø
		VER-Ø35.Ø
		VER-Ø36.Ø
		VER-Ø37.Ø
		VER-Ø38.Ø
		VER-Ø41.Ø
5 REJECT	Ø1 COSMETIC-INDIVIDUAL	CS-ØØ3.Ø
		CS-Ø15.Ø
		CS-Ø34.Ø
		OCS-Ø6Ø.Ø
		OCS-Ø61.Ø
		OCS-Ø62.Ø
		OCS-Ø63.Ø
		OCS-Ø71.Ø
		OCS-Ø72.Ø
		OCS-Ø74.Ø
		OCS-Ø81.Ø
		OCS-Ø84.Ø
		OCS-Ø86.Ø
		OCS-Ø94.Ø
		OCS-Ø96.Ø
		OCS-1Ø9.Ø
		OCS-117.Ø
		OCS-119.Ø
		OCS-121.Ø
		OCS-122.Ø
		OCS-123.Ø
		OCS-124.Ø
		OCS-125.Ø
		OCS-168.Ø
		OCS-169.Ø
		OCS-17Ø.Ø
		OCS-174.Ø
		OCS-176.Ø
		OCS-177.Ø
		OCS-183.Ø
		OCS-192.Ø
		OCS-193.Ø
		OCS-196.Ø
		OCS-197.Ø
		OCS-198.Ø
		OCS-2Ø5.Ø
		OCS-2Ø6.Ø
		OCS-2Ø7.Ø
		OCS-2Ø8.Ø
		OCS-2Ø9.Ø

HED Source Index
Sorted on Disposition, Resoulution

Disposition	Resolution Category	Source/HED
5 REJECT	Ø1 COSMETIC-INDIVIDUAL	OCS-23Ø.Ø
		VER-Ø19.Ø
	Ø2 COSMETIC-PANEL/SYSTEM	CS-Ø36.Ø
		CS-Ø38.Ø
		CS-Ø42.Ø
		CS-Ø45.Ø
		CS-Ø47.Ø
		CS-Ø51.Ø
		FP-ØØ2.Ø
		OCS-ØØ5.8
		OCS-Ø51.Ø
		OCS-Ø52.Ø
		OCS-Ø56.Ø
		OCS-Ø87.Ø
		OCS-Ø88.Ø
		OCS-152.Ø
		OCS-153.Ø
		OCS-16Ø.Ø
		OCS-161.Ø
		OCS-162.Ø
		OCS-19Ø.Ø
		OCS-191.Ø
		OCS-233.Ø
	Ø3 FUNCTIONAL-NORMAL	COM-ØØ2.Ø
		COM-ØØ3.Ø
		COM-ØØ4.Ø
		COM-ØØ9.Ø
		COM-Ø1Ø.Ø
		COM-Ø11.Ø
		COM-Ø12.Ø
		COM-Ø13.Ø
		COM-Ø14.Ø
		COM-Ø16.Ø
		COM-Ø17.Ø
		COM-Ø18.Ø
		COM-Ø19.Ø
		COM-Ø2Ø.Ø
		COM-Ø21.Ø
		COM-Ø24.Ø
		COM-Ø26.Ø
		COM-Ø3Ø.Ø
		CS-ØØ2.Ø
		CS-ØØ8.Ø
		CS-Ø16.Ø
		CS-Ø21.Ø
		CS-Ø23.Ø
		CS-Ø24.Ø
		CS-Ø32.Ø
		CS-Ø37.Ø

HED Source Index
Sorted on Disposition, Resoulution

Disposition		Resolution Category	Source/HED
5 REJECT	Ø3	FUNCTIONAL-NORMAL	CS-Ø46.Ø
			CS-Ø54.Ø
			CS-Ø63.Ø
			CS-Ø68.Ø
			OCS-ØØ1.Ø
			OCS-ØØ2.Ø
			OCS-ØØ3.Ø
			OCS-Ø13.Ø
			OCS-Ø58.2
			OCS-165.Ø
			OCS-166.Ø
			OCS-184.Ø
			OCS-185.Ø
			OCS-186.Ø
			OCS-187.Ø
			OCS-188.Ø
			OCS-2Ø4.Ø
			OCS-21Ø.Ø
			OCS-22Ø.Ø
			OCS-222.Ø
			OCS-223.Ø
			OCS-224.Ø
			OCS-225.Ø
			OCS-235.Ø
			OCS-236.Ø
			OCS-237.Ø
			OCS-241.Ø
			OCS-253.Ø
			OCS-269.Ø
			OCS-278.Ø
			QS-ØØ5.Ø
			QS-ØØ6.Ø
			QS-ØØ8.Ø
			QS-Ø1Ø.Ø
			QS-Ø12.Ø
			QS-Ø13.Ø
			QS-Ø16.Ø
			QS-Ø21.Ø
			QS-Ø22.Ø
			QS-Ø26.Ø
			QS-Ø29.Ø
			QS-Ø3Ø.Ø
			QS-Ø35.Ø
			SPD-ØØ6.Ø
			VAL-ØØ1.Ø
			VAL-ØØ4.Ø
			VAL-ØØ5.Ø
			VAL-ØØ6.Ø
			VAL-ØØ8.Ø
			VAL-Ø1Ø.Ø
			VAL-Ø11.Ø

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HED Source Index
Sorted on Disposition, Resoulution

Disposition	Resolution Category	Source/HED
5 REJECT	Ø3 FUNCTIONAL-NORMAL	VAL-Ø12.Ø
		VAL-Ø14.Ø
		VAL-Ø16.Ø
		VAL-Ø25.Ø
		VER-Ø13.Ø
		VER-Ø15.Ø
		VER-Ø21.Ø
		VER-Ø24.Ø
		VER-Ø3Ø.Ø
		VER-Ø34.Ø
		VER-Ø39.Ø
	Ø4 FUNCTIONAL-EMERGENCY	CS-ØØ9.Ø
		CS-Ø14.Ø
		CS-Ø53.Ø
		ENV-ØØ1.Ø
		ENV-ØØ2.Ø
		ENV-ØØ3.Ø
		OCS-Ø1Ø.Ø
		OCS-Ø95.Ø
		OCS-181.Ø
		OCS-221.Ø
		OCS-231.Ø
		OCS-232.Ø
		OCS-238.Ø
		OCS-239.Ø
		SPD-ØØ1.Ø
		SPD-Ø1Ø.Ø
		SPD-Ø13.Ø
		VER-ØØ2.Ø
		VER-ØØ8.Ø
		VER-Ø14.Ø
		VER-Ø17.Ø
		VER-Ø18.Ø
		VER-Ø2Ø.Ø
		VER-Ø25.Ø
		VER-Ø28.Ø
		VER-Ø42.Ø

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-027.0

DESCRIPTION:

CONTROLLER TO THE RIGHT OF FEEDWATER PMP 11 VLV CONTROL; PANEL F; SHOULD BE FEEDWATER PMP 12 VLV CONTROL.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS COMPONENT HAS BEEN LABELED SINCE THE ORIGIONAL SURVEY.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
F		FEEDWATER PUMP 12 VLV CONTROL

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø49.Ø

DESCRIPTION:

ALARM SETPOINTS FOR RADIATION MONITORING SYSTEM: PANEL J. TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMP LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
J		RADIATION MONITORING SYSTEM

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø82.Ø

DESCRIPTION:

NO UNITS SPECIFIED ON BOTTOM RECORDER OF PANEL B3.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

RECORDER IS NOW LABELED DEGREES CENTIGRADE.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
B3		BOTTOM RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: COM-ØØ8.Ø

DESCRIPTION:

SOME CRT SCREENS IN THE CONTROL ROOM HAVE NOT BEEN INSTALLED TO MINIMIZE OR ELIMINATE GLARE (E.G. NO ANTI-GLARE SCREEN HAS BEEN USED).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

CRT SCREENS ARE BEING EQUIPPED WITH ANTI-GLARE FILTERS AND THE POSITION OF THE CRTS IN THE CONTROL ROOM ARE BEING RELOCATED. THIS WILL REDUCE THE EFFECT OF GLARE

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

NINE MILE POINT UNIT 1 HEO

HEO#: COM-Ø22.Ø

DESCRIPTION:

NO FEEDBACK MESSAGES ARE PROVIDED TO THE OPERATOR TO INDICATE CHANGES IN THE STATUS OF COMPUTER SYSTEM FUNCTIONING.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE COMPUTER CURSOR TURNS PURPLE UPON A REQUEST FROM THE OPERATOR IF THE COMPUTER IS DOWN. THERE IS ALSO A MOD REQUEST TO PROVIDE A ANNUNCIATION WHICH WILL ACTIVATE UPON COMPUTER FAILURE.

VERIFICATION:
VERIFY COMPLETION.

HEO#: CS-ØØ5.Ø

DESCRIPTION:

THE TOP ROW OF METERS ARE ABOVE THE RECOMMENDED HEIGHT FOR DISPLAY LOCATION. THESE METERS CANNOT BE EASILY READ DUE TO A POTENTIAL PARALLAX PROBLEM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE METERS IN QUESTION CAN BE ACCURATELY READ FROM THE EXPECTED OPERATOR POSITION. SEE OCS-15 FOR RESOLUTION.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
A1		GENERIC
A2		GENERIC
A4		GENERIC
A5		GENERIC
A8		GENERIC
F		GENERIC
H		GENERIC
K		GENERIC
L		GENERIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-018.0

DESCRIPTION:

SOME FUNCTION KEYS ON THE COMPUTER KEYBOARDS ARE USED BY OTHERS THAN THE OPERATORS. OPERATORS INDICATE THEY ARE NOT SURE ABOUT ALL FUNCTION KEYS BUT THIS DOES NOT APPEAR TO INTERFERE WITH THEIR USE OF THE KEYBOARD.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALL NON-OPERATOR FUNCTIONS WILL BE REMOVED BY THE TIME THE SPDS AND PC KEYBOARDS ARE REVIEWED AND COMPLETED BY THE SPRING '84 REFUELING OUTAGE. THESE WILL BE ALLOCATED TO THE TSC OR ANOTHER KEYBOARD STATION BEING OPERATED BY THE STA OR OTHERS. ALSO, THE KEYBOARD WILL BE REVIEWED FOR OTHER HF CONCERNS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

QUERY OPERATORS.

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø15.Ø

DESCRIPTION:

CONTROLS AND DISPLAYS ARE LOCATED LOWER AND/OR HIGHER THAN THE RECOMMENDED LIMITS ON BENCHBOARDS F;H;K;L; AND A1 DISPLAYS ARE OUTSIDE RECOMMENDED LIMITS ON BENCHBOARDS A2-A8. CONTROLS AND DISPLAYS ARE LOCATED LOWER AND/OR HIGHER THAN THE RECOMMENDED LIMITS ON VERTICAL PANELS J; B1-B8; AND G.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALL DISPLAY HEIGHTS FALL WITHIN THE UPPER 75% OF VISUAL FIELD (75% ABOVE HORIZONTAL LINE OF SIGHT FOR THE 5TH % FEMALE.) HOWEVER , SOME UPPER DISPLAYS FALL OUTSIDE OF THEF 45 DEG ANGLE LINE OF SIGHT TO THE FACE PLANES WHICH RESULT IN AN UPPER LIMIT OF APPROX 75" FOR THE 5TH PERCENTILE FEMALE. THE WORST CASE FOR THESE DISPLAYS ARE THEF ANNUNCIATORS WHICH ARE APPROX 1Ø5" HIGH. THE ANNUNCIATOR SYSTEM, HOWEVER, IS DESIGNED TO BE READ AND OPERATED FROM PANEL E. FROM THIS PANEL BOTH CRITERIA ARE ACCEPTABLE. SOME OTHER DISPLAYS (NOTABLY THE ROD POSITION MIMIC ON PANEL F) ARE ABOVE THE HEIGHT OF 75" NECESSARY TO MEET THE CRITERIA.
CIRCULAR METERS ON A3-A8 ARE NOT DIFFICULT TO READ AND ALSO ARE NOT CRITICAL. THE DESIGN OF THE METERS (CIRCULAR) MAKE IT LESS PRONE TO PARALLAX.
ON PANEL A1 AND A2 METER PARALLAX IS A PROBLEM ON VERTICAL METERS. HOWEVER, THIS INFO IS NOT CRITICAL TO OPERATION. ON PANELS H,K, AND L, ALL INFO SUBJECT TO PARRALAX (UPPER ROW) IS NOT CRITICAL TO OPERATIONS EXCEPT FOR THE LISTED COMPONENTS ON THE HED. TO ELIMINATE THE POTENTIAL FOR PARALLAX ON THESE METERS, A STEP STOOL WILL BE PROVIDED CLOSE TO PANEL K AND L WHICH CAN BE USED FOR VALUE READINGS.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
K		DOWN CORNER SUBMERGENCE
K		DRYWELL WATER LEVEL
K		TORUS WATER LEVEL CH 11
K		TORUS WATER LEVEL CH 12
L		DRYWELL PRESSURE
L		DRYWELL PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø65.Ø

DESCRIPTION:

TEMPORARY CHANGES AND MODIFICATIONS TO LABELING ARE GENERALLY NOT CONSISTENT AND CONTROLLED; IN NOMENCLATURE; FONT AND COLOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALL MODIFICATIONS TO PANELS ARE CONTROLLED BY ADMINISTRATIVE PROCEDURE AND NOW ALL TEMPORARY LABELING IS CONTROLLED BY A STANDING ORDER. THE NMP-1 HUMAN FACTORS DESIGN MANUAL WILL STATE SPECIFICATIONS FOR TEMPORARY LABELING.

VERIFICATION:
VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-200.0

DESCRIPTION:

THE GOVERNOR AND EXCITER CONTROLS DO NOT MOVE IN THE EXPECTED DIRECTION; THESE SWITCHES HAVE RAISE TO LEFT AND LOWER TO RIGHT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALL THE TURBINE GENERATOR CONTROLS FOLLOW THE SAME CONVENTION. TO MODIFY THIS CONVENTION WOULD RESULT IN A NEGATIVE TRANSFER SITUATION. THE CURRENT CONFIGURATION WILL BE ACKNOWLEDGED AS AN NMP-1 SWITCH CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL. THE CONVENTIONS IN THIS MANUAL WILL BECOME PART OF THE OPERATOR TRAINING CURRICULUM. ALL APPLICATIONS OF THIS CONTROL CONVENTION WILL BE CHECKED TO ENSURE COMPLIANCE.

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
A4		EXCITER CONTROL
A5		EXCITER CONTROL
A7		EXCITER CONTROL
E		EXCITER CONTROL

HEO#: OCS-2Ø1.Ø

DESCRIPTION:

THE TRANSFORMER 1Ø TAP.POS. DOES NOT MOVE IN THE EXPECTED DIRECTION; THESE SW HAVE RAISE-LEFT AND LOWER-RIGHT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALL THE TURBINE GENERATOR CONTROLS FOLLOW THE SAME CONVENTION. TO MODIFY THIS CONVENTION WOULD RESULT IN A NEGATIVE TRANSFER SITUATION. THE CURRENT CONFIGURATION WILL BE ACKNOWLEDGED AS AN NMP-1 SWITCH CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL. THE CONVENTIONS IN THIS MANUAL WILL BECOME PART OF THE OPERATOR TRAINING CURRICULUM. ALL APPLICATIONS OF THIS CONTROL CONVENTION WILL BE CHECKED TO ENSURE COMPLIANCE.

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
A6		TRANSFORMER 1Ø TAP POS SWITCH

HEO#: OCS-202.0

DESCRIPTION:

THE MECHANICAL AND ELECTRICAL PRESS REG DO NOT MOVE IN THE EXPECTED DIRECTION; THESE SWITCHES HAVE RAISE TO LEFT AND LOWER TO RIGHT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALL THE TURBINE GENERATOR CONTROLS FOLLOW THE SAME CONVENTION. TO MODIFY THIS CONVENTION WOULD RESULT IN A NEGATIVE TRANSFER SITUATION. THE CURRENT CONFIGURATION WILL BE ACKNOWLEDGED AS AN NMP-1 SWITCH CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL. THE CONVENTIONS IN THIS MANUAL WILL BECOME PART OF THE OPERATOR TRAINING CURRICULUM. ALL APPLICATIONS OF THIS CONTROL CONVENTION WILL BE CHECKED TO ENSURE COMPLIANCE.

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
E		MECHANICAL ELECTRICAL PRESSURE REGULATOR

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-203.0

DESCRIPTION:

THE LOAD LIMIT DOES NOT MOVE IN THE EXPECTED DIRECTION; THESE SW HAVE RAISE TO LEFT AND LOWER TO RIGHT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALL THE TURBINE GENERATOR CONTROLS FOLLOW THE SAME CONVENTION. TO MODIFY THIS CONVENTION WOULD RESULT IN A NEGATIVE TRANSFER SITUATION. THE CURRENT CONFIGURATION WILL BE ACKNOWLEDGED AS AN NMP-1 SWITCH CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL. THE CONVENTIONS IN THIS MANUAL WILL BECOME PART OF THE OPERATOR TRAINING CURRICULUM. ALL APPLICATIONS OF THIS CONTROL CONVENTION WILL BE CHECKED TO ENSURE COMPLIANCE.

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
A2		LOAD LIMIT

HEO#: OCS-234.Ø

DESCRIPTION:

WINDOW ARRAYS HAVE BEEN PROVIDED WITH A TOP-TO-BOTTOM NUMERIC CODE. THIS CODE; HOWEVER; DOES NOT CONFORM WITH THE ANNUNCIATOR IDENTIFICATION CODE USED IN BOTH THE ELEMENTARY WIRING DIAGRAMS AND THE ANNUNCIATOR PROCEDURES. AS SUCH THE NUMERICS PROVIDED ARE OF NO USE; THE OPERATOR MUST COUNT WINDOWS. THE WINDOW CODE USED IS NOT A MATRIX TYPE CODE. THE WINDOWS ARE CONSECUTIVELY NUMBERED FROM L-TO-R. THE OPERATOR HAS TO PERFORM 2 MENTAL CALCULATIONS: 1) TO COUNT ACROSS AND 2) TO ADD THE NUMBER OF WINDOWS IN PREVIOUS ROWS. THIS PROCESS COULD BE SIMPLIFIED BY PROPER WINDOW IDENTIFICATION ON EACH WINDOW.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE PROCEDURES HAVE BEEN CHANGED TO PROVIDE NUMERIC CODE USED ON WINDOW BOXES. P&IDS AND ELEMENTARIES WILL ALSO BE CHANGED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATOR WINDOWS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-277.0

DESCRIPTION:

A SUBSTANTIAL NUMBER OF PERSONS ARE PRESENT IN THE CONTROL ROOM AT TIMES. THIS CONTRIBUTES TO BACKGROUND NOISE LEVELS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE WILL BE A REDESIGN OF SHIFT SUPERVISION OFFICE TO ELIMINATE MAINTENANCE TRAFFIC INTO THE CR. THERE WILL BE A SEPERATE POLICY RULE TO HELP FACILITATE THE PROBLEM. THE NEW SIMULATOR ALSO REMOVES MUCH OF THE TRAINING PERSONNEL, DESIGN ENGINEERS, AND OPERATORS FROM THE CR.

VERIFICATION:
QUERY OPERATORS.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-018.0

DESCRIPTION:

THESE ARE CONTROLS LOCATED LOW ON THE PANELS THAT COULD BE JUMPED BY A PASSER BY'S KNEES AND ACCIDENTALLY ACTIVATED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: 5C

EXPLANATION:

INSTALL A PERCEPTUAL BARRIER WITH AN 8" TAPED AREA CONTIGUOUS TO THE CONTROL PANEL AND DEMARCATE THE AREA AS A CONTROLLED AREA WITH NO ACCESS TO PASSING TRAFFIC.

VERIFICATION:

VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø31.Ø

DESCRIPTION:

LABELS ENGRAVED ON KEYBOARD KEYS ARE ABBREVIATIONS OR SYMBOLS. THESE ABBREVIATIONS AND SYMBOLS ARE USED INCONSISTENTLY, THEIR MEANING IS NOT ALWAYS CLEAR AND THEY DON'T CONFORM TO ABBREVIATIONS USED ELSEWHERE IN THE CONTROL ROOM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE KEYBOARDS WERE DESIGNED SPECIFICALLY FOR THE NMP-1 COMPUTER FUNCTIONS (I.E., NOT STANDARDIZED TYPERS). THE KEYBOARDS WHICH WERE PURCHASED WERE STANDARDIZED. THERE ARE CERTAIN KEYS NOT USED BY THE OPERATORS, BUT THESE ARE FEW. THERE WILL BE A STUDY TO DETERMINE ABBREVIATIONS AND SYMBOLS USED ON THE COMPUTER AND WHERE THESE DO NOT CONFORM TO CONTROL ROOM CONVENTIONS. THEY WILL BE MADE CONSISTENT..

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

NINE MILE POINT UNIT 1 HEO

HEO#: DS-032.0

DESCRIPTION:

CRTS ARE LOCATED BEHIND THE OPERATORS WHEN AT THEIR USUAL WORKSTATIONS, SO THEY MUST TURN AWAY FROM THE CONTROL PANELS IN ORDER TO VIEW THE CRTS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE LAYOUT IS PRESENTLY BEING CHANGED TO REORIENT THE EQUIPMENT.

VERIFICATION:
VERIFY COMPLETION.

PLANT COMPUTER/SPDS

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø34.Ø

DESCRIPTION:

OPERATORS CALL UP INFORMATION REGARDING PARTICULAR SENSOR (POINTS) ON THE COMPUTER WITH A CODE CONSISTING OF A LETTER AND 3 NUMBERS. THE MANUAL IN WHICH THEY LOOK UP THE CODE NUMBERS IS NOT WELL ORGANIZED AND IS TIME CONSUMING TO USE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: 4E

EXPLANATION:

A NEW MANUAL IS BEING PREPARED WHICH ASSISTS THE LOCATION OF EACH CODE.

VERIFICATION:
VERIFY COMPLETION.

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

NINE MILE POINT UNIT 1 HEO

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: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE SPDS SPECIFICATION HAS PROVISIONS TO INCORPORATE THESE FEATURES.

VERIFICATION:
VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-007.0

DESCRIPTION:

UNVALIDATED DATA POINTS ARE NOT CODED TO SHOW THEIR STATUS AS DIFFERENT FROM VALID AND INVALID DATA POINTS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE NEW DESIGN SPECIFICATION SPECIFIES THAT INVALID DATA POINTS WILL BE COLOR CODED.

VERIFICATION:
VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-256.Ø

DESCRIPTION:

ADMINISTRATIVE PROCEDURES HAVE NOT BEEN IMPLEMENTED TO ASSURE STANDARDIZATION OF PROCEDURE FORMAT FOR TYPE SIZE AND STYLE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

HEO#: OCS-257.0

DESCRIPTION:

ADMINISTRATIVE PROCEDURES HAVE NOT BEEN IMPLEMENTED TO ASSURE STANDARDIZATION OF PROCEDURE FORMAT FOR USE OF NOMENCLATURE; GRAMMAR; TERMINOLOGY; SYNONYMS; ACRONYMS; AND ABBREVIATIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-258.Ø

DESCRIPTION:

ADMINISTRATIVE PROCEDURES HAVE NOT BEEN IMPLEMENTED TO ASSURE STANDARDIZATION OF PROCEDURE FORMAT FOR USE OF AS-LABELED DESIGNATIONS FOR COMPONENTS; SYSTEMS; AND PROCESS UNITS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-259.Ø

DESCRIPTION:

ADMINISTRATIVE PROCEDURES HAVE NOT BEEN IMPLEMENTED TO ASSURE STANDARDIZATION OF PROCEDURE FORMAT FOR NUMBERING OF PROCEDURES; PARAGRAPHS; STEPS AND SUBSTEPS FOR INCREASED LEVELS OF DETAIL.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-260.0

DESCRIPTION:

ADMINISTRATIVE PROCEDURES HAVE NOT BEEN IMPLEMENTED TO ASSURE STANDARDIZATION OF PROCEDURE FORMAT FOR STEP OR PARAGRAPH SPACING AND PAGE LAYOUT AND IDENTITY.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-261.Ø

DESCRIPTION:

ADMIN. PROCEDURES HAVE NOT BEEN IMPLEMENTED TO ASSURE STANDARDIZATION OF PROCEDURE FORMAT FOR ENTRY AND EXIT CONDITIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-262.Ø

DESCRIPTION:

ADMIN. PROCEDURES HAVE NOT BEEN IMPLEMENTED TO ASSURE STANDARDIZATION OF PROCEDURE FORMAT FOR CROSS-REFERENCING; REFERENCES ARE GIVEN WITHOUT LOCATION (PANEL) IDENT.; DRAWING NO'S; OR PLANT EQUIPMENT LOCATION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-263.Ø

DESCRIPTION:

SUCCINT ACTION VERBS AND STATEMENTS ARE NOT ALWAYS LOCATED SUCH THAT THEY COMMAND ATTENTION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-264.Ø

DESCRIPTION:

CAUTIONS AND REFERENCES ARE NOT EFFECTIVELY DELINEATED FROM OTHER STEPS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-265.Ø

DESCRIPTION:

SYMPTOMATIC OR DIAGNOSTIC ANALYSIS OR ENTRY EVENT GUIDANCE IS NOT USED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-266.0

DESCRIPTION:

CHARTS; DIAGRAMS; AND GRAPHS ARE NOT INTEGRATED INTO THE BODY OF THE PROCEDURES TO SUPPLEMENT STEPS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-267.Ø

DESCRIPTION:

PHYSICAL PANEL LOCATIONS OF REFERENCED INSTRUMENTATION AND HARDWARE ARE NOT PROVIDED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A WRITERS GUIDE FOR THE EMERGENCY PROCEDURES HAS BEEN ESTABLISHEDAND THERE IS A STANDARDIZED FORMAT ESTABLISHED IN THE APN. THERE ARE REVIEWS FOR ALL PROCEDURES AND THIS NETWORK IS ACKNOWLEDGED AND CONSIDERED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-271.0

DESCRIPTION:

CONTINGENCY ACTIONS OR CONDITIONAL INSTRUCTIONS ARE NOT ALWAYS PROVIDED WHEN EXPECTED RESULTS OR ACTIONS ARE NOT ACHIEVED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE NEW EMERGENCY PROCEDURES WILL HAVE THIS FEATURE.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-273.0

DESCRIPTION:

IN MAKING REVISIONS OR CORRECTIONS TO PROCEDURES; WALK-THRUS ARE NOT USED TO VERIFY CORRECTNESS; UNDERSTANDING AND THE OPERATORS ABILITY TO USE THE PROCEDURES.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE NEW EMERGENCY PROCEDURE WILL HAVE A VALIDATION WALK-THROUGH FOR EACH. ON OTHER PROCEDURES, OPERATORS ARE USED IN THE REVIEW PROCESS TO ADDRESS THESE ISSUES.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-Ø11.Ø

DESCRIPTION:

COLOR USAGE IS INCONSISTENT AND DOES NOT TAKE INTO ACCOUNT POP. STEREOTYPES AND/OR PLANT STANDARDS (RED=ALARM, YELLOW=CAUTION, GREEN=NORMAL). RESERVED COLORS (RED,YELLOW,GREEN) ARE USED FOR NON-INFO BEARING FIELDS(STATIC FIELDS).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: 4C

EXPLANATION:

THERE IS A DEFINED COLOR SPECIFICATION WHICH WILL BE INCORPORATED INTO THE HF MANUAL.

VERIFICATION:
VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-Ø14.Ø

DESCRIPTION:

BY DEPRESSING THE WRONG FUNCTION KEY BUTTON THE OPERATOR (OR TSC PERSONNEL) MAY CAUSE THE COMPUTER DISPLAY PROCESSOR TO HANG NECESSITATING A REBOOT OF THE SYSTEM. AN OPERATOR MUST LEAVE THE CONTROL ROOM TO ACCOMPLISH THIS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS PROBLEM IS OF MAJOR CONCERN AND IS BEING ADDRESSED.

VERIFICATION:
ELABORATE ON ASSESSMENT.

NINE MILE POINT UNIT 1 HEO

HEO#: VER-005.0

DESCRIPTION:

THE ABOVE CHARTS OR GRAPHS ARE NOT AVAILABLE FOR USE IN CONJUNCTION WITH THE EOPS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (IN PROGRESS)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THESE GRAPHICS WILL BE SUPPLIED WITH THE NEW EOPS CURRENTLY IN PREPARATION.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		HEAT CAPACITY TEMPERATURE LIMIT
		SUPPRESSION POOL LOAD LIMIT

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø27.Ø

DESCRIPTION:

ESCUTCHEONS ARE MARKED CLOSED-AUTO-OPEN BUT REFER TO CONTROL TRANSFER TO THE RSP FROM THE CR. THESE SHOULD BE LABELED CR-?-RSP.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE ESCUTCHEONS HAVE BEEN CHANGED AND NOW READS "NORMAL"-"EMERG" WHICH CORRESPONDS TO FUNCTION.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
RSP		EMER CON #121 & #122 LEVEL CONTROL TRANSFER
RSP		EMER CONDENSER COND RETURN IV #12

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø12.Ø

DESCRIPTION:

IT IS NOT CLEAR WHETHER EMERG COND VENT TO TORUS BYPASS VLV 12;
PANEL K; IS THE END OF A FLOW PATH OR NOT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE NEW LABEL IN THE DEVICE INDICATES THAT THE FLOW IS TO TORUS.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
K		EMERG CONDENSER VENT TO TORUS BYPASS VALVE 12

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø26.Ø

DESCRIPTION:

CONTROLLER 6Ø-17; PANEL K; SHOULD BE EMERG COND MAKEUP LEVEL 11.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
K		CONTROLLER
		CONTROLLER 6Ø-17

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø28.Ø

DESCRIPTION:

THE CONTROLLER BELOW FEEDWATER PMP 13 VLV CONTROL; PANEL F; IS TAPED OVER WITH DUCT TAPE; BUT NO LABEL IS PROVIDED NOR A TAGOUT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE COMPONENT HAS BEEN LABELED AND TAPE HAS BEEN REMOVED SINCE SURVEY.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
F		PREFERENTIAL BIAS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-035.0

DESCRIPTION:

RECORDERS ON PANEL G ARE NOT LABELLED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

RECORDERS ARE NOW LABELED.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
G		RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø41.Ø

DESCRIPTION:

TO THE RIGHT OF THE REACTOR LEVEL INDICATORS (CHANNEL 11 AND 12) PANEL F; ARE SETPOINTS FOR HIGH-LEVEL; LOW-LEVEL; AND LOW-LOW LEVEL. THIS IS ALSO THE CASE TO THE LEFT OF THE PRESSURE VESSEL LEVEL INDICATOR PANEL E. TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMPORARY LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
F		REACTOR LEVEL INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-042.0

DESCRIPTION:

THE ADS SETPOINTS ARE NOTED ABOVE THE POWER OPERATED RELIEF VLVS; PANEL F. TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMPORARY LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
F		POWER OPERATED RELIEF VLVS

HEO#: OCS-043.0

DESCRIPTION:

INFO ON CONDENSATE FLOW RATES IS PROVIDED ABOVE THE CONDENSATE CONTROLS; PANEL H3; TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMP LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
H3		CONDENSATE CONTROLS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø44.Ø

DESCRIPTION:

CONTAINMENT SPRAY ACTUATION CONDITIONS AND FLOW RATE ARE SHOWN ABOVE THE CONTAINMENT SPRAY PMPS; PANEL K. TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMP LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
		CONTAINMENT SPRAY PUMPS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø45.Ø

DESCRIPTION:

THE SHUTOFF PRESSURE HEAD FOR CORE SPRAY IS SHOWN ABOVE THE CORE SPRAY DISCHARGE ISOL VLV CONTROLS; PANEL K. TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMP LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
K		SHUTOFF PRESSURE HEAD FOR CORE SPRAY

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø46.Ø

DESCRIPTION:

TURBINE BLDG SUPPLY FAN CONTROLS HAVE SUPPLEMENTAL OPERATING INFO TAPED TO THE PANEL; PANEL L; TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMP LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
L		TURBINE BUILDING SUPPLY FAN CONTROLS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø47.Ø

DESCRIPTION:

THE INSTRUCTION "LIFT PMPS-ON-OFF 9ØØ RPM" APPEARS ABOVE THE BEARING LIFT PMP CONTROLS; PANEL A1. TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMP LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
A1		BEARING LIFT PUMP CONTROLS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø48.Ø

DESCRIPTION:

OTHER INSTRUCTIONS ARE SHOWN ON PANEL E. TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMP LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

E

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-050.0

DESCRIPTION:

LABELING OF THE CONTROL ROD DRIVE DUMP VOLUME VENT VLV INDICATING LIGHTS IS NOT DETAILED AS THE OPERATORS HAVE ADDED LABELS; PANEL F. TEMP LABELS ARE USED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE TEMP LABELS HAVE BEEN REMOVED, VERIFIED, AND REPLACED WITH PERMANENT LABELS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
F		CONTROL ROD DRIVE DUMP VOLUME VENT VLV

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-069.0

DESCRIPTION:

TORUS WATER LEVEL RECORDERS; PANEL L; ARE SCALED IN TERMS OF PLANT ELEVATION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THESE RECORDERS HAVE BEEN MODIFIED TO READ IN FEET.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
L		TORUS WATER LEVEL RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø85.Ø

DESCRIPTION:

THE GENERAL ELECTRIC RECORDER ON PANEL A2 HAS A POINTER WHICH OBSCURES GRADUATION MARKS AND NUMERALS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THESE RECORDERS HAVE BEEN REPLACED SINCE THE ORIGINAL SURVEY.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
A2		GENERAL ELECTRIC RECORDER DDDDD DD DD

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-171.Ø

DESCRIPTION:

REACTOR VESSEL LEVEL RECORDER HAS A SCALE Ø-1ØØ; CHART PAPER IS -5-3.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

CHART PAPER HAS BEEN CHANGED TO READ APPROPRIATE VALVES SINCE ORIGIONAL SURVEY.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
	1F14	REACTOR VESSEL

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-182.Ø

DESCRIPTION:

DUAL-PEN RECORDER MARKINGS ON THE KILOVOLT RECORDER ARE NOT DISTINCTIVE. ONE POINTER IS RED WHILE THE OTHER IS BLACK; HOWEVER; BOTH USE RED INK.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

INKING HAS BEEN REPLACED WITH APPROPRIATE COLOR SINCE ORIGIONAL SURVEY.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
A3		KILOVOLT RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-216.0

DESCRIPTION:

GUARDHOUSE IN TROUBLE; WINDOW A1-11; IS ON THE ELECTRICAL BENCHBOARD.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE ANNUNCIATOR LEGEND NO LONGER EXISTS.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
A1		ANNUNCIATOR WINDOW A1-11
A2		ANNUNCIATOR WINDOW A2-25
A2		ANNUNCIATOR WINDOW A2-26

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-227.Ø

DESCRIPTION:

WINDOWS K1-3Ø AND K3-19; TORUS DRYWELL RELIEF CHECK VLV OPEN; HAVE BEEN LETTERED WITH A BURNING TOOL.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS PROBLEM HAS BEEN CORRECTED SINCE THE ORIGIONAL SURVEY.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
K		ANNUNCIATOR WINDOW K1-3Ø
		ANNUNCIATOR WINDOW K3-19

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-227.1

DESCRIPTION:

SOME WINDOWS ARE HAND LETTERED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS PROBLEM HAS BEEN CORRECTED SINCE THE ORIGIONAL SURVEY.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
F		ANNUNCIATOR WINDOW F2-24
F		ANNUNCIATOR WINDOW F2-48

HEO#: OCS-228.0

DESCRIPTION:

SOME WINDOWS ARE HARD TO READ ON PANELS A8;E;F3;AND F4 DUE TO TEMP LABELS/LETTERING OR FADED/WORN LETTERING.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS PROBLEM HAS BEEN RESOLVED SINCE THE ORIGIONAL SURVEY.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
A8		ANNUNCIATOR WINDOWS
E		ANNUNCIATOR WINDOWS
F3		ANNUNCIATOR WINDOWS
F4		ANNUNCIATOR WINDOWS

NINE MILE POINT UNIT 1 HEO

HEO#: TA-ØØ1.Ø

DESCRIPTION:

THE LABELS FOR THESE VLVS DO NOT PROPERLY DESCRIBE THEIR FUNCTION. TWO OF THESE DISCHARGE TO CONTAINMENT AND THE OTHER TWO TO CORE SPRAY.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

NEW LABELS HAVE BEEN INSTALLED TO INDICATE THIS INFO.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
O		CONTAINMENT SPRAY RAW WTR DISCH V 111
O		CONTAINMENT SPRAY RAW WTR DISCH V 112
O		CONTAINMENT SPRAY RAW WTR DISCH V 121
O		CONTAINMENT SPRAY RAW WTR DISCH V 122

NINE MILE POINT UNIT 1 HEO

HEO#: CS-019.0

DESCRIPTION:

SOME PROCEDURE PAGES (MAINLY FIGURES AND DIAGRAMS) WERE TORN OUT OF THEIR BINDERS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ADMIN PROCEDURES ARE IN PLACE TO ENSURE ADEQUACY OF PROCEDURES.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		COMPUTER KEYBOARD OPERATING PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: CS-026.0

DESCRIPTION:

METER DISPLAYS ARE ABOVE THE MAX HEIGHT. THEY RANGE FROM 59" TO 84" ABOVE FLOOR WHILE THE RECOMMENDED RANGE IS 48" TO 68".

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

BOTH RSP PANELS HAVE STEPS TO GAIN APPROPRIATE HEIGHT FOR METER READING.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
RSP		DRYWELL PRESS
RSP		DRYWELL TEMP
RSP		EMER COND #121 & 122 LVL
RSP		POWER BOARD #103 1 & 2 PHASE VOLTAGE
RSP		POWER BOARD #103 2 & 3 PHASE VOLTAGE
RSP		REACTOR LVL
RSP		REACTOR PRESS
RSP		REACTOR TEMP
RSP		TORUS TEMP

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-ØØ5.Ø

DESCRIPTION:

PANELS F AND H CONTAIN SPACES FROM PERMANENTLY REMOVED PANEL COMPONENTS WHICH HAVE NOT BEEN COVERED TO PREVENT DEBRIS OR DUST FROM ENTERING PANEL INTERVALS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS HAS BEEN CORRECTED SINCE ORIGINAL SURVEY.

VERIFICATION:
VERIFY COMPLETION.

F
H

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-064.0

DESCRIPTION:

TEMP CHANGES AND MODIFICATIONS ARE GENERALLY NOT CONTROLLED IN APPLICATION THRU ADMINISTRATIVE PROCEDURE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALL MODIFICATIONS TO PANEL ARE CONTROLLED BY ADMINISTRATIVE PROCEDURE AND NOW ALL TEMP LABELING IS CONTROLLED BY A STANDING ORDER.

VERIFICATION:

VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-066.0

DESCRIPTION:

NO ADMINISTRATIVE PROCEDURE IS IN EFFECT TO INCORPORATE CHANGES AND MODIFICATIONS INTO OPERATING PROCEDURES.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE NOW IS AN ADMINISTRATIVE PROCEDURE AP-6 FOR INCORPORATING CHANGES MODIFICATIONS INTO OPERATING PROCEDURE.

VERIFICATION:
ELABORATE ON ASSESSMENT.

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø67.Ø

DESCRIPTION:

CHANGES AND MODIFICATIONS ARE NOT REVIEWED PERIODICALLY TO DECIDE IF THEY SHOULD BE MADE PERM OR REMOVED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NOW A STANDING ORDER CALLED CONTROL OF OPERATION AIDS WHICH ADDRESSES THIS ISSUE.

VERIFICATION:
ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
ALL		INDICATOR SCALES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-229.0

DESCRIPTION:

TEMP CHANGES AND MODIFICATIONS TO ANNUNCIATOR WINDOWS ARE NOT CONTROLLED BY PROCEDURE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NOW A PROCEDURE FOR THIS OPERATION.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATOR WINDOWS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-240.0

DESCRIPTION:

ANNUNCIATOR RESPONSES ARE LOCATED WITHIN THE OPERATING PROCEDURES AND ACCESSED BY SYSTEM IDENTIFICATION. NO ENTRANCE OR EXIT CONDITIONS ARE PROVIDED PER ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NOW AN OP-53 WHICH PROVIDES A MATRIX WHICH CORRESPONDS TO THE BOX LOCATIONS GIVING THE NUMBER OF THE RESPONSE PROCEDURES WHICH ARE ENVOLVED.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-244.0

DESCRIPTION:

NO ADMINISTRATIVE PROCEDURE EXISTS TO ALLOW PROMPT RECOGNIZATION OF AN OUT-OF-SERVICE ANNUNCIATOR. NUREG-0700 RECOMMENDS A PROCEDURE BE IN PLACE FOR OUT-OF-SERVICE ANNUNCIATORS. THE OPERATORS HAVE DEVELOPED AN UNWRITTEN PROCEDURE. THEY USE A YELLOW DOT ON ANNUNCIATOR WINDOWS TO DESIGNATE OUT-OF-SERVICE ANNUNCIATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A PROCEDURE IS NOW IN PLACE WHICH CONTROLS THE OUT-OF-SERVICE ANNUNCIATOR (APN-7A).

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-245.0

DESCRIPTION:

ANNUNCIATORS ARE NOT PERIODICALLY TESTED ON A STRICT BASIS; THEY ARE TESTED WHEN TIME IS AVAILABLE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: 3A

EXPLANATION:

THERE IS NOW A PERIODIC TEST INCORPORATED INTO SHIFT TURNOVER FOR ANNUNCIATOR BULB TEST.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-252.0

DESCRIPTION:

STORAGE SPACE FOR PROCEDURES AND REFERENCE MATERIALS IS LIMITED; PROCEDURES ARE STACKED IN A RANDOM MANNER.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

RACKS HAVE BEEN INSTALLED AND THIS PROBLEM HAS BEEN RESOLVED SINCE THE ORIGIONAL SURVEY.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-254.0

DESCRIPTION:

NO LAYDOWN SPACE IS AVAILABLE FOR USE OF PROCEDURES EXCEPT AT THE OPERATORS LEVEL.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NOW A TABLE AVAILABLE FOR LAYDOWN OF PROCEDURES.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-255.Ø

DESCRIPTION:

OPERATING PROCEDURE BINDERS AND EMERGENCY PROCEDURE BINDERS ARE THE SAME IN COLOR; THIS DOES NOT FACILITATE QUICK RECOGNITION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE RACK HAS NOW BEEN INCORPORATED WITH A COLOR CODING SCHEME FOR RECOGNIZATION OF EMERGENCY PROCEDURES.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-272.0

DESCRIPTION:

IDENTIFICATION IS NOT ALWAYS MADE AS TO HOW OR WHEN EMERGENCY SYSTEMS OR AUTOMATIC CONTROLS MAY BE MANUALLY CONTROLLED OR OVERRIDDEN AFTER AUTOMATIC INITIATION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

PROCEDURE NOW ADDRESSES WHEN, WHERE, AND HOW TO MANUALLY CONTROL AN OVERRIDE AUTOMATIC INITIATION.

VERIFICATION:
QUERY OPERATORS.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-274.0

DESCRIPTION:

NO ADMINISTRATIVE PROCEDURES EXIST TO REQUIRE THE RECORDING OF VERBAL INSTUCTIONS AND FEEDBACK UPON EXECUTION OF OPERATIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

SUFFICIENT INFORMATION AND FEEDBACK BETWEEN OPERATOR AND ASSISTANTS WHICH FACILITATE UNDERSTANDING AND TRANSFER OF ACTIONS ALREADY EXISTS. THESE INCLUDE CHECKOFF PROCEDURE, SURVEILLENCE TEST, STATUS LOGS, SHIFT TURNOVER SHEETS, AND ROUTINE PRACTICES.

VERIFICATION:
QUERY OPERATORS.

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-279.Ø

DESCRIPTION:

TAGS; SUCH AS ON PANEL K; OBSCURE THE DEVICES IMNMIDIATELY BELOW THE TAGGED DEVICE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NOW A POLICY WHICH INSTITUTES A NEW TAG WHICH DOES NOT HANG DOWN INTO THE COMPONENT BELOW. OPERATORS ARE ALSO INSTRUCTED AS TO HOW TO HANG THE TAG SO THAT IT DOES NOT OBSCURE COMPONENTS.

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-ØØ1.Ø

DESCRIPTION:

THE SHIFT TURNOVER SHEET IS NOT EFFECTIVE AND IS REDUNDENT WITH THE LOG BOOK.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A STANDING COMMITEE CALLED THE OPERATIONAL MANAGEMENT COMMITEE COMPOSED OF OPERATIONS AND MANAGEMENT PERSONNEL MET AND COMPLETED A REVISED VERSION OF THE SHIFT TURNOVER SHEET.

VERIFICATION:
QUERY OPERATORS.

ELABORATE ON ASSESSMENT.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-037.0

DESCRIPTION:

THE PRESSURE OF THE SECURITY STATION IN THE CONTROL ROOM CAUSES PROBLEMS FOR THE OPERATORS. THE GUARDS AND SECURITY CONSOLE ARE OBSTRUCTIONS TO MOVEMENT AND THE SECURITY RADIOS AND TYPER CREATE NOISE THAT HAMPERS COMMUNICATIONS AND ATTENTION TO AUDITORY SIGNALS IN THE CONTROL ROOM. THE GUARDS ARE DISTRACTIONS TO THE OPERATORS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE GUARDS HAVE BEEN REMOVED FROM THE CONTROL ROOM.

VERIFICATION:
VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø33.Ø

DESCRIPTION:

THERE IS A POTENTIAL PARALLAX DUE TO THE HEIGHT OF THE RSP DISPLAYS ABOVE EYE LEVEL.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

BOTH PANELS HAVE STEPS OR OTHER MEANS TO GAIN HEIGHT.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
RSP		ALL METERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø93.Ø

DESCRIPTION:

DIFFERENT ZERO REFERENCE POINTS ARE USED FOR ADJACENT WATER LVL INDICATORS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS PROBLEM HAS BEEN CORRECTED SINCE THE CONDUCT OF THE SURVEY.

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
		ADJACENT WATER LEVEL INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø26.Ø

DESCRIPTION:

THE POSITIONS FOR THE "RAW WTR TO CONT SPRAY VLV" IS LISTED AS "CONT SPRAY". SIMILARILY THE "CNMT RAW WTR TO CORE SPRAY" POSITION IS LISTED AS "CORE SPRAY". THE POSITIONS FOR THESE VLVS ARE CLOSE AND OPEN.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: RESOLVED (COMPLETED)

RISK CATEGORY: NOT NEEDED

EXPLANATION:

PERMANENT LABELS HAVE BEEN PROVIDED FOR THESE VLVS WHICH IDENTIFY THE APPROPRIATE FUNCTION OF THE CONTROL POSITIONS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
	3K18-1	RAW WATER TO CONT SPRAY
		CNMT RAW WTR TO CORE SPRAY

NINE MILE POINT UNIT 1 HEO

HEO#: CS-ØØ4.Ø

DESCRIPTION:

RECORDERS CONTAIN TEMP SCALES WHICH ARE DIFFICULT TO READ.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE PERMANENT SCALEPLATE IN ACCORDANCE WITH HF MANUAL.

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

Panel ID #	Equipment ID #	Equipment Name
7L6		TORUS H2O LVL CHNL 12
5L18		TORUS H2O LVL CHNL 11

NINE MILE POINT UNIT 1 HEO

HEO#: CS-ØØ7.Ø

DESCRIPTION:

LABELS ON COMPONENTS DO NOT SPECIFY PROCESS UNITS AND/OR MULTIPLIERS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE NEW LABEL AS NECESSARY IN ACCORDANCE WITH HF DESIGN MANUAL.

VERIFICATION:

COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

Panel ID #	Equipment ID #	Equipment Name
1F27		FWP 11 VALVE CONTROL
1F28		FWP 12 VALVE CONTROL
1F53		FWP 11 BYPASS VALVE
1F54		FWP 12 BYPASS VALVE
1H17		R BLD COOL/SERV WTR V
2K15		EH CNDSR MAKEUP LCV 11
2K16		EM CNDSR MAKEUP LCV 12
4H26		FW RECIRC TO COND FLOW CONTROL
5K12		SHUTDOWN COOLING TCV 11
5K13		SHUTDOWN COOLING TCV 12
5K14		SHUTDOWN COOLING TCV 13
6K14		CV TO COND & WASTE FLOW
6K16		CV RCV 11 (LP)
6K18		CV SYS SELECTOR
6K21		CV RCV 12 (HP)
6K4		CV SYS FLOW
7L2		SPENT FUEL POOL MAKEUP VLVS (UNITS AND LABEL)
F		345 KV LINE RECORDER (BLACK PEN)
A		CRD FLOW CONTROL
A		HYDROGEN GAS TEMP CONTROL
A		TURB BYPASS VALVE 12H-121
A		TURBINE OIL TEMP CONTROL
B		CORE MONITOR
E		EJECTOR COND FLOW
E		FEEDWATER MASTER (VLV POSITION)
E		RECIRC MASTER
E		STACK GAS MONITOR 7
E		STACK GAS MONITOR 8
H		DILUTION FLOW CONTROLLER

H	INTAKE COND WATER TEMP RECORDER
H	LAKE WTR LVL ALARM SETPOINT (NO LABEL)
J	CONDSR CIRC WATER PUMP DISCH PR RECORDER
L	MANUAL/AUTO CONTROLLER 11 (UNITS)
L	MANUAL/AUTO CONTROLLER 12 (UNITS)
L	NITROGEN SUPPLY #11 (MULTIPLIER X 100)
L	NITROGEN SUPPLY #12 (MULTIPLIER X 100)
L	SYSTEM 11 O2 & H2 CONCENTRATION (UNITS)
L	SYSTEM 12 O2 & H2 CONCENTRATION (UNITS)

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø11.Ø

DESCRIPTION:

INDICATOR SCALE DIFFICULT TO READ DUE TO TEMP SCALE.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PREPARE NEW SCALEPLATE FOR THE METERS IN ACCORDANCE WITH HF DESIGN MANUAL. EXISTING RANGES ARE TO BE MAINTAINED.

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
2H13-1		CHILLER 11 OFF GAS TEMP
2H13-2		CHILLER 12 OFF GAS TEMP
2H13-3		CHILLER 13 OFF GAS TEMP
2H14-2		OFF GAS DILUTED TEMP
2H4		OFF GAS SYS FLOW
E		OFF GAS CHILLER DISCH TEMP
E		OFF GAS TEMP

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø25.Ø

DESCRIPTION:

THE ESCUTCHEONS FOR THE IRM/ARM SELECT SWITCHES DO NOT IDENTIFY WHICH OF THE TWO POSSIBLE IRMS OR ARMS ARE BEING SELECTED. SIMILARLY THE RECORDER INDICATOR SCALES ARE NOT MARKED TO INDICATE WHICH IRM/ARM IT IS ASSOCIATED WITH. THERE ARE FOUR RECORDERS AND EIGHT SELECTOR SWITCHES.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE A PERMANENT LABEL FOR THE RECORDER TO INCLUDE PEN COLOR AND PARAMETER TO REPLACE THE GREASE PENCIL LABEL. ALSO PROVIDE A LABEL FOR SELECTOR SWITCH TO IDENTIFY PEN COLOR AND WHICH PARAMETER CONTROLLED.

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
E		IRM/ARM SELECT SWITCHES AND RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: CS-030.0

DESCRIPTION:

THE METERS ARE ARRANGED IN ROWS. THE LABELS BELOW EACH BANK OF METERS ARE ARRANGED IN COLUMNS. TOP LABEL NAME GOES WITH LEFT MOST METER; ETC. LABEL ASSOCIATION WITH METER IS NOT APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

RELABEL ALL ITEMS EXCEPT FOR REACTOR LEVEL AND PRESSURE BECAUSE THESE METERS HAVE LABEL INFORMATION LABELS. INDICATE THE UNITS SO THAT THE RELATIONSHIP CAN BE MADE.

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
RSP		DRYWELL PRESS
RSP		DRYWELL TEMP
RSP		REACTOR LVL
RSP		REACTOR PRESS
RSP		REACTOR TEMP (RRP #14)
RSP		REACTOR TEMP (RRP #15)
RSP		TORUS TEMP

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø39.Ø

DESCRIPTION:

PRI VENT VLVS AND EMERG COND VENT VLV LEGEND LIGHTS ARE NOT PROVIDED WITH LEGENDS TO IDENTIFY COMPONENTS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE LABELS AND ENGRAVING FOR COMPONENTS ON THE PRIMARY CONTAINEMENT ISOLATION MIMIC WHICH ARE NOT NOW IDENTIFIED.

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		PRIMARY CONTAINMENT ISOLATION MIMIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø49.Ø

DESCRIPTION:

MEANING OF YELLOW LIGHT ASSOCIATED WITH COMPONENT IS NOT CLEAR. COLOR MEANING OR CODING IS UNCLEAR AND NO LABEL IDENTIFIES ITS PURPOSE.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

ENSURE THAT INDICATOR LIGHT COLOR CONFORMS WITH CONVENTION IN HUMAN FACTORS DESIGN MANUAL.

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
1H32		SCREEN HOUSE TEMPERING GATE

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø58.Ø

DESCRIPTION:

METER LABEL NAMES ARE LOCATED ON LEFT SIDE OF THE METER WHEREAS OTHER SIMILAR METERS HAVE THE NAMES ON THE BLANK RIGHT SIDE OF THE METER. THE LABEL NAME FOR THOSE COMPONENTS ARE CROWDED IN WITH THE NUMERALS AND IT IS VERY DIFFICULT TO READ.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

CHANGE SCALE PLATE TO PROVIDE (Ø-15Ø) RANGE IN APPROPRIATE NUMERIC INCREMENTS IN ACCORDANCE WITH HF DESIGN MANUAL FOR CONTAINMENT FLOWS. PROVIDE NEW SCALE PLATE FOR N2 VENT EMERG VENT PRESS USING SAME SCALE WITHOUT LABEL INFO. PROVIDE NEW LABEL PLATES WITH THE LABEL INFO FOR ALL THREE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
5L18-1		CONTAINMENT #11 FLOW
5L18-2		CONTAINMENT #12 FLOW
5L18-3		N2 VENT TO EMERG. VENT PRESS

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø61.Ø

DESCRIPTION:

THERE ARE MORE THAN 9 MARKINGS BETWEEN NUMBERED INTERVALS FOR CONTAINMENT FLOWS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
5L18-1		CONTAINMENT #11 FLOW
5L18-2		CONTAINMENT #12 FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø65.Ø

DESCRIPTION:

MEANING OF TWO GREEN LIGHTS ON COMPONENTS IS NOT EVIDENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE COLOR CODING SCHEME WILL ESTABLISH APPROPRIATE LENS COLORS. CHANGE LENS TO MATCH THE CRITERIA. THE GREEN LIGHTS HAVE BEEN CHANGED TO WHITE IN ACCORDANCE WITH THE HF DESIGN MANUAL TO INDICATE EQUIPMENT MODE SELECTIONS.

VERIFICATION:

FOUND TO BE ADEQUATE DURING VERIFICATION.

Panel ID #	Equipment ID #	Equipment Name
1E86		FW CH 11 RESET TO NORMAL
1E87		FW CH 12 RESET TO NORMAL
1E88		FW RETURN TO NORMAL

NINE MILE POINT UNIT 1 HEO

HEO#: CS-067.0

DESCRIPTION:

LEGEND LIGHT FOR NORTH REHEATER DISCHARGE VLV HAS NO LEGEND TO IDENTIFY COMPONENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

ENGRAVE LEGEND FOR THE LEGEND PUSHBUTTONS.

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
N		NORTH/SOUTH REHEADER MIMIC

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-ØØ7.Ø

DESCRIPTION:

THERE APPEARS TO BE EITHER A TEMP MIMIC OR REMOVED MIMIC BAR CONNECTING R1Ø12 WITH THE 4.16 KV BUS ON PANEL A4 AND ALSO CONNECTING R1Ø13 AND THE 4.16 KV BUS ON PANEL A5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

COMPLETE MIMIC LINES CONNECTING R1Ø12 AND R1Ø13 WITH THE 4.16 KV BUS.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

Panel ID #	Equipment ID #	Equipment Name
A4		ELECTRICAL SYSTEM MIMIC
A5		ELECTRICAL SYSTEM MIMIC

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø18.Ø

DESCRIPTION:

BLUE INDICATOR LIGHTS ARE USED FOR POWER OPERATED RELIEF VLVS; PANEL F. IT IS NOT CLEAR THAT THESE LIGHTS ACTIVATE UPON THE ELECTRICAL SIGNAL TO OPEN THE ELECTROMATICS AS OPPOSED TO THE RED INDICATORS WHICH ACTIVATE UPON SOLENOID ACTIVATION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE BLUE INDICATOR LIGHTS ON THE POWER OPERATED RELIEF VALVES INDICATE THAT THE VALVE IS OPEN AND THE SIGNAL FOR ACTIVATION HAS BEEN SENT TO THE SOLENOID. THIS IS IN ACCORDANCE WITH THE STANDARD ESTABLISHED IN THE HF DESIGN MANUAL.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

Panel ID #	Equipment ID #	Equipment Name
F		ELECTRICAL LIGHTS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø19.Ø

DESCRIPTION:

THE MAIN STEAM ISOLATION VLV CONTROLS; PANEL F; FOR VLVS 112 AND 122 HAVE ONE YELLOW AND ONE WHITE LIGHT. NO INDICATION IS PROVIDED TO SHOW THAT YELLOW IS FOR A 7% TEST AND WHITE IS FOR A FULL TEST CONDITION. THESE SAME WHITE LIGHTS ARE USED ON VLVS 111 AND 121.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE YELLOW LIGHT FOR THE MAIN STEAM ISOLATION VALVES HAVE BEEN CHANGED TO WHITE TO INDICATE THE INPUT SELECTION STATUS IN ACCORDANCE WITH THE STANDARDS ESTABLISHED IN THE HF DESIGN MANUAL.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-020.0

DESCRIPTION:

NO INDICATION IS GIVEN AS TO THE MEANING OF THE WHITE LIGHT ON THE FEEDWATER PUMP (SHAFT) 13 CLUTCH ENGAGEMENT CONTROL; PANEL F.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE WHITE LIGHT ON THE FEEDWATER PUMP 13 CLUTCH ENGAGEMENT MEANS THAT THE PUMP AND SHAFT ARE SYNCHRONOUS. THIS CONFORMS TO T HE COLOR CODE ESTABLISHED IN THE NMKP-1 HUMAN FACTORS MANUA L WHICH INDICATES THAT A WHITE LIGHT REFERS TO AN ENGAGEMENT MODE.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

Panel ID #	Equipment ID #	Equipment Name
F		FEEDWATER PUMP CLUTCH ENGAGEMENT CONTROL

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-022.0

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE YELLOW LIGHT ON THE TURNING GEAR CONTROL INDICATES THAT THE TURNING GEAR CLUTCH IS ENGAGED. THIS CONFORMS TO THE COLOR CO DE CONVENTION ESTABLISHED IN THE HF DESIGN MANUAL.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø23.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE YELLOW LIGHT ON THE TURNING GEAR CONTROL INDICATES THAT THE TURNING GEAR CLUTCH IS ENGAGED. THIS CONFORMS TO THE COLOR CODE CONVENTION ESTABLISHED IN THE HF DESIGN MANUAL.

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; PANEL A2; IS NOT APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE YELLOW LIGHT FOR THE MAIN STEAM ISOLATION VALVES HAVE BEEN CHANGED TO WHITE TO INDICATE THE INPUT SELECTION STATUS IN ACCORDANCE WITH THE STANDARDS ESTABLISHED IN THE HF DESIGN MANUAL.

VERIFICATION:

THE RED LIGHT INDICATES LOW SPEED STOP AND THE YELLOW LIGHT INDICATES HIGH SPEED STOP. BOTH HAVE BEEN CHANGED TO WHITE LIGHTS TO INDICATE AN EQUIPMENT SELECTION. THESE ARE IN ACCORDANCE WITH THE HUMAN FACTORS DESIGN MANUAL. THESE WERE INCLUDED DURING VERIFICATION TESTING AND FOUND TO BE ADEQUATE.

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø25.Ø

DESCRIPTION:

THE SERVO TEST INDICATOR LIGHTS; PANEL B1; HAVE PENCILLED INFORMATION ABOVE INDICATING THE NEED FOR IDENTIFICATION OF MEANING.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

ADD A SEPARATE LABEL FOR THE LIGHT MEANINGS.

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
B1		SERVO TEST INDICATOR

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-029.0

DESCRIPTION:

THE SECOND SET OF LIGHTS ABOVE THE DRYWELL CAM ISOLATION VLV CONTROL; PANEL L; IS UNLABELED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REMOVE OLD LABEL. ADD TWO NEW LABELS ENTITLED DRYWELL CAM INLET IV AND DRYWELL CAM RETURN IV.

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
L		DRYWELL CAM ISOLATION VLV CONTROL

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-030.0

DESCRIPTION:

THE FUNCTION OF THE RED INDICATION LIGHT BELOW FEEDWATER PMP (SHAFT) 13 CLUTCH ENGAGEMENT; PANEL F; IS NOT CLEAR.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE RED LIGHT ON THE FEEDWATER PUMP CLUTCH ENGAGEMENT INDICATES THAT THE SHAFT HAS STOPPED. THIS IS IN ACCORDANCE WITH THE HF DESIGN MANUAL COLOR CODE CONVENTION.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

Panel ID #	Equipment ID #	Equipment Name
F		FEEDWATER PUMP (SHAFT) 13 CLUTCH ENGAGEMENT

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø31.Ø

DESCRIPTION:

THE CONTROLLER ABOVE THE OFF-GAS PREHEATER STEAM BYPASS VLV; PANEL H; IS EITHER UNIDENTIFIED OR THE GE NAME PLATE ON THE COVER OBSCURES THE LABEL.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REMOVE GE NAMEPLATE AND LABEL COMPONENT OFF-GAS MIXING JET FLOW.

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
H		CONTROLLER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø34.Ø

DESCRIPTION:

RECORDERS ON PANEL B3 ARE UNIDENTIFIED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE LABELS IN ACCORDANCE WITH HF DESIGN MANUAL.

VERIFICATION:
COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

Panel ID #	Equipment ID #	Equipment Name
B3		RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø36.Ø

DESCRIPTION:

THE DUAL SET OF CONTROLLERS ABOVE THE TURBINE BLDG COOLING WATER INDICATORS; PANEL H; ARE NOT LABELED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

LABEL CONTROLLERS OFF-GAS VACUUM CONTROL VLV 11 AND OFF-GAS VACUUM CONTROL VLV 12.

VERIFICATION:

COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

Panel ID #	Equipment ID #	Equipment Name
H		CONTROLLERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø39.Ø

DESCRIPTION:

IT IS NOT CLEAR WHAT THE YELLOW LIGHT; 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:

ENSURE THAT INDICATOR LIGHT COLOR CONFORMS WITH CONVENTION IN HUMAN FACTORS DESIGN MANUAL.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø58.1

DESCRIPTION:

THE RECORDER ON PANEL H3 IS MARKED IN BOTH INCHES OF WATER AND INCHES HG FOR CONDENSER VACUUM. THESE WORDS APPEAR BETWEEN SCALE NUMBERS MAKING IT VERY CROWDED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE NEW SCALE PLATE IN ACCORDANCE WITH HF DESIGN MANUAL FOR INCHES OF WATER. KEEP IN HG SCALE AS IS. THE TWO SCALES ARE READING TWO DIFFERENT PARAMETERS.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø73.Ø

DESCRIPTION:

DOWNCOMER SUBMERGENCE HAS NO UNITS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PREPARE A NEW LABELPLATE. INCLUDE UNITS OF FT AND PREPARE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
K		DOWNCOMER SUBMERGENCE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø75.Ø

DESCRIPTION:

DISSOLVED OXYGEN RECORDER HAS A STICKER READING "MULTIPLY READINGS X 5" RATHER THAN A PROPER SCALE.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PREPARE NEW SCALEPLATES (2) FOR RECORDER SO THAT RANGE IS Ø-1ØØ.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
3H11		DISSOLVED OXYGEN RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-076.0

DESCRIPTION:

HOTWELL LEVEL INDICATORS SHOW BOTH UNITS OF INCHES AND FEET.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

"WHITE OUT" THE FT INDICATION ON THE LABEL PLATE OR PREPARE NEW LABELPLATE WITH UNIT OF INCHES.

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
3H1		HOTWELL LEVEL INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø83.1

DESCRIPTION:

ON SOME RECORDERS; THE VARIABLE AND PROCESS UNITS ARE LOCATED CLOSELY BETWEEN SCALE NUMERALS CAUSING DIFFICULT READING.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE NEW SCALE PLATE IN ACCORDANCE WITH HF DESIGN MANUAL FOR INCHES OF WATER. KEEP IN HG SCALE AS IS. THE TWO SCALES ARE READING TWO DIFFERENT PARAMETERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-097.0

DESCRIPTION:

THE CHANNEL 11 DRYWELL FLOOR DRAIN LEVEL AND LEAK RATE RECORDER POSSESS GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
L	6L8	DRYWELL FLOOR DRAIN LEVEL AND LEAK RATE RECORDER

HEO#: OCS-098.0

DESCRIPTION:

THE DRYWELL PRESSURE (0-75 PSIG) ON PANEL K POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
L	4L1	DRYWELL PRESSURE [0-75 PSIG]

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø99.Ø

DESCRIPTION:

THE CLEANUP PMP SUCTION PRESSURE RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
K	6K4	CLEANUP PUMP SUCTION PRESSURE RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-100.0

DESCRIPTION:

THE CONTAINMENT SPRAY PMP AMP INDICATORS POSSESS GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE WITH GRADUATIONS AND NUMBERS IN ACCORDANCE WITH HF DESIGN MANUAL.

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		CONTAINMENT SPRAY PUMP AMP INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-101.0

DESCRIPTION:

THE CORE SPRAY TOPPING PMP AMP INDICATORS POSSESS GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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		CORE SPRAY TOPPING PUMP AMP INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-1Ø2.Ø

DESCRIPTION:

THE DRYWELL PRESSURE (Ø-75 PSIG) ON PANEL K POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
K	3K8	DRYWELL PRESSURE [Ø-75 PSIG]

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-1Ø3.Ø

DESCRIPTION:

THE SHUTDOWN COOLING SYSTEM TEMPERATURE RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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

Panel ID #	Equipment ID #	Equipment Name
K		SHUTDOWN COOLING SYSTEM TEMPERATURE RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-104.0

DESCRIPTION:

THE CONDENSER WASTE FLOW POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
	6K11	CONDENSER WASTE FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-105.0

DESCRIPTION:

THE CONDENSER VACUUM RECORDER (INCHES OF WATER SCALE) POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: 4E

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
H		CONDENSER VACUUM RECORDER [INCHES OF WATER SCALE]

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-106.0

DESCRIPTION:

THE AIR EJECTOR CONDENSER FLOW POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
H		AIR EJECTOR CONDENSER FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-107.0

DESCRIPTION:

THE DISSOLVED OXYGEN RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
H		DISSOLVED OXYGEN RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-108.0

DESCRIPTION:

THE SPRAY PMP AMPS POSSESS GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
H		SPRAY PUMP AMPS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-110.0

DESCRIPTION:

THE SERVICE WATER HEADER PRESSURE POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
H		SERVICE WATER HEADER PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-111.0

DESCRIPTION:

THE SCRAM SOLENOID AIR HEADER PRESSURE RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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		SCRAM SOLENOID AIR HEADER PRESSURE RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-112.0

DESCRIPTION:

THE CORE DIFFERENTIAL PRESSURE RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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

Panel ID #	Equipment ID #	Equipment Name
F		CORE DIFFERENTIAL PRESSURE RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-113.Ø

DESCRIPTION:

THE REACTOR PRESSURE (SUPPRESSED RANGE) RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS. THE LARGE NUMBER OF DIVIDSIONS RESULTS IN DIFFICULTY BY THE OPERATORS IN INTERPRETING SCALE VALUES.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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

Panel ID #	Equipment ID #	Equipment Name
F		REACTOR PRESSURE [SUPPRESSED RANGE] RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-114.0

DESCRIPTION:

THE CRD COOLING WATER/REACTOR DIFFERENTIAL PRESSURE POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATION BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
F		COOLING WATER/REACTOR DIFF PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-115.0

DESCRIPTION:

THE OFF-GAS RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
E		OFF-GAS RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-116.0

DESCRIPTION:

THE STACK GAS RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
E		STACK GAS RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-118.0

DESCRIPTION:

THE DRYWELL-TORUS PSID RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
E		DRYWELL TORUS PSID RECORDER

HEO#: OCS-120.0

DESCRIPTION:

THE STEAM CHEST PRESSURE POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
A2		STEAM CHEST PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-126.0

DESCRIPTION:

THE TEMPERATURE RECORDER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATION BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
B2		TEMPERATURE RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-138.0

DESCRIPTION:

THE AIR EJECTOR CONDENSOR FLOW IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1, 2, OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
H		AIR EJECTOR CONDENSER FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-163.0

DESCRIPTION:

THE NUMERALS ON THE RECORDER SCALE FOR SCRAM DISCHARGE VOLUME HOLDING TANK LEVEL ARE NOT MARKED IN AN UPRIGHT POSITION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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		SCRAM DISCHARGE VOLUME HOLDING TANK LVL

NINE MILE POINT UNIT 1 HEO

HEO#: OC2-172.0

DESCRIPTION:

SCRAM SOLENOID AIR HEADER PRESSURE RECORDER HAS SCALES 0-100 AND 0-850; CHART PAPER IS 0-100.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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		SCRAM SOLENOID AIR HEADER PRESSURE RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-175.Ø

DESCRIPTION:

OFF-GAS FLOW RECORDER (BLACK PEN) HAS SCALES Ø-5Ø AND Ø-2ØØ; CHART PAPER IS Ø-2ØØ.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE CHART PAPER TO ACCOMODATE TWO SCALES (Ø - 5Ø) AND (Ø-2ØØ).

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

Panel ID #	Equipment ID #	Equipment Name
1H31		OFF-GAS FLOW RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-178.0

DESCRIPTION:

KILOVOLT RECORDER HAS SCALES 18 TO 30 AND 270 TO 390; CHART PAPER IS ONLY 270 TO 390.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE NEW CHART PAPER TO ACCOMODATE SCALE FOR MACHINE VOLTS (18-40) AND LINE VOLTS (270-390).

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

Panel ID #	Equipment ID #	Equipment Name
3A		KILOVOLT RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-179.Ø

DESCRIPTION:

DRYWELL PRESSURE AND DEWPOINT RECORDER HAS SCALES Ø TO 7.5 AND Ø TO 2ØØ; CHART PAPER IS Ø TO 1ØØ.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THESE SWITCHES CAN NO LONGER BE MOVED TOO FAR.

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-180.0

DESCRIPTION:

CIRCULATING WATER PUMP DISCHARGE PRESSURE RECORDER CHART PAPER HAS NO SCALE.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE NEW CHART PAPER WITH (0 - 40) SCALE.

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

Panel ID #	Equipment ID #	Equipment Name
J		CIRCULATING WATER PUMP DISCHARGE PRESSURE RECORDER PUMP 11 AND 12

NINE MILE POINT UNIT 1 HEO

HEO#: QS-014.0

DESCRIPTION:

A NUMBER OF ANNUNCIATOR TILES ARE DIFFICULT TO READ BECAUSE THE LETTERING IS TOO SMALL AND THE STROKE WIDTH IS DISPROPORTIONALLY WIDE.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: 4C

EXPLANATION:

PROVIDE NEW ANNUNCIATOR TILES FOR THE LISTED INAPPROPRIATE TILES. FOR A1/3-2 AND H3/4-8 ATTEMPT TO REDUCE THE MESSAGE TO EITHER ELIMINATE THE NEED FOR THE DUAL INPUT OR TO THE POINT WHERE THE APPROPRIATE SIZE LETTERING AND SPACING (IN ACCORDANCE WITH HF DESIGN MANUAL) CAN BE USED TO PRESENT THE MESSAGE.

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
A1		ANNUNCIATOR 3-2
A2		ANNUNCIATOR 4-8
A4		ANNUNCIATOR 1-6
A5		ANNUNCIATOR 4-3
A6		ANNUNCIATOR 2-5
A6		ANNUNCIATOR 3-4
A7		ANNUNCIATOR 4-1
A8		ANNUNCIATOR 2-3
H3		ANNUNCIATOR 4-8
K2		ANNUNCIATOR 2-2
L3		ANNUNCIATOR 2-5

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-022.0

DESCRIPTION:

THE LABELS ON THE DRYWELL TEMP METERS DO NOT REFER TO WHICH METER(S) WOULD PROVIDE THE READING AT THE 330 FT LEVEL. LABELS DO NOT REFER TO ANY LEVELS HOWEVER THE EMER PROCEDURE GUIDELINES REFER TO THIS SPECIFIC TEMP AS A NEEDED INDICATION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

PROVIDE NEW LABELS TO INDICATE LEVELS WHICH ARE NOW INDICATED IN GREASE PENCIL.

VERIFICATION:
COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

Panel ID #	Equipment ID #	Equipment Name
L 9999 9999		DRYWELL AMBIENT TEMP

NINE MILE POINT UNIT 1 HEO

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:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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

NINE MILE POINT UNIT 1 HEO

HEO#: VRR-ØØ2.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

POINTERS WILL BE CHANGED TO WHITE FOR HIGH CONTRAST.

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

NINE MILE POINT UNIT 1 HEO

HEO#: CS-ØØ1.Ø

DESCRIPTION:

SYSTEMS ARE ARRANGED BY PANEL SEGMENTS AND APPEAR TO HAVE WELL DEFINED BOUNDARIES; HOWEVER; DEMARCATION LINES ARE LACKING IN ENHANCING THE RECOGNITION OF SYSTEM GROUPS. HIERARCHICAL LABELING IS NOT USED TO ENHANCE RECOGNITION OF FUNCTIONAL GROUPS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING, AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED-UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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
		GENERIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø1Ø.Ø

DESCRIPTION:

ASSOC. OF FEEDBACK INDICATION TO RELATED CONTROL IS NOT APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

LABEL THE OFF-GAS VACUUM PUMP CONTROLLERS SUCH THAT ASSOCIATION IS EVIDENT THROUGH LABEL. CHILLER SYSTEM INDICATORS ARE DIRECTLY ABOVE CONTROLLERS AND WILL BE ENHANCED THROUGH DEMARCATION. FOR RECOMBINERS, THERE IS NO MODULATION AND FEEDBACK IS NOT NEEDED.

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
2H13-1		CHILLER 11 OFF GAS TEMP
2H13-2		CHILLER 12 OFF GAS TEMP
2H13-3		CHILLER 13 OFF-GAS TEMP
2H14-1		OFF GAS PRESS
2H14-2		OFF GAS TEMP
2H17		OFF GAS VACUUM PUMP 11
2H18		OFF GAS VACUUM PUMP 12
2H2Ø		CHILLER 13 SYSTEM CONTROL
2H22		CHILLER 11 SYSTEM CONTROL
2H23		CHILLER 12 SYSTEM CONTROL
2H24		RECOMBINER 11
2H25		RECOMBINER 12
H		RECOMBINER 11 DISCHARGE TEMP
H		RECOMBINER 12 DISCHARGE TEMP

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø28.Ø

DESCRIPTION:

TWO DIFFERENT TYPE STYLES AND LETTER SIZES ARE USED FOR COMPONENT LABELS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

AFTER A SEPARATE SURVEY CONDUCTED 11-15-84, THE LISTED LABELS ON OCS-55 WERE FOUND TO BE DISTRACTING (STAND OUT) OR LACKING IN INFO. REPLACE THESE LABELS WITH NEW LABELS IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:
COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

Panel ID #	Equipment ID #	Equipment Name
		GENERIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø31.Ø

DESCRIPTION:

INDICATING DEVICES ARE NOT MARKED TO SHOW NORMAL OR ABNORMAL; SAFE OR UNSAFE; EXPECTED OR UNEXPECTED RANGE OF OPERATION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

INAPPROPRIATE SCALES WILL BE REPLACED WITH NEW SCALEPLATES IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
RSP		ALL METERS

NINE MILE POINT UNIT 1 HEO

HEO#: CS-040.0

DESCRIPTION:

LABEL FOR POST LOCA VENT VLV 201.1-14 AND 201.1-16 HAS TYPE SIZE MUCH LARGER THAN OTHER SIMILAR ID LABELS. THE CORRESPONDING LABEL FOR POST LOCA VENT VLV 201.1-9 AND 201.1-11 IS MUCH SMALLER THAN OTHER SIMILAR LABELS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

AFTER A SEPARATE SURVEY CONDUCTED 11-15-84, THE LISTED LABELS ON OCS-55 WERE FOUND TO BE DISTRACTING (STAND OUT) OR LACKING IN INFO. REPLACE THESE LABELS WITH NEW LABELS IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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		PRIMARY CONTAINMENT ISOLATION MIMIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-041.0

DESCRIPTION:

THE SMALLER POST LOCA VENT VLVS 201.1-9 AND 201.1-11 LABEL IS DIFFICULT TO READ AT THE PANEL.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

AFTER A SEPARATE SURVEY CONDUCTED 11-15-84, THE LISTED LABELS ON OCS-55 WERE FOUND TO BE DISTRACTING (STAND OUT) OR LACKING IN INFO. REPLACE THESE LABELS WITH NEW LABELS IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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		PRIMARY CONTAINMENT ISOLATION MIMIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø43.Ø

DESCRIPTION:

LABEL IS NOT CONSISTANT IN TYPE STYLE AND LABEL COLOR TO OTHER SIMILAR ID LABELS ON THE PANEL. LABEL IS NOT CONSISTENTLY LOCATED WITH RESPECT TO OTHER PANEL COMPONENTS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE FW RECIRC TO COND BLOCKING VLV LABEL WILL BE PLACED DIRECTLY ABOVE THE VLV CONTROL. THE EQUIPMENT PIECE NUMBER WILL BE PLACED ABOVE THE INDICATOR LIGHTS.

VERIFICATION:
COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

Panel ID #	Equipment ID #	Equipment Name
1F33		FW RECIRC TO COND BLOCKING VLV

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø44.Ø

DESCRIPTION:

LABEL TYPE AND SIZE IS NOT CONSISTENT WITH SIMILAR COMPONENTS ON THE PANEL. THESE CONTROLLER LABELS ARE LOCATED ABOVE THE COMPONENTS WHEREAS LABELS ON OTHER CONTROLLERS ARE GENERALLY LOCATED BELOW THE COMPONENTS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

AFTER A SEPARATE SURVEY CONDUCTED 11-15-84, THE LISTED LABELS ON OCS-55 WERE FOUND TO BE DISTRACTING (STAND OUT) OR LACKING IN INFO. REPLACE THESE LABELS WITH NEW LABELS IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:
COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

Panel ID #	Equipment ID #	Equipment Name
1F53		FWP 11 BYPASS VLV
1F54		FWP 12 BYPASS VLV

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø48.Ø

DESCRIPTION:

LABEL LETTERING IS SMALLER THAN THOSE OF SIMILAR DEVICES.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

AFTER A SEPARATE SURVEY CONDUCTED 11-15-84, THE LISTED LABELS ON OCS-55 WERE FOUND TO BE DISTRACTING (STAND OUT) OR LACKING IN INFO. REPLACE THESE LABELS WITH NEW LABELS IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:
COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

Panel ID #	Equipment ID #	Equipment Name
4H26		FW RECIRC TO COND FLOW CONTROL

NINE MILE POINT UNIT 1 HEO

HEO#: CS-050.0

DESCRIPTION:

LABEL STYLE AND SIZE IS NOT CONSISTENT WITH OTHER SIMILAR PANEL COMPONENTS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

AFTER A SEPARATE SURVEY CONDUCTED 11-15-84, THE LISTED LABELS ON OCS-55 WERE FOUND TO BE DISTRACTING (STAND OUT) OR LACKING IN INFO. REPLACE THESE LABELS WITH NEW LABELS IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

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

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø52.Ø

DESCRIPTION:

COMPONENTS ARE NOT ORDERED CONSISTENTLY FROM LEFT TO RIGHT 112-111-121-122.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE VLVS ARE MIRROR-IMAGED. A PERMANENT MIMIC OF THE EMERGENCY CONDENSER SYSTEM WILL BE PROVIDED DEPICTING THE SYSTEM FLOWS AND RELATIONSHIPS.

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
2K35		EMERG CONT VENT IV 112
2K36		EMERG CONT VENT IV 122

NINE MILE POINT UNIT 1 HEO

EO#: CS-Ø55.Ø

DESCRIPTION:

LABELS ARE NOT CONSISTENT IN SIZE AND TYPE WITH OTHER PANEL ELEMENTS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

AFTER A SEPARATE SURVEY CONDUCTED 11-15-84, THE LISTED LABELS ON OCS-55 WERE FOUND TO BE DISTRACTING (STAND OUT) OR LACKING IN INFO. REPLACE THESE LABELS WITH NEW LABELS IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
5L16		CONT VENT TO EMER VENTIL SYS IV 121
5L17		CONT VENT TO EMER VENTIL SYS IV 122

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø59.Ø

DESCRIPTION:

LABEL NAME ON METERS READ TOP TO BOTTOM NOT LEFT TO RIGHT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

ALTHOUGH NOT NORMALLY RECOMMENDED, VERTICAL ORIENTATION MAY BE USED WHEN SPACE IS LIMITED. THIS IS THE CASE AT NMP-1. TO ENHANCE READABILITY, A STANDARD FORMAT WILL BE ADOPTED AND APPLIED TO THE CONTROL ROOM WHEREBY THE LABEL INFO IS PRESENTED VERTICALLY WITH THE UNIT AND MULTIPLIER (IF APPLICABLE) PRESENTED IN THE LOWER RIGHT WITH HORIZONTAL ORIENTATION. DEMARCATION AND HIERARCHICAL PANEL LABELING WILL BE EMPLOYED TO ENHANCE METER IDENTIFICATION.

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
5L18-1		CONTAINMENT #11 FLOW
5L18-2		CONTAINMENT #12 FLOW
5L18-3		N2 VENT TO EMERG. VENT PRESS

NINE MILE POINT UNIT 1 HEO

O#: CS-060.0

DESCRIPTION:

INDICATOR SCALES ARE NOT MARKED TO SHOW NORMAL/ABNORMAL; SAFE/UNSAFE; EXPECTED/UNEXPECTED RANGES.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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

nel ID #	Equipment ID #	Equipment Name
5L15		DRYWELL PRESS
5L18-1		CONTAINMENT #11 FLOW
5L18-2		CONTAINMENT #12 FLOW
5L18-3		N2 VENT TO EMERG. VENT PRESS
7L6		TORUS LEVEL

NINE MILE POINT UNIT 1 HEO

HEO#: CS-066.0

DESCRIPTION:

BOTTOM OF REHEATER MIMIC IS DRAWN IN BY MAGIC MARKER.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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
N		NORTH/SOUTH REHEADER MIMIC

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-ØØ5.1

DESCRIPTION:

SEPARATE VENTILATION SYSTEM; AIR COMPRESSORS; AND CONTAINMENT AUX SYSTEMS CONTROLS AND DISPLAYS; PANEL L. THESE ARE NOT READILY APPARENT SEPARATIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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
L		VENTILATION SYS AIR COMPRESSORS SYS CONTROLS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-005.2

DESCRIPTION:

SEPARATE CORE SPRAY; SHUTDOWN COOLING; AND CONTAINMENT SPRAY SYSTEMS; CLEANUP SYSTEMS;DISPLAYS. THESE SEPARATIONS ARE NOT READILY APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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		CORE SPRAY COOLING CLEANUP SYSTEMS

NINE MILE POINT UNIT 1 HEO

EO#: OCS-005.3

DESCRIPTION:

SEPARATE SERVICE AND COOLING WATER; CONDENSER; AND OFF-GAS SYSTEM CONTROLS AND DISPLAYS; PANEL H. (NOT READILY APPARENT)

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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
H		CONDENSER
		OFF-GAS SYS CONTROLS AND DISPLAYS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-ØØ5.4

DESCRIPTION:

ENCLOSE FEEDWATER SYSTEM AND CONTROL ROD DRIVE SYSTEM CONTROLS; PANEL F. THESE SEPARATIONS ARE NOT READILY APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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		FEEDWATER SYS CONTROL ROD DRIVE

NINE MILE POINT UNIT 1 HEO

IO#: OCS-ØØ5.5

DESCRIPTION:

ENCLOSE FISH SCREEN CONTROLS BETWEEN THE OFF-GAS AND CONDENSER SYSTEM CONTROLS; PANEL H2. THE ASSOCIATIONS ARE NOT READILY APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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
H2		FISH SCREEN CONTROLS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-005.6

DESCRIPTION:

SEPARATE POWER OPERATED RELIEF VLVS FROM REACTOR BYPASS AND VENT VLVS; PANEL F. (NOT READILY APPARENT)

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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		RELIEF VLVS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-005.7

DESCRIPTION:

ENCLOSE MAIN STEAM LINE ISOLATION VLV CONTROLS; PANEL F. NOT READILY APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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		MAIN STEAM LINE ISOLATION VLV CONTROL

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-ØØ6.Ø

DESCRIPTION:

SEPARATE RELATED SUBGROUPS OF COMPONENTS WITHIN THE CONTAINMENT AUX SYSTEMS: PANEL L. NOT READILY APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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
E		RELATED CONTROLS
H3		CONDENSATE AND FEEDWATER CONTROLS AND DISPLAYS
K		SEPARATE CORE SPRAY
L		CONTAINMENT AUX SYS CONTROLS AND DISPLAY
L		CONTAINMENT AUX SYSTEM
L		SEPARATE VENTILATION SYS AIR COMPRESSORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-006.2

DESCRIPTION:

DIVIDE THE CONDENSATE AND FEEDWATER CONTROLS AND DISPLAYS; PANEL H3. NOT READILY APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-008.0

DESCRIPTION:

GREASE PENCIL MIMICS HAVE BEEN USED TO CONNECT COMPONENTS WITHIN THE TORUS AND DRYWELL N2 VENTILATION AND PURGE SYSTEM VLVS; PANEL L. THESE MIMICS ARE BADLY FADED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-009.0

DESCRIPTION:

GREASE PENCIL MIMICS HAVE BEEN USED IN THE FOLLOWING.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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		CORE SPRAY SYS CONTROLS
K		EMERGENCY CONDENSER SYS CONTROL
9999		
N		REHEATER CONDENSER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø11.Ø

DESCRIPTION:

PART OF THE EMER COND SYSTEM CONTROLS; PANEL K; ARE MIRROR IMAGED. THE VENT TO MAIN STEAM ISOL VLVS AND VENT BLOCKING VLVS ARE MIRRORED BETWEEN CHANNELS 11 AND 12.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING LINES OF DEMARCATION AND SUMMARY LABELING WILL BE APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGNS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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
		VENT TO MAIN STEAM ISOL AND VENT BLOCKING VLVS
K		VENT OF STEAM ISOL AND VENT BLOCKING VLV

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø14.Ø

DESCRIPTION:

SOME PANELS CONTAIN UNDIVIDED STRINGS OR MATRICES OF COMPONENTS OF RELATED FUNCTIONS. THESE GROUPINGS SHOULD BE DIFFERENTIATED WITH DEMARCATION LINES , HIERARCHICAL LABELING, SPACING, OR COLOR CODING.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

FLOW PATH MIMICING, LINES OF DEMARCATION, BACKGROUND SHADING AND SUMMARY LABELING WILL BE SYSTEMATICALLY APPLIED ACROSS THE CONTROL BOARDS. THESE DESIGN CONSIDERATIONS WILL BE MOCKED UP ON THE SIMULATOR AND EVALUATED. THE FINAL DESIGN CONSIDERATIONS/CHANGES WILL THEN BE IMPLEMENTED ON THE CONTROL BOARDS.

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
A4		ELECTRICAL METER ARRAYS
A5		ELECTRICAL METER ARRAYS
A7		ELECTRICAL METER ARRAYS
A9		ELECTRICAL METER ARRAYS
L		TORUS AND DRYWELL; AIR AND N2 VLV SYS CONTROLS
L		TORUS/DRYWELL INDICATOR STRING FOR TEMP PRESS FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-016.0

DESCRIPTION:

NO OFFICIAL PLANT COLOR STANDARD EXISTS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE YELLOW LIGHT FOR THE MAIN STEAM ISOLATION VALVES HAVE BEEN CHANGED TO WHITE TO INDICATE THE INPUT SELECTION STATUS IN ACCORDANCE WITH THE STANDARDS ESTABLISHED IN THE HF DESIGN MANUAL.

VERIFICATION:
FOUND TO BE ADEQUATE DURING VERIFICATION.

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø17.Ø

DESCRIPTION:

THE USE OF RED/GREEN INDICATOR LIGHTS AS APPLIED TO VLVS;PMPS;BREAKERS;ETC; IS INCONSISTENT. THERE ARE SOME INSTANCES IN WHICH YELLOW INDICATING LIGHTS ARE USED INCONSISTENTLY. YELLOW IS USED BOTH IN THE ELECTRICAL SYSTEM FOR VARIOUS INDICATIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE YELLOW LIGHT FOR THE MAIN STEAM ISOLATION VALVES HAVE BEEN CHANGED TO WHITE TO INDICATE THE INPUT SELECTION STATUS IN ACCORDANCE WITH THE STANDARDS ESTABLISHED IN THE HF DESIGN MANUAL.

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
H1		TEMPERING GATE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-032.0

DESCRIPTION:

THE SWITCH BELOW THE N2 PURGE BYPASS SWITCH, PANEL L, HAS NO LABEL.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: 4D

EXPLANATION:

THE COMPONENT IS THE CHANNEL 12 N2 PURGE BYPASS AND IT IS USED IN CONJUNCTION WITH THE CHANNEL 11 SWITCH. THE LABEL SERVES AS THE HIERARCHICAL LABEL FOR BOTH. CHANNEL 11 AND 12 LABELS HAVE BEEN ADDED SINCE THE ORIGIONAL SURVEY.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
L		SWITCH

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø53.Ø

DESCRIPTION:

THE FOLLOWING INCONSISTENT ABBREVIATIONS WERE NOTED: ISOLATION VALVE/ISOL VALVE/IV; REACTOR BLDG/R.B./REACTOR BUILDING; CONDENSER/CNDSR/COND/CONDSR; STM SUPPLY/STM S; RECIRCULATION/ RECIRC/R; FEEDWATER/FWTR/FW;EMERGENCY/EMERG/EMER/EM.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

A STANDARD CONTROL ROOM ABBREVIATION LIST WILL BE ESTABLISHED AND APPLIED TO ALL FUTURE PANEL MODIFICATIONS. THIS CONVENTION WILL BE INCLUDED INTO THE U1 HF MANUAL.

VERIFICATION:

THE CONTROL ROOM ABBREVIATIONS LIST DEVELOPED IN THE HF DESIGN MANUAL WAS USED DURING THE DEVELOPEMENT OF THE ICP AND FOUND TO BE ADEQUATE DURING SIMULATOR VERIFICATION.

NINE MILE POINT UNIT 1 HEO

EO#: OCS-Ø55.Ø

DESCRIPTION:

THE CONTROLLER ABOVE THE OFF-GAS PREHEATER STEAM BYPASS VLV; PANEL H; IS EITHER UNIDENTIFIED OR THE GE NAME PLATE ON THE COVER OBSCURES THE LABEL.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

AFTER A SEPARATE SURVEY CONDUCTED 11-15-84, THE LISTED LABELS ON OCS-55 WERE FOUND TO BE DISTRACTING (STAND OUT) OR LACKING IN INFO. REPLACE THESE LABELS WITH NEW LABELS IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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

9999	
A7	R925 (BLACK)
A8	6 VOLNEY OF METERS (BLACK)
E	BYPASS RWM ESCUTCHEON
E	EJECTOR CND FLOW
E	OFF GAS CHILLER DISCH TEMP RECORDER
E	OFF GAS TEMP RECORDER
E	REACTOR PRESSURE COMPENSATOR-REMOVE OLD LABEL
F	FWP 11 BYPASS VLV
F	FWP 12 BYPASS VLV
F	FWP 12 VLV CONTROL (UNLABELLED)
F	FWP 13 VLV CONTROL (UNLABELLED)
F	MAIN SPRAY ISOL VLV 7% TEST (MIMIC)
F	POST LOCA VENT VLVS 201.1-9 AND 2H1.11
H	CHANNEL 11 SCRAM SOLENOID GROUP
H	CHANNEL 12 SCRAM SOLENOID GROUP
H	CHILLER 11 SYSTEM CLC-24
H	CHILLER 12 SYSTEM CLC-24
H	CHILLER 13 SYSTEM CLC-24
H	TEMPERING GATE
H	UNLABELLED CONTROLLERS (H1)
H	UNLABELLED GE CONTROLLER (H2)
	86-17
	BVA033-41 (PUSHBUTTON)
K	CLEANUP SYSTEM FLOW-OFF
L	DRYWELL CAM IV
L	EM VENT EXHAUST FAN 11 INLET PCV (LIGHTS)
L	POST LOCA VENT VLVS 2Ø.1-14 AND 2Ø1.1-16

L POST LOCA VENT VLVS 201.2-09 AND
201.1-16

L SYSTEM 11 O2/H2 RECORDERS

L SYSTEM 12 O2/H2 RECORDERS

L UNLABELLED (CH12 BYPASS)-N2 PURGE BYPASS

UNLABELLED CONTROLLER ON L4

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø59.Ø

DESCRIPTION:

VERTICAL SCALE INDICATORS UTILIZE A TOP-BOTTOM LETTERING OF LABELING WORDS ADJACENT TO THE SCALES. READING OF LABELS IS VERY DIFFICULT; WHEN INDICATORS ARE MOUNTED HIGH OR OPERATOR IS UNDER STRESS. READING IS ALSO DIFFICULT AS INDICATORS ARE PLACED IN ROWS OF SIX OR MORE.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

ALTHOUGH NOT NORMALLY RECOMMENDED, VERTICAL ORIENTATION MAY BE USED WHEN SPACE IS LIMITED. THIS IS THE CASE AT NMP-1. TO ENHANCE READABILITY, A STANDARD FORMAT WILL BE ADOPTED AND APPLIED TO THE CONTROL ROOM WHEREBY THE LABEL INFO IS PRESENTED VERTICALLY WITH THE UNIT AND MULTIPLIER (IF APPLICABLE) PRESENTED IN THE LOWER RIGHT WITH HORIZONTAL ORIENTATION. DEMARCATION AND HIERARCHICAL PANEL LABELING WILL BE EMPLOYED TO ENHANCE METER IDENTIFICATION.

VERIFICATION:

COMPONENT LABELS HAVE BEEN INCLUDED DURING VERIFICATION TESTING ON THE SIMULATOR AND FOUND TO BE ADEQUATE.

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø68.Ø

DESCRIPTION:

THE INDICATING SCALES FOR REACTOR WATER LEVEL ON PANELS E;F;AND K ARE MARKED SHOWING NORMAL AND ABNORMAL RANGES OF OPERATION. HOWEVER, IN GENERAL, INDICATOR SCALES ARE NOT MARKED IN THIS MANNER.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE COLOR BANDING ON METERS WHERE APPROPRIATE IN ACCORDANCE WITH HF DESIGN MANUAL. A SPECIAL STUDY WILL IDENTIFY APPROPRIATE METERS AND RANGES.

VERIFICATION:

COLORBANDING WAS FOUND TO BE NOT APPROPRIATE FOR MOST NMP-1 INDICATORS DURING VERIFICATION TESTING. INAPPROPRIATE SCALES THAT ARE DIFFICULT TO READ WILL BE REPLACED WITH NEW SCALEPLATES IN ACCORDANCE WITH THE HF DESIGN MANUAL.

Panel ID #	Equipment ID #	Equipment Name
ALL		INDICATOR SCALES
E;F;K		INDICATOR SCALES

NINE MILE POINT UNIT 1 HEO

EO#: OCS-Ø83.Ø

DESCRIPTION:

MOSTLY INDICATORS HAVE BEEN DESIGNED WITH ADEQUATE VISUAL DISTINCTION BETWEEN SCALE MARKINGS; UNITS; LABELING; BUT ON VERTICAL INDICATORS, LETTERING FROM TOP TO BOTTOM TENDS TO RUN WORDS TOGETHER WHEN LABELS ARE LONG WHICH MAKES THEM DIFFICULT TO READ VAR. AND PROCESS UNITS ARE TOO CLOSELY LOCATED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

MAKE ALL UNITS ON VERTICAL METERS CONSISTENT WITH THE UNITS AND MULTIPLIER (IF APPLICABLE) IN THE LOWER RIGHT AND WITH HORIZONTAL ORIENTATION. DEMARCATION AND HEIRARCHICAL PANEL LABELING WILL BE EMPLOYED TO ENHANCE DISTINCTION.

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
ALL		INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-127.0

DESCRIPTION:

MANY INDICATORS ARE SCALED IN MULTIPLES OF 25; MAKING THE SMALLEST SUBDIVISION 2.5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

INAPPROPRIATE SCALES WILL BE REPLACED WITH NEW SCALEPLATES IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
L		INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-128.0

DESCRIPTION:

THE FUEL POOL LEVEL (DIFFERENTIAL FROM NORMAL) IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

SCALE WILL BE REPLACED WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
L		FUEL POOL LEVEL [DIFFERENTIAL FROM NORMAL]

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-129.0

DESCRIPTION:

THE DRYWELL EQUIPMENT DRAIN TANK LEVEL RECORDER IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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

Panel ID #	Equipment ID #	Equipment Name
L		DRYWELL EQUIPMENT DRAIN TANK LEVEL RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-130.0

DESCRIPTION:

THE DRYWELL FLOOR DRAIN LEVEL RECORDERS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: 1B

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
L		DRYWELL FLOOR DRAIN LEVEL RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-131.0

DESCRIPTION:

THE CLEANUP PMP SWITCH PRESSURE RECORDER IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
K		CLEANUP PUMP SUCTION PRESSURE RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-132.Ø

DESCRIPTION:

THE LIQUID POISON HEADER PRESSURE IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: 4D

EXPLANATION:

PROVIDE A NEW SCALE FOR THIS METER WITH THE CURRENT RANGE BUT WITH A NUMERICAL PROGRESSION AND SUBDIVISION INCREMENTS IN ACCORDANCE WITH THE HUMAN FACTORS MANUAL.

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 HEADER PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-133.Ø

DESCRIPTION:

MANY SPRAY PUMP AMPS INDICATORS HAVE MULTIPLES OF 15. THE FOLLOWING INDICATORS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

SCALES WILL BE REPLACED WITH NEW SCALEPLATE IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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		SPRAY PUMP AMPS INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-134.0

DESCRIPTION:

THE AUX CLEANUP PUMP AMPS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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		AUX CLEANUP PUMP AMPS

NINE MILE POINT UNIT 1 HEO

EO#: OCS-135.Ø

DESCRIPTION:

THE EMERGENCY CONDENSER WATER TEMP INDICATORS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
K		EMERG CONDENSER WATER TEMP INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-136.Ø

DESCRIPTION:

THE EMERGENCY CONDENSER STEAM HEADER PRESSURE IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
K		EMERG CONDENSER STEAM HEADER PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-137.0

DESCRIPTION:

THE SHUTDOWN COOLING SYSTEM HEAT EXCHANGER OUTLET TEMPERATURE INDICATORS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
K		SHUTDOWN COOLING SYS HEAT EXCHANGER OUTLET TEMP

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-139.Ø

DESCRIPTION:

THE DEMINERALIZED WATER TANK LEVEL IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
H		DEMINERALIZED WATER TANK LEVEL

NINE MILE POINT UNIT 1 HEO

EO#: OCS-140.0

DESCRIPTION:

THE SPRAY PMP AMPS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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

nel ID #	Equipment ID #	Equipment Name
H		SPRAY PUMP AMPS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-141.Ø

DESCRIPTION:

THE RECOMBINER DISCHARGE TEMP INDICATORS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
H		RECOMBINER DISCHARGE TEMPERATURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-142.0

DESCRIPTION:

THE OFF-GAS DILUTED TEMPERATURE IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
H		OFF-GAS DILUTED TEMPERATURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-143.0

DESCRIPTION:

THE CHILLER OFF-GAS TEMP INDICATORS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
H		CHILLER OFF-GAS TEMPERATURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-144.Ø

DESCRIPTION:

THE SERVICE WATER HEADER PRESSURE IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
H		SERVICE WATER HEADER PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-145.0

DESCRIPTION:

THE TOTAL RECIRCULATION FLOW RECORDER IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
F		TOTAL RECIRCULATION FLOW RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-146.0

DESCRIPTION:

THE CORE DIFFERENTIAL PRESSURE RECORDER IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
F		CORE DIFFERENTIAL PRESSURE RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-147.Ø

DESCRIPTION:

THE REACTOR PRESSURE (SUPPRESSED RANGE) RECORDER IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
F		REACTOR PRESSURE [SUPPRESSED RANGE] RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-148.0

DESCRIPTION:

THE RECIRCULATION PUMP DIFFERENTIAL PRESSURE INDICATORS ARE SCALED WITH SUBDIVISONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PROVIDE A NEW SCALE FOR THIS METER WITH THE CURRENT RANGE BUT WITH A NUMERICAL PROGRESSION AND SUBDIVISION INCREMENTS IN ACCORDANCE WITH THE HUMAN FACTORS MANUAL.

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		RECIRCULATION PUMP DIFFERENTIAL PRESSURE

NINE MILE POINT UNIT 1 HEO

EO#: OCS-149.0

DESCRIPTION:

THE RECIRCULATION PMP FLOW INDICATORS ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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		RECIRCULATION PUMP FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-150.0

DESCRIPTION:

THE REACTOR DIFFERENTIAL PRESSURE IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
F		REACTOR DIFFERENTIAL PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-151.Ø

DESCRIPTION:

THE REACTOR RECIRC FLOW IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: 4D

EXPLANATION:

PROVIDE A NEW SCALE FOR THIS METER WITH THE CURRENT RANGE BUT WITH A NUMERICAL PROGRESSION AND SUBDIVISION INCREMENTS IN ACCORDANCE WITH THE HUMAN FACTORS MANUAL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
-		REACTOR RECIRCULATION FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-154.0

DESCRIPTION:

THE REACTOR VESSEL PRESSURE ARE SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1;, 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
E		REACTOR VESSEL PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-155.0

DESCRIPTION:

THE OFF-GAS CHILLER DISCHARGE TEMP RECORDER IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PREPARE A NEW SCALEPLATE IN ACCORDANCE WITH THE HF MANUAL, EXISTING RANGE IS TO BE MAINTAINED.

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
E		OFF-GAS CHILLER DISCHARGE TEMP RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-156.0

DESCRIPTION:

THE OFF-GAS TEMPERATURE RECORDER IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
E		OFF-GAS TEMP RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-157.0

DESCRIPTION:

THE AIR EJECTOR CONDENSER FLOW RECORDER IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
E		AIR EJECTOR CONDENSER FLOW RECORDER

HEO#: OCS-158.0

DESCRIPTION:

THE TURBINE OIL TEMPERATURE IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

VALUE READINGS FROM THESE INDICATORS ARE OFTEN NEEDED. REPLACE SCALE WITH NEW SCALEPLATE (WHICH CONTAIN NO MORE THAN NINE GRADUATIONS BETWEEN NUMERALS) IN ACCORDANCE WITH THE HF DESIGN MANUAL.

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
A1		TURBINE OIL TEMPERATURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-159.Ø

DESCRIPTION:

THE STEAM CHEST PRESSURE IS SCALED WITH SUBDIVISIONS OTHER THAN DECIMAL MULTIPLES OF 1; 2; OR 5.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
A2		STEAM CHEST PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-211.0

DESCRIPTION:

NO GUARDS ARE PROVIDED TO PREVENT INADVERTENT OPERATION OF HANDLES LOCATED NEAR THE EDGE OF CONTROL PANELS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NO OPERATIONAL HISTORY OF INADVERTANT ACTUATION AT NMP-1. THERE ARE NO SWITCHES ON THE VERTICAL SECTOR BELOW THE BENCHBOARD WHERE A KNEE COULD CAUSE A PROBLEM. ADDITIONAL EFFORTS ARE UNDER WAY TO LIMIT TRAFFIC NEXT TO THE CONTROL BOARDS. (MARKED CONTROL AREAS, SEE HEO OS-18 FOR RESOLUTION)

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

ALL

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-226.0

DESCRIPTION:

ANNUNCIATOR WINDOWS ARE GENERALLY CONSISTENT IN NOMENTCLATURE; SYNTAX; AND ABBREVIATIONS. ONLY A FEW MULTIPLE ABBREVIATIONS WERE NOTED: WATER/WTR/W; PRESSURE/PRESS/PR; LOW/LO/L; HIGH/HI/H.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

A STANDARD CONTROL ROOM ABBREVIATION LIST WILL BE ESTABLISHED AND APPLIED TO ALL FUTURE PANEL MODIFICATIONS. THIS CONVENTION WILL BE INCLUDED INTO THE U1 HF MANUAL.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATOR WINDOWS

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø1Ø.Ø

DESCRIPTION:

MOST OF THE SUITABILITY CHECKS FOR THE PMP AMMETERS (I.E. RANGE AND DIVISIONS) WERE FOUND TO BE UNSUITABLE.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REPLACE SCALE WITH NEW SCALEPLATE IN ACCORDANCE WITH HF DESIGN MANUAL.

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
		ALL PUMP AMMETERS

NINE MILE POINT UNIT 1 HEO

HEO#: VER-040.0

DESCRIPTION:

MANY CONTROLS HAVE THE INAPPROPRIATE HANDLE TYPES IN THE VERIFICATION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

SEVERAL CONTROL HANDLES WERE REPLACED AS PART OF THE ICP. THIS WAS DONE IN ACCORDANCE WITH THE HF DESIGN MANUAL. THESE WERE TESTED DURING VERIFICATION AND FOUND TO BE ADEQUATE.

VERIFICATION:

SEVERAL CONTROL HANDLES WERE REPLACED AS PART OF THE ICP. THIS WAS DONE IN ACCORDANCE WITH THE HF DESIGN MANUAL. THESE WERE TESTED DURING VERIFICATION AND FOUND TO BE ADEQUATE.

NINE MILE POINT UNIT 1 HEO

HEO#: COM-ØØ7.Ø

DESCRIPTION:

SOME ALPHA-NUMERIC CHARACTERS ARE DIFFICULT TO READ (E.G. IT IS DIFFICULT TO DISCRIMINATE BETWEEN THE LETTERS "C" AND "O").

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4E

EXPLANATION:

THE CRTS ARE ADJUSTED PERIODICALLY TO ENSURE THE CRT PICTURES PROVIDE THE BEST RESOLUTION POSSIBLE. THIS FREQUENCY WILL BE INCREASED TO ENSURE FULL RESOLUTION CAPABILITY. WITH FULL RESOLUTION PROPERTIES, THE DISCRIMINATION IS NOT A PROBLEM.

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

HED#: COM-027.0

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 COLOR SURVEY WILL BE CONDUCTED FOR THE CRT DISPLAYS. THESE USES WILL BE COMPARED TO THE CONTROL ROOM COLOR CONVENTIONS. WHERE THERE IS AN ESTABLISHED COLOR CONTEXT IN THE CONTROL ROOM AND THE SAME CONTEXT IS EMPLOYED ON THE COMPUTER DISPLAY, THEN THESE COLOR USES WILL BE MADE CONSISTENT.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

NINE MILE POINT UNIT 1 HEO

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 COLOR SURVEY WILL BE CONDUCTED FOR THE CRT DISPLAYED. THESE USERS WILL BE COMPARED TO THE CONTROL ROOM COLOR CONVENTIONS. WHERE THERE IS AN ESTABLISHED COLOR CONTEXT IN THE CONTROL ROOM AND THIS SAME CONTEXT IS EMPLOYED ON THE COMPUTER DISPLAY, THEN THESE COLOR USES WILL BE MADE CONSISTENT.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

NINE MILE POINT UNIT 1 HEO

HEO#: COM-Ø29.Ø

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 COLOR SURVEY WILL BE CONDUCTED FOR THE CRT DISPLAYS. THESE USES WILL BE COMPARED TO THE CONTROL ROOM COLOR CONVENTIONS. WHERE THERE IS AN ESTABLISHED COLOR CONTEXT IN THE CONTROL ROOM AND THIS SAME CONTEXT IS EMPLOYED ON THE COMPUTER DISPLAY, THEN THESE COLOR USES WILL BE MADE CONSISTENT.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

NINE MILE POINT UNIT 1 HEO

HEO#: CS-017.0

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:

ESTABLISH PROGRAM FOR REVIEWING, UPGRADING, OR REFURBISHING RECORDERS AS NECESSARY.

VERIFICATION:
ELABORATE ON ASSESSMENT.

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

NINE MILE POINT UNIT 1 HEO

HEO#: FP-003.0

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: SC

EXPLANATION:

THE CRACKED KNOBS WILL BE REPLACED WITH NEW KNOBS. A PERMANENT REPLACEMENT HANDLE THAT RESISTS CRACKING WILL BE INVESTIGATED.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: FP-ØØ4.Ø

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: FIX

RISK CATEGORY: 4B

EXPLANATION:

THIS APPEARS TO BE ASSOCIATED WITH THE HANDLE TYPE FOR THIS CONTROL. ALL CRACKED HANDLES WILL BE REPLACED AND A NEW REPLACEMENT HANDLE WILL BE INVESTIGATED.

VERIFICATION:
VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

EO#: HR-002.0

DESCRIPTION:

THE MECHANICAL PRESSURE REGULATOR (MPR) UTILIZES A LOWER TO RIGHT AND RAISE TO LEFT CONFIGURATION. THIS IS THE OPPOSITE OF THE MPR METER (FEEDBACK INDICATION) AND THE EXPECTED CONFIGURATION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

ALL THE TURBINE GENERATOR CONTROLS FOLLOW THE SAME CONVENTION. TO MODIFY THIS CONVENTION WOULD RESULT IN A NEGATIVE TRANSFER SITUATION. THE CURRENT CONFIGURATION WILL BE ACKNOWLEDGED AS AN NMP-1 SWITCH CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL. THE CONVENTIONS IN THIS MANUAL WILL BECOME PART OF THE OPERATOR TRAINING CURRICULUM. ALL APPLICATIONS OF THIS CONTROL CONVENTION WILL BE CHECKED TO ENSURE COMPLIANCE.

RIFICATION:
ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
E		MECHANICAL PRESSURE REGULATOR

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-021.0

DESCRIPTION:

THE MEANINGS OF THE YELLOW; RED; AND WHITE LIGHTS TO THE RIGHT OF THE CONTAINMENT MIMIC; PANEL F; ARE NOT SPECIFIED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: NOT RECORDED

EXPLANATION:

REMOVE SERIES OF (6) LIGHTS AND PLUG HOLES.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
F		SCRAM DISCHARGE VOLUME ACCOUSTIC MONITOR

HEO#: OCS-089.0

DESCRIPTION:

TRANSFORMER 10 TAP. POS. SW.; PANEL A6; HAS LOWER-RIGHT AND RAISE--LEFT WHILE THE CORRESPONDING INDICATOR IS THE REVERSE ORIENTATION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

ALL THE TURBINE GENERATOR CONTROLS FOLLOW THE SAME CONVENTION. TO MODIFY THIS CONVENTION WOULD RESULT IN A NEGATIVE TRANSFER SITUATION. THE CURRENT CONFIGURATION WILL BE ACKNOWLEDGED AS AN NMP-1 SWITCH CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL. THE CONVENTIONS IN THIS MANUAL WILL BECOME PART OF THE OPERATOR TRAINING CURRICULUM. ALL APPLICATIONS OF THIS CONTROL CONVENTION WILL BE CHECKED TO ENSURE COMPLIANCE.

VERIFICATION:
ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
A6		TRANSFORMER 10 TAP POS SWITCH

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-090.0

DESCRIPTION:

THE MECHANICAL AND ELECTRICAL PRESSURE REGULATOR SW ON PANEL E: HAVE RAISE TO LEFT AND LOWER TO RIGHT. THE INDICATORS READ CLOCKWISE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

ALL THE TURBINE GENERATOR CONTROLS FOLLOW THE SAME CONVENTION. TO MODIFY THIS CONVENTION WOULD RESULT IN A NEGATIVE TRANSFER SITUATION. THE CURRENT CONFIGURATION WILL BE ACKNOWLEDGED AS AN NMP-1 SWITCH CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL. THE CONVENTIONS IN THIS MANUAL WILL BECOME PART OF THE OPERATOR TRAINING CURRICULUM. ALL APPLICATIONS OF THIS CONTROL CONVENTION WILL BE CHECKED TO ENSURE COMPLIANCE.

VERIFICATION:
ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
E		MECHANICAL ELECTRICAL PRESSURE REGULATOR
E		PRESSURE REGULATOR

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-091.0

DESCRIPTION:

THE LOAD LIMIT SWITCH, PANEL A2, IS RAISE TO LEFT; BUT THE ASSOCIATED INDICATOR ON PANEL E HAS THE LOW POSITION COUNTERCLOCKWISE FROM THE NO LOAD POSITION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

ALL THE TURBINE GENERATOR CONTROLS FOLLOW THE SAME CONVENTION. TO MODIFY THIS CONVENTION WOULD RESULT IN A NEGATIVE TRANSFER SITUATION. THE CURRENT CONFIGURATION WILL BE ACKNOWLEDGED AS AN NMP-1 SWITCH CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL. THE CONVENTIONS IN THIS MANUAL WILL BECOME PART OF THE OPERATOR TRAINING CURRICULUM. ALL APPLICATIONS OF THIS CONTROL CONVENTION WILL BE CHECKED TO ENSURE COMPLIANCE.

VERIFICATION:
ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
A2		LOAD LIMIT SWITCH
E		ASSOCIATED INDICATOR

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-092.0

DESCRIPTION:

THE EXCITER RHEOSTAT; GOVERNOR; AND VOLTAGE ADJUST SWITCHES ON PANELS E AND A7 ARE RAISE TO LEFT. THE METERS ON PANEL E ARE GENERALLY READ IN A CLOCKWISE MANNER.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

ALL THE TURBINE GENERATOR CONTROLS FOLLOW THE SAME CONVENTION. TO MODIFY THIS CONVENTION WOULD RESULT IN A NEGATIVE TRANSFER SITUATION. THE CURRENT CONFIGURATION WILL BE ACKNOWLEDGED AS AN NMP-1 SWITCH CONVENTION IN THE NMP-1 HUMAN FACTORS MANUAL. THE CONVENTIONS IN THIS MANUAL WILL BECOME PART OF THE OPERATOR TRAINING CURRICULUM. ALL APPLICATIONS OF THIS CONTROL CONVENTION WILL BE CHECKED TO ENSURE COMPLIANCE.

VERIFICATION:
ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
A7		EXCITER RHEOSTAT; GOVERNOR; AND VOLTAGE ADJUST SWITCHES
E		EXCITER RHEOSTAT; GOVERNOR; AND VOLTAGE ADJUST SWITCHES
E		METERS

NINE MILE POINT UNIT 1 HEO

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. PHOTO #41.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 5E

EXPLANATION:

ESTABLISH PROGRAM FOR REVIEWING, UPGRADING, OR REFURBISHING RECORDERS AS NECESSARY.

VERIFICATION:
ELABORATE ON ASSESSMENT.

Panel ID #	Equipment ID #	Equipment Name
B		CHART RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-219.Ø

DESCRIPTION:

CONENTRATOR ELECTRICAL BOILER; WINDOW H2-25. ANNUNCIATORS ARE GENERALLY GROUPED BY SPECIFIC SYSTEM WITHIN AN ANNUNCIATOR BOX. IN SOME CASES; HOWEVER; SEEMINGLY UNRELATED ANNUNCIATORS ARE MIXED WITHIN A BOX.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4E

EXPLANATION:

REMOVE ANNUNCIATOR WINDOW IF CONCENTRATOR ELECTRIC BOILER IS MOTH BALLED.

VERIFICATION:
VERIFY COMPLETION.

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-243.Ø

DESCRIPTION:

NO METHOD IS PROVIDED TO ASSURE WINDOW PLATE REPLACEMENT IN THE CORRECT LOCATION DURING ANNUNCIATOR MAINTENANCE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 5D

EXPLANATION:

STANDING ORDER WILL BE DEVELOPED TO INSURE 1 WINDOW IS REPLACED AT A TIME.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATORS

NINE MILE POINT UNIT 1 HEO

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:

A REQUEST FOR MODIFICATIONS TO TIE INTO COMMON ANNUNCIATOR SILENCE BUTTON WILL BE ISSUED. A MOD IS IN TO INCORPORATE THE SILENCE FUNCTION WITH THE PANEL E ANNUNCIATOR SILENCE BUTTON.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-007.0

DESCRIPTION:

GATE ALARM WINDOW ARE ESTRANEOUS BECAUSE THEY ARE NO LONGER USED TO INDICATE WHEN GATES TO HIGH RADIATION AREAS HAVE BEEN OPENED. THESE INDICATIONS ARE TAKING UP VALUABLE SPACE ON THE E PANEL THAT COULD BE USED . E.G. BY INDICATORS FOR AREA RADIATION MONITORS OR CONTINUOUS AIR MONITORS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 3E

EXPLANATION:

REMOVE WINDOWS AND USE AREA FOR ADDITIONAL ANNUNCIATORS.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
E		GATE ALARM WINDOW

NINE MILE POINT UNIT 1 HEO

HEO#: QS-009.0

DESCRIPTION:

A NUMBER OF INDICATORS GIVE UNRELIABLE READINGS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 5A

EXPLANATION:

ALL HAVE BEEN FIXED OR HAVE PAPER WORK TO BE FIXED EXCEPT H2 AND O2 RECORDERS OF CAD SYSTEM #11 AND #12. REQUEST FOR MOD WILL BE ISSUED TO REPLACE OR REGAIN THESE RECORDERS.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		MAINSTEAM RADIATION MONITORS H2 AND O2 RECORDERS OF CAD SYSTEM #11 AND #12. TURB SPEED INDICATION BY A7 PANEL. RAD LVL READINGS ON F PANEL NOT RELEVENT.

NINE MILE POINT UNIT 1 HEO

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:

RSSB FACILITY IS BEING ADDED TO THE PLANT WHICH HAS A GROUP OF ARMS TO BE WIRED INTO THE CONTROL ROOM. THIS WILL SIMPLIFY THE ANNUNCIATOR/ALARM CONNECTION.

VERIFICATION:
VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø19.Ø

DESCRIPTION:

THESE CONTROLS ARE PRONE TO BE ACCIDENTALLY ACTUATED. A KEY LOCK SHOULD BE CONSIDERED FOR THE LOWER RIGHT SW ON THE REACTOR BLDG EMER VENT, TO DISCOURAGE ACCIDENTAL DUMPING OF THE DRYWELL TORUS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 5C

EXPLANATION:

KEYLOCK SW WILL REPLACE THE PRESENT DRYWELL VENT TO CONDENSOR CONTROL SW TO PREVENT INADVERTENT ACTUATION.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		DRYWELL VENT TO CONDENSER CONTROL

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø23.Ø

DESCRIPTION:

ALARM ANNUNCIATORS OCCUR UNNECESSARILY ON THE SMALL VACUUM PUMPS (PIGLETS) THAT TAKE SUCTION ON THE CIRCULATION WATER AND WATER BOXES, WHEN PUTTING THE SYSTEM IN SERVICE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

THE ANNUNCIATOR WILL BE EXAMINED TO DETERMINE THE STEPS NECESSARY TO KEEP FROM ILLUMINATING WHEN SYSTEM IS OUT OF SERVICE.

VERIFICATION:
VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

EO#: QS-024.0

DESCRIPTION:

A SPURIOUS ALARM OCCURS WHEN THE SYSTEM CALIBRATES ITSELF. THE HYDROGEN MONITORING SYSTEM IS SELF-CALIBRATING. THE SENSOR THAT TRIGGERS THE ALARM WORKS OFF THE METER. IN CALIBRATION MODE, THE METER DISPLAYS A SPURIOUS READING, TRIGGERING A SPURIOUS ALARM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 5B

EXPLANATION:

THE DESIGN WILL BE MODIFIED TO ELIMINATE THE SPURIOUS ALARM. SEE HEO# QS-009.

VERIFICATION:
VERIFY COMPLETION.

anel ID #	Equipment ID #	Equipment Name
		OFF-GAS HYDROGEN MONITORING SYS ALARM

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø25.Ø

DESCRIPTION:

THERE IS A TEMP POINT ON EITHER THE B2 OR B3 PANEL THAT GOES OVER THE ALARM POINT ON THE RECORDER BEFORE PRINTING A TEMP BELOW THE ALARM SET POINT. THIS CAUSES A SPURIOUS ALARM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

NEW RECORDERS ARE ON ORDER TO REPLACE THESE.

VERIFICATION:
ELABORATE ON ASSESSMENT.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-027.0

DESCRIPTION:

PAGE MESSAGES ARE DIFFICULT TO HEAR WHEN STANDING AT THE BACK PANELS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4C

EXPLANATION:

ADD A SPEAKER TO BACK PANEL AREA OF THE CONTROL ROOM.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

Panel ID #	Equipment ID #	Equipment Name
		PAGING SYSTEM

NINE MILE POINT UNIT 1 HEO

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:

REQUEST MOD CHANGES TO DETERMINE THE NUMBER OF PAGING CHANNELS NECESSARY WHICH WOULD FACILITATE THE DEDUCTION OF A CHANNEL FOR OPERATIONS. AT THIS TIME ONLY 3 CHANNELS ARE AVAILABLE.

VERIFICATION:

ELABORATE ON ASSESSMENT.

QUERY OPERATORS.

Panel ID #	Equipment ID #	Equipment Name
		GAITRONICS SYSTEM

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø33.Ø

DESCRIPTION:

ALARM INFORMATION ON THE LOG TYPER IS PRINTED IN LARGER TYPE THAN NON-ALARM INFORMATION, BUT OPERATORS FIND IT HARD TO DISTINGUISH THE TWO. AFTER A TRIP, MUCH OF THE INFORMATION PRINTED IS SUPERFLUOUS., THIS MAKES IT DIFFICULT FOR OPERATORS TO DETERMINE THE CAUSE OF THE TRIP. INFORMATION CONCERNING ALARMING POINTS COULD BE PRINTED IN RED. OPERATORS LIKED THE PREVIOUS PRINTER THAT DID THIS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 6B

EXPLANATION:

PROVIDE A MORE VISIBLE MEANS TO DISTINGUISH THE DIFFERENCE BETWEEN ALARMS AND OTHER INFO. CURRENT MEANS (PRINT SIZE) IS NOT SUFFICIENT.

VERIFICATION:
QUERY OPERATORS.

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-002.0

DESCRIPTION:

PROCEDURE N1-SOP-26 REFERS TO AIR EJECTOR OFF-GAS DISCHARGE WHILE THE CONTROL BOARD EQUIPMENT IS TITLED OFF-GAS TO STACK ISOLATION VLV.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: 4C

EXPLANATION:

CHANGE NOMENCLATURE IN PROCEDURE TO AGREE WITH EQUIPMENT NAME.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
		OFF-GAS TO STACK ISOLATION VLV

NINE MILE POINT UNIT 1 HEO

HEO#: VRR-003.0

DESCRIPTION:

CONTROL HANDLE SWITCH POSITIONS ARE LABELED "OPEN-AUTO-OPEN". THERE IS NO WAY TO IDENTIFY WHICH SYSTEM IS OPEN.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: FIX

RISK CATEGORY: NOT NEEDED

EXPLANATION:

CONTROL HANDLE POSITIONS WILL BE CHANGED TO "COOL""AUTO""OPEN", TO PROVIDE A CLEAR INDICATION OF POSITION.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
L		EM VENT LOOP 11 INLET BV
L		EM VENT LOOP 12 INLET BV

NINE MILE POINT UNIT 1 HEO

HEO#: COM-ØØ1.Ø

DESCRIPTION:

THE LIMIT OF 24 CHARACTERS FOR THE DESCRIPTIONS OF POINT IDS SOMETIMES REQUIRES EXTENSIVE USE OF OBBREVIATIONS. THESE ABBREVIATIONS CAN BE CRYPTIC AT TIMES.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 4D

EXPLANATION:

A PROGRAM WILL BE ESTABLISHED TO ANALYZE ALARM CONDITIONS, DESCRIPTIVE TERMS OF THE ANNUNCIATIONS, AND THE CORRESPONDING COMPUTER POINTS TO ENSURE THE COMPUTER MESSAGES ARE CONSISTENT. THE ACCEPTED ABBREVIATION LIST IN THE HF MANUAL WILL BE USED TO CORRECT THE CONDITIONS OF THIS ITEM. WHEN THE STANDARD ABBREVIATION CAN FIT THE 24 CHARACTER FIELD, THEY WILL BE USED.

VERIFICATION:

ELABORATE ON ASSESSMENT.

NINE MILE POINT UNIT 1 HEO

HEO#: CS-035.0

DESCRIPTION:

THERE IS NO POSITIVE MEANS OF DIAGNOSING FAILED INDICATING LIGHTS. THERE IS ALSO NO SUPPLY OF BULBS AT THE RSP PANELS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

THESE BULBS ARE DUAL (EITHER ONE OR THE OTHER ARE ON) INDICATIONS AND THERE IS A SERVEILLANCE PROCEDURE TO DETECT THESE KINDS OF FAILURE. A SUPPLY OF BULBS WILL BE PROVIDED AT THE STATION.

VERIFICATION:
VERIFY COMPLETION.

RSP

NINE MILE POINT UNIT 1 HEO

HEO#: ENV-004.0

DESCRIPTION:

THE "DRYWELL WATER LEAK DETECTION SYS" ANNUNCIATOR IS IN FALSE ALARM FREQUENTLY AND IS A NUISANCE TO OPERATIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 1B

EXPLANATION:

A MODIFICATION REQUEST TO CORRECT THE SPURIOUS ALARMING CONDITION WILL BE ISSUED.

VERIFICATION:
ELABORATE ON ASSESSMENT.

QUERY OPERATORS.

NINE MILE POINT UNIT 1 HEO

HEO#: FP-ØØ1.Ø

DESCRIPTION:

TRAINING ON THE USE AND OPERATION OF THE FIRE PANEL IS INADEQUATE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 5D

EXPLANATION:

FIRE PANEL TRAINING WILL BE STRENGTHENED.

VERIFICATION:
QUERY OPERATORS.

NINE MILE POINT UNIT 1 HEO

HEO#: FP-ØØ5.Ø

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:

A REQUEST TO INVESTIGATE RESOLUTIONS TO CUT OUT ALARM SIGNALS FOR OUT OF SERVICE DETECTORS WILL BE ISSUED.

VERIFICATION:

VERIFY COMPLETION.

NINE MILE POINT UNIT 1 HEO

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:

A REQUEST TO INVESTIGATE THE FEASIBILITY TO REMOVE THIS ANNUNCIATOR WILL BE ISSUED.

VERIFICATION:

REDO HUMAN FACTORS REVIEW.

QUERY OPERATORS.

NINE MILE POINT UNIT 1 HEO

HEO#: FP-007.0

DESCRIPTION:

NOT ALL LAMPS ARE PROVIDED WITH A LAMP TEST.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 4B

EXPLANATION:

A REQUEST TO INVESTIGATE THE FEASIBILITY OF PUTTING ALL LAMPS OR AT LEAST A CONSISTENT PATTERN OF LIGHTS FOR THE LAMP TEST WILL BE ISSUED.

VERIFICATION:
ELABORATE ON ASSESSMENT.

NINE MILE POINT UNIT 1 HEO

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 REQUEST TO INVESTIGATE THE FEASIBILITY OF PUTTING ALL LAMPS OR AT LEAST A CONSISTENT PATTERN OF LIGHTS FOT THE LAMP TEST WILL BE ISSUED.

VERIFICATION:
ELABORATE ON ASSESSMENT.

HEO#: FP-009.0

DESCRIPTION:

THE CONTROL FOR THE DIESEL FIRE PUMP DOES NOT CONFORM TO THE CONTROL DESIGN CONVENTION FOR THE FIRE PANEL

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 5C

EXPLANATION:

REVIEW THE SWITCH CONTACT DRAWINGS AND ESTABLISH THE CORRECT FUNCTIONING OF THE SWITCH. THE SWITCH CURRENTLY IS LABELED "TWIST TO START" WITH INDICATOR LIGHTS BAT 11 AND BAT 12. THE FUNCTIONING OF THE SWITCH IS NOT EVIDENT BY THE SWITCH LABELING AND SWITCH INDICATORS. REVIEW THE FIRE PANEL PROCEDURE AND ENSURE IT IS ACCURATE WITH RESPECT TO THE SWITCH OPERATION. INCLUDE SWITCH OPERATION IN THE TRAINING OF THE FIRE PANEL.

VERIFICATION:

ELABORATE ON ASSESSMENT.

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-195.0

DESCRIPTION:

SINGLE INDICATING LIGHTS ARE UTILIZED IN THE ANALOG TRIP SYSTEM TROUBLE LIGHTS. IN THESE SITUATIONS; A FAILED BULB CANNOT BE DISTINGUISHED FROM A NORMAL CONDITION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 3E

EXPLANATION:

PROVIDE A LIGHT TEST CIRCUIT TO ACTUATE WITH THE ANNUNCIATOR TEST BUTTON OR PROVIDE A DUAL BULB INDICATION (I.E., ONE CONSTANTLY ON AND GOING OFF AND ONE OFF AND GOING ON FOR A TROUBLE CONDITION). INCORPORATE THIS CHANGE INTO THE TRAINING CURRICULUM TO ENSURE OPERATOR AWARENESS.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
F		ANALOG TRIP SYSTEM TROUBLE LIGHTS

NINE MILE POINT UNIT 1 HEO

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: FIX

RISK CATEGORY: 4B

EXPLANATION:

THESE SWITCHES CAN NO LONGER BE MOVED TOO FAR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		FIRE PANEL CONTROLS

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-Ø12.Ø

DESCRIPTION:

THE ABBREVIATIONS USED IN THE TABLE OF PARAMETERS ON THE BOTTOM OF THE OVERVIEW DISPLAY ARE TERSE. ALSO THIS AREA OF THE DISPLAY IS OVERCROWDED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 4C

EXPLANATION:

ABBREVIATIONS WILL BE INCORPORATED INTO THE HF MANUAL AND IF CHANGES ARE NECESSARY THEY WILL BE ADDRESSED.

VERIFICATION:
REDO HUMAN FACTORS REVIEW.

NINE MILE POINT UNIT 1 HEO

HEO#: VRR-001.0

DESCRIPTION:

SEVERAL OPERATORS RECOMMENDED PROTECTIVE COVERS ON THE CITED PUSHBUTTONS, THEY SAY THAT THEY HAVE BEEN INADVERTENTLY PUSHED SEVERAL TIMES. THE PUSHBUTTONS ARE RECESSED SO THE PROBLEM IS NOT ACCIDENTAL PUSHING. IT IS FELT THAT A PROTECTIVE COVER WOULD REQUIRE AN EXTRA STEP AND AN EXTRA THOUGHT PROCESS AND WOULD PREVENT ACCIDENTS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: FIX

RISK CATEGORY: 5A

EXPLANATION:

PROTECTIVE COVERS ARE TO BE PLACED OVER THE STATED CONTROLS.

VERIFICATION:
VERIFY COMPLETION.

Panel ID #	Equipment ID #	Equipment Name
A		UNIT EMERGENCY TRIP
A		VACUUM TRIP 2
E		DRYWELL ISOLATION 11
E		DRYWELL ISOLATION 12
E		REACTOR TRIP 11
E		REACTOR TRIP 12
E		UNIT EMERGENCY TRIP

NINE MILE POINT UNIT 1 HEO

HEO#: CS-029.0

DESCRIPTION:

THERE IS NO DISTINCTION BETWEEN SCALE #121 AND SCALE #122 ON DUAL SCALE METER.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE UNITS ARE TIED TOGETHER BY A COMMON HDR, LEVEL INSTRUMENTS MONITOR LEVEL ON BOTH UNITS WHICH IS THE SAME. THEREFORE, LEVELS ON BOTH INSTRUMENTS COME FROM THE SAME SOURCE AND ONE INDICATION PROVIDES LEVEL OF BOTH UNITS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
RSP		EMER COND #121 & #122 MAKEUP

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-194.0

DESCRIPTION:

SINGLE INDICATING LIGHTS ARE UTILIZED IN THE FOLLOWING APPLICATIONS. IN THESE SITUATIONS; A FAILED BULB CAN NOT BE DISTINQUISHED FROM A NORMAL ONE.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS A BULB TEST FOR THESE LIGHTS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
-		CONTAINMENT ISOLATION MIMIC STATUS LIGHT

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-276.Ø

DESCRIPTION:

AUDIBLE SIGNALS ARE NOT 2Ø DB OR MORE OVER BACKGROUND NOISE LEVEL. SIGNALS ARE, HOWEVER, LOUD ENOUGH TO BE CLEARLY HEARD BY OPERATORS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALARMS ARE LOUD ENOUGH TO BE CLEARLY HEARD BY OPERATORS. THE ALARMS CAN BE HEARD FROM ANY PART OF THE CONTROL ROOM REGARDLESS OF THE BACKGROUND NOISE LEVEL.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

OPERATOR CAN READ THE REQUIRED INFO AT EACH STATION. THE COMPONENT IDENTIFICATION LABELS AND SWITCH POSITION LABELS ARE EASILY READ FROM ANY VANTAGE POINT.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: COM-005.0

DESCRIPTION:

WHEN RESPONSE TIME EXCEEDS 3 SECONDS, NO DELAY MESSAGE IS PRESENTED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE OPERATOR RECEIVES SEVERAL DIFFERENT CUES FROM THE COMPUTER TO INDICATE IF IT IS PROCESSING AN ENTRY OR IF IT IS OUT OF ORDER. AN INVALID REQUEST MESSAGE NOTIFIES THE OPERATOR THAT A PARTICULAR ENTRY CANNOT BE PROCESSED. A PURPLE CURSOR INDICATES THAT THERE IS A COMPUTER PROBLEM. A DELAY MESSAGE IS NOT NEEDED DUE TO THE PRESENCE OF OTHER COMPUTER STATUS MESSAGES.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-006.0

DESCRIPTION:

POINT IDS ARE NOT CROSS-INDEXED BY PROGRAM NAME OR BY FUNCTIONAL GROUP IDENTIFICATION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS A LISTING OF POINT ID SORTED BY SYSTEMS WHICH ARE USED BY OPERATORS TO IDENTIFY POINT ID.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-Ø15.Ø

DESCRIPTION:

PERIODS ARE NOT PLACED AFTER ITEM SELECTION DESIGNATORS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE NMP-1 COMPUTER DATA PRESENTATION FORMAT IS SUCH THAT PERIODS WOULD SERVE NO PURPOSE. PERIODS ARE NOT ENTERED AS PART OF ITEM SELECTION INPUT AND THEREFORE WOULD BE EXTRANEOUS ON THE DESIGNATORS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-023.0

DESCRIPTION:

WHEN A COMMAND IS ISSUED TO THE SYSTEM, THERE IS NO POSITIVE INDICATION THAT THE COMMAND HAS BEEN ACCEPTED. THIS IS BECAUSE THE MESSAGE "REQUEST ACCEPTED", ONCE DISPLAYED IS NOT CLEARED PRIOR TO INPUT OF A NEW COMMAND.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE "REQUEST ACCEPTED" SIGNAL IS NOT THE ONLY POSITIVE IDENTIFICATION. THE VALUE DISPLAY AREA WILL ALWAYS DISPLAY THE REQUESTED PARAMETER. IF THIS IS PRESENT THEN THE REQUEST IS IN PROGRESS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-242.0

DESCRIPTION:

NO REFERENCE WITH RESPECT TO ANNUNCIATORS IS PROVIDED IN THE NMP-1 PROCEDURES.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ANNUNCIATORS ARE CODED AND REFERENCED IN PROCEDURES. THIS MAY NOT HAVE BEEN EVIDENT TO THE ORIGIONAL SURVEY TEAM, HOWEVER, THIS WAS VERIFIED IN ASSESSMENT BY THE ASSESSMENT TEAM.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-280.0

DESCRIPTION:

NO ADMINISTRATIVE GUIDELINES EXIST TO EVALUATE THE PHYSICAL AND MENTAL CONDITION OF ON-COMING SHIFT OPERATORS ON A DAILY BASIS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE WAS TRAINING FOR MANAGEMENT TO IDENTIFY ABORHENT BEHAVIOR. ALSO THIS IS NOT A CRDR ISSUE.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø64.Ø

DESCRIPTION:

ALARM POINTS ON RECORDERS ARE NOT IDENTIFIED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE COMPUTER PROVIDES ALARM SETPOINTS AND INFORMATION OF ALARM SETPOINTS IS NOT OF INTEREST TO THE TREND DEVICES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
15L15		DRYWELL PRESS
7L6		TORUS LEVEL

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-268.0

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:

ALL RELEVANT IMPORTANT INFORMATION IS PROVIDED IN THE PROCEDURES. THE PROCEDURES ARE WRITTEN TO PROVIDE THE NEEDED DATA WITHOUT EXTRANEOUS INFORMATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: COM-Ø25.Ø

DESCRIPTION:

WHEN A PROCESS OR SEQUENCE IS COMPLETED BY THE SYSTEM, NO POSITIVE INDICATION IS PRESENTED TO THE OPERATOR CONCERNING THE OUTCOME OF THE PROCESS AND REQUIREMENTS FOR SUBSEQUENT OPERATOR ACTIONS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE OPERATOR REQUESTS ARE FOR DISPLAY PURPOSE ONLY. THERE IS NO PROCESS OUTCOME OTHER THAN THE DISPLAY. THE CRITERIA DOES NOT APPLY TO THE NMP-1 COMPUTER SYSTEM.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: CS-ØØ6.Ø

DESCRIPTION:

ALL CONTROLLERS PRESENT THE DEMAND SIGNAL TO THE COMPONENT ON A METER GENERALLY ON A RANGE OF Ø-1ØØ. OPERATORS ARE AWARE THAT THIS DISPLAY IS A DEMAND INDICATION BUT IS NOT LABELED AS SUCH.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

WITHOUT EXCEPTION, ALL CONTROLLERS PRESENT CONTROLLER OUTPUT AND OPERATORS ARE AWARE OF THIS. IT IS PART OF THEIR TRAINING AS AN OPERATOR TO KNOW CONTROLLER OPERATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A		HYDROGEN GAS TEMP CONTROL
A		TURBINE OIL TEMP CONTROL
E		FEEDWATER MASTER
E		RECIRC MASTER
F		GENERIC
H		GENERIC
K		GENERIC
L		GENERIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø12.Ø

DESCRIPTION:

CONTIGUOUS LEGEND PUSHBUTTONS ARE NOT PROVIDED WITH BARRIERS TO PREVENT INADVERTENT ACTUATION OF ADJACENT PUSHBUTTONS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THESE ARE LIGHTS AND NOT PUSHBUTTONS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
G		LPRM AUXILIARIES
G		LPRM-APRM AUXILIARIES
H		CHILLER 11 INLET OUTLET BV
H		CHILLER 12 INLET OUTLET BV
H		CHILLER 13 INLET OUTLET BV

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø13.Ø

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:

LOGOS DO NOT INTERFERE WITH POINTER, GRADUATIONS, NUMERALS OR READING OF METER.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø2Ø.Ø

DESCRIPTION:

AN INTERCOM SYSTEM IS NOT PROVIDED BETWEEN THE CONTROL ROOM AND THE SHIFT SUPERVISORS OFFICE. OFFICE IS ADJACENT TO THE CONTROL ROOM AND DOES HAVE VISUAL AND VERBAL ACCESS TO THE CR PERSONNEL.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

OFFICE IS ADJACENT TO THE CR AND DOES HAVE VISUAL AND VERBAL ACCESS TO THE CR PERSONNEL.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: CS-022.0

DESCRIPTION:

THERE APPEARED NOT TO BE A CONSISTENT METHOD TO SECURELY AFFIX MAINTENANCE TAGS TO PANEL COMPONENTS. SCOTCH TAPE WAS USED TO AFFIX ONE TAG TO THE PANEL.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS A CLEARLY STATED, ADMINISTRATIVE PROCEDURE FOR CONTROL OF TAGGING COMPONENTS. THIS PROCEDURE IS TO BE FOLLOWED WHENEVER MAINTENANCE TAGS ARE AFFIXED TO PANEL COMPONENTS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: CS-056.0

DESCRIPTION:

HANDLES OBSCURE POSITION LABELS DUE TO THE LOCATION OF THE COMPONENTS ON THE PANEL.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

SWITCH IS SPRING RETURN AND LIGHTS PROVIDE POSITION CUE.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø56.Ø

DESCRIPTION:

HANDLES OBSCURE POSITION LABELS DUE TO THE LOCATION OF THE COMPONENTS ON THE PANEL.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

SWITCH IS SPRING RETURN AND LIGHTS PROVIDE POSITION CUE.

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

NINE MILE POINT UNIT 1 HEO

HEO#: CS-057.0

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

NO COMPARISONS ARE MADE BETWEEN THESE METERS. THESE METERS ARE LOCATED TO FACILITATE OTHER ASSOCIATIONS.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø62.Ø

DESCRIPTION:

METERS ARE NOT DESIGNED SO THAT A FAILURE MODE IS EVIDENT.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS A FAILURE MODE CONVENTION OF DOWN SCALE FOR METER. THIS IS A DESIGN FEATURE THAT ALL OPERATORS ARE FAMILIAR WITH.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
5L18-1		CONTAINMENT #11 FLOW
5L18-2		CONTAINMENT #12 FLOW
5L18-3		N2 VENT TO EMERG VENT PRESS

HEO#: HR-ØØ1.Ø

DESCRIPTION:

THERE IS NO ANNUNCIATOR TO INDICATE WHEN THE PLANT DISCHARGE TEMPERATURE VS PLANT INLET TEMPERATURE AT TECHNICAL SPECIFICATION IS EXCEEDED. ALTHOUGH THERE IS AN INDICATION OF THIS DIFFERENTIAL TEMPERATURE PLANT SPECIFICATIONS HAVE BEEN EXCEEDED DURING OPERATION.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NO LONGER A TECH SPEC FOR THIS CONDITION.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-004.0

DESCRIPTION:

BENCHBOARD FOOT SPACE IS LESS THAN THE RECOMMENDED MINIMUM FOOT SPACE.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

BENCHBOARDS HAVE AN ANGLE RETURN AND ARE PANELS AT WHICH OPERATORS STAND (NOT SITDOWN CONSOLES).

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø33.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE COMPONENT HAS A LABEL INTEGRATED INTO THE CONTROL AND IS LOCATED BELOW THE ASSOCIATED METER.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø37.Ø

DESCRIPTION:

THE CHILLER SYSTEMS CONTROL; CHILLER SYSTEMS BYPASS; DOES NOT SPECIFY THAT THIS IS A VLV; PANEL H.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE FUNCTION IS OBVIOUS BY THE LABEL, ITS POSITION ON THE PANEL, TYPE OF CONTROL, AND APPEARANCE. TRAINED OPERATORS ARE AWARE OF THE FUNCTION OF THIS CONTROL.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø38.Ø

DESCRIPTION:

THE CONTROL CLEANUP SELECTOR CONDENSER WATER; 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 IS OBVIOUS BY THE LABEL, ITS POSITION ON THE PANEL, TYPE OF CONTROL, AND APPEARANCE. TRAINED OPERATORS ARE AWARE OF THE FUNCTION OF THIS CONTROL.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: QCS-040.0

DESCRIPTION:

THE CONTROL; RECIRC PUMPS COOL WATER ISOLATION; PANEL H; DOES NOT SPECIFY THIS AS A VALVE CONTROL.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE FUNCTION IS OBVIOUS BY THE LABEL, ITS POSITION ON THE PANEL, TYPE OF CONTROL, AND APPEARANCE. TRAINED OPERATORS ARE AWARE OF THE FUNCTION OF THIS CONTROL.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø54.Ø

DESCRIPTION:

LABEL NOMENCLATURE IS NOT ALWAYS CLEAR; FOR EX.; BV; BYPASS BV. IT REFERS TO BLOCKING VALVE. A CLEAR AND DISTINCTIVE SET OF ABBREVIATIONS SHOULD BE ADHERED TO.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

"BV" IN THIS PLANT STANDS FOR BLOCK VLV. A LIST OF NMP-1 ABBREVIATIONS WILL BE ESTABLISHED IN THE HF DESIGN MANUAL.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø57.Ø

DESCRIPTION:

THE LABELS ARE VISUALLY DISTINCTIVE THROUGHOUT THE CONTROL ROOM WITH ONE NOTED EXCEPTION, THE RED MIMIC LINES OF PANELS A6-A8 CONTAIN LETTERING WHICH IS VERY DIFFICULT TO READ FROM THE NORMAL VIEWING DISTANCE; CHANGING THIS ENGRAVED LETTERING TO A WHITE ON RED TYPE WOULD ALLEVIATE THIS CONDITION.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

LABEL IS REDUNDENT INFORMATION. THE COLOR (RED) INDICATES THE VOLTAGE OF THE LINE AND THESE ARE WELL KNOWN BY ALL OPERATORS. THE COLORS ARE USED TO ENHANCE THE COLOR CODING OF THE MIMIC.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A6		ELECTRICAL SYSTEM
A6-A8		ELECTRICAL SYSTEM
A7		ELECTRICAL SYSTEM
A8		ELECTRICAL SYSTEM

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-070.0

DESCRIPTION:

DRYWELL PRESSURE INDICATORS (SCALES 0-1 AND 0-75) ARE IN PSI WHERE PSIG SHOULD BE USED FOR CLARITY. PHOTO #8.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALL PSI READINGS ARE PSIG AND THIS IS A WELL KNOWN CONVENTION FAMILIAR TO ALL NMP-1 OPERATORS.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø77.Ø

DESCRIPTION:

NO UNITS ARE SPECIFIED FOR STACK GAS RECORDERS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS IS A COMPUTER TREND RECORDER WHICH MAY HAVE ANY PARAMETER ASSIGNED BY THE OPERATOR.

VERIFICATION:

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

Panel ID #	Equipment ID #	Equipment Name
E		STACK GAS RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø78.Ø

DESCRIPTION:

NO UNITS ARE SPECIFIED FOR EJECTOR CONDENSER FLOW RECORDER.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS IS A COMPUTER TREND RECORDER WHICH MAY HAVE ANY PARAMETER ASSIGNED BY THE OPERATOR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		EJECTOR CONDENSER FLOW RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-079.0

DESCRIPTION:

NO UNITS ARE SPECIFIED FOR THE OFF GAS RECORDER.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS IS A COMPUTER TREND RECORDER WHICH MAY HAVE ANY PARAMETER ASSIGNED BY THE OPERATOR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		OFF-GAS RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-080.0

DESCRIPTION:

NO UNITS OR VARIABLES ARE DISCERNABLE ON THE RECORDER BENEATH THE TORUS-ATMOSPHERE DIFFERENTIAL PRESS RECORDER.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS IS A COMPUTER TREND RECORDER WHICH MAY HAVE ANY PARAMETER ASSIGNED BY THE OPERATOR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
[illegible]		RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-164.0

DESCRIPTION:

CALIBRATION STICKERS ARE ABSENT ON MANY INDICATORS THROUGHOUT THE CONTROL ROOM. IF PROCEDURES REQUIRE THE PRESENCE OF CALIBRATION STICKERS, THEN THESE SHOULD BE PRESENT ON ALL INDICATORS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ANY METER WHICH BY TECH SPECS REQUIRES A PERIODIC CALIBRATION HAS A CALIBRATION STICKER. CALIBRATION STICKERS MAY BE ON THE BACK OF METERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		INDICATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-173.Ø

DESCRIPTION:

DISSOLVED OXYGEN RECORDER HAS SCALE OF Ø-2Ø; CHART PAPER IS Ø-1ØØ.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

CHART PAPER IS CORRECT; METER SCALE IS NOT AND IS BEING REPLACED BY HED OCS-75.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		DISSOLVED OXYGEN RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-189.Ø

DESCRIPTION:

CHARTS ARE NOT MARKED PERIODICALLY WITH THE DATE AND INITIALS; ONLY TIME IS ENTERED.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NO REQUIREMENT TO MARK RECORDERS AND THERE IS NO RATIONALE TO REQUIRE INITIALS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
[illegible]		CHARTS
[illegible]		CHARTS
G		CHARTS
H		CHARTS
J		CHARTS
K		CHARTS
L		CHARTS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-199.Ø

DESCRIPTION:

INDICATING LIGHT BULB REPLACEMENT IS IN GENERAL A BIT DIFFERENT.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NO HUMAN FACTORS CRITERIA IN VIOLATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		INDICATING LIGHT BULB

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-212.1

DESCRIPTION:

OBLONG HANDLES HAVE AN ARROW ENGRAVED IN THE TOP TO INDICATE POSITION; BUT IN MOST CASES THE ARROWS HAVE NOT BEEN COLORED IN FOR DISTINCTION.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

ALMOST WITHOUT EXCEPTION, THE OBLONG HANDLES ARE SPRING RETURN TO CENTER AND THEREFORE ARROW WOULD ALWAYS POINT TO CENTER (NO POSITION). ALSO, THERE ARE LIGHT INDICATIONS PROVIDING SWITCH POSITION.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-213.Ø

DESCRIPTION:

THE KEYLOCK SWITCHES ON PANELS USE A COMMON KEY. THERE ARE ABOUT SIX COMMON KEYS LOCATED IN THE OPERATORS DESK. HOWEVER, THESE KEYS ARE NOT IDENTIFIED TO DISTINGUISH THEM FROM OTHER KEYS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE KEYS AND KEYLOCK SWITCHES ARE COLOR CODED. THE KEYS MATCH THE LOCK WHICH THEY OPEN (I.E. SILVER KEY TO SILVER KEYLOCK AND BRASS KEY TO BRASS KEYLOCK.).

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-214.0

DESCRIPTION:

FEEDWATER HEATER EXTRACTION STEAM DRAIN TRAP LEVEL WINDOWS A6-5 AND A6-6 ARE WITHIN THE ELECTRICAL BENCHBOARD. ANNUNCIATORS ARE GENERALLY GROUPED BY SPECIFIC SYSTEM WITHIN AN ANNUNCIATOR BOX. IN SOME CASES, HOWEVER, SEEMINGLY UNRELATED ANNUNCIATORS ARE MIXED WITHIN A BOX.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

EVALUATOR DID NOT UNDERSTAND THE SYSTEM. THESE ANNUNCIATORS ARE ASSOCIATED WITH TURBINE PARAMETERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A6		ANNUNCIATOR WINDOW A6-5
A6		ANNUNCIATOR WINDOW A6-5
A6		ANNUNCIATOR WINDOW A6-6
A6		ANNUNCIATOR WINDOW A6-6

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-215.0

DESCRIPTION:

MOISTURE SEPARATOR HIGH LEVEL TRIP; WINDOW A1-24; IS ON THE ELECTRICAL BENCHBOARD. ANNUNCIATORS ARE GENERALLY GROUPED BY SPECIFIC SYSTEM WITHIN AN ANNUNCIATOR BOX. IN SOME CASES, HOWEVER, SEEMINGLY UNRELATED ANNUNCIATORS ARE MIXED WITHIN A BOX.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

EVALUATOR DID NOT UNDERSTAND THE SYSTEM. THESE ANNUNCIATORS ARE ASSOCIATED WITH TURBINE PARAMETERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATOR

HEO#: OCS-217.0

DESCRIPTION:

MOISTURE SEPARATOR WINDOWS A2-25 AND A2-26 IS ON THE ELECTRICAL BENCHBOARD. ANNUNCIATORS ARE GENERALLY GROUPED BY SPECIFIC SYSTEM WITHIN AN ANNUNCIATOR BOX. IN SOME CASES, HOWEVER, SEEMINGLY UNRELATED ANNUNCIATORS ARE MIXED WITHIN A BOX.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

EVALUATOR DID NOT UNDERSTAND THE SYSTEM. THESE ANNUNCIATORS ARE ASSOCIATED WITH TURBINE PARAMETERS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-218.0

DESCRIPTION:

SEISMIC DETECTION EQUIPMENT EVENT; WINDOW H2-6, IS NOT GROUPED BY A SPECIFIC SYSTEM.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE ARE NO RELATED SYSTEMS ON THE FRONT PANELS FOR THIS ANNUNCIATOR BUT SEISMIC EQUIPMENT ARE LOCATED ON THE BACK PANEL OF PANEL H.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H2		ANNUNCIATOR WINDOW H2-6

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-246.0

DESCRIPTION:

THE COMPUTER SYSTEM UTILIZED IS NOT IMMEDIATELY AVAILABLE AFTER POWER TRANSIENTS. AUTOMATIC REINITIALIZATION OCCURS WITHIN 10 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:

A NEW COMPUTER HAS BEEN INSTALLED SINCE 1981. A NEW REVIEW WILL BE CONDUCTED FOR THE COMPUTER SURVEY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		COMPUTER SYSTEM

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-247.0

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A NEW COMPUTER HAS BEEN INSTALLED SINCE 1981. A NEW REVIEW WILL BE CONDUCTED FOR THE COMPUTER SURVEY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		CRT DISPLAY

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-248.Ø

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: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A NEW COMPUTER HAS BEEN INSTALLED SINCE 1981. A NEW REVIEW WILL BE CONDUCTED FOR THE COMPUTER SURVEY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		CRT DISPLAY

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-249.0

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A NEW COMPUTER HAS BEEN INSTALLED SINCE 1981. A NEW REVIEW WILL BE CONDUCTED FOR THE COMPUTER SURVEY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		COMPUTER

NINE MILE POINT UNIT 1 HEO

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: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A NEW COMPUTER HAS BEEN INSTALLED SINCE 1981. A NEW REVIEW WILL BE CONDUCTED FOR THE COMPUTER SURVEY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		COMPUTER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-251.0

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A NEW COMPUTER HAS BEEN INSTALLED SINCE 1981. A NEW REVIEW WILL BE CONDUCTED FOR THE COMPUTER SURVEY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		COMPUTER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-270.0

DESCRIPTION:

EQUIPMENT AND ADMINISTRATIVE LIMITS FOR OPERATION ARE NOT GIVEN.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

WHERE OPERATIONAL OR EQUIPMENT LIMITS ARE PERTINENT, THEY ARE PROVIDED IN THE PROCEDURE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-275.0

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 ARE AUDIBLY DIFFERENT TONES FOR ALARM SIGNALS. ALL PERSONNEL ARE TRAINED IN THE IDENTIFICATION OF THE SIGNAL. THE ALARMS ARE PRIORITIZED ACCORDING TO SYSTEM AND IMPORTANCE.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS IS NOT A CRDR ISSUE BUT WILL BE BROUGHT TO THE ATTENTION OF OPERATIONS MANAGEMENT. ENVIRONMENTAL TESTS PERFORMED UNDER NORMAL CONDITIONS FOUND THE TEMPERATURE IN THE CONTROL ROOM TO BE ADEQUATE.

VERIFICATION:

NINE MILE POINT UNIT 1 HED

HEO#: QS-ØØ3.Ø

DESCRIPTION:

THERE ARE POOR AIR QUALITY CONTROLS IN THE CONTROL ROOM.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE AIR QUALITY IN THE CR IS ADEQUATE. IT IS BELIEVED THAT THIS COMMENT REFERS TO SMOKERS AND IT WILL BE BROUGHT TO THE ATTENTION OF THE OPERATIONS MANAGEMENT. ENVIRONMENTAL TESTS PERFORMED UNDER NORMAL CONDITIONS FOUND THE AIR CIRCULATION TO BE ADEQUATE.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: QS-011.0

DESCRIPTION:

THIS VLV DOES NOT ALWAYS STAY IN THE POSITION SET MANUALLY BY THE OPERATOR.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS NO APPARENT PROBLEM INDICATED BY REPRESENTATIVE FROM PLANT OPERATIONS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K	6V16-1	CLEANUP SYSTEM LOW FLOW PRESSURE CONTROL VALVES.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø15.Ø

DESCRIPTION:

SOME CHART RECORDERS ARE HARD TO READ.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

NOT SPECIFIC ENOUGH INFO TO EVALUATE THIS HED. READIBILITY OF CHART RECORDERS IS EVALUATED IN OTHER ELEMENTS OF THE REVIEW.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø36.Ø

DESCRIPTION:

THE FUEL POOL FILTER PROCEDURE IS INCOMPLETE AND INACCURATE. VLVS HAVE BEEN ADDED TO THE SYSTEM SINCE THE PROCEDURE WAS WRITTEN. THEREFORE, OPERATORS NOW PERFORM A MODIFIED AND UNDOCUMENTED VERSION OF THIS PROCEDURE.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS EQUIPMENT IS NOT IN THE CR AND THEREFORE NOT A CRDR ISSUE. IT WILL BROUGHT TO THE ATTENTION OF OPERATIONS MANAGEMENT.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-002.0

DESCRIPTION:

THERE IS CURRENTLY NO TECHNICAL SPECIFICATION WHICH DEFINES COMPENSATORY MEASURES FOR THE OPERATOR WHEN THE SPDS IS INOPERABLE.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS IS A CURRENTLY A STANDING ORDER FOR USE WHEN THE COMPUTER IS DOWN.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-003.0

DESCRIPTION:

DISPLAY FORMAT DOES NOT CHANGE AS A FUNCTION OF PLANT MODE, EITHER AUTOMATICALLY OR THROUGH OPERATOR INTERVENTION. MOREOVER, PLANT MODE IS NOT DISPLAYED TO THE OPERATOR.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE COMMON DISPLAY FORMAT PROVIDES ALL OF THE PARAMETER INFO NECESSARY FOR ANY MODE OF OPERATION.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-004.0

DESCRIPTION:

THE ALGORYTHM USED TO DETERMINE TRENDS MAY NOT BE ADEQUATE TO TRACK OSCILLATING PARAMETERS WHEN THE DISPLAY UPDATE PERIOD IS DECREASED FROM 30 SEC TO 2 SEC.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE ALGORYTHM IS BASED ON THE SAMPLE RATE AND NOT REFRESH RATE. SAMPLE RATE CAN BE SELECTED FOR ONE SECOND WITHOUT DISRUPTING TREND PROCESSING.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-ØØ8.Ø

DESCRIPTION:

THE HONEYWELL 44ØØ DOES NOT HAVE OPERATING SYSTEM REGENERATION CAPABILITIES. AS A RESULT, IT IS NOT CONDUSIVE FOR ADDING ADDITIONAL TERMINALS, PROCESSORS, OR MEMORIES. THIS RESTRICTION INHIBITS THE FLEX OF THE SPDS DESIGN.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE SYSTEM IS ADEQUATE TO ACCOMPLISH THE FUNCTION AS DEFINED IN THE FUNCTIONAL SPECIFICATIONS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-ØØ9.Ø

DESCRIPTION:

DATA POINT CODES ARE NOT CROSS-INDEXED. THE CODES USED TO NAME DATA POINTS ARE NOT APPARENTLY GROUPED OR ORDERED IN A MEANINGFUL WAY.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

DATA POINTS ARE CROSS REFERENCED BY SYSTEM AND ALSO PROVIDED IN PSID.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: TA-002.0

DESCRIPTION:

THE EMERGENCY PROCEDURE GUIDELINES REFER TO INJECTING 291.5 POUNDS OF BORON. THERE CURRENTLY IS NO WAY TO DETERMINE THE LIQUID POISON TANK LEVEL WHICH CORRESPONDS TO THIS VLV.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE LIQUID POISON TANK IS SIZED TO PROVIDE THE APPROPRIATE QUANTITY OF BORON BY SIMPLY TURNING ON PUMP. THIS LEVEL DOES NOT HAVE TO BE MONITORED, THE OPERATOR DOES NOT NEED THIS INFORMATION.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-ØØ3.Ø

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:

THE BYPASSES ARE LOCATED IN THE VICINITY OF THEIR RELATED CONTROLS AND DISPLAYS AND DO NOT CAUSE ANY PROBLEMS IN OPERATING RESET ACTIONS. THIS IS THE APPROPRIATE LAYOUT FOR OPTIMUM ASSOCIATION AMONG CONTROLS AND DISPLAYS.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-007.0

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: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

- TEST PANEL IS IN THE CONTROL ROOM. THERE ARE ALWAYS TWO OPERATORS IN THE CR AND THE ONE WHO GOES TO PANEL M IS WITHIN SPEAKING DISTANCE WITH OTHER OPERATORS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-ØØ9.Ø

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 CAN BE INITIATED FROM PANEL E AND CAN BE VERIFIED BY THE PRIMARY MIMIC ON PANEL F LOCATED DIRECTLY IN FRONT OF AN OPERATOR WORKING AT PANEL E.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø13.Ø

DESCRIPTION:

THE ANNUNCIATOR ENTITLED "HIGH DRYWELL PRESS" IS LOCATED ON PANEL K2. THE APPROPRIATE RANGED METER (Ø-4PSI) FOR DRYWELL PRESSURE FOR RESPONSE ACTION TO THIS ANNUNCIATOR IS LOCATED ON PANEL L.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS A METER WITH THIS PARAMETER RANGE ON PANEL K.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		DRYWELL PRESSURE

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø15.1

DESCRIPTION:

THE RESET SWITCH FOR THE FEEDWATER PUMP LOGIC WHICH IS USED IN ORDER TO TAKE MANUAL CONTROL OF FEEDWATER FOR LEVEL CONTROL IS LOCATED ON PANEL E WHILE THE LEVEL CONTROLLING OPERATION IS PERFORMED AT PANEL F.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE CONDITION IDENTIFIED AT THE SIMULATOR IS NOT A VALID OBSERVATION BECAUSE THE MODELING OF THE FEEDWATER SYSTEM IS NOT UP TO DATE TO MODS WHICH HAVE BEEN INSTALLED. THE FEEDWATER RESET SWITCHES ARE NOW NOT REQUIRED IN THE LEVELING OPERATION BUT ARE MORE IMPORTANT IN THE USE WITH OTHER FEEDWATER ACTIONS AT PANEL E.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		FDWTR RESET TO NORMAL SUPPLY
E		FDWTR RESET TO NORMAL SUPPLY
E		FEEDWATER RETURN TO NORMAL AFTER HPCI
E		RETURN TO NORMAL AFTER HPCI

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø15.2

DESCRIPTION:

FOR THE OPERATOR TO HIT THE FEEDWATER PUMP LOGIC RESET SWITCH WHEN CONTROLLING REACTOR LEVEL THE OPERATOR TYPICALLY REACHES OVER THE VERTICAL SECTION OF PANEL E IN LIEU OF WALKING AROUND IN ORDER TO STAY CLOSE TO PANEL F. THIS ACTION INCREASES THE POTENTIAL FOR INADVERTENT ACTUATION OF CONTROLS ON PANEL E.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE CONDITION IDENTIFIED AT THE SIMULATOR IS NOT A VALID OBSERVATION BECAUSE THE MODELING OF THE FEEDWATER SYSTEM IS NOT UP TO DATE TO MODS WHICH HAVE BEEN INSTALLED. THE FEEDWATER RESET SWITCHES ARE NOW NOT REQUIRED IN THE LEVELING OPERATION BUT ARE MORE IMPORTANT IN THE USE WITH OTHER FEEDWATER ACTIONS AT PANEL E.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		FDWTR RESET TO NORMAL SUPPLY
E		FDWTR RESET TO NORMAL SUPPLY
E		FDWTR RETURN TO NORMAL AFTER HPCI
E		FDWTR RETURN TO NORMAL AFTER HPCI

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø17.Ø

DESCRIPTION:

TWO PEOPLE ARE NEEDED TO CONTROL RPV PRESSURE USING THE MAIN TURBINE BYPASS DUE TO THE LAYOUT OF THE CONTROL PANELS. ONE PERSON MUST MONITOR STEAM FLOW AND FEED FLOW ON PANEL F2 WHILE THE SECOND OPENS BYPASS VLVS ON PANEL A2.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS ONLY OCCURS IN SHUTDOWN WHEN OPERATORS ARE AVAILABLE. THERE IS NOW AN AUTOMATIC LOW FLOW FEEDWATER CONTROL SYSTEM WHICH IS NOT YET AVAILABLE IN THE SIMULATOR WHERE THIS OBSERVATION WAS MADE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A		BYPASS OPENING JACK
F		FEEDWATER PUMP 11 FLOW
F		FEEDWATER PUMP 12 FLOW
F		FEEDWATER PUMP 13 FLOW
F		TOTAL FW FLOW
F		TOTAL STEAM FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø18.Ø

DESCRIPTION:

OPERATOR DOES NOT HAVE APPROPRIATE FEEDBACK OF RPV PRESSURE AT K PANEL WHEN OPENING CONDENSATE RETURN VLVS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

CONDENSATE VALVES ARE NOT THROTTLEABLE VALVES. IMMEDIATE FEEDBACK OF RPV PRESSURE IS THEREFORE NOT NEEDED IN THIS SITUATION.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø19.Ø

DESCRIPTION:

OPERATOR DOES NOT HAVE APPROPRIATE FEEDBACK OF RPV PRESSURE AT K PANEL WHEN INCREASING REACTOR WATER CLEANUP FLOW.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS FEEDBACK IS PROVIDED TO THE OPERATORS. THERE IS AN INDICATION OF RPV PRESS ENTITLED CLEANUP SYS INLET PRESS THAT PROVIDES THE REQUIRED INFORMATION TO THE OPERATOR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
Ø		REACTOR PRESSURE
F		REACTOR PRESSURE
K		CLEANUP SYS SELECTOR
K		EMERG CNDSR COND RET ISOLATION VLV 11
K		EMERG CNDSR COND RET ISOLATION VLV 12

NINE MILE POINT UNIT 1 HEO

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:

THIS IS A BACKUP FUNCTION. THERE ARE SEVERAL OTHER OPTIONS WHICH ARE AVAILABLE TO THE OPERATOR TO PERFORM THE INTENDED FUNCTION. THE ALTERNATIVE PROCEDURES WOULD BE PERFORMED AND THE DESIRED FUNCTION WOULD BE ACCOMPLISHED.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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:

THIS IS A BACKUP FUNCTION. THERE ARE SEVERAL OTHER OPTIONS WHICH ARE AVAILABLE TO THE OPERATORS TO PERFORM THE INTENDED FUNCTION. THE ALTERNATIVE PROCEDURES WOULD BE PERFORMED AND THE DESIRED FUNCTION WOULD BE ACCOMPLISHED.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø23.Ø

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 REFERS TO A SPOOL PIECE WHICH IS INSTALLED. THIS CANNOT BE PHYSICALLY AVAILABLE FROM THE CR.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø24.Ø

DESCRIPTION:

OPERATOR MUST HOLD OPEN/CLOSE THE RPV HEAD VENT VALVE FOR ABOUT 2 MIN. WHILE THE VLV TRAVELS OPEN/SHUT.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION;

THESE ARE SEAL IN TYPE. OBSERVATION IS INCORRECT.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
F		REACTOR VESSEL VENT VLV 11
F		REACTOR VESSEL VENT VLV 12

NINE MILE POINT UNIT 1 HEO

HEO#: VER-ØØ1.Ø

DESCRIPTION:

THERE IS SOME CONFUSION ON THE PART OF THE VERIFICATION TEAM AS TO THE SUITABILITY OF THE RPV LEVEL INDICATORS IN THE CONTROL ROOM. FULL RANGE IS NOT PROVIDED BY ALL INDICATORS.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

NOT ALL INDICATIONS PROVIDE FULL RANGE, EACH METER OR RECORDER PROVIDES THE APPROPRIATE INCREMENTS OVER THE DESIRED RANGE. THERE IS ALSO A FULL CORE DIGITAL DISPLAY ACCURATE TO 1" LOCATED AT EYE LEVEL IN TWO LOCATIONS ON PANEL F. THERE ARE VISIBLE FROM MOST WORK STATIONS IN THE CR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		RPV LVL FUEL ZONE
		RPV TRIPPLE LOW ROSEMONTS
		GE/MAC WIDE RANGE RPV LVL
		GE/MAC YARWAY RPV LVL

NINE MILE POINT UNIT 1 HEO

HEO#: VER-003.0

DESCRIPTION:

THE CRT INDICATIONS ARE LISTED IN THE VERIFICATION AS "NOT AVAILABLE".

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE INVENTORY DID NOT INCLUDE INDIVIDUAL ITEMS ON THE CRT. ALL OF THE CRT DATA ITEMS ARE AVAILABLE ON THE CRT.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		COMP RPV LVL
		HIGH STEAM LINE FLOW
		REACTOR PRESSURE
		RECIRC PP DISCHARGE TEMP
		RECIRC PP SUCTION TEMP
		RPV WATER TEMP
		STEAM LINE TEMP
		TAILPIPE TEMPERATURES

NINE MILE POINT UNIT 1 HEO

HEO#: VER-004.0

DESCRIPTION:

ALL ANNUNCIATORS IN THE VERIFICATION ARE LABELED AS "NOT AVAILABLE".

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE INVENTORY DID NOT INCLUDE THE INDIVIDUAL ANNUNCIATORS. ALL OF THE ANNUNCIATORS LISTED ARE AVAILABLE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		ADS RESET
		APRMS DOWNSCALE
		AREA MONITOR HIGH
		BORON ACTUATED
		CLEANUP ISOLATION
		CONDENSATE RETURN LINE OPEN
		CONDENSER VACUUM LO
		CONTINUOUS AIR MONITOR ALARM
		CORE SPRAY ACTUATED
		CORE SPRAY ACTUATED
		CORE SPRAY HIGH POINT VENTS CLOSED
		DRYWELL COOLING FAN TROUBLE
		EMERG VENTILATION IN SERVICE
		FIRE PUMP RUNNING
		FLOOR DRAIN SUMP HIGH LEVEL
		HIGH AREA RAD ALARM TURBINE BLDG
		HIGH AREA TEMP ALARM
		HIGH DRYWELL PRESSURE
		HIGH STM LINE FLOW
		HPCI INITIATION
		MAIN STEAM ISOL VLV CLOSE
		MAIN STEAM LINE CLOSED
		MAIN STEAM LINE HIGH RAD
		MAIN STEAM RAD MONITOR SCRAM
		MAIN STEAM WARM UP CLOSED
		MANUAL RX TRIP CHANNEL
		MN STM LINE HIGH RAD
		MSIV RAD MONITOR ALARM
		R BLDG SUMP LEVEL R15
		R. BLDG SUMP LEVEL R16
		REACTOR CLEANUP CLOSED
		REACTOR SCRAM CHANNEL

RPV PRESSURE SCRAM
RWCU ISOLATION
RX AUTO TRIP
RX LEVEL TRIP
RX LO LO LEVEL
SAFETY RELIEF VLV OPEN
SAFETY RELIEF VLV OPEN
SAFETY RESET VLV OPEN
SHUTDOWN COOLING PPS TRIP
SHUTDOWN COOLING SYSTEM ISOLATED
STACK MONTIOR ALARM
STM LIN BREAK
STM LINE BREAK
TURBINE TRIP

NINE MILE POINT UNIT 1 HEO

HEO#: VER-006.0

DESCRIPTION:

THE ITEMS ASSOCIATED WITH THE CORE MAP ON PANEL F ARE LISTED AS NOT AVAILABLE.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE CORE MAP AND ITS ASSOCIATED INDICATIONS WERE NOT INDIVIDUALLY LISTED ON THE INVENTORY. ALL ITEMS ARE AVAILABLE AND SUITABLE FOR OPERATOR USE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		CORE MAP SELECT LIGHTS
		DIGITAL VLV INDICATORS
		ROD SCRAM INDICATION LIGHTS
		SCRAM VLV LIGHTS

NINE MILE POINT UNIT 1 HEO

HEO#: VER-007.0

DESCRIPTION:

CONTROLLER INDICATORS AND CENTRAL CAPABILITIES ARE LISTED AS UNAVAILABLE IN THE COMPUTER GENERATED VERIFICATION.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

CONTROLLERS WERE LISTED SEPERATELY IN THE INVENTORY DATA FILE AND THEREFORE WERE NOT IN THE INDICATOR OR CONTROL FILE. THE CONTROLLER AVAILABILITY AND SUITABILITY WAS PERFORMED MANUALLY. THE EQUIPMENT LISTED IN THIS HEO WERE BOTH AVAILABLE AND SUITABLE FOR THE TASKS UNDER CONSIDERATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
1F28-1		FDWTR FLOW CONTROL
1F29-1		FDWTR FLOW CONTROL
1F81-1		FDWTR FLOW BYPASS CONTROL
2F42-1		REACTOR RECIRC PUMP SPEED CONTROLLER 11
2F43-1		REACTOR RECIRC PUMP SPEED CONTROLLER 12
2F43-1		REACTOR RECIRC PUMP SPEED CONTROLLER 13
2F44-1		REACTOR RECIRC PUMP SPEED CONTROLLER 13
2F45-1		REACTOR RECIRC PUMP SPEED CONTROLLER 14
2F46-1		REACTOR RECIRC PUMP SPEED CONTROLLER 15
3F9-1		CRD FLOW CONTROLLER
5K12-1		SHUTDOWN COOLING CONTROL 11
5K13-1		SHUTDOWN COOLING CONTROL 12
5K14-1		SHUTDOWN COOLING CONTROL 13
5L12-1		EMERG VENT FLOW CONTROL
5L12-2		EMERG VENT FLOW CONTROL
6K14-1		RWCU REJECT VALVE
6K18-1		REACTOR WATER CLEANUP FLOW
E170-1		MASTER RECIRC FLOW CONTROL
E171-1		FEEDWATER MASTER FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: VER-ØØ9.Ø

DESCRIPTION:

THE ADS RESET TIMER AND DISPLAY IS LISTED AS NOT AVAILABLE IN THE VERIFICATION.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS COMPONENT WAS INADVERTENTLY LEFT OFF OF THE INVENTORY. IT IS AVAILABLE AND SUITABLE FOR THE TASK.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
[illegible]		ADS RESET TIMER

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø12.Ø

DESCRIPTION:

THE CONTINUITY LIGHT FOR THE LIQUID EXPLOSIVE VLV 11 WAS LISTED AS UNAVAILABLE ON THE VERIFICATION.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS LIGHT IS AVAILABLE AND SUITABLE FOR OPERATOR USE. IT WAS INADVERTENTLY OMITTED FROM THE INVENTORY.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø16.Ø

DESCRIPTION:

THE ITEMS ASSOCIATED WITH THE PRIMARY ISOLATION MIMIC ARE LISTED AS "UNAVAILABLE" ON THE VERIFICATION.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE PRIMARY ISOLATION MIMIC WAS NOT INDIVIDUALLY LISTED ON THE INVENTORY. ALL ITEMS LISTED ARE AVAILABLE, AND SUITABLE FOR OPERATOR TASKS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø22.Ø

DESCRIPTION:

RANGES OF THE IRMS AND APRMS ARE LISTED AS Ø-125 OR Ø-4Ø IN THE TASK REQUIREMENTS. WHEREAS THE METERS ARE SCALED AT Ø-4Ø IN THE INVENTORY.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE ARE TWO RANGES FOR ALL IRMS AND APRMS; Ø-4Ø AND Ø-125. THESE ARE SUFFICIENT TO MONITOR REACTOR POWER.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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:

THERE IS A STATUS LIGHT FOR CLOSED POSITION WHICH SATISFIES THESE TASK REQUIREMENTS OF VERIFY SRV CLOSED. THESE VLVS CLOSE AUTOMATICALLY AT 5Ø PSI AND WILL ALSO CLOSE IF OPERATOR WENT TO AUTO POSITION AND PRESSURES WERE WITHIN OPERATING RANGES. LABELING THE SWITCH POSITION CLOSED WOULD BE INAPPROPRIATE BECAUSE AUTO PROVIDES AN AUTOMATIC FUNCTION AS WELL AS A CLOSE FUNCTION.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø27.Ø

DESCRIPTION:

THE FUSES FOR THE ELECTROMATIC RELIEF VLVS ARE LISTED AS NOT AVAILABLE.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE FUSES FOR THESE VLVS ARE LOCATED AT THE LOCAL CONTROL PANEL AND ARE AN ALTERNATIVE MEANS AVAILABLE TO ATTEMPT TO SCRAM THE REACTOR IN THE EVENT OF A FAILURE TO SCRAM. THIS IS THE DESIRED LOCATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		FUSES FOR ELECTOMATIC RELIEF VLV

NINE MILE POINT UNIT 1 HEO

HEO#: VER-029.0

DESCRIPTION:

THE TASK ANALYSIS LISTS A FEEDWATER PMP BYPASS SW FOR USE IN ESTABLISHING A FLOW PATH THROUGH THE SRV TO THE SUPPRESSION POOL. THIS VLV IS NOT AVAILABLE.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS EQUIPMENT IS PROPERLY REFERRED TO AS FEEDWATER PMP HIGH LEVEL TRIP. THESE KEEP THE FEEDWATER PMPS FROM TRIPPING AT HIGH WATER LEVEL WHILE ESTABLISHING A LEVEL TO THE ISOLATION VLVS IN ORDER TO LINEUP THE DESIRED FLOW PATH. THE BYPASS SWITCHES WERE INADVERTENTLY LISTED IN THE INVENTORY AS 'INDICATORS. THEY ARE AVAILABLE SWITCHES FOR OPERATOR TASKS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		FEEDWATER PUMP BYPASS

NINE MILE POINT UNIT 1 HEO

HEO#: VER-031.0

DESCRIPTION:

UNITS, RANGES, AND DIVISIONS FOR CONTROL ROD DRIVE INJECTION WATER FLOW WERE LISTED AS UNSUITABLE IN THE VERIFICATION (REQUESTED 0-80 X 10**2 LB/HR) METER PROVIDED 0-5 GPM.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THERE IS A CONTROLLER WITH METER INDICATIONS OF TOTAL CRD SYS FLOW RANGING FROM 0-100 X 10**3 LB/HR WHICH IS SUITABLE FOR THIS TASK. THE DIVISIONS FOR THE METER IS SUFFICIENT FOR THE PRECISION NEEDED IN THESE TASKS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		CONTROL ROD INJECTION WTR FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: VER-032.0

DESCRIPTION:

RANGE FOR THE RAW WATER FLOW WERE FOUND TO BE UNSUITABLE IN THE VERIFICATION. (REQUESTED 0-250 X 10**4 LB/HR, METER PROVIDES 0-200 X 10**4).

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE METER IS A FEEDBACK FOR INITIALIZING SUPPRESSION POOL COOLING. THE RANGE ON THE METER IS SUFFICIENT FOR THIS OPERATION. THE RANGE IN THE TASK ANALYSIS WAS INAPPROPRIATELY GIVEN.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		RAW WATER FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: VER-033.0

DESCRIPTION:

RANGES FOR THE CONTAINMENT SPRAY FLOW WERE FOUND TO BE UNSUITABLE IN THE VERIFICATION. (REQUESTED 0-250 X 10**4 LB/HR, METER PROVIDES 0-200 X 10**4).

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THIS INDICATION IS FEEDBACK FOR INITIALIZING CONTAINMENT SPRAY WHICH MAINTAINS A SET FLOW. THE METER RANGE IS SUFFICIENT. THE RANGE IN THE TASK ANALYSIS WAS INAPPROPRIATELY GIVEN.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		CONTAINMENT SPRAY FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: VER-035.0

DESCRIPTION:

DIVISIONS FOR THE DRYWELL PRESSURE WERE FOUND TO BE UNSUITABLE IN THE VERIFICATION (10 PSI INCREMENTS IN LIEU OF 5).

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

FOR WIDE RANGE DRYWELL PRESSURE, 10 PSI INCREMENTS ARE SUFFICIENT. IF THE OPERATOR DESIRES FINER READINGS THEY ARE AVAILABLE IN OPERATING RANGES AND FROM THE COMPUTER.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		DRYWELL PRESSURE

NINE MILE POINT UNIT 1 HEO

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 LOWER RANGES OF THE SRMS ARE SUFFICIENT FOR READING LOW POWER. POWER LEVELS BETWEEN Ø.Ø AND Ø.1 X 1Ø**-6% ARE NOT RELIABLY DETECTABLE AND DO NOT HAVE ANY SIGNIFICANCE TO PLANT OPERATION AND SAFETY. THERE ARE READINGS FOR BOTH % AND CPS AVAILABLE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		SRMS

NINE MILE POINT UNIT 1 HEO

HEO#: VER-037.0

DESCRIPTION:

LEGEND LIGHTS OFF OF THE ROD BLOCK MONITOR ARE LISTED AS UNAVAILABLE ON THE VERIFICATION.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THESE ITEMS WERE INCORRECTLY IDENTIFIED AS A CONTROL PUSHBUTTON AND LISTED IN THE CONTROL FILE. THESE ARE AVAILABLE AND SUITABLE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		ROD BLOCK MONITOR

NINE MILE POINT UNIT 1 HEO

HEO#: VER-038.0

DESCRIPTION:

THERE IS NO SHUTDOWN COOLING FLOW FEEDBACK AVAILABLE WHEN INITIATING SHUTDOWN COOLING FLOW.

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE AMOUNT OF COOLING FLOW IS NOT THE NEEDED FEEDBACK, TEMPERATURE INDICATION IS THE CRITICAL INDICATION TO MONITOR. VALVE INDICATIONS ARE AVAILABLE FOR FEEDBACK OF COOLING FLOW INITIALIZATION AND THERE ARE LOCAL FLOW INDICATIONS OF COOLING FLOW.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		SHUTDOWN COOLING FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: VER-041.0

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: INVALID

DISPOSITION: INVALID

RISK CATEGORY: NOT NEEDED

EXPLANATION:

THE CONTROL ROD DRIVE WATER PRESSURE VALVE IS USED FOR GROSS INDICATIONS OF FLOW WITHIN THE SYSTEM. THE PRESENT DIVISIONS ARE SUITABLE FOR TASKS ASSOCIATED WITH THIS METER.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		DRIVE WTR PRESS

NINE MILE POINT UNIT 1 HEO

HEO#: CS-ØØ3.Ø

DESCRIPTION:

NAMEPLATES OR POINT IDENTIFICATION INFO ARE PRESENTED ON THE LOWER RECORDER WINDOW BLOCKING SOME OF THE TRENDED INFO.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE NAMEPLATES BLOCK ONLY A PART OF THE TREND INFORMATION, THE MOST RECENT DATA IS VISIBLE. REAL TREND INFORMATION CAN ONLY BE OBTAINED BY REMOVING THE CHART PAPER AND EXAMINING THE DATA THAT HAS OCCURED OVER TIME, TWO INCHES OF THE RECORDER WINDOW DOES NOT AFFECT THIS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A		ALL RECORDERS
B		GENERATOR INLET/OUTLET CONDUCTIVITY RECORDER
B		TURBINE TEMPERATURES RECORDER
E		DRYWELL -TORUS PSID RECORDER
E		EJECTOR COND FLOW RECORDER
E		OFF-GAS CHILLER DISCH TEMP RECORDER
E		OFF-GAS TEMP RECORDER
E		TORUS-ATMOS PSID RECORDER
F		ALL RECORDERS
G		2ØØ' TWR- 2ØØ' LEV-WS
G		2ØØ' TWR-2ØØ' LEV-WD
G		9Ø' TWR WD RECORDER
G		9Ø' TWR WS RECORDER
G		ABS TEMP-3Ø' LEV
G		SELECTABLE WD
G		SELECTABLE WS
G		d TEMP 3Ø' TO 1ØØ'
G		d TEMP 3Ø' TO 2ØØ'
H		ALL RECORDERS
J		CONDSR CIR WTR PUMP PR
J		CONSR IN/DISCH TNL ^T
J		DRYWELL RAD
J		INLET/DISCH TNL ^T
K		ALL RECORDERS
L		ALL RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: CS-015.0

DESCRIPTION:

DIFFICULT TO DETERMINE TREND RECORDER DATA FOR dTEMP 30'TO 100' FROM dTEMP 30' TO 200'. DATA RAN TOGETHER AND NOT COLOR CODED.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1A

EXPLANATION:

THE INFO IS NOT CRITICAL FOR OPERATION. THERE IS NO CONNECTION WITH PLANT SYSTEMS. THE READING REQUIRES CLOSE EXAMINATION BUT IS READABLE. THERE IS LITTLE PROBABILITY OF ERROR AND THE CONSEQUENCE OF THE ERROR IS NOT A SAFETY CONCERN.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		dTEMP 30' TO 100' RECORDER
		dTEMP 30' TO 200' RECORDER
G		ABS TEMP 30' LEV

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø34.Ø

DESCRIPTION:

THE POINTER OBSCURES THE NUMERALS ON THE GE CIRCULAR METERS AT THE RSP.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

ONE NUMERAL, AT MOST, IS BLOCKED BY THE POINTER ON THESE CIRCULAR METERS. IT IS EASY TO TELL FROM THE PREVIOUS NUMBER AND THE NEXT NUMBER ON THE SCALE, THE VALUE THAT THE POINTER IS RESTING UPON. THESE METERS ARE ADEQUATE FOR THE NATURE OF THE DATA THAT THEY PRESENT.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
RSP		POWERBOARD #1Ø3 1 & 2 PHASE VOLTAGE
RSP		POWERBOARD #1Ø3 2 & 3 PHASE VOLTAGE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-060.0

DESCRIPTION:

LABELS APPEAR ABOVE THE INDICATING LIGHTS FOR SEAL OIL PMP ON PANEL A1; CONVENTION IS TO POSITION BELOW LIGHTS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THESE LABELS, ABOVE THE INDICATING LIGHTS CLEARLY ARE ASSOCI ATED WITH THE SEAL OIL PUMP. THE OPERATORS REPORT NO CONCERN WITH THIS EXCEPTION TO THE CONVENTION. THERE ARE NO OTHER INDICATORS NEARBY THAT COULD CAUSE CONFUSION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A1		SEAL OIL PUMP NAMEPLATE N107

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø61.Ø

DESCRIPTION:

THE LABEL FOR EXCITER RHEOSTAT POSITION FOR AUTO VOLTAGE REGULATION APPEARS OVER INDICATING LIGHTS ON PANEL A7 AND E.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THE LIGHTS ARE PROPERLY LABELED AND ALTHOUGH NOT TO CONVENTION, THERE IS LITTLE CONFUSION AS TO THE MEANING OF THE LIGHTS. THE COMPONENT LOCATED ABOVE THE LIGHTS IS PROPERLY LABELED AND CANNOT BE CONFUSED WITH THE LIGHTS AND THEIR LABEL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A7 & E		EXCITER RHEOSTAT POSITION FOR AUTO VOLTAGE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø62.Ø

DESCRIPTION:

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:

THE CONVENTION AT NMP-1 IS FOR LABELS TO BE POSITIONED ABOVE THE COMPONENTS THAT THEY DESCRIBE. WHERE COMPONENTS ON VERTICAL PANELS ARE ABOVE EYE LEVEL THE LABELS ARE PLACED BELOW COMPONENTS TO ENHANCE READIBILITY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A		METERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø63.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

THE CONTROLLERS ARE IN ACCORDANCE WITH THE LABELING CONVENTION FOR PANEL E ABOVE CONTROLS. THE LABEL FOOR THE FEEDWATER MASTER DIRECTLY ABOVE IS ALSO ON TOP OF THE CONTROLLER.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø71.Ø

DESCRIPTION:

TORUS AREA LEAKAGE IS SCALED IN ELEVATION; PANEL K. 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 EXISTING UNITS REFLECT ELEVATION OF WATER LEVEL. ALTHOUGH THIS DOES REQUIRE OPERATOR CONVERSION, THIS IS NOT A TIME CRITICAL SITUATION, AND THEY ARE VERY FAMILIAR WITH THESE TERMS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K	3K4Ø	TORUS AREA LEAKAGE

HEO#: OCS-072.0

DESCRIPTION:

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 SYSTEM WAS DESIGNED AND BUILT TO RELATE TO LBM/HR. LBM/HR IS USED CONSISTENTLY THROUGHOUT THE CONTROL ROOM FOR THESE FLOWS. THE CONSISTENCY OF USE MAKES THESE UNITS APPROPRIATE FOR THEIR APPLICATION. OPERATORS DO NOT CONSIDER THIS DIFFICULT TO USE.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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 FEEDBACK METERS ON THESE CONTROLLERS ARE USED FOR REFERENCE PURPOSES ONLY AND NOT FOR INDICATION READINGS. THESE ARE DEMAND SIGNALS AND THERE ARE ASSOCIATED METERS WHICH PROVIDE ACTUAL PARAMETERS INDICATION. THERE ARE NO APPROPRIATE UNITS TO LABEL THESE METERS WITH.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

EO#: OCS-Ø81.Ø

DESCRIPTION:

THE MEGAWATT AND MEGAVAR METERS FOR NMP-VOLNEY 9 HAVE SCALE MULTIPLIERS OF X1.67; RATHER THAN BEING CALIBRATED TO ACCOUNT FOR THIS FACTOR.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE LOAD DISPATCHERS ARE THE ONLY PERSONNEL TO USE THESE METERS. THEY ARE AWARE OF THE REQUIRED CONVERSION AND REPORT NO CONCERNS WITH IT. THESE METERS ARE NOT USED BY THE PLANT OPERATOR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A8		MEGAWATT AND MEGAVAR METERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-084.0

DESCRIPTION:

THE WESTRONICS RECORDER ON PANEL H HAS POINTERS WHICH OBSCURE BOTH NUMERALS AND PROCESS UNITS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THE OPERATORS HAVE TIME TO DETERMINE CORRECT READINGS ON THIS RECORDER BY INTERPOLATING BETWEEN THE SCALE VALUES. AS A BACKUP, THIS INFORMATION IS AVAILABLE ON OTHER RECORDERS AND THE COMPUTER. THESE REDUNDANT INDICATIONS PROVIDE SUFFICIENT INFORMATION TO THE OPERATORS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H	3H29	WESTRONIC RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø86.Ø

DESCRIPTION:

POINTERS ON THE TURBINE BYPASS VLV 12H-12I; TEND TO BLOCK NUMERALS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

THE OPERATORS ARE ABLE TO INTERPOLATE BETWEEN SCALE VALUES TO DETERMINE THE ACTUAL SCALE READING. IN ADDING, THIS INDICATOR IS REDUNDENT TO THE BYPASS LIGHT AND NOT USED FOR FINE READING. ITS PURPOSE IS THE READINGS OF GROSS INDICATION OF THE NUMBER OF BYPASS VLVS OPEN.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A2	215	POINTERS ON TURBINE BYPASS VLV

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø94.Ø

DESCRIPTION:

THE ALIGNMENT BETWEEN POINTER AND SCALE ON MULTIPLE RANGE METERS DOES NOT FACILITATE READING WITHOUT VISUAL EXTRAPOLATION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

THESE METERS ARE NOT USED FOR FINE READING BUT INSTEAD FOR GROSS READING PURPOSES. THE OPERATORS ARE ABLE TO PERFORM THESE READINGS WITH AN EASY EXTRAPOLATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A6		MULTIPLE RANGE METERS

NINE MILE POINT UNIT 1 HEO

EO#: OCS-Ø96.Ø

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:

THIS SCALE IS USED FOR GROSS (RELATIVE) SCALE READINGS AND NOT FOR FINE READING. THE NOTED GREASE PENCIL MARKS DO NOT SERVE AS SCALE DIVISIONS, THEY ARE PUT ON THE METER TO PROVIDE INFORMAL TREND INFORMTION.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-109.0

DESCRIPTION:

WESTRONIC RECORDER INDICATOR POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THE OPERATORS HAVE TIME TO DETERMINE CORRECT READINGS ON THIS RECORDER BY INTERPOLATING BETWEEN THE SCALE VALUES. AS A BACKUP, THIS INFORMATION IS AVAILABLE ON OTHER RECORDERS AND THE COMPUTER. THESE REDUNDANT INDICATIONS PROVIDE SUFFICIENT INFORMATION TO THE OPERATORS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		WESTRONIC RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-117.0

DESCRIPTION:

THE UNIDENTIFIED RECORDER (LEFT OF OFF-GAS) POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THIS RECORDER IS A TREND RECORDER WHICH THE OPERATOR CAN ASSIGN ANY VARIABLE. THE SCALE IS NOT USED TO OBTAIN A VALUE READING BUT INSTEAD A TRENDING OF THE PARAMETER OVER TIME. THE VARIABLE CHARACTER OF THIS RECORDER ALSO MAKES SCALE SUITABILITY VARIABLE WITH THEF DIFFERENT PARAMETERS SELECTED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		UNIDENTIFIED RECORDER [LEFT OF OFF-GAS]

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-119.0

DESCRIPTION:

THE MEGAWATT CIRCULAR METER POSSESSES GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE CIRCULAR METERS HAVE NUMBERED INTERVALS WITH 15 DIVISIONS BETWEEN NUMBERS. ANY ADDITIONAL NUMBERS TO THE SCALE WOULD CROWD THE SCALE AND MAKE READING DIFFICULT. THE OPERATORS REPORT NO DIFFICULTY IN READINGS OR INTERPRETING THE SCALE. IN ADDITION, THESE INDICATORS ARE NOT CRITICAL INFO AND TEND TO STAY STEADY OVER TIME.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		MEGAWATT CIRCULAR METER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-121.Ø

DESCRIPTION:

THE TWO CIRCULAR METERS ON PANEL A3 POSSESS GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THE SCALES ON THESE INDICATORS ARE APPROPRIATE FOR THE PURPOSE USED. EXACT VALUE READINGS ARE SELDOM NEEDED, THE CURRENT DESIGN CLEARLY PRESENTS AN INDICATION OF THE REQUIRED INFORMATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A3		TWO CIRCULAR METERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-122.0

DESCRIPTION:

THE INCOMING AND RUNNING A-C VOLTS; GENERATOR 102 KILOVARS; PB 16A; PB 16B; POSSESS GREATER THAN NINE INTERMEDIATE GRADUATION BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE CIRCULAR METERS HAVE NUMBERED INTERVALS WITH 15 DIVISIONS BETWEEN NUMBERS. ANY ADDITIONAL NUMBERS TO THE SCALE WOULD CROWD THE SCALE AND MAKE READING DIFFICULT. THE OPERATORS REPORT NO DIFFICULTY IN READINGS OR INTERPRETING THE SCALE. IN ADDITION, THESE INDICATORS ARE NOT CRITICAL INFO AND TEND TO STAY STEADY OVER TIME.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A4		GENERATOR 102 KILOVARS
A4		INCOMING AND RUNNING A-C VOLTS
A4		P B 16A
A4		P B 16B

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-123.0

DESCRIPTION:

THE INCOMING AND RUNNING A-C VOLTS; GENERATOR 103; KILOVARS; PB 17A; PB 17B; POSSESS GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE CIRCULAR METERS HAVE NUMBERED INTERVALS WITH 15 DIVISIONS BETWEEN NUMBERS. ANY ADDITIONAL NUMBERS TO THE SCALE WOULD CROWD THE SCALE AND MAKE READING DIFFICULT. THE OPERATORS REPORT NO DIFFICULTY IN READINGS OR INTERPRETING THE SCALE. IN ADDITION, THESE INDICATORS ARE NOT CRITICAL INFO AND TEND TO STAY STEADY OVER TIME.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A5		GENERATOR 103 KILOVARS
A5		INCOMING AND RUNNING A-C VOLTS
A5		P B 17A
A5		P B 17B

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-124.0

DESCRIPTION:

THE 115 KV BUS A-C KILOVOLTS; OSW-NMP1 AND NMP-FITZ4 A-C KILOVOLTS; NMP-VOLNEY 9 A-C MEGAWATTS; POSSESS GREATER THAN NINE INTERMEDIATE GRADUATIONS NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE CIRCULAR METERS HAVE NUMBERED INTERVALS WITH 15 DIVISIONS BETWEEN NUMBERS. ANY ADDITIONAL NUMBERS TO THE SCALE WOULD CROWD THE SCALE AND MAKE READING DIFFICULT. THE OPERATORS REPORT NO DIFFICULTY IN READINGS OR INTERPRETING THE SCALE. IN ADDITION, THESE INDICATORS ARE NOT CRITICAL INFO AND TEND TO STAY STEADY OVER TIME.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A8		115 KV BUS A-C KILOVOLTS
A8		NMP-FITZ 4 A-C KILOVOLTS
A8		NMP-VOLNEY 9 A-C MEGAWATTS
A8		OSW-NMP1 KILOVOLTS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-125.Ø

DESCRIPTION:

LPRM-APRM AUX PERCENT POWER SCALES POSSESS GREATER THAN NINE INTERMEDIATE GRADUATIONS BETWEEN NUMBERED SCALE DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THESE BACK PANEL SCALES DO NOT PROVIDE TIME CRITICAL INFORMATION TO THE OPERATORS. THE SCALES CAN EASILY BE READ AND INTERPRETED WHEN NEEDED. THESE SCALES ARE PART OF A VENDOR PANEL WHICH WOULD MAKE REPLACEMENT DIFFICULT, ESPECIALLY CONSIDERING THE MINIMAL BENEFIT.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-168.Ø

DESCRIPTION:

TORUS AND DRYWELL PRESSURE RECORDER HAS SCALES Ø-1.Ø AND Ø-2; CHART PAPER IS Ø-1ØØ.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

THESE RECORDERS ARE THE COMPUTER POINT TREND RECORDERS AND THE PAPER ON THE SCALES ARE DESIGNED TO READ FROM Ø-1ØØ% OF THE TOTAL VALUE. THE RECORDER SCALES PROVIDE AN IMMEDIATE VALUE READING, THE CHART PAPER PROVIDES A PERCENTAGE RECORD OVER TIME.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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:

THESE RECORDERS ARE THE COMPUTER POINT TREND RECORDERS AND THE PAPER ON THE SCALES ARE DESIGNED TO READ FROM 0-100% OF THE TOTAL VALUE. THE RECORDER SCALES PROVIDE AN IMMEDIATE VALUE READING, THE CHART PAPER PROVIDES A PERCENTAGE RECORD OVER TIME.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-170.0

DESCRIPTION:

OFF-GAS CHILLER DISCHARGE TEMP RECORDER HAS SCALE -50-150; CHART PAPER IS 0-100.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

THESE RECORDERS ARE THE COMPUTER POINT TREND RECORDERS AND THE PAPER ON THE SCALES ARE DESIGNED TO READ FROM 0-100% OF THE TOTAL VALUE. THE RECORDER SCALES PROVIDE AN IMMEDIATE VALUE READING, THE CHART PAPER PROVIDES A PERCENTAGE RECORD OVER TIME.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		OFF-GAS CHILLER DISCHARGE TEMP RECORDER

NINE MILE POINT UNIT 1 HEO

EO#: OCS-174.Ø

DESCRIPTION:

INTAKE TUNNEL DIFFERENTIAL PRESSURE RECORDER HAS SCALES Ø-30 AND Ø-1ØØ; CHART PAPER IS Ø-1ØØ.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE VALUES FROM THIS RECORDER ARE OF NO INTEREST OR USE FOR THE OPERATOR; THE USE OF THIS INFO IS FOR RELATIVE TREND OF VALUES TO ENSURE IF WATER LEVEL IS DROPPING THEN VACUUM IS DROPPING. THE Ø-30 SCALE IS FOR CONDENSER VACUUM AND THE Ø-1ØØ SCALE IS TUNNEL DIFFERENTIAL RECORDER. THE CHART PAPER PROVIDES A RECORD OF PERCENTAGE OVER TIME.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-176.Ø

DESCRIPTION:

DRYWELL EQUIP DRAIN TANK RECORDER HAS SCALES OF 2ØØ TO 8ØØ; CHART PAPER IS Ø-1ØØ.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THE TREND DATA IS USED TO DETERMINE SLOPE ANGLE AND THERE ARE PLASTIC OVERLAYS WHICH ARE USED TO COMPARE THE SLOPE TO STANDARDS. THEREFORE, TREND DATA HAS NO RELATION TO SCALE VALUE. CHART PAPER IS USED TO PROVIDE A PERCENTAGE RECORD OVER TIME.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
L		DRYWELL EQUIPMENT DRAIN TANK RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-177.0

DESCRIPTION:

DRYWELL FLOOR DRAIN RECORDER HAS SCALES OF 200 TO 800; CHART PAPER IS 0-100.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

THE TREND DATA IS USED TO DETERMINE SLOPE ANGLE AND THERE ARE PLASTIC OVERLAYS WHICH ARE USED TO COMPARE THE SLOPE TO STANDARDS. THEREFORE, TREND DATA HAS NO RELATION TO SCALE VALUE. CHART PAPER IS USED TO PROVIDE A PERCENTAGE RECORD OVER TIME.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
L		DRYWELL FLOOR DRAIN RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-183.0

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THE INFO IS AVAILABLE ON OTHER RECORDERS AND COMPUTER POINTS. THE INFO IS NOT CRITICAL AND OPERATOR HAS TIME TO DETERMINE CORRECT READING. THE MARKINGS ARE ADEQUATE FOR THIS SELDOMLY USED REDUNDANT INSTRUMENT.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		WESTRONIC RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-192.0

DESCRIPTION:

SINGLE INDICATING LIGHTS ARE UTILIZED IN THE REACTOR RECIRC MOTOR GENERATOR SCOOP TUBE AIR FAILURE LOCK. IN THESE SITUATIONS; A FAILED BULB CANNOT BE DISTINGUISHED FROM A NORMAL CONDITION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THESE BULBS ARE REGULARELY CHECKED DURING SURVEILLANCE TESTS. ALSO, THERE ARE ALARMS WHICH PROVIDE THE OPERATOR WITH THIS SAME INFORMATION WHEN A LOCK UP CONDITION EXISTS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
F	2F47-51	REACTOR RECIRC MOTOR GEN SCOOP TUBE AIR FAILURE LOCK

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-193.0

DESCRIPTION:

SINGLE INDICATING LIGHTS ARE UTILIZED IN THE ATWS CHANNEL LIGHTS LOCATIONS. IN THESE SITUATIONS; A FAILED BULB CANNOT BE DISTINGUISHED FROM A NORMAL CONDITION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 4E

EXPLANATION:

THESE BULBS ARE REGULARLY CHECKED DURING SURVEILLANCE TESTS CONDUCTED IN REGULAR INTERVALS. THERE IS A REDUNDANT ANNUNCIATOR WHICH ALARMS UNDER THESE CONDITIONS WHICH IS USED AS A BACKUP TO THESE LIGHTS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
F		ATWS CHANNEL LIGHTS

NINE MILE POINT UNIT 1 HEO

EO#: OCS-196.0

DESCRIPTION:

SINGLE INDICATING LIGHTS ARE UTILIZED IN THE CONTAINMENT MONITOR SYSTEM CALIBRATION MODE LIGHTS. IN THESE SITUATIONS; A FAILED BULB CANNOT BE DISTINGUISHED FROM A NORMAL CONDITION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

THESE BULBS ARE REGULARLY CHECKED DURING SURVEILLANCE TESTS CONDUCTED IN REGULAR INTERVALS. THERE IS A REDUNDANT ANNUNCIATOR WHICH ALARMS UNDER THESE CONDITIONS WHICH IS USED AS A BACKUP TO THESE LIGHTS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
L		CONTAINMENT MONITOR SYSTEM CALIBRATION MODE LIGHTS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-197.0

DESCRIPTION:

SINGLE INDICATING LIGHTS ARE UTILIZED IN THE REHEATER SYSTEM MIMIC LIGHTS. IN THESE SITUATIONS, A FAILED BULB CANNOT BE DISTINGUISHED FROM A NORMAL CONDITION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THESE INDICATORS HAVE FOUR BULBS WHICH DIM TO INDICATE TO OPERATOR THAT BULBS NEED TO BE REPLACED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
N		REHEATER SYS MIMIC LIGHTS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-198.0

DESCRIPTION:

WITH THE EXCEPTION OF THE DISPLAY TEST FEATURE ON THE CONTAINMENT ISOLATION MIMIC; THERE IS NO INDICATING LIGHT TEST CAPABILITY FOR THE DIAGNOSIS OF FAILED INDICATING LIGHTS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-INDIVIDUAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THERE ARE BACKUP ALARMS WHICH DUPLICATE THE TROUBLE STATUS. THERE ARE SURVEILLANCE TESTS WHICH CHECK BULBS. THERE ARE ALSO SOME TEST FEATURES. THESE COMBINE TO PROVIDE THE OPERATORS WITH DATA TO ASCERTAIN THE PRESENCE OF ANY FAILED INDICATING LIGHTS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		INDICATING LIGHTS

NINE MILE POINT UNIT 1 HEO

O#: 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:

CENTER CLOSED POSITION IS COMMON TO BOTH SYSTEM. STATUS LIGHTS CLEARLY INDICATE WHEN VLV IS IN CLOSED POSITION.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

EO#: 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:

CENTER CLOSED POSITION IS COMMON TO BOTH SYSTEM. STATUS LIGHTS CLEARLY INDICATE WHEN VLV IS IN CLOSED POSITION.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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:

THE SWITCH IS A SPRING RETURN SELECTOR SWITCH, CENTER CLOSED POSITION IS COMMON TO BOTH SYSTEM. IN ADDITION, STATUS LIGHTS CLEARLY INDICATE WHEN THE VALVE IS IN THE CLOSE POSITION.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-2Ø8.Ø

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:

SWITCH IS A SPRING RETURN SELECTOR SWITCH, CENTER CLOSED POSITION IS COMMON TO BOTH SYSTEM. IN ADDITION, STATUS LIGHTS CLEARLY INDICATE WHEN THE VALVE IS IN THE CLOSE POSITION.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THIS IS A SPRING RETURN MECHANISM AND WHITE ARROW WOULD ONLY SHOW MID OR NO POSITION. ADJACENT STATUS LIGHTS ARE USED TO INDICATE SWITCH POSITION.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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 ALARM INFORMATION IS ON SINGLE TILE ANNUNCIATORS. THESE ALARMS ARE MULTIPLE INPUT ALARMS OR TROUBLE ANNUNCIATORS WHICH ARE SUPPORTED BY BACKUP INDICATIONS OR LOCAL PANEL INFORMATION. IN ADDITION, THE COMPUTER TYPER PROVIDES SPECIFIC INFORMATION FOR MANY OF THESE ALARMS. ALL ANNUNCIATORS AND RESPONSE PROCEDURES INCLUDING SUPPORT INDICATIONS AND INFORMATION ARE PART OF THE OPERATOR TRAINING CURRICULUM.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A	A1-26	ALARM TO SYS DIFFICULTY
A	A2-21	ALARM TO SYS DIFFICULTY
F	F1-22	NON AMBIGUOUS
H	H1-16	NON AMBIGUOUS
H	H1-24	NON AMBIGUOUS CHART RECORDER BACK-UP
H	H1-29	NON AMBIGUOUS
H	H1-3	MULTIPLE ALARMS
H	H1-32	READINGS ON COMPUTER AND BACK PANELS
H	H2-20	MULTIPLE ALARMS-COMPUTER PRINTOUT
H	H2-31	CONSTANT TRENDING RATE OF RISE SUMPS PRIMARY LEAK
H	H2-35	ALERTS TO PROBLEM PARTICULAR SECTION
K	K3-27	NON AMBIGUOUS
K	K3-29	RX WATER CONDUCTIVITY HIGH
K	K3-32	NON AMBIGUOUS
L	L1-10	TRIP OR VIBRATION COMPUTER PRINTOUTS
L	L1-12	TRIP OR VIBRATION COMPUTER PRINTOUTS
L	L1-16	COMMON ALARMS FOR MULTIPLE SIGNALS COMPUTER PRINTOUTS PROVIDE DESIGNATION
L	L1-18	MULTIPLE ALARMS
	L1-24	COMMON ALARMS FOR MULTIPLE SIGNALS COMPUTER PRINTOUTS PROVIDE DESIGNATION
L	L1-26/25	NEW EUSCHUSHION IN THIS LOCATION
L	L1-29	COMPUTER AND LOCAL PANEL
L	L1-9	MULTIPLE ALARMS COMPUTER PRINTOUT
L	L1=23	MULTIPLE ALARMS

NINE MILE POINT UNIT 1 HEO

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:

THE DIVISIONS OF 1Ø.Ø AND 5 PSI, RESPECTIVELY PROVIDE SUFFICIENT PRECISION FOR TASKS INVOLVING THESE DEVICES. THESE METERS DO NOT PROVIDE THE TYPE OF FINE DETAIL INFORMATION THAT MUST BE DISPLAYED IN INCREMENTS AS FINE AS 2.Ø.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø36.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THE POINTERS ON VERTICAL METERS IS HIGHLY VISIBLE WHITE. THE POINTERS ON CIRCULAR METERS IS BLACK, THE SAME COLOR AS FACE PLATE PRINTING BUT THE PRINTING IS AT THE BOTTOM OF THE DISPLAY AND THE NUMERALS AND POINTER IS AT THE TOP.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
N		GENERIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-038.0

DESCRIPTION:

MOST FLOW PATHS ARE NOT MARKED WITH ARROWS TO SHOW FLOW PATH.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1A

EXPLANATION:

THIS MIMIC IS A DIAGNOSTIC TOOL NOT A CONTROL TOOL. FLOW PATH ARROWS ARE NOT ESSENTIAL TO THE UNDERSTANDING OF THE SYSTEM. THE MIMIC LINES AND COMPONENT DEMARCATION PROVIDE THE RELEVENT INFORMATION IN THE PRIMARY CONTAINMENT ISOLATION MIMIC.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

EO#: 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: REJECT

RISK CATEGORY: 2D

EXPLANATION:

LABEL LOCATIONE ARE NECESSARY BECAUSE THERE IS NO ROOM ABOVE OR BELOW COMPONENTS. LABELS WILL BE REPLACED AS PART OF COSMETIC PACKAGE WITH MORE CONSISTANT LABELS AND THEIR ASSOCIATION WITH THE MIMIC LEGEND LIGHT MAY BECOME MORE APPARENT.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø45.Ø

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:

THE HANDLE TYPE IS NOT READILY SUSCEPTABLE TO INADVERTANT ACTUATION. ALSO, THE COMPONENTS ARE NOT RELEVENT TO PLANT OPERATIONS.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø47.Ø

DESCRIPTION:

LABEL TYPE STYLE AND SIZE IS NOT CONSISTENT WITH OTHER SIMILAR PANEL COMPONENTS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: NOT RECORDED

EXPLANATION:

THESE LABELS ARE NOT CONSISTENT WITH OTHER CONTROL ROOM LABELS BUT THEY ARE EASILY READ AND CLEARLY DESIGNATE THEIR RELATED COMPONENTS. THE LABELS CANNOT BE REPLACED DUE TO SPACE LIMITATIONS IN THIS AREA OF THE PANEL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
1F55		FW PUMP 11 HI LVL TRIP BYPASS
1F56		FW PUMP 12 HI LVL TRIP BYPASS

NINE MILE POINT UNIT 1 HEO

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.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: FP-ØØ2.Ø

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: REJECT

RISK CATEGORY: 1C

EXPLANATION:

ZONE GROUPING THROUGH DEMARCATION OR OTHER TECHNIQUES WOULD NOT ENHANCE THE UNDERSTANDING OF THE PANEL. THE FIRE PANEL UTILIZES A COMPLEX CODING SYSTEM THAT THE OPERATORS ARE TRAINED ON. THE COMPLEXITY OF THE FUNCITON OF THE FIRE PANEL IS SUCH THAT COSMETIC ENHANCEMENTS WOULD NOT ASSIST UNDERSTANDING.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-005.8

DESCRIPTION:

SEPARATE RELATED CONTROLS ON PANEL E. NOT READILY APPARENT.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: NOT RECORDED

EXPLANATION:

PANEL E DOES NOT LEND ITSELF TO DEMARCATION LINES OR SYSTEM LABELING BECAUSE THE CONTROLS ARE NOT RELATED. PANEL E IS USED FOR OVERALL SYSTEM OPERATION AND IS ARRANGED AS A SERIES OF UNIQUE CONTROLS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		RELATED CONTROLS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-051.0

DESCRIPTION:

PANEL LABELS HAVE NOT BEEN USED TO IDENTIFY SYSTEM DESIGNATION. THE APPLICATION OF SYSTEM SUMMARY LABELS TO ALL PANELS WOULD OBVIATE THE NEED FOR REPEATING THE SYSTEM NAME ON EVERY COMPONENT LABEL.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: NOT RECORDED

EXPLANATION:

SYSTEM LABELING WAS TRIED AND DISCARDED DURING THE VERIFICATION P HASE OF THE ICP. SYSTEM LABELING WAS FOUND TO BE INAPPROPR IATE DUE TO THE LAYOUT OF THE PANELS AND THE NATURE OF THE EXISTING COMPONENT LABELS.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø52.Ø

DESCRIPTION:

PANEL LABELS HAVE NOT BEEN USED TO IDENTIFY THE PANEL FUNCTION.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: NOT RECORDED

EXPLANATION:

SYSTEM LABELING WAS TRIED AND DISCARDED DURING THE VERIFICATION PHASE OF THE ICF. SYSTEM LABELING WAS FOUND TO BE INAPPROPRIATE DUE TO THE LAYOUT OF THE PANELS AND THE NATURE OF THE EXISTING COMPONENT LABELS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

TO#: OCS-056.0

DESCRIPTION:

THROUGHOUT THE CONTROL ROOM; THE SYSTEM DESIGNATORS APPEAR AS THE FIRST FEW WORDS OF EACH COMPONENT LABEL; SUCH AS "CORE SPRAY" OR "EM VENTILATION". INSTITUTION OF A HIERARCHICAL LABELING SYSTEM WOULD MINIMIZE REDUNDENT LABELS; SHORTEN DEVICE DESC;AND ACCENTUATE FUNCTIONAL GROUPINGS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: NOT RECORDED

EXPLANATION:

SYSTEM LABELING WAS TRIED AND DISCARDED DURING THE VERIFICATION PHASE OF THE ICP. SYSTEM LABELING WAS FOUND TO BE INAPPROPRIATE DUE TO THE LAYOUT OF THE PANELS AND THE NATURE OF THE EXISTING COMPONENT LABELS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-087.0

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE POINTER ON THESE SCALES OBSCURES ONE DIGIT AT MOST. IT IS EASY TO OBTAIN A READING ON THESE SCALES, THE POINTER CLEARLY INDICATES THE GRADUATION MARK AND IF A DIGIT IS PARTIALLY BLOCKED, A QUICK GLANCE AT THE REST OF THE NUMBERINGS PROVIDES THE DESIRED INFORMATION.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø88.Ø

DESCRIPTION:

ELECTRICAL METER POINTERS SOMETIMES OBSCURE SCALE NUMERALS.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE POINTER ON THESE SCALES OBSCURES ONE DIGIT AT MOST. IT IS EASY TO OBTAIN A READING ON THESE SCALES, THE POINTER CLEARLY INDICATES THE GRADUATION MARK AND IF A DIGIT IS PARTIALLY BLOCKED, A QUICK GLANCE AT THE REST OF THE NUMBERINGS PROVIDES THE DESIRED INFORMATION.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-152.0

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:

THERE ARE REDUNDANT, ACCESSIBLE INDICATIONS WHICH PROVIDE THIS INFO MORE CONVENIENTLY FOR THE OPERATOR. THE INFORMATION THAT THE OPERATOR MUST OBTAIN FROM THIS INSTRUMENT IS READILY AVAILABLE IN ITS PRESENT FORM. THIS INSTRUMENT IS NOT USED TO DETERMINE LICENSE LIMIT.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-153.0

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 ARE AUTOMATIC SYSTEMS AND BACKUP ANNUNCIATORS WHICH WOULD PREVENT A SIGNIFICANT SAFETY PROBLEM SHOULD THE READING BE IN ERROR.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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 TOO THE RUNNING AC VOLTS FOR A MATCH. THEREFORE 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.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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 READINS OF THESE METERS WILL BE AT 115 KV OR AT ZERO. SPECIFIC VALUES ARE NOT READ. SIGNIFICANT DEVIATIONS FROM THE 115 KV, INDICATING A DEGRADED SITUATION, WOULD BE READILY IDENTIFIED FROM THE METERS AND ARE ALSO SUPPORTED BY BACKUP ANNUNCIATORS.

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 READ IN TEST SITUATIONS ONLY. THERE ARE REDUNDANT INDICATIONS ON THE FRONT PANELS WHICH ARE UTILIZED BY THE OPERATORS AND BACKUP ANNUNCIATORS WHICH ALERT THE OPERATORS SHOULD A DEGRADED SITUATION OCCUR. THE INFORMATION THAT THE OPERATOR NEEDS FROM THIS METER IS READILY AVAILABLE, IT CAN BE OBTAINED WITHIN THE REQUIRED TIME CONSTRAINTS IN ITS PRESENT FORM.THESE ARE VENDOR SUPPLIED PANELS AND IT IS IMPRACTICAL TO FIX SCALE.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

O#: OCS-190.0

DESCRIPTION:

WITH THE EXCEPTION OF THE REACTOR VESSEL LEVEL RECORDER ON PANEL F; RECORDERS ARE NOT MARKED TO INDICATE NORMAL AND ABNORMAL RANGES.

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 3B

EXPLANATION:

DURING PREPARATION OF THE ICP IT WAS DETERMINED FROM DISCUSSIONS WITH OPERATIONS PERSONNEL THAT COLORBANDING WAS INAPPROPRIATE FOR RECOORDERS. APPROPRIATE RECORDER RANGES CHANGE WITH TIME AND CONDITION AND A SELECTED COLORBAND WOULD NOT ALWAYS BE ACCURATE.

VERIFICATION:

nel ID #	Equipment ID #	Equipment Name
ALL		RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-191.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: COSMETIC-PANEL/SYSTEM

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THIS IS DUE TO DIFFERENCES IN LENS CAPS. THE OPERATORS REPORT NO PROBLEMS IN DETERMINING IF THE BULB IS LIT AND ITS COLOR. ALL COLORS ARE DESTINCTLY DIFFERENT FROM ONE ANOTHER.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		INDICATING LIGHTS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-233.0

DESCRIPTION:

HIGH PRIORITY ALARM 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:

A FEW ALARM WINDOWS HAVE BEEN HIGHLIGHTED WITH RED TO MAKE THEM STAND OUT AS HIGH PRIORITY ALARMS. IF THIS PRACTICE WAS UTILIZED FREQUENTLY THROUGHOUT THE CONTROL ROOM THE PRIORITY CHARACTERISTIC OF THE RED HIGHLIGHTING WOULD BE LOST.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: COM-002.0

DESCRIPTION:

THERE IS NO DIRECT INDICATION (E.G. SNAP, FEEL, AUDIBLE CLICK, RELEASE OF RESISTANCE) TO PROVIDE POSITIVE KEY ACTUATION FEEDBACK FROM THE KEYBOARD, TO THE OPERATOR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE CONSEQUENCE OF ENTRY ERROR IS AN ERROR MESSAGE OF "INVALID REQUEST" OR THE WRONG DATA PAGE WHICH CAN BE QUICKLY IDENTIFIED BY THE OPERATOR. KEY ENTRIES ARE PRINTED ON THE SCREEN SO THAT THE OPERATOR CAN VISUALLY VERIFY THE MESSAGE.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-003.0

DESCRIPTION:

THE COMPUTER SYSTEM DOES NOT CONTAIN A SEQUENTIAL FILE OF OPERATOR ENTRIES, AVAILABLE UPON OPERATOR REQUEST.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THERE IS A PROCEDURE (OP-42 PROCESS COMPUTER) WHICH PROVIDES THIS INFORMATION FOR THE OPERATOR. THE OPERATOR IS TRAINED IN THE USE OF THE COMPUTER USING THE PROCEDURES, AND CAN OBTAIN THE SEQUENTIAL FILE OF OPERATOR ENTRIES WITHOUT DIFFICULT COMPUTER MANIPULATION.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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 KEYBOARDS WERE DESIGNED SPECIFICALLY FOR THE NMP-1 COMPUTER FUNCTIONS (I.E., NOT STANDARDIZED TYPERS). THE LAYOUT OF KEYS AND FUNCTIONS OF ALL THE KEYBOARDS WHICH WERE PURCHASED ARE CONSISTENT. THERE ARE CERTAIN KEYS NOT USED BY THE OPERATORS, BUT THESE ARE VERY FEW. THE KEYS WHICH COULD ALTER THE SOFTWARE HAVE BEEN DEACTIVATED. THE KEYBOARDS HAVE BEEN IN USE FOR FOUR YEARS AND ARE NOW VERY FAMILIAR TO THE OPERATORS. ANY FUNCTIONAL CHANGE WOULD ADD TO COMPLEXITY.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-ØØ9.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE CRTS IN THE CONTROL ROOM ARE READABLE FROM THE EXPECTED OPERATOR POSITIONS, IN THE AMBIENT LIGHTLY CONDITIONS. IN ADDITION THE SCREEN BRIGHTNESS IS ADJUSTABLE TO THE OPERATORS PREFERENCE.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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:

THE CRTS IN THE CONTROL ROOM ARE READABLE FROM THE EXPECTED OPERATOR POSITIONS IN THE AMBIENT LIGHTING CONDITION. THE BRIGHTNESS AND CONTRAST ARE ADJUSTABLE TO ALLOW THE OPERATORS TO CHOOSE THE DISPLAY CONDITIONS WHICH THEY ARE MOST COMFORTABLE VIEWING.

VERIFICATION:

HEO#: COM-011.0

DESCRIPTION:

ALPHA-NUMERIC CHARACTERS HAVE LESS THAN 10 RESOLUTION ELEMENTS PER CHARACTER HEIGHT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE CRTS IN THE CONTROL ROOM ARE READABLE FROM THE EXPECTED OPERATER POSITIONS IN THE AMBIENT LIGHTING CONDITIONS. THE DISPLAYED INFORMATION ESSENTIAL TO THE OPERATOR IS EASILY ACCESSIBLE AND CAN BE READ WITH NO DIFFICULTY.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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:

THE CRTS IN THE CONTROL ROOM ARE READABLE FROM THE EXPECTED OPERATOR POSITIONS IN THE AMBIENT LIGHTING CONDITIONS. GRAPHIC LINES ARE SHARP AND DISTICT AND PROVIDE THE NEEDED INFORMATION TO THE OPERATORS IN AN EASILY COMPREHENSIBLE FASHION.

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 PRINTED DOT MATRIX CHARACTERS ARE EASILY READ UNDER CONTROL ROOM AMBIENT LIGHTING CONDITIONS. THE CONTROL ROOM PRINTED MATERIAL PROVIDES THE INFORMATION NEEDED BY THE OPERATORS IN A FORM THAT IS NOT DIFFICULT TO READ.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-Ø14.Ø

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:

DATA IS PRESENTED IN TABULAR FORM IN CERTAIN CRT DISPLAYS, HOWEVER, THIS DATA IS NOT COMPARED OR MANIPULATED ACROSS PARAMETERS. FOR THIS PURPOSE, IT IS NOT NECESSARY TO HAVE DECIMAL PLACE ALIGNMENT.   THE PRESENT TABULAR CONFIGURATION ALLOWS FOR COLUMNS TO BE EASILY DISTINQUISHED FROM ONE ANOTHER AND MAKES DATA PRESENTATION NEAT AND COMPACT.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-Ø16.Ø

DESCRIPTION:

THE STANDARDIZED FORMAT FOR TIME (HH:MM:SS) IS NOT USED. THE FORMAT USED IS HHMMSS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2C

EXPLANATION:

THE FORMAT FOR TIME IS SUFFICIENT FOR THE USE OF THE TIME VALUE IN THE NMP-1 COMPUTER DISPLAY. THIS VALUE IS OF LITTLE VALUE TO THE OPERATOR.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-Ø17.Ø

DESCRIPTION:

THE STANDARDIZED FORMAT FOR DATE (MM:DD:YY) IS NOT USED. THE FORMAT USED IS MM-DD-YY.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE FORMAT FOR THE DATE IS SUFFICIENT FOR THE NEED OF THE DATE IN THE NMP-1 COMPUTER DISPLAY. THE DATE IS OF LITTLE VALUE TO THE OPERATOR.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-Ø18.Ø

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:

THE PRIMARY FUNCTION OF THE PROCESS COMPUTER IS TO SELECT AND DISPLAY PARAMETER DATA. THE OPERATOR DOES NOT HAVE THAT MANY DATA QUERIES WHEREBY THIS CRITERIA WOULD COME INTO PLAY. WHICH ITEMS HAVE A HIGHER PROBABILITY OF SELECTION IS DIFFERENT UNDER DIFFERENT OPERATIONAL SITUATIONS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: COM-019.0

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:

THE LIST OF MENU OPTIONS DOES NOT LEND ITSELF TO A FIRST WORD ALPHABETICAL LIST. ALPHABETIZING THE LIST WOULD NOT INCREASE THE EFFICIENCY OF LOCATING AN OPTION BECAUSE THE TERMINOLOGIES BY WHICH THE OPERATORS SEEK OPTIONS DIFFER BETWEEN PEOPLE AND TYPE OF ORGANIZATION (OPERATORS, MAINTAINENCE, ETC.) THERE IS NO TIME CRITICAL OPERATION WHICH WOULD BE INVOLVED IN THIS SELECTION AND NO SAFETY CONSEQUENCES.

VERIFICATION:

HEO#: COM-020.0

DESCRIPTION:

WHEN DIRECTIONS TO THE OPERATOR ACCOMPANY MENU OPTIONS, THE DIRECTIONS DO NOT PRECEDE PRESENTATION OF THE OPTIONS (E.G. OD-10 OPTIONS MENU).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

NMP-1 HAS ESTABLISHED A FORMAT WHEREBY THE DIRECTIONS ARE PRINTED IN A STANDARD MESSAGE AREA AT THE BOTTOM OF THE DISPLAY. THIS FORMAT IS READILY UNDERSTANDABLE TO THE OPERATORS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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:

ALTHOUGH CHANGES IN PLANT STATUS ARE NOT INDICATED ON THE SCREEN, THE TYPER PRINTS OUT ALL CHANGES. ALSO, ALL SAFETY SIGNIFICANT STATUS CHANGES ARE BACKED UP BY ANNUNCIATIONS. THE OPERATORS USE OF THE COMPUTER DOES NOT INCLUDE THIS FUNCTION. THE INDICATION OF CHANGES IN PLANT STATUS IS A FUNCTION ALLOCATED TO THE ANNUNCIATOR/ALARM SYSTEM AND THE SPDS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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:

ANY PROGRAM WHICH IS SHORT TERM IS PROCESSED IMMEDIATELY BY THE COMPUTER. PROGRAMS WHICH TAKE LONGER RUN TIMES HAVE A LOWER RUN PRIORITY AND CAN BE INTERRUPTED BY HIGH PRIORITY PROGRAMS. THE OPERATORS ARE AWARE OF THESE LONGER RUNNING PROGRAMS, IT ENSURES THAT THE MORE IMPORTANT MESSAGES ARE PRESENTED AS QUICKLY AS POSSIBLE. THIS DOES NOT PRESENT A PROBLEM.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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: REJECT

RISK CATEGORY: 2B

EXPLANATION:

ALTHOUGH CHANGES IN PLANT STATUS ARE NOT INDICATED IN THE SCREEN, THE PRINTER PRINTS OUT ALL CHANGES. ANNUNCIATORS ARE USED TO ALERT THE OPERATORS OF IMPORTANT CHANGES IN SYSTEM STATUS, THE CRT DISPLAY IS A SECONDARY SOURCE OF INFORMATION.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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:

SINCE DATA TO BE PRINTED IS STORED IN A SPOOL FILE UNTIL THE PRINT PROCESS IS COMPLETED, NO DATA IS LOST DUE TO PRINT SPEED. THE CURRENT PRINT SPEED IS ADEQUATE TO PROVIDE THE NEEDED DATA TO THE OPERATORS.

VERIFICATION:

HEO#: CS-ØØ2.Ø

DESCRIPTION:

ASSOCIATION OF FEEDBACK INDICATION TO RELATED CONTROLS IS NOT MADE READILY APPARENT THROUGH LABELING; MIMICS; DEMARCATION; OR POSITION. SCALES ON METERS ALSO PRESENT A PROBLEM.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

FOR O2 ANALYZER, THERE ARE TWO METERS (ONE FOR EACH SCALE) WHICH PROVIDE A POSITIVE INDICATION OF THE SCALE SELECTED AND READING. FOR H2 ANALYZER, ALTHOUGH THERE ARE NOT METERS WHICH SHOW DIRECTLY THE SCALE SELECTED, THERE IS AN ADMINISTRATIVE PROCEDURE TO KEEP THE SCALE ON THE Ø - 5% AND THERE ARE BACKUP ANNUNCIATORS TO ALERT OPERATORS IF THE SCALE IS MISREAD. THERE IS NO REASON TO CHANGE THE RANGE FROM THE Ø-5% BAND DURING NORMAL OPERATION. THE FACT THAT THERE ARE BACKUP INFORMATION AND ALARM SOURCES ELIMINATES A SAFETY CONSIDERATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
3L29		CONTAINMENT MONITOR SYSTEM 11 OXYGEN ANALYZER RANGE
3L3Ø		CONTAINMENT MONITOR SYS 12 OXYGEN ANALYZER RANGE
3L31		CONTAINMENT MONITOR SYS 11 HYDROGEN ANALYZER RANGE
3L32		CONTAINMENT MONITOR ANALYZER 12 HYDROGEN ANALYZER RANGE
L		SYS 11 METER DISPLAY
L		SYS 12 METER DISPLAY

NINE MILE POINT UNIT 1 HEO

HEO#: CS-ØØ8.Ø

DESCRIPTION:

THERE IS ONLY ONE SET OF ANNUNCIATOR RESPONSE CONTROLS. ALL ANNUNCIATOR WINDOWS CANNOT BE READ FROM SILENCE OR ACKNOWLEDGE BUTTONS.(6.3.4.1.)

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 4A

EXPLANATION:

THE CONTROL ROOM HAS BEEN DESIGNED FOR CENTRALIZED CONTROL FROM THE E PANEL WHERE ALL CRITICAL OPERATIONS AND SURVEILLANCE HAS BEEN CENTRALIZED. TO DIVERT ATTENTION AWAY FROM THIS AREA AND HAVE OPERATORS DISTRACTED BY ANNUNCIATORS THAT CAN ONLY BE SILENCED AT THE LOCAL PANELS WOULD ADD TO THE CONFUSION, STRESS, AND TIME BINDS. THIS PHILOSOPHY OF OPERATION PERMITS A SINGLE SENIOR OPERATOR TO BE IN CHARGE AND KNOWLEDGEABLE CONCERNING THE CONDITION OF THE ENTIRE UNIT AND NOT SPECIFIC SYSTEMS AND EQUIPMENT. THESE ANNUNCIATORS OFF TO THE SIDE WHICH ARE MORE DIFFICULT TO READ ARE NOT CRUCIAL TIME DEPENDENT ITEMS. THESE ANNUNCIATORS CAN BE RECOGNIZED BY THEIR MATRIX LOCATION. THERE ARE ALSO COMPUTER ALARM PRINTOUTS WHICH ARE USED TO SUPPORT ANNUNCIATOR INFORMATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		GENERIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø16.Ø

DESCRIPTION:

THE THREE DRUM TYPE COUNTERS ARE TOO HIGH ON THE PANEL FOR PROPER VIEWING.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THIS INFO IS NOT ESSENTIAL TO PLANT OPERATIONS. THE COMPUTER DISPLAY OF THE MEGAWATT OUTPUT COMMERCIAL METER WHICH CONTAINS THE INFORMATION FROM THE DRUM COUNTERS, IS TAKEN ONCE A DAY. THE LOCATION OF THESE COUNTERS IS ADEQUATE FOR THE FREQUENCY OF USE THAT THEY RECEIVE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
B		GEN GROSS MEGAWATT HRS

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø21.Ø

DESCRIPTION:

THERE IS GLARE ON THE VERTICAL METERS THROUGHOUT THE CONTROL ROOM FRONT PANELS AT 2-4 FT FROM THE PANELS. THE GLARE IS LESS PROMINENT FROM THE OPERATORS CONSOLE STATION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THE OPERATORS DO NOT REPORT GLARE AS A PROBLEM. YOU MUST BE POSITIONED IN JUST THE RIGHT (WRONG) SPOT TO ENCOUNTER THE REPORTED GLARE. ACCURATE VALUE READINGS FROM THE VERTICAL METERS ARE EASILY OBTAINED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		GENERIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø23.Ø

DESCRIPTION:

INVENTORIES ARE NOT KEPT FOR OPERATIONAL SPARE PARTS AND EXPENDABLES. CR PERSONNEL REPLACE EXPENDABLES IN STORAGE LOCATIONS AS NEEDED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THE INVENTORY OF CR SUPPLIES ARE UPDATED AND MAINTAINED BY STANDARD OPERATING PROCEDURES FOR THE SHIFT.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø24.Ø

DESCRIPTION:

MULTI-CHANNEL RECORDERS DO NOT IDENTIFY THE CHANNEL BEING PLOTTED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

CHANNELS FROM THESE COMPUTER TREND RECORDERS CAN BE SELECTED BY THE OPERATOR. ONCE THE OPERATOR MAKES A SELECTION, HE HAS IMMEDIATE FEEDBACK ON THE RECORDER.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
[illegible]		STACK GAS E 335 MONITOR 8
E		OFF GAS CHILLER DISCH TEMP
E		STACK GAS E 334 MONITOR 7

HEO#: CS-Ø32.Ø

DESCRIPTION:

THE METER FACES HAVE REFLECTED GLARE FROM THE FLORESCENT LIGHT LOCATED IN FRONT OF THE PANEL.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1A

EXPLANATION:

THE PANEL WILL BE USED ONLY IN EXTREME CIRCUMSTANCES. FROM OBSERVING PANEL, GLARE IS A MINOR PROBLEM IN READING THE METERS. A STEPSTOOL IS AVAILABLE TO ELIMINATE PARALLAX IN READING AND USING THE STEP THE GLARE IS MINIMIZED. ADEQUATE AMBIENT LIGHTING IS NEEDED IN THE RSP FOR CONTROL OPERATIONS.

VERIFICATION:

RSP

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø37.Ø

DESCRIPTION:

METERS OR RECORDERS ARE BELOW THE RECOMMENDED HEIGHT FOR DISPLAYED INFO. OPERATORS MUST SQUAT TO READ.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THESE ARE CALIBRATION DRAWERS FOR I&C PERSONNEL AND NOT USED BY OPERATORS. THERE IS SUFFICIENT ROOM FOR THE PERSONNEL TO POSITION THEMSELVES TO MONITOR THE RECORDER. .

VERIFICATION:

B	
B	CORE MONITOR
B	HYD COOLER GAS TEMP RECORDER
B	TURBINE RPM RECORDER
G	CHANNEL 11 IRM RECORDER
G	CHANNEL 11 SRM RECORDER
G	CHANNEL 12 IRM RECORDER
G	CHANNEL 12 SRM RECORDER
G	CHANNEL 13 IRM RECORDER
G	CHANNEL 13 SRM RECORDER
G	CHANNEL 14 IRM RECORDER
G	CHANNEL 14 SRM RECORDER
G	CHANNEL 15 IRM RECORDER
G	CHANNEL 16 IRM RECORDER
G	CHANNEL 17 IRM RECORDER
G	CHANNEL 18 IRM RECORDER
J	GENERIC
N	GENERIC

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø46.Ø

DESCRIPTION:

CONTROLS ARE LOCATED ABOVE THE MAX 6Ø" LIMIT FOR RECOMMENDED CONTROL HEIGHT. THIS MAY MAKE OPERATION OF CONTROL A PROBLEM FOR SHORTER OPERATORS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THESE CONTROLS ARE LOCATED IN AN AREA BETWEEN 34" AND 7Ø" ABOVE THE FLOOR. THEY HAVE NEVER BEEN USED YET, BUT CAN BE REACHED BY ALL OPERATORS WHICH WAS VERIFIED AT THE SIMULATOR.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
1F55		FW PUMP 11 HI LVL TRIP BYPASS
1F56		FW PUMP 12 HI LVL TRIP BYPASS

NINE MILE POINT UNIT 1 HEO

HEO#: CS-054.0

DESCRIPTION:

COMPONENTS ARE LOCATED ABOVE THE MAX LIMIT OF 60" FOR RECOMMENDED CONTROL HGT. THIS MAY MAKE IT DIFFICULT TO OPERATE FOR SHORTER OPERATORS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THESE CONTROLS ARE LOCATED IN AN AREA BETWEEN 34" AND 70" ABOVE THE FLOOR. THEY HAVE NEVER BEEN USED YET, BUT CAN BE REACHED BY ALL OPERATORS WHICH WAS VERIFIED AT THE SIMULATOR.

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

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø63.Ø

DESCRIPTION:

ACCORDING TO OPERATORS, INKING IN THE RECORDERS IS A PROBLEM. DEVICES ARE MAINTAINED BY I&C. DEVICES WERE NOT INKING AT THE TIME OF CHECKLIST DATA COLLECTION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

STANDARD OPERATING PRACTICE PRESENTLY ENSURES PROPER REPLACEMENT OF CHART PAPER, INK, AND OTHER MAINTENANCE. THERE IS NO APPARENT MECHANICAL PROBLEM ASSOCIATED WITH RECORDERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
5L15		DRYWELL PRESS
7L6		TORUS LEVEL

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø68.Ø

DESCRIPTION:

THERE IS NO POSITIVE MEANS TO DIAGNOSE FAILED INDICATING LIGHTS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THESE BULBS ARE REGULARLY CHECKED DURING SURVEILLANCE TESTS CONDUCTED AT REGULAR INTERVALS, ANY FAILED BULBS ARE REPLACED AT THIS TIME. THIS IS SUFFICIENT TO MAINTAIN THE OPERATIONAL INTEGRITY OF THIS BACK PANEL MIMIC.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		NORTH/SOUTH REHEADER MIMIC

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-ØØ1.Ø

DESCRIPTION:

CONTROLS AND DISPLAYS ARE MOUNTED OUTSIDE OF RECOMMENDED HEIGHT RANGES ON MOST PANELS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

IT HAS BEEN VERIFIED THAT ALL CONTROLS CAN BE OPERATED AND FREQUENTLY OPERATED CONTROLS ARE IN THE ACCEPTABLE RANGES. ALL DISPLAYS CAN BE READ WITHOUT PARALLAX PROBLEMS. SEE HEO OCS-15 FOR RESOLUTION.

VERIFICATION:

HEO#: OCS-ØØ2.Ø

DESCRIPTION:

THE DEPTH OF THE CONTROLS ON CONSOLE E IS GREATER THAN THE RECOMMENDED MAX REACH DISTANCE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

A 5TH PERCENTILE FEMALE OPERATOR HAS A FUNCTIONAL EXTENDED REACH OF 29 INCHES (MIL STD 1472). ALL OPERATORS WILL BE ABLE TO REACH CONTROLS IN THE BENCHBOARD WHICH IS 28 INCHES DEEP.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-ØØ3.Ø

DESCRIPTION:

ALL BENCHBOARD ANNUNCIATORS EXCEED THE MAXIMUM RECOMMENDED HEIGHT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2C

EXPLANATION:

THE SILENCE BUTTON IS LOCATED ON PANEL E WHICH ALLOWS OPERATORS TO BE BACK FROM THE BOARDS. THIS ALLOWS A GREATER ANGLE FOR THE VIEWING OF ANNUNCIATORS. THIS WOULD BE A CONCERN WITH RESPECT TO THE READING OF ANNUNCIATORS FROM DIRECTLY BELOW THE ANNUNCIATOR BOX. HOWEVER THE OPERATION OF ANNUNCIATOR CONTROLS FROM THE E PANEL ELIMINATES THIS AS A CONCERN.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø13.Ø

DESCRIPTION:

COMPONENTS OF SIMILAR FUNCTION HAVE BEEN ORDERED ACCORDING TO THE NORMAL CONVENTION OF LEFT TO RIGHT AND TOP TO BOTTOM. A FEW CASES WERE IDENTIFIED IN WHICH ORDERING IS THE OPPOSITE OF THIS CONVENTION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

FOR VACUUM RELIEF CHECK VLVS, THERE IS ONLY ONE #14 CHECK VLV AND THERE ARE 3 EACH OF THE #11,12, AND 13 CHECK VLVS. SOMETHING WILL ALWAYS BE OUT OF PATTERN. PRESENT DESIGN IS PREFERRED. SERVO TEST CONTROLS ARE IN THE ESTABLISHED CONVENTION FOR THE TURBINE SYSTEM. CHILLER SYSTEM CONTROLS ARE GROUPED AROUND THEIR BYPASS CONTROL. THERE IS NO SEQ OF USE OR PATTERN USED WITH THESE CONTROLS. THE STEAM SEAL REGULATOR BLOCK CONTROLS ARE IN A MIMIC ARRANGEMENT FOR EASY IDENTIFICATION AND ARE NOT USED IN SEQ. THE ORDER ON THE INDICATOR LIGHTS FOR CONTAINMENT MONITORING SYSTEM IS UNIMPORTANT. ALL ARE OPERATED BY A SINGLE SW AND ALL WILL EITHER BE OPEN OR CLOSED.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø58.2

DESCRIPTION:

THE WESTRONIC RECORDER; PANEL H; HAS POINTERS WHICH MAY OBSCURE THE INFO.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THE COMPONENT IS USED VERY LITTLE. THE INFO IS AVAILABLE ON OTHER RECORDERS AND COMPUTER POINTS. THE VALUE READINGS ARE ALSO AVAILABLE ON THE RECORDER PAPER. THE INFO IS NOT CRITICAL AND OPERATOR HAS TIME TO DETERMINE CORRECT READING.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-165.Ø

DESCRIPTION:

THE TAP POS TRANSFORMER 1Ø CIRCULAR METER IS NOT DESIGNED SUCH THAT A FAILURE MODE IS EVIDENT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE USE OF THIS METER IS RESTRICTED TO ONLY FEEDBACK WITH THE USE OF THE TAP CHANGES. THIS OPERATION WOULD ONLY BE ACCOMPLISHED AFTER KNOWLEDGE OF VOLTAGE IRREGULARITY AND THE VOLTMETERS ARE USED FOR THIS INDICATION. THEREFORE, THE FAILURE OR INACCURACY OF THIS METER WOULD BE EVIDENT.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A6		TAP POS TRANSFORMER 1Ø

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-166.Ø

DESCRIPTION:

SOME METERS ON PANEL A2 HAVE NO SCALES.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THESE METERS PROVIDE A DIRECTION CUE ONLY. THE INDICATION THAT OPERATORS MAINTAIN FROM THESE INSTRUMENTS IS ONE OF RELATIVE POSITION, SCALES WOULD SERVE NO PURPOSE, MAY EVEN BE CONFUSING.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A2		METERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-184.Ø

DESCRIPTION:

MULTI-POINT RECORDERS DO NOT HAVE POINT SELECT CAPABILITY.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THE VALUES PLACED ON THESE TYPE RECORDERS ARE OF LITTLE IMPORTANCE AS TO SPECIFIC VALUE BUT COULD BE OF IMPORTANCE FOR A GENERAL TREND. IF IT IS IMPORTANT TO GET A VALUE FOR ONE OF THESE PARAMETERS, THE OPERATOR DOES NOT HAVE TO WAIT FOR THE RECORDER TO CYCLE TO THE VALUE, HE CAN CALL IT UP ON THE COMPUTER. THERE IS NO NEED FOR TWO REDUNDANT CAPABILITIES FOR OBTAINING THIS LOW PRIORITY DATA.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		MULTI-POINT RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-185.Ø

DESCRIPTION:

CHART PAPER EVIDENTLY BINDS ON OFF-GAS CHILLER DISCHARGE TEMP RECORDER.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

STANDARD OPERATING PRACTICE PRESENTLY ENSURES PROPER REPLACEMENT OF CHART PAPER, INK, AND OTHER MAINTENANCE. THERE IS NO APPARENT MECHANICAL PROBLEM ASSOCIATED WITH RECORDERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		OFF-GAS CHILLER DISCHARGE TEMPERATURE

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-186.Ø

DESCRIPTION:

CHART PAPER EVIDENTLY BINDS ON OFF-GAS (UNLABELLED) RECORDER.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

STANDARD OPERATING PRACTICE PRESENTLY ENSURES PROPER REPLACEMENT OF CHART PAPER, INK, AND OTHER MAINTENANCE. THERE IS NO APPARENT MECHANICAL PROBLEM ASSOCIATED WITH RECORDERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
E		OFF-GAS RECORDER

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-187.Ø

DESCRIPTION:

CHART PAPER EVIDENTLY BINDS ON STACK GAS RECORDER.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

STANDARD OPERATING PRACTICE PRESENTLY ENSURES PROPER REPLACEMENT OF CHART PAPER, INK, AND OTHER MAINTENANCE. THERE IS NO APPARENT MECHANICAL PROBLEM ASSOCIATED WITH RECORDERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
[illegible]E		STACK GAS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-188.Ø

DESCRIPTION:

CHART PAPER EVIDENTLY BINDS ON CLEANUP SYSTEM FLOW RECORDER.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

STANDARD OPERATING PRACTICE PRESENTLY ENSURES PROPER REPLACEMENT OF CHART PAPER, INK, AND OTHER MAINTENANCE. THERE IS NO APPARENT MECHANICAL PROBLEM ASSOCIATED WITH RECORDERS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K		CLEANUP SYS FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-204.0

DESCRIPTION:

THE CHILLER SYSTEM SW; PANEL H; HAVE "OFF" LOCATED IN THE CENTER POSITION WITH "STANDBY" AND "AUTO" TO THE LEFT; THIS IS THE OPPOSITE OF THE EXPECTED POSITIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THE TEST POSITION IS ON THE RIGHT OF SWITCH. THEREFORE THE OFF POSITION MUST BE IN THE CENTER TO PREVENT PASSING THROUGH 'TEST' TO ACTUATE THE SWITCH.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		CHILLER SYSTEM SWITCHES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-210.0

DESCRIPTION:

THE SRM SWITCHES ON PANEL G CANNOT BE REACHED FROM A NORMAL OPERATING DISTANCE; THE OPERATOR MUST KNEEL TO REACH THESE CONTROLS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THERE IS PLENTY OF AREA TO KNEEL TO REACH THIS SELDOMLY USED BACK PANEL OUT OF TRAFFIC AREA EQUIPMENT.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
G		SRM SWITCHES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-220.0

DESCRIPTION:

ANNUNCIATORS ARE GENERALLY GROUPED BY SPECIFIC SYSTEM WITHIN AN ANNUNCIATOR BOX. IN SOME CASES; HOWEVER; SEEMINGLY UNRELATED ANNUNCIATORS ARE MIXED WITHIN A BOX.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THESE ANNUNCIATORS HAVE A FUNCTIONAL PURPOSE WHERE THEY ARE LOCATED. FOR AN UNUSUAL CONDITION (FLOODING DRYWELL THROUGH THE FW SYSTEM FROM FIRE SYSTEM DURING COCA CONDITIONS) THE LOCATION FITS IN WITH OTHER FW SYSTEM ANNUNCIATORS. THE NEGATIVE TRANSFER OF MOVING THESE ANNUNCIATORS IS MORE DETREMENTAL THAN ANY ADVANTAGE OF LOCATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H2		H2-16 FIRE HEATER PRESSURE LOW
H2		H2-8 FIRE PUMP TRIP OVERLOAD

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-222.0

DESCRIPTION:

SOME ANNUNCIATORS ARE NOT LOCATED ABOVE THEIR RELATED CONTROLS AND DISPLAYS. THE OFF-GAS; CHILLER; AND RECOMBINER ANNUNCIATORS ARE LOCATED ON PANEL L; BUT THE CONTROLS ARE ON PANEL H.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3B

EXPLANATION:

SIMULTANEOUS ACTUATION OF CONTROLS AND MONITORING OF ANNUNCIATORS IS NOT REQUIRED. ALTHOUGH THESE ANNUNCIATORS ARE NOT DIRECTLY ABOVE THE EQUIPMENT, THESE ARE WITHIN CLOSE PROXIMITY. THE EQUIPMENT RELATED TO THESE ANNUNCIATORS ARE NOT CRITICAL TO SAFETY AND OPERATIONS. TECH SPEC LIMITS WOULD NOT BE VIOLATED BECAUSE OF AUTOMATIC ISOLATION EQUIPMENT ON THESE SYSTEMS.ALSO, THE ANNUNCIATOR ACKNOWLEDGE IS FROM THE E PANEL AND NOT FROM THE INDIVIDUAL PANEL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		ANNUNCIATOR
H		CHILLER ANNUNCIATOR
H		CHILLER CONTROLS
H		OFF-GAS CONTROLS
H		RECOMBINER CONTROLS
L		CHILLER ANNUNCIATOR
L		OFF-GAS ANNUNCIATORS
L		RECOMBINER ANNUNCIATOR

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-223.0

DESCRIPTION:

SOME ANNUNCIATORS ARE NOT LOCATED ABOVE THEIR RELATED CONTROLS AND DISPLAYS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3B

EXPLANATION:

SIMULTANEOUS ACTUATION OF CONTROLS AND MONITORING OF ANNUNCIATORS IS NOT REQUIRED. ALTHOUGH THESE ANNUNCIATORS ARE NOT DIRECTLY ABOVE THE EQUIPMENT, THEY ARE WITHIN CLOSE PROXIMITY. ALSO THE ACKNOWLEDGE IS FROM THE E PANEL AND NOT FROM THE INDIVIDUAL PANEL, THIS IS PART OF THE NMP-1 CONTROL ROOM PHILOSOPHY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K		ANNUNCIATOR WINDOW K2-19
K		ANNUNCIATOR WINDOW K2-20
L		N2 CONTROLS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-224.0

DESCRIPTION:

PANEL A ANNUNCIATORS ARE NOT ALWAYS LOCATED ABOVE RELATED CONTROLS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3B

EXPLANATION:

SIMULTANEOUS ACTUATION OF CONTROLS AND MONITORING OF ANNUNCIATORS IS NOT REQUIRED. ALTHOUGH THESE ANNUNCIATORS ARE NOT DIRECTLY ABOVE THE EQUIPMENT, THESE ARE WITHIN CLOSE PROXIMITY. THE EQUIPMENT RELATED TO THESE ANNUNCIATORS ARE NOT CRITICAL TO SAFETY AND OPERATIONS. TECH SPEC LIMITS WOULD NOT BE VIOLATED BECAUSE OF AUTOMATIC ISOLATION EQUIPMENT ON THESE SYSTEMS.ALSO, THE ANNUNCIATOR ACKNOWLEDGE IS FROM THE E PANEL AND NOT FROM THE INDIVIDUAL PANEL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A		ANNUNCIATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-225.Ø

DESCRIPTION:

WARNING AND DIAGNOSTIC ALARMS ARE NOT SEGREGATED FROM INFORMATIONAL AND ADVISORY DISPLAYS ON PANELS A;H;K; AND L.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3D

EXPLANATION:

THE OPERATOR SHOULD RESPOND TO EACH ANNUNCIATOR AS IF IT WERE A WARNING ALARM. ALL ALARMS ARE OF THE TYPE WHICH REQUIRE IMMEDIATE OPERATOR RESPONSE. ALARMS MAY APPEAR DIAGNOSTIC IN NATURE BUT THERE AR REQUIRED RESPONSES FOR EACH ALARM.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A		ALARMS
H		ALARMS
K		ALARMS
L		ALARMS

HEO#: OCS-235.Ø

DESCRIPTION:

SILENCE BUTTONS FOR ALARM RESPONSE ARE NOT ON CONTROL PANELS. ONLY CONSOLE E HAS A SILENCE BUTTON.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

THE CONTROL ROOM HAS BEEN DESIGNED FOR CENTRALIZED CONTROL FROM THE E PANEL WHERE ALL CRITICAL OPERATIONS AND SURVEILLANCE HAVE BEEN CENTRALIZED. TO DIVERT ATTENTION AWAY FROM THIS AREA AND HAVE OPERATORS DISTRACTED BY ANNUNCIATORS THAT CAN ONLY BE SILENCED BY GOING TO LOCAL PANELS WOULD ADD TO CONFUSION STRESS AND TIME BINDS. THIS IS AN IMPORTANT ASPECT OF THE NMP-1 CONTROL ROOM PHILOSOPHY.

VERIFICATION:

HEO#: OCS-236.0

DESCRIPTION:

NO ACKNOWLEDGE BUTTONS ARE PROVIDED. THE CONSOLE E SILENCE BUTTON ACTS AS AN ACKNOWLEDGE BUTTON.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

THE SILENCE FEATURE ALSO SERVES THE ACKNOWLEDGE FUNCTION. BECAUSE THE CONTROL ROOM HAS BEEN DESIGNED FOR CENTRALIZED CONTROL FROM THE E PANEL, A SEPARATE ACKNOWLEDGE FUNCTION IS NOT NEEDED. THE OPERATORS ARE INSTRUCTED TO LOCATE AND READ THE ALARMING WINDOW PRIOR TO SILENCING AND ACKNOWLEDGING THE ALARM. ALARMS ALSO PRINTED ON THE COMPUTER TYPER.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-237.Ø

DESCRIPTION:

NO RESET BUTTONS ARE PROVIDED; THE OPERATOR RECEIVES A VISUAL REFLASH WHEN THE ALARM CLEARS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

THIS IS AN AUTOMATED FUNCTION. IT ONLY FLASHES WHEN THE SIGNAL IS WITHIN LIMITS AND THE FLASH INDICATES A CHANGING STATE.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-241.Ø

DESCRIPTION:

PROCEDURE CONTENT PROVIDES ONLY THE ANNUNCIATORS WHICH SHOULD LIGHT UNDER A PARTICULAR SCENARIO PLUS THE INSTRUCTION THAT THE OPERATOR SHOULD CHECK ALL ANNUNCIATOR PANELS. NO SETPOINTS OR SENSOR IDENTITIES ARE GIVEN FOR ANNUNCIATOR RESPONSE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3D

EXPLANATION:

THE NORMAL OPERATING PROCEDURES HAVE THE SETPOINT INFORMATION. FOR EMERGENCY PROCEDURES THIS INFO IS NOT DESIRED. THE SENSOR IDENTITIES ARE NOT DESIREABLE TO BE IN EITHER TYPE OF PROCEDURE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		ANNUNCIATORS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-253.Ø

DESCRIPTION:

NO PROCEDURAL INSTRUCTIONS EXIST FOR THE OPERATION OF MANUAL AND AUTOMATIC CONTROLLERS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THERE IS NO NEED OR DESIRE TO HAVE AN OPERATING PROCEDURE FOR THE OPERATION OF MANUAL AND AUTOMATIC CONTROLLERS. THIS KNOWLEDGE IS ACQUIRED BY THE OPERATOR IN TRAINING CLASSES AND SIMULATOR EXPERIENCES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURAL INSTRUCTIONS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-269.Ø

DESCRIPTION:

SETPOINTS AND SENSOR IDENTITIES FOR ANNUNCIATOR RESPONSE ARE NOT GIVEN WITHIN THE TEXT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3D

EXPLANATION:

SETPOINTS ARE PROVIDED IN NORMAL PROCEDURES IN A SEPARATE SECTION OF EACH PROCEDURE. SETPOINTS ARE NOT DESIRED ON EMERGENCY PROCEDURES AS SETPOINTS WOULD HAVE BEEN EXCEEDED. SENSOR IDENTITIES ARE NOT NEEDED OR DESIRABLE FOR INCLUSION IN PROCEDURES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		PROCEDURES

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-278.0

DESCRIPTION:

PHONE CORDS ON PANELS ARE ALLOWED TO HANG AMONG PANEL DEVICES.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3B

EXPLANATION:

THE CORD LENGTH IS NECESSARY TO PROVIDE COMMUNICATIONS CAPABILITY AT ALL POINTS IN THE CR. RETRACTABLE CORDS ARE NOT PRACTICAL SINCE THE PHONES ARE LOCATED WITHIN THE PANEL ELEMENTS AND WOULD RESULT IN GREATER POTENTIAL FOR INADVERTENT ACTUATION. PRESENT CORDS ARE COILED AND DO NOT PRESENT A GREAT HAZARD NOR A HINDRENCE TO OPERATIONS. POTENTIAL FOR INADVERTANT ACTUATION IS SLIGHT. SEVERAL OTHER ALTERNATIVES HAVE BEEN INVESTIGATED BUT THE PRESENT CONFIGURATION WAS FOUND TO PRESENT THE LEAST DIFFICULTY.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		PHONE CORDS

HEO#: QS-ØØ5.Ø

DESCRIPTION:

A TEMPERATURE METER FOR THE NON-REGENERATIVE HEAT EXCHANGER OUTLET TEMP TO CLEAN-UP IS NEEDED. THIS INDICATOR IS PRESENTLY AVAILABLE ONLY AT THE COMPUTER.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

VARIABLE CLOSING OF COOLING FLOW NOT NEEDED. THIS INFORMATION IS PRESENTLY AVAILABLE IN THE COMPUTER PRINTOUT. THIS INFORMATION IS USED VERY SELDOM.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		METER FOR NON-REGENERATIVE HEAT EXCHANGER OUTLET TEMPERATURE TO CLEAN-UP.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-ØØ6.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3E

EXPLANATION:

THE INFO IS NOT REQUIRED.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: QS-ØØ8.Ø

DESCRIPTION:

DRYWELL WATER LEAK RATE RECORDER IS DIFFICULT TO MAINTAIN.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

THIS FRONT PANEL RECORDER PRESENTS NO ACCESS PROBLEMS AND SINCE THIS IS A NON-OPERATIONAL PROBLEM, MAINTENANCE CAN BE PERFORMED WITHIN REASONABLE TIME CONSTRAINTS. THERE ARE ANNUNCIATOR BACKUPS FOR THIS REACORDER TO ELIMINATE ANY POTENTIAL SAFETY CONCERNS.

VERIFICATION:

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

HEO#: QS-Ø1Ø.Ø

DESCRIPTION:

THIS ANNUNCIATOR IS EXTRANEOUS BECAUSE THE BOILER IS NO LONGER USED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1A

EXPLANATION:

THE EQUIPMENT IS STILL LOCATED IN PLANT AND CONSIDERED AVAILABLE ALTHOUGH MOTHBALLED TEMPORARILY. THIS ANNUNCIATOR WILL BE REMOVED IF IT IS DECIDED THAT THE BOILER IS GOING TO BE PERMANENTLY REMOVED FROM THE OPERATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		ANNUNCIATOR FOR CONCENTRATOR ELECTRIC BOILER #11.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø12.Ø

DESCRIPTION:

THE DRYWELL WATER LEAK DETECTION ANNUNCIATOR, LOCATED ABOVE THE H PANEL, IS NOT LOCATED NEAR THE ASSOCIATED CHART RECORDERS, WHICH ARE ON THE L PANEL.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 4A

EXPLANATION:

IF THE OPERATOR GETS THE ANNUNCIATOR HE REFERS TO HIS CHART RECORDERS. THIS IS A NON TIME CRITICAL OPERATION. THIS IS ALSO WITHIN A TIME REASONABLE SPATIAL LOCATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
H		ANNUNCIATOR FOR DRYWELL WATER LEAK DETECTION.

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø13.Ø

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 WESTRONIC RECORDER IS NOT AN OPERATIONAL TOOL, NOT TIME CRITICAL. IT IS NOT NECESSARY TO CHANGE PAPER SO OFTEN AS TO WARRENT MOVING THE RECORDER.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø16.Ø

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: REJECT

RISK CATEGORY: 3A

EXPLANATION:

THERE IS NOT SPACE AVAILABLE FOR ALL CAMS AND ARMS ON THE FRONT PANELS. THIS EQUIPMENT IS LOCATED JUST BEHIND K PANEL AND IS EASILY ACCESSIBLE BECAUSE OF THE CENTER ENTRY TO THE BACK PANEL AREA. THE SAFETY SIGNIFICANCE IS NOT COMPROMISED BY NOT HAVING THESE EQUIPMENT ON THE ACCESSIBLE BACK PANEL.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø21.Ø

ESCRIPTION:

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: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE ALARM TILE HAS HAD THE LEGEND REMOVED SO THAT IT CANNOT BE READ. THE EQUIPMENT IS STILL LOCATED IN PLANT AND CONSIDERED AVAILABLE ALTHOUGH MOTHBALLED TEMPORARILY, THEREFORE THE ANNUNCIATOR REMAINS CONNECTED. THERE IS NO CONFUSION WITH RESPECT TO THE ANNUNCIATOR.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		FIRE PANEL ANNUNCIATOR

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø26.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THESE ALARMS ALERT THE OPERATORS ATTENTION TO LOCAL PANELS OR BACKPANELS WHERE OTHER INFORMATION IS AVAILABLE FOR THE OPERATOR TO RESPOND TO THE ALARM. THERE IS NO NEED TO SLIT THE TILES OUT SINCE THE OPERATOR MUST GO TO THE LOCAL PANEL IN ANY CASE TO OBTAIN PARAMETER INFORMATION.

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

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø29.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1E

EXPLANATION:

RADIOS ARE AVAILABLE FOR COMMUNICATION IN THESE AREAS. MOST OPERATIONAL AREAS ARE COVERED BY THE GAITRONICS SYSTEM BUT IN THE INFREQUENT INSTANCES WHERE THE OPERATOR DOES NOT HAVE EASY ACCESS TO THE GAITRONICS SYSTEM, RADIOS ARE MADE AVAILABLE FOR CONTACTING THE CONTROL ROOM OR OTHER RELATED PLANT OPERATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		GAITRONICS SYSTEM

NINE MILE POINT UNIT 1 HEO

HEO#: QS-Ø3Ø.Ø

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 INFO IS PROVIDED ØN METERS IF THERE IS ANY QUESTION AND THERE ARE BACKUP ALARMS IF ANY PARAMETER GOES OUT OF BOUNDS. THESE ARE THE PRIMARY INDICATIONS USED BY THE OPERATORS, IF THEY FIND THE COMPUTER COUNT AT THE UPPER LIMIT THE REDUNDANT INDICATORS WOULD BE CONSULTED.

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:

THE INVENTORY OF CR SUPPLIES ARE UPDATED AND MAINTAINED BY STANDARD OPERATING PROCEDURES FOR THE SHIFT. UNAVAILABLE SUPPLIES IS NOT A COMMON SITUATION, IT CAN BE CAUSED BY LOGISTICS PROBLEMS OUTSIDE THE DOMAIN OF THE CONTROL ROOM PROCEDURES.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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 CURRENT UPDATE PERIOD OF BETWEEN 5-3Ø SECONDS IS SUFFICIENT FOR THE OPERATOR TO DISCRIMINATE ABNORMAL CONDITIONS USING THE CURRENT COMPUTER SYSTEM A 2 SEC UPDATE PERIOD IS NOT POSSIBLE.

VERIFICATION:

HEO#: VAL-001.0

DESCRIPTION:

THE OPERATOR MUST REFER TO INSTRUMENTATION LOCATED ON BACK PANELS FOR AREA RADIATION MONITORING.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

AN ANNUNCIATOR ALERTS THE OPERATORS TO THE PRESENCE OF A PROBLEM ON THE AREA MONITORS AND ONE OPERATOR GOES TO THE BACK TO READ THE MONITOR. A SECOND OPERATOR REMAINS IN THE PRIMARY AREA AT ALL TIMES. THERE IS ALSO VOICE COMMUNICATIONS AVAILABLE BETWEEN OPERATORS. THESE RADIATION MONITORS HAVE BEEN PLACED ON THE BACK PANELS BECAUSE THEY ARE NOT ESSENTIAL, FREQUENTLY REFERRED TO INSTRUMENTS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-ØØ4.Ø

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 CONTROL ROOM HAS BEEN DESIGNED FOR CENTRALIZED CONTROL FROM THE E PANEL WHERE ALL CRITICAL OPERATIONS AND SURVEILLANCE HAVE BEEN CENTRALIZED. TO DIVERT ATTENTION AWAY FROM THIS AREA AND HAVE OPERATORS DISTRACTED BY ANNUNCIATORS THAT CAN ONLY BE SILENCED BY GOING TO LOCAL PANELS WOULD ADD TO CONFUSION STRESS AND TIME BINDS. THIS IS A CENTRAL PARTY OF THE NMP-1 CONTROL ROOM OPERATING PHILOSOPHY.

VERIFICATION:

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

ALTHOUGH THESE ARE NOT ADJACENT STATIONS, REJECT FLOW IS NORMALLY UTILIZED IN CLEANUP OPERATIONS WHOSE COMPONENTS ARE LOCATED ON PANEL K. THE SITUATION ABOVE IS VERY UNUSUAL AND THERE ARE TWO OR MORE OPERATORS AVAILABLE IN THE CR. THE DISTANCE BETWEEN STATIONS IS NOT SUCH THAT IT CANNOT BE ACCOMPLISHED AS DEMONSTRATED IN THE VALIDATION. THE CONTROLS HAVE BEEN ARRANGED TO ACCOMODATE THE MORE PROBABLE OPERATIONAL SCENARIO.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-ØØ6.Ø

DESCRIPTION:

PROCEDURE N1-SOP-32 REFERS TO STAND-BY LIQUID CONTROL SYSTEM WHEREAS THE CONTROL BOARD EQUIPMENT REFERS TO LIQUID POISON.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THIS IS NOT A PROBLEM FOR THE OPERATORS BECAUSE THEY ARE TRAINED IN THE SYSTEM AND KNOW EACH BY THEIR SEVERAL NAMES. THERE WILL BE A STANDARD ABBREVIATIONS, ACRONYMS, AND EQUIPMENT NAME LIST WHICH WILL BE IMPLEMENTED AND ALL PROCEDURES, LABELS, ETC.,WILL BE STANDARDIZED AS THEY ARE REPLACED.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-ØØ8.Ø

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:

SIMULTANEOUS ACTUATION OF CONTROLS AND MONITORING OF ANNUNCIATORS IS NOT REQUIRED. ALTHOUGH THESE ANNUNCIATORS ARE NOT DIRECTLY ABOVE THE EQUIPMENT, THESE ARE WITHIN CLOSE PROXIMITY. THE EQUIPMENT RELATED TO THESE ANNUNCIATORS ARE NOT CRITICAL TO SAFETY AND OPERATIONS. TECH SPEC LIMITS WOULD NOT BE VIOLATED BECAUSE OF AUTOMATIC ISOLATION EQUIPMENT ON THESE SYSTEMS.ALSO, THE ANNUNCIATOR ACKNOWLEDGE IS FROM THE E PANEL AND NOT FROM THE INDIVIDUAL PANEL.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø1Ø.Ø

DESCRIPTION:

PROCEDURE N1-SOP-29 REFERS TO SUPPRESSION POOL TEMPS WHEREAS THE CONTROL BOARD EQUIP. IS TITLED TORUS WATER TEMP..

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THIS IS NOT A PROBLEM FOR THE OPERATORS BECAUSE THEY ARE TRAINED IN THE SYSTEM AND KNOW EACH BY THEIR SEVERAL NAMES. THERE WILL BE A STANDARD ABBREVIATIONS, ACRONYMS, AND EQUIPMENT NAME LIST WHICH WILL BE IMPLEMENTED AND ALL PROCEDURES, LABELS, ETC.,WILL BE STANDARDIZED AS THEY ARE REPLACED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
Ø		TORUS WATER TEMP
K		TORUS WATER TEMP

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø11.Ø

DESCRIPTION:

PROCEDURE N1-SOP-29 REFERS TO CONTAINMENT PRESSURE WHILE THE CONTROL BOARD EQUIP IS ENTITLED DRYWELL AND TORUS PRESSURES.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1D

EXPLANATION:

THIS IS NOT A PROBLEM FOR THE OPERATORS BECAUSE THEY ARE TRAINED IN THE SYSTEM AND KNOW EACH BY THEIR SEVERAL NAMES. THERE WILL BE A STANDARD ABBREVIATIONS, ACRONYMS, AND EQUIPMENT NAME LIST WHICH WILL BE IMPLEMENTED AND ALL PROCEDURES, LABELS, ETC.,WILL BE STANDARDIZED AS THEY ARE REPLACED.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø12.Ø

DESCRIPTION:

THE PROCEDURE CALLS FOR A SPECIFIC COOLDOWN RATE OF 1ØØ DEG/HR WHICH IS IDENTIFIED USING RCP TEMP. THERE IS NO DEDICATED HEATUP RATE METER.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THERE IS A COMPUTER TREND RECORDER WHICH IS USED WITH AN OVERLAY WHICH GIVES DIRECT INDICATION OF ACCEPTABLE COOLDOWN RATE. OPERATORS ARE TRAINED IN THIS PROCESS AND IT IS STANDARD PROCESS IN STARTUP AND SHUTDOWN. AN INSTRUMENT DEDICATED TO HEATUP RATE WOULD BE USED SO SELDOMLY THAT IT WOULD BE AN EXTRANEOUS PIECE OF EQUIPMENT.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-Ø14.Ø

DESCRIPTION:

THE VLVS FOR REACTOR R PUMP SUCTION AND REACTOR R PUMP DISCHARGE HAVE TO BE HELD IN THE CLOSE POSITION FOR ABOUT 2 MINUTES WHILE VLV SHUTS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

A THROTTLE CAPABILITY IS NEEDED FOR THESE VALVES IN ORDER TO PRECLUDE FLUX EXCURSIONS WHICH RESULT IN REACTOR SCRAMS AT LOW POWER. THESE VALVES ARE OPERATED PRIMARILY IN STARTING UP IN A STAGING PROCESS. THE VALVES ARE OPENED GRADUALLY ALLOWING REACTOR POWER TO REACH A STEADY STATE BEFORE INCREASING RECIRC FLOW TO THE NEXT STAGE. GE HAS ATTEMPTED TO USE SEAL IN FEATURES FOR THESE VALVES UNSUCCESSFULLY. AT POWER THESE VALVES ARE NORMALLY NOT OPERATED.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
F		REACTOR R PUMP 11 DISCHARGE VLV
F		REACTOR R PUMP 11 SUCTION VLV
F		REACTOR R PUMP 12 DISCHARGE VLV
F		REACTOR R PUMP 12 SUCTION VLV
F		REACTOR R PUMP 13 SUCTION VLV
F		REACTOR R PUMP 14 DISCHARGE VLV
F		REACTOR R PUMP 14 SUCTION VLV
F		REACTOR R PUMP 15 DISCHARGE VLV
F		REACTOR R PUMP 15 SUCTION VLV

NINE MILE POINT UNIT 1 HEO

HEO#: VAL-016.0

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: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THIS IS A VERY UNLIKELY CONTINGENCY AND A RESET SW IS NOT DESIRED TO BE AVAILABLE FOR SAFETY REASONS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THIS IS A VERY UNLIKELY CONTINGENCY AND A RESET SW IS NOT DESIRED TO BE AVAILABLE FOR SAFETY REASONS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø13.Ø

DESCRIPTION:

THE TURBINE BYPASS FLOW IS LISTED IN THE VERIFICATION AS HAVING UNSUITABLE RANGES AND DIVISIONS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 3B

EXPLANATION:

ACTUAL FLOW THROUGH TURBINE BYPASS IS NOT A NEEDED FEEDBACK VALUE. THE APPROPRIATE FEEDBACK IS THE NUMBER OF VLVS OPEN. WHEN THE BYPASS OPENING JACK IS OPERATED THE FEEDBACK IS A COMBINATION OF THE NUMBER OF VLVS OPEN AND THE CHANGE IN STEAM PRESSURE, OR RPV PRESSURE, AND TEMP WHICH RESULTS. THIS IS SUFFICIENT AND APPROPRIATE FEEDBACK FOR TASKS USING TURBINE BYPASS FLOW.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø15.Ø

DESCRIPTION:

THE RANGES AND DIVISIONS FOR THE RECIRC FLOW WAS FOUND TO BE UNSUITABLE IN THE VERIFICATION. SOMETIMES RECIRC FLOWS WERE ALSO LISTED IN UNITS OF % IN THE TASK ANALYSIS WHEREAS THE METERS ARE IN UNITS OF LB/HR.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2B

EXPLANATION:

THE APPROPRIATE UNITS FOR RECIRC FLOW IS LB/HR, THIS IS SPECIFIED IN TRAINING AND PROCEDURES. THE PRESENT RANGES ARE SUFFICIENT AND THE DIVISIONS ARE APPROPRIATE FOR THE REQUIRED LEVEL OF ACCURACY.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: VER-021.0

DESCRIPTION:

THE RANGES FOR THESE TEMPERATURES ARE LISTED AS 0-500 DEG F WHILE METERS ARE RANGED 50-300 DEG F. THE DIVISIONS FOR THESE TEMPS ARE LISTED AS 5.0 DEG/F WHEREAS THE METER INDICATES IN DIVISIONS OF 10.0 DEG/F. ON SOME TASKS THE DRYWELL TEMP DIVISIONS WERE LISTED AS 1 DEG/F.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE METER DIVISIONS ARE IN 5 DEG/F. THE INVENTORY IS INCORRECT. AN ACCURACY OF 5 DEG/F IS SUFFICIENT FOR TASKS ASSOCIATED WITH THIS METER. THE RANGES FOR THESE METERS ARE SUFFICIENT FOR ALL EMERGENCY TASKS. THE VALUE OF 500 WAS PROVIDED IN THE TASK ANALYSIS BECAUSE THIS WAS THE END POINT PROVIDED IN THE GRAPHS OF THE EOP GUIDELINE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		DRYWELL TEMP
		SUPPRESSION POOL TEMP
		TORUS AMBIENT TEMP

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø24.Ø

DESCRIPTION:

THE MAIN STEAM LINE DRAIN VLVS ARE LISTED AS UNAVAILABLE IN THE VERIFICATION.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-NORMAL

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

ALTHOUGH THESE ARE NOT IN THE PRIMARY AREA, THE PUSHBUTTON VLVS ARE ON THE ADJACENT BACKPANEL. NORMALLY, THESE VLVS ARE USED IN SHUTDOWN OPERATIONS ONLY AND IN THE EMERGENCY PROCEDURE AS ONE OF SEVERAL POSSIBLE PATHS FOR STEAM REJECTION. THEIR LOCATION IS APPROPRIATE FOR THESE USES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		MAIN STEAM LINE DRAIN VLVS

NINE MILE POINT UNIT 1 HEO

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 OPERATOR DOES NOT NEED 1 PSI INCREMENTS IN ORDER TO PERFORM TASK. IF THIS WERE DESIREABLE BY THE OPERATOR, HE COULD PUT RPV PRESS ON THE COMPUTER (WHICH IS A PERMANENT FEATURE ON THE SPDS) AND GET ACCURATE READINGS. A SCALE MARKED TO MEET DIVISIONS OF 1.0 PSI WOULD BE VERY CLUTTERED OR TWO SCALES WOULD BE REQUIRED. THESE ARE NOT DESIREABLE ALTERNATIVES.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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: REJECT

RISK CATEGORY: NOT NEEDED

EXPLANATION:

IF LEVEL IS BELOW 1.25 FT, THE SUPPRESSION POOL LEVEL IS CONSIDERED TO BE ZERO. FOR GREATER THAN 13.75 FEET, THE LEVEL INDICATIONS CAN BE OBTAINED FROM DRYWELL LEVEL INSTRUMENTATION. THE INDICATED SCALE RANGE IS ADEQUATE FOR SUPPRESSION POOL LEVEL, FOR VALUES BEYOND THIS RANGE OTHER INSTRUMENTATION IS DESIREABLE TO INCLUDE OTHER PARAMETERS.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø39.Ø

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:

NINE MILE POINT WAS DESIGNED WITH THESE FLOWS IN LB/HR. THIS IS THE APPROPRIATE UNIT FOR FEEDWATER FLOW AND IS APPROPRIATE FOR OPERATOR TASKS AS SPECIFIED IN PROCEDURES AND TRAINING. RANGES FOR FEEDWATER FLOW ARE ADEQUATE.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
		FEEDWATER FLOW

NINE MILE POINT UNIT 1 HEO

HEO#: CS-ØØ9.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

IN AN EMERGENCY SITUATION THESE PUMPS AUTO START AND THEREFORE FEEDBACK RELATIONSHIP IS NOT IMPORTANT. IT IS IN A GOOD CONFIGURATION FOR VERIFICATION OF OPERATION FOR THE STRING IN LEFT TO RIGHT, THIS IS THE MORE IMPORTANT CONSIDERATION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
4K1-1		CORE SPRAY PUMP 111 AMPS
4K1-2		CORE SPRAY 111 HDR PRESS
4K1-3		CORE SPRAY TOP PUMP 111
4K17		CORE SPRAY DISCHARGE IV 111 CONTROL
4K18		CORE SPRAY DISCHARGE IV 112 CONTROL
4K19		CORE SPRAY DISCHARGE IV 121 CONTROL
4K2-1		CORE SPRAY PUMP 121 AMPS
4K2-2		CORE SPRAY 121 HDR PRESS
4K2-3		CORE SPRAY TOP PUMP 121
4K2Ø		CORE SPRAY DISCHARGE IV 122 CONTROL
4K3-1		CORE SPRAY PUMP 112 AMPS
4K3-2		CORE SPRAY 112 HDR PRESS
4K3-3		CORE SPRAY TOP PUMP 112
4K4-1		CORE SPRAY PUMP 122 AMPS
4K4-2		CORE SPRAY 122 HDR PRESS
4K4-3		CORE SPRAY TOP PUMP 122

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø14.Ø

DESCRIPTION:

SOME OF THE INDIVIDUAL ROD POSITION READOUTS ARE NOT DISPLAYED. EITHER THE BULB IS OUT OR THE PROJECTION WHEEL IS DAMAGED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THERE ARE REDUNDANT INDICATIONS FOR THE ROD POSITION. THIS IS A UNIQUE AND REDUNDANT SYSTEM WHICH HAS BEEN INSTALLED AS AN OPERATOR AID IN CORE/FUEL MANAGEMENT. OTHER INDICATIONS PROVIDING THIS INFORMATION INCLUDE COMPUTER PRINTOUTS AND ROD BUTTON LIGHTS. THERE ARE WORK REQUESTS WHICH ARE ALREADY IN PLACE TO RESOLVE THIS CONDITION. THESE ARE CORRECTED ON A PERIODIC BASIS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
F		INDIVIDUAL ROD POSITION DIGITAL READOUT

NINE MILE POINT UNIT 1 HEO

HEO#: CS-Ø53.Ø

SCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2D

EXPLANATION:

THE CONVENTION IS TO HAVE LIGHTS FOR EACH OF THE VLVS. THERE IS ONE GREEN TO INDICATE BOTH VLVS ARE CLOSED AND THE TWO REDS INDICATE SINGULARLY EACH IS OPEN. THIS IS SECONDARY INDICATION FOR THE OPERATOR NORMALLY THEY USE PRIMARY VENT MIMIC FOR THIS INFO. THE MEANING OF THE THESE LIGHTS IS IN ACCORDANCE WITH THE CONVENTIONS ESTABLISHED IN THE HF DESIGN MANUAL.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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: REJECT

RISK CATEGORY: 2C

EXPLANATION:

THIS PANEL IS NOT NORMALLY MANNED. LIGHTING CONDITIONS ARE WITHIN THE BOUNDRY REGION OF ACCEPTANCE (FOR THE ACCURACY OF THE INSTRUMENT USED) FOR EMERGENCY LIGHTING CONDITIONS. VIEWING DISTANCES UNDER USE WOULD BE OPTIMUM SINCE THE PANEL IS LESS THAN 4 FT. IN WIDTH. VALUES FROM DISPLAYS AT THE PANEL ARE READABLE AT THE EXPECTED VIEWING DISTANCES. THERE IS ALREADY SOME GLARE ON THE INSTRUMENTS ON THE RSP, INCREASING THE LIGHT LEVEL WOULD EXACERBATE THE SITUATION.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: ENV-ØØ2.Ø

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:

THIS PANEL IS NOT MANNED DURING PLANT OPERATION. PERSONNEL WHO MONITOR PANEL WILL NOT REMAIN IN THE AREA LONGER THAN 4 HRS. THE ONLY TIME THE PANEL WILL BE MANNED WILL BE TO SHUTDOWN THE PLANT AFTER WHICH THE NOISE LEVEL WILL BE WELL WITHIN THE ACCEPTABLE LIMITS OF NOISE FOR OPERATING STATIONS. PERSONNEL IN THIS AREA OF THE PLANT ARE EXPECTED TO WEAR PROTECTIVE EQUIPMENT.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: ENV-ØØ3.Ø

DESCRIPTION:

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

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 3B

EXPLANATION:

THESE PANELS ARE NOT MANNED DURING NORMAL PLANT OPERATION. THEY WOULD ONLY BE NAMMED UNDER EXTREME EMERGENCY CONDITIONS AND ONLY FOR A SHORT PERIOD OF TIME. THE COMFORT ZONE WAS DEVELOPED FOR A CONSTANTLY MANNED ENVIRONMENT. THE MEASURES AT BOTH REMOTE SHUTDOWN PANELS ARE WITHIN THE WINTER/SUMMER TOLERANCE ZONES ESTABLISHED FOR OSHA WORK STANDARDS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø1Ø.Ø

DESCRIPTION:

SOME CONTROLS OF THE ELEC. SYST. ARE MIRROR IMAGED BETWEEN PANELS A4 AND A5. THIS COULD CAUSE MISACTIVATION WITH RESPECT TO THE NORMAL/RESERVE BUSES. THE NORMAL BUS CONTROL FOR PB11; PB13; IS ON THE LEFT OF THE NORMAL RESERVE PAIR WHILE FOR PB12 IT IS ON THE RIGHT. THIS MIGHT BE ALLEVIATED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE CONTROLS ACCURATELY REFLECT THE LAYOUT OF THE ACTUAL BREAKERS. THE MIMIC ARRANGEMENT IN CONJUNCTION WITH THE MIRROR IMAGERY FACILITATE THE OPERATORS ABILITY TO VISUALIZE THE LINES BEING GOVERNED BY THE BREAKERS AND TO LOCATE THE CORRESPONDING ELEMENTS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
A1		ANNUNCIATOR WINDOW A1-24
A4		ELECTRICAL SYS
A5		ELECTRICAL SYS
A5		ELECTRICAL SYS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-Ø95.Ø

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:

THERE ARE ADJACENT METERS FOR THESE PARAMETERS OR K PANEL FOR EASIER COMPARISONS IN THE OPERATING PRESSURE RANGES. BEYOND OPERATING RANGES, THERE ARE NO SEPERATE TORUS INDICATIONS AS THESE ARE BY DESIGN REDUNDENT INDICATIONS (NO SEPERATE SPRAYS OR OTHER OPERATIONS CAN EFFECT PRESSURE AND THESE ARE COUPLED).

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-181.Ø

DESCRIPTION:

ALARM POINTS ARE GENERALLY NOT IDENTIFIED ON RECORDERS.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 3B

EXPLANATION:

THE COMPUTER PROVIDES ALARM SETPOINTS AND INFORMATION OF ALARM SETPOINTS IS NOT OF INTEREST TO THE TREND DEVICES.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		RECORDERS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-221.Ø

DESCRIPTION:

THE ANNUNCIATOR WINDOWS OF PANELS 1F AND 2F ARE (FOR THE MOST PART) MIRROR-IMAGED WITH THOSE OF PANELS 4F AND 3F, RESPECTIVELY.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 4D

EXPLANATION:

THE MIRROR IMAGRY OF THESE PANELS FACILITATE THE OPERATORS ABILITY TO LOCATE WINDOWS AND EVALUATE CONDITIONS. THESE ARE VITAL ANNUNCIATORS AND COME IN PAIRS DURING AN ACTUAL ALARM CONDITION. THE PRESENCE OF ONE OR MORE OF THESE ALARMS PRESENTS A PATTERN WHICH IS THEN COMPARED TO THE OTHER SIDE OF THE "MIRROR" TO VALIDATE THE PRESENCE OF AN ACTUAL ALARM CONDITION VS. A HALF SCRAM SIGNAL. THERE ARE NO MIRRORED CONTROLS WHICH COULD PRESENT A PROBLEM IN THIS ARRANGEMENT.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
1F		ANNUNCIATOR WINDOWS
2F		ANNUNCIATOR WINDOWS
3F		ANNUNCIATOR WINDOWS
4F		ANNUNCIATOR WINDOWS

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-231.0

DESCRIPTION:

THERE ARE INSTANCES OF ALARM 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:

THE SETPOINT INFORMATION COULD BE USED TO IDENTIFY THE PARAMETER IN ALARM BY CHECKING THE METER INDICATIONS. HOWEVER, ALL MULTIPLE ALARM WINDOWS HAVE COMPUTER ALARM SETPOINTS WHICH ARE PRINTED WHEN ONE ALARM COMES IN IDENTIFYING THE SPECIFIC PARAMETER IN ALARM. THIS METHOD IS EMPLOYED BY THE OPERATORS THUS ELIMINATING THE NEED FOR CLUTTERING UP THE TILE LEGEND WITH SETPOINT INFO.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-232.0

DESCRIPTION:

THERE ARE MANY INSTANCES OF MULTIPLE CHOICE WINDOWS. SOME ENCOMPASS TWO ALARMS SUCH AS L1-28; DRYWELL TORUS TEMP HIGH/COOLING FAN TRIP VIB; OTHERS CONTAIN A MULTIPLICITY OF HIGH/LOW OR LEVEL/PRESS./TEMP; OTHERS SHOW A CHOICE BETWEEN SYSTEMS AS L1-7; INST. AIR COMP 11-12-13 TRIP.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2E

EXPLANATION:

WHEN THESE ALARMS COME IN , THE PARTICULAR INPUT IS EITHER EVIDENT TO THE OPERATOR OR THE INFO IS OBTAINED FROM THE COMPUTER PRINTOUT. ALL MULTIPLE INPUT ALARMS HAVE COMPUTER ALARM SETPOINTS WHICH ARE PRINTED WHEN THE ALARM COMES IN, IDENTIFYING THE SPECIFIC PARRAMETER IN ALARM.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-238.Ø

DESCRIPTION:

NO FIRST-OUT FEATURE OR DUAL RESET IS PROVIDED.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: NOT NEEDED

EXPLANATION:

A FIRST OUT CAPABILITY IS PROVIDED BY THE COMPUTER. DUAL RESET IS NOT NEEDED FOR APPROPRIATE RESPONSE.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: OCS-239.Ø

DESCRIPTION:

ALARM WINDOWS DO NOT REFLASH FOR SECOND ALARM INPUT.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: NOT NEEDED

EXPLANATION:

MULTIPLE INPUT WINDOWS ARE DESIGNED SO THAT IT IS UNLIKELY THAT MORE THAN ONE INPUT WILL BE INCOMING. IF THIS CONDITION DOES OCCUR A SEPARATE COMPUTER ALARM IS USED TO ALERT THE OPERATOR TO THE SECOND ALARM. THIS REDUNDANT SYSTEM IS SUFFICIENT TO DEAL WITH THE UNLIKELY SITUATION IN QUESTION.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
ALL		ALARM WINDOWS

HEO#: SPD-ØØ1.Ø

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:

VIDEO DISPLAY MENU IS PROVIDED BY ONE OF THE FUNCTION KEYS. THIS MENU PROVIDES THE INPUT NO. AND NAME OF THE DISPLAY FOR SPDS. THE OPERATOR TYPES IN THE DESIRED DISPLAY NUMBER FROM THE SCREEN TO OBTAIN THE DISPLAY. THIS IS NOT A COMPLEX SET OF OPERATIONS. MOST OF THE TIME ONLY A SINGLE [OVERVIEW] DISPLAY WILL BE LEFT ON FOR CONTINUOUS USE.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-Ø1Ø.Ø

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: REJECT

RISK CATEGORY: 1C

EXPLANATION:

PAGE NUMBERS ARE NOT USED IN THE OPERATION OF THE SPDS AND A LOGICAL ORDERING OF DISPLAY IS NOT NEEDED. THESE ARE USED FOR MODIFICATION PURPOSES ONLY. DISPLAYS ARE IDENTIFIED BY NAME, THIS IS A MORE APPROPRIATE IDENTIFYING TOOL.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

HEO#: SPD-Ø13.Ø

DESCRIPTION:

THERE IS EXTRANEOUS INFO ON THE UPPER LEFT CORNER OF THE DISPLAYS (X-COORDINATE; Y-COORDINATE; SCREEN NO).

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 1C

EXPLANATION:

THE INFO IS SMALL, UNINTRUSIVE, AND CAN BE REMOVED FROM THE DISPLAY FOR VIEWING PURPOSES. THIS INFORMATION SERVES AS A SECONDARY IDENTIFIER, IT CAUSES NO PROBLEM ON THE DISPLAY.

VERIFICATION:

HEO#: VER-ØØ2.Ø

DESCRIPTION:

THE ACOUSTIC MONITOR WHICH IS USED TO IDENTIFY IF THE SRV IS OPEN IS NOT WITHIN THE PRIMARY CONTROL AREA.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 3A

EXPLANATION:

THIS IS ONLY ONE OF SEVERAL MEANS TO IDENTIFY OR VERIFY AN OPEN SRV. THE TAILPIPE TEMP ON THE COMPUTER ALONG WITH THE SEVERAL ANNUNCIATORS IN THE CR ARE THE PRIMARY MEANS. ALSO THE COMPUTER PRINTOUT IDENTIFIES INDIVIDUAL VALVE INDICATIONS.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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:

ALTHOUGH NO DEDICATED RECORDER IS AVAILABLE, THE OPERATORS WHEN PERFORMING THIS TASK PRESENT THE INFO ON A COMPUTER TREND RECORDER. THE COMPUTER TREND DATA IS ADEQUATE FOR THE INFORMATION REQUIREMENT.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

HEO#: VER-Ø14.Ø

DESCRIPTION:

RANGE FOR THE RPV AND SUPPRESSION POOL TEMP WAS FOUND TO BE UNSUITABLE IN THE VERIFICATION. OPERATORS REPORTED A NEED FOR A RANGE OF Ø-6ØØ DEG/F WHEREAS THE INDICATORS PROVIDE A 5Ø-6ØØ DEG/F RANGE.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 1B

EXPLANATION:

THE RANGE PROVIDED IS SUFFICIENT FOR SUPPRESSION POOL TEMPERATURE. THE TEMPERATURE OF THE SUPPRESSION POOL RARELY GOES AS LOW AS 5Ø DEG- AND COULD NEVER GO DOWN TO ZERO DEGREES. THERE IS NEVER ICE IN THE SUPPRESSION POOL.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
K	2K9-1	SUPPRESSION POOL TEMP

NINE MILE POINT UNIT 1 HEO

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:

A SCALE OF INCHES IS APPROPRIATE. IT ALLOWS FOR MEASUREMENTS IN WHOLE NUMBERS, A SCALE IN FEET WOULD REQUIRE THE USE OF FRACTIONS. THIS SCALE IS ALSO MARKED TO PROVIDE A RAPID IDENTIFICATION BY THE OPERATOR ON THE STATUS OF THE PARAMETER.

VERIFICATION:

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

NINE MILE POINT UNIT 1 HEO

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: REJECT

RISK CATEGORY: 3A

EXPLANATION:

ABOVE 4 PSI, THE DRYWELL PRESSURE WILL BE UTILIZED FOR THIS INDICATION. TORUS PRESSURE RANGE OF Ø-4 PSI PROVIDES AN ACCURATE LOW RANGE PRESSURE INDICATION.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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 AND RANGES FOR CORE SPRAY FLOW AND FEED WATER FLOW ARE SUFFICIENT FOR THE TASKS ASSOCIATED WITH THIS METER.THE RANGES ARE ALSO SUITABLE. THE VALUES PROVIDED IN THE TASK ANALYSIS WERE ESTIMATES AND INAPPROPRIATE FOR THE TASKS.

VERIFICATION:

Panel ID #	Equipment ID #	Equipment Name
	IF5-3	FEEDWATER FLOW
K	4K3-2	CORE SPRAY FLOW

[illegible]

[illegible]

[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

NINE MILE POINT UNIT 1 HEO

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:

THESE SWITCHES ARE NOT IN THE PRIMARY OPERATING AREA, THEY ARE ON THE ADJACENT BACKPANEL. THEIR PRIMARY USE IS IN TESTING THE SCRAM CHANNELS SIGNALS BUT CAN BE USED IN A FAILURE TO SCRAM ACCIDENT. THE BACKPANEL IS WITHIN VERBAL COMMUNICATIONS OF THE PRIMARY AREA. THIS IS AN ACCEPTABLE AND DESIREABLE LOCATION FOR THE SCRAM TEST SWITCHES.

VERIFICATION:

NINE MILE POINT UNIT 1 HEO

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: REJECT

RISK CATEGORY: 2A

EXPLANATION:

CORE SPRAY AND CONTAINMENT SPRAY ARE NOT THROTTLEABLE AND ARE NOT NEEDED TO BE THROTTLEABLE. THE OPERATOR CAN ADEQUATELY ADJUST FLOW BY TURNING SELECTED PMPS ON AND OFF. THE FUNCTION OF SPRAY ADJUSTMENT IS SATISFIED BY THE EXISTING EQUIPMENT.

VERIFICATION:

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

[illegible]

[illegible]
[illegible]
[illegible]

[illegible]

[illegible]
[illegible]
[illegible]

HEO#: VER-042.0

DESCRIPTION:

THE RANGE AND DIVISIONS FOR THE DRYWELL TEMP WERE LISTED AS UNSUITABLE IN THE VERIFICATION. TASK REQUIREMENTS WERE 212 - 550 DEG F, 5 DEG; METER INDICATIONS ARE 50 -300 DEG F, 10 DEG.

ASSESSMENT/RESOLUTION CATEGORY: FUNCTIONAL-EMERGENCY

DISPOSITION: REJECT

RISK CATEGORY: 2A

EXPLANATION:

ALL OPERATOR ACTIONS IN RESPONSE TO DRYWELL TEMPERATURES ARE PERFORMED PRIOR TO 300 DEG F. IF THE DRYWELL TEMP IS IN EXCESS OF THIS VALUE ACCURATE MEASUREMENT OF THE PARAMETER IS IN QUESTION.

VERIFICATION:

APPENDIX A

PROGRAM TEAM MAKE-UP

8507050261

Table A-1

Team for NMP-1 Detailed Control Room Design Review (including NMP-1 Shift Operations Representative(s))

Program Representation	Experience/Background
NMPC Program Manager Licensing/Systems Engineering	Licensing Engineer Cybernetics
Design Eng. PROGRAM MANAGER MAKE-UP	Instrumentation & Controls Design Engineer
[illegible]	Training Supervisor
Operations Technical Support	Technical Support Supervisor
Operations Technical Support	Sr. Technical Assistant
Operations - NMP-1	Operations Supervisor
Operations - NMP-1	Asst. Operations Supervisor
Operations - NMP-2	Station Shift Supervisor
GE Program Manager	Human Factors Specialist
GE Management	Vice President, ARC
ARC Human Factors Engineer	Human Factors Specialist
ARC Human Factors Engineer	Human Factors Specialist
ARC Human Factors Engineer	Human Factors Specialist

Table A-1

Program Team for NMP-1 Detailed Control Room Design Review
(Excluding NMP-1 Shift Operations Representatives)

Name	Program Representation	Experience/Background
J. L. Benson	NMPC Program Manager Licensing/Systems	Licensing Engineer Cybernetics
D. F. Bernfeld	Design	Instrumentation and Controls Design Engineer
M. Goldych	Training	Training Supervisor
R. G. Randall	Operations Technical Support	Technical Support Supervisor
H. Barrett	Operations Technical Support	Sr. Technical Assistant
J. C. Aldrich	Operations - NMP-1	Operations Supervisor
D. J. Matthews	Operations - NMP-1	Asst. Operations Supervisor
M. J. Colomb	Operations - NMP-2	Station Shift Supervisor
D. F. Taylor	ARD Program Manager	Human Factors Specialist
R. L. Kershner	ARD Management	Vice President, ARD
R. L. Horst	ARD Human Factors Engineer	Human Factors Specialist
R. C. Munson	ARD Human Factors Engineer	Human Factors Specialist
R. Klein	ARD Human Factors Engineer	Human Factors Specialist

NIAGARA MOHAWK POWER CORPORATION

... Detailed Control Room Design Review

Cybernetic Systems, San Jose State University

Chemical Engineering

...ersity of Washington

... graduate engineering and special management courses ta...

... work and school related publications and presentations

... Supervisor

... Mohawk Power Corporation ... Support Supervisor

... Nuclear Technology

... Engineer: ... all NUREG-0737 ... Item for application ... Nine Mile Point Unit ... individual ... the Detailed Control Room Design ... Parameter Display System, Emergency Operating ... Technical Support Center. Assisting ... with other licensing programs, as needed for ... internal and external regulatory/safety ... preparing licensing responses to various ... safety evaluations, including 10CFR50.59, ... and 10CFR21 determinations and ... company ... various licensing issues. Represent NMPC at the ... group ... representative and coordinate all ... and ... the various ... covered ... Also manage ... funding and ... this group. Assist ... Nuclear Engineering and Licensing on special programs ... and broad experience is required, such as the ... Nine Mile Point Unit 2 ... Also ... work related to special cybernetic ... developing technology ... programs ... utilities/organizations.

... Human Factors Specialist

NIAGARA MOHAWK POWER CORPORATION

RESUME OF JOHN L. BENSON

EDUCATION:

1984 M.S., Cybernetic Systems, San Jose State University

1953 B.S., Chemical Engineering
University of Washington
Many graduate engineering and special management courses taken
Many work and school related publications and presentations authored

EXPERIENCE:

1984 to Present: Niagara Mohawk Power Corporation
Nuclear Technology
Syracuse, NY

Senior Nuclear Engineer: Program managing all NUREG-0737, Supplement 1 items for application toi Nine Mile Point Unit 1. This includes principally the Detailed Control Room Design Review, Safety Parameter Display System, Emergency Operating Procedures and Technical Support Center. Assisting Lead Engineer, Licensing, with other licensing programs, as needed. This includes handling internal and external regulatory/safety auditing programs, preparing licensing responses to various subjects, helping with safety evaluations, including 10CFR50.59, 10CFR50.55e and 10CFR21 determinations, and developing company positions on various licensing issues. Represent NMPC at the BWR Owners Group as primary representative and coordinate all company activities and positions on the various topics covered by the group. Also manage all company funding and authorizations for work by this group. Assist the Vice President, Nuclear Engineering and Licensing on special programs where independence and broad experience is required, such as the NRC mandated Nine Mile Point Unit 2 QA audit in 1984. Also carrying out R&D work related to special cybernetic aspects of assigned work and developing technology interchange programs with pertinent overseas utilities/organizations.

...n Corporation, Campbell, CA
...ing and Environmental Services

...er: Managed all Quadrex licensing programs and personnel, ...ting activities for clients and support for in-house ...t. This incorporated offerings in about 10 different programs, including technical documentation, systems ...is, regulatory affairs, issue management, nuclear safety, ...ment information systems, risk assessment, and project ...ment activities. Business extended to all electric power ...ies worldwide. In this capacity, was responsible for all development, marketing and sales activities, proposals, administration, project management, subcontracting, client ...nation, and anything else needed to complete jobs to the ...action of clients. Was also responsible for profit/loss, ... ranked at 35%, administration, and ... the restructuring. A broad and systematic ...ing of the logic and tenets of ethnological ...in global context and societal environments was ...ed.

... Licensing Corp., San Jose, CA
..., Planning, Licensing

...provided all licensing and safety support work for ...projects with staff of up to 10 experienced senior ...lists in each organization of licensing ... ...tatic, restriction of customer/regulatory issues, ...ry interactions with AEC and utilities to satisfy ...ments of licensees. Program managed safety analysis work ...of diverse engineering/analytical specialists. Complete ...ering of overseas and U.S. nuclear facilities was ...in advising eye separate areas, such as difficult and ...in Japan. Position strengthened growth and appreciation of ...ences, business and technological differences and their ...cultural roots.

... on 15th Campaign

...ted 12 managers in contacting business, manufacturing, professional organizations throughout California to promote ...ng against anti-nuclear campaign. Worked with other ...itical organizations and obtained money, made public and ...speeches, and generated support literature. Activities ...ed previous political experience, included being ...ed to a small public office.

1980 - 1983 Quadrex Corporation, Campbell, CA
Licensing and Environmental Services

Manager: Managed all Quadrex licensing programs and personnel, including activities for clients and support for in-house projects. This incorporated offerings in about 10 different major programs, including technical documentation, systems analysis, regulatory affairs, issue management, nuclear safety, management information systems, risk assessment, and project management activities. Business extended to all electric power utilities worldwide. In this capacity, was responsible for all program development, marketing and sales activities, proposals, client negotiations, project management, subcontracting, client coordination, and anything else needed to complete jobs to the satisfaction of clients. Was also responsible for profit/loss, hiring (staffing peaked at 35), administration, and organizational structuring. A broad and systematic understanding of the impact and risks of technological enterprises on global business and societal environments was also important.

1976 - 1980 General Electric Company, San Jose, CA
International Reactor Licensing

Manager: Provided all licensing and safety support work for GE's overseas projects with staff of up to 10 experienced senior engineers. This included preparation of licensing documentation, resolution of customer/regulatory issues, and regulatory interactions with AEs and utilities to satisfy requirements and concerns. Program managed safety analysis work of many diverse engineering/analytical specialists. Complete understanding of overseas and U.S. nuclear regulations was required for advising overseas licensees such as Hitachi and Toshiba in Japan. Position heightened a growing appreciation of international business and technological differences and their socio-cultural roots.

1976 <u>Committee for "No on 15" Campaign</u>

Directed 12 GE managers in contacting business, manufacturing, and professional organizations throughout California to promote support against anti-nuclear campaign. Worked with other political organizations and obtained money, made public and radio-TV speeches, and generated support literature. Activities complemented previous political experience, included being elected to a small public office.

[illegible] Electric Company, San Jose, CA
[illegible] Reactor Licensing

[illegible] Engineer and Manager: Managed licensing services to [illegible] plant customers with license revisions for equipment [illegible] new analysis developments, [illegible] with up to 12 senior engineers and managers. Advised [illegible] on safety-related plant incidents. Assessed [illegible] new nuclear power plant operating experience [illegible] considerable creativity in solving many complex [illegible] licensing problems. Also required extension of understanding of the public as their concerns and the [illegible].

[illegible] Nuclear Corp., A General Electric Company

[illegible] reactors

[illegible] and Supervisor: Provided technical support for [illegible] reactor operation [illegible] as [illegible] technical activities affecting operations. [illegible] process [illegible] optimum [illegible] and monitor [illegible] performance to nuclear safety [illegible] performed equipment/system tests including [illegible] conducted analyses, and supervised [illegible] programs.

[illegible] Affiliations

Registered Nuclear Engineer, State of California
American Nuclear Society
Society for General Systems Research

1969 - 1976 General Electric Company, San Jose, CA
Operating Reactor Licensing

Principal Engineer and Manager: Managed licensing services for operating plant customers with license revisions for equipment changes, new analysis development, backfits and reloads with staff of up to 12 senior engineers and managers. Advised customers on safety-related plant incidents. Assessed design impact of new nuclear power plant operating experience and exercised considerable creativity in solving many complex, precedent setting problems. Job also required extension of technical understanding to the public as their concerns and the media spotlight intensified.

1956 - 1969 Douglas United Nuclear Corp. & General Electric Company
Handford, WA
Process Engineering, NPR, DR, KE reactors

Engineer and Supervisor: Provided technical support for staff of 4 to nuclear reactor operating organization and was interfaced for all technical activities affecting operations. Assisted operators with process difficulties, achieving optimum system performance, and monitored conformance to nuclear safety requirements. Also performed equipment/system tests, including startup of new reactors, conducted analyses, and supervised technical development programs.

Professional Affiliations

Registered Nuclear Engineer, State of California
Member of American Nuclear Society
Member of Society for General Systems Research

NIAGARA MOHAWK POWER CORPORATION

RESUME OF DAVID F. BERNFELD

EDUCATION:

October 1983	BWR Owners Group Control Room Survey Workshop
	Instrument Society of America Courses taken: Automatic Process Control for Engineers Principals and Control of Industrial Processes Selection of Control Valves and Other Final Control Devices
1972 - 1974	Onondaga Community College Thermodynamics I & II Industrial Instrumentation Fluid Mechanics - 16 credit hours
June 1967	Erie County Community College Buffalo, NY
September 1983	Iroquois Central High School Elma, NY
September 1983	General Physics - Applied Human Factors in Power Plant Design and Operation - Seminar

WORK EXPERIENCE:

	Niagara Mohawk Power Corporation Nuclear Design Department Mechanical Engineering
1982 to Present	Project Designer: Duties included design and/or specification of electronic control systems, instrumentation, and final control devices. Design and specification of control panel and instrument racks for condensate demineralizer system. Supervision of all design changes to plant P & ID's and main control panels. Other duties include standards development, equipment qualification and upgrading existing systems in order to improve reliability or maintainability, supervision of Junior Design Personnel.

Engineering
Mechanical Design Department

1978 - 1982	Designer B&C: Specification of and installation design of process instrumentation for nuclear and fossil fueled power generating plants. Worked extensively in the development of control schemes, logic diagrams, P & ID's, and a control panel for new radwaste solidification systems. Participated in various TMI modification designs for the nuclear power plant. Supervision of Junior Design Personnel.
1974 - 1978	Designer A: Prepared engineering drawings of nuclear and fossil fuel power plant equipment installations, piping, instrumentation, and P & ID's. Developed a specification for instrument installation on off-gas and radwaste solidification system additions for the nuclear power plant.
1967 - 1974	Prepared engineering drawings from sketches and layouts for various process systems in nuclear and fossil fueled power generating plants.
1968 - 1971	(Military Service)

NIAGARA MOHAWK POWER CORPORATION

RESUME OF MICHAEL SOLDYCH

emistry
University of New York at Albany
duate Credit Hours
ion, BS from University of New York College at Oswego

State Permanent Certification to Teach
try, Physics, and General Science

Regulatory Commission Senior Operator License

Training - Physics Group, charged with implementing
ing process necessary to achieve and maintain state of Nuclear
erations accreditation

Nine Mile Point Unit 1 Simulator: Responsible for
ng acceptance testing; initiating operator training
procedures; simulator instructor guidelines and
ying; establishing a method of simulator revision.
ject on management, "configuration management;" acting
ive briefer at the Joint News Center during a
gency Classification; and participating in the site
nd company site the Nine Mile Point Unit 1 Detailed
Room Design Review (a Human Factors Engineering study)
ed by the NRC).

Unit Training Supervisor - Nine Mile Point Unit 1
tions Training. Participated in or coordinated training
ncrease requalification in plant design and safety
ms, plant modifications, reactor theory, and
odynamics; coordinated Niagara Mohawk participation with
Control Room Operator Task Analysis; conducted NRC Systems
ing or courses Nuclear Engineering and Licensing, for
firefighters, and for unlicensed nuclear operators;
pated as a technical assistant to the Corporate
ency Director at the Emergency Operations Facility during
an Emergency Classification.

istry and Radiation Protection Technician A at the Nine
Point Unit 1 Nuclear Station

NIAGARA MOHAWK POWER CORPORATION

RESUME OF MICHAEL GOLDYCH

EDUCATION:

1968	B.S. Chemistry State University of New York at Albany 36 Graduate Credit Hours Education, State University of New York College at Oswego
1973	New York State Permanent Certification to Teach Chemistry, Physics, and General Science
1982	Nuclear Regulatory Commission Senior Operator License

EMPLOYMENT:

1984 to Present	Supervisor: Training Analysts Group, charged with implementing the training process necessary to achieve Institute of Nuclear Power Operations Accreditation
May 1984 to November 1984	Supervisor - Nine Mile Point Unit 1 Simulator: Responsible for coordinating acceptance testing; initiating operator training in emergency procedures; simulator instructor scenarios and instructor guides; establishing a method of simulator revision and modification management, "Configuration Management;" acting as a technical briefer at the Joint News Center during a Nuclear Emergency Classification; and participating in the site committee to complete the Nine Mile Point Unit 1 Detailed Control Room Design Review (a Human Factors Engineering study required by the NRC).
December 1980 to May 1984	Assistant Training Supervisor - Nine Mile Point Unit 1 Operations Training: Participated in or coordinated training for operator requalification in plant design and safety systems, plant modifications, reactor theory, and thermodynamics; coordinated Niagara Mohawk participation with INPO Control Room Operator Task Analysis; conducted BWR Systems training or Syracuse Nuclear Engineering and Licensing, for nuclear fire-fighters, and for unlicensed nuclear operators; participated as a technical assistant to the Corporate Emergency Director at the Emergency Operations Facility during a Nuclear Emergency Classification.
Sept. 1980 to Dec. 1980	Chemistry and Radiation Protection Technician A at the Nine Mile Point Unit 1 Nuclear Station

1969 - 1980	Teacher at Oswego High School; Physics, Chemistry, Physical Sciences, Chemistry and the Environment, Technology and the Future, and Algebra; Coach - Varsity Football, Junior Varsity Wrestling.
	President, Oswego Classroom Teachers Association, 1973-78; directed grievance processing, contract administration, and collective bargaining for the 320 member local; Manager, self-insured Teacher Dental Insurance Program, 1976-1980; Guest Lecturer at several Graduate Education and Educational Administration classes at SUNY College at Oswego; SUNY College at Oswego Task Force on Competency Based Teacher Education (1974-1980, Chair 1975-76); New York State United Teachers College and University Task Force, 1976-77.

NIAGARA MOHAWK POWER CORPORATION

[illegible] OF ROBERT E. TARDALL

[illegible]

[illegible] College of Technology

[illegible] Mechanical Engineering

[illegible]

[illegible] technical support: Responsibilities included [illegible] engineering [illegible] including [illegible] design [illegible] and support [illegible]

[illegible] Atomic Energy Company
[illegible], MA

Shift Technical Advisor (Yankee Rowe). STA on shifts, [illegible] guidance and training of other STA's, along with [illegible] responsibilities listed under Reactor Engineer. Taught [illegible] dynamics, R. Theory, Fluid Flow, and Heat Transfer for [illegible] Reports.

NIAGARA MOHAWK POWER CORPORATION

RESUME OF ROBERT G. RANDALL

EDUCATION:

1969	Greenville Central High School Greenville, NY Regents Diploma
1973	Clarkson College of Technology Potsdam, NY Bachelor of Mechanical Engineering
1973	New York State E.I.T. Certification
1975	Babcock and Wilcox Simulator 1 week
1979	R.O. Certified (not licensed) Yankee Rowe Course Average - 94% 16 weeks
1980	Surry Simulator 3 weeks
1980	Fully Qualified Shift Technical Advisor Yankee Rowe
1982	NMPC Management Training 1 week

EMPLOYMENT:

February 1981 to Present — Niagara Mohawk Power Corporation
Syracuse, NY

Supervisor, Technical Support: Responsibilities included form and supervision of an in-plant engineering group to provide engineering services including operational engineering assessment; performance improvement; conceptual design; design review; modification installation and testing; and support for maintenance, operations, instrumentation and control, and chemistry departments.

January 1980 - February 1981 — Yankee Atomic Energy Company
Framingham, MA

Senior Shift Technical Advisor (Yankee Rowe): STA on shift, technical guidance and training of other STA's, along with responsibilities listed below under Reactor Engineer. Taught Thermodynamics, Rx Theory, Fluid Flow, and Heat Transfer for STA and RO/SRO Requal.

April 1977 to January 1980	Staff Reactor Engineer (Yankee Rowe): Supervision of startups, shutdowns and refueling; ISI coordinator; Physics Testing; Appendix J Testing; Eddy Current Examination; Review of Design Modifications.
June 1976 to April 1977	Electrical Maintenance Engineer (Yankee Rowe): Electrical Maintenance Engineering; Conceptual Design, Procurement, and installation of Electrical Modifications.
November 1975 to June 1976	Systems Engineer (Yankee Atomic Engineering Office): System Systems Engineering in support of Design Modifications.
June 1973 to November 1975	Babcock and Wilcox, Inc. Lynchburg, VA Transient Analysis Engineer: Performed hand and computer calculations of reactor transients for design input. Developed BTU limit curves used in all 177 fuel assembly B&W reactors. Performed steam generator tube rupture,, loss of feedwater, and pressurizer sizing analyses.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

NIAGARA MOHAWK POWER CORPORATION

RESUME OF HAROLD BARRETT

EDUCATION:

1971 - Cicero High School
Cicero,, NY
Regents Diploma

1975 S.U.N.Y. Maritime College
Marine Nuclear Science
Fort Schulyer, Bronx NY
B.S.

S.U.N.Y. Maritime College
Marine Engineer

U.S. Coast Guard Licenses:

Third Assistant Engineer, Steam Vessels - any horsepower
Third Assistant Engineer, Moitor Vessels - any horsepower

Self Study U.S. Coast Guard Licenses:

Second Assistant Engineer, Steam Vessels - unlimited horsepower

TRAINING COURSES:

Radiological Controls and Engineering
Mare Island Naval Shipyard

Quality Assurance and Technical Writing
Mare Island Naval Shipyard

Shift Refueling Engineer.
Mare Island Naval Shipyard

Transactional Analysis
Northeast Utilities Service Co.

Fire Brigade Training
Eastern Connecticut Fireman's Training School

NDT, Radiography, ASME Level III
Hartford Steam Boiler Inspection & Insurance Co.

S5W Submarine Reactor Plant Fundamentals
Norfolk Naval Shipyard

[illegible]

[illegible]

[illegible]

EMPLOYMENT:

8/81 to Present — Niagara Mohawk Power Corporation

Senior Technical Assistant: Perform detailed operational engineering assessment of current problems throughout the commercial nuclear industry. Perform detailed engineering assessment of current plant performance. Prepare and review reports to regulatory agencies. Perform engineering duties as assigned, i.e. plant modification, studies, evaluations, etc. Provide guidance and supervision over Junior Technical Assistants and Technical Assistants in the Technical Support Group. Provide engineering support to the corporate engineering staff as required.

11/80 - 7/81 — Norfolk Naval Shipyard

Nuclear Engineer GS-11: Administration and conduction of Naval Nuclear Reactor Plant Testing Evolutions before, during and after overhauls. Received training in all phases of submarine reactor plant operation, design and testing.

4/80 - 11/80 — Department of the Navy, Military Sealift Command, Atlantic

First Assistant Engineer, Class A-1, Steam NW: Planning, assigning, and supervising the work of Assistant Engineers ad unlicensed personnel ensuring the proper operation, maintenance and preservation of all Engine Department machinery and equipment aboard a $16,500 shaft horsepower steam geared turbine powered refrigerated stores ship. On arrivals and departures to/from ports, supervising the securing and warming up of the main engines, and taking overall charge of the main engines during maneuvering.

5/79 - 4/80 — Second Assistant Engineer, Class A-1 Steam W: Functioned as a Licensed Marine Engineer in charge of a 5 man watch of sea and in port and responsible for all maintenance and repair of the ships boilers, boiler auxiliaries, feed system, fuel oil service and transfer systems, fuel oil inventory and fueling equipment.

8/78 - 5/79 — Third Assistant Engineer, Class A-1, Steam W: Functioned as a Licensed Marine Engineer in charge of a 5 man watch sea and in port. Also responsible for all maintenance and repair to the main lubricating oil system, main condenser and auxiliaries, main engines and reduction glass, turbo-generators, and ships diesel oil systems.

6/77 - 8/78 — Connecticut Yankee Atomic Power Company

Associate Engineer: Project Engineer at the plant level for numerous plant betterment projects, dealing with scheduling, funding, technical representation, interfacing with regulatory agencies and vendors, and overseeing actual construction work.

12/76 - 5/77 Department of the Navy, Military Sealift Command, Atlantic

Third Assistant Engineer, Class A-10, Steam W: Functioned as a Licensed Marine Engineer in charge of a 5 man watch at sea and in port. Also responsible for all maintenance and repair to the main lubricating oil system, main condenser and auxiliaries, main engines and reduction glass, turbo-generators, and ships diesel oil systems.

12/76 - 5/77 Mare Island Naval Shipyard

Refueling Engineer: Provided engineering support during refueling operations on Naval Nuclear Propulsion Plants, participating on shield surveys, and received training to become a Shift Refueling Engineer.

NIAGARA MOHAWK POWER CORPORATION

RESUME OF JOHN C. ALDRICH

EDUCATION:

North Rose Central School; North Rose, NY
1949 - 1962 - Regents Diploma

Vallejo Junior College; Vallejo, CA
1963 - 64, Math/Chemistry, no degree

California Maritime Academy; Vallejo, CA
1964 - 67, Major - Marine Engineering
Degree - Bachelor of Science, Point/hr 3.3/4.0

Metals Engineering Institute
Fundamentals of Non-Destructive Testing
January 1975 - 10 Day Course

Niagara Mohawk Sponsored - Fundamentals of Quality Auditing
February 1975 - 10 Day Course

Metals Engineering Institute
Metallurgy of Welding and Joining
July 1975 - 10 Day Course

General Physics Corporation Course
Reactor Operator License Preparation
1977 - 520 hours

General Electric BWR Simulator Course
Morris, IL
1977 - 7 days

General Physics Corporation Course
Senior Reactor Operator License Preparation
1977 - 312 hours

General Physics BWR Requalification Simulator Course
Chattanooga, TN
1977 - 3 days

General Electric BWR Requalification Simulator Course
Morris, IL
1978 - 3 days

General Electric Company Station Nuclear Engineering Course
January 1979 - 160 hours

General Electric BWR Requalification Simulator Course
Morris, IL
1979 - 3 days

General Electric BWR Requalification Simulator Course
Morris, IL
1980 - 3 days

General Electric BWR Requalification Simulator Course
Morris, IL
1981 - 3 days

General Electric BWR Requalification Simulator Course
Morris, IL
1982 - 3 days

EMPLOYMENT:

Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Site

11/81 to Present	Supervisor Operations - Nuclear: Duties included to plan and manage station operations to ensure safe, efficient power production of the Nuclear Station. To direct activities of licensed and non-licensed operations personnel and to coordinate efforts of all other departments, with regard to station operation.
	To assure fulfillment of all regulating requirements set forth in the operating license, technical specifications and government documents.
	Nuclear Generation
1975 - 1981	Training Supervisor & Superintendent: Activities included planning, organizing, conducting and evaluating the effectiveness of training programs for all personnel at the Nine Mile Point site. Addressing all regulatory requirements with regard to personnel training and coordinate efforts of all off-site company support groups, consultants, and government agencies with regard to training programs, personnel licensing and training inspection. Responsible for interpretation of NRC requirement and guides concerning training and initiation of programs to meet new requirements.
1973 - 1975	Quality Control Engineer: On an assigned basis, responsible for the selection and implementation of a quality control program meeting the requirements of the Nuclear Regulatory Commission 10CFR50 Appendix B, Regulatory Guides and ANSI N45.2.

Contractor qualification, procurement document review, review of contractor's procedures, inspections, test procedure review, maintenance of quality assurance records, scheduling and conducting periodic audits. Was responsible for quality control on the Corporation's $7 million Off-Gas Modification at Nine Mile Point Nuclear Station Unit 1.

Newport News Shipbuilding and Dry Dock Company
Newport News, VA

1971 - 1973 Senior Test Engineer: Responsible for all non-nuclear testing during the overhaul of nuclear submarines.

Development of test requirements from U.S. Navy Specifications, initiate test procedures, plan and schedule system tests, review test results prior to audit by NAVSHIPS and present documentation to customer. Additional responsibilities included: senior shipyard representative on overhaul sea trials, liaison agent between design and production forces, direct the activities of 5-15 engineers and designers in the performance of testing as workload warranted.

Design Engineer: Under limited supervision of senior test engineer, responsible for the preparation of test procedures, as interpreted from specifications and drawings, witnessing of test performance and evaluating test results.

1967 - 1971 United States Lines Company, New York City, NY

Second Assistant & Third Assistant Engineer: Watchstanding Engineer abroad the S.S. American Challenger and S.S. American Legion. As Third Assistant abord the S.S. American Challenger, was responsible for lube oil and fresh water systems and components. Made several piping changes to the lube oil system to reduce the time spent in maintenance.

As Second Assistant aboard the S.S. American Legion, was responsible for fuel oil and boiler feed systems as well as two 1000 psig boilers. Developed a shipboard maintenance schedule for cleaning an repairing boilers.

PROFESSIONAL LICENSES:

U.S.C.G. Second Assistant Engineer, Steam, Unlimited Horsepower - Current

U.S.C.G. Third Assistant Engineer, Diesel, Unlimited Horsepower - Current

U.S. Nuclear Regulatory Commission Operator License OP-4416 May 12, 1977.

U.S. Nuclear Regulatory Commission Senior Operator License SOP-3129, December 12, 1977 - Current

NIAGARA MOHAWK POWER CORPORATION

RESUME OF DONALD JAY MATTHEWS

EDUCATION: Niagara Mohawk Industrial Atomic Energy Course

Nine Mile Point Unit 1 Nuclear Station 50 Weeks Nuclear Training

General Electric Boiling Water Technology Course 4 Weeks BWR 2

General Electric Boiling Water Technology Course 4 Weeks BWR 4

General Electric Training for Senior Operators

Qualified on G.E. BWR Simulator Morris IL

Qualified on T.V.A. Simulator BWR 4 Daisy TN

High School Graduate

EXPERIENCE: I&C Technician Coal Fired Plant

Senior Shift Control Operator Pulverized Fuel Boiler

Chief Shift Operator BWR 2 Nine Mile Point Unit 1 R.O. License

Station Shift Supervisor BWR 4, J.A. FitzPatrick Nuclear Power Plant S.R.O. License

Station Shift Supervisor BWR 2 Nine Mile Point Unit 1 S.R.O. License Active

Assistant Supervisor of Operations Nine Mile Point

EMPLOYMENT RECORD: 1946 TO PRESENT: NIAGARA MOHAWK POWER CORPORATION

NUCLEAR POWER EXPERIENCE:

NINE MILE POINT UNIT #1 BWR 2

Participated in every phase of plant startup

During start-up participated in physics testing, performance of preoperational testing and start-up test procedures

Participated in the installation of all of the reactor fuel and in-core neutron instrumentation

Directed the operation of refuel floor activities

Developed and administered an operators course in basic plant system design and operation

Site Training Supervisor (Acting)

Assistant Supervisor of Operations Nine Mile Point Unit 1 - Direct the day to day operation of Nine Mile Point Unit 1

J.A. FITZPATRICK NUCLEAR POWER PLANT BWR 4

Station Shift Supervisor during pre-startup through to full power operation

Developed preoperational tests for plant start-up

Developed the initial operator training program

Acting Training Supervisor

Modification and Improvement Supervisor 1977 refuel outage

ADDITIONAL EXPERIENCE

Niagara Mohawk Power Corporation representative to G.E./BWR Owners Group, Emergency Procedure Subcommittee. Active in the entire program of this subcommittee since its inception in 1979.

NIAGARA MOHAWK POWER CORPORATION

RESUME OF MICHAEL J. COLOMB

EDUCATION:

1968	St. Anthony of Padau High School Syracuse, NY
1970	Onondaga Community College Syracuse, NY A.A.S. in Electrical Technology
1/82 - 3/82	General Physics Basic Introduction Course (8 weeks)
4/72	General Electric BWR Technology Course (4 weeks)
5/72	General Electric BWR Technology Course (2 weeks)
6/72	Niagara Mohawk System Course (2 weeks)
6/74	Niagara Mohawk Fire School (3 days)
12/74 - 3/75	General Physics Training Program (80 hours)
4/75 - 5/75	General Physics License Preparation Course (4 weeks)
1/77 & 5/78	TVA BWR Simulator Traininng (3 days)
10/80 - 2/81	General Physics Senior Reactor Operator Upgrade Training Program (17 weeks)
11/81 & 11/82	GE BWR Simulator Training (3 days)
1980 to Present	Matriculated at Rochester Institute of Technology in a Bachelor Degree Program in Mechanical Engineering Technology. Completed approximately 200 credit hours.
	Clarkson University (Org. Behavior, Communications) 6 credit hours Potsdam, NY

PROFESSIONAL LICENSES:

Currently hold a Senior Reactor Operators License for Nine Mile Point Nuclear Station, Unit 1 (License #3935)

Previously held a Reactor Operators License for the J.A. FitzPatrick Nuclear Power Plant (License #3844-1)

EMPLOYMENT:

June 1981 to Present	Station Shift Supervisor: Responsibilities included on-shift supervision of operating staff during preliminary testing of plant systems. Assisted inn training of operating personnel in preparation for licensing. Review of FSAR for submittal to the Nuclear Regulatory Commission. Development of Operating Procedures. Development of Emergency Operating Procedures. Participated in the Nine Mile Point, Unit 1 and 2 Control Room Design Reviews.
1979 - 1981	Chief Shift Operator: Responsibilities included writing preoperational tests, operating and special procedures, and surveillance tests for Unit 2. During the 1979 Unit 1 refueling outage, supervised installation and testing of several plant modifications.
1976 - 1979	Chief Shift Operator, James A. FitzPatrick Nuclear Power Plant: Responsible for operation of control room. Provided supervision and training for all lower grade operators. Participated in all phases of plant operation,, startup and shutdown. Performed and directed surveillance tests on all plant safety systems.
1975 to 1976	Nuclear Operator E, James A. FitzPatrick Nuclear Power Plant: As Senior In-Plant Operator responsible for care and operation of all plant equipment including the main turbine generator, all plant auxiliary systems and reactor safety systems. Participated inn all phases of plant startup, shutdown and operation, including surveillance testing. Participated in all phases of refueling operations. Obtained Reactor Operator License in June 1975.
1972 - 1975	Nuclear Operator C, James A. FitzPatrick Nuclear Power Plant: Participated in all phases of preoperational testing and initial plant startup testing program. Responsible for initial equipment "run-ins," system flushing operations and system turnover for operations.

1971 - 1972	Nuclear Operator C, Nine Mile Point Nuclear Power Plant: As Auxiliary Operator on shift obtained experience operating all plant auxiliary systems from outside the control room. Participated in all phases of refueling operations, and "sipping" procedures.
1970 - 1971	Gas Mechanic B, Niagara Mohawk Power Corporation, Oswego, NY: During this period was promoted from Gas Mechanic Helper to Gas Mechanic A to position above. Responsibilities were to operate various machinery associated with construction, maintenance and repair of natural gas lines and services. Also worked in the maintenance crew during a refueling outage at Unit 1 during this period.

NIAGARA MOHAWK POWER CORPORATION

RESUME OF WILLIAM F. BANDLA

EDUCATION:

1960 - 1964	Cardinal Mindszenty High School
1972 -	Eight week General Physics Academic Refresher Course
1972 -	Two week Systems Courses Nine Mile Point Unit 1
1972 -	One week of Simulator Training in Morris, IL
1973 -	144 hour course by General Physics including Radiation Control and Safety, Reactor Operation, I&C, Technical Specifications, Operation and Emergency Procedures, Miscellaneous Math and Computer and Exam Review
1976 -	General Electric Simulator Requalification Course
1977 -	Successfully completed a General Physics upgrade SRO program
1980 -	Attended a General Physics Shift Technical Advisor Certification Course
1980 - 1981	Participated in an academic refresher course provided by R.I.T.
1981 -	Successfully completed an accredited Management Development Training Course provided by Clarkson University
1982 -	Attended a K-T problems solving training program
1985 -	Successfully completed a NRC supervised license requalification program

ON THE JOB TRAINING:

1964 - 1967	3.5 years experience in Steam Station Operation at Dunkirk, New York. During that time fulfilled the duties and responsibilities of an Auxiliary Operator "A," "B" and "C"
1967 - 1971	3.5 years experience as an I&C Technician "A," "B" and "C" at Dunkirk Steam Station, also during that time obtained some limited Chemical Lab. experience.
1972 - 1973	Nuclear Operator "C" at Nine Mile Point - worked at all levels of operation. Responsible for operational care of Main Turbo Generator and reactor units. Operated or directed the operation of auxiliary units.

April 1973	Obtained NRC Reactor Operator's License. OP-3265
1973 - 1977	Nuclear Operator "E" at Nine Mile Point Unit 1. Responsible for providing operational attendance to plant equipment. Ad required, responsible for operation of turbo-generator and related equipment from the Control Room. When acting for the Chief Shift Operator as Principle Reactor Operator, assumed his duties which included responsibility for the reactor and its components. Worked on refuel floor during four refuel outages. Duties included reloading fuel, dechanneling and rechanneling fuel, replacing LPRM strings, and sipping fuel.
1977 - 1978	Obtained a Senior Reactor Operator's License
1978 to Present	Fulfilled the duties and responsibilities of the Station Shift Supervisor on shift, and during major refueling outages have supervised refueling activities. In addition, have assisted in the developing and implementation of procedures relating to plant modifications and improvements.

NIAGARA MOHAWK POWER CORPORATION

RESUME OF THERON LUCAS

EDUCATION:

Lowville Academy and Central School
Lowville, NY
Graduate - 1959

Completed 12 week course in Aircraft Mechanics
July 1969

Completed 27 Volume E.C.I. Correspondnece Course in Management for Supervisors in August, 1968

Completed various other courses in Aircraft Electrical hydraulic, instrumentation and safety related systems
Approximately 15 weeks

General Physics Course
Reactor Operator License Preparation
Courses - 1978 - 520

Reactor Theory
Features of Facility Design
General Operating Characteristics
Instruments and Control
Safety and Emergency Systems
Standard and Emergency Operating Procedures
Radiation Control and Safety

NOTE: The above course has been recommended for 24 college semester hours of credit by New York State Program on Non-Collegiate Sponsored Instruction.

General Electric BWR Simulator Course
Morris, IL
Hot License Certification Program
1978 - 7 days

General Electric Company
Morris, IL
Simulator Training BWR - 3 Day Requalification Program
1979, 1980, 1981, 1982, 1983

Niagara Mohawk Power Corporation sponsored courses
Reactor Operator Requalification Program
1976 - 1985

Employed by Niagara Mohawk Power Corporation
Nine Mile Point Unit 1
P.O. Box 32
Lycoming, NY 13093

EMPLOYMENT:

Holder of Nuclear Regulatory Operator License, OP-4930-1

1983 to Present	Chief Shift Operator: Under general supervision, on a shift, to direct and perform the work of, and to assist in the training of all personnel engaged in the operation of major steam-electric generating units, including electrical and mechanical equipment, auxiliaries, controls and associated transmission facilities.
1979 - 1982	Nuclear Auxiliary Operator "E": Under general supervision on a shift in a Nuclear Station to perform any of the duties of Auxiliary Operators of lower grade and to assist in their training; and at times, as required, to be responsible for the operation of the reactor turbo-generator unit and related equipment from the Control Room.
1977 - 1979	Nuclear Operator "C": Responsible for care of main turbine generator and reactor units. To operate or direct the operation of the highest auxiliary equipment. To execute safe and efficient mark-ups on equipment within the station. Also to assist in the training of Auxiliary operators of a lower grade.
1976 - 1977	Auxiliary Operator B: Under direct supervision on a shift, to be responsible for the operational care of various types of complicated auxiliary equipment associated with one or more main turbo-generator or boiler units and with only casual supervision to start and stop such equipment under normal and emergency situations.

Niagara Mohawk Power Corporation
Watertown, NY .

1969 - 1976	Gas Mechanic: To install and maintain underground natural gas mains and laterals. To check for gas leaks and repair same. Qualified as gas welder to make up gas services.
4/69 - 10/69	Meter Reader: To take electrical and gasmeter readings for customer billing data.

NIAGARA MOHAWK POWER CORPORATION

RESUME OF MARK W. TURNER

EDUCATION:

North Syracuse Central High School
North Syracuse, NY
Graduated 1969

Erie Community College
Williamsville, NY
Major: Management Engineering Tech.
Degree: A.A.S., 1972

General Physics License Training Course
1977 - 200 hours
Obtained NRC Reactor Operator License

1975 -	GE BWR Simulator Morris, IL 3 Day Requal. Program
1976 -	GE BWR Simulator Morris, IL 3 Day Requal. Program
1977 -	TVA BWR Simulator Soddy-Daisy, TN 3 Day Requal. Program
1978 -	GE BWR Simuator Morris, IL 3 Day Requal. Program
1979 -	GE BWR Simulator Morris, IL 3 Day Requal. Program
1980 -	GE BWR Simulator Morris, IL 3 Day Requal. Program
1981 -	GE BWR Simulator Morris, IL 3 Day Requal. Program

EMPLOYMENT/
EXPERIENCE:

Niagara Mohawk Power Corporation
Syracuse, NY

1978 to Present	Chief Shift Operator: Under general supervision, on a shift, to direct and perform the work of, and to assist in the training of all personnel engaged in the operation of major steam-electric generating units, including electrical and mechanical equipment, auxiliaries, controls and associated transmission facilities.
1976 - 1978	Nuclear Auxiliary Operator "E": Under general supervision on a shift in a Nuclear Station to perform any of the duties of Auxiliary Operators of lower grade and to assist in their training; and at times, as required, to be responsible for the operation of the reactor turbo-generator unit and related equipment from the Control Room.
1974 - 1976	Nuclear Auxiliary Operator "C": Under direct supervision on a shift in a Nuclear Station to be responsible for the operational care of main turbo-generator and reactor units; to operate or direct the operation of the highest types of auxiliary equipment; to execute safe and effective mark-ups on equipment within the station and to assist in the detailed training of Auxiliary Operators of lower grade.
1973 - 1974	Auxiliary Operator"B": Under direct supervision on a shift, to be responsible for the operational care of various types of complicated auxiliary equipment associated with one or more main turbo-generator or boiler units and with only casual supervision to start and stop such equipment under normal and emergency equipment.
1972 - 1973	Draftsman

NIAGARA MOHAWK POWER CORPORATION

RESUME OF RALPH INGHAM

EDUCATION:

Brocton Central School
Regents Diploma: June 1949

Purdue University
Agricultural Courses
2 Yrs.: 1949-51 no degree

ICS - Steam Elec. Power Plant Course
1957-59

EMPLOYMENT:

1976 to Present	Niagara Mohawk Power Corporation Syracuse, NY Nine Mile Point Unit 1 Lycoming, NY Chief Shift Operator: Under general supervision, on a shift, to direct and perform the work of, and to assist in the training of all personnel engaged in the operation of major steam-electric generating units, including electrical and mechanical equipment, auxiliaries, controls and associated transmission facilities.
1967 - 1976	Relief Operator P: Assume duties of Shift Control Room Operator, as required and perform other various operating jobs throughout the plant. NMPC Service Department Syracuse, NY Serviceman C: 2 yrs, gas and electric meter installation troubleshooting and adjustments of customer gas and electric equipment. Serviceman B: 2 yrs, gas and electric meter installation.
1958 - 1961	Niagara Mohawk Dunkirk Steam Station Auxiliary Operator D: (approx. 1 yr., 8 mo.) perform duties of a roving steam operator such as starting and stopping of main turbo-generator units and various other complicated auxiliary equipment, associated with boiler, turbines, generators and power distribution. Perform electrical switching, execute markups, electrical and mechanical troubleshooting (2-100MW units).

Auxiliary Operator C: (1 yr.) perform duties of starting, stopping and operation of various types of complicated auxiliary equipment associated with several main turbo-generators and boiler units (2-100 MW units) (initial startup of new 200 MV unit)

1957 New York State Experiment Station - Agricultural Experiment Work

NIAGARA MOHAWK POWER CORPORATION

RESUME OF MICHAEL E. STANCLIFFE

EDUCATION:

1961 - 1965	H.C. Technical High School - Buffalo, NY
1965 - 1969	State University of New York, Buffalo, NY Electrical Engineering
1972 -	Eight week General Physics course in Mathematics, Physics, and Reactor Theory
1972 -	General Electric BWR Simulator, 7 days Morris, IL
1972 -	100 Hour Systems Course - Nine Mile Point Unit 1
1973 -	144 Hour course by General Physics Corporation including Radiation Control & Safety, Reactor Operation, I&C, Technical Specifications, Operation & Emergency Procedures, Miscellaneous Math and Computer and Exam Review
1976 -	General Electric Requalification Simulator Course Morris, IL

ON THE JOB TRAINING:

1972 - 1973	Nuclear Operator "C" at Nine Mile Point - worked at all levels of operation. Responsible for operational care of Main Turbo Generator and reactor units. Operated or directed the operation of auxiliary units.
April 1973	Obtained NRC Reactor Operator's License. OP-3266
1973 to Present	Nuclear Operator "E" at Nine Mile Point Unit 1. Responsible for providing operational attendance to plant equipment. As required, responsible for operation of turbo-generator and related equipment from the Control Room. When acting for the Chief Shift Operator as Principle Reactor Operator, assumed his duties which included responsibility for the reactor and its components. Worked on refuel floor during four refuel outages. Duties included reloading fuel, dechanneling and rechanneling fuel, replacing LPRM strings, and sipping fuel.
1974 -	Participated in preop testing of Waste Building at James A. FitzPatrick Nuclear Station. Participated in several reactor startups and shutdowns and surveillance testing.

1977 - 1978	Obtained NRC Senior Reactor Operating License.
1978 to Present	Presently fulfilling the duties of Station Shift Supervisor at Nine Mile Point Unit 1.

ARD Corporation

DONALD F. TAYLOR
Manager, Energy Systems Group
Senior Engineer

- Human Factors Engineering
- Industrial Engineering
- Information Presentation Techniques
- Procedures Enhancement
- Nuclear Engineering
- Training
- Experimental Design
- Workspace Layout
- Statistical Analysis

Mr. Taylor has been active in human factors for a period of twelve years. He has applied experience in mechanical and fluids engineering as well as in nuclear maintenance and operations. As Manager of Energy Systems Group in the Applied Systems Technology Division, Mr. Taylor has served as project manager to a number of the ARD nuclear programs.

Mr. Taylor has extensive experience in the design, evaluation; and enhancement of the man-machine interface in process control applications. He developed human factors guidelines for the design of nuclear power plants (Electric Power Reseach Institute Guide NP-1637); prepared emergency procedures for the Duke Power Company; and developed maintenance procedures and documentation at Duke Power. He has participated in all phases of Control Room Design Reviews (CRDRs), including over 75 interviews with licensed nuclear operators and surveys of 15 control rooms.

- Nine Mile Point Unit 1 Detailed Control Room Design Review - Served as Project Director responsible for the planning and coordination of all project tasks. Conducted Operator Interview and Control Room Survey efforts. Established methods and procedures to identify and analyze operator tasks based upon the plant specific BWROG EPGs. Established methods and procedures and conducted the verification of suitability and availability of information and control needs to accomplish operator task. Designed and conducted efforts to validate that emergency task can be effectively accomplished by the operating crew in the NMP-1 control room. Directed a review of the proposed Safety Parameter Safety System and a survey of the Technical Support Center and Emergency Offsite Facility. Developed methodology and procedures for the NMP-1 Assessment Phase and conducted the assessment of HEDs. Developed conceptual solutions to significant discrepancies and designed and established a Human Factors Manual providing guidance and criteria for the implementation of control room enhancements. Developed detailed solutions for the implementation of control room enhancements including establishment of system and subsystem demarcation lines, mimicing of system flows, system, subsystem, and component labeling packages, replacement of meter scales, and color coding of meter scales. Designed and conducted efforts to verify that enhancements effectly resolve discrepancies but do no introduce new HEDs.

- Ginna Control Room Design Review - Served as Project Director responsible for planning and coordination of all project tasks. Established methodology and procedure for utilizing the Westinghouse generic ERGs to identify operator tasks for accomplishing critical safety functions. Directed and conducted the Control Room Survey effort including the environmental measures of control room lighting, noise, humidity, temperature, and air velocity. Established methodology and procedures for

the Ginna DCRDR Validation of control room functions conducted in coordination with the Ginna EOP development program. Directed and evaluation of the Ginna SPDS in response to NUREG 0737, Supplement 1, requirements. Peformed a human engineering review of panel modification drawings and characteristics for equipment installed in response to Reg. Guide 1.97. Currently conducting the Ginna Assessment Phase.

o Nine Mile Point Unit 2 Detailed Control Room Design Review - Served as Project Director responsible for the planning and coordination of all project tasks. Directed a survey of control room instrumentation and controls, an inventory of control room equipment and a review of historical documents for BWR plants. Directed a review of the Safety Parameter Display System the Technical Support Center, and the Emergency Offsite Facility. Revised methodology and procedures for identifying operator tasks and establishing the information and control needs to execute the emergency operating procedures. Conducted the comparison of the information and control needs to the control room inventory to establish availability and suitability of control room equipment. Established methodology and procedures for the walk-through/talk-through validation of control room functions. Conducted the talk-through validation task effort. Currently conducting the assessment of NMP-2 HEDs.

o Arkansas Power & Light Control Room Design Review - Task Leader for the identification of operator functions and analysis of emergency task for ANO-1. Working with ANO-1 operators, identified information and control needs for executing task objectives. Conducted a review of NUREG-0700 criteria and basis documents to establish the ANO survey checklist. Determined the applicability of the Section 6 design criteria to the ANO-1 control room and researched the basis documentation for the appropriateness of specific criteria values to the nuclear power plant control room application. Conducted the ANO-1 Control Room Survey effort to identify discrepancies to appropriate design criteria.

o Marble Hill Control Room Design Review - Task Leader for the operator interviews and checklist efforts. Conducted over 25 interviews with Marble Hill training and operations personnel. Analyzed results to identify potential human engineeing discrepancies, and prepared the Operator Interview Task Report. Using the Westinghouse Emergency Response Guidelines (ERGs) as a baseline, identified the operator functions and tasks needed to accomplish the emergency response objectives. Working with Marble Hill subject matter experts, identified the information and control needs to perform emergency tasks comprising the Westinghouse ERGs.

PREVIOUS EXPERIENCE

o 1982 to 1983 BioTechnology, Incorporated, Falls Church, Virginia
Senior Program Analyst

Served as project director for the Duke Power control room review human factors support effort. Principal in an operating experience review for the Duke Power control room review and established checklist criteria and methodology for the control room survey effort. Principle investigator in a project conducted for Duke Power to prepare a guide for the development of maintenance

procedures. Prepared and conducted training seminars for Duke Power procedure writers and engineers to enhance their technical writing skills.

o 1980 to 1982 Essex Corporation, Alexandria, Virginia
Human Factors Branch Manager

Responsible for the planning and coordination of projects with private utilities to enhance control room operations in nuclear power applications. Designed survey checklists and data forms for evaluation of control room environment, equipment design, and facility design and layout. Developed a methodology for the review of plant system functions and analysis of operator tasks. Designed and conducted an experiment using the Duke Power control room training simulators to evaluate the effectiveness of three candidate emergency procedure formats. Principle author of a writer's guide for emergency procedures prepared for the nuclear stations at Duke Power.

o 1978 to 1980 U.S. Coast Guard, Washington, DC
Industrial Engineer

Technical expert and staff advisor to the Office of Research and Development on matters of industrial engineering, human factors, and operations research. Primary projects were in the areas of product design and safety, crew station design, and crew performance. Directed efforts to establish an index of life saving capability for personal flotation devices. Planned and organized research to assess the effects of wave motions on crew performance and designed a ship test program to establish criteria for fatigue standards on Coast Guard 41-foot and 44-foot search and rescue crafts.

o 1974 to 1978 Norfolk Naval Shipyard, Portsmouth, Virginia
Nuclear Engineer

Successfully completed 1,500 hours of course work and formal instruction in the operation and maintenance of the S5W submarine reactor plant. Qualified by NAVSEA on the Naval Reactor Exam as a Reactor Plant Shift Test Engineer and advanced to the highest grade level of nuclear engineer. Prepared technical instructions and specifications for the repair and maintenance of the mechanical and fluids systems of the Westinghouse reactor plant.

o 1972 to 1974 Virginia Polytechnic Institute and State University, Blacksburg, Virginia
Research Assistant

Assisted in research projects specializing in eye movements and visual search. Established an experimental setup to collect eye position data at a sample rate of 1,000-per-second and developed computer models of search behavior to extract eye movement parameters.

EDUCATION

M.S., Industrial Engineering and Operations Research (Human Factors), Virginia Polytechnic Institute and State University, Blacksburg, Virginia, 1975

EDUCATION (continued)

B.S., Industrial Engineering and Operations Research, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, 1972

PROFESSIONAL AFFILIATIONS

Human Factors Society
American Institute of Industrial Engineers

ARD Corporation

ROBERT L. KERSHNER
Vice President, Applied Systems Technology Division
Principal Human Factors Engineer

- Human Factors Engineering
- System Analysis
- Experimental Design
- Anthropometrics
- Statistical Analysis
- Control Room Reviews
- Training
- General Systems Theory

As Vice President of the Applied Systems Technology Division, Mr. Kershner is responsible for the coordination and review of all human engineering, applied behavioral research, human factors and industrial engineering projects for ARD Corporation. Mr. Kershner has been active in providing professional services for over ten years. In the private sector of the industry, he has conducted Government-sponsored research as well as held professional positions within the Federal Government.

Mr. Kershner's specialty is the application of general systems theory to the design, analysis and improvement of complex systems, applying human factors engineering principles to process control design. Mr. Kershner has managed ARD's control room review support to the Arkansas Power & Light Company's Arkansas Nuclear One station, Public Service Indiana's Marble Hill station and the Commonwealth Edison Company's Dresden, Byron and Braidwood nuclear generating stations. In addition, he supervised Safety Parameter Display System development for the Virginia Electric and Power Company. Mr. Kershner has developed Control Room Design Review program plans for several major utilities including Commonwealth Edison, Virginia Electric and Power, Arkansas Power & Light, and Public Service Indiana. He was instrumental in the design and development of the ARD Performance Measurement System for the validation of Emergency Operating Procedures and the evaluation of control room equipment modifications.

PREVIOUS EXPERIENCE

- 1980 to 1981 Andrulis Research Corporation, Bethesda, Maryland
  Director, Human Factors Engineering Division

Responsible for corporate human engineering and social science research projects. Provided technical direction of research and development, test and evaluation studies in: human factors engineering; military systems design, analysis and improvement; and personnel profiles. Completed a variety of projects for the U.S. Army Human Engineering Laboratory, including Human Factors Engineering Recommendations in the System Development Process, a profile of the enlisted infantryman, a critical review of Infantry Systems Testing, the effects of CB clothing and equipment on soldier performance, and a critical review of Night Vision Systems (Infrared and Light Intensification).

- 1978 to 1980 National Bureau of Standards (NBS) - Consumer Sciences Division, Gaithersburg, Maryland
  Engineering Research Psychologist, Project Leader

Provided human factors engineering research and analysis support to other federal agencies and to NBS-sponsored programs. Areas of involvement included analysis of driver navigation aids; research on operator visual search patterns and determination of the efficacy of establishing a standard

ergonomic reference data system. Developed a set of human engineering guidelines for energy consumption displays.

o 1977 to 1978 Biotechnology, Incorporated, Falls Church, Virginia
Research Associate

Provided human factors engineering support to projects in the Personnel Performance and Transportation Programs. Conducted an evaluation of a new format for information presentation to time critical materials for the U.S. Navy and investigated an U.S. Air Force-sponsored project to test and evaluate low-fidelity simulation aids for intermediate-level avionics training.

o 1976 to 1977 Federal Highway Administration - Analysis and Experimental Division, McLean, Virginia
Assistant Research Psychologist

Responsible for conducting all phases of human engineering research, in particular, driver performance studies in support of the Federal Highway Administration's research programs related to traffic management and motorist information systems.

o 1975 to 1977 Cybernetics Research Institute, Washington, DC
Assistant Research Psychologist

Responsible for the psychological research conducted at the institute contracted through the Bureau of Education for the Handicapped. Assisted in the development and evaluation of selected vibrotactile codes as an alternative communication system for the deaf and/or blind.

EDUCATION

M.A., Human Factors Psychology, The Catholic University of America, Washington, DC, 1977

B.A., Applied Psychology, cum laude, University of Baltimore, Baltimore, Maryland, 1975

Certificate, Industrial Safety, Health and Environment - Department of Engineering, University of Wisconsin, Madison, Wisconsin, 1979

PROFESSIONAL AFFILIATIONS

Human Factors Society (National & Potomac Chapter)
American Nuclear Society
Psi Chi (Psychology Honorary)

MILITARY SERVICE

U.S. Army Paratroops, 1968 to 1970

ARD Corporation

RICHARD L. HORST
Manager, Applied Behavioral Research Group
Senior Engineer

- Human Factors Engineering
- Multivariate Statistics
- Cognitive Information-Processing
- Computer-based Data Acquisition Systems
- Display Technology and Computer Graphics
- Human Performance Assessment
- Human Electrophysiology in Operational Settings
- Teleoperation, 3-D Viewing

As a senior engineer, Dr. Horst provides human factors engineering support to a variety of ARD's corporate and power industry clients. He is also responsible for a number of the company's research and development efforts. His human factors support has included the task-level management of the Control Room Design Review at Public Service Indiana's Marble Hill station; a task analysis at Commonwealth Edison's Byron station to define the parameters for the Safety Parameter Display System; an evaluation of lighting and alternative louvers for the Byron control room; operator surveys at Marble Hill, Arkansas Power and Light's Arkansas Nuclear One and Niagara Mohawk's Nine Mile Point stations; an assessment of operator performance using Emergency Operating Procedures at Virginia Electric and Power Company's Surry station control room simulator; an analysis of graphics hardware and software needs for the Virginia Electric and Power Company Emergency Response Facilities; a review of the SPDS and plant computer graphics for Louisiana Power and Light's Waterford 3 station; and an evaluation of several CRT graphics systems being marketed for process control applications. Dr. Horst's background in experimental psychology and neuroscience is currently being utilized through his direction of ARD's research projects in robotics, 3-D viewing systems, and biocybernetics.

PREVIOUS EXPERIENCE

- 1980 to 1982 University of Maryland Medical School - Applied Neuroscience Laboratory, Baltimore, Maryland
  Research Faculty and Project Coordinator

Responsible for managing the day-to-day operations of a research lab studying electrophysiological, psychometric and nutritional indices of human development. Supervised and trained lab personnel. Coordinated installation and maintenance of computer hardware and software. Conducted research on neurometric measures of normal development and the feasibility of their use for assessing learning disabilities. Adapted and implemented a computerized system for recording EEG and evoked potentials in a hospital ICU. Participated in the clinical electrophysiological assessment of neurology and neurosurgery patients. Designed and programmed software for data management and analysis. Developed grant support for research.

- 1975 to 1979 University of Illinois, Champaign-Urbana, Illinois
  Research Assistant, Cognitive Psychophysiology Laboratory

While doing dissertation research, participated in a group studying electrophysiological measures of human performance with applications to human engineering. Responsible for laboratory studies of visual information-processing, auditory signal detection, and computer-assisted instruction.

Developed statistical techniques (principal components analyses, discriminant analysis, and cross-correlation analyses) for evoked potential data. Designed, programmed and documented a comprehensive, general-purpose computer program for quantifying peak amplitudes and latencies of evoked potentials. Made extensive use of SPSS, BMDP and ALICE data analysis packages. Contributed to the development of grant and contract support for research.

- 1971 to 1975 Carnegie-Mellon University - Psychology Department, Pittsburgh, Pennsylvania
  Graduate Research Assistant

During graduate course-work in experimental psychology, was responsible for research projects in human visual perception and animal memory processes. Developed a lab facility for recording human-evoked potentials. Designed and programmed software for real-time data acquisition and data management and used SPSS for statistical analyses.

EDUCATION

Ph.D., Experimental Psychology, NIMH Graduate Traineeship, Carnegie-Mellon University, Pittsburgh, Pennsylvania, 1981

M.S., Experimental Psychology, Carnegie-Mellon University, Pittsburgh, Pennsylvania, 1972

B.S., Biology-Psychology, Bucknell University, Lewisburg, Pennsylvania, 1971

PROFESSIONAL AFFILIATIONS

Human Factors Society
American Psychological Association
American Association for the Advancement of Science
Society for Psychophysiological Research
Psi Chi (Psychology Honorary)
Phi Sigma (Biology Honorary)

ARD Corporation

ROBERT C. MUNSON
Project Engineer
Human Factors Psychologist

- Human Factors Engineering
- Computer Graphics
- Control Room Reviews
- Computer Software Design
- Psychophysiology
- Psychometric Applications
- Statistical Analysis
- Experimental Design

Mr. Munson provides human factors support, to both nuclear and non-nuclear clients, primarily in the areas of computer graphic display systems. He is currently Project Manager in support of the Virginia Electric and Power Company' Emergency Response Facilities system development efforts. This effort involves the design and review of both CRT displays and the hardware and console systems on which the displays will be implemented. Mr. Munson has performed numerous SPDS reviews (including those at Nine Mile Point Units 1 and 2 and Ginna), as well as a large number of NUREG-0700 (Section 7) reviews of process computers in the context of ARD's DCRDR project work. He also provided support to Gould's System Simulation Division in the preparation of a proposal to the FAA to redesign the Air Traffic Control System. Mr. Munson's efforts for this proposal were concentrated in the areas of hardware design (both console design and computer display technology), maintenance, and CRT display design.

Mr. Munson also has a strong background in Experimental Psychology and User-System Interface (USI) design. He is currently Principal Investigator of a NASA-funded Phase I SBIR project entitled "Polar Graphics for Rapid Assessment of Multivariate Information" and is Co-Investigator of a NASA-funded Phase II SBIR project entitled "Brain Wave Measures of Workload in the Advanced Cockpit". Mr Munson is well-acquainted with current concepts in display technology and has implemented a variety of computer systems for such applications as real-time data acquisition, data base management, and color graphics displays.

EXPERIENCE

- 1982 to 1983 General Physics Corporation, Columbia, Maryland
  Staff Scientist, Human Factors Engineering

Participated in CRDRs at Zimmer, Susquehanna and Salem nuclear generating stations. Provided human engineering support for resolution of human engineering discrepancies to Shoreham station. Performed a human factors assessment of the layout design of the Technical Support Center at Salem station. Assisted in the development and implementation of an entry-level selection test for technicians for the Intermountain Power Project. Administered selection tests to reactor operator trainee candidates at the Vermont Yankee and Perry stations.

- 1979 to 1982 University of Maryland School of Medicine, Baltimore, Maryland
  Research Fellow, Department of Physiology

Conducted experiments which focused on the measurement of event-related brain potentials (ERPs), recorded from the scalp of humans, during subjects' performance of psychophysical tasks. Subsequent data analyses investigated

the relationships between various components of the ERP to both behavioral measures and assumed underlying cognitive processes. Duties included data collection and analysis, computer programming and preparaton of drafts for publication.

- 1978 to 1980 Towson State University, Towson, Maryland
  Graduate Assistant, Department of Psychology

Provided small group and individualized instruction in statistics and experimental design. Assisted in the instruction of a seminar in statistics and programming in BASIC and FORTRAN.

- 1978 to 1979 Towson State University, Towson, Maryland
  Graduate Assistant to Dean of Division of Continuing Studies

Developed, administered and reported results of survey instruments designed to assess student and faculty opinion relative to curriculum issues.

EDUCATION

M.A., Experimental Psychology, Towson State University, Baltimore, Maryland, 1982

B.A., Psychology, University of Maryland Baltimore County, Baltimore, Maryland, 1977

PROFESSIONAL AFFILIATIONS

Society for Psychophysiological Research
American Association for the Advancement of Science
Sigma Xi

ARD Corporation

ROBERT KLEIN
Staff Engineer
Human Factors Psychologist

- o Human Factors Engineering
- o Systems Analysis
- o Display Technology
- o Human Performance Assessment
- o Systems Safety
- o Statistical Analysis

Mr. Klein has been involved with human engineering in the design and evaluation of complex control and display systems for over four years. He prepared an overall assessment of cruise missile weapon control system hardware and software components, reporting on human factors engineering, operability, maintainability, safety, and nuclear security. He was the human factors member of a multidiscipline maintainability demonstration team to verify system compliance with Navy maintenance standards. He participated in experimental design, execution, and analysis on Coast Guard and DOD related projects. Mr. Klein's experience in military applications of process control and integrated display systems is now utilized in support of nuclear power plant control room design reviews. As a Staff Engineer in ARD's Human Factors Technology Group, he is involved in the inventory, checklist, validation, and task analysis phases of the Detailed Control Room Design Review for the Arkansas Nuclear One, Ginna, Quad Cities, LaSalle, and Nine Mile Point (Units 1 and 2) stations.

PREVIOUS EXPERIENCE

o 1982 to 1984 Vitro Corporation, Silver Spring, Maryland
Human Factors Engineer

Performed analysis of Tomahawk cruise missile weapons control system man/machine interface. Performed anthropometric observation and evaluation of hardware onboard Navy destroyer to ensure compliance with military standards. Made design recommendations to enhance system operability, maintainability, and safety. Reviewed system software to ensure adequate control and display information is provided to system operators. Participated in maintainability demonstrations to verify safe and efficient system and equipment maintenance and to satisfy Navy maintainability requirements.

o 1979 to 1981 Bendix Field Engineering Corporation, Columbia, Maryland
Technical Writer and Editor

Wrote and prepared documentation for NASA Spaceflight Tracking and Data Network. Wrote occupational safety manual for NAVELEX.

o 1976 to 1977 Hughes Aircraft Company, Culver City, California
Human Factors Engineer

Designed and conducted target detection experiments to determine relative merits of several radar image enhancement techniques. Performed computer data analysis, wrote detailed recommendations, and reported findings at science staff meetings.

ARD Corporation

o 1977 Franklin Institute Research Laboratories, Philadelphia, Pennsylvania
Human Factors Engineer

Initiated a project of photometric research for night safety of small boats, which was sponsored by the U.S. Coast Guard. Developed experimental design and built effective apparatus to measure low level glare thresholds.

EDUCATION

M.S., Industrial Psychology, California State University at Long Beach, Long Beach, California, 1978

B.S., Psychology, St. Joseph's College, Philadelphia, Pennsylvania, 1973

PROFESSIONAL AFFILIATIONS

Human Factors Society

ARD Corporation

ARD

1.0 CORPORATE PURVIEW

ARD Corporation is a Maryland-based professional services firm providing specialized technical services to industry and government. The staff consists of scientists, engineers and management specialists whose combined training and experience consists of a variety of engineering, behavioral, management and organizational disciplines. ARD is organized to concentrate this high level of expertise on a variety of application areas through two corporate divisions: Engineering Technology and Corporate Development.

1.1 Engineering Technology

The Engineering Technology Division is a team of system performance specialists, mechanical and electrical engineers, marine engineers and manufacturing experts drawn from a number of behavioral and engineering disciplines. The services provided by this team are applied to the analysis of complex systems, the design and evaluation of specific man-machine interfaces, the integration of design elements into products and systems, and the operating and maintenance processes required for successful production. The human factors disciplines of this division are applied with heavy emphasis on the implementation of programs to improve system efficiency for both military and non-military systems. Our training and experience in complex systems, product design and process control operations are directed towards achieving greater

safety, productivity gains, maintaining high levels of quality and improving total system performance.

This division uses advanced proprietary recording and analysis techniques to respond to assignments in the following functional areas:

Training device and material design
Man-machine interface design and evaluation
Shock, noise and vibration analysis of complex systems
Task and job analysis
Systems analysis
Display hardware/software design
System test and evaluation
Marine engineering
Human performance measurement
Safety analysis
Product design and efficiency
Instructional material development
Operability and production measures
Productivity improvement programs
Work measurement and simplification

1.2 Corporate Development

The Corporate Development Division is a multidisciplinary team of business experts drawn from the specialties of behavioral science, management analysis, engineering, human resources and management consulting. Using a team approach, these experts identify problems, develop solution plans and guide clients through the implementation of change strategies. Although non-traditional in approach, this strategy is proven to be most effective because of its ability to react effectively to a dynamic situation.

ARD Corporation

This division responds to assignments in the following areas:

<u>Organizational Development</u>

Human Resource Planning
Group Dynamics
Organizational Design
Career Development

<u>Management Support</u>

Personnel Assessment
Management Training and Development
Management Information Systems
Compensation Planning

1.3 Facilities

ARD Corporation's main offices are located in Columbia, Maryland. Two field representatives are located in Chicago, Illinois and Los Angeles, California. In addition to administrative activities, the main office is the site of two laboratories: The Automation Technology Laboratory and a Mock-Up Facility. The Automation Technology Lab features tele-operated robotic systems and a video 3-D viewing system. A Portable Performance Measurement unit is available for use on-site or in-house. The Human Performance Laboratory and Noise/ Vibration Analysis Laboratory are located off-site and are dedicated to research in display evaluation and user-system interaction studies, and complex system noise analysis, respectively.

ARD's main research facilities are cleared to DOD level of secret.

2.0 NUCLEAR POWER PROJECTS EXPERIENCE

The goal of ARD's Human Factors Technology Group has been the integration of human factors engineering into the design and review process of nuclear power plants and their control rooms. The total integration program considers operating processes throughout the plant, including control room activities, onsite and Emergency Response Facilities (ERFs) interfaces, operating procedures and training. ARD integrates human factors in the entire design review process.

Table 1 presents a summary of ARD Corporation Human Factors Engineering projects in the nuclear industry. These projects reflect considerable experience in providing quality support to the utilities. A summary description of projects, listed by company, follows.

Table 2 presents a summary of ARD Corporation Human Factors Engineering staff experience. Individuals' plant experience and project management responsibility are illustrated.

2.1 Commonwealth Edison Company

2.1.1 Commonwealth Edison Program Plan for Detailed Control Room Design Reviews

ARD has developed a fully-integrated human factors engineering Program Plan for conducting Detailed Control Room Design Review (DCRDRs) in all six Commonwealth Edison Company (CECo) plants. The Program Plan addresses pertinent TMI-2 task action items including control room assessment, as well as the integration of these activities with ERF needs and development of

NUCLEAR POWER PLANT	TYPE	REACTOR GENERATOR SUPPLIER	A/E	PRELIMINARY DESIGN ASSESSMENT	CONTROL ROOM DESIGN REVIEW	SAFETY PARAMETER DISPLAY SUPPORT	HUMAN ERROR ANALYSIS	WORK-STATION DESIGN	DCRDR PROGRAM PLAN	TASK ANAL-SIS	TRAINING DEVEL-OPMENT	PROCEDURE REVIEW & V&V	R.G. 1.97, 1.47 SUPPORT	CRT DISPLAY CHARACTER-ISTICS	ERF DESIGN AND REVIEW
ARKANSAS POWER & LIGHT															
Arkansas Nuclear One Unit 1 (Russelville, ARK)	PWR	B&W	B		IP			C	C	C			IP		
Arkansas Nuclear One Unit 2 (Russelville, ARK)	PWR	C-E	B		IP			IP	C	IP			IP		
COMMONWEALTH EDISON CO.															
Dresden 2 (Morris, IL)	BWR	GE/GE	S&L		C	IP	C		C	C	C	IP	IP	IP	IP
Dresden 3 (Morris, IL)	BWR	GE/GE	S&L		C	IP	C		C	C	C	IP	IP	IP	IP
LaSalle 1 (Seneca, IL)	BWR	GE/GE	S&L	C	IP	IP			C	IP	IP	IP	IP	IP	IP
LaSalle 2 (Seneca, IL)	BWR	GE/GE	S&L	C	IP	IP			C	IP	IP	IP	IP	IP	IP
Zion 1 (Zion, IL)	PWR	W/W	S&L,		IP	IP	C		C			IP	IP	IP	IP
Zion 2 (Zion, IL)	PWR	W/W	S&L	C	IP	IP	C		C			IP	IP	IP	IP
Byron 1 (Byron, IL)	PWR	W/W	S&L	C	IP	C		C	C	C		IP	IP	IP	IP
Byron 2 (Byron, IL)	PWR	W/W	S&L	C	IP	C		C	C	C		IP	IP	IP	IP
Braidwood 1 (Braidwood, IL)	PWR	W/W	S&L	C	IP	IP		C	C	C		IP	IP	IP	IP
Braidwood 2 (Braidwood, IL)	PWR	W/W	S&L	C	IP	IP		C	C	C		IP	IP	IP	IP
Quad Cities 1 (Cordova, IL)	BWR	GE/GE	S&L		IP	IP			C	C	IP	IP	IP	IP	IP
Quad Cities 2 (Cordova, IL)	BWR	GE/GE	S&L		IP	IP			C	C	IP	IP	IP	IP	IP
LOUISIANA POWER & LIGHT															
Waterford 3 (Taft, LA)	PWR	CE/W	E		IP	IP			C	C		IP	IP	IP	IP
NIAGARA MOHAWK POWER CORP.															
Nine Mile Point 1 (Scriba, NY)	BWR	GE/GE	UTILITY		IP	IP		C		C			IP	IP	IP
Nine Mile Point 2 (Scriba, NY)	BWR	GE/GE	UTILITY		IP	IP		IP		IP			IP	IP	IP
ROCHESTER GAS & ELECTRIC															
Ginna, Robert A. (Ontario, NY)	PWR	W/W	GILBERT		IP	IP		IP	C	IP				IP	
SNUPPS															
Union Electric Co.															
Callaway 1 (Fulton, MO)	PWR	W/GE	B		C				C	C				C	
KG&E, KCP&L KEPC															
Wolf Creek (Burlington, KA)	PWR	W/GE	B/S&L		C				C	C				C	
VIRGINIA ELECTRIC & POWER CO.															
Surry 1 (Gravel Neck, VA)	PWR	W/W	S&W	C		C		C	C		C		IP	IP	IP
Surry 2 (Gravel Neck, VA)	PWR	W/W	S&W	C		C		C	C		C		IP	IP	IP
North Anna 1 (Mineral, VA)	PWR	W/W	S&W			C		C	C		C		IP	IP	IP
North Anna 2 (Mineral, VA)	PWR	W/W	S&W	C		C		C	C		C		IP	IP	IP
PUBLIC SERVICE INDIANA															
Marble Hill 1 (Jefferson Co., IN)	PWR	W/W	S&L	C	IP/S	C		C	C	C	IP/S	C	IP/S	C	IP/S
Marble Hill 2 (Jefferson Co., IN)	PWR	W/W	S&L	C	IP/S	C		C	C	C	IP/S	C	IP/S	C	IP/S

C - Completed
IP - In Progress
IP/S - In Progress, Suspended

PWR - Pressurized Water Reactor
BWR - Boiling Water Reactor

W/W - Westinghouse
G/E - General Electric

S&W - Stone and Webster
S&L - Sargent and Lundy

B&W - Babcock and Wilcox
B - Bechtel

C-E - Combustion Engineering
E - Ebasco

TABLE 1. ARD CORPORATION HUMAN FACTORS ENGINEERING PROJECTS IN THE NUCLEAR INDUSTRY

	ANO	BRAIDWOOD	BYRON	CALLAWAY	DRESDEN	GINNA	LASALLE COUNTY	MARBLE HILL	NINE MILE POINT	NORTH ANNA	QUAD CITIES	SURRY	WATERFORD III	WOLF CREEK	ZION	PALISADES	OCONEE	MCGUIRE	CATAWBA	ST. LUCIE	V. C. SUMMER	SHEARON HARRIS	RANCHO SECO	CALVERT CLIFFS
R. KERSHNER	●	●	●	●	●	●	0	●	●	●	●	●	●	●	0									
E. SILVERMAN	0	0	0	0	●		●	0	0	●	●	●		0	●	0								
S. COOLEY		0	0		0			●	0		●		0											
R. DUSEK	0					●			●															
C. WEISS	0	0	●	0		0		0	0		0	0	0	0										
R. HORST	●	0	0	0				●		0		0		0										
R. MUNSON	0			0	0			0		●		●		0		0								
D. TAYLOR	●			●		●		0	●					●			●	●	●	0	0	0	0	0
J. GEBHARD										0		0												
J. WINTER					●					0	●	0	0											
P. GIRARD	0							0																
C. PLOTT					0						0		0											
M. BOGGI					0						0		0											
D. SHANNON	●								0				●											
K. BARNES	0					0			0															
R. KLEIN	0					0			0															

● = Senior Project Engineer

0 = Participating Engineer

TABLE 2. ARD PERSONNEL NUCLEAR POWER PLANT EXPERIENCE SUMMARY

operating procedures. The plan envisions the six DCRDRs being performed in succession over a six-month period. Each DCRDR will be plant-specific, although similarities between plants are taken into account in order to avoid unnecessary duplication of efforts.

2.1.2 Dresden Detailed Control Room Design Review

ARD is currently conducting a DCRDR for the Dresden station based on the CECo Program Plan and NUREG-0700 requirements. A team of ARD human factors specialists will perform an operating history review, task analysis, checklist survey, inventory and validation and verification. These tasks will lead to the identification, assessment, and correction of Human Engineering Discrepancies (HEDs). In addition, ARD will support CECo with all Nuclear Regulatory Commission (NRC) audits based on the DCRDR review. ARD has configured a database management system (DBMS) to document and sort DCRDR data on CECo's Prime computer system, and has worked with CECo to develop a comprehensive task analysis approach that will support training requirements in addition to meeting DCRDR objectives.

2.1.3 Byron/Braidwood Preliminary Design Assessments

The ARD Corporation provided human factors engineering support to CECo for the Preliminary Design Assessment (PDA) of the Byron generating station Units 1 and 2 and the duplicate plant, Braidwood Units 1 and 2. The objective of the review was to improve the man-machine interface between the operators and control boards and to satisfy an NRC licensing requirement. The multifaceted review consisted of examining control room instrumentation, layout and plant events.

In support of the PDA, ARD developed an operator questionnaire to assist operators in recalling potential operator control board interface problems; conducted a systematic comparison of the control room design features using accepted human factors design standards; developed and conducted a simulated "walk-through" and analysis to identify HEDs associated with specific plant events; and supported the assessment and implementation of the resultant design changes as the HEDs were identified. The PDA review has been submitted to the NRC, and ARD has supported CECo throughout each phase of the review.

2.1.4 Byron Center Desk Design

ARD conducted a human factors engineering review of the Byron generating station center desk. The operational issues considered were:

- Existing instrumentation
- Layout and workspace features
- Common panel accessibility
- Visibility
- Communications
- Personnel interface requirements
- Out-of-service coordination
- Procedures/technical specifications

The review began with structured interviews of operating personnel to identify the constraints imposed by the original design. A task analysis of the duties associated with center desk activity was then performed and this information was used to develop alternative designs for review. The proposed design changes were simulated in the control room using mock-ups. In addition, walk-throughs of normal, abnormal and emergency operations were videotaped for further study. Using this procedure, the various suggestions were tested for validity and refinements were made before actual design change proposals were initiated.

As a result of the review, design changes which were considered included elevating the floor inside the center desk work area to increase visibility; designing and implementing an integrated communication system; and incorporating additional work surface and filing space for the Piping and Instrumentation Drawing (P&ID) and Valve and Equipment lists.

2.1.5 Byron/Braidwood Control Board Enhancements

In order to correct many of the HEDs identified in the PDA, a human factors review was performed on the annunciator system, labeling scheme, background

shading, demarcation, and mimics at Byron and Braidwood. The annunciators were relabeled to ensure consistency of message formats, standardization of abbreviations, and unambiguous messages. Also, the tiles were regrouped to ensure functional groupings and preserve control/display-alarm relationships. The auditory coding scheme for the control room was also reviewed and separate alarm horns were set for the different control panels.

A hierarchical labeling scheme was instituted for the Byron/Braidwood control boards. This arrangement, in conjunction with background shading and demarcation lines, aided the operator in visually separating and grouping systems. By using this type of labeling, redundancy and ambiguity was minimized and label messages were standardized.

In addition, ARD has provided support to the Byron/Braidwood simulator in updating the boards, as well as ensuring minimal plant/simulator differences.

2.1.6 Zion Unit 2 Control Room Review

ARD Corporation participated in the human factors review of the Zion Unit 2 control room. Working with the CECo human factors engineering task force, ARD completed a study which concentrated on addressing the human factors concerns identified in the Kemeny and Rogovin reports.

The objective of the control room review was to improve the human factors engineering interfaces between the control room operators, the Emergency Operating Procedures (EOPs) and the Zion station control boards. The review was conducted to increase the control room operator's ability to assess plant conditions under stressful situations. The human factors engineering study resulted in a number of improvements which were incorporated at the Zion station. These improvements were also incorporated into the Westinghouse Zion simulator.

ARD Corporation personnel were responsible for the development of human factors engineering checklists, the review of videotaped procedures and the review of written operational procedures.

2.1.7 LaSalle Unit 1 Control Room Review

ARD Corporation personnel participated in the human factors engineering review of the LaSalle County station control room, as part of a CECo task force. The objective of the control room review was to identify significant human factors deficiencies and instrumentation problems in the LaSalle Unit 1 control room. Recommendations were made which improved the control room operator's ability to assess and control abnormal plant operations and stressful situations.

The study used two methods for identifying control room problems related to human factors engineering. The first method involved a review of operating experience. This was accomplished through reviewing historical reports and conducting operator interviews and questionnaire surveys. The second method entailed a task force survey of the human factors aspects of the control room. A number of human factors areas were reviewed including controls, annunciators and alarms, visual displays, control room environment, maintenance, computers and EOPs. The human factors review resulted in a number of recommendations for improving the operator's ability to assess and control plant operations.

These findings and recommended improvements were included in a control room review Near-term Operating License (NTOL) report submitted to the NRC. ARD Corporation staff assisted CECo during every phase of the subsequent NRC audit.

The final schedule was developed, documenting specific human factors engineering improvements to be implemented prior to fuel-loading and during the first refueling outage.

2.2 Arkansas Power & Light Company

2.2.1 Program Plan for Detailed Control Room Design Reviews of Arkansas Nuclear One

ARD provided support to Arkansas Power & Light (AP&L) Company in preparing a DCRDR Program Plan for Arkansas Nuclear One (ANO). The Program Plan was written in response to Generic Letter (G.L.) 82-33 and specifies the requirements for separate DCRDRs for the two units of the plant. The program was

designed to enhance operator effectiveness by identifying appropriate improvements to strengthen the man-machine interface. Although human factors engineering support was utilized throughout the program, all key decisions were intended to be made by the utility with appropriate support from the consultant.

The Program Plan provided a discussion that integrated other areas of concern, such as upgraded emergency procedures, the design of an Safety Parameter Display System (SPDS) and the inclusion of post accident monitoring instrumentation. These programs were coordinated within the DCRDR to ensure that an integrated operable control room resulted, as emphasized in NUREG-0737, Supplement 1.

2.2.2 Arkansas Nuclear One Units 1 and 2 Detailed Control Room Design Reviews

ARD is providing all human factors engineering support to AP&L in the conduct of their DCRDRs for Units 1 and 2. The support is intended to ensure that human engineering concerns are addressed to determine problems and to assess the extent that these problems affect performance. In addition, ARD will support AP&L in developing and implementing modifications and training as necessary to resolve significant discrepancies, and in establishing a working interface with the SPDS, emergency procedures upgrade, and post accident monitoring instrumentation efforts.

Six review processes will be used to identify HEDs within the control room: operating history review, task analysis, control room inventory, control room survey and verification and validation. The first three are foundation processes in which frames of reference and benchmarks for discrepancy identification will be established. The last three are investigative processes where the established benchmarks will be applied and discrepancies identified.

2.3 Niagara Mohawk Power Corporation

2.3.1 Detailed Control Room Design Review

ARD provided support to Niagara Mohawk Power Corporation in conducting a DCRDR for Nine Mile Point Unit 1. The purpose of the review was to enhance operator effectiveness by identifying appropriate improvements to strengthen the man-machine interface. This review addressed human factors concerns and the extent to which they may effect operating personnel performance.

The Boiling Water Reactor Owner's Group (BWROG) program for performing control room design reviews was followed. The review process involved application of the BWROG Supplemental Checklist to each panel in the control room and to remote shutdown panels. Other review processes included:

- A review of operating experience
- Analysis of operator tasks
- Inventory of control room equipment
- Survey of control room instrumentation
- Verification of control room equipment availability and suitability
- Validation of control room functions

A similar review is currently in progress for Nine Mile Point Unit 2. The Unit 2 review will utilize checklists based on NUREG-0700 guidelines in lieu of the BWROG program checklists.

2.4 Rochester Gas and Electric

ARD is supporting Rochester Gas and Electric (RGE) in conducting of the DCRDR at its Ginna Nuclear Generating Station. The objective of the project is to enhance control room operations at Ginna. Review tasks include:

- A review of historical operating documentation from Ginna and other similar plant designs.

- A survey of Ginna operations personnel.
- An analysis of operator tasks associated with accomplishing critical emergency functions.
- An inventory of Ginna control room equipment and instrumentation.
- A human factors survey of control room equipment based upon the guidelines contained in NUREG-0/00.
- A verification of the availability and suitability of Ginna control room intrumentation to support operator emergency tasks.
- A validation of the layout and configuration of the Ginna control room to support operator task performance.
- An assessment of the significance of the human factors discrepancies identified in the review.
- Development of resolutions and recommendations to enhance control room operations.

2.5 Louisiana Power and Light

ARD is supporting Louisiana Power and Light in conducting of the DCRDR at its Waterford 3 nuclear station. The purpose of the review is to enhance operator effectiveness by identifying appropriate improvements to strengthen the man-machine interface. The review process involves the following tasks:

1. An analysis of historical operating information from Waterford 3 and other similar Combustion Engineering plants.
2. A questionnaire survey of nuclear operations personnel.
3. An inventory of control room equipment and instrumentation.

4. A task analysis of operator duties performed during critical emergencies.

5. A human factors analysis of control room equipment using the NUREG-0700 checklist.

6. A verification of the availability and suitability of the control room equipment to support operator emergency tasks.

7. A validation of the procedures, training and control room design to support operator performance during emergencies.

8. An evaluation of the human factors discrepancies identified during the review.

2.6 Public Service Indiana

2.6.1 Marble Hill Program Plan for Detailed Control Room Design Review

ARD Corporation provided human factors engineering support to Public Service Indiana (PSI) to develop a Program Plan to satisfy the NUREG-0700 licensing requirement for a DCRDR. The evaluation plan was tailored to the construction schedule of the Marble Hill station and the availability of support personnel in the areas of operations, maintenance, licensing, systems engineering and instrumentation and control. Where feasible, the plan called for the human factors specialists to conduct review activities on a full scale, three-dimensional photo mosaic mock-up of the Marble Hill control room. This approach allowed for many HEDs to be identified and corrected prior to fabrication of the actual control panels. Other review activities were conducted on a generic plant simulator.

2.6.2 Marble Hill Detailed Control Room Design Review

ARD conducted a DCRDR for the two-unit Marble Hill station. The DCRDR, based on NUREG-0700 requirements, was performed in a two-phase process due to the

Marble Hill construction schedule. The first phase, conducted prior to the installation of the control panels, utilized life-sized control board mock-ups of Marble Hill Unit One. This phase included an industry-wide operating historical review and operator survey, task analysis, checklist survey, and control room inventory.

2.6.3 Marble Hill Center Area Review

The center area of the Marble Hill control room was reviewed by ARD personnel. This review included the design of the center desk workstation shared by both units, the unit desk workstations and computer consoles located in the control room. The analysis included all center area computer equipment, communication equipment, documents, emergency clothing and equipment and supplies. By interviewing plant operators and engineers and researching human factors criteria, ARD developed a center area design which met the requirements of all applicable regulations as well as satisfied the operators' needs.

2.6.4 Marble Hill Emergency Response Facility

ARD provided human engineering support to the design of the Technical Support Center (TSC) and Emergency Operations Facility (EOF) at Marble Hill. This support entailed a job analysis to identify resource requirements for ERF personnel, a facility communications system evaluation and an anthropometric review of proposed workstation consoles. In addition, an evaluation of the SPDS and other computer color graphics displays was conducted with respect to both display layout and USI considerations.

2.6.5 Marble Hill Procedure Development/Review Verification and Validation

ARD supported PSI in the implementation of the ARD Procedure Development/Review Program. Under this program, ARD specialists performed an in-depth and detailed review of all of the maintenance, I&C, health physics, chemical, administrative, operating, abnormal, emergency and surveillance procedures at Marble Hill. The purpose of the review was to evaluate procedure format, style, consistency and degree of compliance with various guidelines and

requirements, such as NUREG-0899, ANSI/ANS 3.2 1982, and G.L. 82-33. Through this program, ARD assisted in the development and review of the PSI EOP writer's guide, technical guidelines and a Procedures Generation Package (PGP) for submittal to the NRC.

ARD provided further support by developing a tailored advanced procedures writing course for the PSI personnel responsible for generating procedures. In addition to technical assistance, ARD also provided documentation services and assisted in the coordination of procedure development to facilitate the station's licensing process. In conjunction with the ARD G.L. 82-33 integration program, ARD specialists implemented a procedure verification and validation program to support PSI in complying with the verification and validation requirement contained in G.L. 82-33.

2.7 Virginia Electric and Power Company

2.7.1 Surry/North Anna Program Plan for Detailed Control Room Design Reviews

ARD worked with the Virginia Electric and Power Company (Vepco) in developing a Program Plan and Implementation Guideline for conducting DCRDRs of the Surry and North Anna plants. The Program Plan and Implementation Guideline addressed all NUREG-0737 areas and is specifically tailored to the Vepco plants. In addition to detailed procedures for carrying out the various review activities, estimates of DCRDR manpower needs for both Vepco personnel and the human factors specialists were included. The Program Plan and Implementation Guideline also detailed a parallel schedule for completing the DCRDRs at the two sites so that relevant findings could be shared.

2.7.2 Emergency Response Facilities Computer Graphics System Implementation

ARD is presently supporting Vepco in its implementation of a computer color graphics display system. This system is intended to incorporate the SPDS graphic displays as well as graphic displays to be used in the TSC and EOF at Surry and North Anna and the Central EOF in Richmond. ARD has provided support to Vepco in this effort in the areas of floor design layout, workstation console design, computer graphics system evaluation and graphics design guidelines.

2.7.3 Surry Analog Safety Parameter Display System

ARD supported Vepco engineering in the development of a proposed Analog SPDS. This system was developed to comply with the requirements set forth in NUREG-0660, "NRC Action Plan Developed as a Result of the TMI-2 Accident," and NUREG-0737, "A Clarification of TMI Task Action Items."

ARD provided human factors engineering design recommendations in the selection and layout of the analog displays which comprised the Analog SPDS and the Engineered Safeguards status panel. ARD also developed an evaluation plan, using the simulator at the Surry generating station and ARD's portable Performance Measurement System, to compare operator performance with and without the Analog SPDS in response to simulated emergency and abnormal plant conditions.

2.7.4 North Anna Unit 2 Preliminary Control Room Review

ARD Corporation personnel have provided human factors engineering support to Vepco for a review and implementation of NRC NTOL requirements at the North Anna Unit 2 (3-loop Pressurized Water Reactor) control room. An extensive human factors effort was completed in response to NRC requirements to meet human factors criteria in the North Anna Unit 2 control room, prior to issuing an operating license. Implementation of functional grouping of controls, relocating meters and controls, color padding enhancement, labeling, communications reviews and procedure reviews were the result of the initial human factors engineering analysis.

2.7.5 Surry Preliminary Control Room Reviews

ARD Corporation personnel provided human factors engineering support to Vepco for extensive control room reviews of Surry Units 1 and 2, prior to an NRC audit. The reviews consisted of a comprehensive analysis of the controls, displays and operational procedures for each unit.

The results of the analysis provided Vepco with the essential modifications and development schedule that would allow the plant to meet the near-term human factors review requirements.

2.8 Standardized Nuclear Unit Power Plant System

2.8.1 Program Plan for Detailed Control Room Design Reviews

ARD provided support to the Standardized Nuclear Unit Power Plant System (SNUPPS) in preparing a DCRDR Program Plan in response to G.L. 82-33. The Program Plan outlined the procedures used to satisfy the NRC requirements for a DCRDR at the Wolf Creek (Kansas Gas and Electric) and Callaway (Union Electric) stations. Many of the NRC requirements have already been fulfilled through the activities of a former human engineering consultant and by drawing on the efforts of the Westinghouse Owners Group Emergency Restoration Guidelines Verification and Validation Project. ARD used its familiarity with the intent of G.L. 82-33 to provide guidance in the preparation of the Program Plan which emphasized the integrative aspects of SNUPPS activities in all of the NUREG-0737 areas.

2.8.2 Checklist Survey

ARD provided support to SNUPPS in completing the checklist survey items not completed during the initial survey. These items included communication, computers and environmental survey items.

2.9 General Human Factors Engineering Support Services

ARD has developed a number of special-purpose programs that are available for nuclear clients. These services address regulatory concerns within the industry as well as the utilities' programs in training, operations, and maintenance.

2.9.1 Task Analysis Program

ARD has performed a comprehensive review of the task analysis procedures necessary to satisfy the licensing requirements for a DCRDR, develop EOPs and enhance training programs. To provide an overview of the different task analysis approaches and techniques developed and implemented for various purposes, ARD conducted a thorough literature search and review. Consequently, numerous variations to the task analysis method were identified. These variations were examined and the key elements of each were considered in the development of the ARD Task Analysis program. The computerized program is designed to expedite the collection of data to the appropriate level of detail and to maintain documentation control which can be cross-referenced with inventory forms and checklist specifications. This program has been favorably reviewed by the regulatory community.

2.9.2 Procedure Development, Verification and Validation

ARD Corporation's Human Factors Technology Group has provided a number of utilities with extensive support during the preparation and review of emergency operating, operating, maintenance, and administrative procedures. In response to client need, ARD has developed several programs along with system hardware to facilitate the procedure development and review process.

Procedure development is a dynamic continuing process that typically involves vast amounts of organizational resources in both time and personnel. The procedure development process must be flexible to respond to modifications necessitated by organizational changes, design modifications and enhancements, vendor notices, regulator requirement additions or modifications and operating/user experience. Procedures should also accurately and consistently reflect organizational philosophies and goals. ARD has developed a systematic program to support and assist our clients in every phase of the procedure development and upgrade process in addition to providing procedure quality control and assurance. Important procedural developmental issues encompassed by our program include:

- Clarification/confirmation of organizational structure, philosophy and goals

ARD Corporation

- Identification and delineation of procedure user needs, to include the items required by users to complete procedural tasks
- Assessment of environmental conditions and organizational structures that impact procedure use
- Integration of in-house training programs with procedure implementation, use, and revision
- Assessment of procedure compliance with guidance documents such as NUREG-0899 and ANSI/ANS 3.2 1982
- Evaluation of procedure format and style for optimal efficiency within anticipated and/or actual context and use
- Evaluation of the procedure revision process to ensure that the process is orderly, timely, and consistent with organizational goals and thoroughly documented

The ARD Procedure Development/Review Program was designed, and is being implemented, to facilitate maximum client input to provide our clients with an end product that reflects their organizational objectives and optimizes user performance.

To complement our Procedure Development/Review Program, ARD has developed a training course on the fundamentals of procedure writing. The course draws on experience in the procedure development process from the expertise of licensed operators, human factors engineers, technical writing specialists and psychologists. The course is designed for use by station operating and training personnel who are typically assigned the responsibility of producing a first draft procedure. Topics presented in the course include:

- Identifying the procedure goal
- Identifying and selecting source materials
- Identifying and specifying tasks to be accomplished in the procedure
- Identifying and evaluating the procedure user so that the procedure produced is user oriented
- Integrating user inputs
- Evaluating and selecting optimal format
- Information presentation and information processing in terms of writing style, sentence structure and word usage

- Documenting, producing and implementing the procedure
- Revising and maintaining procedures
- Verifying and validating procedures

The course consists of lecture material and small group workshop exercises. Participants receive a course workbook that contains lecture summaries, exercises and numerous examples of both "bad" and "good" practices within each topic area. Because station personnel time is of a high premium, the course length has been limited to two days. It can be offered at either onsite or offsite locations, and can be presented in conjunction with an in-house training program and schedule. As an additional service to our clients in this area, ARD has developed an advanced procedure writing course. A major distinction between the advanced and fundamentals courses is that the advanced course is tailored to the individual client's needs. Many of the topic areas in the fundamentals course are covered in more depth and to a greater detail in the advanced course.

ARD has developed a comprehensive verification and validation program to assist our clients in meeting the requirements of G.L. 82-33 and ensure full compliance with NUREG-0899. ARD's program includes:

a. Verification in which the integration of NUREG-0737 task action items I.C.2 to I.C.5 are examined, EOPs are compared to the writer's guide and a nomenclature review between EOPs and the control room is conducted.

b. A Simulator to Plant Fidelity Evaluation in which plant versus simulator validation scenarios are selected, developed and tested; an appropriate procedure set is identified and prepared; and simulator versus plant differences are minimized.

c. A Validation Orientation Process in which performance measurement tools are prepared and operating crews are selected and oriented.

d. Validation in which real-time simulator runs are conducted and operating crews are debriefed.

e. Validation Evaluation in which the data from real-time runs are analyzed, results of the program are presented, the necessity for procedure change determined and, if necessary, criteria and guidelines for procedure revision implementation are developed and instituted.

ARD's portable Performance Measurement System (see Paragraph 3.5) has multiple uses in the procedure verification and validation process. In the data analysis stage of a procedure validation program, it allows the analyst to generate detailed decision paths, identify and classify performance deviations, and calculate error rates. The quantitative and qualitative information obtained allows the client to prioritize and evaluate problem areas revealed in the validation. The data are recorded on tape to give the client the advantage of readily available validation documentation as well as the use of the documentation in operator training.

2.9.3 Technical Support Center, Emergency Operations Facility and Disturbance Analysis Surveillance System Software Development

ARD Corporation is presently creating a software development program which defines the requirements, documents and specifications for the TSC, EOF and Disturbance Analysis and Surveillance System (DASS). The program includes specifications for display functions, operator functions and associated database management functions. The formal requirements and documentation of software specifications necessitate an emphasis on the man-machine interface. The program includes:

a. Identification of the system environment which establishes a concept of operations for the operator's use of the system (requirements definition);

b. Establishment of a configuration for a display system that will achieve the desired capabilities at a minimum cost (display design); and,

c. Development of software design specifications to the level of detail necessary to begin programming implementation (software design).

Display functions to be specified within human factors engineering bounds include:

- Display format - alphanumeric, schematic, graphic (mimic)
- Display dynamics - passive, active
- Event selection
- Event display time
- Scroll technique
- Display scaling
- Color selection
- Shape selection
- Display density
- Character size (pixel quantity, number of lines)

Operator functions to be specified include:

- Critical event selection
- Event storage
- Editing
- Monitoring
- Data analysis
- Trend analysis
- Scroll control
- Scale control
- Annotation

Database management functions include:

- Interactive device control
- Operator data retrieval and storage
- Operator search strategy

APPENDIX B

HISTORICAL REVIEW

PROBLEM ANALYSIS REPORTS

Nine Mile Point Unit One PAR-1

Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): Kevin Bennett, Don Taylor

Report Type and Number: LER 81-005

Station: NMP Unit: 1

Event Date: 2/2/81 Operating Status: 90% power

Circumstances and Events Leading to the Problem: Implementation of circulating water reverse flow operation.

Nature of the Problem: Plant discharge vs. plant inlet temperature (water) exceeded tech specs.

Steps Taken to Correct or Alleviate the Problem Reduction in power load.

Outcome: Reduction of discharge temperatures to acceptable level.

Corrective Measures Undertaken: Check of discharge temperatures added to shift checklist.

Human Performance Problems Associated With Event: Operator needs alarm indication of high plant inlet/discharge ΔT.

Nine Mile Point Unit One
Historical Document Review

PAR-1

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes X No ____
(If no, end form here.)

In Which Areas: Same plant.

Corrective Actions Taken: See page 1.

Unresolved Discrepancies: Lack of indication. Consider adding
(If none, end form here.)
annunciator.

HEO Number: HR-1

Summary: On February 2, 1981 the NMP-1 water discharge temperature exceeded the differential outlined in technical specifications for a period of 52 hours. Although a check of the differential temperature change was added to the shift checklist, an annunciator would alert operators to the condition immeaiately.

LICENSEE EVENT REPORT

CONTROL BLOCK: (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

LICENSEE CODE	N Y N M P 1 (2)
LICENSE NUMBER	0 0 - 0 0 0 0 0 - 0 0 (3)
LICENSE TYPE	4 1 1 1 1 (4)
CAT	(5)

CON'T

REPORT SOURCE	L (6)
DOCKET NUMBER	0 5 0 0 0 2 2 0 (7)
EVENT DATE	0 2 0 2 8 1 (8)
REPORT DATE	0 3 0 4 8 1 (9)

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 During normal operation while implementing circulating water reverse flow operation,
0 3 the plant discharge temperature vs. plant inlet temperature ΔT Technical Specification
0 4 was exceeded for a 52-hour period. During this period, the Main Condenser differential
0 5 temperature was within Technical Specification requirements.
0 6
0 7
0 8

SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
H F (11)	A (12)	A (13)	Z Z Z Z Z Z (14)	Z (15)	Z (16)

LER/RO REPORT NUMBER (17)	EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
	8 1	—	0 0 5	/	0 4	L	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
X (18)	G (19)	B (20)	Z (21)	0 0 0 2	N (23)	N (24)	N (25)	0 0 8 0

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 For the first six and one-half hours of reverse flow operation, the inlet/discharge ΔT
1 1 were within limits. Following this period it was found that the ΔT had exceeded the
1 2 50°F differential limit varying between 51-55°F for approximately a 52-hour period.
1 3 Upon Supervisory recognition, an immediate station load reduction was taken which
1 4 brought this ΔT within limits. For future prevention, a check of (SEE OVER)

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
1 5	E (28)	0 9 0 (29)	N/A	B (31)	SUPERVISORY INSPECTION

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
1 6	Z (33)	Z (34)	N/A	N/A

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
1 7	0 0 0 (37)	Z (38)	N/A

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
1 8	0 0 0 (40)	N/A

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
1 9	Z (42)	N/A

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
2 0	N (44)	N/A	

this plant ΔT during reverse flow operation will be added to the Operations shift checklist. In addition, the requirement of this limit was re-emphasized to operations personnel.

Nine Mile Point Unit One

Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): Kevin Bennett, Don Taylor

Report Type and Number: LER 81-036

Station: NMP Unit: 1

Event Date: 7/29/81 Operating Status: 98% power

Circumstances and Events Leading to the Problem: Emergency condenser vent monitors exceeded upscale trip set point (LER 81-030). #11 and #12 system high radiation isolation function was bypassed.

Nature of the Problem: These switches also bypass emergency condenser high steam flow system isolation function, violating tech spec 3.6.2.c.

Steps Taken to Correct or Alleviate the Problem None.

Outcome: Protective system isolation signals of high steam and radiaton were inoperable for a period of approximately 45 minutes.

Corrective Measures Undertaken: Change in requalification instruction sessions; cross reference aid for locating related components for system safety.

Human Performance Problems Associated With Event: Failure to follow procedure -- potential need for operator aid to access tech spec information.

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes X No ______
(If no, end form here.)

In Which Areas: Same plant.

Corrective Actions Taken: See page 1.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ______

Summary: See LER.

CON'T 0 1 LICENSEE CODE N Y N M P 1 (2) 0 0 - 0 0 0 0 0 - 0 0 (3) LICENSE NUMBER 4 1 1 1 1 (4) LICENSE TYPE CAT

0 1 REPORT SOURCE L (6) 0 5 0 0 0 2 2 0 (7) DOCKET NUMBER 0 7 2 9 8 1 (8) EVENT DATE 0 8 1 2 8 1 (9) REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 SEE ATTACHED

0 3

0 4

0 5

0 6

0 7

0 8

0 9 SYSTEM CODE B A (11) CAUSE CODE A (12) CAUSE SUBCODE A (13) COMPONENT CODE I N S T R U (14) COMP. SUBCODE E (15) VALVE SUBCODE Z (16)

(17) LER/RO REPORT NUMBER EVENT YEAR 8 1 — SEQUENTIAL REPORT NO. 0 3 6 / OCCURRENCE CODE 0 1 REPORT TYPE T — REVISION NO. 0

ACTION TAKEN Y (18) FUTURE ACTION = (19) EFFECT ON PLANT Z (20) SHUTDOWN METHOD Z (21) HOURS (22) 0 0 0 0 ATTACHMENT SUBMITTED Y (23) NPRD-4 FORM SUB. N (24) PRIME COMP. SUPPLIER I (25) COMPONENT MANUFACTURER G 0 8

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 SEE ATTACHED

1 1

1 2

1 3

1 4

1 5 FACILITY STATUS E (28) % POWER 0 9 8 (29) OTHER STATUS (30) NA METHOD OF DISCOVERY D (31) DISCOVERY DESCRIPTION (32) RESIDENT INSPECTOR OBSERVATION

1 6 ACTIVITY RELEASED Z (33) CONTENT OF RELEASE Z (34) AMOUNT OF ACTIVITY (35) NA LOCATION OF RELEASE (36) NA

1 7 PERSONNEL EXPOSURES NUMBER 0 0 0 (37) TYPE Z (38) DESCRIPTION (39) NA

1 8 PERSONNEL INJURIES NUMBER 0 0 0 (40) DESCRIPTION (41) NA

1 9 LOSS OF OR DAMAGE TO FACILITY (43) TYPE Z (42) DESCRIPTION NA

2 0 PUBLICITY ISSUED (44) DESCRIPTION (45) NRC USE ONLY

NAME OF PREPARER Richard Neild PHONE (315) 343-2110, X1528

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES

On 6/30/81 during a routine calibration of the Emergency Condenser Vent Monitors, all four monitors exceeded the upscale trip set point. This incident was previously reported as LER 81-30. On 7/29/81, while performing a followup investigation of this incident, the technician requested permission from the Shift Supervisor to work on Emergency Condenser Vent Monitor #122. In order to prevent an inadvertent system isolation during the trouble shooting effort, the #12 System high radiation isolation function was bypassed using a keylock switch. In addition, as a precaution against a possible personnel error, the #11 system high radiation isolation function was bypassed in the same manner. These switches also bypass the Emergency Condenser High Steam flow system isolation function. The isolation functions were bypassed for approximately 30 minutes, at which time #11 Emergency Condenser was returned to normal. The isolation functions of #12 Emergency Condenser remained in bypass for an additional 15 minutes. These actions were in violation of Technical Specification Table 3.6.2c which specifies the minimum number of tripped or operable systems and the minimum number of operable instrument channels per operable trip system required for Emergency Cooling System Operability.

The heat removing capability of the Emergency Condenser remained operable throughout the incident. However, the protective system isolation signals of high steam flow and high radiation were inoperable. There was no release of radioactivity, and no effect on the health and safety of the public or plant personnel.

CAUSE, DESCRIPTION AND CORRECTIVE ACTIONS

Violation of Technical Specifications during this event was caused by failure to follow station Administrative Procedures. Present procedures call for maintaining records in the control room of all equipment status changes which may render the equipment or system not capable of performing its intended function in its required manner. The procedures further require that these status changes or the placement of jumpers or blocks shall include reference to the applicable Technical Specifications. All operating, technical, and maintenance personnel are instructed on these procedures as they apply to their duties.

As discussed at the Management meeting in the Region I office, that during primary and requalification instruction sessions an increased emphasis will be placed on the importance of the rationale in Technical Specifications. Also during the meeting, we discussed the fact that the investigation of this event and the two previous occurrences, Inspection 80-13 and LER 81-04, was still continuing. This investigation revealed, from operator feedback, that previous training has failed to emphasize that both the LCO's for a given system, and the LCO's for instrumentation, which may initiate or isolate a given system, must be referred to whenever component failures occur or when maintenance or testing is to take place on that system. Failure to check both sections of the Technical Specifications may be the cause of inadvertant Technical Specification violations. Training will place increasedemphasis on this matter. Also a component oriented cross-

reference system will be developed as an aid to readily access all portions of Technical Specifications which may directly or indirectly pertain to the operability or non-operability of all safety-related components or systems.

Nine Mile Point Unit One
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): Kevin Bennett, Don Taylor

Report Type and Number: LER 81-030

Station: NMP Unit: 1

Event Date: 6/30/81 Operating Status: Outage

Circumstances and Events Leading to the Problem: Performance of routine calibration of emergency condenser vent monitors.

Nature of the Problem: All four monitors exceeded upscale trip set point.

Steps Taken to Correct or Alleviate the Problem Tested monitors with real rather than simulated test signal.

Outcome: Still under investigation (see LER 81-036).

Corrective Measures Undertaken: See LER 81-036.

Human Performance Problems Associated With Event: See LER 81-036.

Nine Mile Point Unit One
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes X No ____
(If no, end form here.)

In Which Areas: Same plant.

Corrective Actions Taken: See page 1.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: See LER.

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 | N Y N M P 1 (2) 0 0 - 0 0 0 0 0 - 0 0 (3) 4 1 1 1 1 (4) | | (5)
LICENSEE CODE — LICENSE NUMBER — LICENSE TYPE — CAT

CON'T REPORT SOURCE L (6) 0 5 0 0 0 2 2 0 (7) 0 6 3 0 8 1 (8) 0 7 3 0 8 1 (9)
DOCKET NUMBER — EVENT DATE — REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 | During a refueling outage, while performed routine calibration of the Emergency
0 3 | Condenser Vent Monitors, Procedure N1-RTP-20, all four monitors exceeded the
0 4 | upscale trip set point of 25 mr/hr. Three of the monitors (#111, 112, 121) were
0 5 | >25 mr/hr but were within the allowable tolerance setting by Technical Specificatio
0 6 | 3.6.2C. One monitor (#122) tripped at 200 mr/hr which is out of specs and over the
0 7 | tolerance level. The consequences of the affected equipment were minimal since
0 8 | the plant was in refuel mode at the time.

SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
I B (11)	E (12)	E (13)	I N S T R U (14)	E (15)	Z (16)

(17) LER/RO REPORT NUMBER	EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
	8 1	—	0 3 0	/	0 3	L	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
E (18)	G (19)	Z (20)	Z (21)	0 0 0 0	Y (23)	N (24)	L (25)	G 0 8

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 | There was a difference found in the response between the test signal and the
1 1 | actual signal. Previous tests were run with a simulated test signal, the test is
1 2 | now run with an ARM calibration device using Cobalt 60 as the source. The procedure
1 3 | has been revised to confirm the trip setting by response to the source. All four
1 4 | monitors were recalibrated, using the actual source, to 20 mr/hr high trip point.

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
1 5	H (28)	0 0 0 (29)	NA	B (31)	Surveillance Testing

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
1 6	Z (33)	Z (34)	NA	NA

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
1 7	0 0 0 (37)	Z (38)	NA

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
1 8	0 0 0 (40)	NA

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
1 9	Z (42)	NA

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
2 0	N (44)	NA	

Richard C. Neild B-12 (315)343-2110 Ext. 152

ATTACHMENT TO LER 81-30

Cause Description and Corrective Actions (continued)

The discrepancy between the test signal and the actual signal is still under investigation.

PAR-4

Nine Mile Point Unit One
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): Kevin Bennett, Don Taylor

Report Type and Number: LER 83-019

Station: NMP   Unit: 1

Event Date: 6/23/83   Operating Status: Full power

Circumstances and Events Leading to the Problem: Installation of the "inadequate core cooling - accident level monitor".

Nature of the Problem: Monthly surveillance tests were not performed.

Steps Taken to Correct or Alleviate the Problem None.

Outcome: None (after shutdown monitor was tested prior to start-up).

Corrective Measures Undertaken: Procedures for surveillance have been added to schedule.

Human Performance Problems Associated With Event: Failure to include instrument on surveillance schedule.

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes X No ____
(If no, end form here.)

In Which Areas: Same plant.

Corrective Actions Taken: Component added to surveillance schedule.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: See LER.

(7-77)

LICENSEE EVENT REPORT

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

Licensee Code (2)	N Y N M P 1
License Number (3)	0 0 - 0 0 0 0 0 - 0 0
License Type (4)	4 1 1 1 1
CAT (5)	

CON'T 0 1

Report Source (6)	L
Docket Number (7)	0 5 0 0 0 2 2 0
Event Date (8)	0 6 2 3 8 3
Report Date (9)	0 7 2 2 8 3

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 Two monthly surveillance tests on the Inadequate Core Cooling-Accident Level Monitor,
0 3 installed per NUREG 0737, Item II.F 2, were missed during the period immediately
0 4 following its installation on December 31, 1981, until the 1982-1983 shutdown.
0 5 Consequences were minimal since a preoperational test was performed on the monitor
0 6 before being put into service. The monitor was tested prior to startup from the
0 7 1982-1983 shutdown, when it was found to be properly calibrated and functional.
0 8

0 9

System Code (11)	Cause Code (12)	Cause Subcode (13)	Component Code (14)	Comp. Subcode (15)	Valve Subcode (16)
I E	D	Z	I N S T R U	I	Z

(17) LER/RO REPORT NUMBER

Event Year		Sequential Report No.		Occurrence Code	Report Type		Revision No.
8 3	—	0 1 9	/	0 3	L	—	0

Action Taken (18)	Future Action (19)	Effect on Plant (20)	Shutdown Method (21)	Hours (22)	Attachment Submitted (23)	NPRD-4 Form Sub. (24)	Prime Comp. Supplier (25)	Component Manufacturer (26)
G	Z	Z	Z	0 0 0 0	N	N	N	G 0 8 0

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 Procedures for the surveillance have been generated and the surveillance has been
1 1 added to the schedule.
1 2
1 3
1 4

1 5

Facility Status (28)	% Power (29)	Other Status (30)	Method of Discovery (31)	Discovery Description (32)
E	1 0 0	NA	A	Review of Procedures

1 6

Activity Released (33)	Content of Release (34)	Amount of Activity (35)	Location of Release (36)
Z	Z	NA	NA

1 7 PERSONNEL EXPOSURES

Number (37)	Type (38)	Description (39)
0 0 0		NA

1 8 PERSONNEL INJURIES

Number (40)	Description (41)
0 0 0	NA

1 9 LOSS OF OR DAMAGE TO FACILITY (43)

Type (42)	Description
Z	NA

2 0 PUBLICITY

Issued (44)	Description (45)	NRC USE ONLY
N	NA	

12-81 - Aril 5

Performed 1st Test 12-81 Per Op. April 5, 82

NMPC
Station NMP
Unit 1

LER No. 83-19

Control No. 83-46
Type 01 Prompt Notification / /
03 30 Day Report / ✓ /
04 Environmental / /

OFFICE USE ONLY

GENERAL

1. EVENT DESCRIPTION Missed Surveillance Test(s)
2. EVENT DATE 6-23-83
3. EVENT TIME
4. INITIATING DEPT. I&C

PART I. INITIALIZING SECTION/DEPT. REPORT

1. Power Mwt ______ 1a. MWe ______ 1b Remarks ______
2. Mode Switch RUN 3. SSS ______ 4. SOF ______
5. Method of Discovery a. Testing ______ Procedure # ______
   b. Review ✓
   c. INSPECTION ______ NRC ______
   d. Operational event ______
   e. Environmental event ______
6. System # 36 Name ICC 7. WR Yes ___ No ✓ Number NA
8. INITIAL CORRECTIVE ACTION
   a. Description Missed Surveillance Test(s) due Jan & Feb for Inadequate Core Cooling - Accident level Monitor Monthly Surveillance Test.
   b. Set point/limit: Required NA Found ______ Left ______
   c. Technical Specification requirement: Yes ✓ No ___ Para. #4.6.11 (3)
   d. Equipment GE / Model number NA Serial# NA
   e. Manufacturer GE/Acurex/Rosemount
9. Reported By B E Taylor

PART II. 1ST REVIEW AND TECH. SPEC. REQUIREMENTS

1. Preliminary Classifications a. Reportable Yes ✓ No ___
   b. Deviation ✓ c. Incident ______
2. NOTIFICATIONS: a. Off Normal Hours - Site On Call Supt: Yes ___ No ✓
   b. Normal Hours - Plant Supt/Del. Yes ✓ No ___
   c. NAME T. Roman DATE/TIME 6-23-83
3. T.S. Section 6.9.2 (NMP) Part: a(1) ___ a(2) ___ a(3) ___ a(4) ___ a(5) ___ a(6) ___ a(7) ___ a(8) ___ a(9) ___ (Report is a type P, T, if any of these are checked)
   b(1) ___ b(2) ___ b(3) ✓ b(4) ___ (Report is an L if checked)
   c. Environmental report (report type P,T)
4a. Tech. Spec. Requirements (Explain) INADEQUATE ADMINISTRATIVE CONTROL
4b. Surveillance performed ✓ Yes ______ No
c. Surveillance # N1-ICP-36-ICC ✓
   → N1-ISP-36-ICC
5. Reviewed & completed NAME B Taylor DATE 6-23-83 TIME 1100
   Station Shift Supervisor or qualified Supervisor

NHPC CONTROL NO. 83-46

Station Report No. 83-19

PART III. 2ND LEVEL REVIEW AND CONCURRENCE

1. Concure with Section II. Yes ✓ No ____ [signature]
   (If no, complete below two lines) Station Superintendent
   a. New Classification ____ Date/Time ____
   b. Reason: ____

2. Notifications:
   a. Prompt Notification Type 01 Event: Report by
      1. 24 hour Telephone Region I to ____ NAME ____ DATE/TIME
      2. Facsimile Confirmation Next Working Day (Type P). ____ DATE/TIME
      3. 14 Day Followup (Type T) due ____ (10 day if environmental) ____ DATE/TIME
   b. 30 Day Letter (Type L) due ____ ____ DATE/TIME

3. Original set to Gen. Supt. 01/11/83 0900 DATE/TIME

PART IV. RESOLUTION AND ACCEPTANCE (By SORC if reportable, by plant supt. if not reportable.)

1. Long Term corrective Action Recommendation

2. Resolution Summary

3. Acceptance:
   a. Q.C. Supv. ____ Date/Time ____
   b. Plant Supt. ____ Date/Time ____
   c. Gen. Supt. ____ Date/Time ____
   d. SORC Chmn. ____ Date/Time ____
   Meeting No. ____

4. Required Reports Dispatched: Yes ____ No ____ Date ____

Nine Mile Point Unit One
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): Kevin Bennett, Don Taylor

Report Type and Number: LER 83-031

Station: NMP Unit: 1

Event Date: 7/14/81 Operating Status: 01% power

Circumstances and Events Leading to the Problem: During start-up inadequate draining of #11 emergency condenser system was experienced.

Nature of the Problem: Main steam IV's closed, low reactor pressure and no condenser vacuum caused inadequate draining.

Steps Taken to Correct or Alleviate the Problem SSS isolated #11 EC loop.

Outcome: The loop cooled down and was restored to service about 11 hours later.

Corrective Measures Undertaken: Changed procedures.

Human Performance Problems Associated With Event: Start-up procedure inadequate in addressing potential need for operator action.

Nine Mile Point Unit One
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes X No ____
(If no, end form here.)

In Which Areas: Same plant.

Corrective Actions Taken: See page 1.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: See LER.

LICENSEE EVENT REPORT

CONTROL BLOCK: | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 | N Y N M P 1 (2) LICENSEE CODE (9–14) | 0 0 - 0 0 0 0 0 - 0 0 (3) LICENSE NUMBER (15–25) | 4 1 1 1 1 (4) LICENSE TYPE (26–30) | | (5) CAT (57–58)

CON'T 0 1 REPORT SOURCE L (6) | 0 5 0 0 0 2 2 0 (7) DOCKET NUMBER (61–68) | 0 7 0 4 8 1 (8) EVENT DATE (69–74) | 0 8 0 3 8 1 (9) REPORT DATE (75–80)

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 While Mode switch was in Startup and Reactor was at low pressure the Emergency

0 3 Condenser Loop #11 was removed from service because of a water hammer.

0 4

0 5

0 6

0 7

0 8

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
0 9	S F (11)	E (12)	B (13)	H T E X C H (14)	D (15)	Z (16)

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
8 1	—	0 3 1	/	0 3	L	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
X (18)	Z (19)	Z (20)	Z (21)	0 0 0 0	N (23)	N (24)	[illegible] (25)	[illegible] (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 The cause of this event is the result of Main Steam IV's closed, [illegible]

1 1 and no condenser vacuum causing inadequate draining of #11 Emergency Condenser Sys-

1 2 tem. The action taken by the SSS was to isolate #11 E.C. Loop. The loop cooled down

1 3 and was restored to service about 11 hours later. Future action is being investi-

1 4 gated to change procedures when the MSIV's are closed and reactor is (SEE OVER)

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
1 5	C (28)	0 0 1 (29)	NA	A (31)	OPERATOR OBSERVATION

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
1 6	Z (33)	Z (34)	NA	NA

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
1 7	0 0 0 (37)	Z (38)	NA

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
1 8	0 0 0 (40)	NA

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
1 9	Z (42)	NA

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
2 0	N (44)	...	

NAME OF PREPARER Richard Neild PHONE (315)343-2110, X1502

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (continued):

isolated, to open the Main Steam Line Drain Valve to FII Turbine Building Equipment Sump to drain condensate from lines.

Nine Mile Point Unit One
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): Kevin Bennett, Don Taylor

Report Type and Number: LER 81-004

Station: NMP Unit: 1

Event Date: 2/9/81 Operating Status: 87% power

Circumstances and Events Leading to the Problem: Radiation monitor signal was fluctuating causing spurious half scram activations.

Nature of the Problem: Main steam RAD monitor signal was inoperable but RPS trip system was not placed in tripped condition.

Steps Taken to Correct or Alleviate the Problem RAD monitor connectors were replaced.

Outcome: During blockage, the main steam RAD monitoring system was inoperable but untripped.

Corrective Measures Undertaken: 1) Review w/ shift personnel, 2) review w/ all operating personnel, 3) procedure changes, 4) training for operations, and 5) instrument and control dept.

Human Performance Problems Associated With Event: Failure of operations personnel to follow procedure.

Nine Mile Point Unit One
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes X No ____
(If no, end form here.)

In Which Areas: Same plant.

Corrective Actions Taken: See page 1.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: See LER.

NRC FORM 366 (7-77)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

CONTROL BLOCK: [| | | | |] (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

N Y N M P 1 (2) 0 0 - 0 0 0 0 0 - 0 0 (3) 4 1 1 1 1 (4) (5)
LICENSEE CODE — LICENSE NUMBER — LICENSE TYPE — CAT

REPORT SOURCE L (6) 0 5 0 0 0 2 2 0 (7) 0 2 0 9 8 1 (8) (9)
DOCKET NUMBER — EVENT DATE — REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

During normal operation, the #111 Main Steam Radiation Monitor input to the #11 RPS Trip System was inoperable for approximately 90 minutes while the #11 Trip System was left in the untripped condition. This is contrary to the RPS Instrument Channel operability requirements as given in the Technical Specifications. The Technical Specifications require that the Trip System be placed in the tripped condition when either of the Instrument Channels associated with that Trip System is inoperable. During this time the redundant monitor input to #11 Trip System, and the two (2) (SEE OVER)

SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
S H (11)	A (12)	A (13)	R E L A Y X (14)	X (15)	Z (16)

(17) LER RO REPORT NUMBER	EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
	8 1	—	0 0 4	/	0 1	X	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
X (18)	H (19)	Z (20)	Z (21)	0 0 0 0	Y (23)	N (24)	N (25)	0 0 0 0 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

The subject radiation monitor signal had been fluctuating sufficiently to cause multiple spurious half scram actuations. Consequently, the SSS granted permission to install a block in the RPS actuation relay of the subject monitor, to prevent further spurious half scrams, while the Instrument technician was to proceed with trouble shooting by withdrawing the detector from the holder. Upon removal (SEE OVER)

FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
E (28)	0 8 7 (29)	N/A	B (31)	SUPERVISION REVIEW

ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
Z (33)	Z (34)	N/A	N/A

PERSONNEL EXPOSURES

NUMBER	TYPE	DESCRIPTION (39)
0 0 0 (37)	Z (38)	N/A

PERSONNEL INJURIES

NUMBER	DESCRIPTION (41)
0 0 0 (40)	N/A

LOSS OF OR DAMAGE TO FACILITY (43)

TYPE	DESCRIPTION
Z (42)	N/A

PUBLICITY

ISSUED	DESCRIPTION (45)	NRC USE ONLY
N (44)	N/A	

LICENSEE EVENT REPORT

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES

monitor inputs to #12 Trip System were operable, thus there was no significant safety concern.

CAUSE DESCRIPTION AND CORRECTION ACTIONS

of the detector, it was discovered that the detector-to-cable connector was loose, which was causing the fluctuating output signal. The connector was tightened, the detector reinstalled, and the monitor returned to normal indication. The RPS relay block was then removed. At this time the #11 Main Steam Line Radiation Monitor was fully operable.

In order to prevent occurrences of this nature in the future, several corrective actions have been taken. First, a review of the circumstances was made with the shift personnel involved. Second, an instruction has been issued to all operations personnel regarding this matter. Third, procedural changes have been made to ensure specific Technical Specification reviews are made and documented when equipment important to safety is removed from service. Fourth, this incident and aforementioned procedure changes will be incorporated into regularly scheduled training sessions for Operations personnel. Fifth, training sessions will be conducted within the Instrument and Control Department regarding instrumentation important to safety and the Technical Specifications requirements in general.

0 0 4 1 4 1 7 6 9

III

LER 81-04
DOCKET NO. 50-220

ATTACHMENT - ADDITIONAL INFORMATION

This occurrence was initially discovered during the same day by management review of a jumper/block log sheet which indicated that a block had been installed in the RPS actuation relay for the purpose of checking out the detector cable while the associated Trip System was left in the untripped condition. The NRC Region I office was immediately notified by telephone that the Technical Specification governing the Main Steam Radiation Monitoring Instrument Channel/Trip System operability requirements had been violated. The following day a telecopy report was submitted as required, which provided details of the occurrence.

Further management review of the occurrence has revealed that the SSS expected at the time that the troubleshooting effort would lead to an Instrument Channel calibration, which would allow the monitor to be made inoperable. The SSS then granted permission to install the relay block, based on operator judgment that a faulty instrument and/or cable was causing the spurious half scrams, and that further half scrams and RPS relay actuations caused by the trouble shooting and calibration effort could result in unnecessary wear and damage to the relay mechanisms.

A manual half scram should have been inserted in Trip System 11 prior to placing the relay block in order to satisfy Technical Specifications operability requirements. Previously mentioned steps are being taken to make all Operations and Instrument & Control personnel aware of this requirement.

8104170767

Nine Mile Point Unit One
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): Kevin Bennett, Don Taylor

Report Type and Number: LER 81-054

Station: NMP   Unit: 1

Event Date: 12/21/81   Operating Status: 96% power

Circumstances and Events Leading to the Problem: Shallow control rods were inserted during normal operation.

Nature of the Problem: The average planar linear heat generation rate exceeded tech specs.

Steps Taken to Correct or Alleviate the Problem Other control rods were inserted.

Outcome: Actual APLHGR was lowered to within specifications.

Corrective Measures Undertaken: None.

Human Performance Problems Associated With Event: Failure to recognize potential for and onset of exceeding tech spec for APLHGR.

Nine Mile Point Unit One
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes X No ____
(If no, end form here.)

In Which Areas: Same plant.

Corrective Actions Taken: None.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: See LER.

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 | N Y N M P 1 (2) | 0 0 - 0 0 0 0 0 - 0 0 (3) | 4 1 1 1 1 (4) | | | (5)

LICENSEE CODE — LICENSE NUMBER — LICENSE TYPE — CAT

CON'T 0 1 | REPORT SOURCE L (6) | 0 5 0 0 0 2 2 0 (7) | 1 2 2 1 8 1 (8) | 0 1 1 3 8 2 (9)

DOCKET NUMBER — EVENT DATE — REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 During steady state operation, the insertion of shallow control rods resulted in an

0 3 average planar linear heat generation rate (APLHGR) of 8.72 kw/ft which exceeded the

0 4 limit of 8.43 kw/ft as per Tech. Spec. Table 3.1.7.d. This placed the plant in a limiti

0 5 condition as per Tech. Spec. 3.1.7.a. The safety concerns of this event were minimal

0 6 because of its short duration and magnitude. LERs 78-32, 80-01 and 80-04 reported

0 7 similar occurrences.

0 8

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
0 9	R C (11)	X (12)	Z (13)	Z Z Z Z Z Z (14)	Z (15)	Z (16)

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
8 1	—	0 5 4	/	0 3	L	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
X (18)	Z (19)	B (20)	Z (21)	0 0 3 -	N (23)	N (24)	Z (25)	Z 9

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 The cause of the event was due to flux coupling between control rods. Immediately

1 1 upon discovering that the APLHGR limit was exceeded, several control rods were inserted

1 2 which acted to lower the actual APLHGR to 7.98 kw/ft. A Tech. Spec. change has since

1 3 been implemented which raised the APLHGR limit above the value incurred by this event.

1 4

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
1 5	E (28)	0 9 6 (29)	N/A	A (31)	Computer Printout

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
1 6	Z (33)	Z (34)	N/A	N/A

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
1 7	0 0 0 (37)	Z (38)	N/A

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
1 8	0 0 0 (40)	N/A

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
1 9	Z (42)	N/A

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
2 0	N (44)	N/A	

NINE MILE POINT NUCLEAR STATION UNIT 1

DOCUMENT TRANSMITTAL AND VERIFICATION

LER 84-55

Title of Document

ASSIGNED	BY [illegible]	TO AR Schmidt	DATE [illegible]
DUE	DATE [illegible]		LOGGED DATE
SUBJECT	LER 84-55		
DOCUMENT ADDRESSED TO	US NRC Document Control Desk Washington DC 20555		
PREPARED BY	AR Schmidt		DATE 6-25-84
REVIEWED BY	[illegible]		DATE [illegible]
	N.T. Bobbs		DATE 6-25-84
			DATE
			DATE
VERIFIED BY	[illegible]		DATE [illegible]
	[illegible]		DATE [illegible]
			DATE
			DATE
COMMENTS			
RECEIVED FOR TRANSMITTAL			DATE
SENT TO ADDRESSEE	BY		DATE
COPY RETURNED TO SITE	BY	LOGGED AT SITE	DATE
FILED AT SITE	DOC.CONTROL RECORD		DATE
OFFICE STAMPS			

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): Don Taylor

Report Type and Number: ~~Scram Report - dated 7/26/80~~

Station: NMP Unit: 1

Event Date: 7/26/80 Operating Status: Start-up

Circumstances and Events Leading to the Problem: Operator was adjusting the mechanical pressure regulator (MPR) to increase reactor pressure from 935 psig to 950 psig.

Nature of the Problem: A pressure spike caused the neutron flux to increase to the IRM scram point.

Steps Taken to Correct or Alleviate the Problem None.

Outcome: Reactor scram.

Corrective Measures Undertaken: None.

Human Performance Problems Associated With Event: In regulating pressure, the MPR control utilizes a lower-to-right and raise-to-left configuration; the opposite of the MPR meter (feedback indication) and the expected configuration.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes X No ____
(If no, end form here.)

In Which Areas: ____

Corrective Actions Taken: None.

Unresolved Discrepancies: Control configuration and feedback
(If none, end form here.) compatability.

HEO Number: HR-2

Summary: While adjusting the mechanical pressure regulator (MPR) to increase reactor pressure, a pressure spike caused the neutron flux to increase to the IRM scram point.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: LER 79-056/03L-0

Station: Dresden Unit: 2

Event Date: 10/04/79 Operating Status:

Circumstances and Events Leading to the Problem:

Changing closed indication light bulb for the 2-D electromatic relief valve.

Nature of the Problem: Closed indication light bulb socket shorted while replacing the light bulb internally.

Steps Taken to Correct or Alleviate the Problem

Outcome:

Corrective Measures Undertaken: Socket replaced.

Human Performance Problems Associated With Event: None.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes X No ____
(If no, end form here.)

In Which Areas: Not H.F.

Corrective Actions Taken: ____

Unresolved Discrepancies: ____
(If none, end form here.)

HEO Number: ____

Summary: ____

LICENSEE EVENT REPORT

CONTROL BLOCK: [| | | | |] (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1	I L D R S 2 (2) — LICENSEE CODE (9–14)
	0 0 - 0 0 0 0 0 - 0 0 (3) — LICENSE NUMBER (15–25)
	4 1 1 1 1 (4) — LICENSE TYPE (26–30)
	(5) — CAT (57–58)
REPORT SOURCE	L (6) (60)
	0 5 0 0 0 2 3 7 (7) — DOCKET NUMBER (61–68)
	1 0 0 4 7 9 (8) — EVENT DATE (69–74)
	1 0 2 3 7 9 (9) — REPORT DATE (75–80)

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 While changing the closed indication light bulb for the 2-D electromatic relief

0 3 valve, the socket shorted blowing the fuses for normal and reserve power to the

0 4 relief valve and rendering the relief valve inoperable. Safety significance

0 5 minimized because HPCI was operable as were remaining relief valves during

0 6 repairs to the socket. This is the first event of this nature.

0 7

0 8

0 9	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
	S F (11)	E (12)	A (13)	I N S T R U (14)	I (15)	Z (16)

(17) LER RO REPORT NUMBER	EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
	7 9	—	0 5 6	/	0 3	L	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
A (18)	Z (19)	Z (20)	Z (21)	0 0 0 0	N (23)	N (24)	N (25)	G 0 8 0 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 The closed indication light bulb socket shorted while replacing the light bulb in-

1 1 ternally. The socket was replaced and operability of the 2D electromatic relief

1 2 valve demonstrated. No further corrective action deemed necessary.

1 3

1 4

1 5	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
	E (28)	0 9 8 (29)	N/A	Z (31)	Operator Observation

1 6	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
	Z (33)	Z (34)	N/A	N/A

1 7	PERSONNEL EXPOSURES NUMBER	TYPE	DESCRIPTION (39)
	0 0 0 (37)	Z (38)	N/A

1 8	PERSONNEL INJURIES NUMBER	DESCRIPTION (41)
	0 0 0 (40)	N/A

1 9	LOSS OF OR DAMAGE TO FACILITY (43) TYPE	DESCRIPTION
	Z (42)	N/A

2 0	PUBLICITY ISSUED	DESCRIPTION (45)	NRC USE ONLY
	N (44)	N/A	

NAME OF PREPARER John Dunbar B-36 PHONE: X-421

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: LER 79-001/03L-0

Station: Dresden Unit: 2

Event Date: 1/3/79 Operating Status:

Circumstances and Events Leading to the Problem: Steady state operation.

Nature of the Problem: Torus level increased to -1 inch.

Steps Taken to Correct or Alleviate the Problem Operator pumped the excess torus water to the hotwell.

Outcome: Restoring water level to -3.5" (within specifications).

Corrective Measures Undertaken: Procedural change.

Human Performance Problems Associated With Event: Inadequate procedure.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes x No ____
(If no, end form here.)

In Which Areas: ____

Corrective Actions Taken: Adequate procedure.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: ____

NRC FORM 366 (7-77)

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01	Licensee Code (2)	I L D R S 2
	License Number (3)	0 0 - 0 0 0 0 0 - 0 0
	License Type (4)	4 1 1 1 1
	CAT (5)	
01	Report Source (6)	L
	Docket Number (7)	0 5 0 0 0 2 3 7
	Event Date (8)	0 1 0 3 7 9
	Report Date (9)	0 1 3 1 7 9

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 During steady state operation the torus level increased to -1 inch, due to re-
03 petitive starts of the HPCI turbine. See RO#79-2/01T-0. Immediate operator action
04 was to pump the excess torus water to the hotwell, restoring water level to -3.5"
05 which is within specifications. This event had minimal safety significance since
06 the 0.5 inch excess in water level did not significantly affect the pressure sup-
07 pression capability. This event has occured previously at Dresden. (Unit 2 RO#75-51).
08 T.S. req's level maintained between -1.5 and -4.75" at 1# D/P.

Line 09	System Code (11)	Cause Code (12)	Cause Subcode (13)	Component Code (14)	Comp. Subcode (15)	Valve Subcode (16)
	S A	D	Z	Z Z Z Z Z Z	Z	Z

LER/RO Report Number (17)	Event Year		Sequential Report No.		Occurrence Code	Report Type		Revision No.
	7 9	—	0 0 1	/	0 3	L	—	0

Action Taken (18)	Future Action (19)	Effect on Plant (20)	Shutdown Method (21)	Hours (22)	Attachment Submitted (23)	NPRD-4 Form Sub. (24)	Prime Comp. Supplier (25)	Component Manufacturer (26)
G	Z	Z	Z	0 0 0 0	N	N	Z	Z 9 9 9

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 Increase in the torus water level was determined to be an inadequate procedure. The
11 HPCI surveillance will be changed to include a "CAUTION" statement so the torus level
12 will not exceed specifications during repetitive starts of the HPCI turbine. No
13 further action is necessary.
14

Line 15	Facility Status (28)	% Power (29)	Other Status (30)	Method of Discovery (31)	Discovery Description (32)
	E	0 9 5	NA	A	Operator Observation

Line 16	Activity Released (33)	Content of Release (34)	Amount of Activity (35)	Location of Release (36)
	Z	Z	NA	NA

Line 17	Personnel Exposures Number (37)	Type (38)	Description (39)
	0 0 0	Z	NA

Line 18	Personnel Injuries Number (40)	Description (41)
	0 0 0	NA

Line 19	Loss of or Damage to Facility Type (42)	Description (43)
	Z	NA

Line 20	Publicity Issued (44)	Description (45)	NRC Use Only
	N	NA	

LICENSEE EVENT REPORT

PREVIOUS REPORT: 1/

CONTROL BLOCK: (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 | I L D R S 2 (2) | 0 0 - 0 0 0 0 0 - 0 0 (3) | 4 1 1 1 1 (4) | (5)
LICENSEE CODE | LICENSE NUMBER | LICENSE TYPE | CAT

REPORT SOURCE L (6) | 0 5 0 0 0 2 3 7 (7) | 0 1 0 3 7 9 (8) | 0 5 0 3 7 9 (9)
DOCKET NUMBER | EVENT DATE | REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 During steady state operation the torus level increased to -1 inch, due to re-
03 petitive starts of the HPCI turbine. See RO#79-2/01T-0. Immediate operator action
04 was to pump the excess torus water to the hotwell, restoring water level to -3.5"
05 which is within specifications. This event had minimal safety significance since
06 the 0.5 inch excess in water level did not significantly affect the pressure sup-
07 pression capability. This event has occured previously at Dresden. (Unit 2 RO#75-51)
08 T.S. req's level maintained between -1.5 and -4.75" at 1# D/P.

SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
09 S A (11)	A (12)	A (13)	Z Z Z Z Z Z (14)	Z (15)	Z (16)

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
7 9	—	0 0 1	/	0 3	X	—	1

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
H (18)	G (19)	Z (20)	Z (21)	0 0 0 0	N (23)	N (24)	Z (25)	Z 9 9 9

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 Increase in the torus water level was determined to result from operator oversight.
11 Personnel involved were admonished to ensure level is properly maintained. The HPCI
12 surveillance will be changed to include a "CAUTION" statement so the torus level will
13 not exceed specifications during repetitive starts of the HPCI turbine. No further
14 action is necessary.

15 FACILITY STATUS E (28) | % POWER 0 9 5 (29) | OTHER STATUS (30) NA | METHOD OF DISCOVERY A (31) | DISCOVERY DESCRIPTION (32) Operator Observation

16 ACTIVITY RELEASED Z (33) | CONTENT OF RELEASE Z (34) | AMOUNT OF ACTIVITY (35) NA | LOCATION OF RELEASE (36) NA

PERSONNEL EXPOSURES
17 NUMBER 0 0 0 (37) | TYPE Z (38) | DESCRIPTION (39) NA

PERSONNEL INJURIES
18 NUMBER 0 0 0 (40) | DESCRIPTION (41) NA

LOSS OF OR DAMAGE TO FACILITY (43)
19 TYPE Z (42) | DESCRIPTION NA

PUBLICITY
20 ISSUED N (44) | DESCRIPTION (45) NA | NRC USE ONLY

NAME OF PREPARER M. Wright- B-40 PHONE: X-422

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: LER 79-046/03L-0

Station: Dresden Unit: 2

Event Date: 7/29/79 Operating Status:

Circumstances and Events Leading to the Problem: Inerting containment.

Nature of the Problem: Nitrogen storage tank level dropped to 55" contrary to T.S.

Steps Taken to Correct or Alleviate the Problem

Inerting stopped to minimize consumption.

Outcome:

Corrective Measures Undertaken: Nitrogen tank alarm will be adjusted from 100 to 80 inches to increase its significance and annunciator procedure changed.

Human Performance Problems Associated With Event:

Setpoint on alarm.

Procedure inadequacy.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes ______ No __x__
(If no, end form here.)

In Which Areas: NMP estimates rate of nitrogen consumption by flow indications; No alarms.

Corrective Actions Taken: ______

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ______

Summary: ______

LICENSEE EVENT REPORT

CONTROL BLOCK: (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 | I L D R S 2 (2) | 0 0 - 0 0 0 0 0 - 0 0 (3) | 4 1 1 1 1 (4) | (5)
LICENSEE CODE | LICENSE NUMBER | LICENSE TYPE | CAT

CON'T 0 1 | REPORT SOURCE L (6) | 0 5 0 0 0 2 3 7 (7) | 0 7 2 9 7 9 (8) | 0 8 2 8 7 9 (9)
DOCKET NUMBER | EVENT DATE | REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 While inerting containment, the nitrogen storage tank level dropped to 55" contrary to
0 3 T.S. 3.7.A.6 b limit of >/ = 60". Safety significance was minimized because inerting
0 4 was stopped to minimize consumption. This event has occurred previously. R.O. 78-13-
0 5 03L-0.
0 6
0 7
0 8

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
0 9	S E (11)	A (12)	A (13)	Z Z Z Z Z Z (14)	Z (15)	Z (16)

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
7 9	—	0 4 6	/	0 3	L	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
H (18)	F (19)	Z (20)	Z (21)	0 0 0 0	N (23)	N (24)	Z (25)	Z 9 9 9 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 Cause was operator error in estimating rate of additional nitrogen consumption after
1 1 receiving alarm. Immediate corrective action was to stop inerting. The nitrogen
1 2 tank level alarm will be adjusted from 100 to 80 inches to increase its significance
1 3 and the annunciator procedure changed to reflect proper operator action.
1 4

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
1 5	F (28)	0 5 3 (29)	N/A	A (31)	Shift Engineer Observation

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
1 6	Z (33)	Z (34)	N/A	N/A

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
1 7	0 0 0 (37)	Z (38)	N/A

NMP- flow indication
no alarm.

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
1 8	0 0 0 (40)	N/A

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
1 9	Z (42)	N/A

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
2 0	N (44)	N/A	

NAME OF PREPARER J. E. Doyle B-43 PHONE: X-265

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: LER 80-047/01T-0

Station: Dresden Unit: 3

Event Date: Operating Status:

Circumstances and Events Leading to the Problem: HPCI System and Isolation Condenser out of service and primary containment integrity broken.

Nature of the Problem: Reactor pressure exceeded 90 psig and primary coolant temperature exceeded 212°F.

Steps Taken to Correct or Alleviate the Problem Increase shutdown cooling flow.

Outcome: Temperature and pressure within limit.

Corrective Measures Undertaken: Operating order.

Human Performance Problems Associated With Event: Inadequate procedure.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes x No ____
(If no, end form here.)

In Which Areas: Procedure.

Corrective Actions Taken: Procedure includes several cautions about stratification.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: ____

CONTROL BLOCK: | | | | | | |

LICENSEE CODE (1)	I L D R S 3
LICENSE NUMBER (2)	0 0 - 0 0 0 0 0 - 0 0
LICENSE TYPE (3)	4 1 1 1 1
CAT (4)	
REPORT SOURCE (5)	L
DOCKET NUMBER (6)	0 5 0 0 0 2 4 9
EVENT DATE (7)	1 2 2 1 8 0
REPORT DATE (8)	1 2 2 9 8 0

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

Reactor pressure exceeded 90 psig and primary coolant temperature exceeded 212 degrees Fahrenheit with HPCI System and Isolation Condenser out of service and Primary Contmt. Integrity broken. There was minimal effect on public health and safety since all other ECCS Systems were functioning and there was no deviation in reactor water level. This is the first event of its kind.

SYSTEM CODE (11)	CAUSE CODE (12)	CAUSE SUBCODE (13)	COMPONENT CODE (14)	COMP. SUBCODE (15)	VALVE SUBCODE (16)
S A	D	Z	Z Z Z Z Z Z	Z	Z

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
8 0	—	0 4 7	/	0 1	T	—	0

ACTION TAKEN (18)	FUTURE ACTION (19)	EFFECT ON PLANT (20)	SHUTDOWN METHOD (21)	HOURS (22)	ATTACHMENT SUBMITTED (23)	NPRD-4 FORM SUB. (24)	PRIME COMP. SUPPLIER (25)	COMPONENT MANUFACTURER
X	G	Z	Z	0 0 0 0	Y	N	N	Z 9 9 9

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

Procedural inadequacy to address temperature stratification within the reactor vessel with recirc. pumps off and low shutdown cooling flow caused this event. Long-term corrective actions include issuing an operating order, making a procedure change and considering system modifications. Immediate corrective action was to increase shutdown cooling flow which brought temperature and pressure within limits.

FACILITY STATUS (28)	% POWER (29)	OTHER STATUS (30)	METHOD OF DISCOVERY (31)	DISCOVERY DESCRIPTION (32)
G	0 0 0	NA	A	Operator Observation

ACTIVITY RELEASED (33)	CONTENT OF RELEASE (34)	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
Z	Z	N/A	N/A

PERSONNEL EXPOSURES

NUMBER (37)	TYPE (38)	DESCRIPTION (39)
0 0 0	Z	N/A

OP1 - several cautions about stratification.

PERSONNEL INJURIES

NUMBER (40)	DESCRIPTION (41)
0 0 0	N/A

LOSS OF OR DAMAGE TO FACILITY (42)

TYPE (43)	DESCRIPTION
Z	N/A

PUBLICITY

ISSUED (44)	DESCRIPTION (45)
N	N/A

NRC USE ONLY

ATTACHMENT TO LICENSEE EVENT REPORT 80-47/01T-0
COMMONWEALTH EDISON COMPANY (CWE)
DRESDEN UNIT 3(ILDRS 3)
DOCKET #050-249

Shortly after achieving a cold shutdown, with recirculation pumps off, Reactor Water Cleanup System isolated and with one loop of shutdown cooling system in operation, it was noted that reactor vessel pressure was 150 PSIG while recirculation loop temperature was 155 degrees fahrenheit. Primary containment integrity had been broken and HPCI and Isolation Condenser were out of service. A second shutdown cooling loop was placed into operation to achieve greater vessel flow to eliminate temperature stratification and when the mixing occurred, recirculation loop temperature temporarily exceeded 212 degrees fahrenheit. Technical Specification Limiting Conditions of Operation 3.5.C.1, 3.5.E.1 and 3.7.A.2 were exceeded during this event. Reactor pressure and water temperatures were immediately reduced to acceptable levels when the second loop was placed into service.

The safety significance of this event is minimal since the reactor was in a shutdown condition, secondary containment integrity was in effect, both low pressure emergency core cooling systems were operational, the shutdown cooling system was in operation, the feedwater system was available and no work was being done that had the potential to drain the vessel. Furthermore, the electromatic relief valves were available to control reactor pressure; water level, was at all times, in the normal operating range. This is the first event of its kind.

The cause of this event is attributable to procedural inadequacy, specifically DOP 1000-3, which fails to address the possibility of temperature stratification in the vessel with recirculation pumps not running.

The corrective actions are based on the need to immediately procedurally address this situation and subsequently to provide system changes.

On an interim basis, an Operating Order has been issued to require the use of two shutdown cooling system loops, one at full flow and the other at a reduced flow to ensure that sufficient flow is available when the recirculation pumps are not running, to prevent temperature stratification of water in the vessel. This Operating Order will remain in effect until the Shutdown Cooling System Operation

[illegible handwritten line]

Procedure, DOP 1000-3, is revised to include a precaution to maintain surveillance of the back panel reactor vessel metal temperature recorder when operating the shutdown cooling system with the reactor recirculation pumps not running. On a long term basis, an investigation into the design of the shutdown cooling system will be conducted to determine changes that could enhance system operation in situations of reduced recirculation flow.

The operating order has already been issued and procedure DOP 1000-3 will be revised by January 1, 1981. A supplemental LER will be issued, once the extent of any system design changes and a schedule for implementation are determined.

— WHAT INDICATIONS WERE RECEIVED ON S.D.C. INSTRUMENTATION (RECORDER) (SHOULD HAVE BEEN NOTED).

— WHAT WAS TIME SPAN OF EVENT

See Wil[illegible] 7/11 * — PANEL CHECKS OF [illegible] MIGHT HAVE PICKED IT UP. (TUNNEL VISION?) SHOULD THIS BE IN PROCEDURE NEEDED?

— ANY VESSEL ΔT PROBLEMS

— ANY PROCESS COMPUTER PTS/ALARMS AVAILABLE FOR MONITORING VESSEL TEMPS

— DESIGN CHANGES ON SDC?

Rev STA

Fuel Pool tied "C"

One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

included in package sent to E.L.Z.

January 19, 1981

Dr. E. L. Zebroski
Nuclear Safety Analysis Center
3412 Hillview Ave.
Palo Alto Calif. 94304

Dear Dr. Zebroski:

On December 21, 1981, Dresden 3 was in cold shutdown but experienced an undetected use in pressure to the point where the limiting condition of operation which governed primary containment was exceeded. The detail of this event are being provided to Bill Layman.

It is recommended that the Nuclear Safety Analysis Center examine this event in detail. It appears that a generic situation of a heat source other than the core or a pressurizer is not adequately recognized in the industry. This type of problem has been experienced in several reactor incidents in the past year.

It is considered that an increased awareness of this problem can enhance reactor operations safety.

Commonwealth Edison will cooperate in providing assistance in the analysis recommended.

R. E. Jortberg

R. E. Jortberg

cc: W. H. Layman (with data package)

9822A

Inadvertent Pressurization of Dresden Unit 3,
DVR 12-3-80-101, LER 80-47/01T-0

Event

On December 21, 1981, Dresden 3 was in cold shutdown with the recirculation pumps off and the reactor vessel not vented. During the course of the shutdown on the previous day, the Rx had not been flooded, to avoid unnecessary thermal cycles on the vessel.

The following systems had been removed from service for modification and maintenance: HPCI, Isolation Condenser, Reactor water cleanups and control rod drives. The unit was being maintained in the cold shutdown condition with one shutdown cooling loop, maintaining 140^0 to 180^0F on the recirculation loop suction temperature indicators. In an effort to establish better control over reactor water temperature as indicated on the recirculation loops, the operators were throttling the shutdown cooling flow from the vessel. Approximately 6 hours after the shutdown cooling flow had been throttled, it was discovered that reactor pressure indicated 110 psig with 155^0F indicated on the reactor circulation loops. Shutdown cooling flow was immediately increased, causing the loop temperatures to increase over 212^0 (220^0F) for about 15 minutes. Reactor pressure started to decrease with the increased cooling flow. Primary containment integrity, which had been broken to cool the drywell for work inside was established. The reactor pressure was restored to 0 PSIG. at approximately 6:30 a.m.

Analysis & Corrective Action

The review of the data indicates that the unit was in a cold shutdown condition as evidenced by the recirculation loop temperature at 7:22 a.m. on December 20. Normal procedures call for the isolation of the recirculation pump discharge valve and discharge bypass valve or the pump suction valve be closed when using the shutdown cooling mode to insure that flow is established through the reactor vessel and not through the idle pump. This temperature was running approximately 155^0F prior to and throughout the pressure rise.

A review of the metal temperatures of the vessel indicates that the temperature of the vessel measured at "below water level" was slowly increasing from about approximately 220^0 to 360^0 over a 6 hour period. The feedwater nozzle temperature was increasing at the same rate. The lower metal temperatures of the vessel were running constant at approximately 110^0F and held constant throughout the duration of the pressure increase. The increase from 220^0 to 360^0F occurred over the period of time that flow was throttled to obtain better control over temperature. The mechanism for the pressure increase with the indication of moderator temp. less than 212^0, is thought to be localized boiling at the reactor vessel inside surface just below the water level. The boiling occurred when shutdown cooling flow was decreased to the point that insufficient turbulence was available to prevent stratification in this region. The heat source appears to be the latent heat in the vessel wall, transmitted down from the vessel flange, which was not cooled down by flooding the vessel on shutdown.

In response to this event, the NRC issued a/n immediate action letter requiring; in part:

1. Completion of an Onsite Review to determine the safety significance of this event and determine actions necessary to prevent future recurrence.

2. Implementation of a station operating order to ensure one shutdown cooling pump will be operated at rated flow during cold shutdown conditions for both units to insure adequate mixing water in the reactor pressure vessel.

3. Provide in the report of this event required by Technical Specification your analysis of the cause of this vent and the description of your plant permanent corrective actions. The report will discuss such items as procedures changes. design changes and your schedule for implementing the corrective action.

The immediate corrective actions taken were to change the procedure by adding a precaution stating that with reactor recirculation pumps not running, temperature stratification of the reactor vessel water is possible under low flow conditions. It also requires a surveillance of the vessel metal temperature recorder to detect possible temperature stratification of the reactor vessel water under reduced shutdown cooling flow conditions.

In addition, the design is being studied for proposed design changes that could prevent a reccurence.

Discussions with the station have indicated that there may be a need for a temperature-saturation pressure meter or/and ability to throttle reactor building close cooling water to the heat exchanger rather than the shutdown cooling flow to insure adequate flow. This would require a design change to allow throttling of the close cooling water heat exchanger valve. NOT DESIGNED FOR THIS

It is our opinion that this incident has possible future chance for recurrence in that the effect of the heat from the upper regions of the reactor vessel has not been considered when in a cold shutdown condition and the vessel is (by plan) not cooled down to prevent unnecessary thermal cycles on the vessel, the head vent is closed for these conditions and the Rx recirculation pumps are not in service.

9723A

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: LER 78-007/03L-0

Station: Dresden　　Unit: 2

Event Date: 2/1/78　　Operating Status:

Circumstances and Events Leading to the Problem: Steady state operation. 2/3 B SBGT system was taken out-of-service for modification.

Nature of the Problem: Surveillance missed.

Steps Taken to Correct or Alleviate the Problem

Outcome:

Corrective Measures Undertaken: Personnel instructed about their error.

Human Performance Problems Associated With Event:

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes ________ No __X__
(If no, end form here.)

In Which Areas: ________

Corrective Actions Taken: ________

Unresolved Discrepancies: ________
(If none, end form here.)

HEO Number: ________

Summary: ________

LICENSEE EVENT REPORT

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

| 1 | I L D R S 2 (2) 0 0 - 0 0 0 0 0 - 0 0 (3) 4 1 1 1 1 (4) (5)

LICENSEE CODE 9–14; LICENSE NUMBER 15–25; LICENSE TYPE 26–30; CAT 57–58

REPORT SOURCE L (6) 0 5 0 0 0 2 3 7 (7) 0 2 0 1 7 8 (8) 0 2 2 1 7 8 (9)

DOCKET NUMBER 61–68; EVENT DATE 69–74; REPORT DATE 75–80

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

| 2 | On 1-30-78, while Units 2&3 were at steady-state operation, 2/3 B SBGT system was tak-
| 3 | en out-of-service for modification. Surveillance on 2/3 A SBGT was performed every-
| 4 | day while B train was out-of-service. For the first two days that B train was out-of-
| 5 | service, however, the operability test on A train was performed only for 30 min., not
| 6 | the 10 hrs required by Tech Spec 4.7.B.1.a. This incident did not affect the availa-
| 7 | bility, of the SBGT system, therefore safe plant operation was not impaired. Event
| 8 | is not a repetitive occurrence.

| 9 | SYSTEM CODE: S C (11) CAUSE CODE: A (12) CAUSE SUBCODE: A (13) COMPONENT CODE: Z Z Z Z Z Z (14) COMP. SUBCODE: Z (15) VALVE SUBCODE: Z (16)

(17) LER/RO REPORT NUMBER: EVENT YEAR 7 8 — SEQUENTIAL REPORT NO. 0 0 7 / OCCURRENCE CODE 0 3 REPORT TYPE L — REVISION NO. 0

ACTION TAKEN: H (18) FUTURE ACTION: Z (19) EFFECT ON PLANT: Z (20) SHUTDOWN METHOD: Z (21) HOURS (22): 0 0 0 0 ATTACHMENT SUBMITTED: N (23) NPRD-4 FORM SUB.: N (24) PRIME COMP. SUPPLIER: Z (25) COMPONENT MANUFACTURER: Z 9 9 9 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

| 10 | After the oversight was discovered the surv. on A train was performed daily for 10
| 11 | hrs. until B train was put back in service. This incident was caused by operation
| 12 | oversight. To avoid recurrence the appropriate personnel have been instructed about
| 13 | their error.
| 14 |

| 15 | FACILITY STATUS: E (28) % POWER: 1 0 0 (29) OTHER STATUS (30): U3 at 60% METHOD OF DISCOVERY: A (31) DISCOVERY DESCRIPTION (32): Tech Staff Review of Surveillances

| 16 | ACTIVITY RELEASED: Z (33) CONTENT OF RELEASE: Z (34) AMOUNT OF ACTIVITY (35): NA LOCATION OF RELEASE (36): NA

| 17 | PERSONNEL EXPOSURES NUMBER: 0 0 0 (37) TYPE: Z (38) DESCRIPTION (39): NA

| 18 | PERSONNEL INJURIES NUMBER: 0 0 0 (40) DESCRIPTION (41): NA

| 19 | LOSS OF OR DAMAGE TO FACILITY (43) TYPE: Z (42) DESCRIPTION: NA

| 20 | PUBLICITY ISSUED: N (44) DESCRIPTION (45): NA NRC USE ONLY

Joe Chan B-54 222

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: LER 78-053/03L-0

Station: Dresden Unit: 3

Event Date: 11/4/78 Operating Status:

Circumstances and Events Leading to the Problem:
Performing offgas radiation monitor calibration.

Nature of the Problem: 3 "A" monitor was found to fail downscale.

Steps Taken to Correct or Alleviate the Problem Inoperable monitor was tripped in the upscale position.

Outcome:

Corrective Measures Undertaken:

Human Performance Problems Associated With Event: None.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes ________ No X
(If no, end form here.)

In Which Areas: ________

Corrective Actions Taken: ________

Unresolved Discrepancies: ________
(If none, end form here.)

HEO Number: ________

Summary: ________

LICENSEE EVENT REPORT

CONTROL BLOCK: [| | | | |] (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 | I L D R S 3 (2) | 0 0 - 0 0 0 0 0 - 0 0 (3) | 4 1 1 1 1 (4) | | (5)

LICENSEE CODE 9–14; LICENSE NUMBER 15–25; LICENSE TYPE 26–30; CAT 57–58

CON'T REPORT SOURCE L (6) | DOCKET NUMBER 0 5 0 0 0 2 4 9 (7) | EVENT DATE 1 1 0 4 7 8 (8) | REPORT DATE 1 1 3 0 7 8 (9)

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 While performing DCP 2700-11 (Offgas Radiation Monitor Calibration), 3"A" monitor

0 3 was found to fail downscale. As required by Tech. Spec. 3.2.D.2 the inoperable

0 4 monitor was tripped in the upscale position. Safety significance minimal because

0 5 the parallel redundant "B" monitor continued to operate normally. This is the first

0 6 occurrence of this type on the Off-Gas Log Rad Monitors.

0 7

0 8

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
0 9	M B (11)	E (12)	A (13)	I N S T R U (14)	X (15)	Z (16)

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
7 8	—	0 5 3	/	0 3	L	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
C (18)	Z (19)	Z (20)	Z (21)	0 0 0 0	N (23)	Y (24)	N (25)	G 0 8 0 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 Cause attributable to a failed amplifier in the 3"A" Off gas Log Rad Monitor. Spare

1 1 Offgas Log Rad Monitor was installed and its setpoints calibrated as required by

1 2 DCP 2700-11. Off Gas Rad Monitors will continue to be calib. quarterly and func-

1 3 tionally tested monthly per DCP 2700-11.

1 4

FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
E (28)	0 5 5 (29)	NA	B (31)	Surveillance Testing

ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
Z (33)	Z (34)	NA	NA

PERSONNEL EXPOSURES

NUMBER	TYPE	DESCRIPTION (39)
0 0 0 (37)	Z (38)	NA

PERSONNEL INJURIES

NUMBER	DESCRIPTION (41)
0 0 0 (40)	NA

LOSS OF OR DAMAGE TO FACILITY (43)

TYPE	DESCRIPTION
Z (42)	NA

PUBLICITY

ISSUED	DESCRIPTION (45)
N (44)	NA

NRC USE ONLY

NAME OF PREPARER Carl Lindberg B-57 PHONE X-289

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: LER 79-004/03L-0

Station: Dresden Unit: 3

Event Date: 3/14/79 Operating Status:

Circumstances and Events Leading to the Problem: Q.A. audit.

Nature of the Problem: Two Control Rod Drives were inadvertently not tested during full core scram testing following refueling.

Steps Taken to Correct or Alleviate the Problem

Outcome:

Corrective Measures Undertaken:

Human Performance Problems Associated With Event:
Personnel not following procedure.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes ________ No __x__
(If no, end form here.)

In Which Areas: ________

Corrective Actions Taken: ________

Unresolved Discrepancies: ________
(If none, end form here.)

HEO Number: ________

Summary: ________

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 | I L D R S 3 (2) | 0 0 - 0 0 0 0 0 - 0 0 (3) | 4 1 1 1 1 (4) | | (5)
LICENSEE CODE | LICENSE NUMBER | LICENSE TYPE | CAT

CON'T
01 | REPORT SOURCE L (6) | 0 5 0 0 0 2 4 9 (7) | 0 3 1 4 7 9 (8) | 0 3 2 8 7 9 (9)
DOCKET NUMBER | EVENT DATE | REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 A Quality Assurance audit identified that two Control Rod Drives, H-8(30-31) and K-8
03 (38-31), were inadvertantly not tested during full core scram testing following refuel
04 on 5-17-78 as required by T.S.4.3.C.1. There was minimal safety significance because
05 the CRD's have been scram tested satisfactorily since this occurrence.
06
07
08

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
09	R B (11)	A (12)	A (13)	C R D R V E (14)	Z (15)	Z (16)

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
7 9	—	0 0 4	/	0 3	L	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
H (18)	Z (19)	Z (20)	Z (21)	0 0 0 0	N (23)	N (24)	N (25)	G 0 8 0 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 Operator selected adjacent control rods for testing, and Tech Staff Rep. inadequately
11 reviewed tests to identify error. The personnel involved have been admonished to
12 ensure procedure is followed correctly.
13
14

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
15	C (28)	0 0 0 (29)	N/A	B (31)	Audit by Quality Assurance

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
16	Z (33)	Z (34)	N/A	N/A

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
17	0 0 0 (37)	Z (38)	N/A

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
18	0 0 0 (40)	N/A

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
19	Z (42)	N/A

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
20	N (44)	N/A	

NAME OF PREPARER Don Maxwell PHONE: 815-942-2920

GPO 917-926

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: LER 80-042/03L-0

Station: Dresden Unit: 2

Event Date: 11/2/80 Operating Status:

Circumstances and Events Leading to the Problem:

Nature of the Problem: Ultrasonic testing of the scram discharge volume was not performed.

Steps Taken to Correct or Alleviate the Problem

Outcome:

Corrective Measures Undertaken:

Human Performance Problems Associated With Event: None - Test missed.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes ________ No ___x___
(If no, end form here.)

In Which Areas: ______________________

Corrective Actions Taken: ______________________

Unresolved Discrepancies: ______________________
(If none, end form here.)

HEO Number: ________

Summary: ______________________

LICENSEE CODE: I L D R S 2 (2) LICENSE NUMBER: 0 0 - 0 0 0 0 0 - 0 0 (3) LICENSE TYPE: 4 1 1 1 1 (4) CAT (5)

REPORT SOURCE: L (6) DOCKET NUMBER: 0 5 0 0 0 2 3 7 (7) EVENT DATE: 1 1 0 2 8 0 (8) REPORT DATE: 1 1 1 4 8 0 (9)

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

During the review of the Unit 2 and Unit 3 Operator's logs and subsequent check with Technical Staff personnel revealed that the ultrasonic testing of the scram discharge volume was not performed during the 1500-2300 shift. The health and safety of the general public was not endangered since the tests performed on the previous shift and immediately following the discovery of the deviation showed no water in the scram discharge volume. This was the first occurrance of this type at Dresden.

SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
R B (11)	A (12)	X (13)	Z Z Z Z Z Z (14)	Z (15)	Z (16)

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
8 0	—	0 4 2	/	0 3	L	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
H (18)	Z (19)	Z (20)	Z (21)	0 0 0 0	N (23)	N (24)	Z (25)	Z 9 9 9

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

The individual responsible for performing the ultrasonic test failed to check the November schedule before the weekend and consequently missed the test. The Quality Control Supervisor has issued a memo instructing the Shift Engineering Assistant to contact the responsible individual if he has not reported within one half hour of the time scheduled for the test. No further action is required.

FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
E (28)	0 5 4 (29)	NA	A (31)	Review of Unit Log Book

ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
Z (33)	Z (34)	NA	NA

PERSONNEL EXPOSURES

NUMBER	TYPE	DESCRIPTION (39)
0 0 0 (37)	Z (38)	NA

PERSONNEL INJURIES

NUMBER	DESCRIPTION (41)
0 0 0 (40)	NA

LOSS OF OR DAMAGE TO FACILITY (43)

TYPE	DESCRIPTION
Z (42)	NA

PUBLICITY

ISSUED	DESCRIPTION (45)	NRC USE ONLY
N (44)	NA	

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: SOER 81-15

Station: Zion-2, Palisades, Ft. Calhoun, Fitzpatrick, Unit: Brunswick-1

Event Date: 9/19/76, 1/6/81, 8/30/82, 12/20/81, 3/25/79 Operating Status:

Circumstances and Events Leading to the Problem:

Nature of the Problem: Vital DC power supply failures due to personnel errors.

Steps Taken to Correct or Alleviate the Problem

Outcome:

Corrective Measures Undertaken:

Human Performance Problems Associated With Event: Lack of alarms, inadequate procedures.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes x No ____
(If no, end form here.)

In Which Areas: All.

Corrective Actions Taken: Procedures cover this event adequately. All such events controlled by shift supervisor.

Unresolved Discrepancies:
(If none, end form here.)

HEO Number: ____

Summary:

INPO

Institute of
Nuclear Power
Operations

1100 Circle 75 Parkway
Suite 1500
Atlanta, Georgia 30339

Significant
Operating
Experience
Report

83-5

May 27, 1983

DC POWER SYSTEM FAILURES

REFERENCES:

UNIT (TYPE):	ZION-2 (PWR)	PALISADES (PWR)
DOC NO/LER NO:	50-304/76000	50-255/81001
EVENT DATE:	9/19/76	1/6/81
NSSS/AE:	WESTINGHOUSE/ SARGENT & LUNDY	COMBUSTION ENGI- NEERING/BECHTEL
UNIT (TYPE):	FORT CALHOUN (PWR)	FITZPATRICK (BWR)
DOC NO/LER NO:	50-285/82017	50-333/81082
EVENT DATE:	8/30/82	12/30/81
NSSS/AE:	COMBUSTION ENGI- NEERING/GIBBS, HILL, DURHAM & RICHARDSON, INC.	GENERAL ELECTRIC/STONE & WEBSTER
UNIT (TYPE):	BRUNSWICK-1 (BWR)	
DOC NO/LER NO:	50-325/79009	
EVENT DATE:	3/25/79	
NSSS/AE:	GENERAL ELECTRIC/ UNITED ENGINEERS & CONSTRUCTORS	

Proceedings of Workshop on Vital DC Power, NSAC 48

INPO Significant Operating Experience Report (SOER): 81-15

NRC IE Information Notice: 81-05

SUMMARY:

Vital DC power supply failures due to personnel errors, lack of adequate procedures, and internal component failures have resulted in inadvertent reactor trips and severe operational transients at operating nuclear power plants.

[illegible]
controlled by S/S.

☒ Green—Normal Attention
☐ Yellow—Prompt Attention
☐ Red—Immediate Attention

DESCRIPTION:

ZION-2

On September 19, 1976, Zion-2 was at 20 percent power following a maintenance shutdown. One emergency diesel generator was under test with rated load, and one of the battery systems was isolated from the DC bus for an equalizing charge. The DC bus isolated from the battery was connected through a tie breaker from a unit 1 DC bus.

During the battery disconnect after the equalizing charge, the operator opened the tie breaker prior to connecting the battery and battery charger, causing loss of power to the DC bus. This in turn resulted in the loss of DC control power to two of the four 4 KV buses, all generator transformer protection (relaying), metering, all main control board annunciators (including windows and horns), and other loads. Due to the loss of DC control power, the reactor coolant pump underfrequency relays tripped. This generated a reactor and turbine trip because the reactor power level was above 10 percent. The trips occurred without any annunciation in the control room. The operators realized that the turbine had tripped (heard and felt closure of the stop valves). They also noticed that the control rods were fully inserted, only two of four reactor coolant pumps were running (because of loss of DC power to breaker trip coils), and the main generator 50-second time delay trip following the turbine trip had not tripped the generator breaker (due to loss of relaying).

Generator breakers on the 345 KV bus were tripped manually to isolate the generator from the switchyard and to prevent motoring of the generator. The operating feedwater pump did not trip automatically (loss of generator relaying) and could not be tripped from the control room (loss of DC control power). The feedpump continued to feed steam generators through partially opened bypass valves. The resultant rapid cooldown and pressure decrease initiated a safety injection. The safety injection signal initiated the auto-start of two idle diesel generators, various emergency core cooling system (ECCS) pumps, and fans. The main feedwater pump eventually was tripped locally.

After tripping of the main generator breaker(s), the 4 KV buses on the unit transformer did not transfer to the system transformer because of the loss of DC control power. Since the diesel generator that was under test during the transient remained tied to the 4 KV buses and the unit auxiliary transformer, it attempted to carry the 4 KV bus loads and resulted in motoring of the diesel generator. A fire resulted in

Main

the diesel generator when the breaker did not trip due to the loss of DC power. The operator attempted to trip the diesel generator locally, but was prevented from reaching the switch due to the intensity of the fire. The diesel generator field windings were burned open. The carbon dioxide system was initiated manually and extinguished the fire.

The pressurizer relief tank rupture disk ruptured due to continued lifting of pressurizer safety valves. Twenty-five hundred gallons of water from the pressurizer relief tank were released into the containment. (NSAC-48 provides more detailed information about this event.)

This event (initiated due to a personnel error) resulted in unanalyzed system interactions and responses; severe equipment damage (burned diesel generator); loss of system status information, protection, and interlocks; a rapid reactor vessel cooldown; and activation of the emergency plan.

PALISADES

On January 6, 1981, while performing monthly surveillance tests on both station batteries, maintenance personnel inadvertently opened the battery output breakers from both station batteries to the associated 125 volt DC buses. Battery chargers were in operation and supplied DC power to the 125 volt DC buses during the time (one hour) the station batteries were disconnected. The opening/tripping of the battery output breaker is not annunciated in the control room. Because of no alarm, control room personnel were not aware of the status of the vital DC power system.

The plant was operating at 99 percent of rated power during this event. Since their control circuits are powered from DC power independent of station DC power, a loss of off-site power during this period would have started the emergency diesel generators. However, in the absence of manual action, the emergency buses supplied by diesel generators could not be loaded because the breaker control power is supplied by station DC power.

FORT CALHOUN

On August 30, 1982, while testing containment hydrogen monitors, the control room operator noticed that there was no valve position indication for both inboard containment isolation valves associated with one of the hydrogen monitors. Investigation revealed that the containment isolation valve solenoids had both experienced coil failures. One solenoid valve coil had an internal short, while the other solenoid valve coil indicated a short to ground. This condition effectively placed a short across the solenoid's 125 VDC electrical supply line, which blew

the fuses. The loss of power supply to the solenoid valves resulted in a loss of valve position indication in the control room and also allowed the valves to fail open. The failed solenoid valve coils were rated for service at a DC voltage of 125 volts ± 10 percent. The solenoid valve coils failed because the coils operated at a higher voltage during the battery's equalizing charge. The 125 VDC system was operated at 140 VDC during the equalizing mode.

This event is an example of premature equipment degradation because the component selection process did not adequately consider all operating conditions of the application.

FITZPATRICK

During normal shutdown operations on December 30, 1981, operators noticed erratic readings on the source range monitors (SRMs) and the intermediate range monitors (IRMs) that were provided with power from Division I of the 24 VDC bus.

Investigation revealed that the erratic SRM and IRM readings were due to low 24 VDC voltage on the Division I battery. The AC power supply for the bus battery charger was out for maintenance, and battery bank discharge resulted in the low voltage condition.

Unavailability of AC power to the charger, coupled with an oversight by operators on plant status, resulted in the discharge of the battery. Some type of battery capacity monitoring could have alerted the operator prior to actual discharge of the battery.

BRUNSWICK-1

On March 25, 1979, during the 125 volt battery capacity test, voltage fell below the first minute battery voltage limit of 105 volts. After the first minute, the battery level increased to 118 volts and remained above 105 volts for the duration of the test. Investigation revealed that the low voltage resulted from loose and oxidized battery terminals and connectors. The terminals and connectors were cleaned and torqued to the manufacturer's recommendation. A battery capacity retest was completed successfully.

Loose and oxidized terminals caused the degradation of battery voltage during the first minute when the battery duty cycle normally is required to carry peak load. A similar situation during the design basis conditions (station black-out) could have resulted in inoperable equipment and systems.

OTHER EVENTS

Licensee Event Reports and Nuclear Plant Reliability Data System (NPRDS) reports were reviewed to identify DC power systems component failures. One hundred and ninety-two reported events through December 1982 were categorized as follows:

battery specific gravity problems	24 percent
personnel errors	23 percent
miscellaneous	22 percent
charger failures	16 percent
battery/cell failures	11 percent
loose/corroded terminals	4 percent

Battery specific gravity problems have resulted from electrolyte stratification, incorrect sampling methods, and the degraded condition of batteries and cells.

Personnel errors were one of the major contributors to DC power system problems and/or failures. Inadequate operating/maintenance procedures and operator training in DC power systems operation caused switching errors that resulted in interruption or loss of power supply to protection and control systems. In some cases, lack of status indication in the control room delayed corrective actions.

Internal component failures (resistors, diodes, silicon controlled rectifiers) and loose connections resulted in most of the charger failures. No single charger component indicated frequent repetitive failures.

Battery or cell failures were caused by cell cracking, "deep cycling" (discharging a battery below the minimum cell voltage), and corroded or loose terminals. Battery cell cracking was attributed to battery positive plate expansion caused by a structural change in the plate material due to a chemical reaction. Deep cycling, particularly in early service life, may lead to shortened cell life.

DC power systems normally are operated above their rated voltage (i.e., a 125 VDC system typically operates at 130 VDC) because of constraints on minimum cell voltage and capacity (ampere-hours).

Therefore, when the battery is put on an equalizing charge (normally 140 VDC), the DC system, including protection and some control components, will operate at the higher voltage condition. Thus, components are subjected to continuous operation at higher than rated voltage; resulting in degradation and subsequent premature failures.

SIGNIFICANCE:

DC power supplies are essential components in protection and control systems. Unanalyzed events, transients and system interactions may occur due to the loss of a DC power supply bus.

Significant effects from the loss of a DC bus are as follows:

- inadvertent reactor and turbine trips
- loss of critical instrumentation
- loss of plant status information
- partial loss of ECCS capability
- partial loss of residual heat removal capability
- unwarranted system interactions
- loss of critical indicators and/or monitors
- unnecessary transients

Operation of DC power systems above their rated voltage may result in premature failure of solenoids, lamps, and relays.

RECOMMENDATIONS:

<u>Design and Analysis</u>

1. Review vital DC power system annunciator and monitoring systems available to the control room operator, and evaluate the need for the following:

   a. alarms

   OK (1) bus under voltage/over voltage } over voltage alarm ?

   OK (2) system ground fault } OK

OK (3) battery charger trouble

OK (4) battery/battery charger input/output breaker positions

?o b. battery capacity monitor (amp-hour meter)

2. Conduct a design review or test as-built vital DC power systems to determine the plant's behavior on loss of a vital DC bus or vital DC system. If the design review or test indicates that loss of a vital DC bus or system may cause significant transients, consider design or procedural changes to ensure that the transient is operationally manageable. N/A

3. N/A Evaluate the sampling method(s), time of sample collection, and calibration methods or standards for electrolytic specific gravity measurements.

4. N/A Review the systems and components supplied by vital DC systems to ensure that they are not subjected to more than their design rated voltage during the various modes of DC system operation (particularly during equalizing charges).

PROCEDURES

5. Establish or upgrade administrative controls over operation, maintenance, and testing of DC power systems to accomplish the following:

N/A a. prevent simultaneous maintenance on redundant DC divisions

N/A b. provide specific instructions to control the operation of tie breakers that connect redundant divisions or that connect units of a multi-unit plant

N/A c. prevent simultaneous testing of redundant DC divisions where the reliability of the DC system would be increased by testing each division separately

?o d. provide guidelines for monitoring battery capacity when chargers are removed from service

6. Review existing vital DC power system operating procedures to ensure that switching operations and sequencing for the following evolutions are specified clearly and correctly:

N/A a. transferring between the float and equalizing modes of operation

N/A b. crosstying between electrical divisions (if permitted)

c. crosstying between units of multi-units plants (if permitted)

d. transferring between normal and standby chargers

7. Review plant operating procedures to ensure that they address initial and follow-up actions on loss of each vital DC bus.

MAINTENANCE

8. N/A Review vital DC power system preventive maintenance procedures to ensure that battery cell terminals, intercell connections, and bus connections are clean. Routine inspections of the battery cell case should be conducted.

TRAINING

9. N/A Ensure that operator training includes vital DC power system operation, with special attention placed on plant responses to losses of vital DC power and proper switching operation.

INFORMATION CONTACT: D. D. Reddy, INPO, (404) 953-5318
OR
K. J. Brown, INPO, (404) 953-5428

Please sign and return the enclosed postcard.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: SER 85-83

Station: Hatch-2 Peach Bottom - 3 Unit:

Event Date: 7/14/83, 11/17/83 Operating Status: Hatch 27%

Circumstances and Events Leading to the Problem:

Nature of the Problem: Misoperation of individual rod scram timing equipment at BWR's.

Steps Taken to Correct or Alleviate the Problem

Outcome:

Corrective Measures Undertaken:

Human Performance Problems Associated With Event: Misoperation of timing equipment.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes x No ____
(If no, end form here.)

In Which Areas: All but switch design. NMP has single switches (an older design).

Corrective Actions Taken: 1) Cautions in procedures. 2) Training 3) Redundant switches.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: ____

I 11203 Williams (INPO) 22-Dec-83 1:40AM-PST Wng 84-4

Subject: INPO SIGNIFICANT EVENT REPORT (SER): 83-93

SUBJECT:	MISOPERATION OF INDIVIDUAL ROD SCRAM TIMING EQUIPMENT AT BWRs	
UNIT(TYPE):	HATCH 2 (BWR)	PEACH BOTTOM 3 (BWR)
DOC NO/LER NO:	50-366/NA	50-278/NA
EVENT DATE:	07/14/83	11/17/83
NSSS/AE:	GENERAL ELECTRIC/ BECHTEL	GENERAL ELECTRIC/ BECHTEL
REFERENCE:	IE INFORMATION NOTICE NO. 83-75 IMPROPER CONTROL ROD MANIPULATION	

SUMMARY:

MISOPERATION OF INDIVIDUAL ROD SCRAM TIMING EQUIPMENT MAY RESULT IN UNANALYZED ROD PATTERNS OR PLANT SCRAMS AT BWRs.

DESCRIPTION:

HATCH 2

WHILE THE UNIT WAS OPERATING AT 27% POWER, CONDENSER VACUUM BEGAN TO DECREASE. THE ROD WORTH MINIMIZER WAS BYPASSED, AND THE OPERATORS BEGAN INSERTING RODS IN SEQUENCE IN ORDER TO DROP POWER BELOW 5% WHERE THE MECHANICAL VACUUM PUMP COULD BE USED. POWER WAS NOT BEING REDUCED QUICKLY ENOUGH; THEREFORE, RODS WERE CONTINUOUSLY INSERTED USING THE EMERGENCY-IN SWITCH. POWER WAS STILL NOT DECREASING FAST ENOUGH TO AVOID A TURBINE-DRIVEN FEEDWATER PUMP TRIP ON LOW VACUUM. PLANT PERSONNEL DECIDED TO CONTINUE INSERTING LOW-WORTH PERIPHERAL RODS USING THE INDIVIDUAL ROD SCRAM TEST SWITCHES. TWO OPERATORS WERE ASSIGNED TO THE SCRAM TEST PANEL. THE OPERATOR AT THE MAIN CONTROL PANEL WAS NOT NOTIFIED WHEN THE SINGLE ROD SCRAMS WERE BEGUN. UPON OBSERVING THE FIRST SCRAM LIGHT ON THE FULL CORE DISPLAY, THE OPERATOR DISCONTINUED ROD MOVEMENTS FROM THE MAIN PANEL. AFTER THE PERIPHERAL RODS WERE INDIVIDUALLY SCRAMMED, NORMAL CONTROL ROD INSERTION WAS RESUMED. AGAIN, POWER WAS NOT DROPPING QUICKLY ENOUGH, AND SINGLE ROD SCRAMS WERE RECOMMENCED. A REVIEW OF THE PROCESS COMPUTER CONTROL ROD POSITION EDIT INDICATED THAT SEVERAL RODS WHICH HAD BEEN PREVIOUSLY SCRAMMED FROM THE TEST PANEL WERE NOT FULLY INSERTED. THE TEST PANEL OPERATORS WERE THEN INSTRUCTED TO HOLD THE TEST SWITCH DOWN FOR AT LEAST FIVE SECONDS TO ENSURE FULL INSERTION, AND THE RODS WERE RESCRAMMED, AFTER WHICH THE PROCESS COMPUTER INDICATED THAT ONE ROD WHICH SHOULD HAVE BEEN FULL-OUT (NOTCH 48) WAS ACTUALLY AT NOTCH POSITION 12. AT THAT POINT, THE REACTOR WAS MANUALLY SCRAMMED PER PROCEDURE.

By OC Proc

Dres & QC
Do not have
RSCS

PEACH BOTTOM 3

THE UNIT WAS REDUCING POWER FOR A PLANNED MAINTENANCE OUTAGE. AS POWER WAS DECREASED, THE ROD SEQUENCE CONTROL SYSTEM (RSCS) CAME INTO EFFECT. WITH THE RSCS IN EFFECT, ROD MOVEMENT IS LIMITED TO THE GROUP NOTCH MODE. IN THIS CASE, IT WAS ESTIMATED THAT UP TO 9 HOURS WOULD HAVE BEEN REQUIRED TO ACHIEVE THE DESIRED LOAD REDUCTION. RODS WERE THEN INSERTED IN SEQUENCE PER AN APPROVED PROCEDURE USING THE INDIVIDUAL ROD SCRAM TEST SWITCHES. AS THIS WAS BEING DONE, PROBLEMS WITH BALANCE OF PLANT (BOP) EQUIPMENT WERE DETECTED. THE OPERATOR AT THE SCRAM TEST PANEL WAS INSTRUCTED TO SPEED UP THE SCRAMMING OF INDIVIDUAL RODS IN ORDER TO DROP POWER. THE OPERATOR THEN BEGAN SCRAMMING RODS ABOUT SIX SECONDS APART. THE GUIDANCE HE WAS FOLLOWING SPECIFIED THAT EACH SCRAM TEST SWITCH WAS TO BE LEFT OPEN FOR AT LEAST FIVE TO SIX SECONDS AFTER THE ROD HAD REACHED FULL-IN INDICATION. THE OPERATOR, THEREFORE, LEFT THE SWITCHES IN THE SCRAM POSITION AS HE WENT ON TO SUCCESSIVE RODS. THIS RESULTED IN UP TO POSSIBLY TEN RODS BEING IN THE SCRAM CONDITION AT ONE TIME. A COMBINATION OF THE FREQUENCY OF THE SCRAMS COUPLED WITH THE LEAKAGE FLOW PAST THE PISTON SEALS ON THE RODS THAT WERE FULL-IN BUT STILL SCRAMMED, RESULTED IN FILLING THE SCRAM DISCHARGE INSTRUMENT VOLUME (SDIV). THE 3 GALLON ALARM OCCURRED BUT WAS NOT NOTICED DUE TO ATTENTION TO THE BOP EQUIPMENT PROBLEMS. WHEN THE 25 GALLON ROD BLOCK ALARMED, THE SHIFT SUPERVISOR TOLD THE OPERATOR TO STOP THE SINGLE ROD SCRAMS, BUT THE 50 GALLON SCRAM DISCHARGE VOLUME HIGH LEVEL SCRAM OCCURRED SIMULTANEOUSLY. ONLY 24 SECONDS HAD ELAPSED FROM THE 25 GALLON ROD BLOCK ALARM UNTIL THE FULL SCRAM OCCURRED.

Ro-A at Dr By Pr

COMMENTS:

1. THESE EVENTS ARE SIGNIFICANT BECAUSE OF THE POTENTIAL TO RESULT IN UNANALYZED ROD PATTERNS OR UNPLANNED TRANSIENTS THROUGH THE USE (OR MIS-USE) OF THE SINGLE ROD SCRAM TEST CIRCUITS.

2. ALL BWR'S HAVE SIMILAR EQUIPMENT. SOME PLANTS HAVE SINGLE SWITCHES FOR EACH DRIVE, ALL MOUNTED ON ONE PANEL WITH A LOCKED DOOR (USUALLY LOCATED IN THE CONTROL ROOM). MORE RECENT DESIGNS HAVE TWO SWITCHES PER DRIVE (ONE FOR EACH SOLENOID), MOUNTED ON EACH HYDRAULIC CONTROL UNIT IN THE REACTOR BUILDING. THE LATTER DESIGN CAN RESULT IN INADVERTENT SCRAMMING OF A ROD IF ONE OF THE SWITCHES IS LEFT IN THE WRONG POSITION. THIS DE-ENERGIZES ONE SOLENOID (HALF SCRAM), AND IF THE OTHER SOLENOID IS DE-ENERGIZED DURING A SUBSEQUENT SURVEILLANCE, THE ROD WILL BE AUTOMATICALLY INSERTED.

Def QC

Cautions in procedures. Prod. Individual switches. Older design. Scram switches.

3. THE SCRAM TIMING PANEL WAS DESIGNED TO SUPPORT SCRAM TIMING REQUIREMENTS AND NOT TO ACCOMPLISH RAPID POWER REDUCTIONS. USE OF THIS PANEL CAN DEFEAT THE PURPOSE OF THE ROD WORTH MINIMIZER AND THE ROD SEQUENCE CONTROL SYSTEM AT LOW POWER LEVELS. PROCEDURES SHOULD CLEARLY DEFINE THE USE AND OPERATION OF THIS PANEL. CARE SHOULD ALSO BE TAKEN TO PREVENT ROD MOVEMENT SIMULTANEOUSLY FROM TWO LOCATIONS (MAIN PANEL AND SCRAM PANEL).

Def QC Same Jives

OK by Proc. ot QC & D

4. WHEN PERFORMING SINGLE ROD SCRAMS IT IS IMPORTANT TO LEAVE THE SOLENOIDS DE-ENERGIZED LONG ENOUGH FOR FULL INSERTION. CONTROL RODS ARE ~~NORMALLY FULL-IN WITHIN FOUR SECONDS, BUT~~ THAT IS NOT ALWAYS THE CASE; IF RODS ARE NOT FULLY INSERTED, ROD PATTERNS MAY RESULT WHICH HAVE NOT BEEN ANALYZED FOR THE ~~ROD DROP ACCIDENT.~~

5. DURING SINGLE ROD SCRAMS, THE SCRAM DISCHARGE VOLUME VENTS ~~AND DRAINS REMAIN OPEN. TO PREVENT UNWANTED SCRAMS, THE~~ INTERVAL BETWEEN SINGLE ROD SCRAMS SHOULD BE SUFFICIENT TO ~~ALLOW FOR DRAINAGE OF THE SCRAM DISCHARGE VOLUME.~~ DURING ~~NORMAL SCRAM TIMING, THIS CAN BE DONE AS THE PREVIOUSLY~~ SCRAMMED ROD IS WITHDRAWN PRIOR TO TESTING THE NEXT ROD.

almost verbatim out of D+QC Proc.

INPO'S EVALUATION OF THESE EVENTS IS CONTINUING.

INFORMATION CONTACT: WADE GREEN, INPO, 404/951-4752

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: SER 50-83

Station: Susquehanna Unit: 1

Event Date: 3/22/83 Operating Status: Hot Shutdown

Circumstances and Events Leading to the Problem: Hot Shutdown

Nature of the Problem: Reactor mode switch was moved from a "startup" to "shutdown" position.

Steps Taken to Correct or Alleviate the Problem

Outcome: Switch failed to provide a full scram as designed.

Corrective Measures Undertaken:

Human Performance Problems Associated With Event: Switch.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes x No ____
(If no, end form here.)

In Which Areas: Same.

Corrective Actions Taken: Replaced mode switch.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: ____

NUCLEAR NOTEPAD INFO

[94]... GILLISPIE (INFO) 14 11:26AM-PDT
SUBJECT: INPO SIGNIFICANT EVENT REPORT (SER): 50-83

Same as 12-5

SUBJECT: REACTOR MODE SWITCH DEFICIENCY

UNIT (TYPE): SUSQUEHANNA 1 (BWR)
DOC NO/LER NO: 50-387/83043
EVENT DATE: 3/22/83
NSSS/AE: GENERAL ELECTRIC/BECHTEL

REFERENCES: FRANKLIN INSTITUTE RESEARCH LAB. REPORT NO. F-A5618-1
HI-REL LABORATORIES REPORT NO. FR-U43058
IE INFORMATION NOTICE NO. 83-42

SUMMARY:

WHILE IN HOT SHUTDOWN THE REACTOR MODE SWITCH WAS MOVED FROM THE "STARTUP" TO "SHUTDOWN" POSITION AND FAILED TO PROVIDE A FULL SCRAM AS DESIGNED.

DESCRIPTION:

WHILE THE REACTOR WAS IN HOT SHUTDOWN, A PRE-STARTUP SURVEILLANCE TEST ON THE SCRAM DISCHARGE VOLUME WAS IN PROGRESS. UPON COMPLETION OF THE SURVEILLANCE TEST THE REACTOR MODE SWITCH WAS MOVED FROM THE "STARTUP" TO "SHUTDOWN" POSITION RESULTING IN A HALF SCRAM RATHER THAN A FULL SCRAM AS DESIGNED. ALL CONTROL RODS WERE IMMEDIATELY VERIFIED TO BE FULLY INSERTED IN THE CORE, AND THE REACTOR WAS THEN MANUALLY SCRAMMED RESULTING IN A FULL RPS ACTUATION AS DESIRED.

THE MODE SWITCH WAS REMOVED AND SENT TO THE THE FRANKLIN INSTITUTE RESEARCH LABORATORY TO DETERMINE THE FAILURE MODES OF THE SWITCH. THE RESULT OF THE SWITCH ANALYSIS SHOWED SIGNIFICANT IRREGULARITIES AMONG THE CAM SHAFT PARTS, AND LARGE DESIGN CLEARANCES THAT RESULTED IN IMPRECISE OPERATION OF THE CAM FOLLOWERS. FOR A GIVEN SWITCH POSITION, THE CAM SHAFT WAS FOUND TO HAVE AS MUCH AS PLUS OR MINUS 10 DEGREES OF ANGULAR (ROTATIONAL) DIFFERENCES OVER THE LENGTH OF THE SWITCH. THESE ANGULAR DIFFERENCES ARE IMPORTANT BECAUSE A CHANGE IN CONTACT STATE OCCURS FOR CERTAIN SWITCH SEGMENTS WITH A SWITCH ROTATION OF 10 DEGREES. THEREFORE, THESE CONTACTS COULD BE EITHER OPEN OR CLOSED AT THE SAME NOMINAL SWITCH HANDLE POSITION. IT WAS FURTHER NOTED THAT THE SWITCH EXHIBITED MAKE-BEFORE-BREAK CONTACT OPERATION THAT IS IN ACCORDANCE WITH GE DRAWING 195B9497, WHICH SPECIFIED THIS TYPE OF OPERATION FOR ALL CONTACTS.

A REPLACEMENT SWITCH SUPPLIED BY GENERAL ELECTRIC COMPANY AND MANUFACTURED BY GOULD WAS INSTALLED AFTER SUCCESSFULLY PASSING RIGOROUS TESTING AND CHECKOUT BY SITE PERSONNEL. BASED SOLEY ON THE RESULTS OF THE FRANKLIN INSTITUTE'S REPORT, THIS SWITCH WAS ALSO DECLARED INOPERABLE AND RETURNED TO GENERAL ELECTRIC.

A SECOND REPLACEMENT SWITCH, MODIFIED BY GENERAL ELECTRIC, WAS SUPPLIED TO SUSQUEHANNA. THIS SWITCH ALSO SUCCESSFULLY PASSED INITIAL TESTING AND CHECKOUTS BY PLANT PERSONNEL. DURING PLANT STARTUP THE SWITCH WAS MOVED FROM THE "REFUEL" TO "STARTUP" POSITION AND A HALF SCRAM WAS RECEIVED THAT COULD NOT BE RESET. SUBSEQUENT SWITCH MOVEMENTS PRODUCED ADDITIONAL ANOMALOUS SIGNALS, AND THE REACTOR MODE SWITCH WAS DECLARED INOPERABLE.

THE FIRST REPLACEMENT SWITCH WAS RETURNED TO THE SITE WHERE IT ONCE AGAIN PASSED THE NECESSARY TESTING ACCEPTANCE CRITERIA AND WAS INSTALLED IN THE CONTROL PANEL. THIS SWITCH HAS BEEN INSTALLED ON A TEMPORARY BASIS UNTIL AN IMPROVED AND MORE RELIABLE SWITCH CAN BE OBTAINED.

THE ORIGINAL EQUIPMENT FAILURE INVOLVED A 4-POSITION REACTOR MODE SWITCH SPECIFIED BY GENERAL ELECTRIC CO. DRAWING 195B9497P005, AND MANUFACTURED BY GOULD. THIS SWITCH IS IDENTICAL TO PART NUMBERS P006, P007, AND P008 EXCEPT FOR THE TYPE OF KEYLOCK SWITCH. THIS SWITCH USES MODULAR CONSTRUCTION. IT IS A PLASTIC ASSEMBLY COMPRISED OF 22 SPACER BLOCKS WITH MALE/FEMALE SPLINED FITTINGS AND PERPENDICULAR DISKS THAT ARE MECHANICALLY JOINED TOGETHER. THEREFORE, IN LIEU OF A SOLID CENTRAL SHAFT, THE CAM SHAFT IS ONE OF MULTIPLE SPACER ASSEMBLIES.

THE FRANKLIN INSTITUTE'S REPORT IDENTIFIED INTERMITTENT OPERATION OF CONTACTS IN BOTH THE SHUTDOWN AND STARTUP/HOT STANDBY SWITCH POSITIONS. GENERAL ELECTRIC CO. AUTHORIZED HI-REL LABORATORIES TO CONDUCT FAILURE MODE ANALYSIS ON SIMILAR SWITCHES. THE RESULTS OF THE HI-REL ANALYSIS ALSO CITED IMPROPER AND INTERMITTENT OPERATION OF THE KEY OPERATED SWITCH, AND ATTRIBUTED THIS TO INCORRECT ASSEMBLY DURING MANUFACTURE.

THE HI-REL ANALYSIS IDENTIFIED AN ADDITIONAL SHORTCOMING CONCERNING THE CAM FOLLOWER. THE CAM FOLLOWER WAS FOUND IN TWO INSTANCES TO EXHIBIT A SHARP POINT THAT WAS THE RESULT OF A MOLD MARK THAT HAD BEEN ONLY PARTIALLY REMOVED. THE CAM FOLLOWER PLASTIC MATERIAL BEING HARDER THAN THAT OF THE CAM RESULTED IN A MACHINING EFFECT ON THE CAM, WHICH WOULD EVENTUALLY PREVENT A SNAP ACTION ON THE MAKE/BREAK THAT COULD LEAD TO EXCESSIVE BURNING OF THE SWITCH CONTACTS.

COMMENTS:

1. THE ORIGINAL REACTOR MODE SWITCH FAILED TO PERFORM RELIABLY DUE TO DESIGN AND MANUFACTURING DEFICIENCIES. THIS PROBLEM IS SIGNIFICANT BECAUSE FAULTY MODE SWITCH PERFORMANCE COULD RESULT IN UNPLANNED CONTAINMENT ISOLATIONS AND SCRAMS, OR FAILURE TO PROVIDE NECESSARY SCRAM SIGNALS AS DESIGNED FOR VARIOUS PLANT OPERATING MODES.

2. THIS SERIES OF REACTOR MODE SWITCH MANUFACTURED BY GOULD AND SUPPLIED BY GENERAL ELECTRIC IS FURNISHED TO SEVERAL BWR'S WITH THE COMPACT BENCH BOARD DESIGN CONTROL PANELS.

3. THESE SWITCHES ARE ESSENTIALLY HANDMADE USING A "CUT-AND-FIT" METHOD THAT WILL PRECLUDE THE IDENTIFICATION OF A CONSISTENT DEFICIENCY CAUSING THE SWITCH'S INTERMITTENT OPERATION.

4. SUSQUEHANNA HAS INSTITUTED THE FOLLOWING ACTIONS TO ENSURE PROPER MODE SWITCH OPERATION:

- O INCREASED SURVEILLANCE AND OPERATIONAL CHECKS ON THE INSTALLED REACTOR MODE SWITCH THAT INCLUDES VERIFICATION OF AUXILIARY CONTACT STATUS AFTER CHANGES IN THE MODE SWITCH POSITION, AND EVERY SEVEN DAYS IF THE SWITCH POSITION HAS NOT BEEN CHANGED.

- O MODIFICATION OF PLANT PROCEDURES TO PROVIDE NECESSARY GUIDANCE TO OPERATIONS PERSONNEL IF A CONTACT STATUS IS FOUND TO BE INCORRECT.

INPO IS CONTINUING TO EVALUATE THIS EVENT.

INFORMATION CONTACT: PHILIP RAY, INPO, 404/953-5310

Replaced mode switch.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR)

Name of Investigator(s): CFW

Report Type and Number: SER 11-84

Station: Quad Cities-1, Dresden-2 Unit:

Event Date: 3/10/83, 1/9/84 Operating Status:

Circumstances and Events Leading to the Problem:

Nature of the Problem: Rods inserted out of sequence due to communication errors.

Steps Taken to Correct or Alleviate the Problem

Outcome:

Corrective Measures Undertaken:

Human Performance Problems Associated With Event: Communication error.

ARD Corporation

Nine Mile Point Unit 1
Historical Document Review

PROBLEM ANALYSIS REPORT (PAR) (Continued)

Applicable to Plant Under Review? Yes x No ____
(If no, end form here.)

In Which Areas: Same.

Corrective Actions Taken: Procedure that technicians are on-site during all start-ups and shutdowns.

Unresolved Discrepancies: None.
(If none, end form here.)

HEO Number: ____

Summary: ____

Lay 84-14

SER 84-11

Yes-REF OLZ 00-17

BWR only

DVR Same as 12-2-84-4

Index # 12-33

To: IZC GILLESPIE (INPO, 02-FEB-84 13:06 PT
Subject: INPO SIGNIFICANT EVENT REPORT (SER): 11-84

SUBJECT:	INCORRECT CONTROL ROD MOVEMENTS AT BWRs DUE TO COMMUNICATION ERRORS	
UNIT (TYPE):	QUAD CITIES 1	DRESDEN 2
DOC NO/LER NO:	50-254/83012	50-237/NA
EVENT DATE:	03/10/83	01/09/84
NSSS/AE:	GENERAL ELECTRIC/ SARGENT & LUNDY	GENERAL ELECTRIC/ SARGENT & LUNDY
REFERENCE:	IE INFORMATION NOTICE NO. 83-75; IMPROPER CONTROL ROD MANIPULATION	
	SER 36-83; MISOPERATION OF CONTROL RODS	

SUMMARY:

TWO BWRs HAD RODS INSERTED OUT OF SEQUENCE DUE TO COMMUNICATION ERRORS BETWEEN THE PLANT OPERATORS AND THE STATION NUCLEAR ENGINEERS.

Phil looks like candidate for Both Dresden and QC

Dick S.

DESCRIPTION.

QUAD CITIES 1

THE UNIT WAS OPERATING AT A DERATED POWER LEVEL DUE TO HIGH CONDENSER BACKPRESSURE. IT WAS DECIDED TO GO INTO A WEEKEND OUTAGE TO CLEAN THE CONDENSER TUBES. THE INTENT WAS TO INSERT RODS TO APPROXIMATELY 5-10% POWER, THEN SCRAM THE REACTOR PER PROCEDURE. THE NUCLEAR ENGINEER DETERMINED THAT FOR SOME ROD GROUPS IT WAS NOT NECESSARY TO STOP THE RODS AT EACH BANKED

POSITION PER THE APPROVED SEQUENCE, BUT RATHER THESE RODS COULD BE FULLY INSERTED WITHOUT STOPPING AT THE BANKED POSITIONS. THEREFORE, A REVISED ROD WORTH MINIMIZER (RWM) SEQUENCE PRINTOUT WAS GIVEN TO THE OPERATORS BY THE NUCLEAR ENGINEER. A SINGLE PAGE NOTE WAS ATTACHED TO THE PRINTOUT INSTRUCTING THE OPERATORS TO USE THAT SEQUENCE FOR THE SHUTDOWN. THE RWM SEQUENCE IS DESIGNED TO BEGIN FROM THE ALL-RODS-IN CONDITION AND SHOULD BE FOLLOWED IN REVERSE ORDER WHEN PERFORMING A SHUTDOWN. THE RWM ENFORCES THIS SEQUENCE WHENEVER POWER IS BELOW 20%.

THE OPERATORS BEGAN INSERTING CONTROL RODS STARTING WITH THE FIRST GROUP OF RODS ON THE RWM PRINTOUT (RATHER THAN AT THE END WHICH WOULD HAVE BEEN CORRECT). THE CONTROL RODS WERE THUS INSERTED IN THE REVERSE ORDER. WHEN POWER HAD DROPPED LOW ENOUGH TO ACTIVATE THE RWM, IT PRODUCED A ROD BLOCK SINCE THE SEQUENCE WAS INCORRECT. THINKING THIS WAS A MALFUNCTION, THE RWM WAS BYPASSED AND A SECOND OPERATOR WAS ASSIGNED TO ENSURE ROD MOVEMENTS WERE IN ACCORDANCE WITH THE RWM PRINTOUT. THE SHUTDOWN CONTINUED TO APPROXIMATELY 10% POWER WHERE THE TURBINE WAS MANUALLY TRIPPED AND THE REACTOR MANUALLY SCRAMMED PER PROCEDURE. THE ERROR WAS FOUND THE NEXT DAY WHEN THE LEAD NUCLEAR ENGINEER USED A CUSTOM-MADE PROCESS COMPUTER PROGRAM TO SEE FROM WHAT PATTERN THE SCRAM HAD TAKEN PLACE. IF THIS HAD NOT BEEN DONE, THE ERROR MAY HAVE GONE UNDETECTED. SUBSEQUENT ANALYSIS INDICATED THAT NO FUEL DAMAGE WOULD HAVE OCCURRED IN THE EVENT OF A ROD DROP.

DRESDEN 2

THE UNIT WAS BEING SHUT DOWN TO CORRECT PROBLEMS WITH THE TURBINE ELECTROHYDRAULIC CONTROL (EHC) SYSTEM. THE SEQUENCE SUPPLIED TO THE OPERATORS BY THE NUCLEAR ENGINEER HAD A LIST OF RODS WITH A BOX ADJACENT TO EACH ROD IDENTIFICATION. PROCEDURES ALLOW THE NUCLEAR ENGINEER TO INDICATE INSERTION OF A ROD BY INITIALING THE BOX OR BY PLACING A 'SLASH' OR 'CROSS' IN IT. AS THE OPERATORS WERE INSERTING RODS, THEY FOUND SOME BOXES INITIALED AND SOME WITH A SLASH. THINKING THAT A 'SLASH' MEANT NOT TO INSERT THE ROD, THESE STEPS WERE SKIPPED IN THE SHUTDOWN SEQUENCE. THE OPERATOR BEGAN TO COME ACROSS AN INCREASING NUMBER OF "SLASHES" SO HE HALTED THE SHUTDOWN AT 37% POWER. A TOTAL OF 28 RODS WERE NOT INSERTED IN SEQUENCE. THE CONTROL ROD PATTERN REMAINED SYMMETRIC THROUGHOUT THE EVENT. THE NUCLEAR ENGINEER WAS CONTACTED, THE CONTROL ROD PATTERN WAS CORRECTED, AND THE SHUTDOWN WAS COMPLETED. THERE WAS NO EVIDENCE OF THERMAL LIMITS

COMMENTS:

1. BOTH OF THESE EVENTS OCCURRED BECAUSE OF A COMMUNICATION ERROR BETWEEN THE NUCLEAR ENGINEERS AND THE OPERATORS. INCORRECT INSERTION OR WITHDRAWAL OF CONTROL RODS CAN RESULT IN EXCEEDING CORE THERMAL LIMITS OR IN UNANALYZED ROD PATTERNS.

2. THE HEAVY RELIANCE ON STATION NUCLEAR ENGINEERS BY THE PLANT OPERATORS FOR DIRECTION IN THE MOVEMENT OF CONTROL RODS MAKES IT ESSENTIAL THAT THIS COMMUNICATION BE COMPLETE AND UNAMBIGUOUS.

INPO IS CONTINUING TO EVALUATE THESE EVENTS.

Information Contact: WADE S. GREEN, INPO, 404/951-4752

Technicians on-site during all start-ups/shut downs.

APPENDIX C

BWR OWNER'S GROUP CHECKLIST

AND SUPPLEMENT

BWR OWNERS' GROUP

CONTROL ROOM IMPROVEMENTS COMMITTEE

HUMAN FACTORS ENGINEERING

CONTROL ROOM SURVEY

Prepared by: D R Pankratz 1/12/81

D. R. Pankratz — Date
General Electric Company

K. C. Ross 1/12/81

K. C. Ross — Date
General Electric Company

Reviewed by: G R Mullee 1/12/81

G. R. Mullee — Date
Control Room Survey Project Mgr.
General Electric Company

Approved by: W J Armstrong 1/13/81

W. J. Armstrong — Date
Chairman, Control Room Improvements Committee
BWR Owners' Group

BWR OWNERS GROUP

CONTROL ROOM SURVEY

PLANT/UNIT: ______________________________

DATE PERFORMED: PHASE I ______________ II ______________

III ______________ IV ______________

SURVEY TEAM MEMBERS: ______________________ Team Leader

OTHER PARTICIPANTS (HFE CONSULTANT, GE A-E, etc.):

NOTE: CHECKLIST ITEMS FOR WHICH ADVANCE RESEARCH IS NECESSARY HAVE BEEN IDENTIFIED WITH AN ASTERISK IN FRONT OF THE ITEM NUMBER.

Revision 1
01/01/81

CONTROL ROOM SURVEY

TABLE OF CONTENTS

CONTROL ROOM SURVEY

TABLE OF CONTENTS (Continued)

I OPERATOR INTERVIEW

DISCUSSION

The purpose of the Operator Interview is to obtain direct operator input to aid in identifying potential or actual deficiencies in the control room layout or design or in operating procedures that result in confusion (mental activities), difficulty (manual activities) or distraction (the environment).

Using the attached questionaire, operators are asked to respond in writing based on their operational experience and knowledge of control rooms. Copies of the written responses will be sent to the survey team for a preliminary review prior to team arrival at the site. Interviewees will retain their copies and review them with a survey team member during a later oral interview. If additional space is needed, the attached Comment Form is to be used.

For the interview a representative group of one-third or more of the operators is selected covering a range of experience, education, ability and physical size. If available, at least two should have a current SRO license and two a current RO license.

The interviews should be conducted by utility personnel and survey team members with background or experience in operations and engineering or design with a position conducive to a free flow of information. It is expected that the oral interview will take one to two hours for each operator with the entire interview taking about one day.

Following the interviews, the survey team will consolidate the information obtained and analyze it to help identify specific areas of concern for detailed analysis during the control room review.

I OPERATOR INTERVIEW

INTRODUCTION TO QUESTIONAIRE

Job Position ______________________________

Years Experience ______________ Commercial Nuclear ______________ Fossil

______________ Navy Nuclear

Date of first License ______________ RO ______________ SRO

Education/Degrees ______________________________

Age ________ Sex ________ Height ________ Weight ________

In response to a post-TMI NRC requirement, your utility, along with other BWR owners, is conducting a control room review to identify and correct design deficiencies in the operator-control room interface to minimize the potential for human error. This review is performed by a survey team composed of representatives of several utilities using checklists prepared by the Control Room Improvements Subgroup of the BWR Owners Group.

You are asked to complete the attached questionaire basing your responses on your operational experience and knowledge of your control room and interfacing systems. You may complete this questionaire in the control room if you desire but please do so without discussing your detailed responses with other operators completing this survey. If additional space is needed, the attached Comment Form is to be used.

Following completion, a survey team representative will review your responses with you. Upon completion of all interviews, the survey team will consolidate the information obtained and apply it in their evaluation of your control room for compliance with human factor engineering principles.

The biographical information requested above will be used in compiling statistics on operating personnel physical characteristics. Current recommendations for panel design are based largely on data obtained from measurements of military personnel; there are few statistics presently available on, for example, the average height and weight of operators.

This survey provides you with a valuable opportunity for applying your knowledge and experience toward improving operating conditions in both your control room and future control room designs. Your honest and forthright opinions are not only welcomed, but needed.

I OPERATOR INTERVIEW

QUESTIONAIRE

A Would you recommend any changes in the following areas:

A1 shift coverage

A2 shift turnover

A3 training

A4 color coding

A5 control room access

A6 control panel layout or access

A7 communication systems

A8 heating or ventilation

I OPERATOR INTERVIEW

QUESTIONAIRE

A9 lighting or noise levels

A10 special test equipment

A11 maintenance or surveillance testing

A12 data recording and log entries

A13 information flow

A14 furniture, equipment or workspace

A15 computers

A16 other?

I OPERATOR INTERVIEW

QUESTIONAIRE

B Are any controls difficult to operate?

C Are any controls designed, positioned or labeled in a manner that causes risk of inadvertent operation?

D Are any recorders or indicators difficult or confusing to read?

E Are any important indicators located such that they are difficult to see during normal or emergency operation?

F Do you feel any control room displays are unnecessary, provide unimportant information or needlessly clutter the control panels?

G Based on your operational experience, does your control room lack any controls or displays needed in your response to normal or emergency situations?

I OPERATOR INTERVIEW

QUESTIONAIRE

H Do you consider the annunciator system to be effective in conveying important information to you?

I Do you have any problems locating or using procedures or operational instructions?

J Are individual responsibilities and chain-of-command clearly understood during all operating conditions?

K Is there an adequate number of operators available in the control room (or immediately available) to effectively operate the plant during all conditions?

L Are you required to perform any duties that you consider unreasonable or distracting in your responsibility as an SRO or RO?

M Based on your operational experience, have any errors or incidents occured which could have been averted through improved control room design?

I **OPERATOR INTERVIEW**

QUESTIONAIRE

N Have you experienced any problems using or understanding your procedures?

P Is there a particular panel which you consider more difficult or confusing to operate than the others?

Q General Comments:

I OPERATOR INTERVIEW

COMMENT FORM

This form is for use by the operator or interviewer for expanded responses to the Operator Interview questions. When used, each response will be identified by item number on this form and also so noted in the space following the applicable question to assure proper cross-referencing.

Item Response

I OPERATOR INTERVIEW

SUMMARY FORM

This form is used by the Interviewer to summarize the information obtained during the Operator Interview. Each entry is to be cross-referenced to the specific checklist item for further evaluation during the Control Room Review.

Item or Area of Concern	Checklist Item(s)

II LICENSEE EVENT REPORT ANALYSIS

DISCUSSION

The purpose of the Licensee Event Report (LER) Analysis is to identify plant specific design deficiencies known to have previously contributed to operator errors and to document the need for further evaluation during the Control Room Review.

Prior to the arrival of the survey team, the host utility will review their plant LERs and scram reports from the past two years. Any occurence for which operator error was identified as a contributing factor will be listed on the attached LER form indicating the LER number and a description of the operator error.

The survey team will then analyze each event to identify possible deficiencies in the human engineering design of the control room by cross referencing the corresponding criteria from the Control Room Review checklists. These items will be included in the detailed evaluation during the Control Room Review.

II LICENSEE EVENT REPORT ANALYSIS

LICENSEE EVENT REPORTS (LERs)

*LER NUMBER	*OPERATOR ERROR	CHECKLIST ITEM

III CONTROL ROOM REVIEW

DISCUSSION

The purpose of the Control Room Review is to review and assess the adequacy of the arrangement and identification of important controls and displays, the usefullness of audio and visual alarm systems, plant status information provided, procedures and training with respect to limitations of existing instrumentation, information recording and recall capability, the control room layout and environment, and other areas of human factor engineering that potentially impact operator effectiveness. The ultimate objective is to identify potential modifications of the operator-control room interface which will reduce the potential for human error.

Each Control Room Review is conducted by the survey team using the attached checklists which are titled, in order, (A) Panel Layout and Design, (B) Instrumentation and Hardware, (C) Annunciators, (D) Computers, (E) Procedures, (F) Control Room Environment, (G) Maintenance and Surveillance, and (H) Training and Manning. Checklist (A), (B), and (C) will be completed for each panel in the control room, including back panels, auxiliary panels and peripheral equipment that contain controls and displays normally operated by the control room operator. The remaining checklists will be completed only once for each control room since they are applicable to the entire control room.

In completing the checklists, particular attention must be given to items identified as a potential problem area in the Operator Interview or the LER Analysis to ensure complete coverage. These items will have been cross-referenced to the checklist items where applicable.

Supplemental information is provided in the workshop to give additional guidance in completing the checklists.

It is anticipated that performance of the Control Room Review will take approximately one week. Due to the functional approach of the survey, in many cases input from on-shift operations personnel will be necessary in evaluation compliance for a given checklist item. In other cases, additional technical information will be required. Checklist items for which advance research is necessary have been identified with an asterisk in front of the item number. It is expected the host utility will compile this information prior to the arrival of the survey team and also provide operations personnel support.

Each checklist item is presented in the form of a question for consideration by a survey team member. Following that question is a series of numbers in which the specific item being reviewed is evaluated. The first set of numbers (4 3 2 1 0) indicates the degree of compliance wherein 4 indications <u>no</u> compliance, 3 indicates <u>somewhat</u> compliance, 2 indicates <u>mostly</u> compliance, 1 indicates <u>full</u> compliance and 0 indicates the specific question being considered is <u>not applicable</u> or cannot be considered at this time since the plant being evaluated is not operational. As each specific question is evaluated, the team member(s) actually doing the evaluation of that question indicates the relative degree of compliance by circling the applicable number.

DISCUSSION (Continued)

Following the number indicating the degree of compliance for each item being evaluated is a predetermined number ranging from one to three which indicates the relative importance of that item with respect to the potential for causing or contributing to operator error. A 3 indicates high potential for operator error, 2 indicates moderate potential and 1 indicates low potential. In the final evaluation of each item considered, it is the product of the degree of compliance times the potential for operator error that determines if the consideration of corrective action is justified. Since some items will not be applicable for consideration in all control rooms, it should be noted that a general comparison of several control rooms by comparison of "scores" is not valid.

Following each checklist item is space for the person performing the evaluation to enter comments. For each specific checklist item, these comments will identify items or components of non-compliance, the scope of review, or any qualifying statement judged to be appropriate to the evaluation. If, for example, a large number of components are reviewed and only a few are in non-compliance, these would be specifically noted in the comment space and the general rating would be "mostly compliance". To provide additional documentation, still photographs will be taken of major items or components of non-compliance such as mimic layouts, control/display groupings, labeling systems or equipment locations. These photographs are cross referenced to the specific checklist item by a notation in the comment space. Due to the importance of comments in the evaluation, additional Comment Forms will be attached for more detail when necessary.

As an example, a review item would possibly be as follows:

		No	Somewhat	Mostly	Full	Not Applicable		Potential for error		Product
		Compliance								
E1	Does the control room operator have available:									
E1.1	a full set of up-to-date plant procedures	4	3	2	1	0	x	3	=	6
		Surveillance procedures are incomplete and not all are latest revision; others are OK								

Since all procedures except surveillance procedures are available to the control room operator and are up-to-date, 2 is circled indicating "mostly" compliance and multiplying that by 3, the potential for error, gives a product of 6.

III CONTROL ROOM REVIEW

COMMENT FORM

This form is to be used during the performance of the Control Room Review to identify, for each specific checklist item as necessary, the scope of review, items or components of non-compliance, or any qualifying statements appropriate to the evaluation of that checklist item. When this form is used, the checklist item number is to be entered here, and a note is to be made in the space following the checklist item to identify the use of this comment form, assuring proper cross-referencing. This form is to be placed in the survey package directly following the page on which the checklist item appears.

Item	Comment

III CONTROL ROOM REVIEW

Panel ________

PANEL LAYOUT and DESIGN

A1 For control panels:

A1.1	does the design generally meet measurement standards per the attached anthropometric diagrams (complete and attach)	4 3 2 1 0 x 2 = ____
A1.2	are they of the same layout and design on multi-unit plants (not mirror image)	4 3 2 1 0 x 2 = ____
A1.3	when panel components are permanently removed, are spaces covered to prevent debris or dust from entering panel internals and repainted to avoid visual distinctiveness	4 3 2 1 0 x 2 = ____
A1.4	have sharp corners and edges been eliminated?	4 3 2 1 0 x 1 = ____

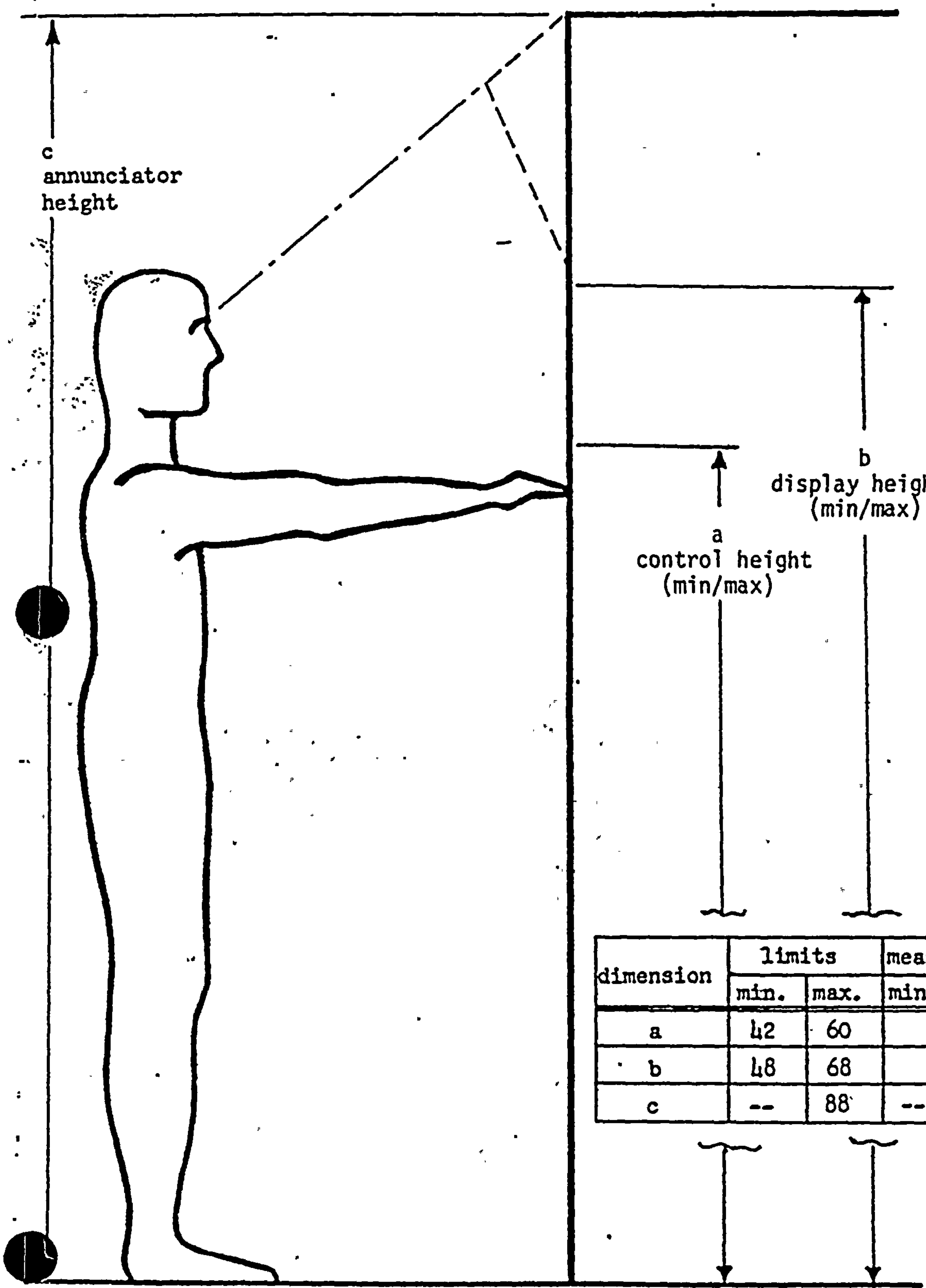
A2 Are lines of demarcation, mimics or other graphic displays:

A2.1	used to distinguish between commonly shared systems or components in multiple unit control rooms	4 3 2 1 0 x 2 = ____
A2.2	used to enclose related displays	4 3 2 1 0 x 3 = ____

A PANEL LAYOUT and DESIGN (Continued)

(A1.1) Anthropometric Diagram

VERTICAL PANEL MEASUREMENT
PANEL ________

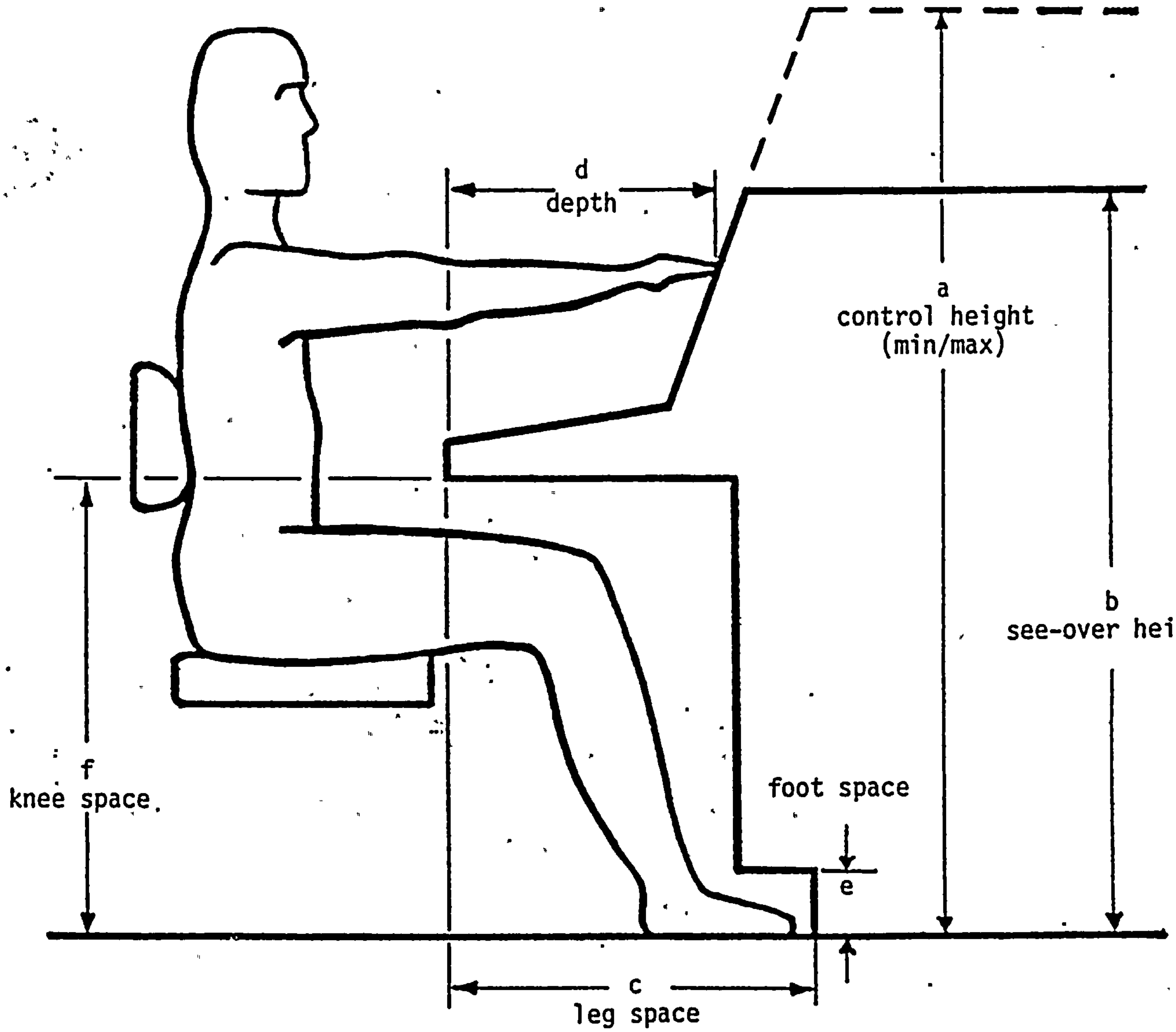


dimension	limits		measurement		comments
	min.	max.	min.	max.	
a	42	60			
b	48	68			
c	--	88	--		

A PANEL LAYOUT and DESIGN (Continued)

(A1.1) Anthropometric Diagram

CONSOLE/DESK MEASUREMENT
PANEL ______________

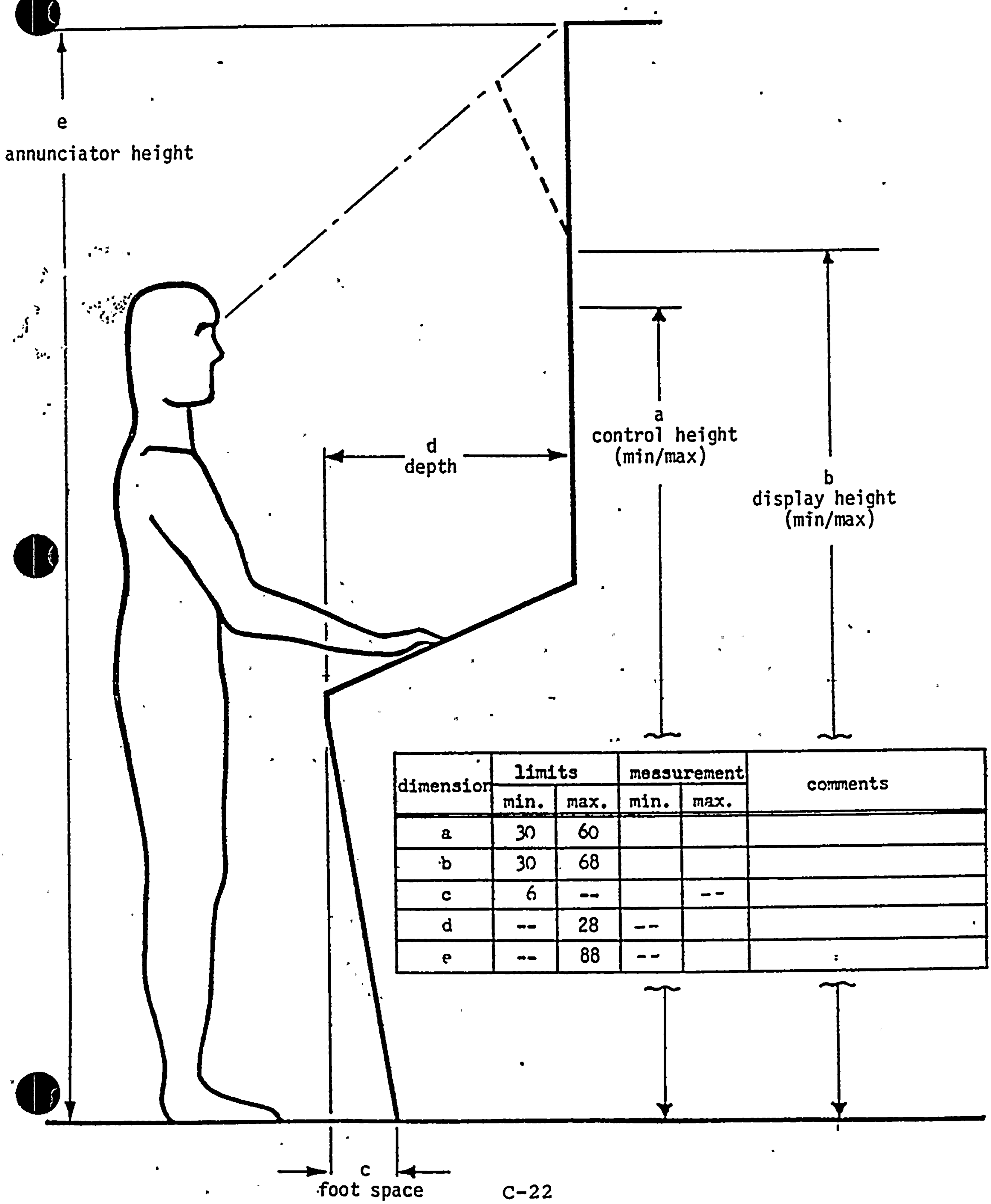


dimension	limits		measurement		comments
	min.	max.	min.	max.	
a	25	54			
b	--	42	--		
c	24	--		--	
d	--	25	--		
e	4	--		--	
f	25	--		--	

A PANEL LAYOUT and DESIGN (Continued)

BENCHBOARD MEASUREMENT
PANEL ______________

(A1.1) Anthropometric Diagram



dimension	limits		measurement		comments
	min.	max.	min.	max.	
a	30	60			
b	30	68			
c	6	--		--	
d	--	28	--		
e	--	88	--		

Panel ________

PANEL LAYOUT and DESIGN (Continued)

A2.3	used to separate similar subgroups of components within system groupings	4 3 2 1 0 x 3 = ____
A2.4	used to distinguish between primary and secondary flow paths	4 3 2 1 0 x 2 = ____
A2.5	visually distinctive between each other and panel/background	4 3 2 1 0 x 2 = ____
A2.6	permanent and maintained	4 3 2 1 0 x 2 = ____
A2.7	laid-out so that flow paths and arrangements are orderly and easily recognized	4 3 2 1 0 x 3 = ____
A2.8	identical in lay-out for repetitive groupings of components	4 3 2 1 0 x 3 = ____

Panel ________

PANEL LAYOUT and DESIGN (Continued)

A2.9 clearly marked with arrows to show direction of "flow" — 4 3 2 1 0 x 2 = ____

A2.10 identified with starting and end points — 4 3 2 1 0 x 2 = ____

A2.11 used to integrate switches, pumps, manual and remotely-operated valves, isolation paths, etc. — 4 3 2 1 0 x 2 = ____

A2.12 consistent in the application of symbols for pumps, valves and other process elements (describe on Comment Form and attach)? — 4 3 2 1 0 x 2 = ____

A3 For controls and displays:

A3.1 are they generally grouped by system (with identical lay-out for repetitive groups) — 4 3 2 1 0 x 3 = ____

A3.2 is ordering for components of similar function consistently from left-to-right or top-to-bottom — 4 3 2 1 0 x 3 = ____

Panel ________

PANEL LAYOUT and DESIGN (Continued)

A3.3	are groupings arranged in functional or sequential relationships	4 3 2 1 0 x 3 = ____
A3.4	when strings (6 or more) or matrices (greater than 4x4) of components of similar or common function are installed, are they visually distinguishable by lines-of-demarcation, hierarchical labeling, color contrast, spacing, shape, etc.	4 3 2 1 0 x 3 = ____
A3.5	are coding methods as used for item 3.4 consistently applied (list on Comment Form and attach)	4 3 2 1 0 x 3 = ____
A3.6	are they generally located in zone "a" or "b" on the anthropometric diagram (see A1.1)	4 3 2 1 0 x 3 = ____
A3.7	are control components located within an arms reach of feedback indications?	4 3 2 1 0 x 3 = ____

Panel ________

PANEL LAYOUT and DESIGN (Continued)

A4 For color use:

*A4.1	is there a plant standard (complete attached list)	4 3 2 1 0 x 3 = ____
*A4.2	is selected use of colors consistently applied for alarm prioritization, indicating lights, labels, lines-of-demarcation, legend plates, graphic displays, indicating devices, tags, etc.	4 3 2 1 0 x 3 = ____
A4.3	when there is a possible dual meaning for colors, is there an additional indication for visual distinction?	4 3 2 1 0 x 3 = ____

A5 Are labels, legend plates and escutcheons:

A5.1	used to identify component function	4 3 2 1 0 x 3 = ____
*A5.2	used to identify operational limits or warnings	4 3 2 1 0 x 3 = ____

III CONTROL ROOM REVIEW

A PANEL LAYOUT and DESIGN (Continued)

A4.1) To evaluate the consistency of the application of color standards in the control room, complete the following for each meaning:

Color	Meaning
____________	Valve Open
____________	Valve Closed
____________	Breaker Open
____________	Breaker Closed
____________	Mid or Transitional Position
____________	On or Operating
____________	Off or Not Operating
____________	Start
____________	Stop
____________	Danger or Warning
____________	Caution, Trouble or Pre-Trip
____________	Trip or Failure
____________	Automatic Operation or Control
____________	Manual Operation or Control
____________	Limit Condition
____________	General Status
____________	Hot
____________	Cold
____________	Other (specify) ________ ________
	CRTs
____________	Alpha-Numeric Identification
____________	Process Variable (in limits)
____________	Process Variable (out of limits)
____________	Process Diagram lines and Symbols
____________	Reference or Scale Markings
____________	Other (specify) ________ ________

Panel ________

PANEL LAYOUT and DESIGN (Continued)

A5.3	used to identify system designation	4 3 2 1 0 x 2 = ____
A5.4	used to identify panel by number and function	4 3 2 1 0 x 2 = ____
A5.5	consistent in nomenclature, use of acronyms, abbreviations, etc. (list on Comment Form and attach)	4 3 2 1 0 x 2 = ____
A5.6	consistent in type style and the application of type size (ie, larger letters in headings, all letters same height, etc.)	4 3 2 1 0 x 2 = ____
A5.7	size coded in a hierarchical system	4 3 2 1 0 x 2 = ____
A5.8	visually distinctive (light letters on dark background or dark letters on light background)	4 3 2 1 0 x 2 = ____

Panel ________

A PANEL LAYOUT and DESIGN (Continued)

A5.9	easily read when stationed at the panel (see A1.1)	4 3 2 1 0 x 3 =	____
A5.10	succinctly worded and accurate with respect to function or input signal	4 3 2 1 0 x 3 =	____
A5.11	consistently positioned above or below devices and readily associated with corresponding controls and displays	4 3 2 1 0 x 3 =	____
A5.12	permanent but replaceable	4 3 2 1 0 x 2 =	____
A5.13	conspicuous and visually distinctive from the panel background	4 3 2 1 0 x 3 =	____
A5.14	oriented to read from left-to-right?	4 3 2 1 0 x 2 =	____

III CONTROL ROOM REVIEW

Panel ________

A PANEL LAYOUT and DESIGN (Continued)

A6 When temporary changes or modifications are made, are they:

A6.1	minimized	4 3 2 1 0 x 2 =	____
*A6.2	controlled in application (for information or status, corrective or cautionary purpose only)	4 3 2 1 0 x 2 =	____
*A6.3	consistent and controlled in nomenclature, font and color	4 3 2 1 0 x 2 =	____
*A6.4	accurate with respect to use or design intent	4 3 2 1 0 x 3 =	____
*A6.5	incorporated into procedures (if informative, cautionary or corrective)	4 3 2 1 0 x 3 =	____
A6.6	applied to not obscure adjacent or background information or colors	4 3 2 1 0 x 2 =	____

Panel ________

A PANEL LAYOUT and DESIGN (Continued)

*A6.7	reviewed periodically and made permanent or removed?	4 3 2 1 0 x 2 = ____

A7 From the operator's primary control area:

A7.1	is the path to the control panel unobstructed	4 3 2 1 0 x 3 = ____
A7.2	are control surfaces visible	4 3 2 1 0 x 3 = ____
A7.3	are annunciator windows visible and identifiable	4 3 2 1 0 x 3 = ____

II CONTROL ROOM REVIEW

Panel ________

B INSTRUMENTATION and HARDWARE

B1 Are controllers that require manual operation:

B1.1	easily reached (see A3.6)	4 3 2 1 0 x 3 =	____
*B1.2	designed to facilitate precise control where fine adjustments are required	4 3 2 1 0 x 2 =	____
B1.3	marked to clearly show manual or automatic mode	4 3 2 1 0 x 2 =	____
*B1.4	provided with mechanical stops at the beginning and end of travel	4 3 2 1 0 x 1 =	____
B1.5	provided with space for hand support?	4 3 2 1 0 x 1 =	____

B2 Are indicating devices:

B2.1	marked to show normal or abnormal, safe or unsafe, or expected or unexpected range of operation where applicable	4 3 2 1 0 x 3 =	____

III CONTROL ROOM REVIEW

Panel ________

B INSTRUMENTATION and HARDWARE (Continued)

B2.2	free from glare and parallax when stationed at the panel (see A1.1)	4 3 2 1 0 x 3 = ____
*B2.3	scaled in process units that relate to system operation	4 3 2 1 0 x 3 = ____
B2.4	provided with visual contrast or distinctiveness between scale graduations, process units, numerals, background and pointer	4 3 2 1 0 x 2 = ____
B2.5	designed so that pointers do not obscure graduation marks, numerals or process units	4 3 2 1 0 x 2 = ____
B2.6	designed so that pointers move from bottom-to-top, left-to-right or clockwise, depending on the display design and orientation	4 3 2 1 0 x 2 = ____
*B2.7	designed so that indicator direction follows control movement	4 3 2 1 0 x 2 = ____

Panel ________

B INSTRUMENTATION and HARDWARE (Continued)

*B2.8	easily correlated with backup indications, especially those instruments with elevated zeros	4 3 2 1 0 x 2 = ____
*B2.9	aligned between pointer or moveable indicator and scale without need for visual extrapolation	4 3 2 1 0 x 2 = ____
B2.10	visually aligned and provided with identical scales to facilitate comparative reading in groups of similar displays	4 3 2 1 0 x 2 = ____
*B2.11	marked with subdivisions that are consistent with the accuracy needed by the operator	4 3 2 1 0 x 2 = ____
B2.12	scaled with a maximum of nine intermediate graduations between numbered markings	4 3 2 1 0 x 2 = ____
B2.13	scaled with subdivisions in decimal multiples of 1, 2 or 5	4 3 2 1 0 x 1 = ____

Panel ________

B INSTRUMENTATION and HARDWARE (Continued)

B2.14	marked or color coded to provide visual distinctiveness between the case, panel or similiar components	4 3 2 1 0 x 1 = ____
B2.15	marked with numerals oriented in an upright position	4 3 2 1 0 x 1 = ____
*B2.16	maintained, calibrated and surveillance tested on a regular basis	4 3 2 1 0 x 3 = ____
*B2.17	designed so that a failure mode is evident	4 3 2 1 0 x 3 = ____
B2.18	marked or color coded to differentiate between scales on multiple range meters?	4 3 2 1 0 x 2 = ____

B3 For recorder charts:

B3.1	are printed values easily read and distinguishable	4 3 2 1 0 x 3 = ____

Panel ______

INSTRUMENTATION and HARDWARE (Continued)

B3.2	are printing devicés properly aligned such that printed value corresponds to scale value	4 3 2 1 0 x 3 = ____
B3.3	is the alarm point identified	4 3 2 1 0 x 3 = ____
B3.4	is there adequate distinction for markings on multi-pen recorders	4 3 2 1 0 x 3 = ____
*B3.5	where fast tracking rates or trends are periodically required, is there Hi/Lo speed capability	4 3 2 1 0 x 2 = ____
B3.6	is point select capability available on multi-point recorders	4 3 2 1 0 x 2 = ____
B3.7	is recorder clearly marked indicating proper type and size of chart paper	4 3 2 1 0 x 1 = ____

Panel ________

B INSTRUMENTATION and HARDWARE (Continued)

*B3.8	is paper replaceable without physically disconnecting wiring or linkage	4 3 2 1 0 x 1 = ____
*B3.9	can the ink supply be maintained without disconnecting wiring or linkage	4 3 2 1 0 x 1 = ____
B3.10	are pen colors consistent from one recorder to another and/or is the color association unambiguous and clearly displayed	4 3 2 1 0 x 2 = ____
*B3.11	does chart paper not bind, eliminating frequent manual corrections	4 3 2 1 0 x 2 = ____
*B3.12	are charts marked periodically (at least once per shift) and when chart speed is changed with date, time and initials to aid in data recovery	4 3 2 1 0 x 2 = ____
*B3.13	has administrative procedure been established for chart marking and used chart/record retention	4 3 2 1 0 x 2 = ____

Panel ________

INSTRUMENTATION and HARDWARE (Continued)

*B4.5	is bulb replacement easily and safely performed	4 3 2 1 0 x 2 = ____
B4.6	are sets of lights in alignment to facilitate comparison between related system elements	4 3 2 1 0 x 2 = ____
*B4.7	is direct indication used in preference to implied indication that a function has been performed	4 3 2 1 0 x 3 = ____
*B4.8	when direct indication is not practical, is there backup instrumentation to indicate that a function has occurred?	4 3 2 1 0 x 3 = ____

B5 For switches:

B5.1	do handles move consistently in the same direction in accordance with expectations (i.e., right for on or start; left for off or stop; center for tripped, standby, or normal; pull-to-lock, etc)	4 3 2 1 0 x 3 = ____
B5.2	is each position clearly marked	4 3 2 1 0 x 3 = ____

Panel ________

INSTRUMENTATION and HARDWARE (Continued)

B5.3	is each reachable at a normal operating distance	4 3 2 1 0 x 3 = ____
B5.4	are handles that are located near the edge of the control panels protected with a guard to prevent inadvertent operation	4 3 2 1 0 x 3 = ____
*B5.5	do handles require normal hand pressure to operate (i.e. no thumb-busters)	4 3 2 1 0 x 3 = ____
B5.6	are handles durable and of adequate size	4 3 2 1 0 x 2 = ____
*B5.7	is switching action responsive and precise	4 3 2 1 0 x 2 = ____
B5.8	are associated displays, indicating lights, and labels free from visual obstruction by hand or arm when the switch is operated	4 3 2 1 0 x 2 = ____

Panel ________

INSTRUMENTATION and HARDWARE (Continued)

B5.9 is there adequate hand space between them	4 3 2 1 0 x 2 = ____
B5.10 is physical distinction provided between pumps, valves, indicating lights, divisional separation, power source, etc.	4 3 2 1 0 x 2 = ____
B5.11 are handles or knobs shaped so as to clearly indicate position without obstruction of legends or confusion of direction?	4 3 2 1 0 x 2 = ____

B6 Are switches for emergency or abnormal use (such as turbine trip, scram, emergency trip, etc.):

B6.1 clearly marked	4 3 2 1 0 x 3 = ____
B6.2 protected from inadvertent operation	4 3 2 1 0 x 3 = ____
B6.3 readily accessible	4 3 2 1 0 x 3 = ____

Panel ________

B INSTRUMENTATION and HARDWARE (Continued)

*B6.4	controlled by specific procedural instructions?	4 3 2 1 0	x 3	= ____
B7	Where key-lock switches are used:			
*B7.1	is immediate actuation not required during plant operation	4 3 2 1 0	x 3	= ____
B7.2	are keys conveniently located and immediately available	4 3 2 1 0	x 3	= ____
B7.3	are keys clearly identified for specific use	4 3 2 1 0	x 3	= ____
*B7.4	is key use administratively controlled	4 3 2 1 0	x 3	= ____
*B7.5	do procedures provide specific instructions for use	4 3 2 1 0	x 3	= ____
*B7.6	is switch action smooth and positive without use of excessive force?	4 3 2 1 0	x 3	= ____

III CONTROL ROOM REVIEW

Panel ________

C ANNUNCIATORS

C1 Are annunciators grouped:

C1.1	within annunciator box by specific systems	4 3 2 1 0	x 2 =	____
C1.2	above related controls and displays	4 3 2 1 0	x 2 =	____
C1.3	such that warning and diagnostic alarms are segregated from informational and advisory displays?	4 3 2 1 0	x 2 =	____

C2 Is alarm window:

C2.1	consistent in nomenclature, use of acronyms, abbreviations, etc.	4 3 2 1 0	x 2 =	____
C2.2	consistent in type style and the application of type size	4 3 2 1 0	x 2 =	____
C2.3	easily read when stationed at the panel	4 3 2 1 0	x 3 =	____

Panel ________

ANNUNCIATORS (Continued)

C2.4	in accordance with checklist criteria for changes or modifications (see A6)	4 3 2 1 0 x 2 = ____
C2.5	succintly worded and accurate with respect to input signal function	4 3 2 1 0 x 3 = ____
C2.6	provided with setpoints for parameters with multiple trip levels (water level, vacuum, containment pressure etc.)	4 3 2 1 0 x 2 = ____
C2.7	without multiple choice indication (high/low level/pressure).	4 3 2 1 0 x 3 = ____
C2.8	prioritized for required response level by legend plate color (preferred) or bulb color in accordance with color use standards (see A4.1)	4 3 2 1 0 x 3 = ____
C2.9	provided with an alpha-numeric code in addition to legends for prompt response and positive procedure identification	4 3 2 1 0 x 2 = ____

Panel ________

C ANNUNCIATORS (Continued)

C3 When an annunciator window is actuated:

C3.1	is there adequate visual distinction between lit and extinguished lights	4 3 2 1 0 x 3 =	____
C3.2	is the size and intensity of alarm lights adequate to command attention?	4 3 2 1 0 x 3 =	____
C4	Does the audible feature meet checklist criteria for audible displays (see F2)?	4 3 2 1 0 x 3 =	____

C5 For alarm response, are the following provided:

C5.1	silence button	4 3 2 1 0 x 3 =	____
C5.2	acknowledge button	4 3 2 1 0 x 3 =	____
C5.3	reset button	4 3 2 1 0 x 2 =	____
C5.4	visual and audible test feature	4 3 2 1 0 x 3 =	____

Panel ________

C ANNUNCIATORS (Continued)

C5.5 silence and reset buttons of consistent size, shape, color, sequence and location between panels — 4 3 2 1 0 x 2 = ____

C5.6 a "first-out" feature or dual reset for information retrieval for high priority alarms? — 4 3 2 1 0 x 2 = ____

C6 For visual annunciation, will each window:

C6.1 flash for initial alarm input — 4 3 2 1 0 x 3 = ____

C6.2 remain in alarm state (solid light) when acknowledged but alarm input has not cleared — 4 3 2 1 0 x 3 = ____

C6.3 reflash for second alarm input — 4 3 2 1 0 x 3 = ____

C6.4 automatically blink (at slower rate) when alarm input clears — 4 3 2 1 0 x 2 = ____

Panel ________

C ANNUNCIATORS (Continued)

C6.5	clear only on operator action?	4 3 2 1 0 x 2 = ____
C7	Do annunciator response procedures meet procedure checklist criteria for:	
C7.1	format (see E3)	4 3 2 1 0 x 3 = ____
C7.2	content (see E4)	4 3 2 1 0 x 3 = ____
C7.3	reference material (see E5)?	4 3 2 1 0 x 3 = ____
*C8	For annunciator maintenance:	
C8.1	if bulb replacement requires legend plate removal, is there a method to assure plate replacement in correct location	4 3 2 1 0 x 3 = ____
C8.2	has an administrative procedure been implemented to allow prompt recognition of an out-of-service annunciator	4 3 2 1 0 x 3 = ____

Panel ________

C ANNUNCIATORS (Continued)

C8.3 are annunciators periodically tested? | 4 3 2 1 0 x 3 = ____

C9 are only meaningful alarms present during a given operating state (list on Comment Form)? | 4 3 2 1 0 x 3 = ____

III CONTROL ROOM REVIEW

D COMPUTERS

D1 Are the computer console and output devices:

D1.1	conveniently located and readily available for operator use	4 3 2 1 0	x 2 =	____
D1.2	generally laid-out per standards of the anthropometric diagrams (see A1.1)	4 3 2 1 0	x 2 =	____
D1.3	arranged for visual distinction and use of dials, buttons and switches?	4 3 2 1 0	x 2 =	____

*D2 Is the computer:

D2.1	capable of displaying selected input information	4 3 2 1 0	x 2 =	____
D2.2	equipped with display change capability	4 3 2 1 0	x 2 =	____
D2.3	available for on-demand use by the control room operator	4 3 2 1 0	x 2 =	____

D COMPUTERS (Continued)

D2.4	capable of receiving all inputs and performing programmed functions without becoming overloaded	4 3 2 1 0 x 2 = ____
D2.5	available after power transients or accident conditions	4 3 2 1 0 x 2 = ____
D2.6	capable of use in post-transient evaluation	4 3 2 1 0 x 1 = ____
D2.7	capable of automatic or manual switchover for processor failure ("failover")?	4 3 2 1 0 x 1 = ____

D3 Are CRT displays:

D3.1	accessible and easily visible when stationed at the controls	4 3 2 1 0 x 2 = ____
D3.2	comprehensible with a minimum of visual search	4 3 2 1 0 x 2 = ____

COMPUTERS (Continued)

D3.3	of adequate brightness for lighting conditions or equipped with conviently located focus, brightness, and/or contrast controls	4 3 2 1 0 x 2 = ___
D3.4	consistent with color standards (see A4.1)	4 3 2 1 0 x 2 = ___
*D3.5	color coded so that loss of a primary color gun does not result in loss of a numerical value or scale	4 3 2 1 0 x 2 = ___
D3.6	consistent with checklist standards for procedural format (see E3)	4 3 2 1 0 x 2 = ___
D3.7	identified by system or program	4 3 2 1 0 x 2 = ___
D3.8	provided with an access mode for display selection (either display menu or sectoring mode)	4 3 2 1 0 x 2 = ___

D COMPUTERS (Continued)

D3.9	provided with verification that the computer is operational and that data is being updated on a periodic basis?	4 3 2 1 0 x 2 = ____

D4 For the typer/printer:

D4.1	is output prioritized	4 3 2 1 0 x 2 = ____
*D4.2	is output periodically reviewed and updated so that only useful information is printed	4 3 2 1 0 x 2 = ____
*D4.3	is capacity sufficient (output not overloaded)	4 3 2 1 0 x 2 = ____
D4.4	is the output identified by time, date, component and system	4 3 2 1 0 x 2 = ____
*D4.5	is a backup available	4 3 2 1 0 x 2 = ____

D COMPUTERS (Continued)

D4.6	is it silenced to not be a noise distraction	4 3 2 1 0 x 1 = ___
D4.7	are paper and ribbon easily replaced	4 3 2 1 0 x 1 = ___
D4.8	are printout easily readable (spacing, headings, formats, print, etc.)?	4 3 2 1 0 x 2 = ___

III CONTROL ROOM REVIEW

E PROCEDURES

E1 Does the control room operator have available:

E1.1	a full set of up-to-date plant procedures	4 3 2 1 0 x 3 =	___
E1.2	a full set of up-to-date emergency, abnormal and normal procedures for each unit on multi-unit plants with a common control room	4 3 2 1 0 x 3 =	___
E1.3	a complete set of up-to-date, as-built flow diagrams and schematics	4 3 2 1 0 x 3 =	___
E1.4	a set of up-to-date Technical Specifications	4 3 2 1 0 x 3 =	___
E1.5	storage space for procedures and reference materials	4 3 2 1 0 x 3 =	___
*E1.6	procedural instructions for the operation of both manual and automatic controllers	4 3 2 1 0 x 3 =	___

PROCEDURES (Continued)

E1.7	lay down space for use of procedures and reference materials?	4 3 2 1 0 x 2 = ___

E2 For immediate access and recognition:

E2.1	are procedures readily available and centrally located	4 3 2 1 0 x 3 = ___
E2.2	is each procedure binder or folder clearly marked	4 3 2 1 0 x 2 = ___
E2.3	does each procedure binder or folder have an index or table of contents	4 3 2 1 0 x 3 = ___
E2.4	are emergency procedures in a separate binder or folder	4 3 2 1 0 x 3 = ___
E2.5	are annunciator response procedures in a separate binder or folder	4 3 2 1 0 x 2 = ___

E PROCEDURES (Continued)

E2.6	are individual procedures readily located (i.e., through use of index tabs or alpha-numeric code)?	4 3 2 1 0 x 3 = ___

E3 Has an administrative procedure been implemented to assure standardization of procedure format for:

E3.1	type size and style	4 3 2 1 0 x 2 = ___
E3.2	use of nomenclature, grammar, terminology, synonyms, acronyms, and abbreviations	4 3 2 1 0 x 2 = ___
E3.3	use of as-labeled designations for components, systems and process units	4 3 2 1 0 x 2 = ___
E3.4	numbering of procedures, paragraphs, steps and sub-steps for increased levels of detail	4 3 2 1 0 x 1 = ___
E3.5	step or paragraph spacing and page layout and identity	4 3 2 1 0 x 1 = ___

E PROCEDURES (Continued)

E3.6	identity of purpose or scope	4 3 2 1 0 x 1 = ___
E3.7	entry and exit conditions	4 3 2 1 0 x 2 = ___
E3.8	cross-referencing	4 3 2 1 0 x 1 = ___
E3.9	rapid identification and recognition of revisions or changes?	4 3 2 1 0 x 2 = ___

E4 Do procedures that require operator action:

E4.1	have succinct action verbs	4 3 2 1 0 x 2 = ___
E4.2	have succinct action statements	4 3 2 1 0 x 2 = ___

E PROCEDURES (Continued)

E4.3	separate steps from each other and from cautions, notes, reference material, etc.	4 3 2 1 0 x 2 = ____
*E4.4	provide cautionary statements (that are positioned to relate to the consequences or results of that action)	4 3 2 1 0 x 3 = ____
E4.5	minimize the need for memorization of actions	4 3 2 1 0 x 2 = ____
E4.6	distinguish between required (shall) and optional (should) actions	4 3 2 1 0 x 3 = ____
E4.7	distinguish between automatic and manual actions	4 3 2 1 0 x 3 = ____
E4.8	provide symptomatic or diagnostic analysis or entry event guidance to assure correct procedure is in use	4 3 2 1 0 x 3 = ____

PROCEDURES (Continued)

*E4.9	give required operational sequencing of actions and identify actions which should be performed in parallel	4 3 2 1 0 x 3 = ___
*E4.10	identify critical steps where errors of omission, commission or sequence cannot be tolerated	4 3 2 1 0 x 3 = ___
E4.11	integrate charts, diagrams, and graphs into body of procedure as needed to directly supplement steps	4 3 2 1 0 x 2 = ___
E4.12	provide physical panel locations of referenced instrumentation and hardware, especially those that are infrequently used	4 3 2 1 0 x 3 = ___
E4.13	give normally expected results (such as valve positions, flow rates, currents, alarms indicating lights, etc.) where appropriate	4 3 2 1 0 x 2 = ___
E4.14	give setpoints and sensor identity for annunciator response	4 3 2 1 0 x 3 = ___

E PROCEDURES (Continued)

*E4.15	give equipment and administrative limits for operation	4 3 2 1 0 x 2 = ____
E4.16	give contingency actions or conditional instructions if expected results or actions are not achieved	4 3 2 1 0 x 3 = ____
E4.17	emphasize the use of multiple or independent indications to provide feedback that an action has occurred in response to a control command	4 3 2 1 0 x 2 = ____
*E4.18	limit actions to those that are essential and effective	4 3 2 1 0 x 2 = ____
*E4.19	explicitly contain all essential actions and not require use of reference material for those actions	4 3 2 1 0 x 3 = ____
E4.20	identify how or when emergency systems or automatic controls may be manually controlled or overridden after automatic initiation	4 3 2 1 0 x 3 = ____

E PROCEDURES (Continued)

E4.21	identify conditions under which instrumentation may be inaccurate and stress the use of multiple indications	4 3 2 1 0 x 2 = ___
E4.22	provide direction for placing and maintaining the plant in cold shutdown with multiple failures of non-safety grade systems or components?	4 3 2 1 0 x 3 = ___
E5	When reference material is identified in a procedure:	
E5.1	is it readily available	4 3 2 1 0 x 3 = ___
E5.2	is the latest available revision identified	4 3 2 1 0 x 2 = ___
E5.3	are steps or actions compatible with the procedure from which it is entered	4 3 2 1 0 x 2 = ___
E5.4	is it standardized or condensed for ease of use?	4 3 2 1 0 x 2 = ___

E PROCEDURES (Continued)

*E6 For revision or corrections to procedures, is there a controlled method:

E6.1	to assure operator review and walkthru to verify correctness, understanding and ability to use	4 3 2 1 0 x 3 =	____
E6.2	for operator feedback and to clarify intent of changes recommended by operators	4 3 2 1 0 x 2 =	____
E6.3	for feedback to the operator as to resolution of recommended change	4 3 2 1 0 x 2 =	____
E6.4	to permit temporary or interim revision by shift personnel to allow deviation from approved procedures	4 3 2 1 0 x 3 =	____
E6.5	to assure prompt revision (both interim and permanent) to incorporate design changes or operational deviations	4 3 2 1 0 x 3 =	____
E6.6	to assure prompt review and approval by personnel experienced in operations and engineering or design	4 3 2 1 0 x 2 =	____

E PROCEDURES (Continued)

E6.7	for prompt distribution and updating of controlled sets (especially control room)	4 3 2 1 0 x 3 = ____
E6.8	for destruction of superseded controlled copies	4 3 2 1 0 x 3 = ____
E6.9	for updating of Index or Table of Contents to show latest available revisions of all procedures	4 3 2 1 0 x 3 = ____
E6.10	to evaluate and incorporate changes made by operators on control panels such as scales or process units, cautionary or informative notes, power sources, charts and graphs, etc.?	4 3 2 1 0 x 2 = ____

*E7 Has an administrative procedure been established to require:

E7.1	recording of time, date and signature (or initials) on all log book entries	4 3 2 1 0 x 2 = ____
E7.2	marking of charts and graphs on a regular basis	4 3 2 1 0 x 2 = ____

E PROCEDURES (Continued)

E7.3	recording of both permanent and temporary plant and equipment status change, including maintenance and testing activities	4 3 2 1 0 x 2 = ____
E7.4	recording of verbal instructions and feedback on execution	4 3 2 1 0 x 2 = ____
E7.5	recording of cyclic operations or transients	4 3 2 1 0 x 2 = ____
E7.6	recording of other information useful to other operators or supervisors	4 3 2 1 0 x 2 = ____
E7.7	reading and initialing of log books by supervisory personnel on a regular basis	4 3 2 1 0 x 2 = ____
E7.8	retention of log books and recorder charts in permanent plant files for required periods of time?	4 3 2 1 0 x 1 = ____

III CONTROL ROOM REVIEW

F CONTROL ROOM ENVIRONMENT

F1 Are communication systems:

F1.1	redundant, diverse or varied (such as hand-held, sound powered, dedicated to specific panels, radio, bell)	4 3 2 1 0 x 3 = ____
*F1.2	available for emergency or abnormal use (such as a loss of normal power)	4 3 2 1 0 x 3 = ____
F1.3	accessible from each panel, unobstructive, and organized	4 3 2 1 0 x 3 = ____
*F1.4	available to the control room operator on a priority basis	4 3 2 1 0 x 3 = ____
*F1.5	capable of accessing all in-plant areas	4 3 2 1 0 x 3 = ____
F1.6	designed to permit hand free operation	4 3 2 1 0 x 2 = ____

F CONTROL ROOM ENVIRONMENT (Continued)

F1.7 equipped with channel select — 4 3 2 1 0 x 2 = ____

F1.8 physically adjustable for individual users — 4 3 2 1 0 x 2 = ____

F1.9 provided for dedicated links to the TSC, EOF and OSC — 4 3 2 1 0 x 2 = ____

F1.10 distinctive/color coded — 4 3 2 1 0 x 1 = ____

F1.11 clearly understood, intelligible and free from reverberation? — 4 3 2 1 0 x 1 = ____

F2 Are audible signals (such as bells, klaxons and sirens):

F2.1 distinguishable for alarm location — 4 3 2 1 0 x 2 = ____

F CONTROL ROOM ENVIRONMENT (Continued)

F2.2	prioritized	4 3 2 1 0 x 2 = ____
F2.3	tested on a periodic basis	4 3 2 1 0 x 2 = ____
F2.4	audible in all parts of the control room	4 3 2 1 0 x 2 = ____
F2.5	not irritating or excessively loud (90 db maximum)	4 3 2 1 0 x 2 = ____
F2.6	loud enough to be heard during noisy periods (at least 20 db over background)?	4 3 2 1 0 x 3 = ____

F3 Is lighting:

F3.1	adequate at panel surfaces (30 footcandles minimum, 50 footcandles recommended. Measure at each operating area and record on Control Room Arrangement Diagram)	4 3 2 1 0 x 3 = ____

F CONTROL ROOM ENVIRONMENT (Continued)

F3.2	diffuse or indirect to eliminate glare?	4 3 2 1 0 x 2 = ____

F4 Is control room heating and ventilation:

F4.1	adequate for both operator comfort and equipment performance (normally between 65-75°F and 25-45% relative humidity)	4 3 2 1 0 x 2 = ____
F4.2	diffuse to eliminate areas of stagnation or direct blowing?	4 3 2 1 0 x 1 = ____

F5 In case of fire:

F5.1	is fire-fighting equipment immediately accessible	4 3 2 1 0 x 3 = ____
*F5.2	is there an automatic warning system?	4 3 2 1 0 x 2 = ____

F6 During emergency situations:

*F6.1	is access to the control room procedurally controlled	4 3 2 1 0 x 3 = ____

F CONTROL ROOM ENVIRONMENT (Continued)

F6.2	is protective clothing accessible	4 3 2 1 0 x 3 = ____
F6.3	is breathing apparatus accessible	4 3 2 1 0 x 3 = ____
F6.4	is portable radiation monitoring equipment accessible	4 3 2 1 0 x 3 = ____
*F6.5	is special clothing or breathing equipment compatible with required operator functions for visibility, reach, tactile sensitivity, communication, hearing and weight	4 3 2 1 0 x 3 = ____
F6.6	are sanitary facilities and drinking water accessible	4 3 2 1 0 x 1 = ____
*F6.7	have provisions been made for handling of telephone communications when operator is occupied	4 3 2 1 0 x 2 = ____

CONTROL ROOM ENVIRONMENT (Continued)

*F6.8	are emergency lighting levels adequate (20 footcandles minimum at panel surfaces. Measure at each operating area and document on Control Room Arrangement Diagram.)	4 3 2 1 0 x 3 = ____
F7	In general:	
F7.1	is the noise level routinely below an interference level for normal conversation (65 dbA maximum. Measure in both dbA and dbC at each operating area and document on Control Room Arrangement Diagram)	4 3 2 1 0 x 3 = ____
F7.2	have noise distractions from both inside and outside the control room been reduced	4 3 2 1 0 x 2 = ____
F7.3	is there adequate, organized storage space for protective gear, personal belongings, spare parts, tools, etc.	4 3 2 1 0 x 2 = ____
*F7.4	are smoking and eating areas controlled	4 3 2 1 0 x 1 = ____
F7.5	is the control room clean and free of unnecessary loose paper, books and other materials	4 3 2 1 0 x 1 = ____

F CONTROL ROOM ENVIRONMENT (Continued)

F7.6	is the control room free of safety hazards such as loose floor mats, long phone leads, defective furniture, etc.	4 3 2 1 0 x 1 = ____
F7.7	is seating provided at consoles for control room operators adjustible from 15 to 18 inches?	4 3 2 1 0 x 1 = ____

G MAINTENANCE AND SURVEILLANCE

*G1 Are operator maintenance functions and surveillance responsibilities:

G1.1 clearly established 4 3 2 1 0 x 3 = ____

G1.2 adminstratively controlled? 4 3 2 1 0 x 2 = ____

*G2 Are jumpers and lifted leads:

G2.1 procedurally controlled 4 3 2 1 0 x 3 = ____

G2.2 approved and periodically reviewed 4 3 2 1 0 x 3 = ____

G2.3 distinctive or color coded 4 3 2 1 0 x 3 = ____

G2.4 tagged and logged for traceability? 4 3 2 1 0 x 3 = ____

G MAINTENANCE AND SURVEILLANCE

*G3 Are permanent modifications:

G3.1	recorded on as-built drawings to show specific changes	4 3 2 1 0 x 2 =	
G5.2	incorporated into operational procedures?	4 3 2 1 0 x 3 =	

*G4 Are tags:

G4.1	procedurally controlled	4 3 2 1 0 x 3 =	
G4.2	readily available	4 3 2 1 0 x 2 =	
G4.3	installed to not obscure components to which they are attached or adjacent components	4 3 2 1 0 x 3 =	
G4.4	distinctive for each functional use	4 3 2 1 0 x 2 =	

MAINTENANCE AND SURVEILLANCE (Continued)

G4.5	readable	4 3 2 1 0 x 3 =	____
G4.6	temporary	4 3 2 1 0 x 2 =	____
G4.7	logged for traceability	4 3 2 1 0 x 2 =	____
G4.8	periodically reviewed?	4 3 2 1 0 x 2 =	____

G5 For operational spare parts:

G5.1	is there an adequate supply of fuses, indicating lights, ink and inking pens, recorder charts, computer paper, etc.	4 3 2 1 0 x 2 =	____
G5.2	are they readily accessible	4 3 2 1 0 x 1 =	____

G MAINTENANCE AND SURVEILLANCE (Continued)

*G5.3	are necessary or special replacement tools available	4 3 2 1 0 x 2 = ___
G5.4	is adequate storage space available	4 3 2 1 0 x 2 = ___
G5.5	where different types, sizes, or styles are required, are they clearly and distinctively marked to avoid misapplication	4 3 2 1 0 x 2 = ___
G5.6	can they be installed without disconnecting linkage or removing component internals?	4 3 2 1 0 x 2 = ___

*G6 Do maintenance and surveillance procedures require:

G6.1	operability verification when returning any system or component to service	4 3 2 1 0 x 3 = ___
G6.2	notification of operations personnel both prior to and upon completion of all activities?	4 3 2 1 0 x 3 = ___

MAINTENANCE AND SURVEILLANCE (Continued)

G6.3	out-of-service components and equipment to be clearly marked at the control station to preclude inadvertent operation and to provide distinction of that condition	4 3 2 1 0 x 3 = ____
G6.4	use of checklists or status boards to identify out-of-service equipment	4 3 2 1 0 x 3 = ____
G6.5	use of checklists or status boards for routine activities	4 3 2 1 0 x 2 = ____
G6.6	prioritization of control room maintenance?	4 3 2 1 0 x 3 = ____

III CONTROL ROOM REVIEW

H TRAINING AND MANNING

*H1 Does the training/requalification program:

H1.1	use new or revised procedures as they are implemented	4 3 2 1 0 x 3 =	____
H1.2	identify known limitations of instrumentation displays in the control room	4 3 2 1 0 x 3 =	____
H1.3	provide for perodic review and walkthru of emergency procedures by operators	4 3 2 1 0 x 3 =	____
H1.4	include training in the use of the computer and CRT displays?	4 3 2 1 0 x 3 =	____

*H2 For control room manning, are administrative guidelines established:

H2.1	to limit the number of hours an operator may work in any given period of time	4 3 2 1 0 x 3 =	____
H2.2	to evaluate the physical and mental condition of on-coming shift operators on a daily basis	4 3 2 1 0 x 3 =	____

III CONTROL ROOM REVIEW

TRAINING AND MANNING

H2.3	to define specific duties, responsibilities, work locations and authority for all shift members, especially during emergency situations?	4 3 2 1 0	x 3 =	____

*H3 During shift change:

H3.1	are congestion and potentially disruptive situations averted	4 3 2 1 0	x 2 =	____
H3.2	are administrative procedures established to require reading of log entries and review of status boards by on-coming shift personnel from time of previous shift coverage	4 3 2 1 0	x 3 =	____
H3.3	are written instructions and checklists used?	4 3 2 1 0	x 2 =	____

ATTACHMENT

BWR OWNERS' GROUP

CONTROL ROOM IMPROVEMENTS COMMITTEE

HUMAN FACTORS ENGINEERING

CONTROL ROOM SURVEY

SUPPLEMENT

Prepared by: ______________________ ____________
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CONTROL ROOM SURVEY SUPPLEMENT

TABLE OF CONTENTS

INTRODUCTION

This supplement is intended to augment Revision 1 of the BWR Owners Group Control Room Survey (CRS) Program dated 1/1/81. It is to be included as part of the Control Room Review Checklists (Section III of the CRS Program) to further document proposed control room enhancements. The additional items listed in the supplement have been drawn from human engineering guidelines recommended in NUREG-0700 and verified through considerable experience of Owners Group Survey teams.

Major sections of the supplement checklists are identified by letters corresponding to section designations used in the original checklists. In order to differentiate between the two numbering systems, an "S" prefix has been assigned to each supplement item.

The CRS Supplement is to be implemented in accordance with the methodology discussed on page 15 of the CRS package. As before, Sections SA, SB, and SC are to be completed for each panel containing controls and displays normally operated by control room operators. The remaining sections apply to the entire control room and therefore need to be completed only once. Sections A, B, and C should also be completed for the remote shutdown panel.

In addition to the attached checklist supplement, several other modifications have been adopted in the CRS Program. These are listed in Table I. All other aspects of the program remain unchanged.

TABLE I

CRS PROGRAM MODIFICATIONS

The following modifications have been implemented in the BWR Owners Group Control Room Survey Program:

- Sections A, B, and C of the Control Room Review Checklists are to be performed for the remote shutdown panel in addition to those panels previously recommended.

- A supplement (attached) has been added to the Control Room Review Checklists.

- Task analyses and walkthroughs are performed based upon symptom oriented emergency procedures developed from the BWR Owners Group Emergency Procedure Guidelines. If plant-specific procedures are not yet available, the guidelines themselves should be utilized in the analysis. In this case, existing procedures for a scram, relief valve failure, and loss of coolant accident should also be evaluated.

SA PANEL LAYOUT AND DESIGN

SA1 Anthropometrics

SA1.1	Is seating area adjacent to desks and sit-down consoles sufficient to allow the operator to get into and out of a chair easily and to turn in the chair to view the equipment behind (30" lateral space, 36" between desk and opposing panel or surface)?	4 3 2 1 0 x 1 = ___
SA1.2	Is sufficient space allowed between the panel and opposing surfaces such that the operator may perform required tasks without hindrance?	4 3 2 1 0 x 2 = ___
SA1.3	If the operator is required to see over a stand-up console, does the console height not exceed 58 inches?	4 3 2 1 0 x 2 = ___

SA2 Control Room Layout

SA2.1	Does the location of the shift supervisor's office permit prompt access to the control room under all conditions?	4 3 2 1 0 x 2 = ___

Panel______

SA2.2 Are operator's desks and chairs comfortable and in good repair? 4 3 2 1 0 x 1 = ___

SA2.3 For a multi-unit plant, are senior operators who supervise or assist in the operations of more than one unit stationed such that they may communicate effectively with all operators and view each control board? 4 3 2 1 0 x 2 = ___

SA2.4 Are operators provided with sufficient desk and working space for performance of required tasks? 4 3 2 1 0 x 1 = ___

SA3 Control/Display Grouping

Is the association of feedback indication to related controls made readily apparent through labeling, mimics, demarcation lines or position? 4 3 2 1 0 x 3 = ___

Panel______

SA4 Labels

SA4.1	Where abstract symbols are used, are they of standard configuration, distinguishable from other symbols, and consistent in use within and across panels?	4 3 2 1 0 x 2 = ___
SA4.2	Are labels located such that they do not cover or detract from other necessary information?	4 3 2 1 0 x 3 = ___
SA4.3	Is extraneous information not included (e.g., manufacturer's trademark, patent notice, etc.)?	4 3 2 1 0 x 1 = ___

SA5 Unit Integration

SA5.1	For a multi-unit plant, are alarms for shared plant systems duplicated in all control rooms?	4 3 2 1 0 x 3 = ___
SA5.2	For multi-unit plants, if equipment is shared between control rooms, is there administrative control over use of the equipment?	4 3 2 1 0 x 2 = ___

Panel______

SA5.3 Is the status of shared equipment displayed in each control room?

4 3 2 1 0 x 3 = ____

Panel______

SB INSTRUMENTATION AND HARDWARE

SB1 Indicators

SB1.1	Are indicator scales easily read when stationed at the panel?	4 3 2 1 0 x 3 = ___
SB1.2	Is the use of multiscale and logarithmic scale indicators minimized?	4 3 2 1 0 x 2 = ___
SB1.3	Are displays which reflect only a demand signal labeled accordingly?	4 3 2 1 0 x 3 = ___
SB1.4	Are process units and multipliers specified?	4 3 2 1 0 x 3 = ___
SB1.5	Are drum-type counters readable from the normal viewing position?	4 3 2 1 0 x 3 = ___

Panel ______

SB1.6	Are digital displays readable from the normal viewing position?	4 3 2 1 0	x 3 =	___

SB2 Recorders

SB2.1	Is all recorder information visible through recorder windows (i.e. open-door operation not required)?	4 3 2 1 0	x 2 =	___
SB2.2	Do multi-channel recorders clearly display the channel being plotted?	4 3 2 1 0	x 2 =	___

SB3 Indicating Lights

	Have procedural or design provisions been implemented to prevent interchanging indicating light lenses?	4 3 2 1 0	x 2 =	___

Panel______

SB4 Switches

SB4.1 Where contiguous legend pushbuttons are used, are barriers provided to prevent inadvertent actuation of adjacent pushbuttons?

4 3 2 1 0 x 3 = ____

SB4.2 Are key-operated switches used only where appropriate (i.e., to prevent unauthorized control actuation)?

4 3 2 1 0 x 2 = ____

Panel______

SC ANNUNCIATORS

SC1 Window Design

Is the density of annunciator matrices such that the operator may quickly ascertain a window position?

4 3 2 1 0 x 3 = ____

SC2 Acknowledgement

Are annunciator response controls coded for ease of recognition (color, shape, demarcation, etc.)?

4 3 2 1 0 x 2 = ____

SD COMPUTERS

SD1 Console

SD1.1	Do typewriter keyboards conform to the standard "QWERTY" arrangement?	4 3 2 1 0	x 1 =	___
SD1.2	Do numeric keyboards conform to either the "telephone" style or the "calculator" style arrangement?	4 3 2 1 0	x 1 =	___
SD1.3	Do function keyboards contain only those keys which are used by the operators (i.e. no irrelevant keys such as used by programmers)?	4 3 2 1 0	x 1 =	___
SD1.4	Are function controls segregated from alpha-numeric keys?	4 3 2 1 0	x 1 =	___
SD1.5	Are function controls clearly labeled to indicate their function?	4 3 2 1 0	x 2 =	___

SD2 Capability

SD2.1	Is computer use and software access administratively controlled?	4 3 2 1 0 x 2 = ___	
SD2.2	Is the system designed such that data is not lost during printer down periods?	4 3 2 1 0 x 2 = ___	

SD3 CRTs

SD3.1	Are CRTs free from glare and easily readable from normal viewing positions?	4 3 2 1 0 x 2 = ___
SD3.2	Are messages which require immediate operator response highlighted to attract the operator's attention?	4 3 2 1 0 x 3 = ___
SD3.3	Are prompts and error messages used to guide the operator in proper system operation?	4 3 2 1 0 x 2 = ___
SD3.4	Are abbreviations, acronyms, and synonyms used consistent with those used elsewhere in the control room?	4 3 2 1 0 x 2 = ___

SD4 Printers

SD4.1	Are printers located in a readily accesible area in the control room?	4 3 2 1 0 x 1 = ___
SD4.2	Do printers have the capability to record alarm, trend, and plant status data?	4 3 2 1 0 x 1 = ___
SD4.3	Is the system capable of providing a hard copy of any page appearing on the CRT?	4 3 2 1 0 x 1 = ___

SE PROCEDURES

SE1 Are procedures, reference materials and other documents readable (i.e. not dirty, torn, dog-eared or otherwise difficult to read)? 4 3 2 1 0 x 3 = ___

SE2 Is a set of computer operating procedures available in the control room describing the computer system, procedures necessary to accomplish operator-computer interface functions and contingency actions in the event of a computer failure? 4 3 2 1 0 x 2 = ___

SF CONTROL ROOM ENVIRONMENT

SF1 Communications

SF1.1	Are periodic maintenance tests performed on all communications sytems?	4 3 2 1 0 x 2 = ___
SF1.2	Is sufficient communications equipment (cords, jacks, etc.) provided in well marked locations?	4 3 2 1 0 x 2 = ___
SF1.3	Is an intercom system provided connecting the control room with the shift supervisor's office?	4 3 2 1 0 x 2 = ___
SF1.4	Are instructions provided for the use of all communications systems?	4 3 2 1 0 x 2 = ___
SF1.5	Are operators trained in the use of all communications systems?	4 3 2 1 0 x 3 = ___

SF2 Lighting

SF2.1	Are illumination levels at operator desks adequate for the tasks being performed (50 footcandles minimum, 100 footcandles maximum, 75 footcandles recommended)?	4 3 2 1 0 x 3 = ___
SF2.2	Is illumination uniform over a given work station and from one station to another?	4 3 2 1 0 x 2 = ___
SF2.3	Is shadowing avoided on panels and other operator work areas?	4 3 2 1 0 x 2 = ___
SF2.4	Have direct sources of glare been avoided (e.g. light emitted from displays and indicators)?	4 3 2 1 0 x 2 = ___

SF3 Emergency Response Equipment

SF3.1	Is operator protective equipment periodically checked?	4 3 2 1 0	x	2	=	___
SF3.2	Is a sufficient quantity of protective equipment and expendables provided?	4 3 2 1 0	x	2	=	___
SF3.3	Are instructions provided for the use of protective equipment and expendables?	4 3 2 1 0	x	2	=	___
SF3.4	Are operators trained in the proper use of protective equipment and expendables?	4 3 2 1 0	x	3	=	___
SF3.5	Are fire and rescue equipment periodically checked?	4 3 2 1 0	x	2	=	___
SF3.6	Are instructions provided for the use of fire and rescue equipment?	4 3 2 1 0	x	2	=	___

SF3.7	Are operators trained in the proper use of fire and rescue equipment?	4 3 2 1 0 x 3 = ___
SF3.8	Is radiation monitoring equipment periodically checked?	4 3 2 1 0 x 2 = ___
SF3.9	Are instructions provided for the use of radiation monitoring equipment?	4 3 2 1 0 x 2 = ___
SF3.10	Are operators trained in the proper use of radiation monitoring equipment?	4 3 2 1 0 x 3 = ___

SG MAINTENANCE AND SURVEILLANCE

SG1 Tags

Are maintenance tags securely affixed to panel components?	4 3 2 1 0	x	2	= ___

SG2 Spare Parts

Are inventories kept for operational spare parts and expendables?	4 3 2 1 0	x	1	= ___

APPENDIX E

INTEGRATED COSMETIC PACKAGE

Appendix E

INTEGRATED COSMETIC PACKAGE

All of the figures and tables describing the Integrated Cosmetic Package (ICP) are contained in Appendix E. Table E-1 lists all HEOs resolved by the ICP and the change that was instituted. Table E-2 lists the component labels included in the ICP. Table E-3 lists the indicator scales changed by the ICP. Table E-4 lists the control handles replaced by the ICP. Table E-5 lists the indicator lights changed by the ICP. Figures E-1 through E-4 show the demarcation lines that were installed on the simulator control panels. Figures E-5 through E-26 are photographs of the ICP as installed on the simulator control panels. On the back of each photo is a list of HEOs addressed by the photograph. Some elements of the ICP were not installed on the simulator for verification in this fashion, for reasons described in the text, Section 5.3.2. Therefore, all cosmetic HEO's cannot be accounted for by the photographs.

Table E-1 NMP-1 Cosmetic Package HEO Resolution

HEO#	Demarcation	Component Labeling	Indicator Scale Replacement	Indicator Range Marking	System Mimics	NMP-1 Codes and Conventions	Chart Paper
CS-001*	X						
CS-004			X				
CS-007		X					
CS-010	X						
CS-011			X				
CS-025*						X	
CS-028		X					
CS-030*		X					
CS-031*		X					
CS-039*		X			X		
CS-040*		X					
CS-041*		X					
CS-043		X					
CS-044		X					
CS-048							
CS-049						X	
CS-050		X					
CS-052*					X		
CS-055*		X					
CS-058*		X	X				
CS-059*		X					
CS-060*		X					
CS-061*			X				
CS-065						X	
CS-066					X		
CS-067*		X					
OCS-100*			X				
OCS-101*			X				
OCS-102			X				
OCS-103			X				
OCS-104			X				
OCS-105			X				
OCS-106*			X				
OCS-107			X				
OCS-108*			X				
OCS-011					X		
OCS-110			X				
OCS-111*			X				
OCS-112			X				
OCS-113			X				
OCS-114			X				
OCS-115*			X				

*Not included in simulator verification study.

Table E-1 NMP-1 Cosmetic Package HEO Resolution (continued)

HEO#	Demarcation	Component Labeling	Indicator Scale Replacement	Indicator Range Marking	System Mimics	NMP-1 Codes and Conventions	Chart Paper
OCS-116*			X				
OCS-118*			X				
OCS-120*			X				
OCS-126*			X				
OCS-127*			X				
OCS-128*			X				
OCS-129			X				
OCS-130			X				
OCS-131			X				
OCS-132*			X				
OCS-133			X				
OCS-134*			X				
OCS-135			X				
OCS-136			X				
OCS-137			X				
OCS-139			X				
OCS-014*	X						
OCS-140*			X				
OCS-141			X				
OCS-142*			X				
OCS-143			X				
OCS-144*			X				
OCS-145			X				
OCS-146			X				
OCS-147			X				
OCS-148*			X				
OCS-149			X				
OCS-150			X				
OCS-151*			X				
OCS-154*			X				
OCS-156*			X				
OCS-157			X				
OCS-158			X				
OCS-159*			X				
OCS-016						X	
OCS-163*			X				
OCS-017						X	
OCS-172*			X				
OCS-175*							X
OCS-178*							X
OCS-179*							X
OCS-180*							X
OCS-018						X	
OCS-019						X	

*Not included in simulator verification study.

Table E-1 NMP-1 Cosmetic Package HEO Resolution (continued)

HEO#	Demarcation	Component Labeling	Indicator Scale Replacement	Indicator Range Marking	System Mimics	NMP-1 Codes and Conventions	Chart Paper
OCS-020						X	
OCS-022						X	
OCS-226						X	
OCS-023						X	
OCS-024						X	
OCS-025*		X					
OCS-029*		X					
OCS-030						X	
OCS-031		X					
OCS-034		X					
OCS-036		X					
OCS-039						X	
OCS-005.1	X						
OCS-005.2	X						
OCS-005.3	X						
OCS-005.4	X						
OCS-005.5	X						
OCS-005.6	X						
OCS-005.7	X						
OCS-053						X	
OCS-055*		X					
OCS-058.1			X				
OCS-059		X					
OCS-006*	X						
OCS-006.2	X						
OCS-068*			X				
OCS-007					X		
OCS-073		X					
OCS-075			X				
OCS-076		X					
OCS-008					X		
OCS-083		X	X				
OCS-083.1			X				
OCS-009					X		
OCS-097			X				
OCS-098			X				
OCS-099			X				
VER-011*			X				
VER-040						X	
VER-010*			X				
OCS-138*			X				
QS-014*		X					
VAL-022		X					

*Not included in simulator verification study.

Table E-2 Component Labels Included In ICP

HEO#	PANEL	LABEL
CS-007	A	Turb Bypass Valve 12H-12I
CS-007	A	Hydrogen Gas Temp Control
CS-007	A	Turbine Oil Temp Control
CS-007	A	Red-345KV Line Voltage Black-24KV Generator Voltage
OCS-055	A	PH1 NMP-Volney 9
OCS-055	A	PH2 NMP-Volney 9
OCS-055	A	PH3 NMP-Volney 9
OCS-055	A	NMP-Volney 9
OCS-055	A	R925
QS-014	A2	Annunciator Tile 4-8
QS-014	A4	Annunciator Tile 1-6
QS-014	A5	Annunciator Tile 4-3
QS-014	A6	Annunciator Tile 2-5
QS-014	A6	Annunciator Tile 3-4
QS-014	A8	Annunciator Tile 2-3
QS-014	A7	Annunciator Tile 4-1
CS-007	B	Core Monitor
OCS-025	B	IVth 12 SERVO TEST
OCS-025	B	IVth 11 SERVO TEST
OCS-034	B	Bearing Oil
OCS-034	B	Stator Temp
OCS-034	B	Rotor Temp
OCS-034	B	H_2 Coolers
OCS-034	B	Stator Water Conductivity
CS-007	E	Red-Stack Gas Monitor 7 Black-Stack Gas Monitor 8
CS-007	E	Feedwater Master
CS-007	E	Recirc Master
CS-025	E	IRM/ARM Select Switches and Recorders
CS-055	E	Red-Off Gas Temp ^{o}F Black-EJ Cond Flow
OCS-055	E	Bypass RWM
OCS-055	E	Off Gas Discharge Temp -50 to +150^{o}F
CS-007	F	CRD Flow Control
CS-007	F	FWP 12 Bypass Valve
CS-007	F	FWP 11 Bypass Valve
CS-007	F	FWP 12 Valve Control
CS-007	F	FWP 13 Valve Control
CS-007	F	FWP 11 Valve Control
CS-043	F	FW Recirc to CNDSR Blocking Vlv
OCS-055	F	Main Spray Isol Vlv 7% Test
OCS-055	F	Post Loca Vent Vlvs 201.1-9 & 201.1-11
OCS-055	F	Post Loca Vent Vlvs 201.1-14 & 201.1-16
CS-007	H	Intake Water Temp
CS-007	H	Dilution Flow
CS-007	H	R Bldg Cool/Serv Water Vlv
CS-007	H	Lakewater Lvl Alarm Setpoint
CS-007	H	FW Recirc to Cond Flow Control
CS-010	H	Off Gas Diluted Press

Table E-2 Component Labels Included In ICP (continued)

HEO#	PANEL	LABEL
CS-010	H	Off Gas System Press
CS-010	H	Off Gas Temp
CS-010	H	Off Gas Vacuum Pump 11
CS-010	H	Off Gas Vacuum Pump 12
CS-049	H	Tempering Gate
OCS-031	H	Off Gas Mixing Jet Flow
OCS-036	H	Off Gas Vacuum Control Vlv 12
OCS-036	H	Off Gas Vacuum Control Vlv 11
OCS-055	H	Chiller 12 System CLC-24
OCS-055	H	Chiller 13 System CLC-24
OCS-055	H	Chiller 11 System CLC-24
OCS-076	H	Hotwell Level North
OCS-076	H	Hotwell Level South
NOT HEO	H	T Bldg Cool/Serv Water Vlv
QS-014	H3	Annunciator Tile 4-8
CS-007	J	Condsr Circ Water Pump Disch Press
CS-007	K	Cleanup PCV 12 (HP)
CS-007	K	Cleanup PCV 11 (LP)
CS-007	K	EM Condsr Makeup LCV 11
CS-007	K	EM Condsr Makeup LCV 12
CS-007	K	Cleanup to Cond & Waste Flow
CS-007	K	Cleanup System Selector
CS-007	K	Shutdown Cooling TCV 11
CS-007	K	Shutdown Cooling TCV 12
CS-007	K	Shutdown Cooling TCV 13
CS-007	K	Cleanup System Flow
OCS-055	K	LOCKOUT 86-17
OCS-055	K	Push to Open BVA 033-41
OCS-073	K	Downcomer Submergence
NOT HEO	K	LOCKOUT 86-16
QS-014	K2	Annunciator Tile 2-2
CS-007	L	Manual/Auto Controller 12
CS-007	L	Manual/Auto Controller 11
CS-007	L	Nitrogen Supply #11
CS-007	L	Nitrogen Supply #12
CS-055	L	Cont Vent to Emer Ventil Sys IV 121
CS-055	L	Cont Vent to Emer Ventil Sys IV 122
CS-058	L	Containment #11 Flow
CS-058	L	Containment #12 Flow
CS-059	L	N_2 Vent to EM Vent Press
OCS-029	L	Drywell Cam Return IV (legend pushbutton)
OCS-055	L	System 12 O_2 Green/H_2 Red
OCS-055	L	System 11 O_2 Green/H_2 Red
OCS-055	L	Drywell Cam IV
OCS-055	L	EM Vent Exhaust Fan 11 Inlet PCV
OCS-055	L	N_2 Purge Bypass
OCS-055	L	Post Loca Vent Vlvs 201.2-09 & 201.1-16
OCS-055	L	Spent Fuel Pool Level
NOT HEO	L	EM Vent Exhaust Fan 12 Inlet PCV

Table E-2 Component Labels Included in ICP (continued)

HEO#	Panel	Label
VAL-022	L	Drywell Ambient Temp
QS-014	L3	Annunciator Tile 2-5
CS-067	N	Discharge Valve (legend pushbutton)
CS-030	RSP	Reactor Temp RRP 14
CS-030	RSP	Torus Temp
CS-030	RSP	Drywell Press
CS-030	RSP	Drywell Temp
CS-030	RSP	Reactor Press
CS-030	RSP	Reactor Temp RRP 15

Table E-3 Indicator Scales Replaced in ICP

HEO#	Panel	Label
OCS-120	A	Steam Chest Pressure
OCS-158	A	Turbine Oil Temp
OCS-126	B	Temperature Recorder
CS-011	E	Off Gas Temp
CS-011	E	Off Gas Chiller Disch Temp
OCS-115	E	Off Gas Recorder
OCS-116	E	Stack Gas Recorder
OCS-118	E	Drywell Torus PSID Recorder
OCS-157	E	Ejector Cond Flow
OCS-112	F	Core Differential Press
OCS-113	F	Reactor Press
OCS-145	F	Total Recirculation Flow
OCS-148	F	Recirc Pump Diff Press
OCS-150	F	Cool Wtr/React Diff Press
OCS-163	F	Scram Discharge Volume Holding Tank Level
OCS-172	F	Scram Solonoid Air Header Press Recorder
CS-011	H	Off Gas Diluted Temp
CS-011	H	Off Gas System Flow
OCS-058.1	H	Cond Vac
OCS-075	H	Dissolved O_2 Cond
OCS-075	H	Dissolved O_2 FW
OCS-105	H	Intake/Disch Tun ΔP
OCS-106	H	Air Ejector Condensor Flow
OCS-108	H	Spray Pump Amps
OCS-141	H	Recombiner 11 Disch Temp
OCS-141	H	Recombiner 12 Disch Temp
OCS-143	H	Chiller #11 Off Gas Temp -50 to 150°F
OCS-143	H	Chiller #12 Off Gas Temp -50 to 150°F
OCS-143	H	Chiller #12 Off Gas Temp -50 to 150°F
OCS-144	H	Service Water Header Pressure
OCS-100	K	Containment Spray Pump Amps
OCS-101	K	Core Spray Topping Pump Amps
OCS-102	K	Drywell Press
OCS-104	K	CU to Cond/Waste Flow
OCS-103	K	SD Cooling System Temp Out
OCS-103	K	SD Cooling System Temp In
OCS-131	K	Cleanup Pump Suction Press
OCS-134	K	Aux Cleanup Pump Amps
OCS-135	K	Emer Cond 121 Water Temp
OCS-135	K	Emer Cond 122 Water Temp
OCS-135	K	Emer Cond 111 Water Temp
OCS-135	K	Emer Cond 112 Water Temp
OCS-136	K	EM Cond Steam HDR 11 Press
OCS-136	K	EM Cond Steam HDR 12 Press
OCS-137	K	SD Heat Exch 11 Out
OCS-137	K	SD Heat Exch 12 Out
OCS-137	K	SD Heat Exch 13 Out
VER-011	K	Liquid Poison Tank Level

Table E-3 Indicator Scales Replaced in ICP (continued)

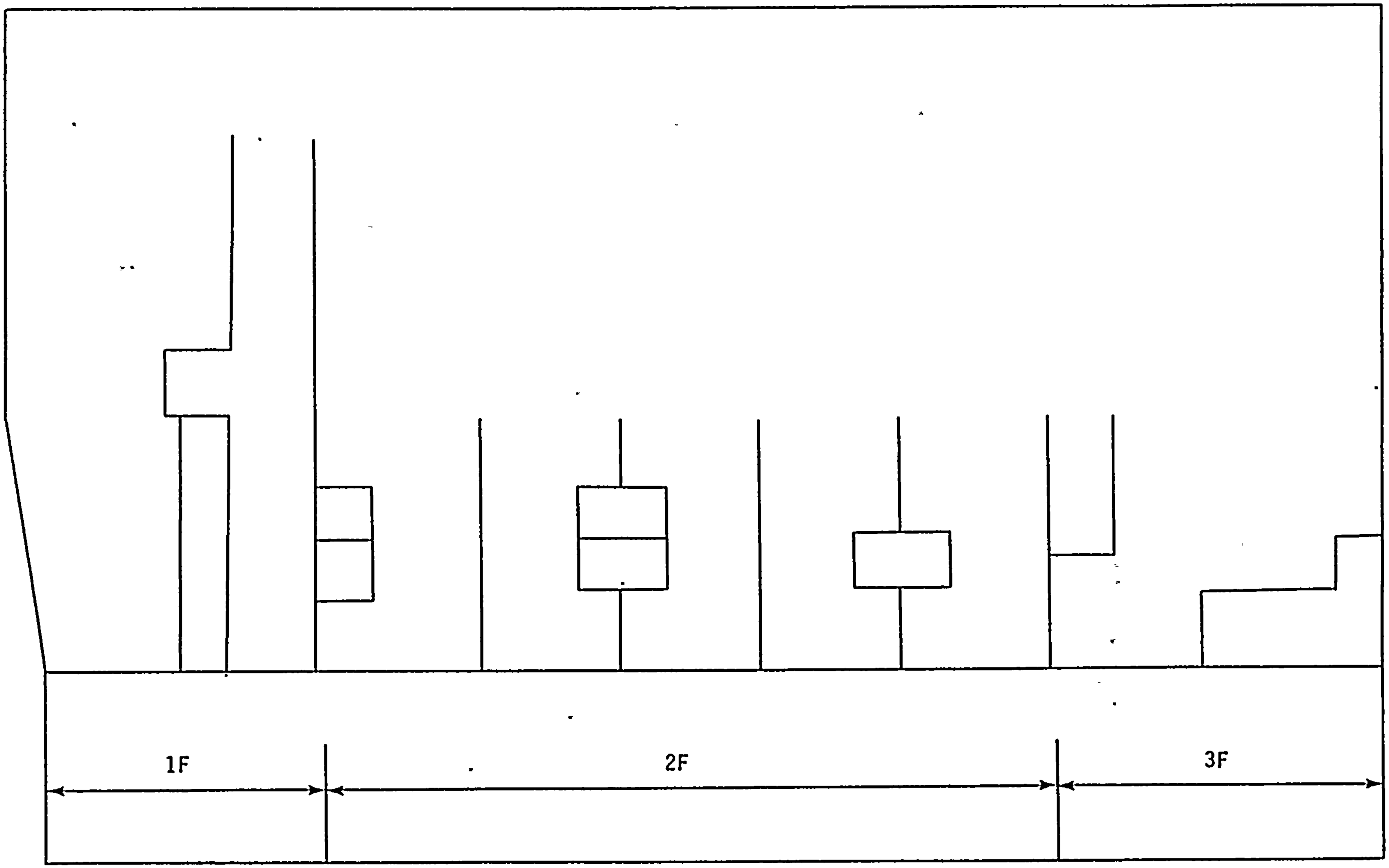
HEO#	Panel	Label
VER-011	K	Makeup Tank Level
CS-004	L	Torus Water Level Chan 11
CS-004	L	Torus Water Level Chan 12
CS-058	L	N_2 Vent to Emerg Vent Press
CS-061	L	Containment Vent #11 Flow
CS-061	L	Containment Vent #12 Flow
OCS-129	L	11 DWEDT Level
OCS-129	L	12 DWEDT Level
OCS-130	L	11 DWFD Leak Rate
OCS-130	L	11 DWFD Level
OCS-130	L	12 DWFD Leak Rate
OCS-130	L	12 DWFD Level
OCS-128	L	Fuel Pool Level (Diff from Normal)
CS-031	RSP	All meters

Table E-4 Control Handles Replaced by ICP

Panel	Equipment	Control Type	Current	Recommended Type
H	Tempering Gate	lower/raise	J	star
H	Fish Screen 11	drain/norm	T	star
H	Fish Screen 12	drain/norm	T	star
F	Main Steam Isol Vlv 7% test	selector	T	star
A	Lift Pump Bypass SW	selector	T	star
A	345 KV Sys Volt Freq	selector	T	star
A	Syn Selector R 1022	selector	T	star
A4	Diesel Governor	raise/lower	T	star
A	Volts Adj Rheostat Gen 102	raise/lower	T	star
A	Volts Adj Rheostat GEn 103	raise/lower	T	star
A5	Diesel Governor	raise/lower	T	star
A	Syn Selector R 1032	selector	T	star
A	Meter Scale Selector	selector	T	star
A	Reclosing Selector R915	selector	T	star
A	Tap Chger Cont Trans 10	raise/lower	T	star
A	Syn Selector R915	selector	T	star
A	Syn Selector R925	selector	T	star
A	Auto Reclosing R915	selector	T	star
A	Auto Reclosing R925	selector	T	star
A	Governor	raise/lower	T	star
A	Freq Select SW 115 KV Bus	selector	T	star
A	Reclosing Selector R925	selector	T	star
A	Auto Reclosing R10	selector	T	star
A	Auto Reclosing R40	selector	T	star
E	Vessel Isol 11	selector	T	star
E	Vessel Isol 12	selector	T	star
E	Mech Pressure Reg	raise/lower	T	star
E	Elec Pressure Red	raise/lower	T	star
E	Governor	raise/lower	T	star
E	Exciter Rheostat	raise/lower	T	star
E	Master Sync	raise/lower	T	star
L	Cont Mon. Sys 11 Oxy Anal Range	Selector	J	star
L	Cont Mon. Sys 12 Oxy Anal Range	Selector	J	star
L	Cont Mon. Sys 11 Hyd Anal Range	Selector	J	star
L	Cont Mon. Sys 12 Hyd Anal Range	Selector	J	star

Table E-5 Indicator Light Color Changes in ICP

HEO#	Panel	Equipment	Light Meaning	Current Color	Recommended Color
OCS-019	F	Main Steam Isol Vlvs	Input selection	yellow	white
OCS-024	A	Load limit controller	latched low speed stop high speed stop	yellow red yellow	yellow white white
CS-065	E	FW CH 11 Reset to normal	normal power supply	green	white
CS-065	E	FW CH 12 Reset to normal	alternate power supply	green	white



PANEL F

Figure E-1 Panel F Demarcation Line

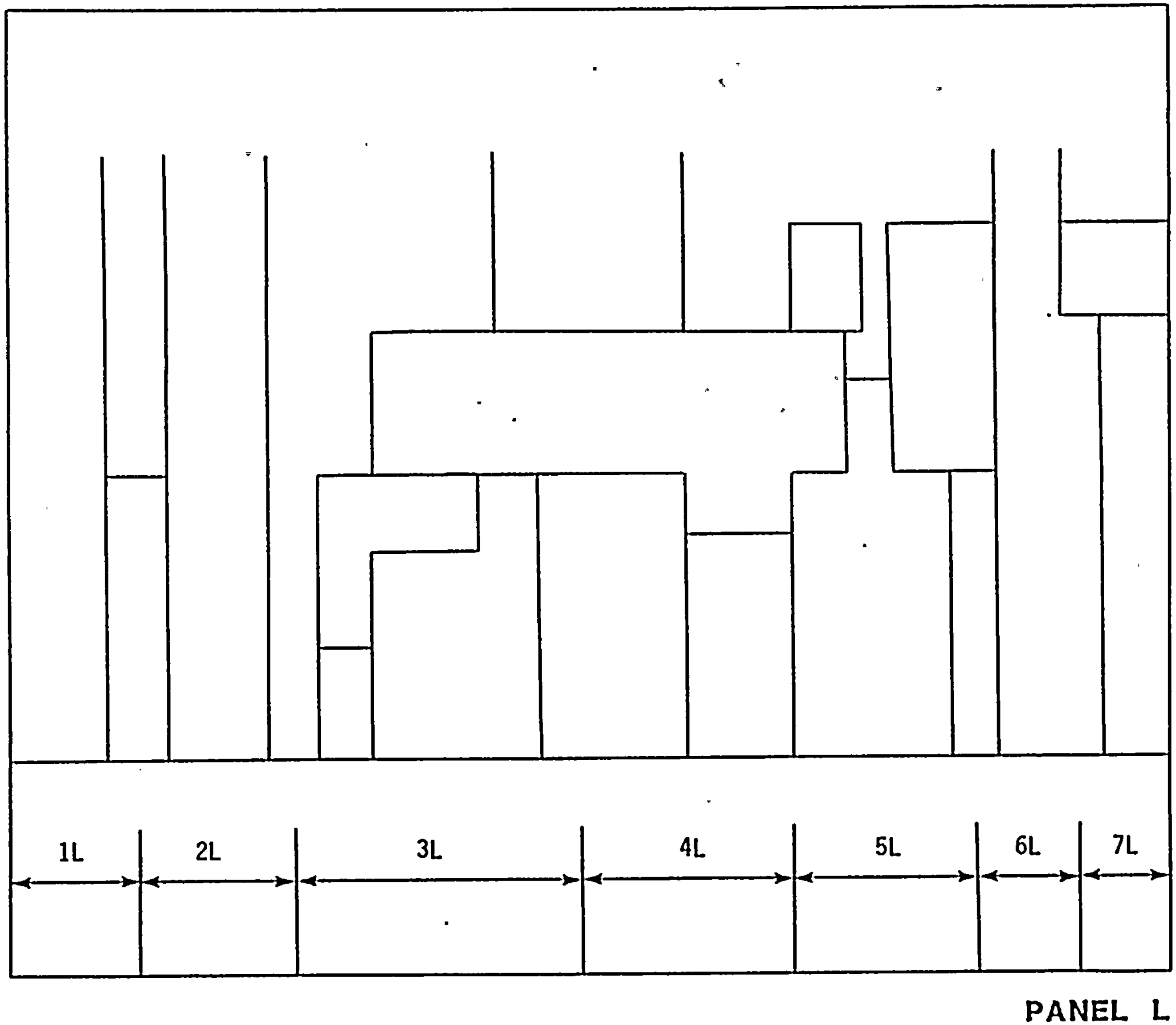


Figure E-2 Panel L Demarcation Lines

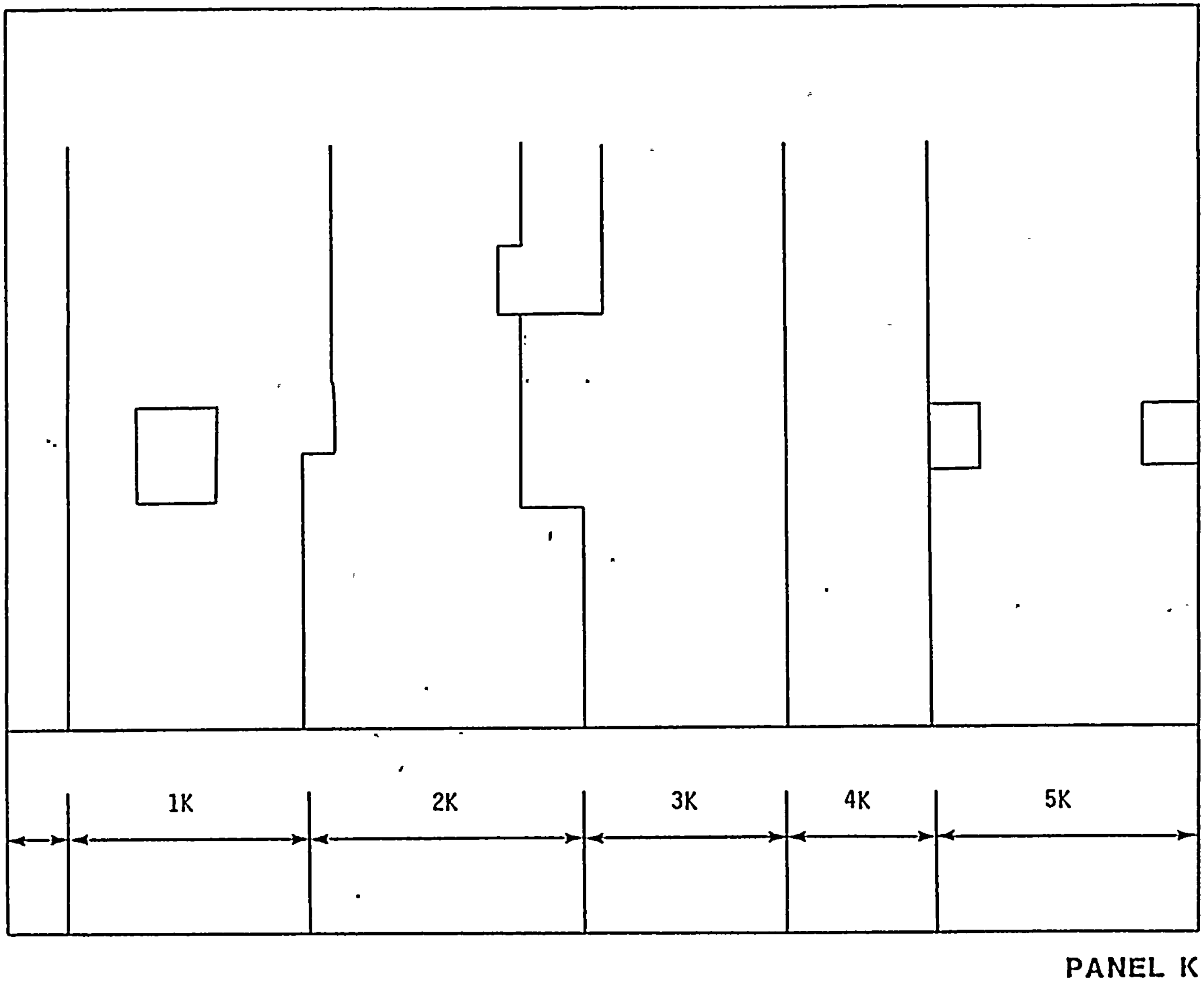


Figure E-3 Panel K Demarcation Lines

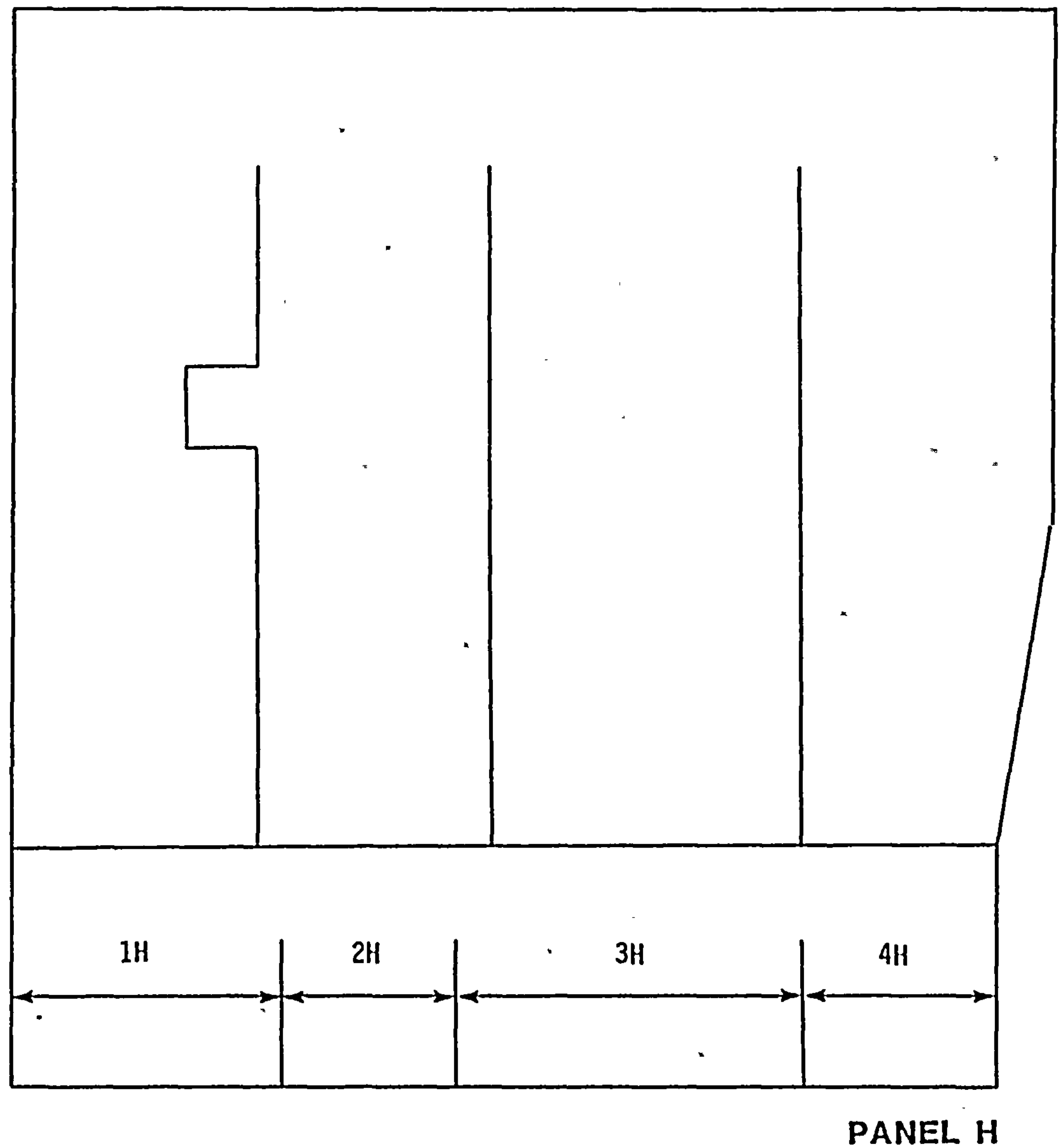
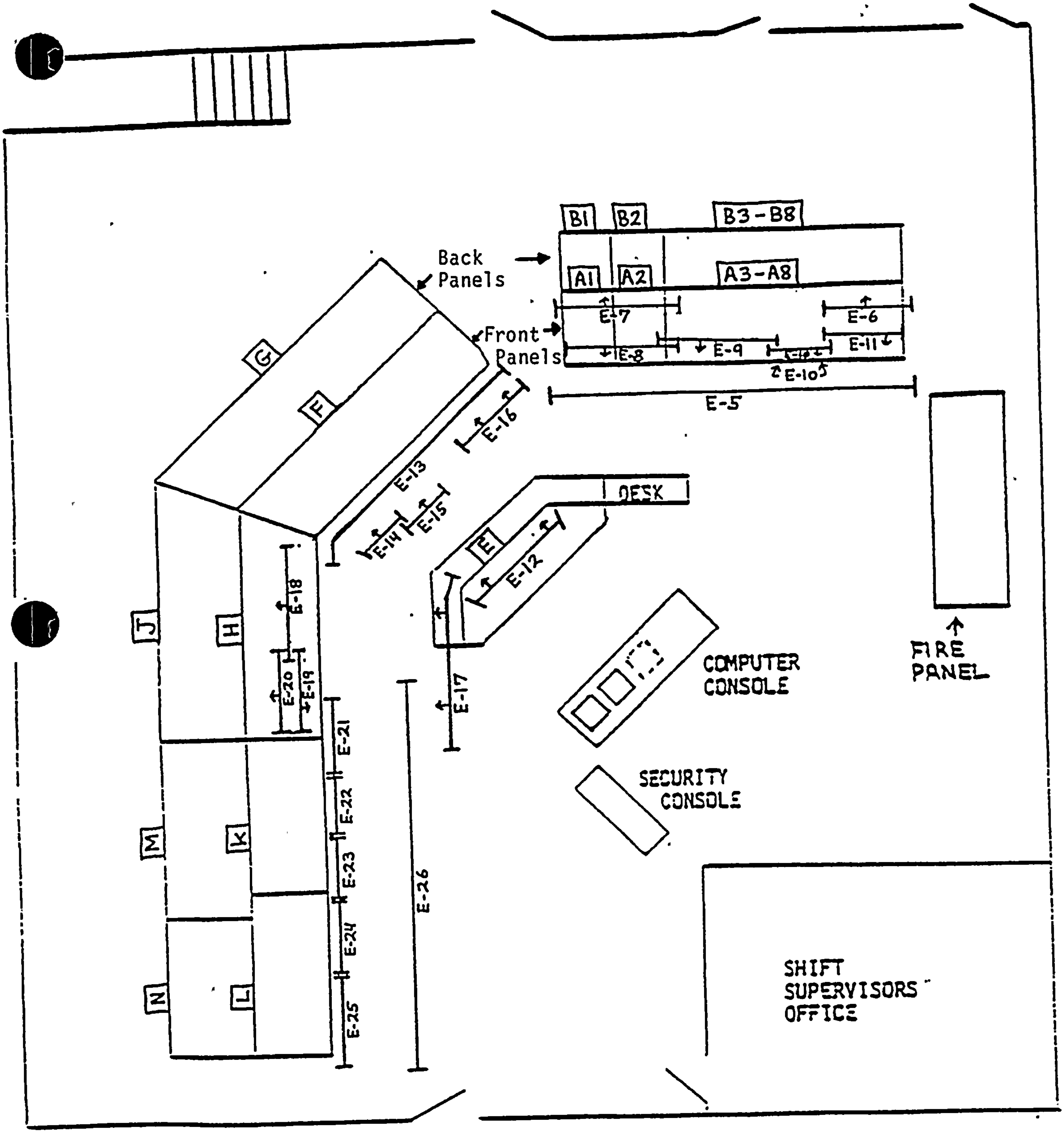


Figure E-4 Panel H Demarcation Lines

E-Numbers Correspond W/Photograph Figure Numbers



CONTROL ROOM ARRANGEMENT

Figure E-26 Panel L and K Overview

HEO resolutions illustrated by Figure E-26:

- OCS-008
- OCS-006
- OCS-005.1
- OCS-005.2

Figure E-26

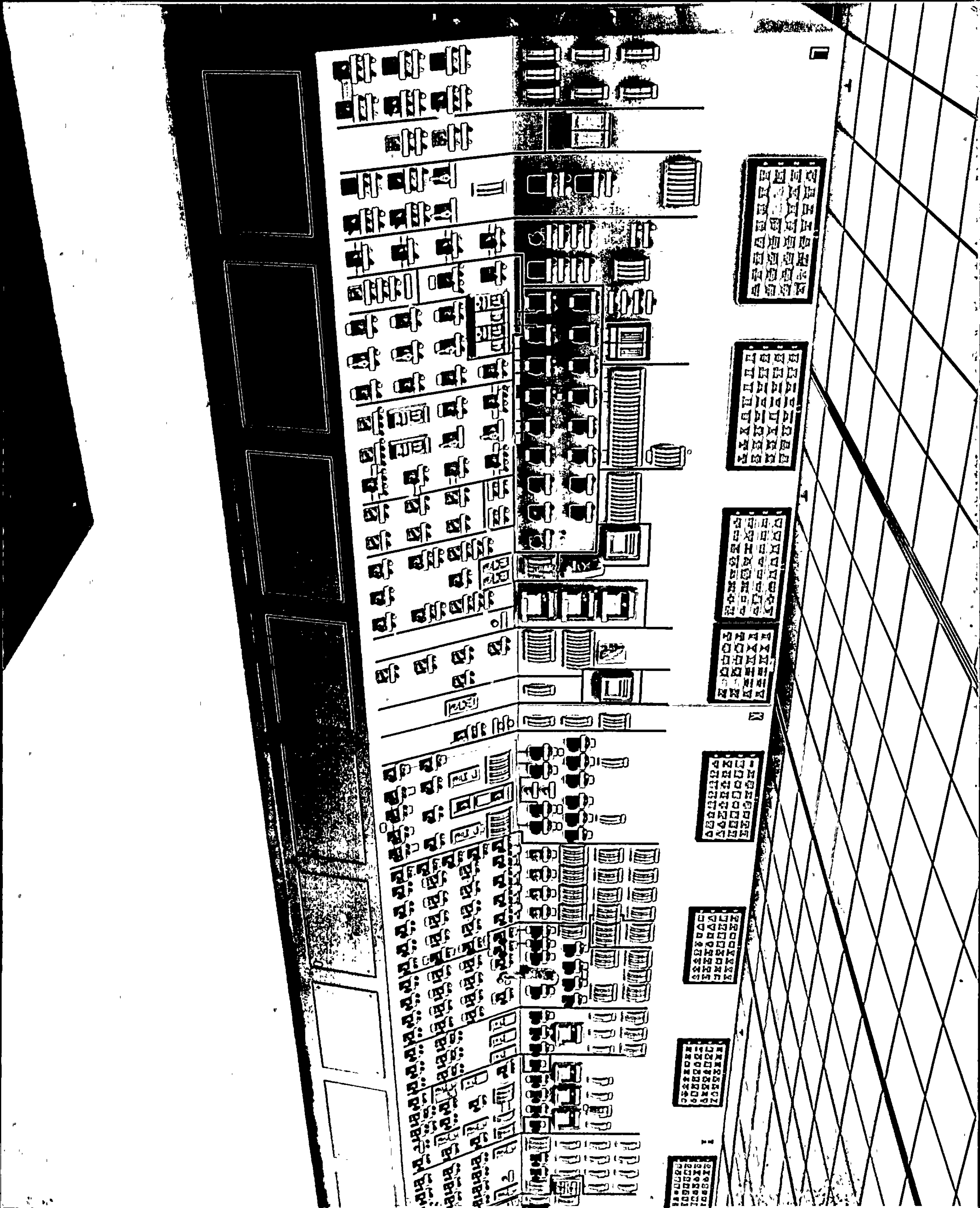


Figure E-25 Panel L

HEO resolutions illustrated by Figure E-25:

CS-007
OCS-005.1
OCS-006
OCS-008
OCS-055

Figure E-25

Page # E-37

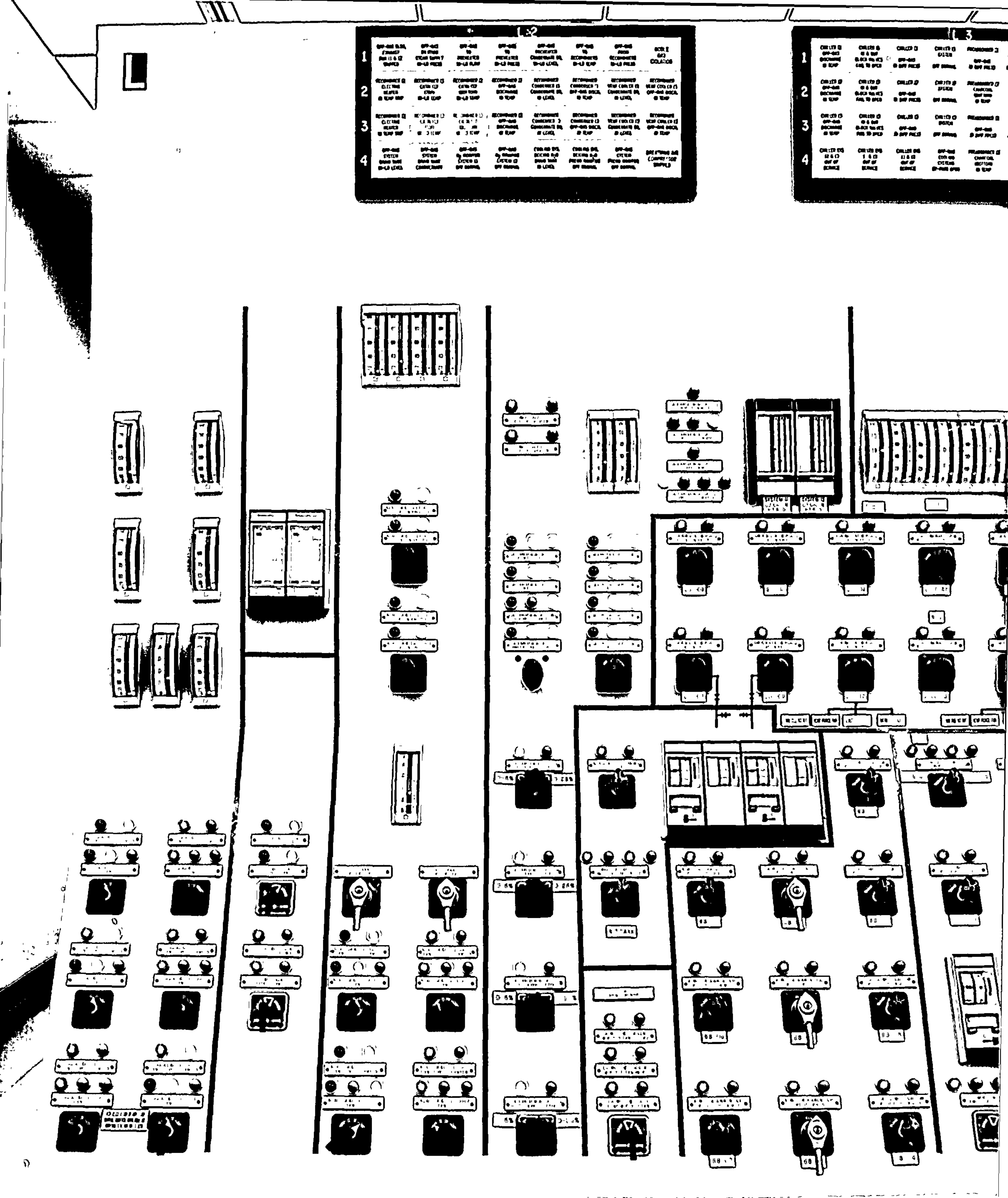

L

Figure E-24 Panel L

HEO resolutions illustrated by Figure E-24:

- VAL-022
- CS-004
- CS-007
- CS-060
- OCS-129
- OCS-130
- OCS-008
- OCS-097
- OCS-098
- OCS-006
- OCS-005.1

Figure E-24

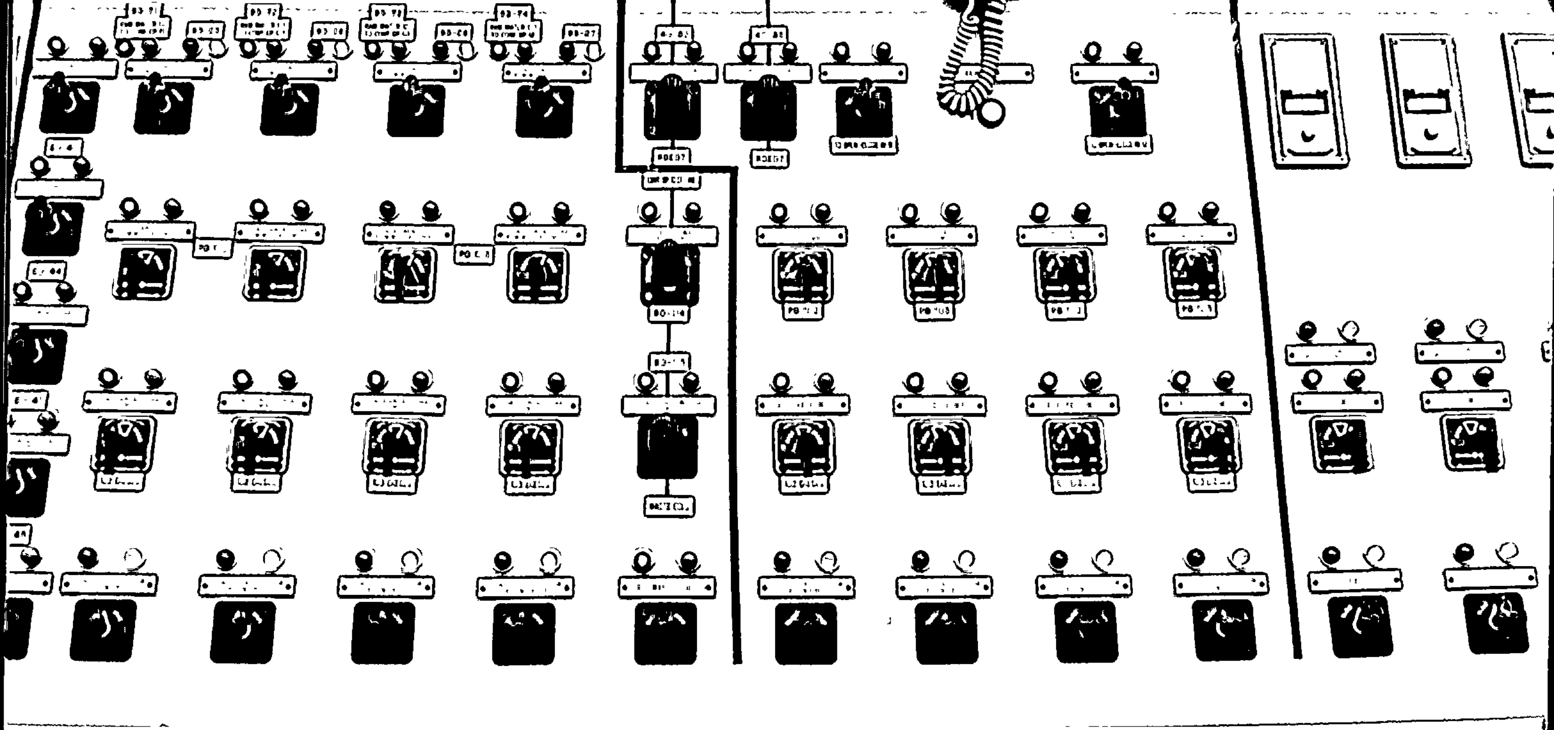


Figure E-23 Panel K and L

HEO resolutions illustrated by Figure E-23:

OCS-011
CS-060
CS-052
CS-004
OCS-135
OCS-136
OCS-005.2
OCS-009
OCS-055
CS-007

Figure E-23

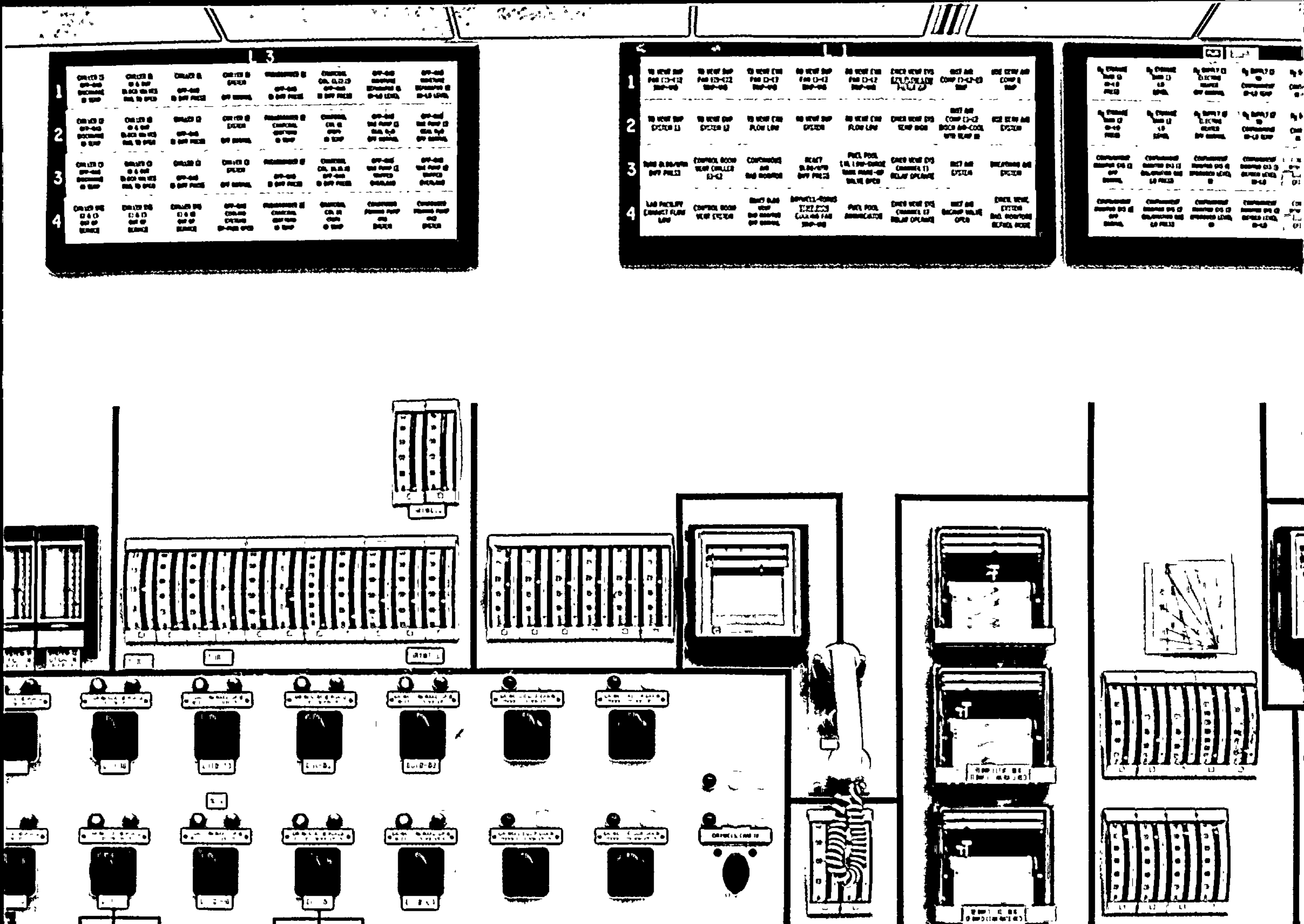


Figure E-22 Panel K

HEO resolutions illustrated by Figure E-22:

OCS-102
OCS-103
OCS-137
OCS-005.2
OCS-006
OCS-073
OCS-009
OCS-055
CS-007

Figure E-22

Page # E-34

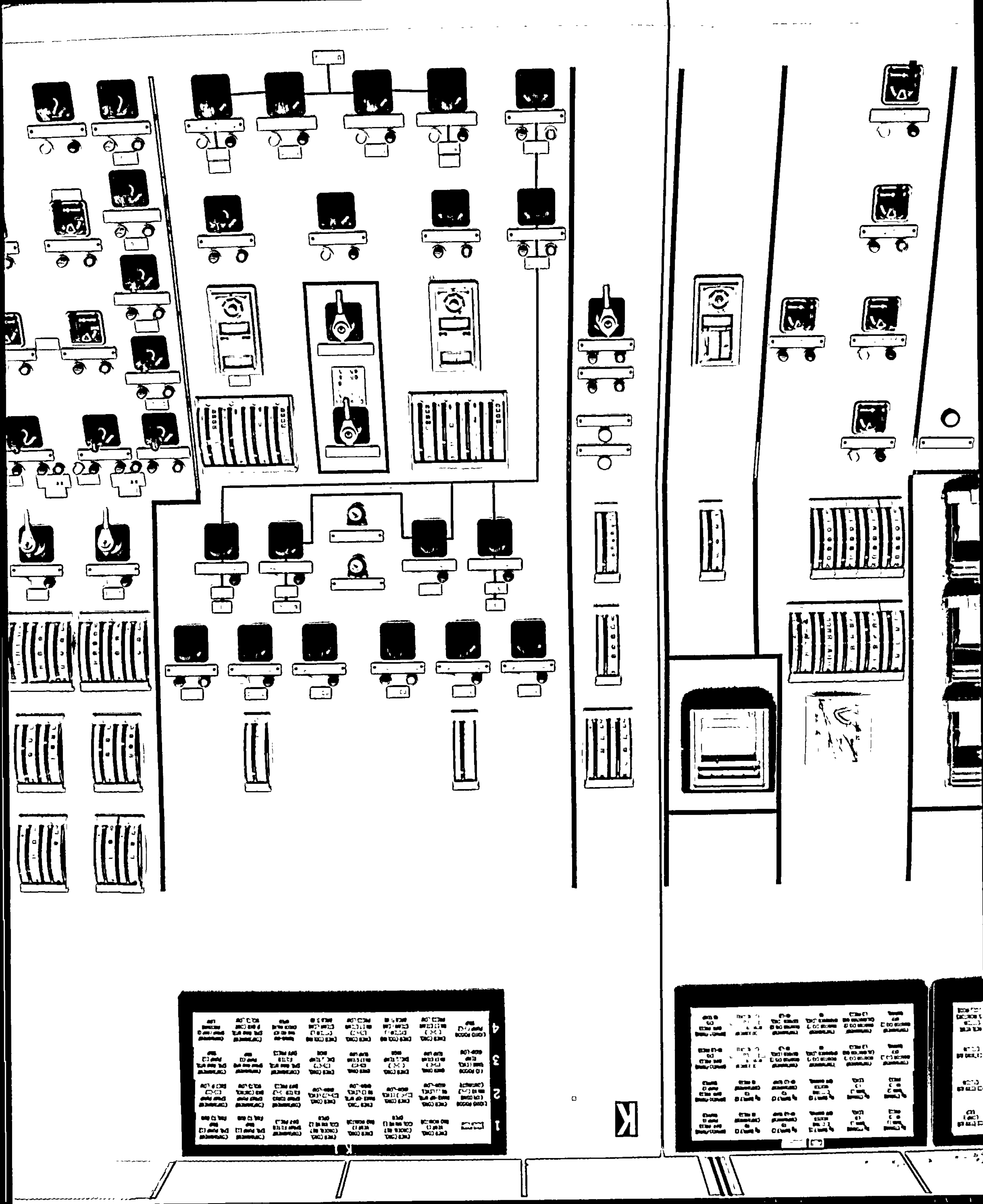


Figure E-21 Panel H and K

HEO resolutions illustrated by Figure E-21:

- OCS-104
- OCS-131
- OCS-099
- OCS-006
- OCS-005.3
- OCS-005.2
- OCS-055

Figure E-21

Page # E-33

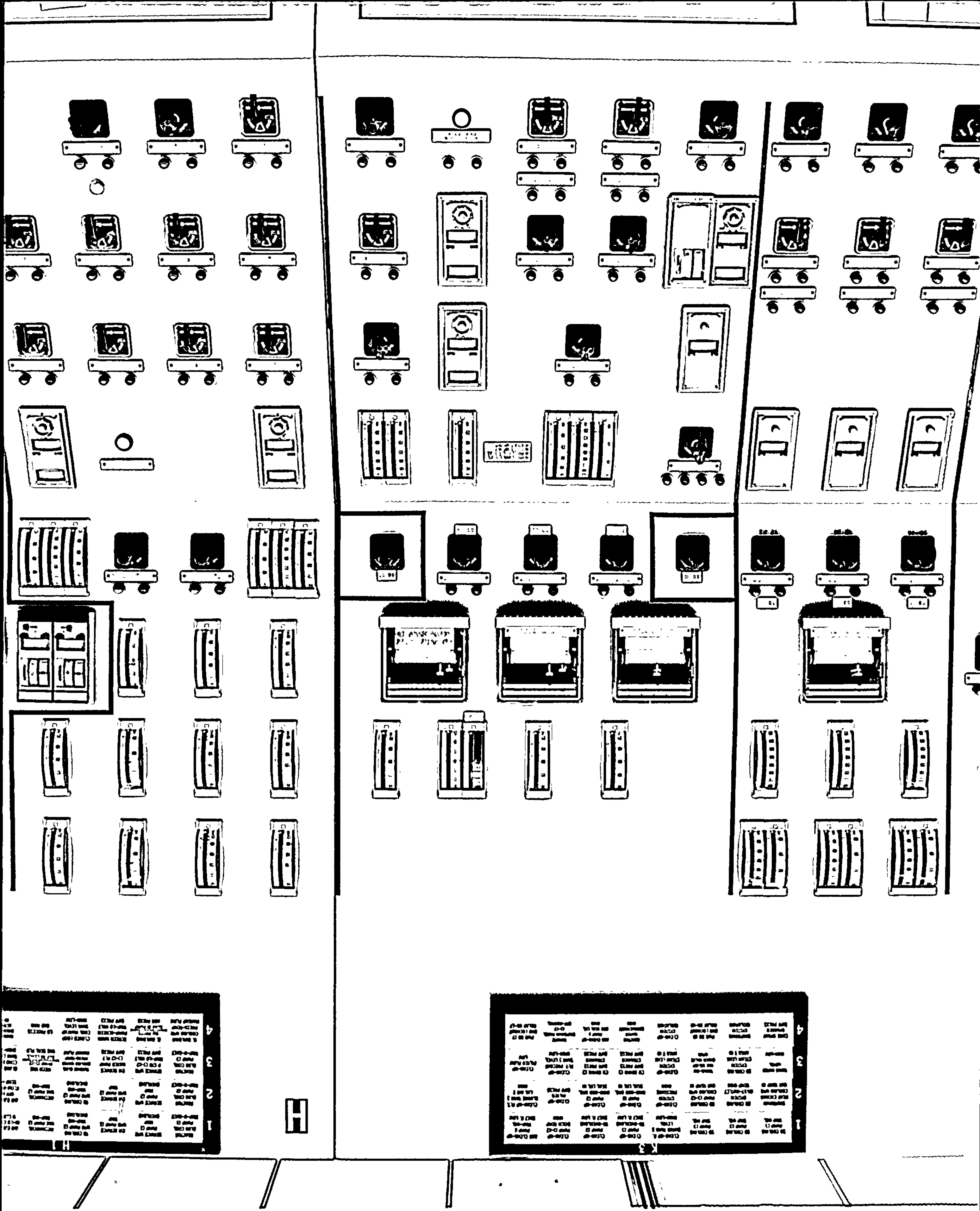

H

Figure E-20 Panel H

HEO resolutions illustrated by Figure E-20:

OCS-005.3
OCS-006
OCS-141
OCS-143
CS-010
CS-011

Figure E-20

Page # E-32

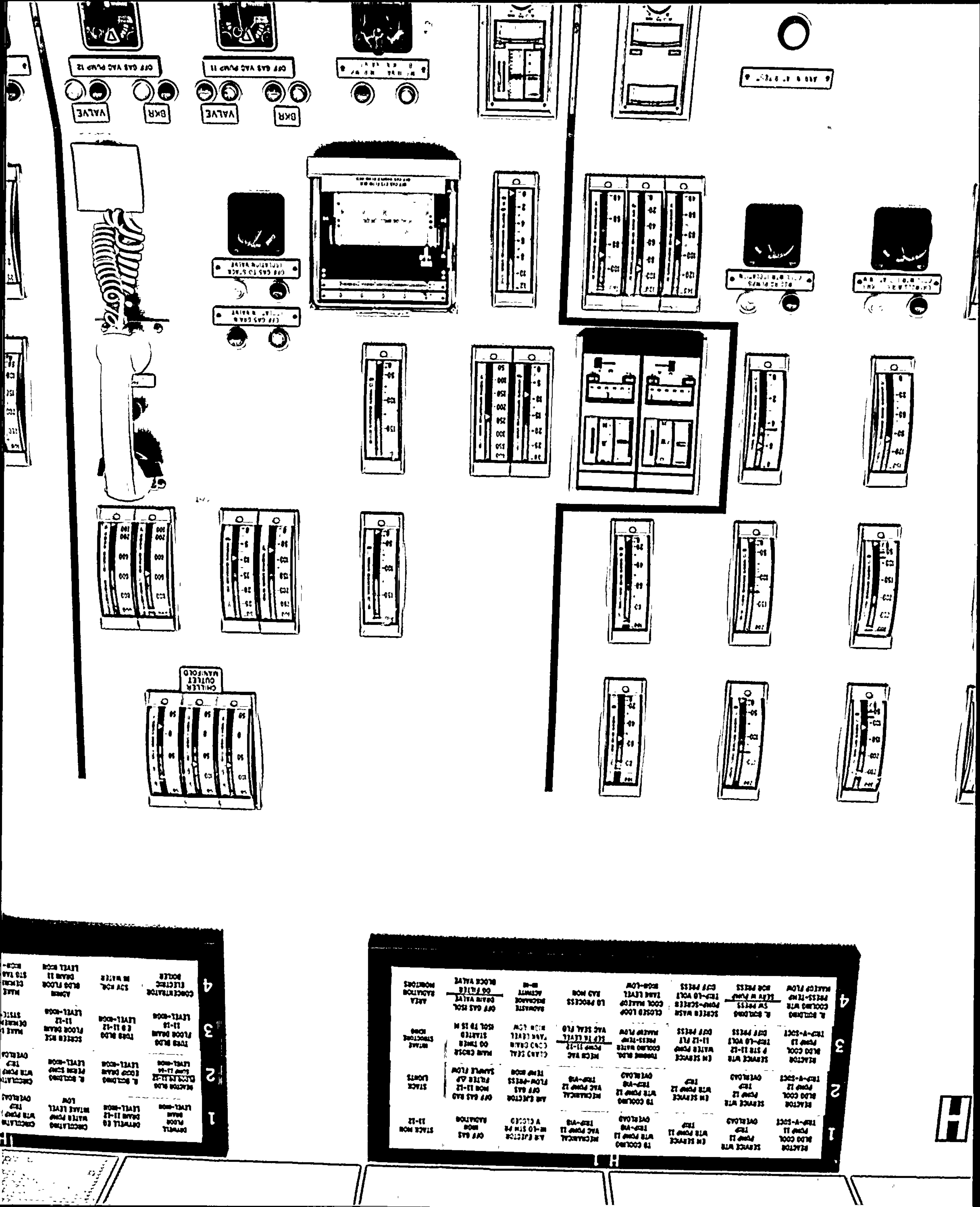


Figure E-19 Panel H

HEO resolutions illustrated by Figure E-19:

OCS-005.3
OCS-005.5
OCS-006
CS-050
CS-010
OCS-017
OCS-055

Figure E-19

Page # E-31

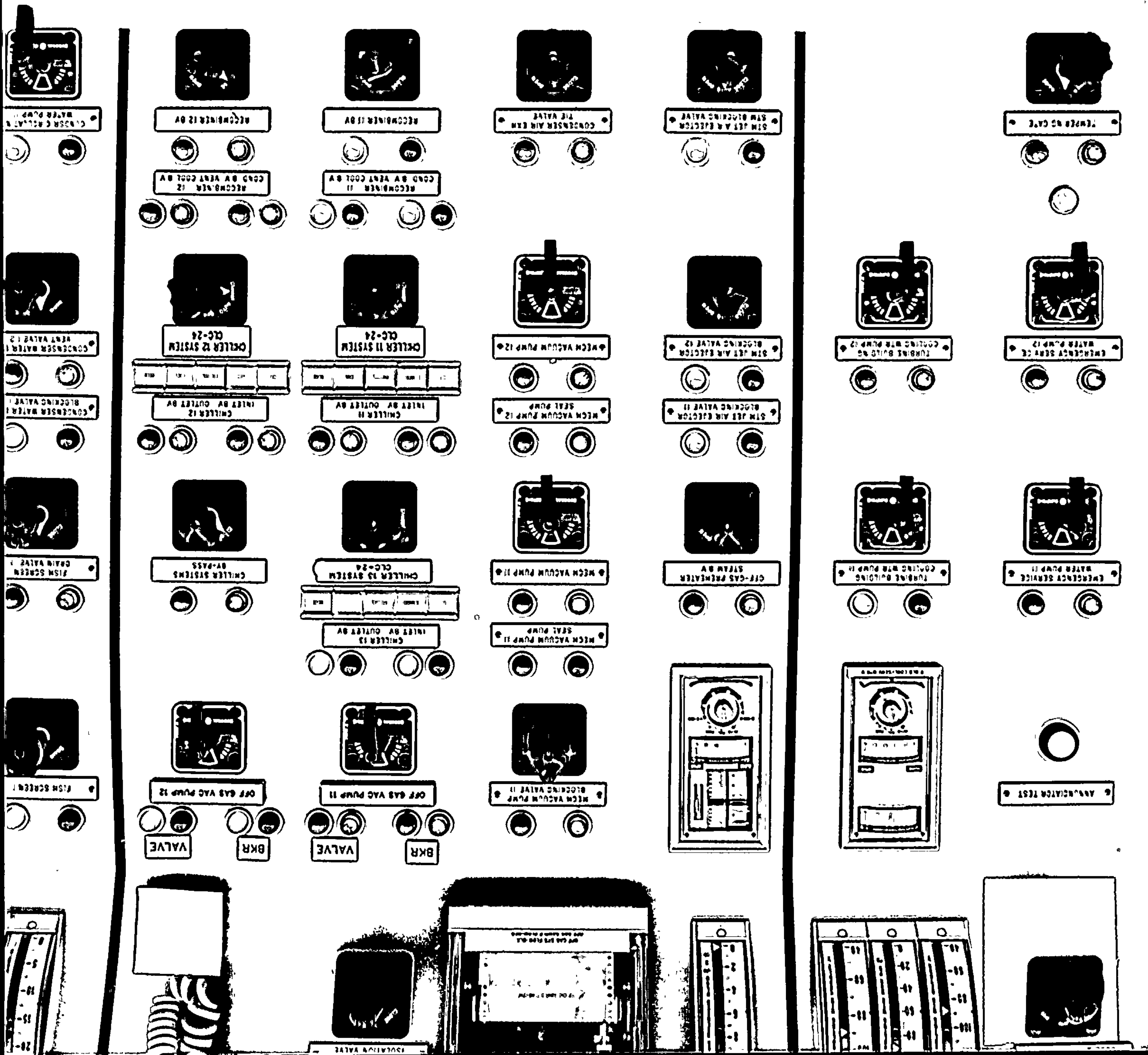

OFF GAS VAC PUMP 12
OFF GAS VAC PUMP 11
VALVE
BKR
VALVE
BKR
ANNUNCIATOR TEST

Figure E-18 Panel H

HEO resolutions illustrated by Figure E-18:

OCS-005.3
OCS-005.5
OCS-006
OCS-006.2
OCS-075
OCS-076
OCS-107
CS-007

Figure E-18

Page # E-30

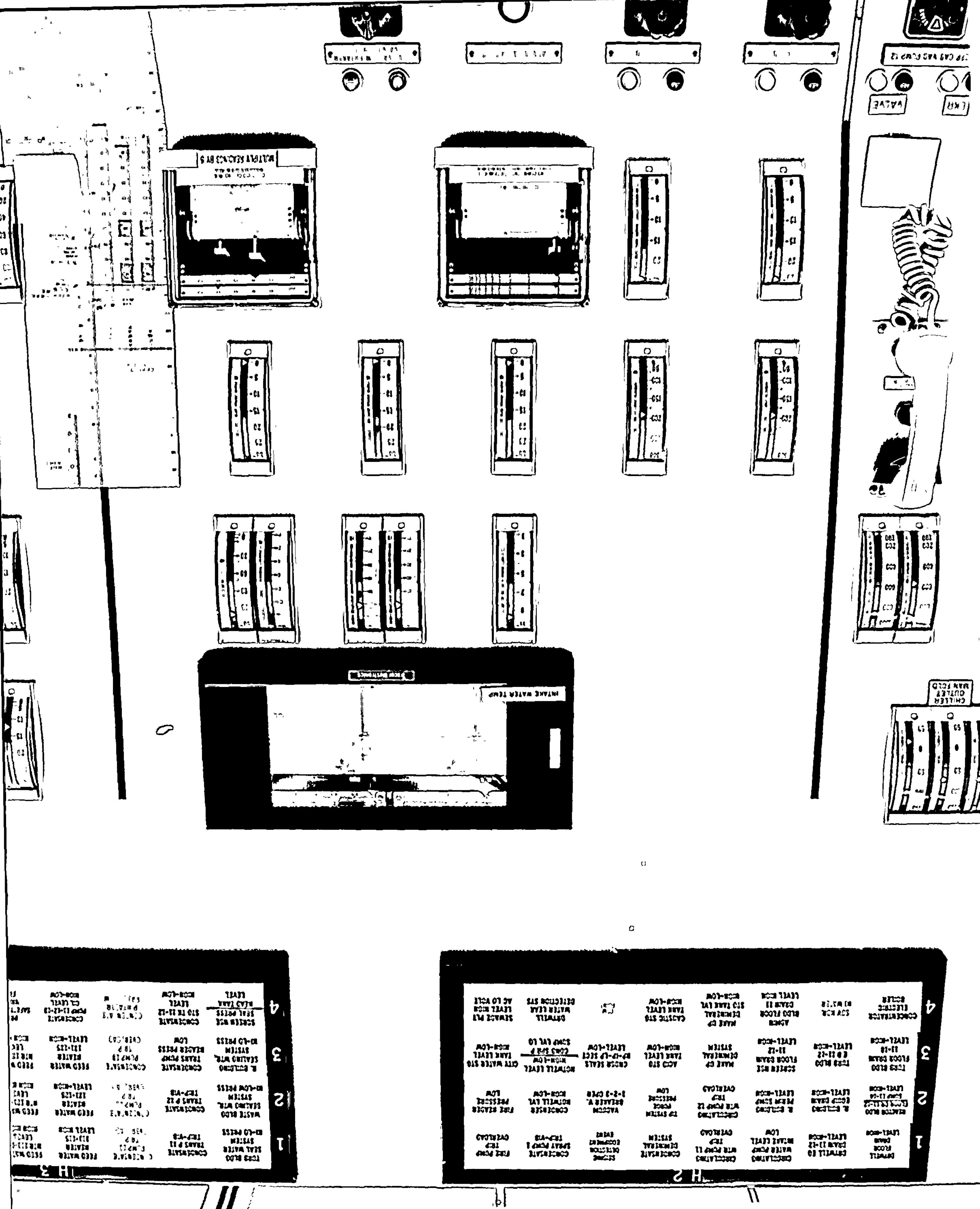


Figure E-17 Panel H Overview

HEO resolutions illustrated by Figure E-17:

OCS-006.2
OCS-005.5
OCS-005.3

Figure E-17

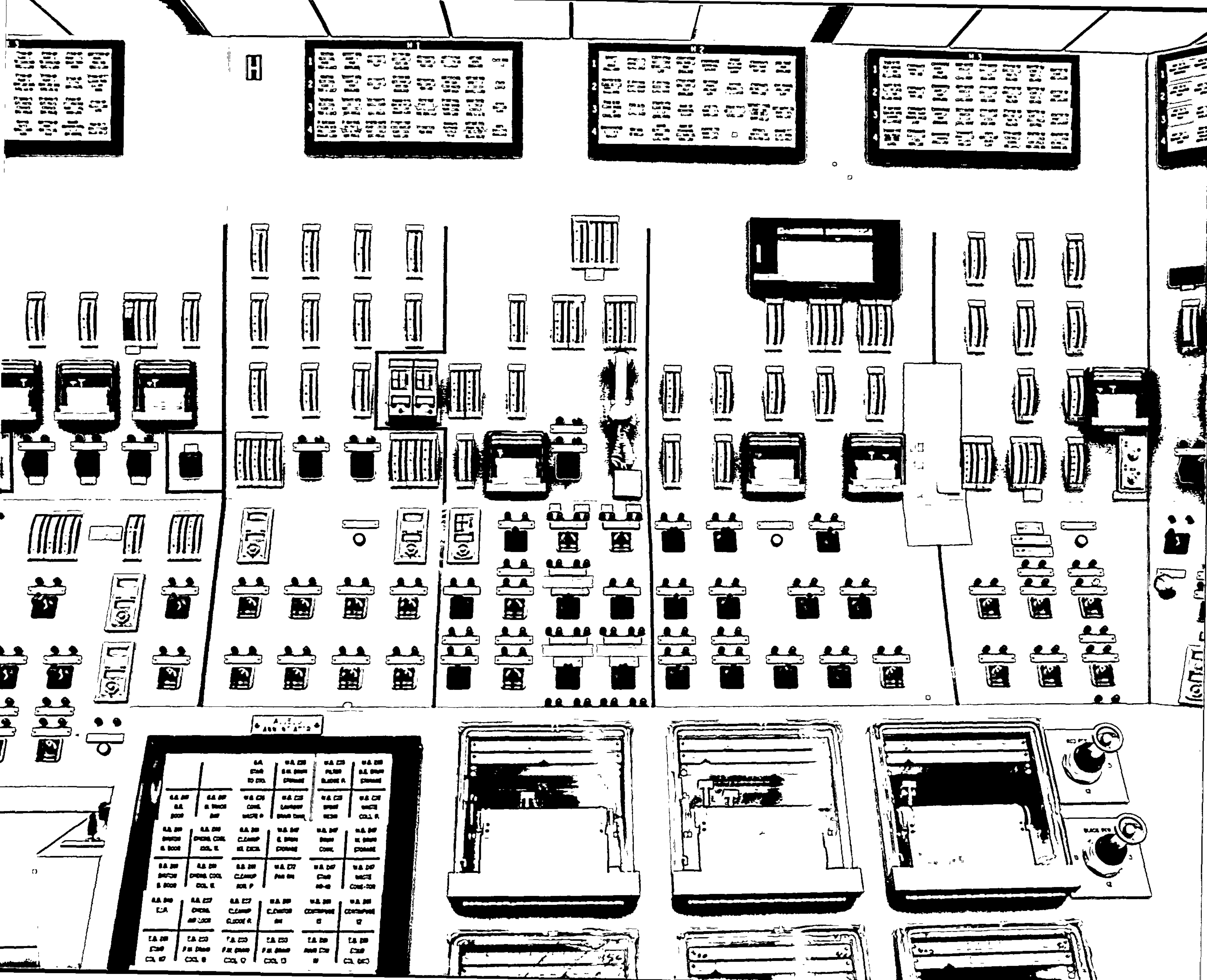


Figure E-16 Panel F

HEO resolutions illustrated by Figure E-16:

OCS-112
OCS-005.4
OCS-145
OCS-146

Figure E-16

Page # E-28

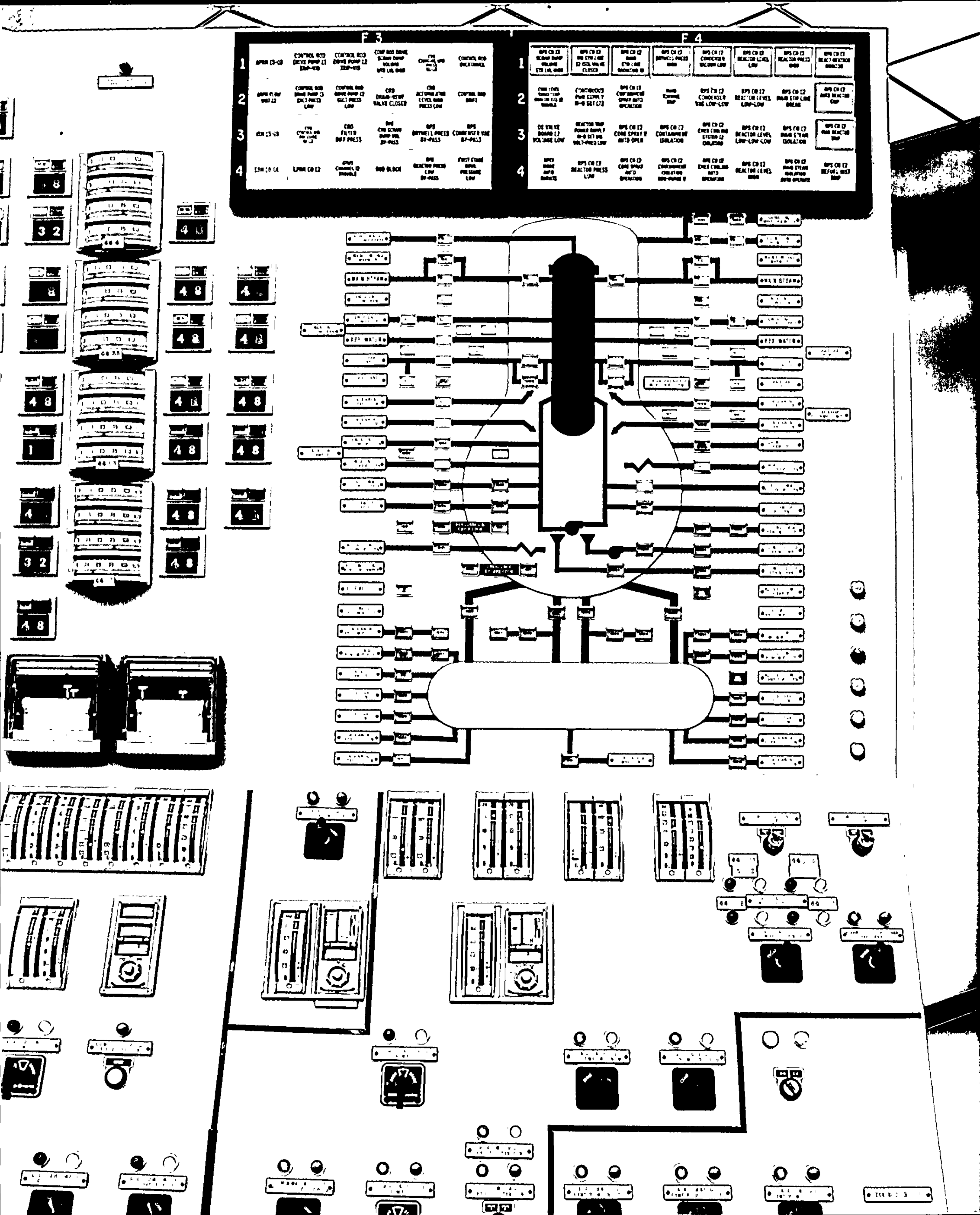
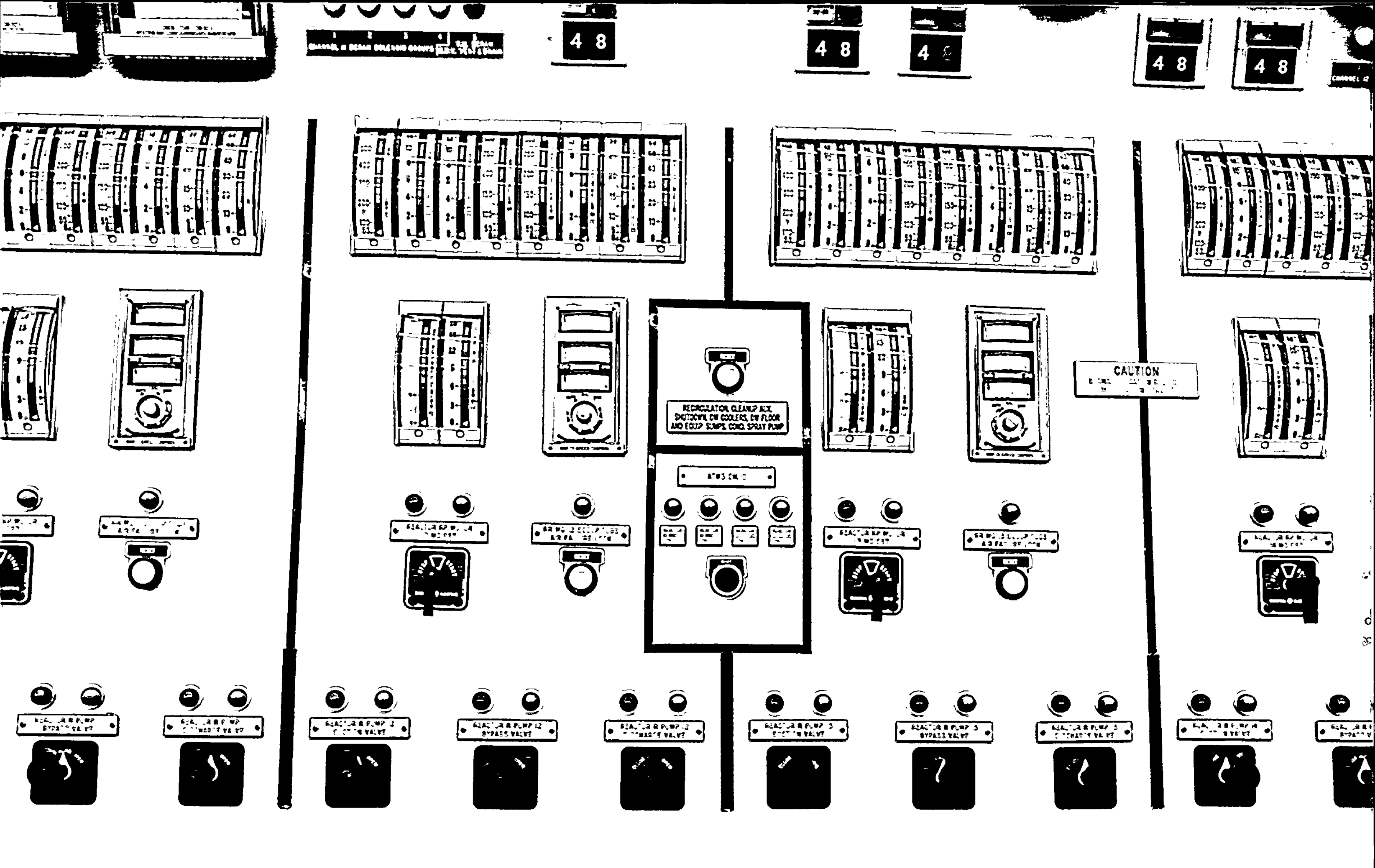

F 3
F 4

Figure E-15 Panel F

HEO resolutions illustrated by Figure E-15:

OCS-114
OCS-005.4
OCS-150
OCS-055
CS-007

Figure E-15



48
48
48
48
CAUTION

Figure E-14 Panel F

HEO resolutions illustrated by Figure E-14:

OCS-018
OCS-019
OCS-020
OCS-030
OCS-005.4
OCS-005.6
OCS-005.7
CS-043
CS-044
OCS-113
OCS-147
CS-007
OCS-055

Figure E-14

Page # E-26

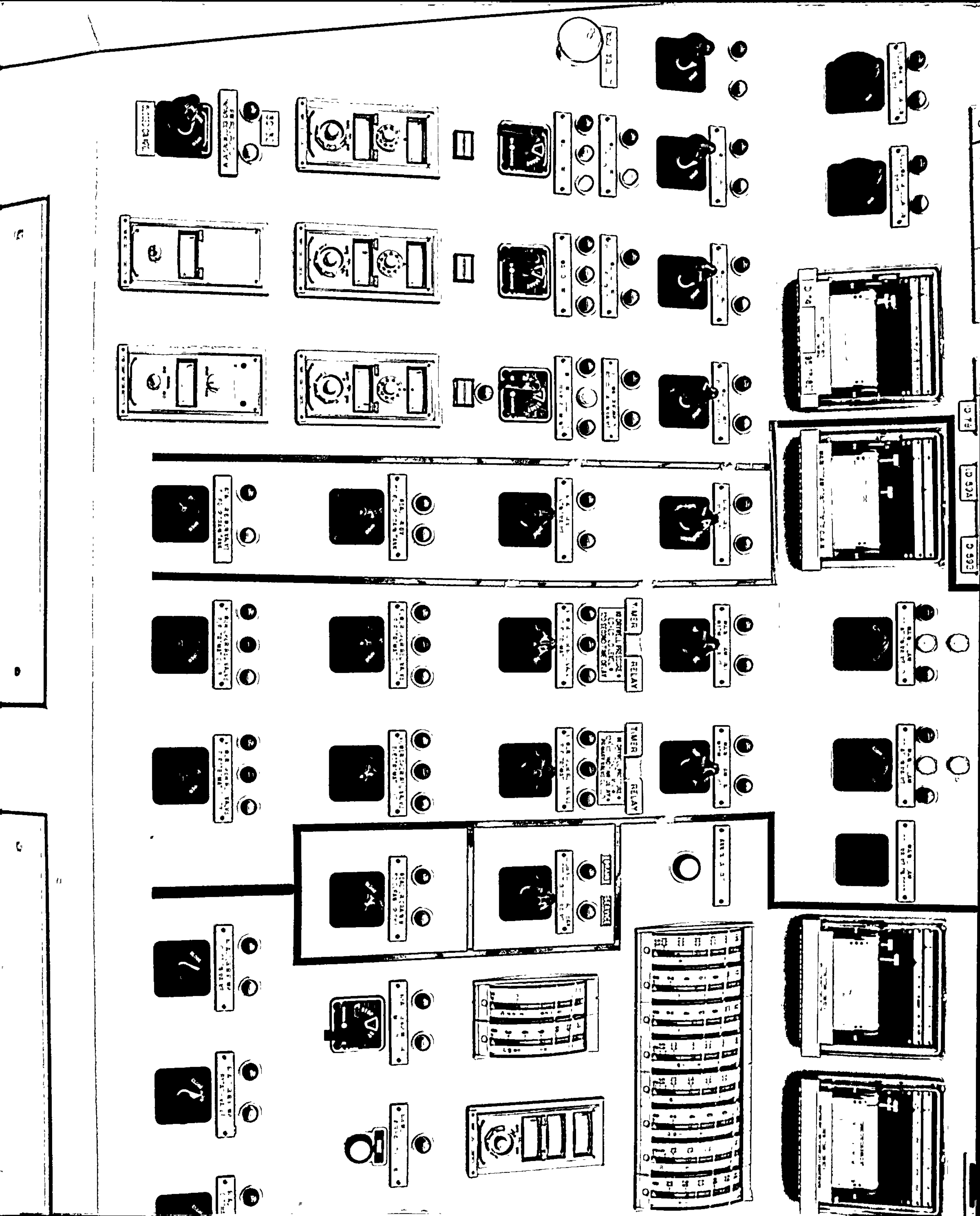

TIMER
RELAY
TIMER
RELAY

Figure E-13 Panel F Overview

HEO resolutions illustrated by Figure E-13:

OCS-005.4
OCS-005.7

Figure E-13

Page # E-25

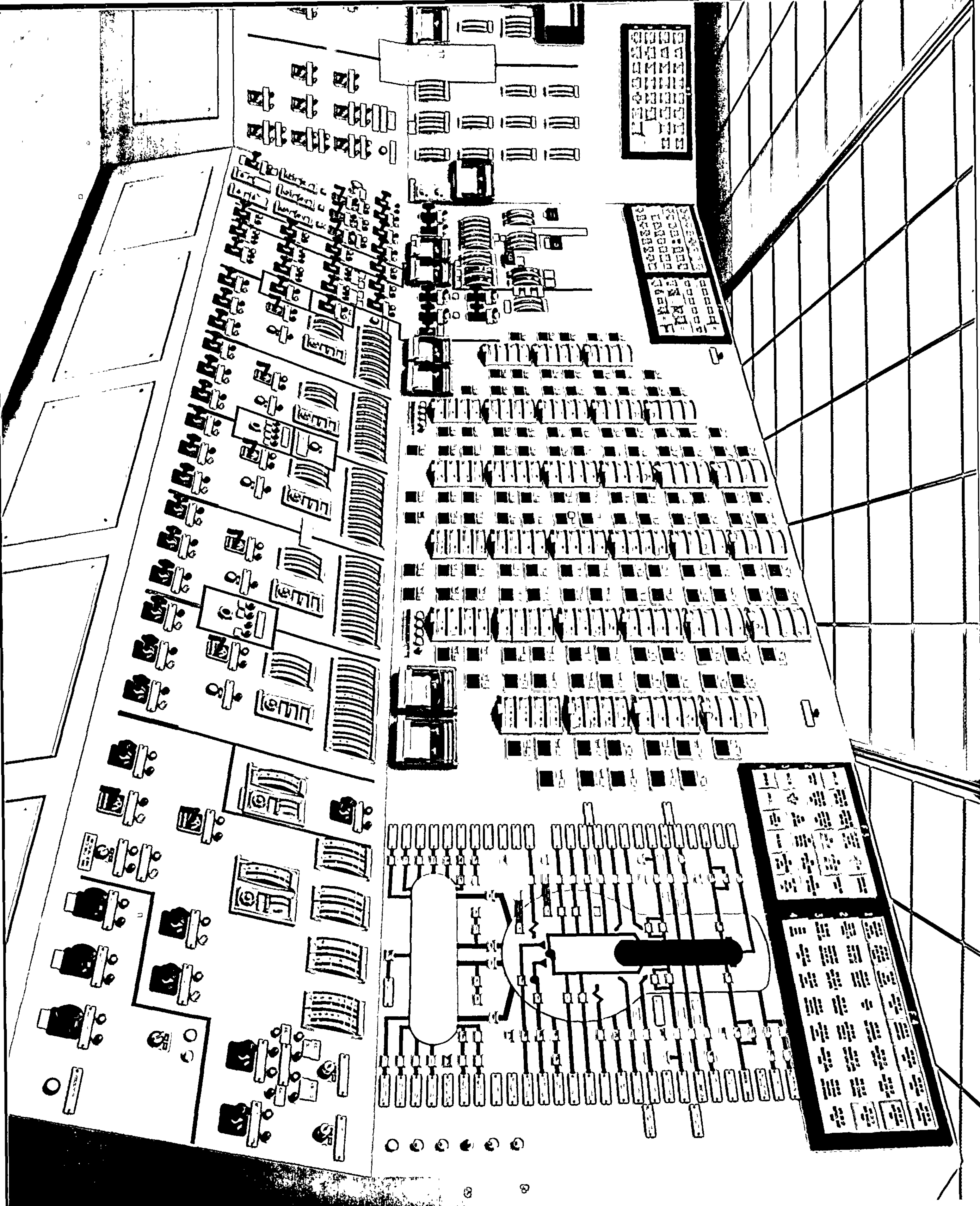


Figure E-12 Panel E

HEO resolutions illustrated by Figure E-12:

CS-011

Figure E-12

Page # E-24

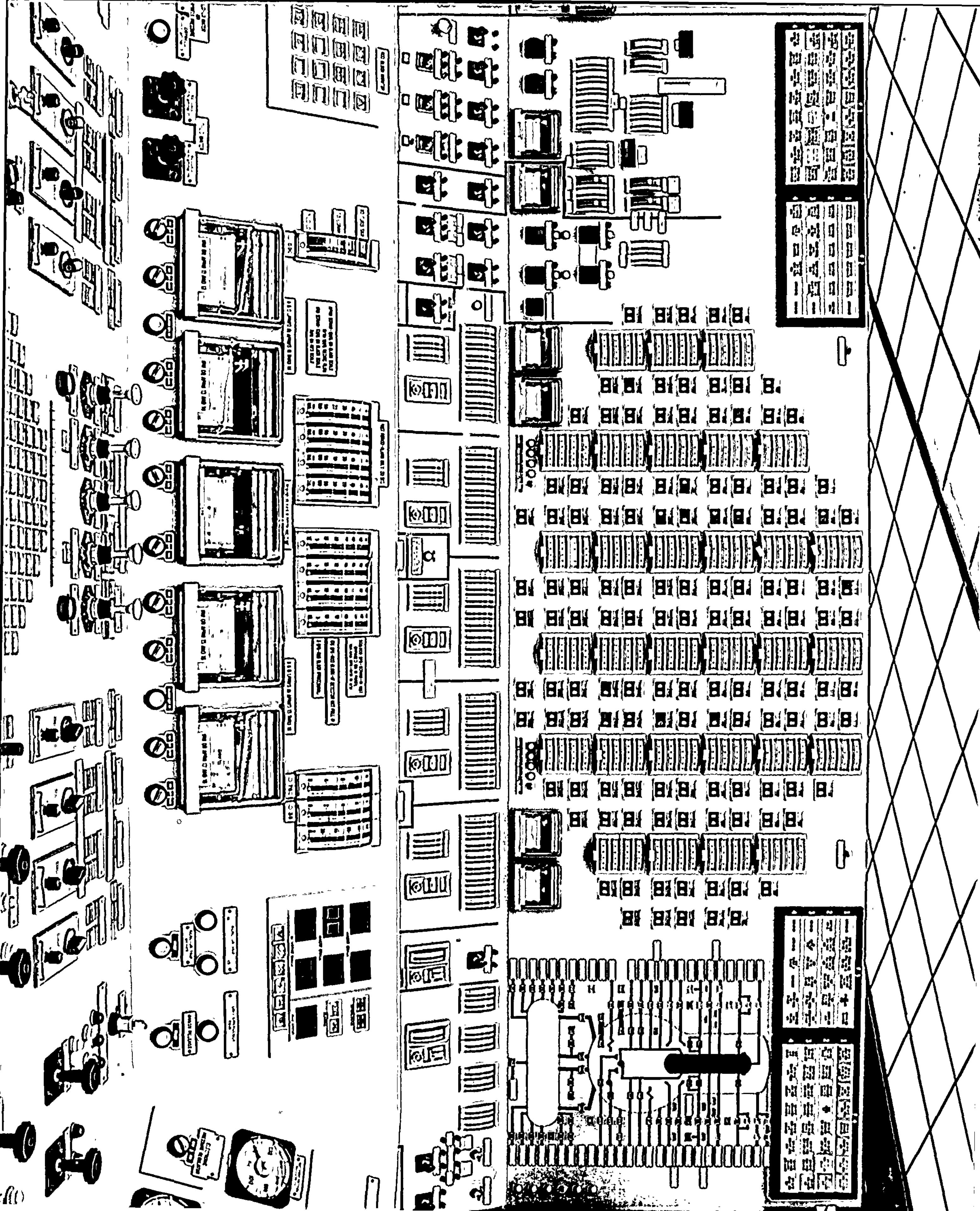


Figure E-11 Panel A

HEO resolutions illustrated by Figure E-11:

OCS-007
VER-040

Figure E-11

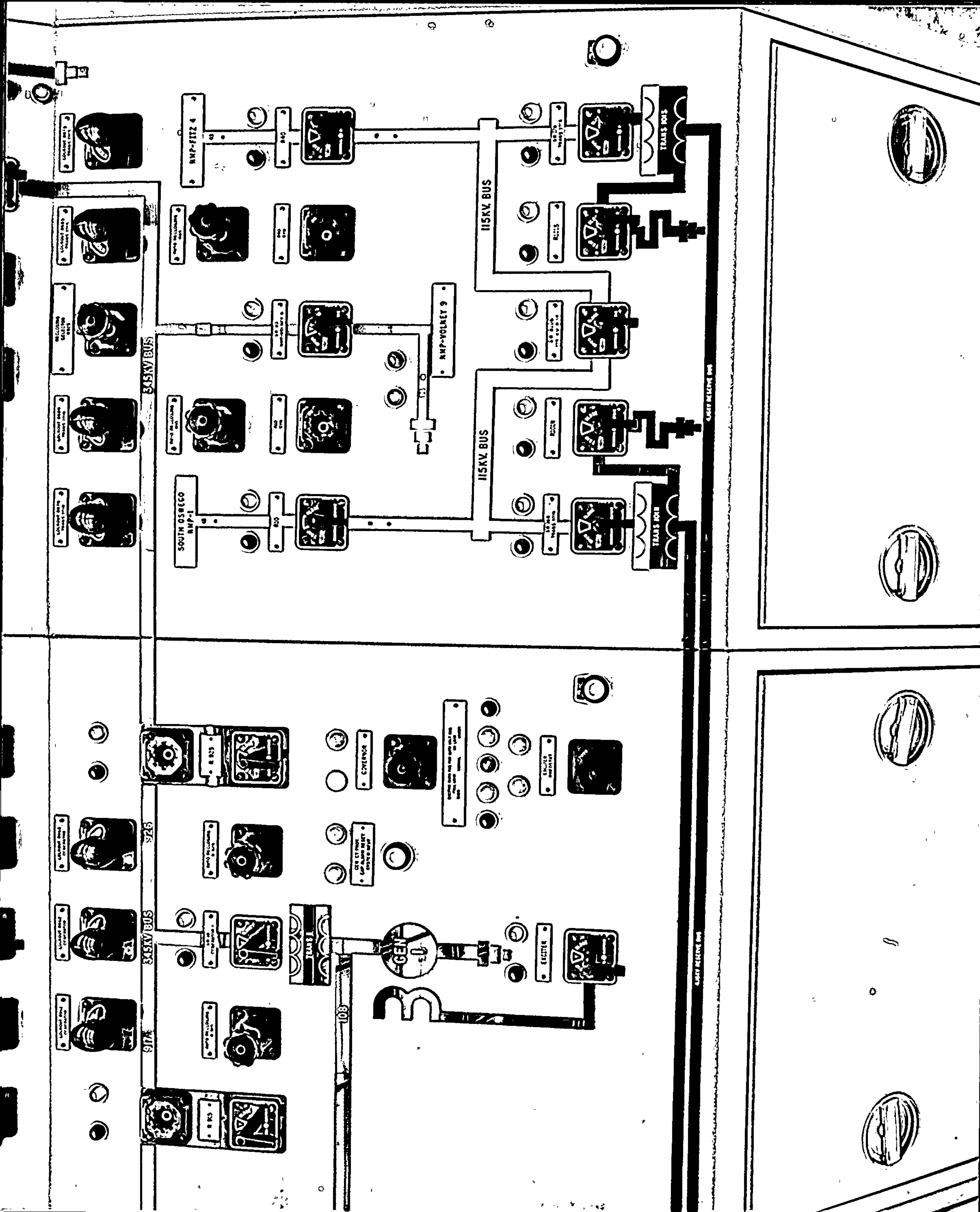

NMP-FITZ 4
115KV. BUS
NMP-VOLNEY 9
345KV BUS
115KV. BUS
SOUTH OSWEGO
NMP-1
GOVERNOR
345KV BUS
GEN
EXCITER

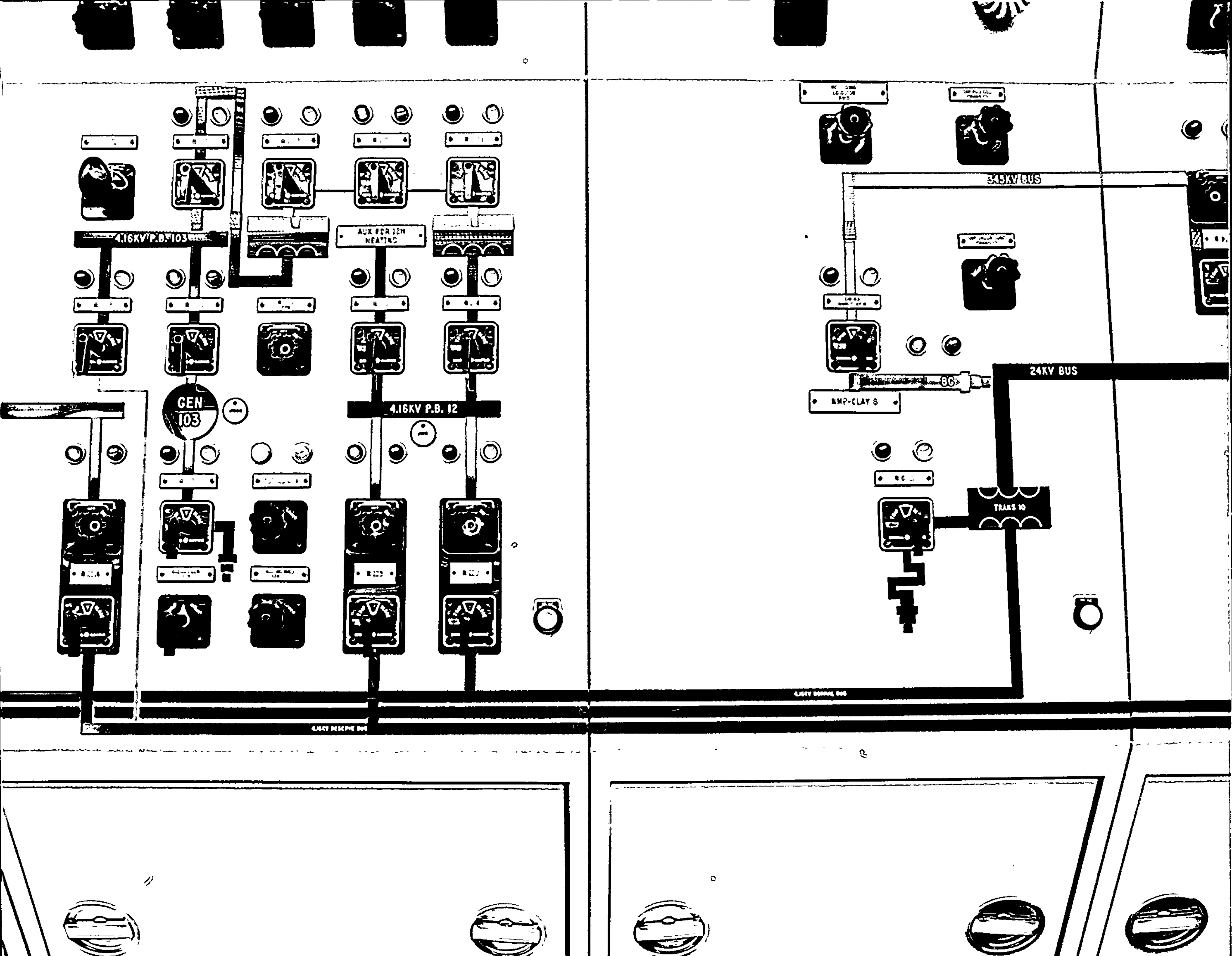
Figure E-10 Panel A

HEO resolutions illustrated by Figure E-10:

OCS-007
VER-040

Figure E-10

Page # E-22



345KV BUS
24KV BUS
86
NMP-CLAY 8
TRANS 10
4.16KV P.B. 103
AUX FOR 12M HEATING
4.16KV P.B. 12
GEN 103

Figure E-9 Panel A

HEO resolutions illustrated by Figure E-9:

OCS-007
VER-040

Figure E-9

Page # E-21

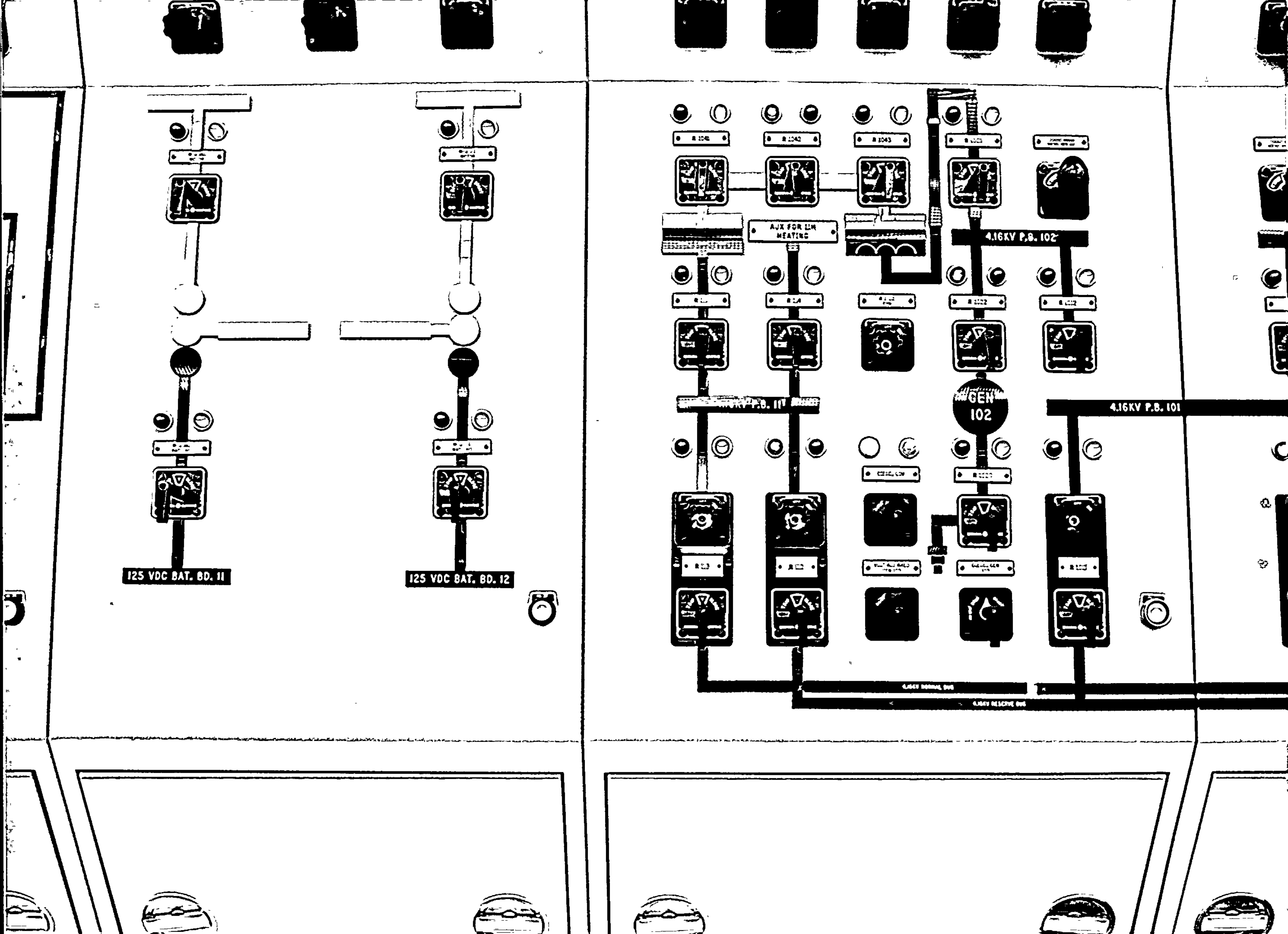

125 VDC BAT. BD. 11
125 VDC BAT. BD. 12
AUX FOR LIM HEATING
4.16KV P.B. 102
GEN 102
4.16KV P.B. 101

Figure E-8 Panel A

HEO resolutions illustrated by Figure E-8:

OCS-022
OCS-023
OCS-024
VER-040
CS-007

Figure E-8

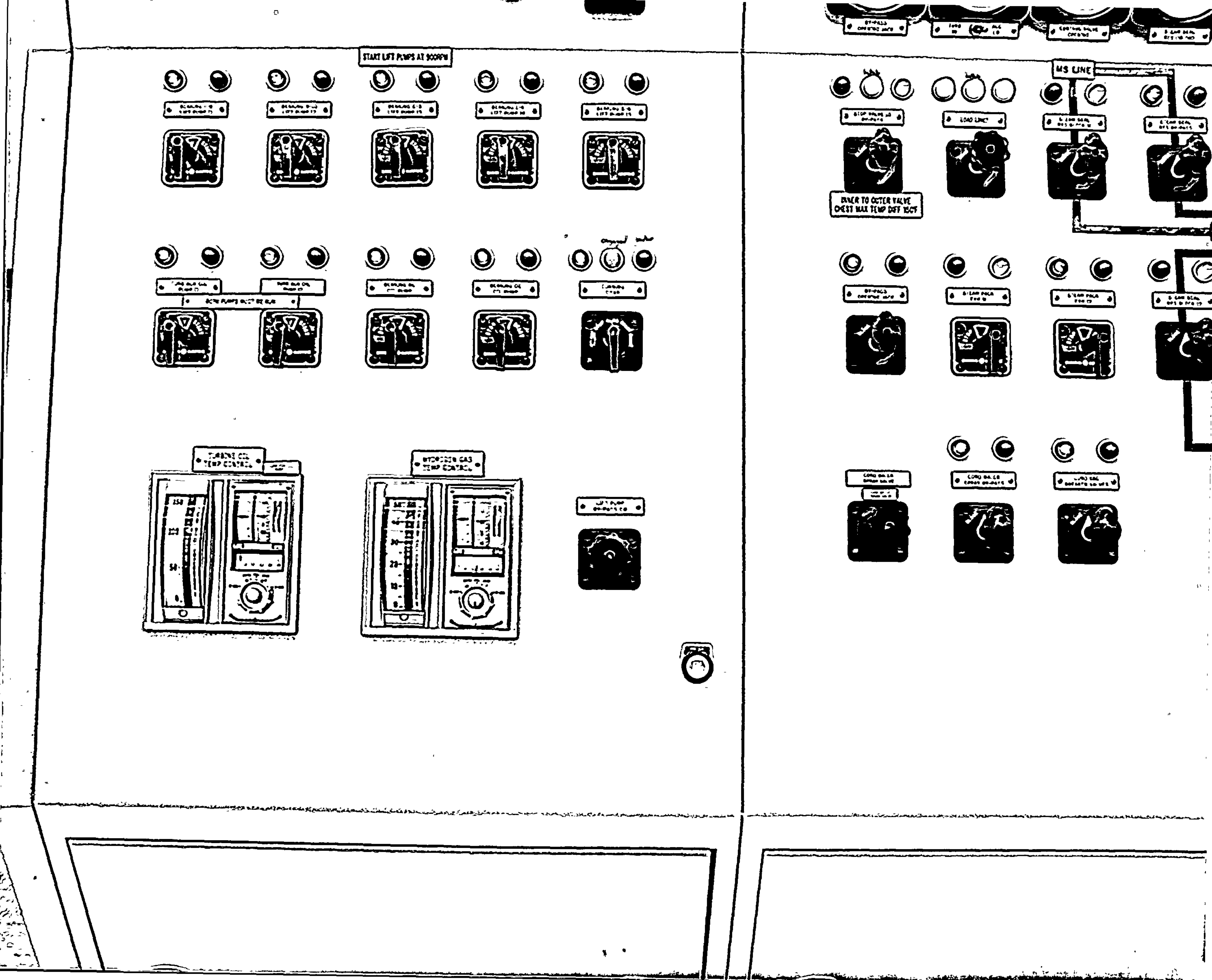

START LIFT PUMPS AT 900RPM
TURBINE OIL TEMP CONTROL
HYDROGEN GAS TEMP CONTROL
MS LINE
LOAD LIMIT

Figure E-7 Panel A

HEO resolutions illustrated by Figure E-7:

OCS-158

Figure E-7

Page # E-19

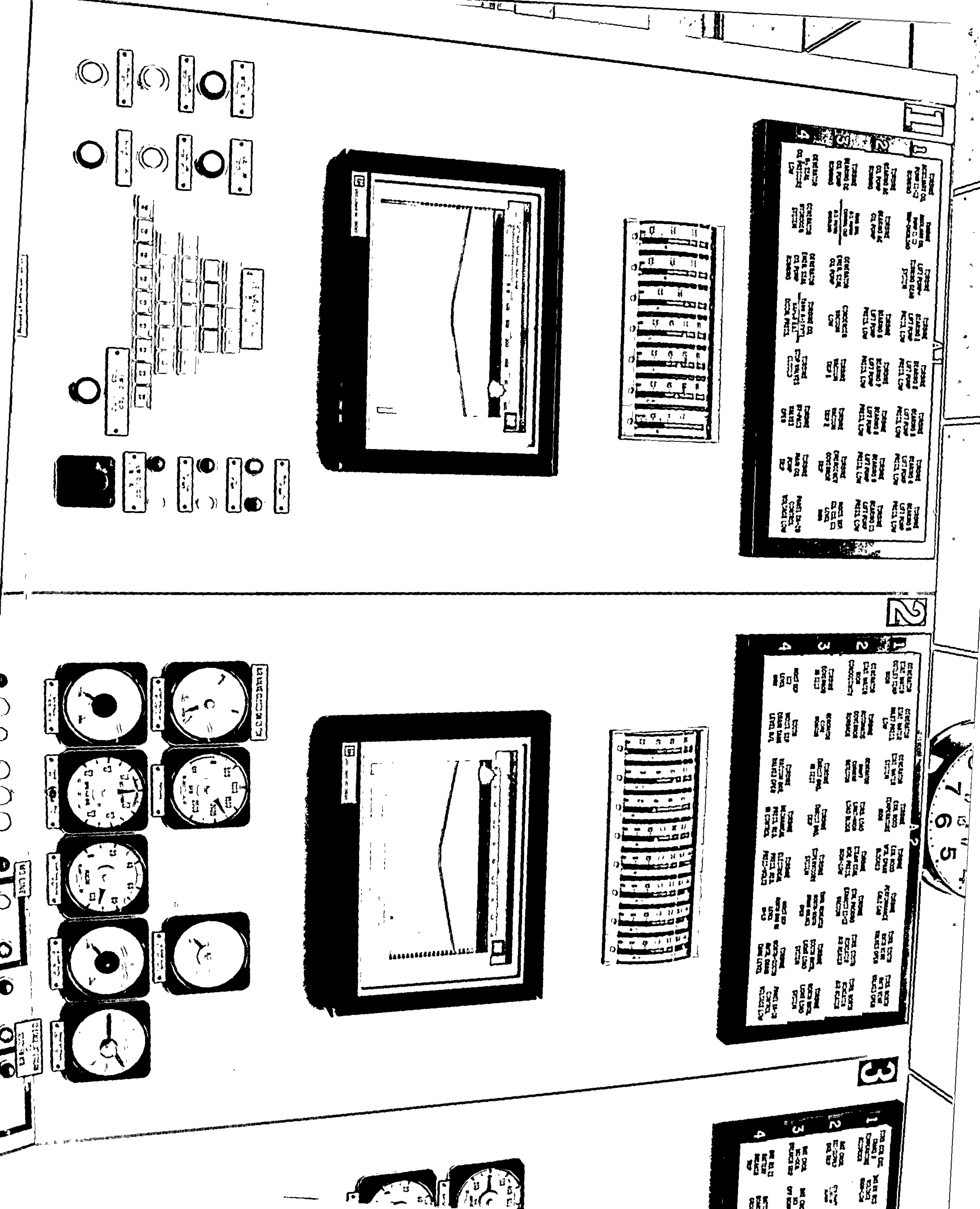


Figure E-6 Panel A

HEO resolutions illustrated by Figure E-6:

OCS-055

Figure E-6

Page # E-18

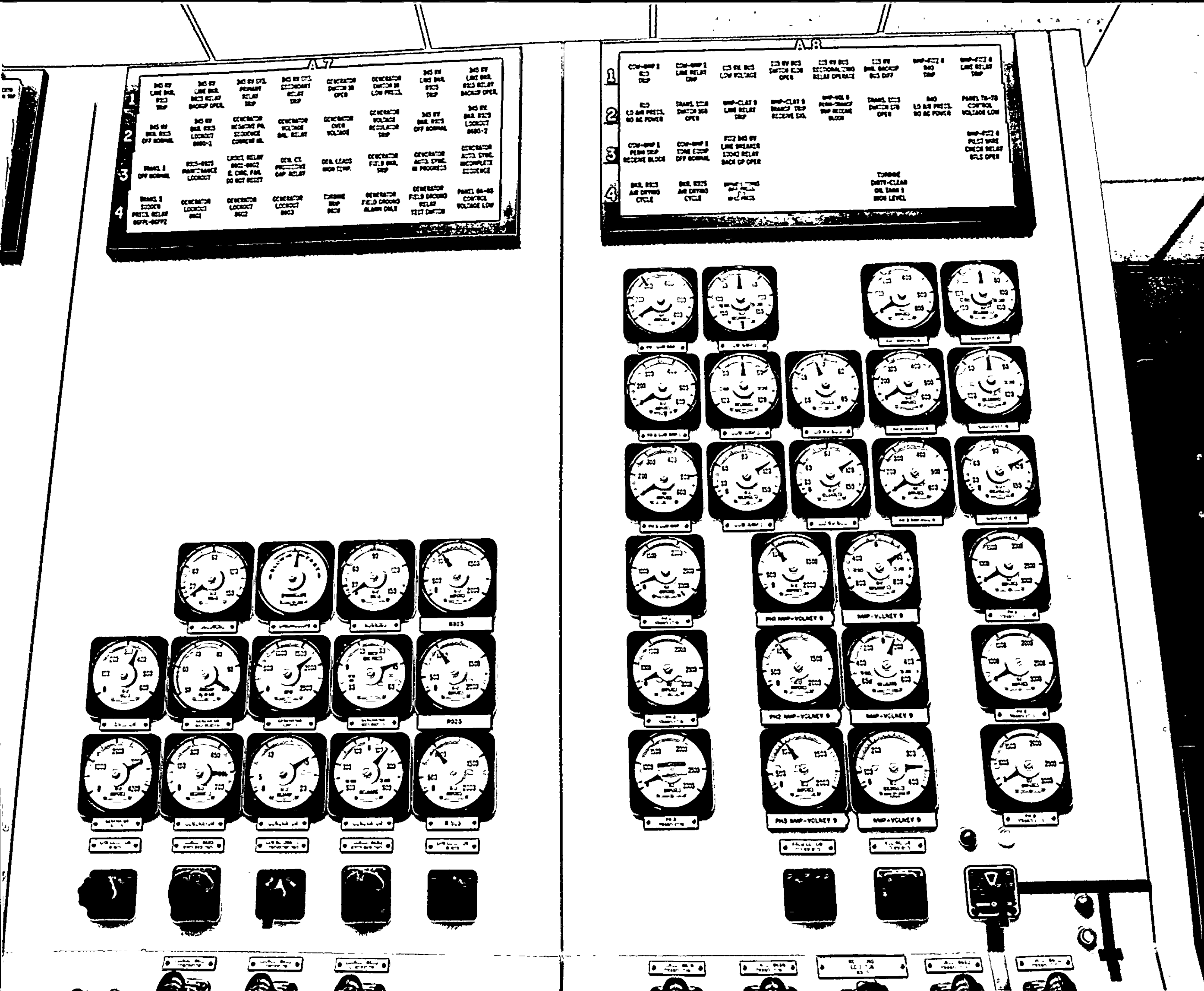

A7
A8

Figure E-5 Panel A Overview

HEO resolutions illustrated by Figure E-5:

OCS-014

Figure-E-5

Page # E-17