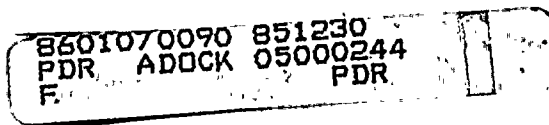


DETAILED CONTROL ROOM DESIGN REVIEW
R. E. GINNA NUCLEAR POWER PLANT
FINAL SUMMARY REPORT
PROGRAM IMPLEMENTATION
Volume 1

Submitted by
Rochester Gas and Electric
December 1985

4359r





Handwritten text at the bottom of the page, appearing as a series of small, dark, illegible marks or characters.

Table of Contents

<u>Section</u>	<u>Page</u>
1.0 OBJECTIVES AND BACKGROUND	1-1
1.1 Reporting Requirements for the DCRDR	1-1
1.2 Summary of Supplement 1 Human Factors Activities Performed	1-2
1.3 Assessment, Implementation and Scheduling	1-4
1.4 Summary Report	1-4
1.5 Summary of Program Findings	1-4
1.6 Audit by the Nuclear Regulatory Commission	1-5
1.7 References	1-6
2.0 MANAGEMENT AND STAFFING	2-1
2.1 DCRDR Team	2-1
2.2 Program Manager	2-2
2.3 DCRDR Project Manager	2-2
2.4 Human Factors Engineering	2-3
3.0 DOCUMENTATION AND DOCUMENT CONTROL	3-1
3.1 Output Documentation	3-1
3.2 Document Control	3-2
3.3 Database Management System	3-3
4.0 HISTORICAL DOCUMENT REVIEW	4-1
4.1 Introduction	4-1
4.2 Identifying, Collecting and Selecting Historical Reports	4-1
4.3 Report Review and Analysis	4-3
4.4 Result Documentation and Reporting	4-4
4.5 Results of the Analysis	4-5
4.6 Historical Document Analysis	4-6
4.7 Human Engineering Discrepancies	4-6

Table of Contents

<u>Section</u>	<u>Page</u>
5.0 CONTROL ROOM OPERATOR SURVEY	5-1
5.1 Objectives and Approach	5-1
5.2 Construction of the Self-Administered Questionnaire	5-2
5.3 Distribution and Analysis of the Self-Administered Questionnaire	5-3
5.4 Follow-up Interviews	5-4
5.5 Integration of Interview Data with Self-Administered Questionnaire Responses	5-5
5.6 Operator Survey Findings	5-6
5.7 References	5-7
6.0 CONTROL ROOM INVENTORY	6-1
6.1 Overview	6-1
6.2 Methods	6-2
7.0 SYSTEM FUNCTION REVIEW - TASK ANALYSIS	7-1
7.1 System Function Review and Task Analysis	7-1
7.2 Method - System Function Review	7-1
7.3 Method - Task Analysis	7-3
8.0 VERIFICATION OF EQUIPMENT AVAILABILITY AND SUITABILITY	8-1
8.1 Objective	8-1
8.2 Method	8-3
8.3 Findings	8-5

Table of Contents

<u>Section</u>	<u>Page</u>
9.0 CONTROL ROOM CHECKLIST SURVEY	9-1
9.1 Human Factors Engineering Checklist	9-3
9.2 Environmental Measurement Procedures	9-5
9.3 Shutdown Capability	9-7
9.4 NUREG-0909	9-8
9.5 Review of NRC Audit Survey Concerns	9-8
9.6 References	9-10
10.0 VALIDATION OF CONTROL ROOM FUNCTIONS	10-1
10.1 Simulator Walk-Throughs	10-1
10.2 Control Room Talk-Throughs	10-6
11.0 ASSESSMENT, IMPLEMENTATION AND SCHEDULING	11-1
11.1 HED Assessment	11-1
11.2 Recommendation Selection	11-3
11.3 Implementation and Scheduling of Recommendations	11-4
11.4 Verification of Corrective Actions	11-4
12.0 COORDINATION WITH OTHER SUPPLEMENT 1 NUREG-0737 INITIATIVES	12-1
APPENDIX A - HISTORICAL DOCUMENT REVIEW (Problem Analysis Report)	A-1
APPENDIX B - HUMAN ENGINEERING DISCREPANCY FORM	B-1
APPENDIX C - CONTROL ROOM DESIGN REVIEW OPERATOR SURVEY	C-1
APPENDIX D - TASK ANALYSIS DATA COLLECTION FORM	D-1



Table of Contents

<u>Section</u>	<u>Page</u>
APPENDIX E - ENVIRONMENTAL MEASUREMENT FORMS	E-1
APPENDIX F - VALIDATION FORM	F-1
APPENDIX G - MANAGEMENT AND STAFFING RESUMES	G-1
APPENDIX H - JUSTIFICATION OF NON-HED OPERATOR RESPONSES	H-1
APPENDIX I - UNIQUE TASKS	I-1
APPENDIX J - NRC AUDIT RECOMMENDATIONS	J-1

1.0 OBJECTIVES AND BACKGROUND

Rochester Gas and Electric (RG&E) Corporation initiated a control room review program for its R.E. Ginna Nuclear Power Plant in response to NUREG-0737 Supplement 1 and earlier guidance that requires all licensees and applicants for operating licenses (OL) to conduct a Detailed Control Room Design Review (DCRDR) to identify and correct design deficiencies. NUREG-0700, "Guidelines for Control Room Design Review", issued in September, 1981, provides human engineering guidelines to assist each licensee and applicant in performing detailed control room review. The RG&E program emphasizes determination of the adequacy of information available to the operator to effectively mitigate emergency conditions. The review program is also designed to correct human factors problems and to improve controls and displays determined to be discrepant from good human factors practices. The DCRDR process, as suggested by NUREG-0700, is divided into four major activities: planning; review; assessment and implementation; and reporting. This report reflects the human engineering processes developed to address the DCRDR requirements.

1.1 Reporting Requirements for the DCRDR

Supplement 1 requires the submittal of a Program Plan containing the following major elements: (1) a qualified multidisciplinary review team; (2) use of function and task analysis; (3) control room inventory comparison; (4) control room survey; (5) HED assessment; and (6) verification of design improvements.



The program plan, which describes how each of the requirements listed above would be accomplished, was submitted to the NRC by letter dated October 31, 1984.

1.2 Summary of Supplement 1 Human Factors Activities Performed

The control room was reviewed to determine whether it could provide the system status information, control capabilities, feedback and performance aids necessary for personnel to accomplish their functions and tasks effectively. In addition, characteristics outside the scope of the Nuclear Regulatory Commission's (NRC) DCRDR requirements for the existing control room's instrumentation, controls, other equipment and physical arrangements were identified that either add to or detract from operator performance. Six review processes were used to analyze the man/machine interface with the control room: (1) operating experience review (historical document review and operator survey); (2) system review, function review and task analysis; (3) control room inventory; (4) control room checklist supplement; (5) verification of task performance capabilities; and (6) validation of control room functions.

The first three are foundation processes in which frames of reference and benchmarks for discrepancy identification were established. The last three are investigative processes in which the benchmarks were applied and Human Engineering Discrepancies (HEDs) identified. Activities performed during these two processes are explained below:

1. Foundation Processes. Industry-wide reviews of Licensee Event Reports (LERs) for similarly designed Westinghouse plants were analyzed. Since these reports have generic applicability, they were used to identify conditions which affect the probability for operator error and the safe operation of the generating station. In addition, operating personnel

completed questionnaires and were interviewed to obtain feedback based on previous operating experience. The procedures used in the Historical Document Review and the Control Room Operator Survey are described in Chapters 4 and 5, respectively.

A control room inventory was conducted on a system-by-system basis to identify all instrumentation, controls and equipment within the control room. This information was compared with the requirements identified through the analysis of operator tasks. The methodology performed during the Inventory phase is described in Chapter 6.

A systems review and function allocation review was conducted. Operator task lists were prepared and used during the task analysis and validation of the control room capabilities. These analyses established the information flow and control requirements between the operator and the control boards. A summary of the approach is included in Chapter 7.

2. Investigative Processes. Using the foundation processes as a basis, the investigative processes provided the appropriate information necessary to determine the adequacy of the control room from a human engineering perspective. Discrepancies were identified and documented during this part of the review. An explanation of the control room checklist survey is contained in Chapter 8. This step was followed by a verification of task performance capabilities which included: (1) availability and adequacy of the instrumentation and controls, and (2) efficient interface between the operator and the control board. A summary of verification is explained in Chapter 8.

Subject to the verification process, a validation of the control room functions was conducted. This procedure



determined whether the functions allocated to the operating crew could be accomplished within the structure of the defined emergency operating procedures and the design of the existing control room. Validation is described in Chapter 10.

1.3 Assessment, Implementation and Scheduling

Upon completion of the Supplemental Review Processes, an examination of the HEDs was conducted by the Human Factors Review Team, described in Chapter 11. This review served to identify the significance of each of the HEDs, as well as to provide the review team with an opportunity for determining, where appropriate, corrective actions. A methodology was also developed to implement the human engineering resolutions.

1.4 Summary Report

This summary report is submitted as part of the R.E. Ginna DCRDR. The report: (1) summarizes the overall review process; (2) describes the identified HEDs; (3) describes human engineering improvements implemented during the course of this and previous reviews; (4) identifies any proposed improvements and the methodology for implementation; and (5) discusses integration of DCRDR activities with other NUREG-0737 Supplemental Requirements.

1.5 Summary of Program Findings

Out of the review and analysis that is described in Sections 4, 5, 7, 8, 9 and 10 of this report came 489 Human Engineering Deficiencies (HEDs) which went through the Assessment/Resolution process described in Section 11. All HEDs are listed in Volume 2 including the categories used to group them, various grading distinctions and a summary statement of the Assessment/Resolution Team's disposition for each one. The HEDs were categorized according to the nature of the problem and corrective action to be implemented. Twenty categories of



corrective actions have been specified, such as labels, controllers and displays. This helps to show the integration of the HED corrective actions and the attention given to the cumulative effect of groups of HEDs.

None of the HEDs identified during the DCRDR involved immediate safety considerations which would require shutdown. Many of them were either readily modifiable or involved modifications that did not require substantial system re-design/equipment changes. This is not too surprising in view of the continuing program of review and changes that the Ginna Station has undergone through its design/operating lifetime of over 20 years. The control room was originally designed by RG&E 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 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 rather than fundamental changes or rearrangements.

1.6 Audit by the Nuclear Regulatory Commission

The NRC Human Factors Engineering Branch (HFEB) conducted a Control Room Design Review/Audit during May 14-17, 1985, at Ginna. During the course of the audit, the NRC team discussed all aspects of the DCRDR program. Documentation of the Control Room Survey, Function and Task Analysis, Operator Survey and the HED Assessment process were reviewed in detail in administrative meeting rooms. The audit team also visited the control room to form opinions about the quality and quantity of HEDs documented during the DCRDR process and how they should possibly be treated during the assessment process. A report was submitted by the NRC's consultant, Lawrence Livermore National Laboratory (LLNL) and the technical content and conclusions agreed upon by the NRC's Division of Licensing. In a letter dated August 9, 1985, from the NRC to Roger W. Kober,



Vice President, Electric and Steam Production, RG&E, the results of the in-progress audit of the Detailed Control Room Design Review were submitted for consideration. The NRC requested that the audit report be used to help complete the DCRDR and for the preparation of the summary report. The conclusion of the audit report contained specific points that were recommended for coverage in the summary report. Each of these recommendations has been addressed within the appropriate sections of this report, a table of these NRC points is provided in Appendix J.

1.7 References

Additional information concerning objectives and background for the DCRDR can be found in the following document:

Rochester Gas and Electric Corporation. Detailed Control Room Design Review Program Plan. Rochester, NY, October, 1984.



2.0 MANAGEMENT AND STAFFING

The purpose of the Detailed Control Room Design Review (DCRDR) was to identify and correct those features in the control room environment which could potentially detract from the safe and efficient operation of the facility. The DCRDR activities were implemented by experienced operations, nuclear systems, licensing and human factors engineering personnel.

2.1 DCRDR Team

The Ginna DCRDR team consisted of a group of professionals from various disciplines with the wide range of skills necessary for the performance of the design review and included:

- Electrical engineering
- Nuclear systems engineering
- Human factors engineering
- Operations
- Training
- Licensing

This core group was supplemented, as required, by other disciplines such as mechanical and I&C engineering. In addition, three members of the review team -- the Director of Engineering, the Nuclear Engineering Manager and the Responsible Engineer -- provided licensing expertise. During the course of the review, any additional specialists required for specific tasks were made available as needed.



Prior to beginning the review, team members were selected and familiarized with the methods and content of relevant NRC documents, general human factors engineering principles, and methodology. Team members were also provided the opportunity to familiarize themselves with the general design and operation of the plant. Any general or specific procedural issues were resolved at this point.

In response to the NRC audit report recommendation concerning the DCRDR review team, the responsibilities of each of the review team positions are described in the following paragraphs. The level of effort of each review team member for each DCRDR task is summarized in Table 2.1; the structure and management of the review team is shown in Figure 2.1. The resumes of all members of the review team are provided in Appendix G.

2.2 Program Manager

The lead for the DCRDR is the Engineering Department. The Nuclear Engineering Discipline Manager has the overall responsibility for the planning and administration of the DCRDR project and is responsible to the Director of Engineering Services. This responsibility included scheduling for the project and coordinating review activities with other Engineering Disciplines, the Ginna Staff and the Corporate Management.

2.3 DCRDR Project Manager

The Responsible Engineer (RE), who served as the DCRDR Project Manager, was responsible for the execution of the DCRDR. He coordinated the DCRDR activities with the technical review leaders and was responsible for scheduling and directing the evaluation and reporting process.

2.4 Human Factors Engineering

ARD Corporation provided support to RG&E in the area of human factors engineering. A Lead Human Factors Specialist (LHFS) was responsible for direction of the HFSSs to insure that human factors principles were not compromised during the DCRDR.



<p>X - Involvement Required ● - Involvement As-needed</p>	PROGRAM MANAGER	●	●							X	X	●
	DCRDR PROJECT MANAGER	●	X	●	●	●	●	●	X	X	X	X
	TRAINING		X							X	X	
	ENGINEERING	X	●	●	●	●	●	●	●	X	X	
	OPERATIONS	●	X	X	X	●	X	X	X	●	●	
	LIAISON ENGINEER		●	X	●	X	X	X	X	X	X	X
	HUMAN FACTORS SPECIALIST	X	X	X	X	X	X	X	X	●	●	●
	LEAD HUMAN FACTORS SPECIALIST	X	X	X		X		X	X	X	X	X
	EXAMINATION OF AVAILABLE DOCUMENTS											
	OPERATING PERSONNEL SURVEY											
	SYSTEM FUNCTION REVIEW AND TASK ANALYSIS											
	CR INVENTORY											
	CR SURVEY											
	VERIFICATION OF AVAILABILITY											
	VERIFICATION OF HUMAN ENGINEERING SUITABILITY											
	VALIDATION OF CR FUNCTIONS											
	HED ASSESSMENT											
	RECOMMENDATION SELECTION											
	PREPARATION OF FINAL REPORT											

Table 2.1 Involvement of DCRDR Personnel Summary Matrix



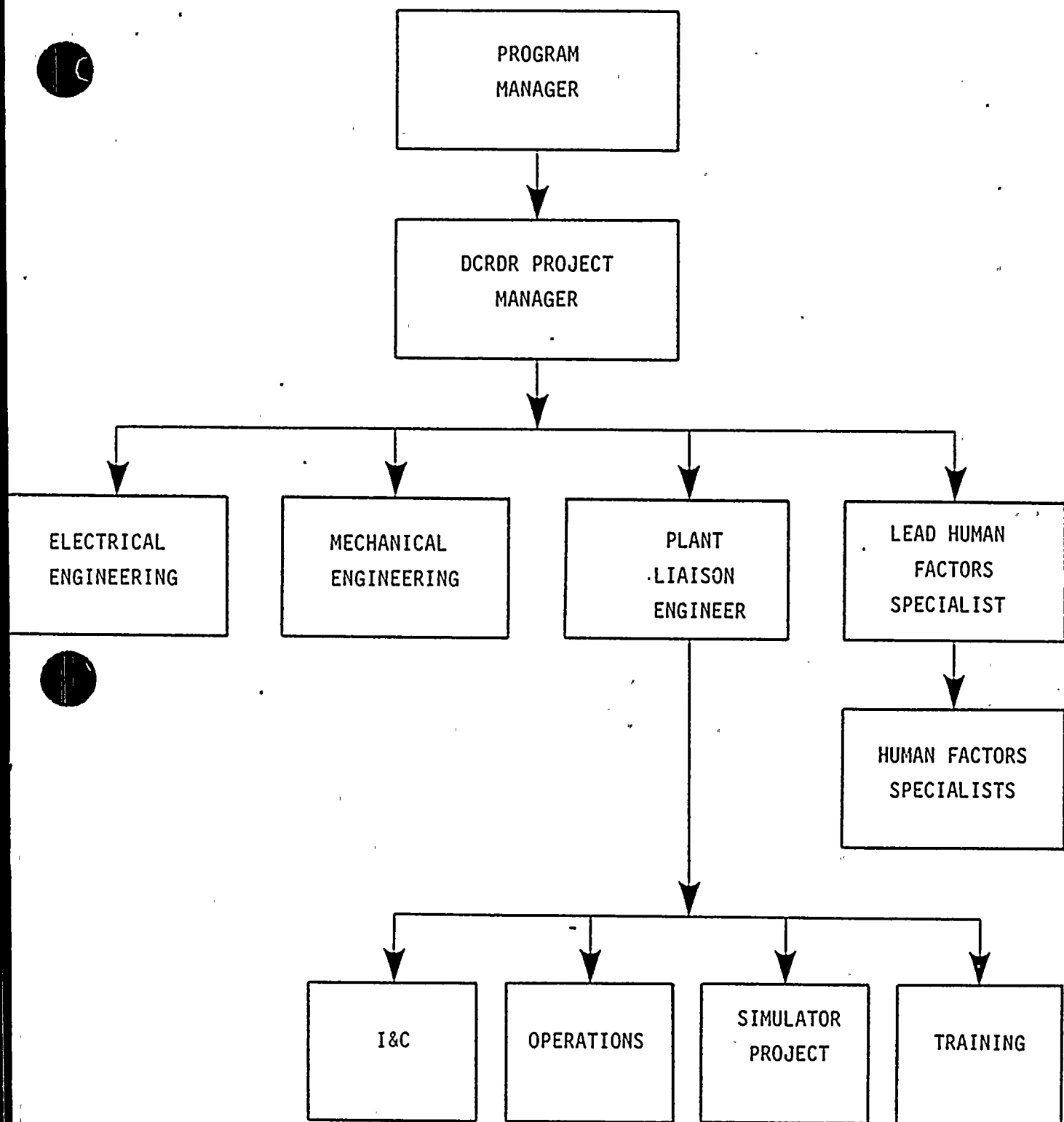


Figure 2.1 Structure and Management of the DCRDR Review Team



3.0 DOCUMENTATION AND DOCUMENT CONTROL

This section describes the documentation system (input/output documents) and documentation management/control procedures which RG&E used to support the R.E. Ginna Detailed Control Room Design Review.

From the beginning of the review, the team had at its disposal the following reference documents:

- System Lists
- System Descriptions
- Piping and Instrumentation Drawings
- Control Room Floor Plan
- Panel Layout Drawings
- Several Lists of Acronyms or Abbreviations
- Samples of Computer Printouts
- Procedures (Emergency, Abnormal and Operating)
- Westinghouse Owners Group Low Pressure Emergency Response Guideline System Review and Task Analysis
- Master Emergency Operating Procedures Summary (MES)

As additional documents were acquired or written, they were added to the library.

3.1 Output Documentation

In order to facilitate systematizing and recording Control Room Design Reviews, a series of standard forms was developed. The



forms used are listed below and appear in their entirety in Appendices A through F.

- Human Engineering Discrepancy (HED) Form
- Historical Document Review Problem Analysis Report (PAR)
- Sound Survey Record
- Lighting Survey - Illuminance Record
- Lighting Survey - Luminance and Reflectance Record
- Humidity/Temperature Record
- Air Velocity Survey Record
- Task Analysis Data Collection Form
- Observations from Validation Walk-Throughs (WT) and Talk-Throughs (TT)
- Self-administered Questionnaire and Cover Letter for DCRDR Operator Survey
- Questions for Follow-up Interviews of RG&E Ginna Station Personnel

3.2 Document Control

Rochester Gas and Electric Corporation recognized that a data collection/analysis effort, such as that inherent in a DCRDR, can generate volumes of paperwork which, if managed improperly, could result in a great loss of time and money. RG&E, therefore, implemented a database management system (DBMS) to collect, update, analyze and provide the information necessary to fulfill the requirements of DCRDRs on a dedicated computer. Implementation of the DBMS minimized the number of manual transformation steps required in the data collection/analysis effort. Furthermore, it afforded the DCRDR team the capability of real-time data analysis. Through the use of the DBMS parameters, any number or combination of data points was accessed and analyzed on an as-needed basis.



3.3 Database Management System

The DBMS was implemented on a VAX 11/730 using INFO/INFO-TEXT. It consists of a master program with memory storage devices to hold the data extracted from various source documents. Because manual handling of data is largely eliminated after data is entered into the system, the DBMS greatly reduced duplication of efforts, document loss and errors resulting from unnecessary handling of data.

After the DBMS was implemented, a series of data files and records was created using information derived from the various source documents. Each source document contained specific forms, charts, schedules, etc., required for the DCRDR and each constituted a single data file. Data files, in turn, comprised individual records which represent the specific parameters contained in the file forms, charts, etc. The file then served as a model of the document from which it was created, as well as an area to store data records. The source documents included those reports and forms listed previously in this chapter. To avoid file damage or unauthorized data manipulation, access to the DBMS was restricted.

4.0 HISTORICAL DOCUMENT REVIEW

4.1 Introduction

The objective of the Historical Document Review was to utilize archival documentation of control room problems to identify areas of investigation. It ensures that the man-machine interface perspective is adequately addressed and significantly reduces the potential for subsequent human error.

Human error in performing complicated tasks is a well documented fact and the potential for it is always present. It can combine with poor design features and contribute to operational problems. Fortunately, in the nuclear 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 process used to review several such documents to identify areas of potential human performance problems at RG&E's R.E. Ginna Nuclear Station.

The review and analysis were conducted by a Human Factors Specialist (HFS) and a Subject Matter Expert (SME) from the DCRDR team.

4.2 Identifying, Collecting, and Selecting Historical Reports

RG&E has three convenient sources of historical reports. These reports are industry-wide sources -- the Licensee Event Report (LER), the Significant Event Report (SER) and the Significant



Operating Event Report (SOER). Since Ginna Station events did not include many found in the industry-wide reports, all Westinghouse plants were included in the review. In this way, plants with a similar construction to R.E. Ginna which would be likely to experience comparable events are included in the review. These plants are Beaver Valley-1, Callaway-1, Catawba-1, Connecticut Yankee, Cook-1, Cook-2, Diablo Canyon-1, Farley-1, Farley-2, Ginna, Indian Point-2, Indian Point-3, Kewaunee, McQuire-1, McQuire-2, North Anna-1, North Anna-2, Point Beach-1, Point Beach-2, Prairie Island-1, Prairie Island-2, Robinson-2, Salem-1, Salem-2, San Onofre-1, Sequoyah-1, Sequoyah-2, Summer, Surry-1, Surry-2, Trojan, Turkey Point-3, Turkey Point-4, Yankee-Rowe, Zion-1, and Zion-2.

LER information is stored in an NRC computerized database and includes all Reportable Occurrences (ROs). Licensees are required to submit these reports to comply with federal regulations. The database is set up to provide ease in obtaining information regarding the incidents.

Since all LERs are submitted to the Institute for Nuclear Power Operations (INPO), an LER sort was obtained from the INPO database. To obtain data that was pertinent and current in its application, the request was limited to reports of those events which occurred in Westinghouse plants over the past five years (January 1979-September 1984).

INPO reviews all LERs and identifies those reports which are significant. These reports (SERs) further analyze LER data. When several SERs have been collected concerning similar types of incidents (at different plants), an SOER is generated by INPO. Thus, SOERs analyze significant generic events in great detail. Data is available from the time both the SER and SOER programs began in 1980. In this review, all SERs and SOERs occurring at Westinghouse plants were reviewed. The HFS, with the assistance of Ginna Station personnel, obtained copies of the applicable LERs, SERs and SOERs. These reports were then



sorted by date and possible applicability. Copies of those events which involve control room operator, procedural or control board equipment failure, and errors attributed to design arrangement were retained in the Historical Review notebook. All reports were screened to determine if they described and documented a control room problem meeting the following criteria:

1. Equipment referenced (valve/pump controls, displays, indicators, etc.) must be in the physical confines of the control room.
2. Procedure steps referenced must be accomplished within the physical confines of the control room.
3. 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.

Reports that meet one or more of the above criteria were retained in the Historical Review notebook for further analysis.

4.3 Report Review and Analysis

For every report that remained after the initial screening, a Problem Analysis Report (PAR) was compiled.

The two-page PAR, shown in Appendix A, was used to record the following information:

- Investigators' names
- Station and unit
- Event date
- Report type and number
- Operating status of plant
- 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 the event

With the assistance of the SME, the HFS reviewed each report to determine whether the event was applicable to Ginna Station. In the cases where the systems or equipment were different at Ginna Station, the report was not considered applicable. For each event determined applicable to Ginna Station, the second page of the PAR was completed. The information completed at this time included:

- Areas in which the event is applicable to the plant under review
- Corrective actions taken at the plant under review
- Unresolved discrepancies (if any)
- HED number (where applicable)

4.4 Result Documentation and Reporting

The PAR, discussed and described above, constitutes the primary document for this aspect of the DCRDR process and contains pertinent information from the analyzed report. In addition, when the recommendations 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 were recorded by the HFS, as an HED on an HED form. The event and task relevant to the HED were noted in the description of the discrepancy.

In addition to maintaining the PARs and HEDs, the HFS responsible for this aspect of the DCRDR maintained the historical review notebook. This notebook is a working

Document which was started at the beginning of the Historical Report Review process that contains:

- Problem Status Report (PSR) -- an index of all reports reviewed
- A copy of all completed HEDs identified during the review
- A copy of all reports concerning Human Factors problems in the control room which were reviewed and analyzed, with the information collected in the review and used in the analysis
- The final PAR for each document reviewed

The HFS responsible for the review of historical documentation worked independently from, but parallel to, the rest of the DCRDR review team. The PSR was devised as a means of keeping the DCRDR team members advised of the progress being made in this review process. The PSR indicates:

- Report type
- Report number
- Event date
- Current investigative status of each report

4.5 Results of the Analysis

The LER sort resulted in a listing of 1412 reports. In addition, 126 SERs and 21 SOERs regarding Westinghouse plant events were collected at the beginning of the review. After the initial review, 23 reports were retained involving problems proved to be control room related, as defined by the criteria listed previously.



The systems and equipment involved in one of the control room-related incidents is not similar to equipment at Ginna. In this case, the incident was judged not applicable and removed from the review process. After this sort, 22 reports remained; of these reports, 20 of the events noted had been corrected or did not exist at Ginna. Two HEDs were identified from the remaining two reports regarding problems which could potentially occur at Ginna Station. A summary of the results of each sort is shown in Table 4.1. In addition, all of the Human Factors/Control Room documents are included in the historical review notebook.

4.6 Historical Document Analysis

The following problems were responsible for many of the events found in the 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, instructions
- Inadequate training (especially with new employees)
- Lack of administrative controls

4.7 Human Engineering Discrepancies

Two HEDs (488, 489) were written for this phase of the DCRDR. One HED identifies a need for interlocks and upgraded procedures to prevent blowdown sampling isolation valves from being inadvertently left closed. The second involves the nuisance alarms in the control room.

Table 4.1. Summary of Results of Sorts

- Inadequate monitoring
- Failure to complete surveillance tests on time
- Missed samples
- Acceptance criteria of procedure not met
- Creation of event contrary to Technical Specifications
- Exceeding Technical Specification limits
- Improperly completed records
- Fire protection deficiencies (removal of fire barriers, fire door blocked open, fire penetrations not sealed, fire pumps out of service)
- Actions/errors by contractors or maintenance personnel
- Inadequate maintenance

<u>Document Status</u>	<u>LER</u>	<u>SER</u>	<u>SOER</u>	<u>Total</u>
Not Applicable to Human Factors/ or Not Control				
Room Related	1396	122	18	1537
Not Applicable to Ginna	0	1	0	1
Problem Corrected at Ginna	14	3	3	20
HED Written	2	0	0	2
Total	1412	126	21	1560



5.0 CONTROL ROOM OPERATOR SURVEY

5.1 Objectives and Approach

The objective of the operator survey 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 DCRDR, the operator survey provides information that will guide the human factors specialists during later, investigative phases of the DCRDR (namely the checklist survey, task analysis, verification, and validation processes). It also provides an avenue for plant management to gather general information about the plant operators' perceptions and opinions of control room design and procedures.

Operators were encouraged to identify both positive and negative features of the control room. The negative items were, as appropriate, deferred for further consideration until later stages of the DCRDR, presented as general reference information for RG&E's consideration, or written as HEDs. The positive items, also presented for reference, suggest control room features that should not be compromised in the course of correcting other HEDs. These items were used by the review team as guidance for corrective actions, since they illustrate aspects of the control room design that the operators find particularly effective. 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 HEDs.

The determination as to which problems qualified as HEDs was based in part on an understanding of the principles of human factors engineering and in part on information collected from operations personnel during the follow-up interviews.

Although emphasis was 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 pursued this direction and identified a number of non-emergency control room features that deserve consideration.

5.2 Construction of the Self-Administered Questionnaire

The self-administered questionnaire was structured to address the following areas, the first nine being those 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
- Operator Aids

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

Each question in the first nine topic areas 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 operator was also asked to fill out a separate sheet detailing his background, level of experience, and current status at RG&E.

5.3 Distribution and Analysis of the Self-Administered Questionnaire

These questionnaires were distributed to forty-two operators, based on a list prepared by RG&E. The participants included all licensed operating personnel as well as trainers licensed on Ginna station in the training department. The operators were given several weeks to fill out the self-administered questionnaire and to return it by mail to ARD. Confidentiality was assured by assigning each outgoing questionnaire a number. The list of potential respondents and corresponding numbers was kept in confidence by ARD personnel.

Twenty-three questionnaires were returned and ARD personnel 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 collapsed 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 taking particular note of those areas of concern to the operators and to the extent to which a consensus emerged on each item.

5.4 Follow-up Interviews

The objectives of the follow-up interviews were as follows:

- To clarify ambiguities in an individual's written responses to the self-administered questionnaire.
- To gather additional details, for example system or component information, pertaining to that individual's responses.
- To examine the extent to which operators agreed or disagreed with their colleagues' suggestions made in response to the self-administered questionnaire.

Thus, there were a few issues that were discussed with all interviewees and some that varied from one individual to the next, depending on each person's written responses on the self-administered questionnaire.

ARD personnel constructed a set of questions and issues to be addressed during the follow-up interviews, based on the analysis of responses to the self-administered questionnaire. This follow-up form (see Appendix C) was distributed to each of the interviewees prior to the on-site interviews, and although not specifically asked, seven filled out the follow-up form. Some of the issues covered in the follow-up interviews afforded



the operators an opportunity to agree or disagree with some of the suggestions that their colleagues had made. In cases where the previous responses had suggested problems, but offered no solution, opinions about possible corrective actions were solicited.

ARD supplied RG&E with a list of the operators whom we wished to interview. Interviews were conducted on-site with eleven of the operators, who had responded to the previous questionnaire. Each interview lasted approximately one hour. Confidentiality of operators' responses was maintained both during the interview process and in the notes taken by ARD personnel during the interviews.

5.5 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 number of operators who agreed or disagreed with specific suggestions in the seven returned forms was tallied. The tables of issues, which had been started previously, were 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 HEDs.
2. Problems that had already been written as HEDs 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.

5.6 Operator Survey Findings

The operator survey identified 30 HEDs that were entered into ARD's computerized database management system and are presented in Volume 2. The findings of the operator survey overlap to some extent with those resulting from other phases of the DCRDR. This redundancy serves as one indication of the extent of identified problems. Another indication of problem 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.

In response to an NRC audit report suggestion, a report was submitted (see Appendix H) to include all items submitted by operating personnel including those which did not become HEDs and the reasons why they were not considered as such. The RG&E DCRDR team sent a copy of the report to the Plant Operations group so that management could determine if any of the issues raised by the operators warranted resolution independent of the DCRDR process. The data gathered during the operator survey were maintained by ARD in a form that will provide the review team with reference material for later phases of the DCRDR.



5.7 References

Additional information concerning the Control Room Operator Survey can be found in the following document:

Report on CRDR Operator Surveys for Rochester Gas and Electric's Ginna Station, Columbia, MD: January 1985.
Advanced Resource Development Corporation.

Report on CRDR Operator Surveys: Justification of Non-HED Responses for the R.E. Ginna Station, Columbia, MD: June 1985. Advanced Resource Development Corporation.

6.0 CONTROL ROOM INVENTORY

6.1 Overview

The objective of the control room inventory for the Ginna Station was to establish a reference set of data to identify instrumentation and controls within the control room. During verification described in Section 8, this reference data is compared with the equipment requirements identified during the task analysis phase of the DCRDR. All displays, controls, controllers, and annunciators in the primary operating area of the control room were included in this inventory. Based on the guidance of NUREG-0700, HFSS completed the inventory with support as needed from Ginna Station Operations staff.

The approach taken was based on the Ginna Station Simulator inventory provided by RG&E. The HFS manually verified the completeness and accuracy of the simulator inventory by a direct comparison with current control boards in the control room. In those few cases where disparities were discovered between the simulator inventory and actual control room equipment, the DCRDR inventory was updated to reflect the actual control room instrumentation and controls. This was done to ensure that an accurate, current inventory was generated for use in all DCRDR phases.

Each piece of equipment on the control boards was assigned a unique reference identifier. This identifier reflected information about the physical characteristics of each piece of equipment as it appeared from the front of the control panels.

Inventory data were stored in the computerized DBMS and sorted in a manner to facilitate the verification process. This information was used to determine the adequacy and usefulness of the equipment to the operators in monitoring and controlling the plant from a human factors standpoint.

6.2 Methods

In response to the NRC audit report concern, the details of the control room inventory process are included below.

All equipment on the front and back of the main control boards and the radiation monitoring and side panels at the Ginna Station were included in the inventory. The panel numbers were: 5, 6, 7, 8, 9, 10, 18, 19, 23, 25, 26.

The HFS adhered to the following steps in performing the inventory:

- Panel evaluation drawings and computer inventory printouts of the Ginna Simulator Project were compared component by component, to the control panels in the actual control room by an HFS. Any discrepancies were then penciled in on both drawings and computer printouts.
- A sequential code was then developed from these drawings to uniquely identify each component on each control panel. The code included both the panel number plus a component number. The component numbers began sequentially with the number one (1) on each panel.

In those instances where control status lights were associated with control switches, a single inventory number was assigned to both light and switch. This approach clearly showed the relationship of the two

components. Indicator lights that were not associated with a control were assigned individual sequence numbers and referred to as "Indicator" status lights to differentiate them from "Control" status lights. Similarly, a single sequence number was assigned to each controller and multi-pen recorder. Specific components of these complex pieces of equipment were identified using sub-numbers.

- As each piece of equipment was entered in the inventory, it was checked against the Ginna Simulator Project computer printout and checked off on the appropriate drawing.

Three separate inventories were established for indicators, controls, and annunciators. Controllers were assigned to either the indicator or control inventories based on the sub-component characteristics of the specific controller.

The following information was collected for each component:

- Panel Number
- Sequence Number
- Label (engraved component label as it appeared on the control boards)
- Manufacturer (if engraved on the component)
- Model Number (if engraved on the component)
- Other Labels (secondary component labels on the control boards or on the equipment itself, including all dyno-tape labels)

The following additional information was obtained for indicators:

- Type of instrument, for example:
 - rotary meter
 - vertical meter
 - single-point recorder
 - multi-point recorder
- Range (the low and high numeric points that were labeled on the meter face and/or chart paper)
- Divisions (the incremental value associated with the distance between adjacent tick marks on the meter face and/or chart paper scale)
- Units (e.g., volts, percent, feet)
- Pens (parameter recorded and associated pen color for multi-pen recorders)
- Number of Recorded Points (for multi-pen recorders)
- Color of Light (for dedicated indicator status lights)

For controls the following information was entered:

- Type of control, for example:
 - joy stick
 - j-handle
 - rotary selector switch
 - rotary continuous switch
- Mode (either Discrete or Continuous)
- Throttleability

- Spring Return Capability
- Pull-to-Lock Capability
- Position/Range (switch position as they appeared on the escutcheon plate, or associated labeling)
- Color (of Control Status Lights)
- Backlit Pushbutton Legends (engraved labels on Pushbutton Legend Tiles)

Controllers typically consisted of several control and display functions (e.g., manual-auto switch, demand signal meter, setpoint control). Individual controller sub-components were given a sub-number identifier and entered into the control or indicator inventory based on the characteristics of the sub-component. Information was then recorded for these sub-components.

Annunciator legends and relative tile positions were entered into a dedicated Annunciator Inventory.

7.0 SYSTEM FUNCTION REVIEW - TASK ANALYSIS

7.1 System Function Review and Task Analysis

A System Function Review and a Task Analysis Identification have been performed at Ginna Station in support of the DCRDR. Both activities were designed to comply with the guidance outlined in NUREG-0700, "Guideline for Control Room Design Reviews".

The first phase, System Function Review, used the Emergency Operating Procedures (EOPs) developed from the Westinghouse Owner's Group Emergency Response Guidelines (ERG) - Systems Review and Task Analysis (SRTA) as the system and functional basis for the Ginna Station task analysis. The second phase, Operator Task Analysis, entailed the identification and documentation of operator tasks and control/display requirements for completing them. The tasks covered all phases of the EOPs.

7.2 Method - System Function Review

The use of EOPs developed from Westinghouse generic ERGs as the system and functional basis for the Ginna task analysis is acceptable as discussed in NUREG-0800, Section 18.1, Appendix A. At Ginna, the EOPs were used as the base document for the System Function Review and Task Analysis.

The foundation for the Westinghouse Owner's Group (WOG) ERG Programs is a well defined framework for emergency operations.



This framework considers the operators' role and special needs during emergency operations and provides a systematic approach to the diagnosis and restoration of safe plant status. This is provided through the Critical Safety Function Restoration concept concurrent with the diagnosis and recovery from predefined event sequences, through use of the Optimal Recovery concept. The WOG ERG-SRTA is a daughter program to the ERG development program. The ERG-SRTA provides a systematic compilation of the operator tasks, and instrumentation and control requirements contained in the ERGs. The secondary objective of the WOG ERG-SRTA program is to develop documentation that can support plant-specific EOP development.

The control operability requirements and EOP consistency were examined during system and task analysis in response to the NRC audit report concern. During WOGs generic ERG development, loop operability requirements were taken into consideration to ensure that parameters, systems, or modes of systems, which were listed as being utilized to mitigate symptoms, were evaluated for environmental availability during the transient. Power configurations (e.g., critical bus, engineered safeguard features, equipment qualifications, etc.) were considered in deriving operator actions.

Ginna Station EOPs were developed from the WOG Low Pressure ERG SRTAs, using a "success path" methodology. The functional goal dictated the tasks required for success path fulfillment. During the plant-specific EOP development, instrument and control loop operability requirements under the abnormal conditions expected to result from plant transients leading to the performance of the EOPs were reviewed on both static and dynamic simulation bases. Shutdown paths were verified and the tasks associated with them confirmed as mitigating the symptoms presented. EOP validation served as additional confirmation that operator actions and system response were realistically defined.



In order to aid in the collection of data during the task analysis phase, the site-specific EOPs were grouped into a set of unique blocks by operator actions and defined as unique tasks. These unique tasks were then used to make a Master EOP Summary (MES) document.

The unique tasks contained in the MES were then analyzed for instrumentation and control requirements in the task analysis phase. As revisions to the site-specific EOPs were made, corresponding revisions were made to the MES. The subsequent MES updates have been tracked, documented and covered in task analysis data collection, re-collection, revision and/or deletion.

In response to the NRC audit report concern of incorporating EOP revisions, the Ginna Operations Department will be charged with incorporating human factors considerations as they may pertain to EOP revisions and their effect on control room modifications.

7.3 Method - Task Analysis

The objective of the Task Analysis was to describe and establish the information flow requirements between man and machine, with the intent of identifying operator needs. For each task identified in the MES, a Task Analysis Data Collection Form (See Appendix D) was completed by an HFS working with a Ginna SME. (Unique tasks are located in Appendix I). It was emphasized to the SME that the task requirements should be considered independently from existing control room features. Each task was generally comprised of several sub-tasks or task elements. These are recorded on the Task Analysis Data Collection Form as Action Steps. The purpose of the Task Analysis Data Collection Form was to identify and document the display feedback information and control requirements for task performance and to provide a template of operator activities in the task for use in the

Verification and validation efforts of the DCRDR. The information collected on the Task Analysis Data Collection Form to create a reference and database system for the task include:

- Task Number/Name - The identification number and task name as listed in the MES documentation
- Equipment Name - The name of the plant equipment involved in the control action, noting the required type of control equipment (e.g., pump isolation valve, flow meter, etc.) and often noting the plant identification number when available

The information collected to describe the control requirements for the operator task was collected by use of a coding scheme as shown at the bottom of the task analysis form. The information for control requirements included:

- Position - The control position etched on the control label (e.g., ON, OFF, RUN, STOP, START, AUTO, 1, 2, etc.)
- Mode - The required operating mode of the control needed to perform the task (i.e., continuous or discrete)
- Functional Requirement - A yes or no coding scheme to determine the need for Spring-Return-to-Center, Pull-to-Lock, or Key/Lock-out requirements for the control cited
- Control Status Light Requirement - A coded question to list the need for, and appropriate color of a status light display dedicated to the cited control

- Flag Requirement - A coded question to determine the need for, and appropriate color of a flag indication for the control cited
- Legend Indicator Tile Requirement - A yes or no question to determine the need for a legend pushbutton
- Feedback Requirement (IND) - An entry to cite the need for a specific feedback for a control manipulation. This entry cross-ties over to the Indicator Requirements section

The display information/indication requirements were also collected using the same coding schemes. The information for indication requirements included:

- Level - An indication of the type of display or feedback required (i.e., STATE, VALUE, TREND)
- Units - The units needed for the display in order to accomplish the tasks without the need for conversion
- Range - The range of values required for the accomplishment of the particular task under investigation (Exponents may be used to indicate log scales)
- Divisions - The required precision of the value displays in terms of the smallest display scale division

Information was also collected and entered on the Task Analysis Form to indicate what control or display, from the present control room inventory, was currently being used to accomplish the task. If appropriate instrumentation was not currently available in the control room, the characteristics of the required instrumentation were recorded and the entry was

lagged as being unavailable. From this information, a corresponding HED was written.

The information collected for required instrumentation included:

- Type - A coded statement describing the type of component needed (i.e., INDICATOR, CONTROL, ANNUNCIATOR, NOT AVAILABLE, or OTHER PERFORMANCE REQUIREMENTS)
- ID Number - A unique number given each display or control as part of the control room inventory and entered into the DBMS. This number corresponds to a unique component number recorded on the control room panel drawings supplied by Rochester Gas and Electric Corporation. Space is also available for listing sub-numbers for identifying individual components on controllers and vendor panels.

An entry field was also provided to list any other performance requirement or to list annunciator/legend tile messages. This area also served as a space to record pertinent comments by the SME relating to information and control needs or task performance.

The Task Analysis Form was specifically designed to support the DCRDR verification and validation efforts. The elements of the form were used in a verification against the existing inventory to determine component suitability/availability. This provided a context within which to survey the control room, and provide a base of understanding on which to assess Human Engineering Discrepancies.



8.0 VERIFICATION OF EQUIPMENT AVAILABILITY AND SUITABILITY

8.1 Objective

The verification is essentially a computerized comparison of the task requirements determined during the task analysis with the inventory of control room equipment.

The objective of the DCRDR verification process was to assure that operator tasks can be performed in the existing control room at the R. E. Ginna Station with minimum potential for human error. The focus was on instruments and equipment, not on operator skills and knowledge. The verification was accomplished by comparing the operators' perceived requirements for information and control capabilities during emergency operations, which were derived from the DCRDR task analysis, with the equipment that is present in the R. E. Ginna control room.

There were two aspects to this verification process. First, it was determined whether or not appropriate equipment was available in the control room to perform each functional task required by emergency operations. Second, for equipment that had been identified as available, it was determined whether or not the characteristics of each piece of equipment made it suitable for the task, i.e., whether it offered the operator efficient control and display capabilities to efficiently accomplish the task. The characteristics addressed were those physical aspects of the equipment that were apparent from the

front of the control panels and which, from a human factors perspective, determined the equipment's useability by the plant operators.

As detailed in the summary of the R. E. Ginna control room inventory, a thorough compilation of relevant equipment characteristics was completed for displays, controls and annunciators.

The inventory identified each piece of equipment with a unique code so that specific equipment could be referenced during the task analysis and all pertinent characteristics of each piece of equipment could be retrieved from a computerized database.

As detailed in the summary of the R. E. Ginna task analysis of emergency procedures, the operators' need for specific display information or control capabilities was identified at each step throughout sequences of emergency operations. The tasks to be performed during emergency operations were derived from the WOG ERG-SRTA. The equipment requirements implied by these tasks were categorized in terms of the equipment characteristics that were identified during the control room inventory.

The verification process involved the collaboration of HFSS from ARD Corporation and control room operators (CRO) from the R. E. Ginna Station. The availability and suitability of appropriate equipment in the control room to meet the needs of each emergency task were judged by SMEs, and noted by HFSS, as part of the task analysis data collection effort. To ensure that the equipment requirements that were determined from different tasks did not place conflicting demands on specific pieces of equipment, the HFS, using the computerized database from the task analysis, grouped all references to each piece of equipment that had been judged to be unsuitable and, in consultation with the SMEs, determined the equipment characteristics that were desirable. HEDs were documented where equipment was perceived to be required but was unavailable or

unsuitable. The Human Engineering Deficiency Assessment Team (HEDAT) review finally determined whether these perceived requirements were in fact required.

8.2 Method

The following approach was used for conducting the verification of equipment availability and suitability for emergency operations:

8.2.1 After the equipment requirements for a given task were identified during the task analysis process, the SME made a judgement as to which, if any, control room instrumentation was presently used to perform that task, and whether or not that piece of equipment was suitable in each of its relevant characteristics.

The HFS noted on the Task Analysis Instrument/Control Requirement Form the identification number of the equipment that was available for the operator to perform each task.

Suitability was determined on the basis of the following criteria:

- a. What should be the control position on the escutcheon plate for this task?
- b. What should be the mode of control, e.g., discrete or continuous?
- c. Should the switch have special functions e.g., spring return, pull to lock, key operated, a cover?
- d. Should there be a control status light (CSL)? a flag?

- e. Should the CSL be lit for this task?
- f. Is there an indicator associated with the control?
- g. What level should the indicator be? (i.e., value, state, or trend.)
- h. What state is the control or indicator in? (i.e., lit.)
- i. What range, interval and divisions are appropriate for the task?
- j. What is the ID type? (e.g., indicator, control, annunciation, other performance requirements, not available)

2.2

The identification number of available equipment was entered as part of the task analysis data into the computerized DBMS developed by ARD for the Ginna DCRDR. An automated comparison was then made between corresponding records in the task analysis and inventory data files. Failures to find appropriate information in the inventory file for equipment needs that were documented in the task analysis file, resulted in task analysis records being flagged as problematic. The database was then sorted based on differences between the "what is" versus "what is needed". Computer printouts of these selected data were then used by the HFS to further investigate apparent discrepancies between the equipment requirements from the task analysis and the equipment characteristics identified during the inventory.

2.3

Required but unavailable equipment was identified from those records in the task analysis database that had

been specified for which no ID number had been specified. After SMEs confirmed the validity of these discrepancies, the HFS documented them as HEDs.

8.2.4 Unsuitable equipment was identified from those records in the task analysis database for which disparities had been specified, but an ID number had been entered. Records were sorted by ID number, in order to group all of the tasks which had referenced a given piece of equipment as being unsuitable. The equipment might have been judged unsuitable for different reasons in different tasks. Moreover, conflicting requirements for a given piece of equipment might have been generated across tasks, implying that in addition to changes being required in some aspect of the available equipment, a new piece of equipment might be needed.

8.2.5 The validity of the disparate items was confirmed by an HFS by checking the requirements specified during the task analysis against the actual piece of equipment in the control room. Any conflicting requirements for a given piece of equipment were resolved with input from SMEs. An HFS then documented the valid discrepancies as HEDs.

8.3 Findings

HEDs resulting from the Ginna verification process were given to the Assessment Team for resolution. This team determined whether missing equipment was in fact required and, if so, what was required. Similarly, they determined what was necessary to resolve "unsuitable" equipment.

9.0 CONTROL ROOM CHECKLIST SURVEY

The human factors engineering survey used a checklist based on that illustrated in Section 6 of NUREG-0700. This survey considered the extent to which equipment and the environment in the control room and the remote shutdown area are designed to accommodate basic human characteristics such as physical size and perceptual-motor capabilities. A comparison of instrument and control features to the human engineering guidelines was conducted using the data generated from the task analysis and from visual observation. HFSSs, in concert with experienced utility personnel knowledgeable of plant systems and control room instruments and equipment, and operations personnel, observed and measured control room features.

Instrumentation, controls and other equipment items were examined for human engineering acceptability as components, without reference to their specific uses in task performance. Discrepancies were based on design incompatibility with human perceptual, motor, psychological or size characteristics. Examples included controls too closely spaced for easy manipulation, meters with markings too small to be distinguishable at a practical distance and displays too high to be read. Environmental conditions were surveyed independently.

The guidelines in the checklist include principles or explanatory statements followed by specific categorical or numeric statements. The procedure is to observe or measure, as required, and check compliance with each categorical or



Numerical statement. The review team members who conducted the checklist survey placed a check in the "Yes" box to indicate compliance and a check in the "No" box to indicate noncompliance. "Yes" was checked only if there was total compliance (i.e., only if every instance of the item was fully consistent with provisions of the checklist). If there was any instance of noncompliance, the "No" box was checked and a reference made as to where noncompliance occurred.

Whenever "No" on the checklist was marked, an HED was written by the HFS who was completing the checklist. Some of the HEDs were written to identify problems with individual components, others were written to identify generic problems. When a few items were not in compliance with a checklist criterion, the HFS would describe the problem on an HED form and identify each component associated with the problem. In some cases, such as labels or annunciators, a majority of the components in the control room were not in compliance with certain checklist criteria and the HFS would write a generic HED to apply to all labels or annunciators. In these instances, it was quickly determined that a significant number of changes would have to be made to correct the identified discrepancies. In this way, the six HEDs identified at the audit that were not specifically addressed by the DCRDR team are included as generic HEDs. The recommended corrective action for these generic HEDs usually specified the need for a detailed study of the problem area that would address the situation throughout the control room. Separate studies are underway to review labels, annunciators, and controllers. These studies examine the effect of HEDs identified from several checklist items to ensure that the corrected components enhance operability of the control room as well as satisfy all checklist criteria. The checklist survey is usually performed by section, each section covering a separate area of concern. At times several HFSS simultaneously examined different checklist sections within the control room. There were 142 HEDs identified by the checklist survey.

The grouping of HEDs into major topic areas allows a holistic view that might have otherwise been lost and minimized data collection redundancy. It forced a cumulative view and focused attention on the importance of the human engineering discrepancies involved. This method of producing HEDs is efficient and does not overburden the assessment team with many individual HEDs that say essentially the same thing and which require the same blanket change. It is for the above reasons that there were statements made in the audit about six HEDs not being identified. In fact, they were identified on a generic basis and are properly addressed during the corrective action phase.

9.1 Human Factors Engineering Checklist

The Human Factors Engineering guidelines were examined for the nine topic areas listed below:

1. Control Room Workspace Section addresses the general layout, availability and accessibility of operating equipment and materials; the anthropometric suitability of work stations; availability and accessibility of emergency equipment; and environmental factors.
2. Communications Section addresses auditory communications equipment used in the control room. Communications is a specialized topic to be treated relatively independently, on a control room-wide basis. Individual work stations are to be considered only incidentally.
3. Annunciator Warning System Section addresses overall concerns such as alarm parameter selection and set points, first-out alarms and prioritization; and design features of the auditory alert, visual alarm and operator response subsystem. To address an NRC

audit report concern, an annunciator study is being performed by ARD in response to HEDs from the checklist. The annunciator system is being examined for grouping of tiles, abbreviations, wording, letter height, and spacing. Of primary interest is to assess and correct any problems that have cumulative effects on work performance. A follow-on, in-house study by RG&E will incorporate these findings into an overall annunciator system review, including auditory coding, reflash and first-out indication.

4. Controls Section addresses principles of selection, protection and designs and specifications for different types of controls.
5. Displays Section addresses principles of displays including information to be displayed, useability of displayed values, readability, printing, markings and coding. Guidelines are also given as to design characteristics of particular types of displays including meters, light indicators, graphic recorders and counters.
6. Labels and Location Aids Section addresses labeling, location, content and lettering; use of temporary labels; and use of location aids such as demarcation, color and mimics.
7. Process Computer Section addresses software security and characteristics (dialogue/command language, prompting, structuring); procedures and other aids to computer use; keyboard arrangement, function controls and other controls; computer response time; and design characteristics of displays and printers/printer messages.



8. Panel Layout Section addresses allocation of controls and displays to preferred panel areas; grouping of controls and displays; spacing, demarcation and color shading to enhance recognizability of individual components and of groupings; ordering of components within groupings; layout consistency within and between panels; and strings, clusters, or matrices of similar components. HEDs were written on control/display relationship problems, primarily concerning controllers. To address an NRC audit report concern regarding assessment of control/display relationship HEDs, a controller study is being performed by ARD to resolve the scale labeling and control/display relationship difficulties on the controllers throughout the control room.
9. Control-Display Integration Section addresses relative positioning of single control and display pairs and multiple controls and displays; function and sequence-of-use relationships; movement relationship; and other aspects of compatibility of controls and displays which are used together.

9.2 Environmental Measurement Procedures

1. Sound Survey Procedures. Using a control room layout drawing, the HFS selected and marked the locations where sound measurements were to be taken. Measurements were taken at each operator position that required verbal communication and/or auditory discrimination of a signal. The meter was located 5 ft. above the floor at positions where the operator stands and 4 ft. above the floor at seated positions. Measurement positions included operator's desk, and operator work station (or points near the center of each panel or console).



Measurement included ambient noise levels (where ambient noise is defined as background control room noise without the contribution of alarms, printers or communications equipment), annunciator alarm levels (work station annunciator and any other annunciators that must be heard at that work station) under both ambient and high-level noise conditions (e.g., with printers, other alarms and signals), telephones and other communication equipment, evacuation signals and other alarms. Integrated "A" weighted db(A) measurements were taken for all of the above positions. The appropriate form is located in Appendix F.

2. Lighting Survey Procedures. Using a control room layout drawing, the HFS selected and marked the location where the illumination measurements were to be taken. Full AC ambient and DC emergency readings were taken in front of each front panel and in the center of the control room at each operator workstation.

In order to determine the luminance and reflectance ratios, the following procedures were followed: (1) the object was covered with a "perfect reflector" pad, being careful not to block light; (2) luminance readings were taken and recorded; (3) the reflector pad was removed; (4) luminance readings of the object were taken and recorded. At each panel, the following measurements were taken using these procedures: reflectance pad on panel, panel background (where reflectance pad was placed), meter faces (with and without glare), and other display faces (with and without glare). The appropriate forms are located in Appendix E.



In response to the NRC audit, the lighting survey was repeated to document illumination problems in the control room. Although there is ample illumination available, Ginna control room operators usually turn off six panels of the overhead fluorescent lights in order to reduce glare and the visual discomfort associated with it. As a result, main control panels 5, 6 and 7 are illuminated unevenly, dark areas exist at operator work stations and portions of the control room fall below NUREG-0700 recommended minimum values. Two HEDs resulted from the lighting survey.

3. Humidity/Temperature Procedures. To measure humidity and temperature, meters were set-up in an area where they would not be disturbed. Readings were taken at floor level and at 6 ft. above floor level every hour for a 24-hour period. The HFS recorded the time and the temperature and humidity values for both levels. No HEDs resulted from this survey. The appropriate form is located in Appendix E.
4. Air Velocity Survey Procedures. Using a control room layout drawing, locations were selected and marked where air velocity readings would be taken. Measurements were taken at principal operator work stations at an elevation of 6 ft. for standing positions, and at 4 ft. for sitting positions. No HEDs resulted from this survey. The appropriate form is located in Appendix E.

9.3 Shutdown Capability

The remote shutdown capability at Ginna Station is performed in several plant areas and is delineated by procedures. In order to arrive at a successful set of actions which would provide this capability, information was obtained from a variety of sources. Existing procedures were gleaned for pertinent information and recovery guidelines reviewed. Functions and

isks were outlined and structured into a comprehensive list of prioritized actions which fulfilled the goal of taking the plant to a hot shutdown condition. Ginna has successfully demonstrated the viability and validity of its current remote shutdown capability.

At present, a number of modifications to Ginna's safe shutdown capability are in the design and construction stages. In response to 10CFR50 Appendix R, RG&E has committed itself to adherence of human factors principles during assessment of all future design modifications. The development of a human factors manual for Ginna, coupled with an in-house review, will ensure that human factors principles will be integrated into any new design changes. This addresses NRC audit report suggestions regarding remote shutdown capability.

During the DCRDR, the remote shutdown capability was reviewed using the NUREG-0700 checklist as a guide. A number of HEDs resulted. Where corective measures have been deemed necessary, action has been taken to implement them.

9.4 NUREG-0909

The NRC Report on the January 25, 1982 Steam Generator Tube Rupture at R.E. Ginna Nuclear Power Plant was reviewed for the purpose of determining if the human factors concerns which were brought to bear in that document were adequately addressed in the DCRDR. Those items which were found to be human engineering discrepancies in the 0909 report, are included in the DCRDR assessment process and were reviewed by a qualified team of personnel.

9.5 Review of NRC Audit Survey Concerns

In response to an NRC audit report concern, the operator survey HED relating to maintaining steam generator water level during low power operation was carefully assessed. Automatic steam

Generator level control during low power operations is a generic problem to all PWR plants. Two Westinghouse recommended modifications to the feedwater bypass valve control system were tried at Ginna in an attempt to anticipate level changes due to compression or expansion of the steam content of the steam generators. The two anticipation signals tried were nuclear power and steam generator pressure. In both cases the results were unsatisfactory. Manual steam generator control must continue. Problems with the existing system were addressed in other facets of the DCRDR are currently being met by in-house periodic review of procedures, or are being corrected by INPO sponsored RG&E programs (component labeling). In response to another NRC audit concern, the lighting survey was repeated. The audit expressed concern that other HEDs may have been missed because the original checklist environmental survey did not yield a lighting HED, although the operator survey did. The DCRDR process is purposefully designed to provide redundant opportunities to document human factors deficiencies. Further explanation follows:

The major lighting difficulty in the control room is uneven illumination. This occurs because six rows of overhead fluorescent lights are routinely turned off during normal operation. These six rows traverse the major control boards and center of the control room. Lights on the perimeter of the control room and immediately above and slightly behind the main control boards are usually turned on. The effect of this arrangement is to leave some center areas darker than others and to leave parts of the control boards darker as well.

NUREG-0700 procedures specify taking one measurement in front of each panel. In the Ginna control room, a single control panel may have significantly different readings depending on the spot chosen. For the second survey, measurements were recorded at the maximum and minimum areas of a panel in order to highlight illuminance problems. One HED was generated as a result of this effort.



6 References

The following publications were used during these phases of the DCRDR:

U.S. Nuclear Regulatory Commission. Guidelines for Control Room Design Reviews (NUREG-0700). Washington, D.C.: September 1981.

Kaufman, J.E. and Haynes, H. (Eds.), IES Lighting Handbook, Reference Volume, New York, NY, 1981.



10.0 VALIDATION OF CONTROL ROOM FUNCTIONS

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

The methodology for the Ginna validation employed the techniques of simulator walk-through and talk-through. Six selected events were taped at the Ginna simulator using the walk-through approach. This task was coordinated with the Emergency Operating Procedure validation effort being conducted by RG&E. Tasks identified in the Ginna task analysis effort were analyzed at the Ginna control panels using the talk-through approach. The criteria described in Table 10.1 were applied in both validation approaches.

10.1 Simulator Walk-Throughs

Simulator walk-throughs were conducted at the Ginna simulator during the month of February. Since the simulator was not operational at the time, the system responses to the sequence of events were predetermined and made known to the operational crew at the appropriate times. Event simulations were conducted in real time.

Table 10.1 Validation Criteria

CONTROLS

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

Useability - 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 is available in the control room without the operator leaving the primary operating area.

Obscured - Controls and displays are located so that displays are not observed 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 10.1 Validation Criteria (continued)

CONTROL/DISPLAY RELATIONSHIPS

C/D 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.



10.1.1 Event Selection

Since the upgraded EOPs based upon the generic Westinghouse ERGs are also being validated, events for the DCRDR validation walk-throughs were selected from the scenario list developed by the validation program. The selection was based on the extent to which the event-based procedure exercised the 22 major sections of the ERGs and encompassed the task identified in the task analysis effort. The following events were selected for the walk-through validation:

- Small LOCA Inside Containment - No AFW
- Secondary Break - All MSIVs Fail to Close
- ATWS From Full Power
- Loss of All Feedwater - Offsite Power Lost
- S/G Tube Leak Plus Spurious SI
- SGTR without PRZR Pressure Control

10.1.2 Simulator Walk-Through Approach

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

1. The validation coordinator selected 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 was 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 expected action response. A camera was available for each reactor operator.

3. The validation coordinator and the HFS 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. Initial conditions, symptoms, entry conditions and assumptions about the operating situation were specified to the operators during the briefing.
4. The event simulation walk-through began. The validation coordinator provided all necessary parameter setpoints, the information necessary to operator decision making, and determined when the scenario progressed sufficiently to effect termination. To facilitate the simulation fidelity, other members of the validation team remained in the background 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 an SME was recorded on the video tape. The narration conveyed what the operator(s) were doing and why. Specifically, the narrator recorded the following information during the event simulation:

- Operators' actions
- Direction of movement
- Display/indicator reference
- System response

5. On a cue from the validation coordinator, the events terminated. The video tape operators then 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 HFS 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 (Appendix F) was used to record the HFS's evaluation of each procedure step. If a comment had not previously been addressed by existing HEDs, it represented a new discrepancy and was reported as such.

10.2 Control Room Talk-Throughs

A walk-through was conducted for each of the six selected validation scenarios. Not all the ERG tasks described in the task analysis database were represented in the selected scenarios. All tasks not represented in the selected events were validated using the talk-through technique.

In the talk-through, an SME demonstrated to the HFS the operator tasks and equipment responses for all tasks identified in the Ginna task analysis effort which were not observed in the walk-through validation. Talk-throughs were conducted in the Ginna control room during the month of February.



10.2.1 Talk-Through Approach

The talk-through examined the operator actions in response to the event starting with the initiating cue(s) and included each immediate and subsequent operator action. Specific plant equipment and operator decisions involved in each task were identified as the SME described the actions from the applicable control panel work station. The goal of the talk-through was to assess the availability and suitability of control room equipment and layout to support the operator's needs in performing emergency tasks using the validation criteria.

During the talk-throughs, questions were raised by the HFS concerning the operator needs and equipment characteristics. In addition, the HFS evaluated the operator performance versus the control board/control room design criteria described above for each action of the task under consideration. The Validation Review Worksheet in Appendix F was used to record evaluation observations.

11.0 ASSESSMENT, IMPLEMENTATION AND SCHEDULING

The DCRDR review process described in this Summary Report resulted in the identification of HEDs. RG&E recognizes that each HED identified may represent a potential source of operator error with possible consequences on plant safety and operations. Moreover, the potential for error can vary across HEDs. Therefore, the HEDs were evaluated to determine the extent to which they could affect plant safety, plant operability, personnel safety and the health and safety of the public. Also requiring evaluation were the recommendations for improvement or correction that the HFSS made for the discrepancies discovered in the DCRDR investigative processes. This section of the DCRDR Summary Report outlines a systematic method for evaluating both the significance of HEDs and the feasibility/viability of the recommended improvements or corrections for the HEDs. The results of these evaluations provide a deliberated, consensual and expert knowledge base for the Operations and Engineering Departments to employ in formulating their decisions to implement recommended improvements. That implementation will be completed using established project modification procedures and according to a suitable schedule. The final portion of this section provides an approach for recommendation, implementation and scheduling.

11.1 HED Assessment

The Assessment Team reviewed and assessed every HED generated based on its impact on plant safety, plant operability, and NRC

guidelines. This review included a formal assessment of each HED and evaluation of any recommended design change to determine the overall value of the change and impact on plant operations. The formal assessment followed the procedure below:

1. Each Assessment Team member was given a binder of HEDs to review and was asked to evaluate each HED.
2. Using established project guidelines, items to be fixed without further assessment were identified and evaluated using an "X" identifier.
3. The Assessment Team members were asked to evaluate all other HEDs using the following scale:
 - a. Highest Significance - could substantially affect a safety system or operator response during an emergency situation
 - b. Significant - could substantially affect or has substantially affected a non-safety system or operator response during routine non-emergency operation
 - c. Least Significant - could or has affected operator response in a non-substantial way
4. Discussions were held to reach a team consensus on the HED ratings. The collection of generic HEDs that describe a general problem area of the control room was helpful in assessing groups of HEDs related to similar controls, annunciators, labels, displays, or controllers. The decision to perform follow-on studies of various component groups, such as annunciators, allowed the cumulative effect of all annunciator HEDs to be factored into the assessment



process. In response to the NRC audit report concern regarding rating of safety significance of HEDs, an evaluation of the HEDs' cumulative impact of category C HEDs was addressed to ensure that the level of significance was fully considered. This was done throughout the assessment and implementation by grouping HEDs according to similar function. As a consensus was reached, the lead HFS recorded the rating and maintained a list indicating the HED numbers and the final rating for each HED.

11.2 Recommendation Selection

After the assessment of an HED, the selection of recommendations for correction was completed by the HED Assessment Team.

In response to an NRC audit report recommendation regarding HED assessment procedures, the HED recommendations assessment procedures are listed below:

1. The committee reviewed the HEDs, one at a time, and discussed each HED's recommendations briefly to clarify any points of concern.
2. The best recommendation for Ginna Station was submitted to the station Operations and Engineering Departments for consideration.
3. The lead HFS's responsibility was to ensure that the recommendations developed and accepted by the committee are in accordance with applicable precepts of sound human factors engineering practice.
4. If a decision was made by Operations or Engineering not to accept a recommendation, a justification was prepared and alternatives were examined.



11.3 Implementation and Scheduling of Recommendations

The HEDs that are to be corrected and their accepted recommended corrective actions, as determined by the procedures outlined herein, are part of this Summary Report. All corrective actions are contained in Volume II. A schedule for corrective actions is predicated upon safety significance and subject to the availability of equipment, outage time availability at the R.E. Ginna Station, engineering design lead time, and relative importance compared with other NRC and RG&E initiated Station modifications. Some HED corrective actions are being assigned an Engineering Work Request (EWR) to ensure that the modifications are made, and permit their scheduling with other related station events.

11.4 Verification of Corrective Actions

Corrective Actions being implemented will be reviewed to verify their effectiveness from a human engineering perspective. This verification will utilize sound human engineering methods. Verification will be performed using panel mock-ups incorporating the corrective actions, consultation with operators and system experts, and/or human factors specialist reviews.

In response to an NRC audit report concern regarding use of the RG&E simulator, the control room simulator will be used to evaluate the suitability of control room modifications where appropriate and as it becomes available. If the result of the verification determines that a corrective action will result in a negative effect on control room operations, then the suggested corrective action will be altered as appropriate. If a corrective action is verified to be effective, it may then be implemented in the control room.



12.0 COORDINATION WITH OTHER SUPPLEMENT 1 NUREG-0737 INITIATIVES

Rochester Gas and Electric Corporation has a coordinated process to address the Supplement 1 to NUREG-0737 initiatives to a reasonable extent, given the degree of completion of the initiatives prior to issuance of Supplement 1. This process provides the necessary coordination and support to ensure that a systematic approach is adopted for the inclusion of each of the recommended design changes resulting from these initiatives. This integrated approach is intended to optimize the interface within the control room network. This section addresses the NRC audit report concern regarding coordination of DCRDR activities with other NUREG-0700 activities.

When Supplement 1 was issued, R.E. Ginna had already progressed on various initiatives based on the pre-existing requirements (NUREG-0737, Regulatory Guide 1.97, etc.). When RG&E responded to Generic Letter 83-33, the Regulatory Guide 1.97 evaluation was underway, work had begun on SPDS design, and emergency response facilities were nearly complete.

RG&E made the decision to implement the Westinghouse Owners Group ERG-SRTA Guidelines for operational use. Existing Supplement 1 initiatives (i.e., enhancements due to the DCRDR work and Regulatory Guide 1.97) were incorporated into the new plant-specific Technical Guidelines and EOPs. However, it was recognized that, given the approved status of the Westinghouse generic analyses, little was to be gained by halting the Procedures Generation Package process to conduct a site-specific function and task analysis at that time.



Similarly, design and implementation of the SPDS proceeded as a high-priority Supplement 1 activity without benefit of a site-specific function and task analysis, although the Westinghouse generic procedures (and Regulatory Guide 1.97 improvements) were used as primary source documents.

Supplement 1 to NUREG-0737 recognized the situation where utilities had previously initiated work in a fashion different from the integration ideal of Supplement 1. For instance, as noted in Section 3.6, "The NRC will make allowances for work already done by licensees in a good-faith effort to meet requirements as they understand them." Furthermore, delays in implementation, just for the sake of integration, were not prudent. Section 3.1 states, "Installation of the SPDS should not be delayed by slower progress on other initiatives, and should not be contingent on completion of the control room design review. Nor should other initiatives, such as upgraded emergency operating procedures, be impacted by delays in SPDS procurement." In this context, RG&E integrated the Supplement 1 initiatives to the extent feasible and reasonable. In addition, the Regulatory Guide 1.97 required indications (including NUREG-0737 improvements such as inadequate core cooling instrumentation) were assessed from a human factors viewpoint and the SPDS was similarly reviewed and HEDs noted.

The R.E. Ginna Master emergency operating procedures summary formed the basis for the task definition phase during the DCRDR. Through use of the resource documents earlier described, utilization of Operations and Engineering SMEs, and the makeup of the DCRDR team, a substantial level of integration has been achieved. Table 12.1 provides a flow chart overview of the R.E. Ginna power plant activities.



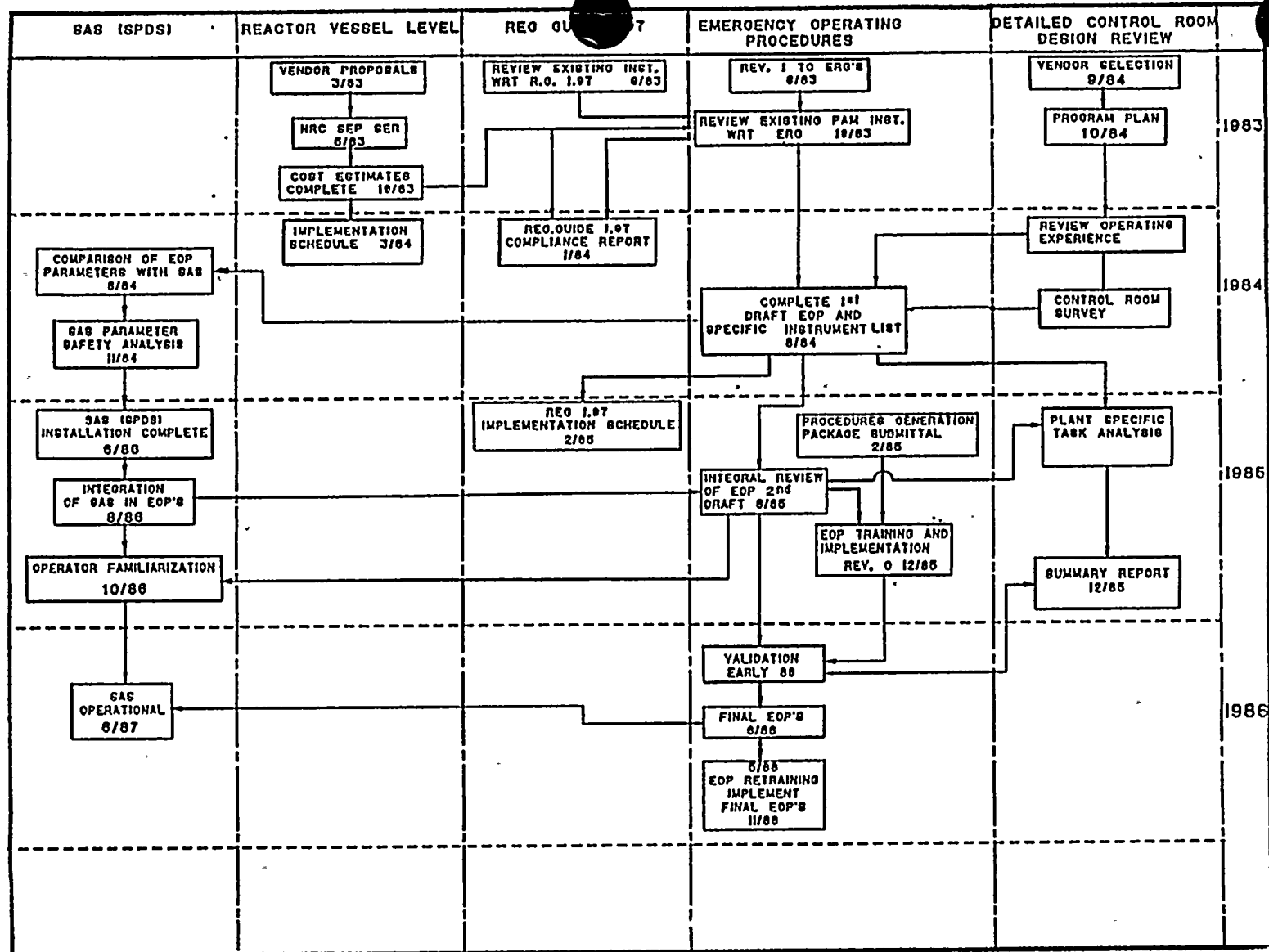


Table 12.1 R. E. Ginna Power Plant Activity Flow Chart



Because several of the Supplement 1 activities were carried out in parallel in accordance with an NRC order, any future integration needs will be addressed through the Human Factors Design Manual being developed in conjunction with the DCRDR process. The station modification program and related work authorization documents will provide for integration with training, operations and maintenance procedures before a modification is put into service.

Appendix A

HISTORICAL DOCUMENT REVIEW
(Problem Analysis Report)



Station



'Appendix B

HUMAN ENGINEERING DISCREPANCY FORM



CONTROL ROOM HUMAN ENGINEERING DISCREPANCY RECORD

HFS: _____ Date: _____ No: _____ Plant: _____
Unit: _____
System: _____

Panel ID#	Equipment ID#	Equipment Name

Description of Discrepancy

Photo Log No.

Photography Instructions

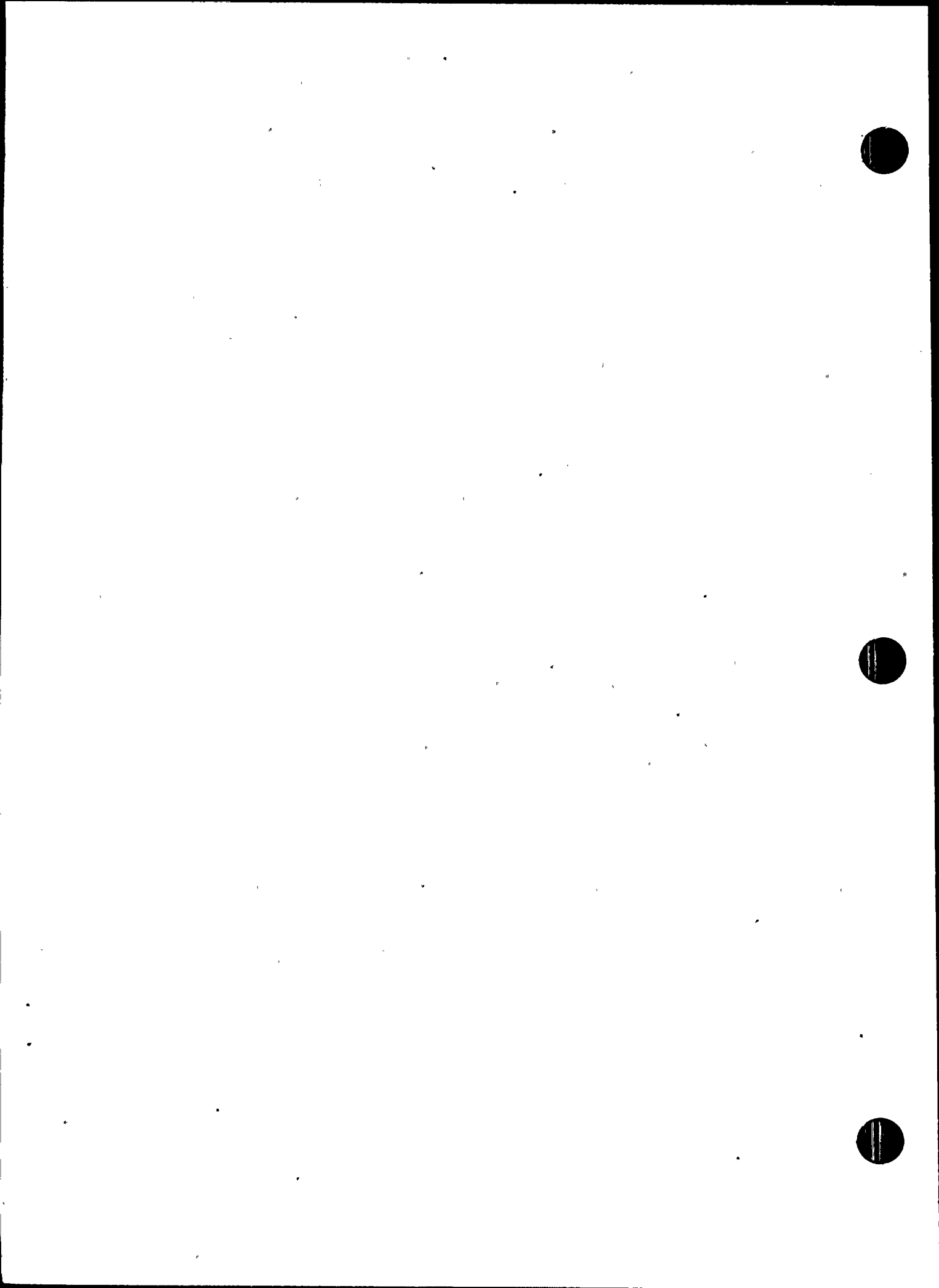
Photo Caption:

C _____ 1. Workspace 6. Labels & Aids
O _____ 2. Communications 7. Computer/CRT
D _____ 3. Annunciators 8. Panel layouts
E _____ 4. Controls 9. C/D Integration
S _____ 5. Displays Other: _____

Guideline No. & Caption:

Comments:

Assessment Category/Level: I _____ II _____ III _____



Recommendation(s) Record

Reviewers: _____

Recommendation(s): _____

Accept Recommendation No.: _____

Rejection Signature

Reject Recommendation Nos.: _____

Rejection Justification: _____

Implementation and Scheduling

Tentative Scheduled Completion Date: _____

Lead Engineer Approval: _____

Station Asst. Supt. Ops. Approval: _____

NCPC Coordinator: _____

HED Completed: _____



Appendix C

CONTROL ROOM DESIGN REVIEW OPERATOR SURVEY



ARD Corporation

Control Room Design Review Operator Survey

The Nuclear Regulatory Commission is requiring that a detailed human factors review of every nuclear power plant control room be performed. This review is being done under EWR 3264. RG&E has contracted with the ARD Corporation to assist in this review. Part of the guidance document published to support these reviews, NUREG-0700, suggests the use of your operating experience to help the review team identify operator/control board interface problems.

Rochester Gas and Electric (RG&E) Corporation and the management of the Ginna Station support the spirit of the NRC's directives. As a result, we are asking for you to support and assist in the program by completing the attached questionnaire. For this program, the company's goal is to improve the operating crew's capability to recognize, control and manage plant abnormal and emergency conditions.

The questionnaire contains 44 questions that cover nine general topic areas dealing with different aspects of control room design as well as the job duties and tasks performed by the operating crew. The questions deal with "problem" areas as well as good or beneficial features associated with the control room. Each question involves a multiple choice response based on your judgements and opinions. In addition, you will be asked to provide specific examples of the positive or negative aspects of the control room on which you used your multiple choice responses.

In completing the questionnaire please read each question carefully, circle the item in the multiple choice that best reflects your view, and provide additional information as appropriate. In preparing your answers, consider the questions from the perspective of all the various modes of plant operation, e.g., startup, hot shutdown, full power, and reduced power, in addition to possible abnormal or emergency operating conditions. Give detailed answers so that someone not as familiar with the area as you are will be able to understand exactly what you mean.

Please answer all the questions. Your responses are important to the success of this review. Use additional paper if necessary and attach it to this questionnaire. If you do use additional paper, please be sure to match your answer to the appropriate question. If you feel that we have left anything out or failed to cover an area in which you have a concern, please tell us by attaching comments to the questionnaire. If you are unable to answer a particular question, please indicate this in the space provided for your response.

In asking for your support in this program we feel it is important for you to know what we will do with your answers. As the questionnaires are returned, ARD Corporation personnel will summarize your answers on a question-by-question basis and compile results for each question. The team conducting the control room design review will then be informed of each problem area identified, so that they can pay special attention to it during the remainder of the review process. As problems are verified, they will be documented more formally. Positive aspects of the control room will also be noted, so that in correcting any problems that arise, these positive features will not be compromised.



ARD Corporation

Although the NRC may eventually be told of the problems you help identify, we want to assure you that your answers and comments on this questionnaire will be kept strictly confidential. You should mail your completed questionnaire directly to ARD using the self-addressed stamped envelope that is attached. Your answers will be summarized so that your exact words do not appear and your name will be dissociated from your answers. You may be contacted for a follow-up interview by ARD personnel, to clarify your written responses or to gather additional information. However, the information you provide at that time will likewise be summarized and treated confidential. Your answers will in no way affect your career, standing, or promotions within RG&E. Therefore, in answering the questionnaire, be as open, honest and straightforward as you can.

In addition to completing the questionnaire, we would like you to supply us with additional background information requested on the following page. It will help us to integrate your responses with other information we must collect as part of this project. However, this background information will not be associated with your responses when they are reported to RG&E or to the NRC.

When you have completed the questionnaire, place it in the envelope provided, seal the envelope, and drop it in the mail. Thank you very much for your cooperation and assistance.

Please Return To: ARD Corporation
5457 Twin Knolls Road
Columbia, MD 21045
Attn.: Ralph Dusek

ARD Corporation

- Name: _____
- Present Position: _____
- Nuclear Operating Experience: _____ years
- Control Board Operating Experience: _____ years
- Held a Reactor Operator (RO) License: _____ years
- Held a Senior Reactor Operator (SRO) License: _____ years
- Age: _____
- Sex: _____
- Height: _____



ARD Corporation

Workspace Layout and Environment

- A.1. Are additional controls needed in the control room? Your response should consider the controls needed to respond to potential emergency or abnormal situations in addition to the various modes of normal operations.

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any needed controls and your reasons for wanting them.

Also identify any systems in which the controls are particularly well designed, i.e. you would not like to see them changed.

- A.2 Are any of the controls that are presently in the control room unnecessary? That is, are there controls that are not used in any mode of plant operation?

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any extraneous controls.

- A.3. Are additional indicators (i.e. meters, status lights, chart recorders) needed in the control room? Your response should consider the indicators needed to respond to potential emergency or abnormal situations in addition to the various modes of normal operations.

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify the needed displays and your reasons for wanting them.

Also identify any systems in which the indicators are particularly well designed, i.e. you would not like to see them changed.

- A.4. Are any of the indicators that are presently in the control room unnecessary? That is, are there indicators that are not used in any mode of plant operation?

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any extraneous indicators.

- A.5. How would you characterize the capability for direct voice communication between personnel in the main control room? Conditions that might impede direct voice communications could include high background noise, physical barriers, or distance between workstations. Remember to consider all modes of operation, including potential abnormal or emergency conditions.

ARD Corporation

- a. Excellent
 - b. Adequate
 - c. Some problem areas
 - d. Many problem areas
- Please identify any problem areas.

- A.6. Air quality (temperature, humidity, ventilation) in the control room is:
- a. Excellent
 - b. Adequate
 - c. Some problem areas
 - d. Many problem areas
- Please identify any problem areas.

- A.7. Lighting in the control room (illumination, glare, reflections) is:
- a. Excellent
 - b. Adequate
 - c. Some problem areas
 - d. Many problem areas
- Please identify any problem areas.

- A.8. Operator's ability to move around the control room in an unobstructed manner is:
- a. Excellent
 - b. Adequate
 - c. Some obstructions
 - d. Many obstructions
- Please identify any obstacle(s) in the main control room which interfere with movement.

B. Panel Design

- B.1. Automatic control operations allow the operator to attend to other instrumentation and intervene only when the automated system malfunctions. Manual control operations typically demand more attention but allow more flexibility, as the operator can tailor his response to the situation at hand. Are there any control device(s) which should be operated manually instead of automatically or vice versa?
- a. None
 - b. 1 or 2
 - c. Several
 - d. Many

Please identify any such inappropriate controls and reasons why they should be reconfigured.

- B.2. Throttleable valves typically require the operator to remain at a given workstation for a period of time, operating a particular control. Are there any throttleable valve(s) that would unnecessarily restrict your time to respond should an emergency situation occur?
- a. None
 - b. 1 or 2
 - c. Several
 - d. Many

Please identify any throttleable valves that could pose a problem in emergency conditions.



ARD Corporation

Also, identify any throttleable valves that pose problems under other modes of operation, e.g. start-up or shut-down.

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

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any systems in which instrumentation is not functionally grouped.

Also, identify systems in which functional grouping is particularly effective (i.e. that you would not like to see changed).

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

- a. Excellent
- b. Adequate
- c. Some problem areas
- d. Many problem areas

Describe any aspects of the layout of control board equipment that should be improved to allow operators to perform more effectively.

Also, describe any areas of the control board where the layout of equipment is particularly conducive to effective operations.

5. Are there areas on the main control boards where your use of a control is hindered or the control may be accidentally activated because of the position, shape, labeling or relationship to the controls?

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any such problem areas.

- B.6. Are there any controls that are hard to reach or indicators that are difficult to read? Remember to consider all modes of plant operation, including possible abnormal or emergency operations.

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any such inaccessible instrumentation.

- B.7. Are there any control(s) or indicators on back panels that should be on front panels, or vice-versa? In formulating your response, please consider the accessibility of instrumentation that you need under all modes of plant operations.

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any controls or indicators that should be moved to a front panel, and explain your reasoning.



ARD Corporation

Please identify any controls or indicators that should be moved to a back panel, and explain your reasoning.

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

- a. None
- b. 1 or 2
- c. Several
- d. Many

Describe any systems that are difficult to operate.

Also, describe any systems that are particularly well-designed for ease of operation (i.e. that you would not like to see changed).

C. Annunciator System

- C.1. Are there any areas in the control room where background noise levels interfere with annunciator auditory signals? Remember to consider all possible plant conditions and modes of operation.

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any areas in which it is difficult to distinguish auditory alarms, and the plant conditions in which the problem occurs.

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?

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please describe any such incidents or potential situations.

- C.3. Are there any alarm windows that have an inappropriate setpoint; that is, those that give the operator either too much or too little time in which to respond to a plant problem? Please consider all modes of plant operation.

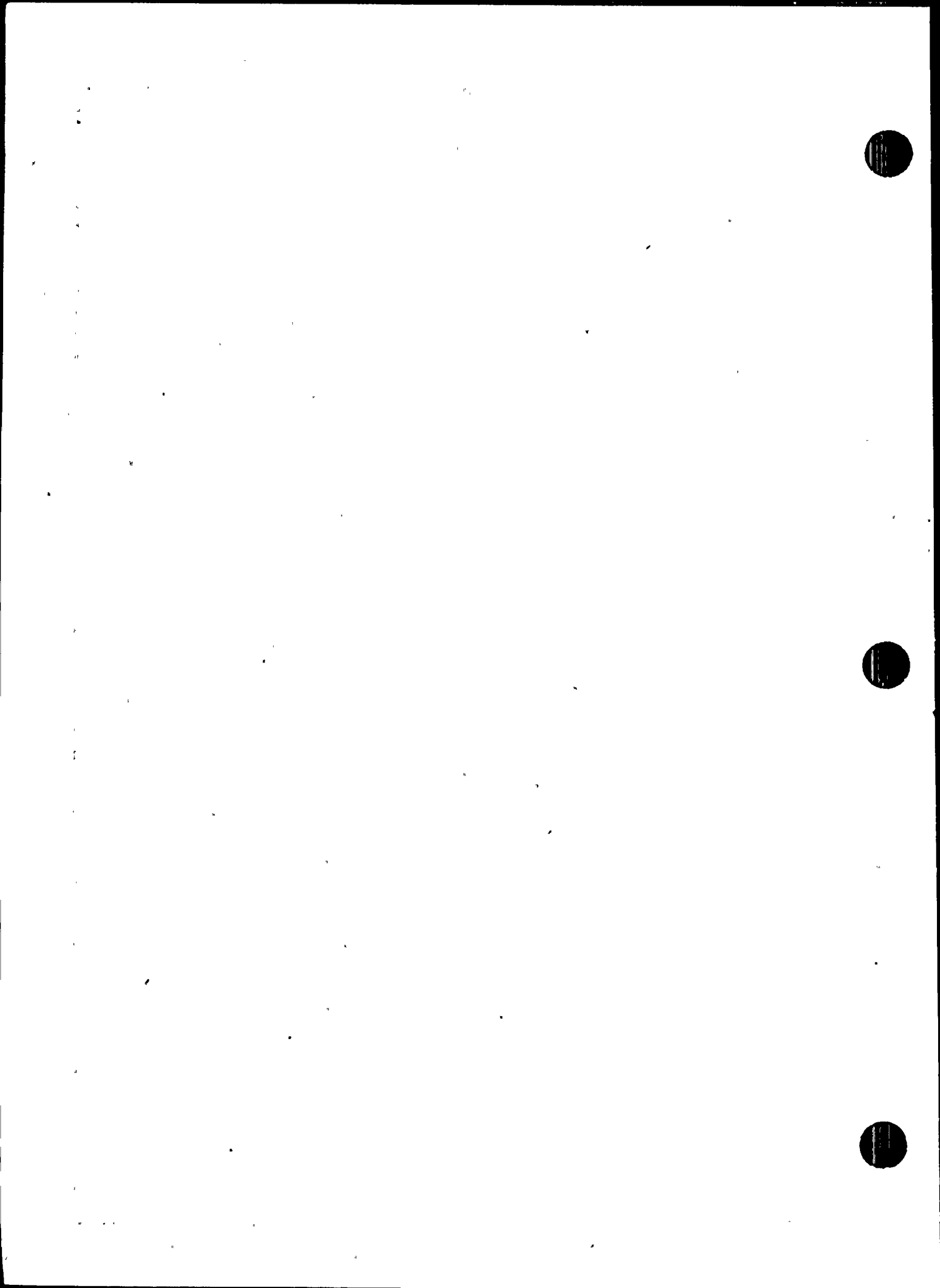
- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify windows that allow too little time and the setpoint(s) that would be more appropriate.

- 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?

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any multiple input alarms that should be split into single inputs.



ARD Corporation

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

a. None
b. 1 or 2
c. Several
d. Many

Please identify any single input alarms that could be eliminated or integrated into multiple input alarms.

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

a. None
b. 1 or 2
c. Several
d. Many

Please identify any confusing alarm engravings and explain why they are difficult to understand.

D. Communications

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

a. None
b. 1 or 2
c. Several
d. Many

Please identify any such auditory signals and the reason for the confusion.

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

a. None
b. 1 or 2
c. Several
d. Many

Please identify any such problem areas.

- D.3. Are there any auditory signals presented in the control room, other than annunciator alarms, which are distracting and should therefore be located in another area of the plant?

a. None
b. 1 or 2
c. Several
d. many

Please identify any such auditory signals.

- D.4. 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?

a. No problems
b. 1 or 2 systems vulnerable
c. Several systems vulnerable
d. Major problems with system design or procedures

Please describe any such potential problems.



ARD Corporation

5. 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?

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please describe any such incidents.

Also describe aspects of the communications systems that are particularly effective from the standpoint of control room personnel.

E. Computer-Generated Information

- E.1. Is there any information or calculations that would be more useful if it were provided on a computer-generated display? Consider all modes of plant operation, including possible abnormal or emergency conditions.

- a. None
- b. 1 or 2 kinds of information
- c. Several kinds of information
- d. Many kinds of information

Please describe any additional computer information that should be made available.

- E.2. Is any of the information presented on the computer printer not useful to control room operations? Particularly consider the information demands of emergency and abnormal operations.

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any extraneous information.

Also identify any aspect of the hardcopy printouts that you find particularly useful and would not want to see changed.

- E.3. Are there any computer system procedures which are difficult to understand?

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any such procedures

F. Maintenance Procedures

- F.1. Are there any maintenance procedures that could contribute to an operational problem? That is, assuming that preventive and corrective maintenance is performed "by the book," are there problem areas that could adversely affect operations, particularly during emergency conditions?

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please describe any such problems.



ARD Corporation

Also, describe aspects of maintenance activities that are particularly effective from the standpoint of control room personnel.

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

- a. Excellent
- b. Adequate
- c. Some problems
- d. Major problems

Please describe aspects of these procedures that are particularly effective.

Please describe aspects of these procedures that are particularly ineffective.

G. Procedures

- G.1. Are there any procedure(s) which are unclear or difficult to use? Please consider all modes of plant operation including possible abnormal or emergency conditions.

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any particular effective procedures.

Please identify any particular ineffective procedures.

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

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify any such materials and suggest how they should be redesigned.

Also, describe operator aids that you find particularly useful.

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

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please identify the troublesome logs and suggest how they could be improved.

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

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please describe the calculations that are troublesome.



ARD Corporation

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? Please consider all modes of plant operation including abnormal or emergency conditions.

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please describe any such duties that should be reallocated and specify who should perform them.

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

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please describe any such sources of distraction and how they can be avoided.

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

- a. Excellent
- b. Adequate
- c. Some problems
- d. Significant problems

If there are problems, suggest how they can be improved.

H.4. Have you experienced or can you conceive of situations in which the operating crew staffing structure could adversely affect control room operations? Consider all modes of plant operation, including potential abnormal and emergency conditions.

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please describe any such incidents or potential situations and suggest how they could be improved.

Also, describe plant conditions or potential conditions for which the present staffing seem particularly appropriate.

I. Training

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

- a. None
- b. 1 or 2
- c. Several
- d. Many

Please describe any emergency situations that you think should receive more emphasis.

Also, describe aspects of your emergency training that you think has been particularly effective.

ARD Corporation

Operator Aids

J.1. What parameters, inputs, operator aids, or other information would assist you in performing operations during the following conditions?

Start up/Shutdown

Normal Operations

Abnormal Operations

4300r

Appendix D

TASK ANALYSIS DATA COLLECTION FORM



1

PROCEDURE: _____

TASK NMNR:

ERG SECTION: _____ SAME AS: _____

ERG PURPOSE: _____

ALTERNATE TO:

[illegible]

O-OTHER PERFORMANCE
REQUIREMENTS
N-NOT AVAILABLE



Appendix E

ENVIRONMENTAL MEASUREMENT FORMS

SOUND SURVEY RECORD

Plant: _____ Date: _____ Time: _____ Sheet # _____ of _____

Measurements made by: _____

Equipment/Instrument used: _____

Serial #: _____ Calibration date: _____

Operator Work Station	db(A)	Octave Band Center Frequency					Remarks
		250	500	1K	2K	4K	



HUMIDITY/TEMPERATURE RECORD

Plant: _____ Date: _____ Time: _____

Measurements made by: _____ Sheet # _____ of _____

Equipment/Instrument used: _____

Serial #: _____ Calibration date: _____

[illegible]

Plant: _____ Date: _____ Time: _____

Measurements made by: _____ Sheet # _____ of _____

Equipment/Instrument used: _____

Serial #: _____ Calibration date: _____



LIGHTING SURVEY ILLUMINANCE RECORD

Plant: _____ Date: _____ Time: _____

Measurements made by: _____ Sheet # _____ of _____

Equipment/Instrument used: _____

Serial #: _____ Calibration date: _____

[illegible]



LIGHTING SURVEY - LUMINANCE AND REFLECTANCE RECORD

Plant: _____ Date: _____ Time: _____

Measurements made by: _____ Sheet # _____ of _____

Equipment/Instrument used: _____

Serial #: _____ Calibration date: _____

[illegible]



Appendix F

VALIDATION FORM

VALIDATION REVIEW WORKSHEET

Event: _____ Operator: _____

Procedure(s): _____ Human Factors Specialist: _____

[illegible]



Appendix G

MANAGEMENT AND STAFFING
RESUMES



NAME: Robert C. Mecredy

POSITION: Director, Engineering Services

YEARS POWER PLANT EXPERIENCE: 14

YEARS NUCLEAR EXPERIENCE: 14

PREVIOUS COMPANIES, POSITIONS AND LICENSES: None

YEARS EMPLOYED BY RG&E, POSITIONS AND LICENSES: 14

Director, Engineering Services - 6 months

Manager, Nuclear Engineering - 11 years

Nuclear Engineer - 3 years

Member Ginna NSARB

Member Callaway NSRB

Member INPO Analysis and Engr. Division Industry Review Group
Representative, Westinghouse Owners Group - 6 years

EDUCATION:

B.S. Engineering Sciences, Purdue University

M.S. Nuclear Engineering, University of Michigan

Ph.D. Nuclear Engineering, University of Michigan

r

NAME: George W. Daniels

POSITION: Manager, Electrical Engineering

YEARS POWER PLANT EXPERIENCE: 2 (U.S. Navy)

YEARS NUCLEAR EXPERIENCE: 19

PREVIOUS COMPANIES, POSITIONS AND LICENSES:

U.S. Navy (Lt. Eng. Officer/Instructor),
Tennessee Valley Auth.

YEARS EMPLOYED BY RG&E, POSITIONS AND LICENSES: 8

Manager, Electrical Engineering

EDUCATION:

B.A. Physics, Boston University

M.A. Physics, Dartmouth College

M.S. Electrical Engineering, University of Delaware
Nuclear Power School, U.S. Navy



NAME: Paul C. Wilkens

POSITION: Manager, Nuclear Engineering

YEARS POWER PLANT EXPERIENCE: 12

PREVIOUS COMPANIES, POSITIONS AND LICENSES:

YEARS EMPLOYED BY RG&E, POSITIONS AND LICENSES: 12

Manager, Nuclear Engineering - 6 months

Acting Technical Manager, Ginna Station - 3 months

Senior Nuclear Engineer, Nuclear Engineer - 11 years

Representative, Westinghouse Owners Group

EDUCATION:

B.S. Engineering Physics, University of South Dakota

M.S. Nuclear Engineering, University of Illinois



NAME: Charles J. Mambretti

POSITION: Senior Nuclear Engineer

YEARS POWER PLANT EXPERIENCE: 24

PREVIOUS COMPANIES, POSITIONS AND LICENSES:

YEARS EMPLOYED BY RG&E, POSITIONS AND LICENSES:

Power Plant Operator
Electric Load Dispatcher
Construction Engineer
I&C Engineer
Startup Coordinator
Ginna Training Coordinator
Construction Project Manager
Nuclear Engineer
SRO License (Expired)

EDUCATION:

B.S. Electrical Engineering, Rochester Institute of Technology.



NAME: E. Clair Edgar

POSITION: I&C Supervisor

YEARS POWER PLANT EXPERIENCE: 22

YEARS NUCLEAR EXPERIENCE: 20

PREVIOUS COMPANIES, POSITIONS AND LICENSES: None

YEARS EMPLOYED BY RG&E, POSITIONS AND LICENSES: 22

I&C Supervisor, Ginna



NAME: Terry White

POSITION: Control Room Foreman

YEARS POWER PLANT EXPERIENCE: 18

YEARS NUCLEAR EXPERIENCE: 18

PREVIOUS COMPANIES, POSITIONS AND LICENSES: U.S. Navy

YEARS EMPLOYED BY RG&E, POSITIONS AND LICENSES: 12

Control Room Foreman

Emergency Operating and Abnormal Procedures

SNUPPS Procedure Writer

Head Control Operator

Control Room Operator

Auxiliary Operator



NAME: Gary Meier

POSITION: Simulator Project Manager

YEARS POWER PLANT EXPERIENCE: 21

YEARS NUCLEAR EXPERIENCE: 21

PREVIOUS COMPANIES, POSITIONS AND LICENSES:

U.S. Navy, 7 1/2 years, Electronics Tech., Reactor Operator,
Instructor

RO license obtained in 1970 on Ginna

SRO license obtained in 1974

YEARS EMPLOYED BY RG&E, POSITIONS AND LICENSES: 16

Auxiliary Operator - 2 years

Control Room Operator - 2 years

Instructor - 4 years

Chairman of Procedure Development Committee for SNUPPS - 2 years

Project Liaison Engineer - 3 years

Simulator Project Manager - 3 years

EDUCATION:

A.S. Electro Mechanical Engineering, Rochester Institute of
Technology



NAME: Richard Marchionda

POSITION: Assistant Training Coordinator

YEARS POWER PLANT EXPERIENCE: 20

YEARS NUCLEAR EXPERIENCE: 20

PREVIOUS COMPANIES, POSITIONS AND LICENSES:

U.S. Navy Nuclear Power - 7 years

YEARS EMPLOYED BY RG&E, POSITIONS AND LICENSES: 14

Ginna Operations - 7 years

Auxiliary Operator, Reactor Operator, Senior Reactor
Operator

Ginna Training - 7 years

Assistant Training Coordinator, Senior Reactor Operators
Licensed Instructor

EDUCATION:

A.S. Electromechanical Engineering, Rochester Institute of
Technology



NAME: Kenneth Masker

POSITION: Emergency Operating Procedures Project Liaison Engineer
CRDR Project Liaison Engineer

YEARS POWER PLANT EXPERIENCE: 4

YEARS NUCLEAR EXPERIENCE: 4

PREVIOUS COMPANIES, POSITIONS AND LICENSES: N/A

YEARS EMPLOYED BY RG&E, POSITIONS AND LICENSES: 4

Training for SRO

Project Manager - EOP revision

Member, Westinghouse Owners Group Procedure Sub-committee

EDUCATION:

B.S. Mechanical Engineering, State University of New York



DONALD F. TAYLOR
Manager, Field Services 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 Field Services 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 Research 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.

- 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.
- 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.
- 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 engineering 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

- 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



cedures. Prepared and conducted training seminars for Duke Power procedure writers and engineers to enhance their technical writing skills.

- 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.

- 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.

- 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.

- 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



RICHARD H. SHANNON
Manager, Systems Technology Group
Senior Engineer

- Human Factors Engineering
- Anthropometrics/Biomechanics
- Job/Task Analysis
- Human Performance Assessment
- Work Measurement
- Systems Analysis
- Experimental Design
- Human Error Analysis

Dr. Shannon is a Senior Engineer providing industrial engineering and research support in human performance measurement. His experience spans a wide range of human factors activities and areas of application, both military and industrial. Dr. Shannon has participated in many studies on the effects of stressful environments upon human performance (cold, heat, chemical warfare, acceleration, vibration, flight). He has recently developed a battery of 31 cognitive and psychomotor tests with fifteen alternative forms in order to observe the effects of the environment using a repeated measures design. He has conducted studies on manual materials handling and the proper biomechanical techniques for handling loads. Dr. Shannon has also worked with numerous existing and emerging naval aircraft and ship systems as a human factors and systems safety engineer.

Dr. Shannon is currently Project Director for the CRDR and other human engineering efforts at the Louisiana Power and Light Company's Waterford-3 station. This position requires that he coordinate and participate in the various phases of inventory review, task analysis, operator experience review, checklist survey, verification and validation. He has also assisted Combustion Engineering in the development of a generic task analysis and instrument/control requirements for the C-E Owner's Group. In addition, Dr. Shannon has supervised the CRDR and enhancement programs at Rochester Gas and Electric's Ginna Station and Niagara Mohawk's Nine Mile Point Unit 1 and Unit 2.

PREVIOUS EXPERIENCE

- 1982 to 1984 Naval Medical Research Institute, Bethesda, Maryland
Head, Performance Physiology Branch

Coordinated a multi-disciplinary program on the effects of cold, heat and chemical warfare on human performance under field and laboratory conditions. Relative to these duties, Dr. Shannon developed a cognitive/psychomotor battery of 31 tests with normative baselines (each test measuring a specific construct and containing 15 alternative forms); and the construction of a human performance laboratory containing various psychomotor apparatus tests, work physiology equipment, evoked-potential computer, a programmable environmental chamber, and a network system of computers for behavioral testing.

- 1979 to 1982 Naval Biodynamics Laboratory, New Orleans, Louisiana
Head, Human Performance Sciences Department; Chief, Task and Workload Division

Coordinated the activities of personnel in the design, scheduling and conduct experiments involving human performance under normal and stressful conditions (acceleration, vibration). Performed task analyses of U.S. Navy jobs and work stations for the purpose of establishing synthetic validity for a selected battery of performance tests. Designed a human performance laboratory which included an automated test battery and six APPLE computers in a network system.

1979 and 1983 to 1984 University of Southern California, Los Angeles, California, and Golden Gate University, San Francisco, California
Lecturer, Human Factors and Safety Science Departments of USC and Public Administration Department of GGU.

Taught ten graduate courses in research methodology, statistics, experimental design, human factors engineering and system safety engineering as a part of the educational extension programs of these two universities in Virginia.

- 1977 to 1979 Naval Safety Center, Norfolk, Virginia
Human Factors Engineer, Systems Safety Engineer

Major areas of effort were to monitor human engineering and system safety efforts on the F18, LAMPS, AV8, OA4M aircraft through plant visits, conferences, program and mock-up/lighting reviews, statistical analyses of mishap reports, functional studies of maintenance and pilot duties, and evaluations of aircraft design deficiencies.

- 1975 to 1977 Texas Tech University, Lubbock, Texas
Doctoral Candidate, Psychology and Industrial Engineering Departments

Emphasis of educational program was upon human factors engineering, biomechanics, human performance, safety, statistics, work measurement and analysis, motion analysis and modeling.

- 1971 to 1975 Naval Aerospace Medical Research Laboratory, Pensacola, Florida
Research Psychologist

Developed pilot and flight officer task analyses in all major aircraft in the Navy inventory. Additional areas of concern were flight student attritions, statistical models for pilot prediction and performance assessment, aircrew human error, instructor reliability and bias, student selection and training, and aircrew safety.

- 1969 to 1971 Fleet Air Wings, U.S. Atlantic Fleet, Norfolk, Virginia
Research Psychologist

Research of Patrol aircrewmembers included personnel fatigue, crew coordination/utilization, human engineering of work stations, performance assessment, maintenance and pilot human errors, and flight safety. In addition, studies into maintenance procedures, organizational climate, aircrew human error, and pilot training within fighter squadrons were conducted.

EDUCATION

Ph.D., Industrial Engineering, Experimental Psychology, Texas Tech University, Lubbock, Texas, 1978.

M.Ed., Industrial Psychology, Springfield College, Springfield, Massachusetts, 1969.

B.S., General Engineering, Naval Science, U.S. Naval Academy, Annapolis, Maryland, 1961.

PROFESSIONAL AFFILIATIONS

Human Factors Society
American Institute of Industrial Engineers (Senior Member)

MILITARY SERVICE

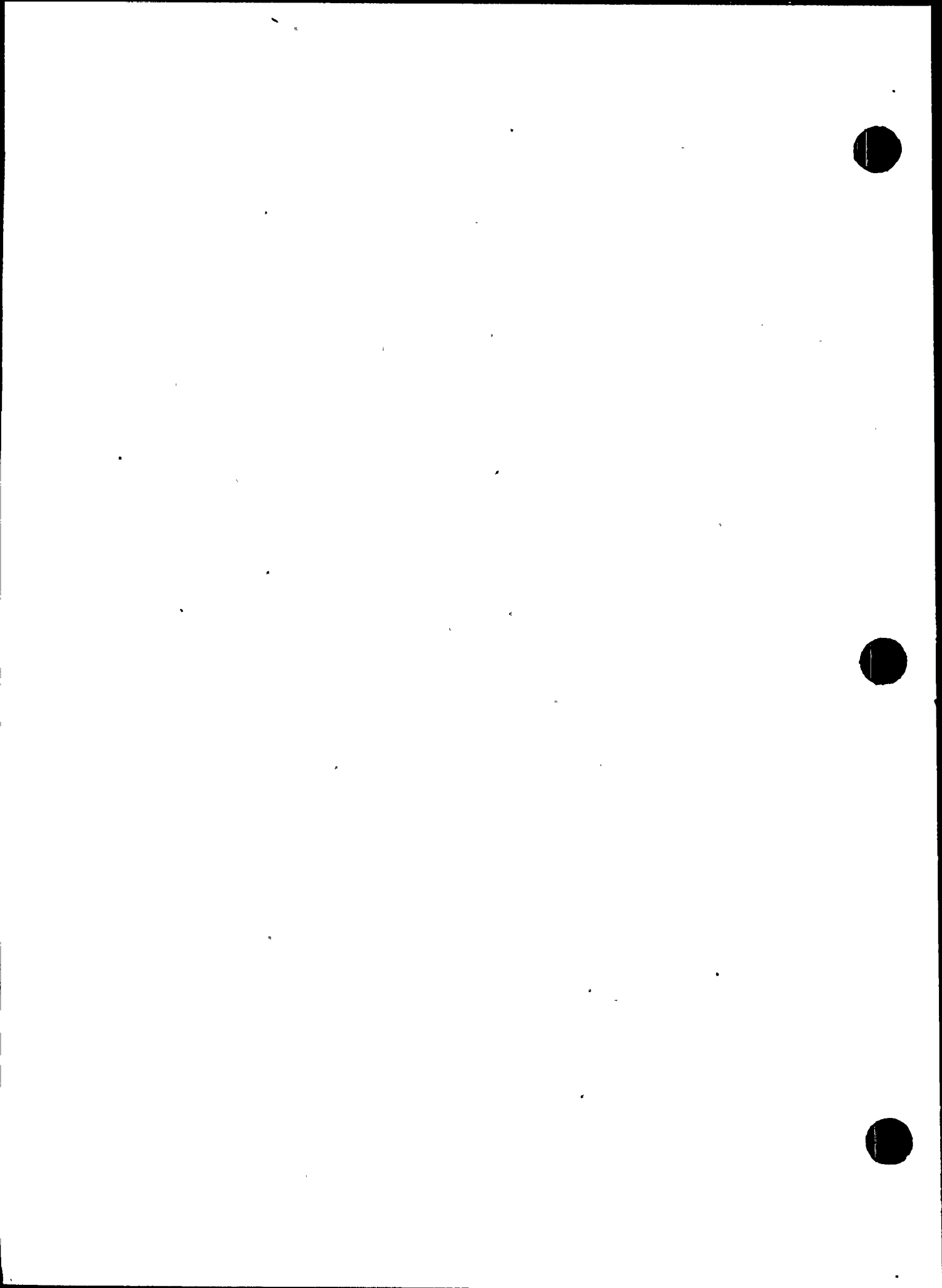
1957 to 1961 Midshipman, U.S. Naval Academy, Annapolis, Maryland

1961 to 1963 Flight Training, Pensacola, Florida

1963 to 1966 Naval Aviator, Plane Commander in S2E Aircraft (received Air Medal), VS-29, San Diego, California

1966 to 1968 Flight Instructor, VT-1, Pensacola, Florida

1969 to 1984 Research Psychologist, U.S. Navy



E. RALPH DUSEK
Manager, Special Projects
Senior Scientist

- Human Factors Engineering
- Man-machine Compatibility Evaluation
- Training and Simulation
- Anthropometrics
- Personnel Selection
- Job Proficiency Measurement

Dr. Dusek has over 30 years of experience in applied experimental psychology and human factors engineering. During that period he held a succession of responsible positions, all involving applied research. In addition, he has extensive management experience in directing the activities of in-house personnel and contractors conducting work for which he was responsible.

Dr. Dusek has conducted studies on the effects of extreme environments on man-machine compatibility. His work in this area has been applied to the design of clothing, equipment and workplaces. Dr. Dusek was responsible for early military studies on performance-based training, testing and on-the-job training, as well realistic unit training techniques. Dr. Dusek's work with performance-based testing has been directed toward qualifying or verifying individual's job proficiency for holding a specific level position. He has also had wide experience with design of tests for selecting and classifying enlisted and officer personnel for assignment to specific positions.

During the past year, Dr. Dusek has participated in human factors evaluations of nuclear plant control room design reviews. He has been responsible for the operating personnel surveys and reports at Niagara-Mohawk's Nine Mile Point 2, Louisiana Power and Light's Waterford 3, Rochester Gas and Electric's Ginna plant, and Commonwealth Edison's Dresden, Quad Cities, and LaSalle plants. He participated in task analyses at Arkansas Power and Light's Arkansas Nuclear One, Unit 2. He has also written Human Factors Manuals for use in future modifications of the Nine Mile Point Unit 1 and Unit 2 and Ginna Station control rooms.

PREVIOUS EXPERIENCE

- 1982 to 83 American Psychological Association, Washington, DC
Administrative Officer for Scientific Affairs

Responsible for promoting the science of psychology and recognition of psychology's scientific achievements. Responsible for stimulating and monitoring research support for the behavioral sciences available from Government agencies and major foundations, and supporting development and dissemination of standards for psychological and educational tests, assessments and the ethics of animal and human experimentation. Senior editor of APA's Guide to Research Support, Washington, DC, 1984.

- 1971 to 81 U.S. Army Research Institute, Alexandria, Virginia
Director, Personnel and Training Research Laboratory

Responsible for planning, directing and managing an Army-wide research program in training, industrial and organizational psychology. Areas included new



Techniques and methods for skill training in schools and units, extension training, leadership and organizational development training, training aids and simulation, selection and classification of officer and enlisted personnel, career development, job proficiency testing and program evaluation.

- 1965 to 71 U.S. Army Institute of Environmental Medicine, Natick, Massachusetts
Director, Behavioral Sciences Laboratory

Planned and directed a research program on the effects of cold, heat, high altitude and work effort on human performance. Research involved altitude and temperature chambers and field maneuvers in extreme environments. Initiated project which resulted in Army doctrine for maneuvering troops at high terrestrial altitudes.

- 1957 to 64 U.S. Army Natick Laboratories, Natick, Massachusetts
Head of Engineering Psychology Laboratory

Planned and directed a research program on the effects of protective clothing (climatic, ballistic, chemical) and personal equipment, materials handling and aerial delivery equipment on human performance. Research also involved obtaining anthropometric data on large numbers of soldiers for use in design of Army equipment and conducting consumer preference research on Army-developed clothing and food products. Initiated project for determining safety and ventilation requirements for missile fuel handler's impermeable uniforms for handling toxic chemicals.

- 1953 to 57 U.S. Army Natick Laboratories, Natick, Massachusetts
Research Psychologist

Conducted research on visual perception and on psychophysiological responses and performance of men exposed to extreme temperatures. Responsible for early research defining effects of ambient temperature and skin temperatures on manual dexterity.

- 1951 to 53 University of Arkansas, Fayetteville, Arkansas
Assistant Professor of Psychology

Taught undergraduate and graduate courses in experimental psychology, statistics and experimental design.

EDUCATION

Ph.D., Experimental Psychology, Statistics, State University of Iowa, Iowa City, Iowa, 1951

M.A., Experimental Psychology, Statistics, State University of Iowa, Iowa City, Iowa, 1949

B.A., Psychology, Mathematics, University of Missouri, Columbia, Missouri, 1947

Resident Student and Graduate, Industrial College of the Armed Forces, Ft. McNair, Washington, DC, 1965

EDUCATION (continued)

Graduate, Senior Executive Institute, Charlottesville, Virginia, 1974

Certificate, Army Human Factors Engineering Course, Natick, Massachusetts, 1960

PROFESSIONAL AFFILIATIONS

Human Factors Society (National and Potomac Chapter); Fellow

American Psychological Association

Society of Applied Experimental and Engineering Psychology; Fellow

Division of Military Psychology; Fellow

Society of Applied Learning Technology

Inter-University Seminar on Armed Forces and Society; Fellow

Psi Chi (Psychology Honorary)

Sigma Xi (Scientific Research Honorary)

Consulting Editor, Journal of Applied Psychology

MILITARY SERVICE

1943 to 1946 U.S. Army Air Corps

1981 U.S. Army, Meritorious Civilian Service Award

JOSEPH B. WINTER, JR.
Senior Engineer
Human Factors Psychologist

- Task Analysis
- Computerized Statistical Analysis
- Human Factors Engineering
- Project Design
- Multipurpose Job Analysis
- Job Evaluation/Compensation

Mr. Winter has over eight years experience providing human factors services, four of which have been in the nuclear power generation area. As a practicing human factors analyst, he has conducted job analysis projects pertaining to selection, classification, performance appraisal, training, and design analysis using a wide variety of analytical techniques. Mr. Winter supported Virginia Electric and Power Company's task analysis/training curriculum program for Nuclear Operations, and has worked extensively at the North Anna and Surry power stations. Mr. Winter has provided a wide variety of human factors engineering services for the CRDR for Louisiana Power & Light Company's Waterford station and Commonwealth Edison Company's Dresden, Quad Cities, and LaSalle Stations, including task analysis for Emergency Operating Procedures, questionnaire development and implementation, checklist survey and verification and validation. He was instrumental in the development of a generic task analysis of Combustion Engineering's CEN-152 Emergency Operating Procedures. Mr. Winter is currently managing the CRDR and follow-on enhancement activities at Rochester Gas and Electric's Ginna Station.

PREVIOUS EXPERIENCE

1982 to 1983 Whittaker General Medical Corporation, Richmond, Virginia
Manager, Corporate Compensation

Directed both Operations and Research and Development staff. Provided technical direction to staff personnel to create a classification system incorporating a task analysis approach, as well as a computerized system to factor geographic differences in pay. Duties included interface with sales and operations managers and executives in over 60 entities in 36 states for pay administration purposes. Maintained control and final approval over sales and gross profit figures flowing from A/R and rebate systems into an automated sales compensation system under CICS. Full responsibility for all calculations and payment of commissions for a salesforce exceeding 500 individuals with 35,000 active customers. DEC, APPLE, and IBM hardware were utilized. Provided salary administration guidance to 2500 other employees. Designed and programmed statistical analysis projects utilizing the SAS software package under TSO and MSA database software for sensitive executive reports. Settled labor disputes with individual employees as well as State and Federal Departments of Labor. Provided guidance and support to three additional manufacturing subsidiaries for pay purposes.

- 1980 to 1982 Virginia Electric and Power Company, Richmond, Virginia
Senior Analyst, Project Leader, In-house Consultant

Responsible for initial start-up and methodology design of Virginia Electric and Power Company's task analysis/training curriculum program for Nuclear Operations. Served as INPO contact and Virginia Electric and Power Company contributor to generic task studies. Devised task inventory booklets, and performed computerized statistical analysis of data compiled from Control Room



Operators, Electricians, and Mechanics. Provided technical direction on 21st Physics and Instrument Technician task analysis projects. Performed a task analysis/job evaluation study on 1500 clerical employees. Lectured security investigative personnel on aberrant behavior.

- 1978 to 1980 City of Richmond - Department of Personnel, Richmond, Virginia
Personnel Analyst

Performed multipurpose job analyses using a variety of methods (including task analysis) for selection, classification, pay and performance appraisal purposes. Validated, devised and administered tests (paper and pencil, oral, performance, etc.) to conform with federal regulatory (EEOC, Department of Labor, Department of Justice and OPM) and professional standards. Served in all phases of assessment center activities for entry level police department applicants (administrator, rater, and role player).

- 1974 to 1978. State of Virginia - Department of Corrections, Richmond, Virginia
Psychologist's Assistant
Staff Psychologist

Conducted diagnostic and prognostic interviews in prison reception centers and jails throughout the State of Virginia for security, vocational, and classification purposes. Initiated court commitment proceedings and represented the State of Virginia in actions involving involuntary commitment state medical hospitals from penal facilities. Conducted psychotherapy and interpreted psychological test batteries.

EDUCATION

M.S., Psychology, Virginia Commonwealth University, Richmond, Virginia, 1979

B.S., Psychology, Virginia Commonwealth University, Richmond, Virginia, 1974

PROFESSIONAL AFFILIATIONS

Psi Chi (Psychology Honorary)
American Psychological Association (affiliate)
Human Factors Society (member)

MILITARY SERVICE

U.S. Army, 1969 to 1972



7

LINDA A. COSGROVE
Senior Scientist

- Training
- Man-Computer Interface
- Visual Perception
- Courseware Development
- Human Factors Engineering
- Video-Based Learning
- Task Analysis
- Psychophysics

As a Senior Scientist, Dr. Cosgrove is responsible for several industrial, computer training, and human factors engineering studies. Her support of ARD clients has included the development of an industrial training program in a manufacturing environment and development of a curriculum for the data processing community. Her support of the nuclear industry includes task analysis of emergency operating procedures at Commonwealth Edison's LaSalle station and annunciator suitability and lighting surveys at Rochester Gas and Electric's Ginna station as well as human factors support at Dresden and Quad Cities stations.

Dr. Cosgrove has twelve years of experience in a variety of training, research and human factors engineering activities. She has been involved in the development, implementation and evaluation of project management and control curricula, instructor training workshops, management information systems, video-assisted computer training programs which involved task analysis and facilitator training, standards workshops, and quality and standards technical bulletins. The conduct and supervision of applied research investigations has also been an important part of her activities. These included an examination of the impact of visual capabilities on performance, the development of diagnostic techniques to differentiate color-defective individuals, the investigation of eye movements related to high-risk occupational performance and the design of equipment.

Dr. Cosgrove has a range of specialized computer and statistical skills. These include six years of Fortran programming, use of SPSS, mainframe and IBM PC-based graphics, word processing, statistics and spreadsheet software.

PREVIOUS EXPERIENCE

- 1983-1985 Federal National Mortgage Association, Washington, D.C.
Information Services Training Coordinator

Responsible for the technical training activities of a 250-person data processing department. Developed and implemented the project management and control curriculum, the video-assisted computer training program, the standards workshop, and published the Quality and Standards Technical Bulletin. Developed and conducted corporate training on business topics which included: Business Writing, Advanced Business Writing, Reading for Results, Improving Your Memory, Technical Writing and Professional Presentations.

- 1980 National Highway Traffic Safety Administration (DOT), Washington, DC.
Consultant

Researched and prepared the literature review on this 4-year project of the visual capabilities of young children and the ways these abilities affect performance in traffic situations.



1974-1979 University of Virginia, Charlottesville, Virginia
Research Psychologist

Planned and directed original research in visual psychophysics and ocular motor perception. Developed a new diagnostic technique to differentiate color-defective observers. Investigated reflexive eye movements with implications to high-risk occupational activities. Designed equipment, trained and supervised 30 research assistants a semester, computer analyzed data.

Taught graduate laboratories in Human Senses.

• 1978-1981 Montgomery County Government, Rockville, Maryland
Research Analyst

Evaluated programs and personnel, planned and directed research, provided forecast information to management, developed and initiated a management information system which resulted in state-wide adoption of the system.

• 1977-1978 National Bureau of Standards, Gaithersburg, Maryland
Research Psychologist

Co-managed a year-long research project on the applied effects of luminance on sensitivity to contrast using psychophysical techniques, at the University of Virginia. Responsible for equipment maintenance, training and supervision of research assistants, data analysis and budget administration.

• 1977 Sleep and Dream Laboratory, University of Virginia Hospital,
Charlottesville, Virginia
Research Psychologist

Responsible for project methodology and computer analysis in a study of the sleep patterns of normal and psychologically depressed patients.

• 1973-1974 George Mason University, Fairfax, Virginia
Research Assistant

Responsible for initiating a ten-year training project of rhesus monkeys in selective discrimination. Managed the colony of 7 monkeys, supervised 2 other undergraduate assistants, conducted training and analyzed data.

EDUCATION

Ph.D., Experimental Psychology, University of Virginia, 1979

M.A., Experimental Psychology, University of Virginia, 1976

B.A., Psychology, George Mason University 1974, summa cum laude

PROFESSIONAL ASSOCIATIONS

American Society for Training and Development
Baltimore-Washington Information Systems Educators
Human Factors Society (National and Chesapeake Chapters)
Sigma Xi



CYNTHIA F. WEISS
Project Engineer
Human Factors Engineer

- Industrial Engineering
- Human Factors Engineering
- Human Performance
- Occupational Safety and Health
- Statistical Analysis
- Anthropometrics
- Epidemiology
- Facility Planning

As a project engineer in the Human Factors Technology Group, Ms. Weiss provides human factors engineering support to a variety of ARD programs. Ms. Weiss is presently providing Detailed Control Room Design Review (DCRDR) support to the Arkansas Power & Light Company's Arkansas Nuclear One generating station and the Louisiana Power and Light Waterford-3 where she has coordinated the Historical Document review and checklist survey phases of the review.

Ms. Weiss' expertise in the control room is in the design and retrofit of annunciator systems. She has performed annunciator reviews for several nuclear stations and has published and presented a paper on this subject. In addition, she has designed workstations for control room operators to ensure that computers, hardcopy records, and spare parts were easily accessible, and performed environmental evaluations on light, ventilation, and auditory design to numerous stations. Ms. Weiss currently is involved in productivity studies for manufacturing as well as office environments, mathematical models for process control variables, facility planning techniques (office layout) and automation technology research projects for ARD's commercial and Government clients.

PREVIOUS EXPERIENCE

- 1982 Michigan Bell, Southfield, Michigan
Master's Thesis

Observed visual display terminal (VDT) operators and supervisors in a telephone company office. Identified the psychophysical stresses of the operators attributed to their interactions with VDTs. Developed, administered, and analyzed questionnaires with respect to these stresses. Recommended redesign of jobs and supervisors' function as well as alternative office layouts. Recommendations were based on questionnaire and interview results as well as an in-depth literature search in an attempt to reduce stress and improve productivity.

- 1979 to 1982 Center for Ergonomics, University of Michigan, Ann Arbor, Michigan
Research Assistant

Responsible for entering job and task data from four industrial plants into a computerized biomechanical model. Edited existing computer files and updated records of tasks which exceeded OSHA standards for manual lifting. Directed driving simulator project involving correlating the scores of a road test with scores on a simulator for both healthy and handicapped subjects. Responsible for coordinating all data collection for the project. Assisted in analysis of data and summarizing the results. Directed maximum reach project involving



the development of a computer graphic representation of maximum reach based on anthropometric data. Responsible for coordinating all data collection for the project.

- 1981 to 1982 Epidemiology Department, University of Michigan, Ann Arbor, Michigan
Research Assistant

Assisted in designing questionnaire, pre-testing questions, phone interviewing, home interviewing, coding, and analysis of a project on the lifestyle and health of senior citizens in Southfield, Michigan.

- 1980 to 1981 University of Michigan, Flint, Michigan
Teaching Assistant

Taught lab for graduate class in work measurement. Prepared and set-up materials for lab. Graded lab reports. Tutored students in Time Study, MTM, and Work Sampling.

- 1980 Economics Laboratory, Incorporated, St. Paul, Minnesota
Industrial Engineer Intern

Developed direct labor cost estimates for existing as well as new products. Established elemental times for receiving, mixing, packaging, fork trucking, and changeover activities for the five chemical plants. Updated documentation standards in the computer's direct labor file. Conducted MTM studies on procedures. Developed graphs on monthly direct labor comparisons.

EDUCATION

M.S.E., Industrial Engineering (Occupational Safety and Health), NIOSH Graduate Traineeship, University of Michigan, Ann Arbor, Michigan, 1982

B.S.E., Industrial Engineering (Human Factors), University of Michigan, Ann Arbor, Michigan, 1981

PROFESSIONAL AFFILIATIONS

Human Factors Society
American Nuclear Society
American Institute of Industrial Engineers (Ergonomic and Utility Divisions)
Society of Women Engineers
Alpha Pi Mu (Industrial Engineering Honorary)



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



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 preparation 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



D. KENT BARNES II
Staff Engineer
Human Factors Engineer

- Human Factors Engineering
- Nuclear Engineering
- Computer Applications
- Control Room Design Reviews
- Probabilistic Risk Assessment
- Task Analysis

Mr. Barnes brings a nuclear engineering background to ARD's CRDR efforts. He has performed task analysis, checklist survey, operator experience survey, historical document review, and verification at several nuclear stations including Arkansas Nuclear One Unit 1 and Unit 2, Nine Mile Point Unit 1 and Unit 2, Waterford 3, and Ginna Station. He also participated in the development of a generic task analysis methodology for Combustion Engineering, to be used by the C-E Owners Group. Mr. Barnes is currently participating in the NRC audit of Arkansas Nuclear One Unit 1 and Unit 2, and the HED Assessment Process for Unit 2. He is also directing a study of annunciator relocation and rewording for Nine Mile Point Unit 2.

Mr. Barnes past Human Factors experience includes a Control Room Design Review for the University of Missouri's 10MW Research Reactor. This review was based on NUREG-0700 and included Operator Survey, Inventory Collection, Document Review, and Human Engineering Deficiency Assessment. Mr. Barnes' background includes a knowledge of Probabilistic Risk Assessment, with an emphasis on Fault Tree Analysis. He has also worked with several PRA computer codes used for evaluating fault trees. Mr. Barnes nuclear background includes a knowledge of computer applications for nuclear power systems. This includes knowledge of large nuclear computer codes such as CITATION, COBRA, and the AMPX-II system.

PREVIOUS EXPERIENCE

- 1984 University of Missouri, Columbia, Missouri
Graduate Research Assistant

Performed a Control Room Design Review for the 10MW Research Reactor. This project was based on NUREG-0700, and the results are to be used for a study of a possible power upgrade for the reactor. Review included Operator Survey, Inventory, Document Review, and Assessment.

- 1983 University of Missouri, Rolla, Missouri
Student Assistant

Helped design a Positron Annihilation Experiment while working at the university's 200KW Training Reactor. This experiment was to be used to determine fatigue in metals.

Programmed an Apple IIe microcomputer. This project involved setting the computer to interact with an electronic measuring device, in order to study radiation damage and dose rates for reactor pressure vessels.



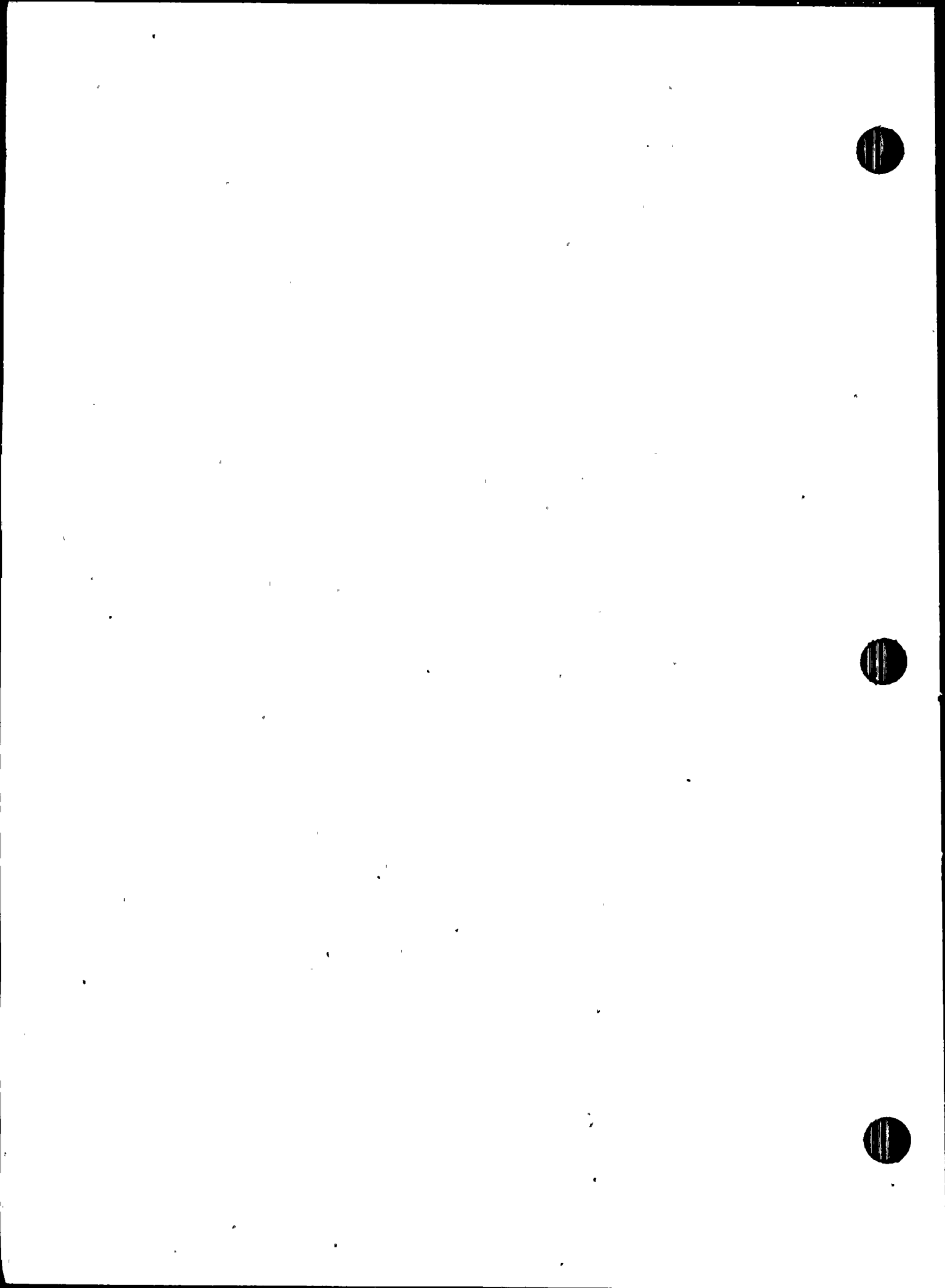
EDUCATION

B.S., Nuclear Engineering, University of Missouri-Rolla, Rolla, Missouri,
1983

Certificate, Engineer in Training

PROFESSIONAL AFFILIATIONS

Human Factors Society
American Nuclear Society
Order of the Engineer



ROBERT KLEIN
Staff Engineer
Human Factors Psychologist

- Human Factors Engineering
- Systems Analysis
- Display Technology
- Human Performance Assessment
- Systems Safety
- 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 has participated 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. He has also worked on the development of a Human Factors Manual for Future Design Change at Nine Mile Point Unit 1 and is currently managing preparation of control room enhancement packages at Nine Mile Point Unit 1 and Unit 2.

PREVIOUS EXPERIENCE

- 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.

- 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.

- 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.



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



VINCENT J. FORTUNATO III
Staff Engineer
Human Factors Psychologist

- Human Factors Engineering
- Psychophysiology
- Human Performance Assessment
- Human Electrophysiology in Operational Settings
- Display Technology
- Experimental Design
- Statistical Analyses
- Man-Computer Interfacing

As a staff engineer, Mr. Fortunato provides human factors support to a variety of ARD clients, both research and consulting. His research activities include NASA-funded projects involving psychophysiological measures of workload, and the generation of computer graphic displays.

His support of ARD's nuclear clients has included human factors reviews of computer graphic display systems at Nine Mile Point Unit 2, Rochester's Ginna station, Commonwealth Edison's Quad Cities and Dresden plants, and Louisiana Power and Light's Waterford 3 station. He has also reviewed graphic displays of radiation/meteorological data for Virginia Electric Power Company and Commonwealth Edison. His support of ARD's nuclear clients has also included control room I&C inventories at Niagara Mohawk's Nine Mile Point Unit 2 and Rochester Gas and Electric's Ginna stations, and has also supported CRDR reviews for Commonwealth Edison.

PREVIOUS EXPERIENCE

- 1984-1985 KLD Associates, Huntington Station, New York
Research Scientist

Project manager responsible for conducting driver performance studies under contract to the Federal Highway Administration. Duties included day-to-day office management, employee training, subject testing, data collection and data analysis.

- 1983-1984 Extensis Medical Center, Roslyn, New York
Biofeedback Consultant

Initiated and developed all facets of biofeedback therapy, from conception to inception, as an integral part of an existing medical practice. Responsibilities included development of effective clinical procedures, purchasing of computer/physiology equipment, and the treatment of patients, which included real-time display of computer graphics and user computer interfacing.

- 1980-1983 State University of New York, Binghamton, New York
Supervisor of Research, Psychophysiology Laboratory

Responsible for direction, coordination, and supervision of all research projects involving psychophysiology measurements and autonomic control using computer assisted biofeedback techniques. Duties included subject testing, data collection and analysis, computer program design, and preparation of drafts for publication, as well as supervision of lab assistants. Also collaborated with computer specialists to design and program CRT graphic displays of electrophysiology.

1980-1982 State University of New York, Binghamton, New York
Instructor

Responsible for development of curricula for several psychology courses including Introduction to Psychology, Psychology of Learning, Learning Laboratory, Motivation Laboratory, Sensation and Perception, Perception Laboratory, and Social Psychology

- 1979-1979 Gerontology Research Center NIH/NIA, Baltimore, Maryland
Psychology Intern/Technician, Lab of Behavioral Sciences

Collaborated with doctors at NIH/NIA in the design and implementation of research projects involving cardiovascular control hypertension, athletic ability and other psychophysiology projects. Responsibilities included subject testing, data collection and analysis, and preparation of drafts for publication.

EDUCATION

M.A., Experimental Psychology, State University of New York, Binghamton, New York, 1982.

B.S., Psychology, State University College, Oswego, New York, 1979.

PROFESSIONAL AFFILIATIONS

Human Factors Society
Biofeedback Society of America
Biofeedback Certification Institute of America
Psi Chi (Psychology Honorary)



ANNE M. FRANCOEUR
Staff Engineer

- Biomedical Engineering
- Acoustics Engineering
- Human Factors Engineering

As a staff engineer, Ms. Francoeur has participated in a study of annunciator relocation and rewording for Niagara Mohawk's Nine Mile Point Unit 2. She is currently assisting in preparing enhancement packages for Nine Mile Point Unit 1 and Unit 2. Ms. Francoeur is also involved in the design development of Automation Technology's Surveyor mobile robot stereoptic viewing system.

PREVIOUS EXPERIENCE

- 1984 to 1985 David Taylor Naval Ship Research and Development Center,
Bethesda, Maryland
General Engineer

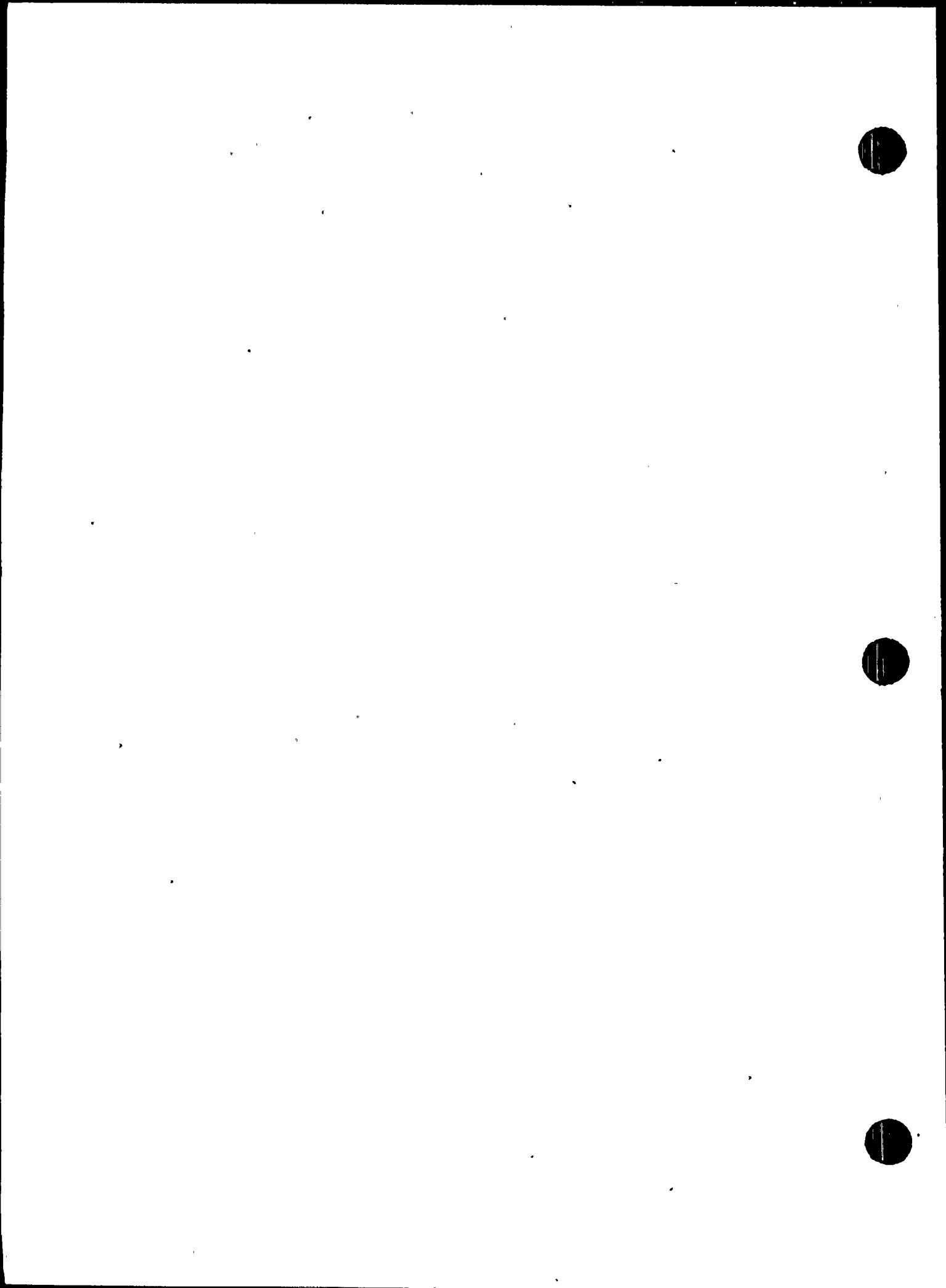
Participated in over ten full-scale submarine acoustical trials. Responsible for at-sea collection, reduction, and computer-aided analysis of submarine radiated noise acoustic trial data. Duties included pre-trial selection of analysis techniques for various test phases; on-site and post-trial diagnostic interaction with those managing other aspects of the trial; and production of a final written report of trial results given to Naval Sea Systems Command sponsors and other Navy laboratory personnel. Special projects included participation in the development of a one-third octave directivity analysis system; processing trial data using this system; and assembling the results into a written report of the directivity patterns exhibited by characteristic acoustic phenomena. Also participated in a submarine silencing technology assessment, producing quantitative and qualitative time-line analyses mapping the acoustic evolution of various submarine systems.

EDUCATION

B.S.E., Biomedical Engineering, The Catholic University of America,
Washington, D.C., 1984.

PROFESSIONAL AFFILIATIONS

American Society of Mechanical Engineers
Tau Beta Pi (Engineering Honorary)



Appendix H

JUSTIFICATION OF NON-HED OPERATOR REPSONSES



Id	<u>Comments</u>	<u>Explanation</u>
A1.1	Instrument air control needed.	Insufficient information to list this as human engineering discrepancy.
A.2	I feel that no new controls are <u>needed</u> , however, some controls or displays could help improve overall performance.	General statement with no specific discrepancy listed.
A1.8	Install a motor operator on condensate cooler bypass valve and put controller on the control board. During summer months this valve is operated continuously with swings in lake temp. (Note: 4 agreed, 3 disagreed)	This is not sufficiently specific to be identifiable as a human factors problem involving safety. Related to HED A1-9.
A1.10	Some improvement in S/G blowdown valves operation is needed. Very awkward to coordinate throttling process when using system as heat removal. (Note: 4 agreed, 3 disagreed)	This does not pose a critical emergency safety problem since operators can handle the situation.
A1.13	Method to place the turbine on the jack from MCB.	This is not sufficiently critical to justify placing jack on the main control board and displaying other critical controls.
A1.15	Volume control switch to lower MCB alarm volume during emergencies so the operator can <u>think</u> . (Note: 1 agreed, 5 disagreed)	Alarms should arouse the operator. Majority disagrees.
A1.16	Barrier to <u>control</u> access to the control board area.	Procedures already exist for controlling access to the control board area if they are enforced.
A1.18	Have the ability to swap controlling channels for steam gen. level signal that feeds S/G level control - in case of failure. (Note: 3 agreed, 3 disagreed)	This can be done in cabinet and placing on the control board is unnecessary.
A1.19	Have the ability to swap pressure level controlling channel and pressurizer pressure channel - in case of failure. (Note: 3 agreed, 3 disagreed)	Same as A1.18.

<u>Item</u>	<u>Comments</u>	<u>Explanation</u>
A1.20	Electro-hydraulic turbine controls well designed.	No human factors discrepancy identified.
A1.21	Auxiliary feedwater well designed.	Positive statement about control board.
A1.22	Standby auxiliary feedwater well designed.	Positive statement about control board.
A1.23	Hotwell level control well designed.	Positive statement about control board.
A1.24	Pressurizer level control well designed.	Positive statement about control board.
A1.25	Main feedwater control valve control well designed.	Positive statement about control board.
A1.26	S/G level control well designed.	Positive statement about control board.
A1.27	All controls are adequate.	Positive statement about control board.
28	Ginna station control board is small, fairly well laid out. 14 years of very good operating experience. Care should be taken not to make changes for the sake of change.	Positive statement about control board.
A1.29	I'm comfortable with the present layout. I'm sure everything could be improved. I like EH system and STM dump, but others have trouble with the STM dump switch or EH nomenclature on buttons.	Positive statement about control board.
A2.2	Containment spray NaOH addition AOV 836A and 836B. No longer used, so why have it on MCB (Note: 3 agreed, 4 disagreed)	Operators disagree over removing these air operated valves from MCB. The majority support retaining them and feel they are useful.
A3.4	Large digital display for easy, instant monitoring Tavg. (Note: 4 agreed, 2 disagreed)	This is nice to have but not necessary for safe operation during an emergency.
9	Narrow range steam gen. level recorders that are not computer dependent. (Note: 5 agreed, 2 disagreed)	These recorders are not critical for safe operations in an emergency.



	<u>Comments</u>	<u>Explanation</u>
A3.12	Large digital clock so accurate time can be instantly determined. (Note: 4 agreed, 3 disagreed)	This clock would not be critical for safe operations in an emergency.
A3.24	Net generation recorder - to enable to see what the generation was at a given time. (Note: 2 agreed, 5 disagreed)	Consensus of operators is that this is not essential for safe operations during an emergency.
A3.33	Feedflow vs. stm flow well designed.	Positive statement about design and no human factors problem specified.
A3.34	Main feed water system well designed.	Positive statement about design and no human factors problem specified.
A3.35	Narrow range s/g level well designed.	Positive statement about design and no human factors problem specified.
A3.36	Leed and Northrup Speedomax recorders are very nice instruments.	Positive statement about design and no human factors problem specified.
A3.37	All indicators are adequate.	Positive statement about design and no human factors problem specified.
A3.38	CV Video Scan System good but could be expanded.	Positive statement about design and no human factors problem specified.
A3.39	All indicators now are needed.	Positive statement about design and no human factors problem specified.
A4.6	Remove alarm panel also (G-24). (Note: 3 agreed, 0 disagreed)	Insufficient justification given for this statement.
A5.6	Annunciator alarms should have volume control. All other alarms are excessively loud.	This is a judgement call since the operator should have to react to alarms and not let them keep sounding which he may do if they are not loud.
A5.8	The CR door sounds like a sonic boom when it shuts.	This is not a human factors problem involving safety of operations in an emergency. However, modifications to door closer are in progress.





Comments

Explanation

A5.11	The MCB alarm sounds continuously during emergencies.	This is not sufficiently specific to justify a human factor discrepancy. Continuous alarms may represent actual status to be dealt with.
A6.3	Control room needs better filtration installed to remove dust from the air.	This would be nice to have, but it is not critical to safe operations as stated.
A6.4	When ventillation system is shut-down for repairs or modifications, the control room becomes unbearably hot.	This is not a human factors problem critical to safe operations as stated.
A6.5	Modification is in progress. Have to wait to evaluate outcome.	Not a human factors problem as stated.
A7.2	Flourescent lighting makes procedure reading sometimes difficult - produces eye strain after extended periods. Would like some type of indirect lighting.	This is part of a larger human factors problem involving lighting, glare, etc., which has been identified as a human factors discrepancy.
A8.7	Slanted floor created by installation of control board seismic supports not so good.	Not sufficiently specific to be identified as a human factors discrepancy.
B3.21	Feedwater control particularly effective.	Positive statement and no human factors problem identified.
B3.22	Feedwater controls main and aux.	Positive statement and no human factors problem identified.
B3.23	S/G section is pretty good. In one area you have all the controls for pumps, feed reg valves, steam dump's, oil pumps and indicators for feed flow, steam flow, steam pres, S/G level.	Positive statement and no human factors problem identified.
B3.24	Reactor coolant pumps indications and controls.	Positive statement and no human factors problem identified.





<u>Item</u>	<u>Comments</u>	<u>Explanation</u>
B4.11	The small physical size of Ginna allows the operator to see not only parameters he is controlling but he can usually, without moving, check on parameters being controlled by another operator (e.g., man on rods can observe S/G levels during startup and turbine controls).	Positive statement and no human factors discrepancies identified.
B4.12	Many years of MCB experience allow me to perform capably under the given equipment setup.	Positive statement and no human factors discrepancies identified.
B4.13	Overall, the layout is very good.	Positive statement and no human factors discrepancies identified.
B4.14	There are problems, but I'm not quite sure that changing them now will help as people know the board the way it is.	Positive and general statement. No specific human factors discrepancies identified.
B4.15	Feedwater system is all in one area, very good layout.	Positive and general statement. No specific human factors discrepancies identified.
B6.11	CV temperatures in another room.	Not specific enough to be a HED.
B7.7	Reheater steam supply controller should be moved to front panel. It also should be smaller. (Note: 0 agreed, 5 disagreed)	Operators do not agree. This move is not critical for safe operations. Insufficient justification.
B7.8	Watt hour meters should be on front. (Note: 2 agreed, 5 disagreed).	Operators do not agree. This is not critical to safe operations. Insufficient justification.
B7.9	Turbine oil temp control should be on front. (Note: 1 agreed, 5 disagreed)	Operators do not agree. This is not critical to safe operations. Insufficient justification.
B7.10	Safety injection accumulator valve switches and indicators should be on front. They are used frequently. (Note: 1 agreed, 6 disagreed)	Operators do not agree. This is not critical to safe operations. Insufficient justification.



<u>Item</u>	<u>Comments</u>	<u>Explanation</u>
B7.12	The emergency diesel generators control panels are on back of board - should be on front for better surveillance of controls. (Note: 2 agreed, 5 disagreed)	Operators do not agree. This is not critical to safe operations. Insufficient justification.
B7.13	CCW Temperature grouping should be on front. (Note: 2 agreed, 5 disagreed).	Operators to not agree. Moving to front is not critical to safe operations. Insufficient justification.
B7.17	CV pressure grouping should be on front. (Note: 3 agreed, 2 disagreed)	Operators not in agreement. Moving to front is not critical to safe operations. Insufficient justification.
B7.18	Alarm light for incore seal table leak alarm: only alarm for this and should be on front panel. (Note: 2 agreed, 4 disagreed)	Operators not in agreement. Moving to front is not critical to safe operations. Insufficient justification.
B7.19	Thermocouples: accessibility on front.	Moving to front is not critical to safe operations. Insufficient justification.
B7.22	Wide range primary pressure indicator. Need to be located by over-pressure protection switches SU-8619 A & B on back of panel. (Note: 2 agreed, 4 disagreed)	Operators not in agreement. Moving to front is not critical to safe operations. Insufficient justification.
B7.25	Moisture separator reader dump valves should be on back. (Note: 3 agreed, 4 disagreed)	Operators not in agreement. Insufficient justification for HED.
B7.27	Dial phone should be on back of control board. (Note: 4 agreed, 2 disagreed)	Operators not in agreement. Insufficient justification for HED.
B7.30	Reactor coolant drain tank pump start /stop switches and lights should be on back. (Note: 1 agreed, 5 disagreed)	Operators not in agreement. Insufficient justification for HED.
B7.31	Service water isol. valve switches and lights should be on back. (Note: 2 agreed, 5 disagreed)	Operators not in agreement. Insufficient justification for HED.
B7.32	Turbine metal temp recorder should be on back. (Note: 4 agreed, 2 disagreed)	Operators not in agreement. Insufficient justification for HED.

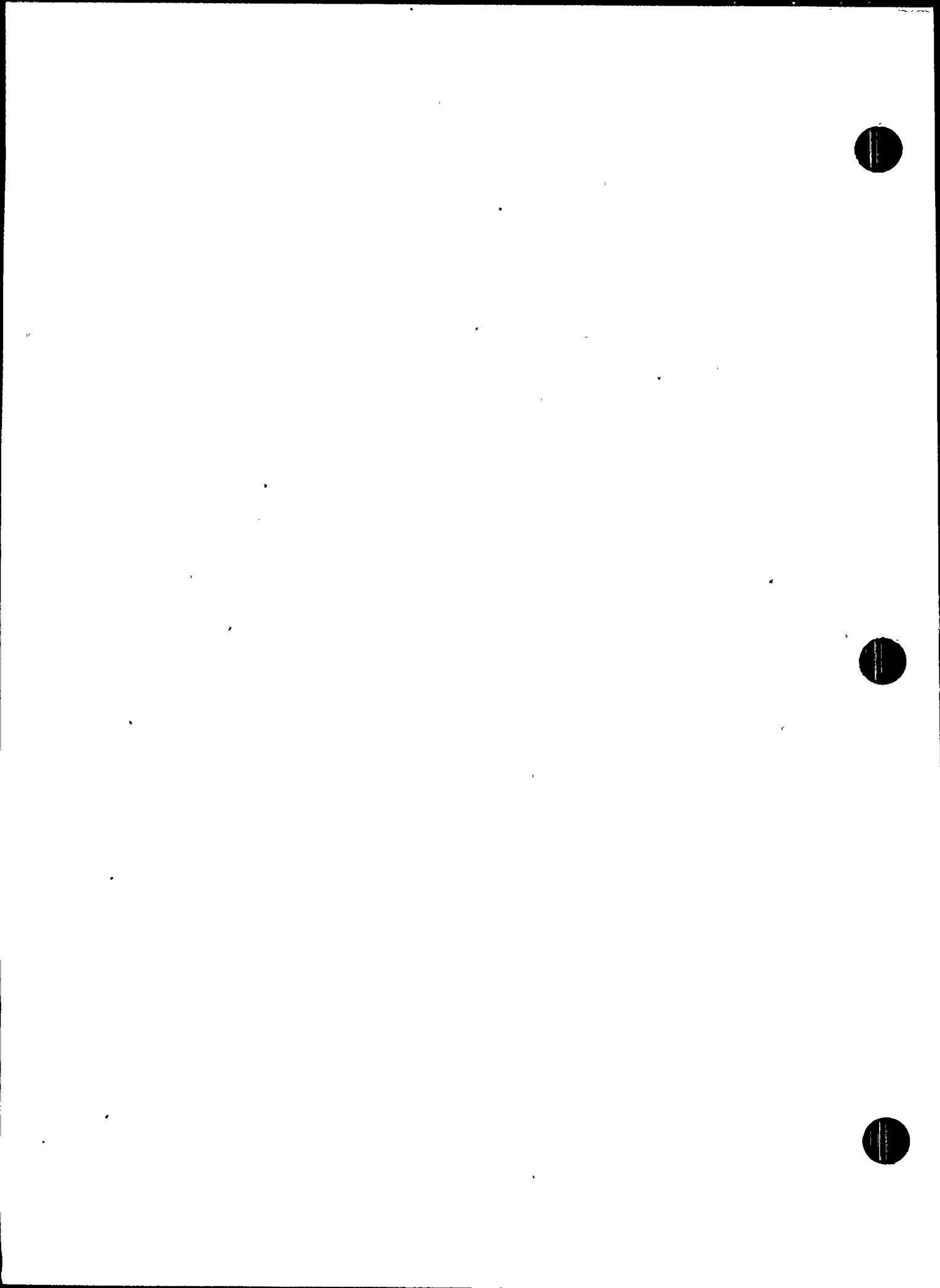


	<u>Comments</u>	<u>Explanation</u>
B8.7	Heater drain tank control system is especially difficult after the new efficiency changes.	Insufficient justification that it affects safety and should be HED.
B8.9	Placing residual heat system in service (equalizing pressure between primary and RHR loop) is difficult to operate.	Insufficient justification that it affects safety and should be HED.
B8.11	Can't think of any except overpressure protection system.	Insufficient justification that it affects safety and should be HED.
B8.12	Rod control is well designed.	Positive statement on design.
B8.13	I am used to operating most controls - I would not like to see them changed.	Positive statement on design.
B8.14	Most systems operate easily.	Positive statement on design.
B8.15	Hotwell level when in automatic.	Positive statement on design.
C1.1	During major transients the <u>amount of auditory alarms</u> sometimes will make it difficult to distinguish between them.	Insufficient specific information for an HED. Related to HEDs C2.7, C2.12 and others.
C2.1	I&C had placed many bistables in trip to perform performance test. This illuminated many of the annunciators, the result being we sustained a turbine runback and did not receive any audible alarm.	Not a human factor problem or insufficient information to identify human factors problem.
C2.5	Annoying alarm noise sometimes causes operator not to acknowledge alarms (allow to flash) during frequent alarming, thus not being alert to other alarms occurring.	Related to HED 2.7 and covered by it.
C2.8	During emergencies the alarm buzzer inhibits clear thinking.	Insufficient information for HED.
C2.9	Several successive alarms could be a nuisance.	Insufficient information for HED.

	<u>Comments</u>	<u>Explanation</u>
C3.10	Probably some. We are reviewing AR's in the emergency procedures committee with this in mind.	Insufficient information for HED.
C3.11	But they have been recently revised to help correct the situation. Have not reviewed the new windows.	Insufficient information for HED.
C6.12	Have dynotape instead of engraving.	Not a human engineering problem.
C6.13	Alarm acknowledge book defines each alarm.	Positive statement and not a HED.
D1.2	CT-1 (rod monitor) in control for various outside systems - "low wire".	Insufficient information for HED.
D1.3	Sping control unit interferes with normal plant alarms. Audibility very nonexistent. Cannot hear it.	Insufficient information. Probably not a human factors problem.
D2.2	In the control board.	Not critical to safety of plant. Insufficient information
D2.3	It depends on whether the speakers are adjusted correctly. The speaker volume varies at times.	Not specific and not critical to plant safety. See HED D4.1.
D3.1	Fire system could fall under this statement especially during hectic periods during day shift. I'm not talking about the alarms that alert you to a fire but rather the "trouble" alarms that come on as you remove and place systems into service.	Not critical to safe operation of the plant.
D3.2	Fire control panel should be removed - plant operator should operate not play at being firemen. Takes a lot of operator time.	Not a human factors problem. Management problem.
D3.3	Sping alarms.	Insufficient information.
D3.4	New air radiation/toxic monitor is loud now. Will be worse at shutdown.	Not a problem critical to plant safety.
D2	Two way radio communications.	Not a problem critical to plant safety. Insufficient information.



	<u>Comments</u>	<u>Explanation</u>
D4.3	Fire radios could be used for continuous communications with aux operators during unusual conditions.	Not specific enough to be critical to plant safety. HED.
D5.3	Portable radios are not effective in some areas of plant. The fire brigade uses these radios and they could be used in emergency conditions or when normal communications aren't available.	Not specific enough to be HED.
D5.5	Ability to page from any phone is advantageous.	Insufficient information for HED.
D5.6	Phone at each desk. Our phone systems good and above average I'm sure. Good reliability.	Positive statement. No HED.
D5.7	We used to be able to pick up the phone, push one button and page. Now you have to dial a 4 digit # to page and then another 4 digit # to talk.	Positive statement. No HED.
D5.8	Plant page from control room has an override feature that allows control room to override other pages.	Positive statement. No HED.
D5.9	The normal phone system used to be effective but since installing the dimension system, the entire system has failed several times. This really puts operations in a bind. The phone company doesn't respond for several days.	Not specific enough for HED.
E1.3	Digital displays.	Insufficient information for HED.
E1.4	System prints with component status and parameters (like at SNUPP's).	Insufficient information for HED.
E1.6	We have a large number of procedures and for a given problem it is sometimes difficult and very time consuming to find the proper procedure. It would be helpful if we could, for example, enter a value, BHR, name of equipment and receive a list of procedures that might apply. The same should be done with Tech. Spec. Current procedure turn around too long if it is truly an emergency.	This is not critical to plant safety and therefore not an HED. Not sufficiently specific.



	<u>Comments</u>	<u>Explanation</u>
E2.2	Part length rods extraneous.	Part length rods were removed a number of years ago. RPI for them will be removed as part of RPI upgraded.
E2.4	All hardcopy printouts useful.	Positive statement and not an HED.
E2.5	Almost all useful - most important - analog trend recorder where input is controlled by operator - (parameter monitored as well as recorder range!).	Positive statement and not an HED.
E2.6	Control room operations entail monitoring for change in parameters - and putting together information to tie together an "effect" with a "cause" - all info is useful (sometime or another).	Positive statement and not an HED.
E2.7	R-11, R-12 - Hardcopies allow you to check trends. Useful.	Positive statement and not an HED.
E2.8	Computer: trend, alarm and log printouts, alarm typewriter, all useful.	Positive statement and not an HED.
E2.9	(Xenon) predict useful. R	Positive statement and not an HED.
E2.10	Thermocouple maps (in reactor core) useful.	Positive statement and not an HED.
E3.3	None with the P250 Computer - the other systems available presently in the control room lack good written procedures.	Not sufficient information for an HED.
E3.4	The procedures could be written better (ex. emergency during tube rupture).	Not an HED on basis of information. Note that EOPs have been revised since the time of the survey.
E3.5	Not with computer user books.	Positive statement and not an HED.
E3.6	There aren't that many with present computer.	Positive statement and not an HED.
1	The problem that could occur is if the maintenance personnel work "outside" the isolation boundary setup as per request to operation.	Not a human factor problem, but an enforcement and management problem.



	<u>Comments</u>	<u>Explanation</u>
F1.2	The only problem is too many "by the book" procedures can be going on at one time.	Not a HF problem critical to plant safety. Management and enforcement of procedures problem.
F1.3	Specifically none comes to mind, yet if a maintenance procedure does not specifically state it is to be performed by operations personnel then the maintenance man may perform the step right or wrong!	Not a problem statement of HED.
F1.4	Communications normally good.	Positive statement.
F1.5	On the most part, it is very helpful the way the managers of different shops research their hold request and safety for different jobs and their help in seeing that operators understand the nature of their work request and cooperation with operations department in that any impact of their maintenance on operations is well known before work begins.	Not a problem statement.
F2.1	Lack of storage space to have these supplies stored for quick access and easy to locate.	Not critical to plant safety as stated. However, access to supplies has been improved.
F2.3	Chart locker outside control room. Adequate supply of bulbs and ink kept in HCO drawer.	Not a critical problem as stated.
F2.5	Seem to always have a pen shortage during outages. Both the old chart and replacement are in the same area	Not a HED as stated. Not critical to safety.
F2.6	so there is little chance of coming up with the wrong replacement.	
F2.7	Supplies are kept in or near CR.	Not a HED as stated. Not critical to safety.
G1.1	One observation, it seems on startup and shutdown you are often in more than one "O" procedure at the same time. Should be a smoother flow path, maybe one giant cook book recipe to get you from cold to hot, hot to steaming.	Not sufficiently specified to be an HED. Not critical to safety as stated.



	<u>Comments</u>	<u>Explanation</u>
G1.2	It seems that as soon as we get accustomed to using a procedure someone changes them to a new format which makes them confusing again.	Not sufficiently specified to be an HED. Not critical to safety as stated.
G1.4	Fire procedures are ineffective.	Not sufficiently specified to be an HED.
G1.5	Emergency procedure which in a few cases becomes confusing. Rewriting may clarify them.	Not sufficiently specified to be an HED. See G1.10 below.
G1.8	Cold to hot shutdown - it works but very hard in some places to understand.	Not sufficiently specified to be an HED.
G1.9	Fire system SC 3,16, 214 are effective.	Positive statement. No HED.
G1.10	All emergency procedures are particularly effective, but they are being rewritten at this time.	Positive statement. No HED.
G1.11	Most procedures are effective.	Positive statement. No HED.
	Drawings can be more up to date. Schematic drawings can be made simpler to read, cleaned up and put in standard format.	P&IDs have been upgraded.
G2.5	Update FSAR.	Not critical enough for HED. FSAR was revised in Dec. 1984 and is now maintained up to date.
G2.6	More TAC info about control board circuitry.	Nice to have. Not critical enough for HED.
G2.9	We lack space for additional information boards.	Not a human factors problem. Not specific. Nice to have.
G2.10	Operations is working on part of this as a recommendation by INPO.	Not a human factors problem. Not specific.
G2.11	The 0-9.1 could be done away with.	Not a human factors problem. Not specific justification..
G2.12	Analog trend recorders effective.	Positive statement. Not a HED.
G13	The curve book is effective. A book that has dilution/boration monographs, NIS data for procedure 0-6.4, power range data ret.	Positive statement. Not a HED.



	<u>Comments</u>	<u>Explanation</u>
G2.14	All aids.	Positive statement. Not a HED.
G2.15	Delta flux target off of computer (limits, present valve, trend analog trace).	Positive statement. Not a HED.
G2.16	System flow prints on walls near the system to be operated. Effective.	Positive statement. Not a HED.
G2.17	RIL table effective.	Positive statement. Not a HED.
G2.18	The ones on the back panel; all the ones that we now use are useful.	Positive statement. Not a HED.
G3.1	Logs insure operator observation of all equipment at least once/ hour - they require <u>operator review</u> or computer "parameter deviation" programs to monitor trends.	Positive statement. Not a HED.
	Most control room logs could be incorporated into the computer.	Positive statement. Not a HED.
G3.2	When computer is out you must take a yellow log that includes almost all control board instrumentation. This is unnecessary and causes the operator to spend too much time taking the log instead of operating the plant.	Not critical to safe operations. No HED.
G3.3	There are many logs we take that could be done away with (example filter D/P). They could be handled when PTs are performed.	Not critical to safe operations. No HED.
G4.1	Power calorimetric - time consuming, especially when have to do many on one shift (8 hours) - redundant to computer calculations.	Insufficient justification for HED.
G4.2	0-6-4 (core quadrant tilt calculation).	Insufficient justification for HED.
G4.3	Calometrics are on computer now, but not on plant computer.	Insufficient justification for HED.
G4.4	I/M plots should be replaced with 8-fold graphs.	Insufficient justification for HED.

	<u>Comments</u>	<u>Explanation</u>
64.5	Yes, should have 2 adding machine size calculators with desired functions (i.e. memorys, exponent function, V, logs).	Insufficient justification for HED.
H1.1	Control room personnel should all be given an opportunity to participate/advise <u>maintenance</u> operations during shut down/refueling ops for experience in interaction between departments as well as being in charge - the planning involved!	Nice to have, but is a management and not human factors problem.
H1.2	Selection and placement of modifications, especially those located in control room.	Not sufficiently specific to be a human factors HED.
H1.3	Rotate on shift personnel off of shift for a time to assist results and test three or six months at a time.	Management problem as described and not critical to safe operations as specified.
H1.4	Certain performance tests such as radiation monitoring system should be handled by our results and test dept. - the PT ties up many on shift personnel.	Management rather than human factors problem.
H1.5	Clerical and administrative function could be performed by other than control room personnel, i.e., holding log, issuing of keys, emergency response contacts.	Management problem maybe.
H1.6	Spent fuel should only be moved by operators or equivalent (people who know the consequences of a mishap).	Not a HED as stated. Others can understand consequences of a mishap.
H1.7	Maintenance foremen should be required to sign for the second verification of hold tags.	Insufficient justification for HED.
H1.8	Control room re-design. R	Insufficient justification for HED.
H1.9	Health physics should have control of locked area log.	Insufficient justification for HED.
H1.10	Testing - valve operating and closing time may not be known to operators since they do not participate in the testing.	Can be taught operating and closing times.



Comments

Explanation

- | | | |
|------|--|---|
| H2.1 | There are times when due to breaks, waiting for part, etc., a large group of maintenance people will congregate in the control room. This distraction can be lessened by having them go behind the control board or asking them either to quiet down or leave the control room. | This is a management problem of enforcing existing rules. |
| H2.2 | Occasional traffic (unnecessary) in control room. This is especially true during shutdowns and when we have a plant problem. A certain amount of socialization takes place in every work area - <u>yes even</u> in nuclear power plant control rooms - each operator must decide for how long or how much his attention will be removed from monitoring vital equipment! An unusual number of people seem to gather in control room during the day. Especially when I & C and results and tests are up here. HP's come in and out. No one pays attention to the signs which request that permission be asked before entering. Too many unnecessary people in the control room on dayshifts. Only those who do some form of work in it should have access to the control room. Weed them out on security access on door cards. Control room seems to be a gathering place for day workers when they want to get away from their jobs. Many people coming into control room to have SWPs signed by shift supervisor. | This is a management problem of enforcing existing rules. (see HED 172) |
| H2.3 | Construction - neither can be avoided. | Not a HED. Management problem. |
| H2.4 | The control room floor (elevated section) is a constant problem. | Not a HED since justification is insufficient. |
| H2.5 | Background noise in control room. | Insufficiently specified to be a HED. |



	<u>Comments</u>	<u>Explanation</u>
H2.6	Keys to locked hi radiation areas - should be assigned to be under control of HP dept - as they should be.	Not a human engineering problem but possibly a management problem.
H2.7	Security tours through control room.	Management problem if a problem.
H2.8	Chemists drawing samples in turbine sample sink fail to call operators. Sampling causes control room alarm which requires actions to be taken. Phone call to control room prior to sampling removes problem.	Not a critical HED problem of safety. A procedural problem.
H2.9	Any spurious alarm (such as sping unit, hi flux at shutdown, etc.).	Insufficient information for HED.
H3.1	Rarely is a large item neglected in the turnover. I think the people who present the best turnover are those that keep an "unofficial" chronological list of the shift activities.	No problem stated.
H3.2	Each turnover should be sensitive to the length of time <u>his relief</u> has been away from control room activities (vacation, days off, etc.) if the period has been extended some background info may be lost by the incoming operator - however only 1/4 licensed personnel in control room.	No significant critical problem specified.
H3.3	This item is only as good as the person giving the turnover. By following procedure you can have a very good turnover, but with a steady state plant things are omitted. Things are much different during shutdown, plant status is more dynamic, turnover's are much more detailed. During shutdowns, during evaluations a pre-shift briefing might be helpful. Stop all work and clear everyone (extra) out of the control room.	This is not a HED problem. It may be a management enforcement problem

	<u>Comments</u>	<u>Explanation</u>
H4.2	<u>Dilution</u> of control experience due to large license classes, seeking other employment, other jobs - solution - make operations department a desirable place to be - 6th shift - a line of progress out of rotating shift work - something.	Not a human factors problem necessarily. Also does not appear to be critical to safety.
H4.3	There could be problems with too many people on a shift stepped up at once.	No problem specified. Only conjecture.
H4.4	Experienced persons on shift are becoming rarer. Many new employees - good operators - are ending up on shifts with average of about 6 years total control room time.	No problem specified. Only conjecture.
H4.6	Excessive overtime is not good for safe operation.	No specific problem given. Only a general statement. No HED.
H4.7	No defined duties for control room foreman. 1) he should be in charge of HCO and CO. 2) he should sign in and out on applicable forms.	Management problem possibly. No HED.
H4.9	During accident conditions, I feel there could be situations where there is a serious lack of man-power, especially on back shifts.	Conjecture rather than specific problem.
H4.10	The present number and structure of the shift is a vast improvement over the shift compliment of say 2 years ago. We are much better prepared to handling both normal and abnormal events.	Positive statement. No HED.
H4.11	There are enough licenses in the control room now that we have the control room foreman.	Positive statement. No HED.
H4.12	Emergencies - staffing better.	Positive statement. No HED.
H4.13	100% steady state power. Staffing appropriate.	Positive statement. No HED.

<u>Id</u>	<u>Comments</u>	<u>Explanation</u>
11.1	You can <u>always</u> use more training on the major accidents.	General statement. No specific HED.
11.2	Dropped rod, need more training.	General statement. No specific HED.
11.6	Control room inhabitability.	General statement. No specific HED.
11.7	Loss of instrument and control air.	General statement. No specific HED.
11.8	If I could think of any I would get info about them - it would be training's job to help me acquire this info and incorporate into operations procedures - at present time this works quite well.	General statement. No specific HED.
11.9	We have addressed just about all plausible scenarios except one - nuclear war - who will man the plant.	Not a specific HED. May be management policy concern.
11.10	On recent system modifications, because of lack of time, instructions are done by reading and acknowledging.	General statement. No specific HED.
11.11	Loss of source water, etc.	General statement. No specific HED.
11.12	Station blackout.	General statement. No specific HED.
11.13	Simulator training has been good. When we get our own, it will be better.	Positive statement.
11.14	Simulator training. Otherwise the training department is inept in as far as not properly trained to teach others. Too much garbage items occupy training time (ex. first aid). Systems are not covered effectively, in depth on secondary and primary system.	General criticism, not a HED.

<u>Code</u>	<u>Comments</u>	<u>Explanation</u>
11.15	You can never have enough training! The reason I selected many is because I feel that simulator training at SNUPPS and Zion hasn't helped me as much as it should. I've seen how a four looper acts, but been told how a two looper acts; which will I remember? I've had the opportunity to operate steam main feed pumps, GE EH unit, and Hagan Controller many many times, but I've rarely had the opportunity to operate the Foxboro Controller here. Using our procedures at simulator is useless most of the time because you may be required to operate something they don't have or vice versa. I'm not really sure if I have the confidence to say I have enough training.	May be management problem. Not specific enough for HED. Simulator is not only way one may be trained.
11.16	The major accidents - training effective.	Positive statement.
11.1	A number of analog trend recorders on board - with a large number of <u>operator inserted</u> parameters available to be monitored. These trends would allow the parameter to be monitored on as large or small a scale as the operator desired - as well as generate a computer alarm when certain "alarm limits" were inserted in the control range determined by the operator.	Nice to have, but not critical to safe operations.
J1.2	Upgrade flow diagrams and prints.	P&IDs have been upgraded. (see HED 166)
J1.3	I would like all the curves converted to tables which are much easier to use. I also would like a "flow chart" showing the procedures necessary to get from CSD to Full PWR.	Nice to have, but not critical to safe operations.
J1.4	We have what we need for S/U's and S/D's. A real useful aid is the analog trend recorders. Could use 3 of them.	Nice to have, but not a HED.

	<u>Comments</u>	<u>Explanation</u>
J1.8	More simulator time.	Not a HED. Nice to have. Should be accomplished with new plant specific simulator.
J1.9	CRT's.	Will be provided with new plant computer.
J1.10	Data general computer.	Insufficient justification.
J1.11	Procedures could be a little more detailed in certain areas as these evaluations are not performed as frequently as in the early days.	General comment, but no specific HED.
J1.12	Large digital displays on control board from computer inputs (Tave, power, etc.).	Nice to have, but not a HED critical to plant safety.
J1.13	Saturation curve permanently mounted, thermocouple map trended on CRT, mimic layout of equipment on board.	Nice to have, but not a HED.
J1.14	CRT display of system flow, prints, logic.	Nice to have, but not a HED. Saturation curve and trend curves will be available on new plant computer.
J1.15	As soon as the 115kv benchboard is removed a control room foreman station (elevated) should be constructed. This should have phones, procedures, useful data, etc.	General suggestion, but no detailed justification for a HED.
J1.18	Mimic layout on board.	Nice to have, but not critical to safety.
J1.19	Upgrade flow diagrams and prints.	See J.1.2.
J1.20	Digital display on MCB, we could put any one of a number of parameters up there, ex. Tave, RC8 press, etc. Similar to Zion and Snupps.	Nice to have, but not a HED critical to plant operation.
J1.22	Data general computer.	Insufficient justification for HED.
J1.23	CRT display of system flow prints, logic.	Insufficient justification for HED.
J1.24	Telex copy machine to send messages to other departments during site contingency - drill or conditions.	Insufficient justification for HED.

	<u>Comments</u>	<u>Explanation</u>
Jl.27	Mimic layout on board.	Insufficient justification for HED.
Jl.28	There aren't any parameters or inputs, that are not already designed into the plant, that we do not use. This question is too open ended. I didn't find a section that covered faulty controllers. We have a boric acid integrater on the primary make up system that has not maintained an adequate or correct total for a long time. We need a new design, one which is reliable.	Statement of general problem which may be an engineering problem rather than a HED.
Jl.29	Better E Procedures. We need to clean up the immediate actions so they leap out at you and are not hidden behind Precaution, Notes, etc. This is in the process of being done.	EOPs have been revised.
Jl.30	Graphic displays would be nice but we have what we need to handle most accidents. However, a RX vessel water level indication would be nice.	Vessel level instrument is being installed.
Jl.31	We have improved just about all operator aids.	Nice to have. Not a HED.
	A computer index that we could use to cross reference any valve pump emergency situation and receive a list of procedures that might be useful.	Nice to have. Not a HED.
	Digital display for parameters.	
Jl.32	New computer system whenever we get it.	New computer is being installed.
Jl.33	Present instruments and aides are sufficient.	No problem stated.
Jl.34	We have what we need for normal ops.	No problem stated.
Jl.36	Most systems, aids etc., adequate, and with new computer coming routine operations will be more efficient and in abnormal operation it will be major help.	No problem stated.



Appendix I

Unique Tasks

RGE Task Header Report

- 1 Actuate SI
- 2 Add Makeup to RWST as Necessary
- 3 Align Containment Spray System for Recirculation
- 3A Align SI System for High Head Recirculation
- 3B Align RHR System for Low Head Recirculation
- 4 Align SI Pump Suction from BAST to RWST
- 5 Deleted
- 6 Check if Voids Exist - Use Attachment A
- 7 Check if AC Emergency Power is Restored
- 8 Check AFW Pumps Running
- 9 Check Auxiliary Building Radiation Monitors - NORMAL
- 10 Check if Break is Isolated
- 11 Check if Charging Flow Has Been Established
- 12 Check if Charging Flow Has Been Established
- Check if Charging Flow Has Been Established
- Check Charging Pump Suction - ALIGNED TO VCT
- 14 Check Containment Hydrogen Concentration
- 15 Check Containment Hydrogen Concentration
- 16 Check Containment Isolation - NOT ACTUATED
- 17 Check Containment Pressure - HAS REMAINTED LESS THAN 28 PSIG
- 18 Check Containment Radiation - LESS THAN 10R/HR
- 18A Check if Containment Spray is Required
- 19 Check if Containment Spray is Required
- 20 Check if Containment Spray Should Be Stopped
- 21 Check Containment Sump Activity Level
- 22 Check Core Cooling
- 23 Check Core Exit TCs - LESS THAN 1200°F
- 24 Check Core Exit TCs - LESS THAN 1200°F
- 25 Check Core Exit TCs - LESS THAN 700°F
- 26 Check CST Level - GREATER THAN 5 FEET
- Check DC Bus Loads
- Delete
- 29 Check if D/Gs Should Be Stopped
- 30 Check FW Status

- 30 Check if High Head Recirculation is Required
- 31A Check Instrument Air to Containment - AVAILABLE
- 32 Check Intermediate Range Flux
- 33 Check if Letdown Can Be Established
- 34 Check Letdown - IN SERVICE
- 35 Check if Main Steamlines Should Be Isolated
- 36 Check MSIV and Bypass Valves of Affected S/G(s) - CLOSED
- 37 Check MSIV and Bypass Valves - CLOSED
- 38 Check Narrow Range Level in Both S/Gs - LESS THAN 50%
- 39 Check Offsite Power Supply to Charging Pumps - AVAILABLE
- 40 Check PRT Conditions - NORMAL
- 41 Deleted Due to ES-0.4 Deletions
- 42 Check PRZR Level
- 43 Check PRZR Level - GREATER THAN 13% (50% ADVERSE CV)
- 44 Check PRZR Level - LESS THAN 87%
- 45 Check PRZR Level - LESS THAN 87%
- Return to Step 10
- Check PRZR Level - Stable
- 48 Check PRZR Level Control
- 49 Check PRZR Pressure
- 50 Check PRZR Pressure Control
- 51 Check PRZR Spray Valves
- 52 Check PRZR PORVs - ALL
- 53 Check if PRZR PORVs Should Be Closed
- 54 Check PRZR PORV Status
- 55 Check PRZR PORVs and Block Valves
- 56 Check PRZR PORVs and Spray Valves
- 57 Check if an RCP Should Be Started
- 58 Check if RCPs Must Be Stopped
- 59 Check if One RCP Should Be Stopped
- 60 Check if RCPs Should Be Stopped
- 61 Check if RCPs Should Be Stopped
- Check RCP Cooling
- Check RCP Seal Cooling
- 64 Check RCP Seal Isolation Status
- 65 Check RCP Seal Isolation Status

Check if RCP Seal Return Flow Should Be Established

67 Check RCP Status

68 Check RCP Status

69 Check RCP Status

70 Check RCP Support Conditions - AVAILABLE PER ATTACHMENT A

71 Check RCP Thermal Barrier CCW Isolation Status

72 Deleted, Contents Incorporated into Mess 89

73 Check RCS Cold Leg Temperatures - STABLE OR INCREASING

74 Check if RCS Cooldown Should Be Stopped

75 Check if RCS Cooldown and Depressurization is Required

76 Check RCS Hot Leg Temperatures - LESS THAN 350°F

76A Check RCS Hot Leg Temperatures - LESS THAN 535°F

77 Check RCS Hot Leg Temperatures - STABLE

78 Check RCS Hot Leg Temperatures - STABLE OR DECREASING

79 Check RCS Hot Leg Temperatures - STABLE

80 Check RCS - INTACT INSIDE CONTAINMENT

Check if RCS is Isolated

Check RCS Pressure - WITHIN TECH SPEC PRESSURE - TEMPERATURE LIMITS FOR
100°F/HR COOLDOWN RATE

83 Check RCS Pressure - INCREASING

84 Check RCS Pressure - GREATER THAN 350 PSIG (98 PSIG ADVERSE CV)

85 Check RCS Pressure - LESS THAN 350 PSIG (98 PSIG ADVERSE CV)

86 Check if RCS Pressure Should Be Increased

87 Check if Low RCS Pressure SI Can Be Blocked

88 Check RCS Subcooling Based on Core Exit TCs - GREATER THAN REQUIREMENTS
OF FIGURE 1

88A Check RCS Subcooling Based on Core Exit TCs - AT MINIMUM REQUIREMENTS OF
FIGURE 2

89 Check RCS Tavg - STABLE AT OR TRENDING TO 547°F

90 Check RCS Temperatures

91 Check RCS Temperatures - LESS THAN 200°F

92 Check RCS Vent Paths

Check for Reactivity Insertion From Uncontrolled RCS Cooldown

Check Reactor Subcritical

99A Check RWST Level - LESS THAN 28%

99B Check RWST Level - LESS THAN 15%



- Check for Adequate Secondary Heat Sink
- 101 Check for Loss of Secondary Heat Sink
- 102 Check if Secondary Heat Sink is Required
- 103 Check Secondary Pressure Boundary
- 104 Check Secondary Radiation Monitors - NORMAL
- 105 Check Secondary Radiation and Activity Levels
- 106 Check if Intact S/Gs Should Be Depressurized to RCS Pressure
- 107 Check if Either S/G is Not Faulted
- 108 Check if Either S/G is Not Faulted
- 109 Check if Both S/Gs are Not Faulted
- 110 Check if Affected S/G(s) Not Faulted
- 111 Check if S/Gs are Not Faulted
- 112 Check if S/Gs are Not Faulted
- 113 Check AFW Flow to Affected S/G(s) - GREATER THAN 25 GPM
- 114 Check if Feed Flow Should Be Isolated to Either S/G
- 115 Check S/G Levels
- 116 Check S/G Levels
- Check Affected S/G(s) Level
- 118 Check Intact S/G Levels
- 119 Check Intact S/G Levels
- 120 Check Intact S/G Levels
- 121 Check Affected S/G(s) Narrow Range Level - LESS THAN 100% (86% ADVERSE CV).
- 122 Check Ruptured S/G(s) Level
- 123 Control Ruptured S/G(s) Narrow Range Level - GREATER THAN 10% (25% ADVERSE CV).
- 124 Maintain Ruptured S/G(s) Narrow Range Level - LESS THAN 67%
- 125 Check Both S/G Pressures - LESS THAN 1085 PSIG
- 126 Check Both S/G Pressures - STABLE OR INCREASING
- 127 Check Affected S/G(s) Pressure
- 128 Check Ruptured S/G Pressure - GREATER THAN 514 PSIG
- 129 Check Ruptured S/G(s) Pressure - STABLE OR INCREASING
- 130 Check Affected S/G(s) Radiation - NORMAL
- 1 Check S/Gs Isolated
- 132 Check if S/G Tubes are Not Ruptured
- 133 Check if S/G Tubes are Not Ruptured

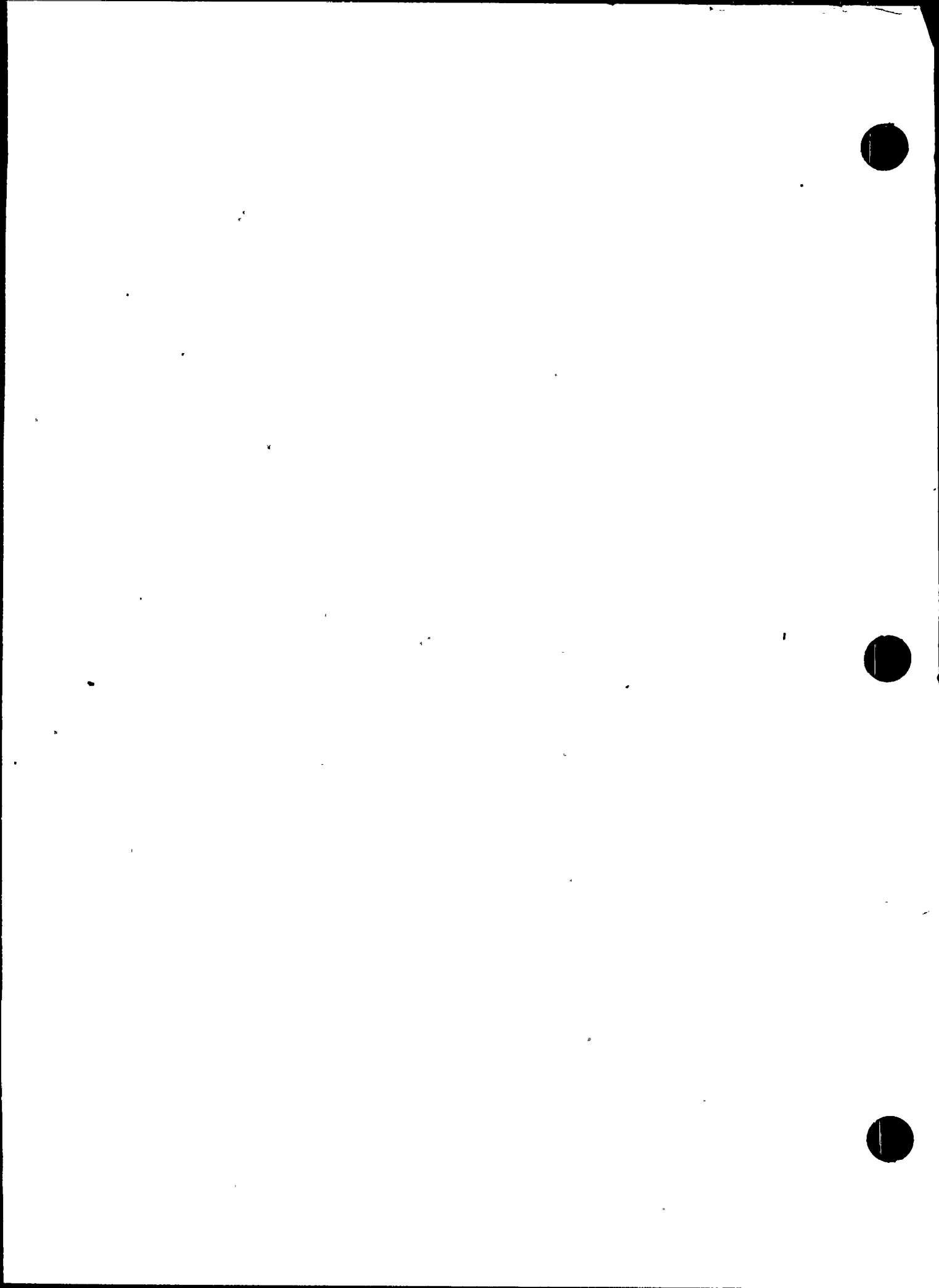


- Check if S/G Tubes are Not Ruptured
- 135 Check if SI is Actuated
- 136 Check if SI Can Be Terminated
- 137 Check if SI Has Been Terminated
- 138 Check if SI Should Be Terminated
- 139 Check if SI Should Be Terminated
- 139A Check if SI Flow Should Be Terminated
- 140 Check if SI Should Be Terminated
- 141 Check if SI Accumulators Should Be Isolated
- 142 Check if SI Accumulators Should Be Isolated
- 143 Check if SI Accumulators Should Be Isolated
- 144 Check if SI Accumulators Should Be Isolated
- 145 Close All SI Accumulator Isolation Valves
- 146 Check SI Accumulator Isolation Valve Status
- 147 Check SI Pumps - ANY RUNNING
- 148 Check if One SI Pump Should Be Stopped
- 149 Check if One SI Pump Should Be Stopped
- 150 Check if One SI Pump Should Be Stopped
- 151 Check SI Signal Status
- 152 Check Source Range Channels - ZERO OR NEGATIVE STARTUP RATE on NI-31D,
NI-32D
- 153 Check if Source Range Detectors Should Be Energized
- 154 Check S/G Radiation Levels - NORMAL
- 155 Check if Subcooled Recovery is Appropriate
- 156 Check if Transfer to Cold Leg Recirculation is Required
- 157 Check if the Following Trips Have Occured
- 158 Check VCT Makeup Control System
- 159 Continue Attempts to Establish Secondary Heat Sink in At Least One S/G
- 160 Continue Attempts to Manually or Locally Dump Steam From Affected S/G(s)
Via
- 161 Deleted Due to ES-0.4 Deletion
- 162 Deleted Due to ES-0.4 Deletion
- 163 Continue RCS Cooldown to Cold Shutdown
- 164 Continue RCS Cooldown to Cold Shutdown
- 165 Continue Filling Affected S/G(s) Until Narrow Range Level Greater Than
10% (25% Adverse CV)

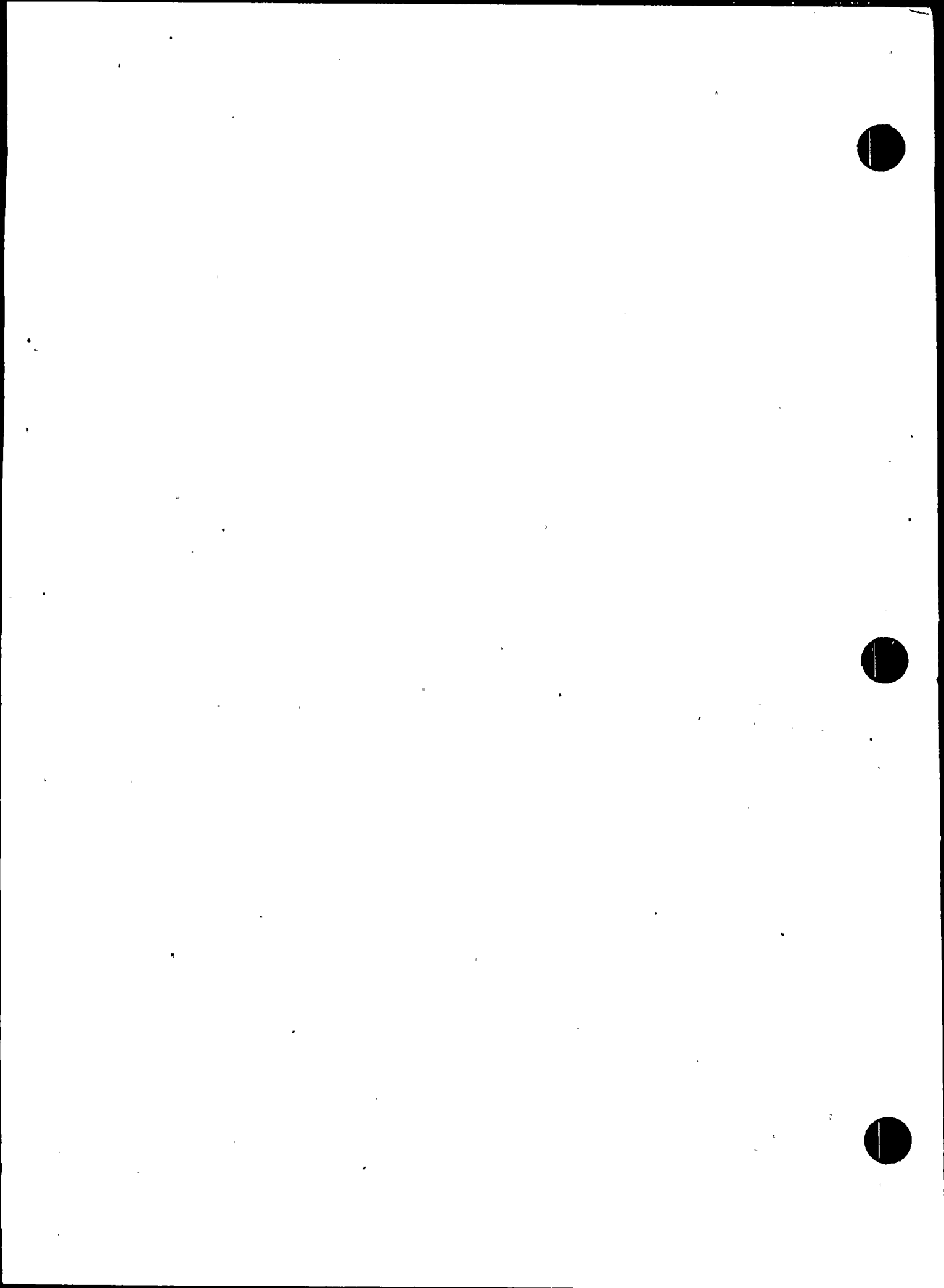
- Control AFW Flow to Minimize RCS Cooldown
- 167 Control Charging Flow to Maintain PRZR Level
- 168 Control Charging Flow to Maintain RCS Inventory
- 169 Control Charging Flow to Maintain RCS Subcooling
- 170 Control Charging and Letdown Flow to Maintain PRZR Level Between 13%
(50% Adverse CV) and 50%
- 171 Control Charging and Letdown as Necessary to Maintain PRZR Level Greater
than 13% (50% Adverse CV)
- 172 Control Charging and Letdown Flow as Necessary
- 173 Control PRZR Pressure
- 174 Control RCS Makeup Flow and Letdown to Maintain PRZR Level
- 175 Control RCS Pressure and Makeup Flow to Minimize RCS-to-Secondary Leakage
- 176 Deleted Due to ES-0.4 Deletion
- 177 Depressurize RCS
- 178 Deleted Due to ES-0.4 Deletion
- 179 Deleted Due to ES-0.4 Deletion
- 180 Depressurize RCS to Backfill From Ruptured S/G(s)
- Depressurize RCS to Minimize RCS Subcooling
- 182 Depressurize RCS to Refill PRZR
- 183 Depressurize RCS to Minimize RCS Subcooling
- 183A Depressurize RCS to Minimize RCS Subcooling
- 184 Depressurize RCS to Minimize Break Flow and Refill PRZR
- 185 Depressurize RCS to Minimize RCS-to-Secondary Leakage
- 186 Depressurize RCS and Ruptured S/G(s) to 350 PSIG (98 PSIG Adverse CV)
- 187 Depressurize RCS Using PRZR PORV to Minimize Break Flow and Refill PRZR
- 188 Depressurize Intact S/Gs to Atmospheric Pressure
- 189 Depressurize Intact S/Gs to Atmospheric Pressure
- 190 Depressurize Intact S/Gs to 260 PSIG
- 191 Depressurize Intact S/Gs to 170 PSIG
- 192 Depressurize Intact S/Gs to 170 PSIG
- 193 Depressurize Intact S/Gs to 780 PSIG at Maximum Rate
- 194 Depressurize Intact S/Gs to Inject Accumulators as Necessary
- 195 Deleted
- Determine Containment Spray Pump Requirements
- 197 Determine Maximum Allowable Venting Time
- 198 Determine if Natural Circulation Cooldown Required



Determine if Cooldown Required
199 Deleted Due to ES-0.4 Deletion
200 Determine if Additional RCS Cooldown Restrictions Are Required
201 Determine if RCS Temperature Soak is Required
202 Determine if Reactor Vessel Head Should Be Vented
203 Dispatch Personnel to Locally Close Valves to Isolate RCP Seals
204 Initiate Steam Dump From Ruptured S/G(s) to Condenser to Gradually Reduce Ruptured S/G Pressure
205 Energize PRZR Heaters as Necessary to Maintain RCS PRESS - EQUAL TO RUPTURED S/G PRESSURE
206 Energize PRZR Heaters as Necessary to Maintain RCS PRESS - EQUAL TO RUPTURED S/G PRESSURE
207 Establish Blowdown From Ruptured S/G to Gradually Reduce Ruptured S/G Pressure
208 Establish Charging Flow
209 Establish Charging Flow
210 Delete
Establish Instrument Air to Containment
212 Establish and Maintain Stable Plant Conditions
213 Establish Minimum SI Flow to Remove Decay Heat (RWST Level Less than 28%)
214 Establish Letdown
215 Deleted Due to ES-0.4 Deletion
216 Establish PRZR Pressure Control
217 Establish RCP Seal Cooling
218 Establish RCP Thermal Barrier Cooling
219 Establish RCS Bleed Path
220 Establish Stable RCS Conditions
221 Deleted
222 Establish S/G Pressure Control
223 Establish One Train of SI Flow (RWST Level Greater than 28%)
224 Evaluate Plant Status
225 Evaluate Long Term Plant Status
226 Equalize Charging and Letdown Flows
226A GO TO E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17
227 GO TO Appropriate Post-SGTR Cooldown Method

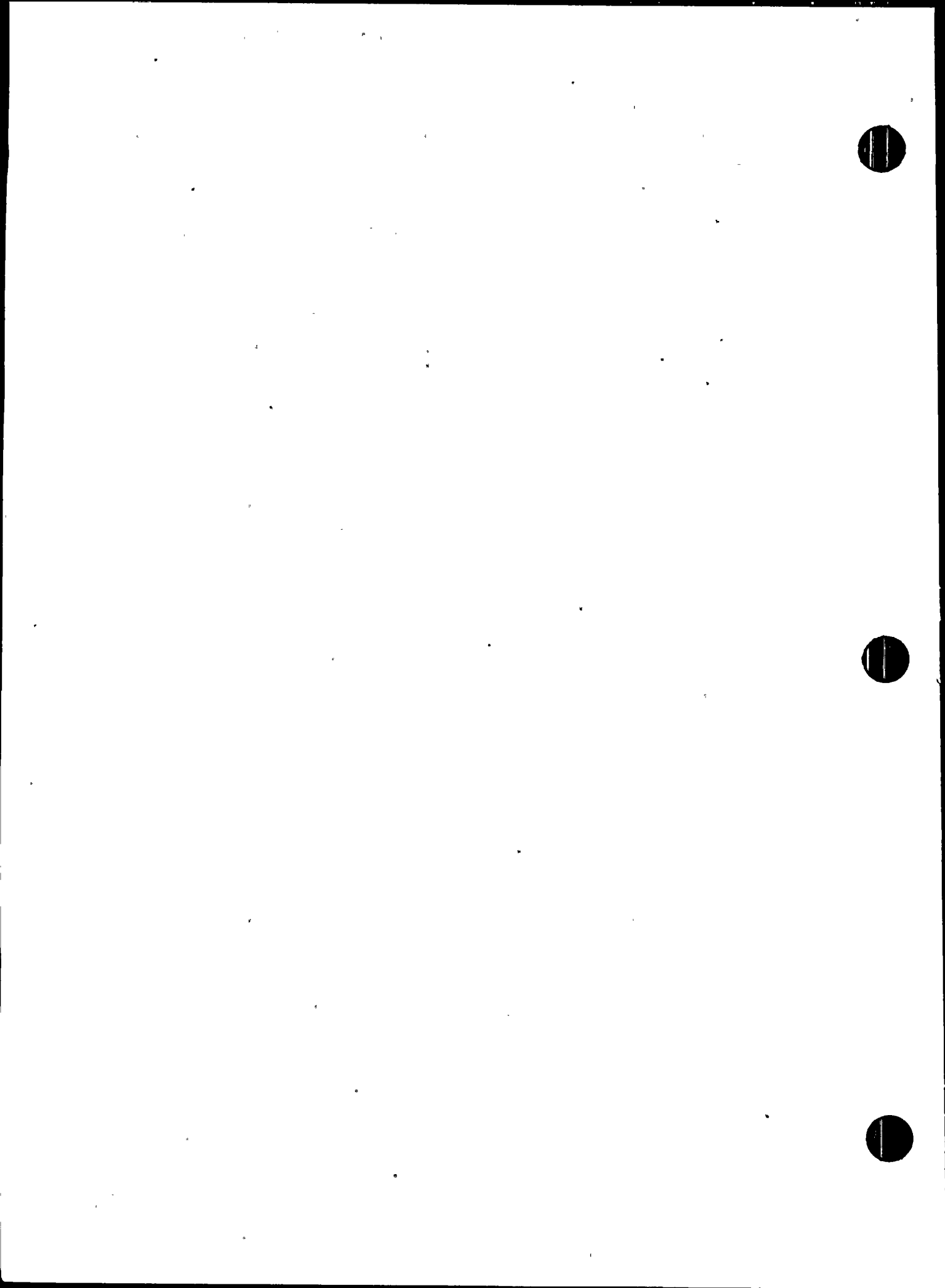


228 Identify Affected S/G(s)
229 Identify Faulted S/G(s)
230 Identify Ruptured S/G(s)
231 Increase Charging Flow to Restore PRZR Level
232 Initiate Emergency Boration of RCS
233 Initiate RCS Cooldown
234 Initiate RCS Cooldown to Cold Shutdown
235 Initiate RCS Cooldown to Cold Shutdown
236 Initiate RCS Cooldown to 350°F
237 Isolate CST From Hotwell
238 Isolate Flow From Ruptured S/Gs
239 Isolate AFW Flow to Affected S/G(s)
240 Isolate SI Accumulators
241 Isolated Faulted S/G(s)
242 Deleted - Incorporated Into MESS 241
243 Maintain Plant Conditions - STABLE
Deleted Due to ES-0.4 Deletion
Maintain RCS Heat Removal
246 Maintain RCS Heat Removal
247 Manually Align Valves to Establish SI Injection Alignment
248 Manually Load Following Equipment on AC Emergency Bus
249 Manually Load Following Safeguards Equipment on AC Emergency Bus
250 Minimize Secondary System Contamination: Consider the Following Actions
251 Notify Plant Staff of CV Radiation Level to Obtain Recommended Actions
252 Obtain Containment Hydrogen Concentration Measurement
253 Transfer Condenser Steam Dump to Pressure Control Mode
254 Place Containment Atmosphere Filtration Systems In Service
255 Place Following Equipment Switch in PULL-TO-LOCK Position
256 Place PRZR Heater Switches in the Following Positions
257 Place Following Pump Switches in Standby
258 Deleted Due to ES-0.4 Deletion
259 Prepare Containment for Reactor Vessel Venting
260A Record and Reset - WHITE TRIP TARGETS
Reset Containment Isolation
261 Reset SI
262 Review Reactor Vessel Venting Termination Criteria



Select Recovery Procedure

- 264 Shutdown Unnecessary Plant Equipment
- 264A Shutdown Unnecessary Plant Equipment
- 265 Stabilize S/G Pressures
- 266 Stop SI and RHR Pumps and Place in AUTO
- 266A Stop All SI Pumps and Place in a Standby Condition
- 266B Stop All SI, CS and Charging Pumps Supplied from RWST
- 267 Stop Pumps Taking Suction From RWST and Place Switches in PULL STOP Position
- 268 Stop Both RCPs
- 268A Check if Unnecessary Pumps Can Be Stopped
- 269 Try to Add Makeup to RCS From Alternate Source
- 269A Deleted
- 270 Try to Dump Steam From the Affected S/G(s) Via
- 271 Try to Establish Auxiliary Spray
- 272 Try to Establish AFW Flow to At Least One S/G
- 273 Try to Establish Feed Flow From Condensate System
- 274A Try to Establish Standby AFW Flow
- 274 Try to Establish Main FW Flow to At Least One S/G
- 275 Try to Establish Normal PRZR Spray
- 276 Try to Identify Unexpected Source of Water to Sump
- 277 Try to Identify and Isolate Break
- 278 Try to Locally Depressurize Intact S/Gs to Atmospheric Pressure
- 279 Try to Restore Emergency Coolant Recirculation Equipment
- 280 Try to Restore Normal Steam Release Capability of Affected S/G(s)
- 281 Try to Restore Offsite Power to All AC Busses
- 282 Try to Restore Power to Any AC Emergency Bus
- 283 Try to Restore PRZR PORV
- 284 Deleted Due to ES-0.4 Deletion
- 285 Try to Start One RCP
- 286 Vent Reactor Vessel
- 287 Verify All AC Busses - ENERGIZED BY OFFSITE POWER
- 288 Delete
- 288A Try to Energize Required Non-Safeguards Loads
- 289 Verify Adequate Shutdown Margin - BORON CONCENTRATION SUFFICIENT FOR COLD SHUTDOWN



Verify AFW Flow - GREATER THAN 200 GPM
291 Verify AFW Flow - GREATER THAN 200 GPM
292 Verify AFW Flow - GREATER THAN 400 GPM
293 Verify AFW Pumps Running
294 Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT
295 Verify Blowdown Isolation Valves From Affected S/G (CV-70,71) - CLOSED
296 Verify CCW Flow to RHR Heat Exchangers
297 Verify CCW Pumps - RUNNING
298 Verify Containment Recirculation Fans - RUNNING
299 Verify Containment Isolation
300 Verify Containment Spray Not Required
301 Verify Containment Ventilation Isolation
302 Verify Following Equipment Loaded on AC Emergency Bus
303 Verify FW Isolation
304 Verify FW Isolation to Affected S/G(s)
305 Verify All Control Rods Fully Inserted
Verify All Dilution Paths - ISOLATED
Verify Normal and Excess Letdown - ISOLATED
308 Verify Power to Both Trains of AC Emergency Busses
309 Verify Natural Circulation
310 Verify Proper Valve Alignment
311 Verify PRZR PORVs - CLOSED
312 Verify Reactor Trip
312A Verify Reactor Trip
313 Verify Adequate RCS Bleed Path
314 Verify RCS Feed Path
315 Verify Reactor Subcritical
316 Verify No Backflow From RWST to Sump
317 Verify Service Water System Operation
318 Verify SI and RHR Flow
319 Verify SI Flow
320 Verify SI Flow Not Required
321 Verify SI Flow Not Required
321A Verify SI Flow Not Required
321B Verify SI Flow Not Required
322 Verify SI Flow Not Required



Verify SI Flow Not Required

324 Verify SI Flow Not Required

325 Verify Adequate SI Flow

326 Verify SI Flow in All Trains

327 Verify SI Flow

328 Verify SI and RHR Pumps Running

329 Verify SI Valve Alignment - PROPER EMERGENCY ALIGNMENT

330 Verify Turbine Trip

4375r



Appendix J

NRC Audit Recommendations



A number of concerns with the DCRDR process were identified as a result of the NRC audit. The audit team submitted the following recommendations to enhance RG&E's ultimate acceptability. The paragraph number of the RG&E response to each of these recommendations in Volume 1 of the Summary Report is shown on the right.

Summary Report
Paragraph No.

NRC Audit
Recommendations

- | | |
|-----|--|
| 2.1 | The specific qualifications and responsibilities of each DCRDR team member along with their level of effort in each DCRDR task should be documented in the final summary report. |
| | |
| 7.2 | The system function and task analysis should be expanded to define instrument and control operability requirements (e.g., instrumentation needed to identify EOP entry conditions must be operable under power supply and environmental conditions that result from the transients requiring use of the EOPs). |
| | |
| 7.2 | A methodology for incorporating revisions to the EOPs into the task analysis should be developed and formalized. |
| | |
| 7.2 | The task analysis should be reviewed to verify consistency with the existing EOPs in order to eliminate the types of "mechanical problems" identified by the audit team. |
| | |
| 6.2 | The DCRDR summary report should include the details of the control room inventory process as described to the audit team. |



Summary Report
Paragraph No.

NRC Audit
Recommendations

- 9.0 RG&E should review the implications of the HEDs identified by the audit team, but not by the DCRDR control room survey, in order to determine if these findings imply a systematic problem with the survey process. Conclusions, and corrective actions should be discussed in the summary report.
- 9.5 The control room lighting survey should be repeated.
- 11.1 The process for assessing cumulative and interactive effects of HEDs should be better defined and formalized. The ultimate process for identifying these effects should be described in the summary report.
- 11.2 REG&E should be careful that benefits of HED correction are given full consideration along with cost during the process of determining which HEDs should be selected for correction.
- 9.1
9.3 RG&E should reevaluate the desirability of correcting the various annunciator problems identified, the lack of lamp test capability, and the difficulty in accessing remote shutdown equipment.
- The assessment of control-display relationship HEDs, particularly those related to Engineered Safety Features, should be reviewed.



Summary Report
Paragraph No.

NRC Audit
Recommendations

- 9.4 The HED relating to the difficulty of maintaining steam generator water level during low power operation should be carefully assessed considering the historical problems with the control system, the potential consequences of misoperation, and the operators' comments about their problems with operation at low power.
- 11.1 Care should be taken to insure that the "Other" safety significance category is not inappropriately used during the HED assessment process. Any HED that affects the operator's use of a safety related display or control should be categorized as a safety related HED.
- 11.4 Once the plant specific control simulator becomes available, RG&E should take full advantage of that facility to evaluate the suitability of proposed control room modifications.
- 12.0 The processes for coordinating other NUREG-0737 activities with the DCRDR process must be better defined and formalized. The specific problems identified by the audit must also be resolved. The specific actions taken to resolve the coordination issue should be discussed in the DCRDR summary report.

12
13
14
15
16

17
18
19

20

21
22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

The NRC submitted the following suggestions not directly related to the DCRDR requirements of NUREG-0737, Supplement 1. The paragraph number of the RG&E response to each of these suggestions in Volume I of the Summary Report is shown on the right.

Summary Report
Paragraph No.

NRC Audit
Recommendations

- | | |
|-----|---|
| 9.4 | HEDs identified by the review of the response to the Ginna steam generator tube rupture event (NUREG-0909) should be factored into the DCRDR process. |
| 5.6 | Operator survey comments that were not evaluated as HEDs should be otherwise considered by RG&E. |
| 9.3 | The design modifications made to the remote shutdown capability should employ conventions and nomenclature that are consistent with those used in the control room. |
| 9.3 | A system function and task analysis should be conducted for the remote shutdown system. This analysis should address the coordination and timing of manual actions to be accomplished by the station operators. |



DETAILED CONTROL ROOM DESIGN REVIEW
R.E. GINNA NUCLEAR POWER PLANT
FINAL SUMMARY REPORT
PROGRAM IMPLEMENTATION
VOLUME 2, PART 1
HEDs 1-252

Submitted by
Rochester Gas and Electric
December 1985

4377r

Table of Contents

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1-1
2.0 RESULTS	2-1
2.1 Groupings	2-2

APPENDIX

1.0 INTRODUCTION

Rochester Gas and Electric (RG&E) had a Detailed Control Room Design Review (DCRDR) performed on its Robert E. Ginna Nuclear Power Plant. The purpose was to identify and correct design deficiencies to lower the probability of human error and to effectively mitigate emergency conditions. The following review processes were used to analyze the man/machine interface within the control room: historical document review, operator survey, inventory, task analysis, verification, checklist and validation. As a result of these review processes, potential Human Engineering Discrepancies (HEDs) were identified. These potential HEDs were reviewed and assessed for their impact on plant safety, plant operability and NRC guidelines. In addition, appropriate corrective actions for each HED were determined and a schedule was developed for the implementation of these corrective actions.



2.0 RESULTS

The Appendix contains the completed HEDs for Ginna Station. The HEDs are arranged sequentially according to HED number to facilitate locating a particular HED. The following information is presented on the HED forms:

HED NUMBER: Numbers were assigned to the HEDs for identification only.

UTILITY NAME: RGE

ORIGINATOR: Provides the initials of the Human Factors Specialist who wrote the HED

PLANT: GINNA

DATE: Date that the HED was written

ASSESSMENT:

CATEGORY: 1 - Safety related
 2 - Non-safety related
 3 - Other

LEVEL: a - Highest significance - could substantially affect a safety system or operator response during an emergency situation

b - Significant - could substantially affect or has substantially affected a non-safety system or operator response during routine non-emergency operation

c - Least Significance - could or has affected operator response in a non-substantial way

RATING: W - Further Evaluation Required

X - Fix

Y - Justify as is

WX - Further evaluation is required to address part of the discrepancy, while a decision to fix the remaining part has been made

XY or YX- Part of the discrepancy is justified as is, while the remainder must be fixed

DESCRIPTION OF DISCREPANCY: Describes the problem identified by the HED

COMMENTS: Provides additional information on the HED; often adds information on the context of the HED

RESPONSE: A statement involving either the actions that will be taken to alleviate the discrepancy or the justification of why no action will be initiated

SOURCE OF DISCREPANCY: Identifies the DCRDR procedure that identified the HED

EQUIPMENT ID NUMBER: Identifies the panel, equipment identification number and equipment name of the components cited on the HED



2.1 Groupings

The HEDs have been grouped to allow examination according to two different parameters to help show functional relationship among the HEDs and to show which DCRDR procedures generated the HEDs. Table 2-1 shows a matrix of functional groupings and the ratings of the associated HEDs. Table 2-2 shows the HEDs generated by each DCRDR procedure.

Note that the following HED numbers were deleted: 37, 38, 179, 233, 328, 330, 335, 340, 343, 387, 401, 440.



Table 2-1. HEDs Categorized By Functional Grouping and Rating

GROUPING	RATING				
	W	X	Y	WX	XY or YX
Alarms	147	45, 114, 115, 116, 129, 157, 214-216	122, 148, 54, 204, 244, 489		
Annunciators	120, 121, 130- 134, 139, 140, 206, 393	117, 119, 209	118, 135-138, 141, 194-196, 198, 199, 201, 203, 205, 211, 319, 344, 356, 449, 456		
Communications		150, 151, 153, 218	72, 149, 152, 217, 219, 220		
Computer Systems		155, 156, 158, 159, 246, 249, 334, 336	154, 248, 326, 327, 329, 331- 333, 337-342, 463		
Controllers	398	78	95, 101, 314		



Table 2-1 (continued)

GROUPING	RATING				
	W	X	Y	WX	XY or YX
Control Room Layout		46, 48, 70, 82, 87, 109, 110, 226-230, 234	47, 68, 69, 71, 83, 100, 103, 104, 105, 107, 108, 111, 112, 113, 221-225, 231, 232, 235- 236, 301, 316, 317		
Controls Needed	43	41, 478	40, 42, 44, 353, 370, 394, 457, 475, 477, 488		
Displays Needed	65, 455, 472	49-52, 60, 61, 64, 67, 177, 252, 315, 408, 413, 415, 418, 425, 426, 450, 460-462, 464, 467, 469, 471	53, 55, 56, 62, 63, 66, 169, 454, 458, 459, 465, 466, 470, 473, 474, 479- 481		
Documentation/ Training/Staffing		163-168, 171, 173, 175, 176	174, 250		
Environment		73-76, 172, 325, 487	31		

Table 2-1 (continued)

GROUPING	RATING				
	W	X	Y	WX	XY or YX
Equipment Characteristics	26	2, 29, 160, 161, 263, 264	30, 34-36		
Fire System		202, 212, 215	170, 251		
I&C Relationship		81, 86, 91, 92, 304, 308-312, 349, 361	77, 79, 80, 88, 93, 106, 162, 178, 181, 210, 300, 302, 313, 346, 348, 354, 355, 357-360, 364		
Labeling and Shading		1, 6, 14, 22, 32, 33, 90, 97, 127, 142, 144- 146, 180, 191, 207, 245 253- 256, 258-262, 265-270, 278-281, 283, 295-298, 305, 306, 318, 320, 323, 324, 347, 352, 395, 397, 399, 400, 402-404, 443, 444	123-126, 128, 143, 187, 192, 193, 200, 208, 257, 282, 299, 307, 321, 322	182-186, 188- 190	247
RCS-S/G△P		59, 373, 453			
Remote Shutdown	367	241	237-240, 242, 243, 365, 366, 368, 369		



Table 2-1 (continued)

GROUPING	RATING				
	W	X	Y	WX	XY or YX
Scales	393, 441	3, 7, 11, 16, 27, 28, 102, 380, 403, 411, 416, 417, 422- 424, 428, 430- 432, 436-438, 447	4, 8, 10, 12, 13, 15, 362, 363, 374, 375, 378, 379, 381-392, 405-407, 409, 410, 412, 414 419-421, 427, 429, 433-435, 439, 446, 448, 483, 485, 486		9
Status Lights	19	58, 89, 197	17, 18, 20, 21, 23-25, 57, 272- 275, 303, 442, 468, 476		
Switch Plates		286-288, 350, 351, 371, 376, 377, 396, 445, 294	271, 276, 284, 290-293		
Switch Protection		94, 98, 99, 372 285	289, 482		
Total Charging Flow		64, 345, 451	452		



Table 2-2. DCRDR Procedures and Associated HEDs

<u>DCRDR Procedure</u>	<u>Associated HEDs</u>
Operator Survey	39-115, 250-252
Historical Review	47, 116-178, 488, 489
Task Analysis	45
Checklist	1-36, 98, 180-232, 234-249, 253-315, 318-325, 365-369, 487
Verification of Availability	360, 379, 393, 405-439, 441-481, 483, 485, 486
Verification of Suitability	370-378, 380-386, 388-400, 402-404, 482
Validation	83, 298, 299, 316, 317, 344-359, 360-364
SPDS Review	326, 327, 329, 331-334, 336-339, 341, 342

Note: In some cases, more than one DCRDR procedure is referenced by a given HED.



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0001
TILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

DISPLAYS ARE NOT IDENTIFIED AS TO WHETHER THEY REFLECT DEMAND OR ACTUAL STATUS.

COMMENTS

DISPLAYS SHOULD CLEARLY INDICATE WHETHER THEY REFLECT DEMAND OR ACTUAL STATUS. FOXBORO CONTROLLERS HAVE A DEMAND INDICATION THAT IS NOT LABELED AS SUCH.

RESPONSE

CONTROLLERS WILL BE LABELED TO INDICATE DEMAND STATUS BY THE END OF THE PROJECTED 1ST REFUELING OUTAGE (4-1-87).

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.1.B(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	9508D&G	RECIRC CONT VLVS BORIC ACID FLOW CONTROL BLENDER CHG PUMP #1 SPEED CONTROL CHG PUMP #2 SPEED CONTROL CHG PUMP #3 SPEED CONTROL MAKEUP H2O BORIC ACID BLENDER	
	107	HOTWELL LEVEL	
	2HPC-431C	SPRAY VLV CONTROL	
	2HPC-431H	SPRAY VLV CONTROL	
	3359		
	431K	VARIABLE HEATER CTL PRESSURIZER PRESS	
	484		

CV-56-3411 ATM STM DUMP PRESS CONT LOOP
CV-57-3410
HCV-466
HCV-476
HCV-480 FW FLOW BYPASS VLV
HCV-481 FW FLOW BYPASS LOOP B
HCV-626 RESID HT REMOVAL LOOP RC RETURN
PCV-135 LETDOWN LINE CONTROLLER
TCV-130 NON-RUN HX LETDOWN TEMP
 HYDROGEN TEMP CONTROL
 TURBINE OIL TEMP CTL

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0002
ILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

WHEN PANEL INSTRUMENTS FAIL OR BECOME INOPERATIVE, THE FAILURE IS NOT APPARENT TO THE OPERATOR. ALL INSTRUMENTS FAIL DIFFERENTLY.

COMMENTS

THERE SHOULD BE SOME INDICATION THAT THE INSTRUMENT HAS FAILED. FOR EXAMPLE, GOING OFF SCALE.

RESPONSE

ALL INSTRUMENTS FAIL AT 0 OR AT THE LOW END OF THE SCALE. NO CORRECTIVE ACTION IS NECESSARY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.1.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0003
ILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

UNITS ON DISPLAY REQUIRE OPERATOR CONVERSION.

COMMENTS

CONTROL ROD DISPLAY VERTICAL METERS ARE DISPLAYED IN INCHES,
OPERATORS CONVERT INTO STEPS.

RESPONSE

THE PRESENT ROD POSITION INDICATION SYSTEM IS SCHEDULED TO BE
REPLACED DURING THE 1987 SPRING REFUELING OUTAGE AS PER EWR
#3797. THE NEW SYSTEM WILL HAVE POSITION INDICATION BOTH STEPS
AND INCHES.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.2.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		ROD CONTROL DISPLAY	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0004
 TILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

OPERATOR IS GIVEN INDICATION IN PERCENTAGE ON DISPLAY WHEN HE
 WOULD RATHER HAVE DISPLAY IN SOME OTHER UNITS APPROPRIATE TO THE
 PARAMETER.

COMMENTS

RESPONSE

THE RECIRC VALVES ADDRESSED IN THIS HED ARE CALIBRATED IN PERCENT
 OPENING WHICH IS A NORMAL CALIBRATION FOR THIS TYPE VALVE AND FOR
 THE SERVICE IT IS USED IN. TO CALIBRATE THESE VALVES FOR SOME
 OTHER PARAMETER WOULD BE DIFFICULT AND IMPRACTICAL. NO CHANGE IS
 INTENDED AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.2.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	V-9508D	RECIRC CONT VLV	
	V-9508G	RECIRC CONT VLV	
	FI-2012		
	FI-2011		

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0005
UTILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

TOO MUCH VARIATION IN DISPLAY OUTPUT. EXCESSIVE MOVEMENT IN
DISPLAY POINTER.

COMMENTS

DISPLAY DYNAMIC SENSITIVITY SHOULD BE SELECTED TO MINIMIZE THE
DISPLAY OF NORMAL RANDOM VARIATION IN EQUIPMENT PERFORMANCES.

RESOLUTION

THIS PROBLEM HAS BEEN CORRECTED BY REPLACING THE TRANSMITTER
FEEDING THIS INDICATOR WITH A DIFFERENT TYPE AND BY ENLARGING THE
HEATER DRAIN TANK VENT.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.2.F

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	LI-2005	HEATER DRAIN TANK LEVEL	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0006
TILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/10/1984

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

NO INDICATION ON DISPLAY OR ADJACENT LABELS OF UNITS BEING MEASURED.

COMMENTS

FOXBORO CONTROLLERS CONTAIN METERS WITH NO LABEL OF UNITS MEASURED.

ESP

CONTROLLERS WILL BE LABELED WITH THE PROPER UNITS OF MEASUREMENT BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.4.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	9508D & G	CV TRACKING METER RECIRC CONT VLVS DRAIN TANK COOLING WATER CTL HOTWELL LEVEL	
	2HPC-413C	SPRAY VALVE CONTROL	
	2PCV-431A	SPRAY VALVE CONTROL	
	2PCV-431B	SPRAY VALVE CONTROL	
	4297	AUX FW BYPASS	
	4298	AUX FW BYPASS	
	431K	VARIABLE HEATER CTL PRESSURIZER PRESS	
	4480	AUX FW BYPASS	
	4481	AUX FW BYPASS	
	484		
	CHC PUMP#1	SPEED CONTROL	
	CHC PUMP#2	SPEED CONTROL	
	CHC PUMP#3	SPEED CONTROL	

CV-56-3411	ATM STM DUMP PRESS CONT LOOP
CV-57-3410	
FI-2011	
FI-2012	
HC-466	FW FLOW LOOP A
HC-476	FW FLOW LOOP B
HC-481	FW FLOW BYPASS LOOP B
HCV-110A	
HCV-111	
AOV-836	CONTAINMENT SPRAY NAOH FLOW
HCV-123	
HCV-133	
HCV-142	CHARGING FLOW CONTROLLER
HCV-624	
HCV-625	
HCV-626	RESID HT REMOVAL LOOP RC RETURN
PCV-135	LETDOWN LINE CONTROLLER
TCV-130	NON-RUN HX LETDOWN TEMP



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0007
 TILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

DISPLAYS ARE IN UNITS DIFFERENT FROM THOSE REFERRED TO IN
 PROCEDURES.

COMMENTS

ROD CONTROL VERTICAL DISPLAYS ARE INDICATED IN INCHES, JUST ABOVE
 ROD CONTROL DRUM TYPE DISPLAYS IN STEPS. MOST PROCEDURES ARE
 STATED IN STEPS.

ESP

RESPONSE #3.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.4.E

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

ROD CONTROL DISPLAYS

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0008
UTILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/10/1984

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

MORE THAN 9 GRADUATIONS SEPARATE MAJOR NUMERALS.

COMMENTS

NO MORE THAN 9 GRADUATION MARKS ARE SUPPOSED TO SEPARATE NUMERALS ON A DISPLAY. TOO MANY GRADUATIONS MAKE IT DIFFICULT TO DETERMINE EXACT READING OF THE DISPLAY.

RES

WHILE IT IS PREFERABLE TO USE NO MORE THAN NINE GRADUATIONS, THE PRIMARY CONCERN IS THE READABILITY OF THE DISPLAYS. A LARGE NUMBER OF GRADUATIONS CAN AVAIL OPERATIONS PERSONNEL THE OPPORTUNITY TO MAKE FINER DISTINCTIONS AND THEREFORE NO CHANGE IS PLANNED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.5.A(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		125 VDC BUS A	
		125 VDC BUS B	
		A-C KV BUS #2	
	13	STA SERV TRANS WATTMETER	
	15	STA SERV TRANS WATTMETER	
	17	STA SERV TRANS WATTMETER	
	18	STA SERV TRANS WATTMETER	
	PI-2151	TURBINE BEARING OIL PRESS	
	PI2031		
	PI2049	TURBINE EXHAUST PRESS	
	PI-2043		
	PI-2044		
	PI-2045		

PI-2061
PI-468
PI-469
PI-478
PI-479
PI-482
PI-483
TI-401
TI-402
TI-403
TI-404
TI-405A
TI-405B
TI-405C
TI-421
TI-422
TI-423
TI-424
TI-425
FI-128
PI-135
PI-420
PI-945
PI-947
PI-949
TI-122
TI-125
TI-140
TI-418
TI-621

CHARGING LINE FLOW
NON-REGEN HX LETDOWN OUT TEMP
RX COOL LOOP LOW RANGE PRESS
CONTAINMENT PRESS 3A

CONTAINMENT PRESS 3A
EXCESS LETDOWN HX OUT TEMP
RCP 1B SEAL WATER INLET TEMP
VOL CTL TANK OUT TEMP

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0009
 UTILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/13/1984

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y_X

DESCRIPTION OF DISCREPANCY

GRADUATION SIZES ON VERTICAL AND ROUND METERS ARE TOO SMALL.

COMMENTS

THE RECOMMENDED SIZES OF SCALE GRADUATIONS FOR A VIEWING DISTANCE OF 3 FT ARE: LARGE=.40", MED=.28", SMALL=.17". THE VERTICAL METER GRADUATIONS WERE MEASURED TO BE: LARGE=.25", MED=.19", AND SMALL=.12". THE ROUND METERS WERE MEASURED TO BE: LARGE=.25", MED=.25", AND SMALL=.19".

RESPONSE

AS AN AID TO RAPID METER READING ZONE BANDING WILL BE USED. THIS TECHNIQUE USES COLOR TO HIGHLIGHT DIFFERENT AREAS OF THE SCALE AND PROVIDES INFORMATION AT-A-GLANCE WITHOUT REQUIRING PRECISE METER READING. THE GRADUATION SIZES DO NOT NEED TO BE CHANGED TO ACCOMPLISH THIS. THE ZONE BANDING WILL BE IMPLEMENTED BY THE END OF THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.5.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0010
TILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/10/1984

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

SUCCESSIVE UNIT VALUES INDICATED ARE DIFFERENT FROM THOSE SPECIFIED.

COMMENTS

THE RECOMMENDED PROGRESSION OF NUMBERS ON A SCALE ARE:

1 2 3 4 5/ OR
5 10 15 20 25/ OR
10 20 30 40 50/ OR
2 4 6 8 10/ OR

SO LOWER OF TEN OF THESE NUMBERS.

RESPONSE

THE SCALE DIVISIONS WHICH DIFFER FROM THOSE RECOMMENDED FOR USE WERE SELECTED BECAUSE OF THEIR UTILITY IN LISTING RANGE, SETPOINTS, AND/OR HAVING THE MEDIAN/NORMAL VALUE LOCATED IN THE EXACT MIDDLE OF THE METER. THERE DOES NOT APPEAR TO BE SUFFICIENT JUSTIFICATION TO DISREGARD THESE CONCERNS IN LIEU OF CONFORMING TO AN A PRIORI SUBJECTIVE SET OF NUMBERS THAT ARE PREJUDGED STANDARD.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.5.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
5	A RCP	LOWER BEARING OIL LEVEL	
5	A RCP	UPPER BEARING OIL LEVEL	
5	B RCP	LOWER BEARING OIL LEVEL	
5	B RCP	UPPER BEARING OIL LEVEL	
		125 VDC BUS A	
		125 VDC BUS B	
		A-C KV BUS #2	

GENERAL ELECT LOAD
INCOMING VOLTMETER
RUNNING VOLTMETER
STA SERV TRANS WATTMETER
STA SERV TRANS WATTMETER
STA SERV TRANS WATTMETER
STA SERV TRANS WATTMETER
LI-2010

13
15
17
18

LI-2003

LI-2004

LI-2006

LI-2007

LI-2008

LI-2009

LI-2011

PI-429

PI-430

PI-431

PI-449

PI-468

PI-469

PI-478

PI-479

PI-482

PI-483

TI-401

TI-402

TI-403

TI-404

HEATER DRAIN TANK

ALL CONTROL ROD INDICATORS

PI-420

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0011
TILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

MULTISCALE INDICATORS USED CAUSE OPERATOR CONFUSION.

COMMENTS

MULTISCALE INDICATORS (I.E. SINGLE POINTER, MULTIPLE SCALES) SHOULD NOT BE USED UNLESS THEY CAN BE JUSTIFIED AS AN OPERATIONAL BENEFIT AND PRECAUTIONS ARE TAKEN TO AVOID OPERATOR CONFUSION.

REMARKS

FLOW INDICATORS FI-2011 AND FI-2012 WILL BE MODIFIED SUCH THAT THE SCALE READS IN GPM ONLY. (SEE HED#4) THE HYDROGEN PURITY METER IS NOT CRITICAL FOR ACCIDENT RECOVERY AND IS PRESENTLY WELL UNDERSTOOD BY CONTROL ROOM OPERATORS. THE NAOH FLOWMETER FI-930 IS USED ONLY TO DETERMINE WHETHER FLOW EXISTS. THE NAOH FLOWRATE IS NOT AS IMPORTANT AS NAOH TANK LEVEL. THEREFORE THESE TWO INDICATORS ARE ACCEPTEABLE AS IS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.5.F

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	FI-2002		
	FI-2011	BYPASS FLOW AUX FEED	
	FI-2012	BYPASS FLOW AUX FEED	
	FI-930		



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0012
 UTILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERTICAL STRAIGHT SCALE VALUES DECREASE WITH UPWARD MOVEMENT OF THE POINTER.

COMMENTS

VERTICAL SCALE VALUES SHOULD ALWAYS INCREASE WITH UPWARD MOVEMENT OF THE POINTER. THE POINTER GOES UP: THE VALUES GOES UP.

ESP

THIS PARTICULAR METER MEASURES CONDENSER VACUUM. THE CONDENSER CAN ALSO BE PRESSURIZED. PRESSURE WOULD BE MEASURED ON THE SAME METER, THEREFORE NULLIFYING THE HED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.2.1.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	PI-2049	CONDENSER VACUUM	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0013
 TILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

POINTERS CONCEAL NUMBERS ON SCALE OF DISPLAYS.

COMMENTS

POINTERS SHOULD NOT OBSTRUCT OPERATOR FROM READING NUMBERS ON
 DISPLAY SCALE.

RESPONSE

THIS IS NOT A PROBLEM BECAUSE THE NUMBERS ON THIS SCALE ARE
 SUFFICIENTLY LARGE. THERE IS NO REASON TO CHANGE THESE METERS
 DUE TO THEIR LARGE SIZE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.2.2.A(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		VIBRATION MONITORS	
		ALL CIRCULAR METERS ON PANEL 5 (50)	
		CV TRACKING METER	
	CVL-2	TURBINE GENERATOR EHC	
	CVL-3	TURBINE GENERATOR EHC	
	CVL-4	TURBINE GENERATOR EHC	
	CVR-1	TURBINE GENERATOR EHC	
	IV-1A	TURBINE GENERATOR EHC	
	IV-1B	TURBINE GENERATOR EHC	
	IV-2A	TURBINE GENERATOR EHC	
	IV-2B	TURBINE GENERATOR EHC	
	PI-2001		
	PI-2002		
	PI-2003		
	LI-2022A		
	LI2022B		



EMERG GEN NO 1A VOLTMETER
EMERG GEN NO 1A WATTMETER
EMERG GEN NO 2B WATTMETER
EMERG GEN NO1B VOLTMETER
ALL CIRCULAR METERS ON PANEL 8
TURBINE GENERATOR SUPERVISORY MONITORS



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0014
UTILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

ZONE MARKINGS ARE NOT USED ON DISPLAYS.

COMMENTS

A GREEN BANDING SYSTEM SHOULD BE USED. DISPLAYS SHOULD BE MARKED WITH A GREEN ZONE TO INDICATE NORMAL OR SAFE OPERATION, A YELLOW BAND TO INDICATE MARGINAL OR BORDERLINE OPERATION AND A RED BAND ON THE DISPLAY TO INDICATE UNSAFE OPERATION.

RESPONSE

ZONE BANDING IMPROVES THE EASE WITH WHICH A DISPLAY IS READ. COLORS INDICATE WHETHER THE VALUE IS IN THE NORMAL (GREEN), BORDERLINE (YELLOW), OR UNSAFE (RED) CONDITION. ZONE BANDING WILL BE IMPLIMENTED IN THE CONTROL ROOM WHERE APPLICABLE BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.2.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0015
TILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

NUMERALS ON DISPLAY ARE NOT ORIENTED VERTICALLY.

COMMENTS

NUMBERS SHOULD NOT BE ORIENTED ON THEIR SIDE, CHANGING ORIENTATION WITH THE CONTOUR OF THE DISPLAY. OPERATOR SHOULD NOT HAVE TO TURN HEAD TO THE SIDE TO READ THE DISPLAY NUMBERS.

RESPONSE

WHILE IT IS PREFERABLE TO ALIGN NUMERALS IN THE HORIZONTAL POSITION, SPACE LIMITATIONS SOMETIMES PROHIBIT ADHERENCE TO THIS STANDARD. THE DISPLAYS IN QUESTION CAN BE READ IN THE VERTICAL POSITION WITHOUT UNDUE HARDSHIP OR HAVING A SIGNIFICANT IMPACT ON PERFORMANCE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.2.4.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		PILOT WIRE TEST METER (2)	
		CONT FAN COOLERS LIQUID MON	
		SPENT FUEL PIT SERVICE WATER MON	
		STEAM GUN BLOWDOWN	
	20K		
	7.5K		
	70K	CONTAINMENT AIR PART MON	
	85K		
	R15	AIR EJECTOR VENT MONITOR	
BACK PANEL		POWER RANGE B DETECTOR CURRENT (8)	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0016
 UTILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 12/11/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

MOVING SCALE, FIXED POINTER METER IS USED.

COMMENTS

ALL DISPLAYS SHOULD USE A FIXED SCALE, MOVING POINTER
 ARRANGEMENT.

RESPONSE

A DIGITAL READOUT ARRANGEMENT WAS INSTALLED IN THE SPRING, 1985
 PER EWR-3744.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.2.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
BACK PANEL		HONEYWELL IN-CORE THERMOCOUPLE	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0017
UTILITY: RGE

ORIGINATOR:
PLANT: GINNA

DATE: / /

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

DUAL BULB OR DUAL FILAMENT LIGHT ASSEMBLIES ARE NOT USED IN ANY OF THE NON LEGEND INDICATOR LIGHTS.

COMMENTS

DUAL BULB OR DUAL FILAMENT LIGHTS REDUCE THE CHANCE OF UNDETECTED BULB FAILURES.

RESOLUTION

ANNUNCIATORS ARE TESTED FOR BULB FAILURE ONCE PER SHIFT. IF PROBLEMS ARE EVIDENT THEY ARE FIXED IMMEDIATELY, EG: THE BULB IS REPLACED OR A MAINTENANCE REQUEST IS WRITTEN AND A CAUTION NOTICE IS PLACED ON THE TILE UNTIL THE CORRECTIVE ACTION IS MADE PER 06.7.1.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.3.1.A(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0018
STILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

IT IS DIFFICULT TO TELL IF INDICATOR LIGHTS ARE ILLUMINATED.

COMMENTS

INDICATOR REFLECTORS ARE SUCH THAT THEY MUST BE VIEWED STRAIGHT ON TO DETERMINE IF THEY ARE LIT.

RESPONSE

THE EMERGENCY D/G AIR START RELAY LIGHTS ARE A SPECIAL HIGH RESISTANCE TYPE LAMP. THESE WERE INSTALLED DUE TO THE LOW CURRENT REQUIREMENTS OF THE AIR START SOLENOIDS. WITHOUT THE HIGH RESISTANCE, AN INCREASE OF BATTERY VOLTAGE TO 140 DC DURING EQUALIZING CHARGE PROVIDED ENOUGH INCREASED CURRENT FLOW WITH NORMAL LIGHT BULBS TO OPEN THE AIR START SOLENOIDS AND START THE D/G. THEREFORE, THE PRESENT INDICATING LIGHTS MUST REMAIN AS THEY ARE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

5.3.1.B
5.3.2.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	NO R-1	EMERG GEN 1B START REL	
	NO R-2	EMERG GEN 1B START REL	
	NO. ASV-1	EMERG GEN 1A AIR START	
	NO. ASV-2	EMERG GEN 1A AIR START	
	NO. ASV-2	EMERG GEN 1B AIR START	
	NO. R-1	EMERG GEN 1A START REL	
	NO. R-2	EMERG GEN 1A START REL	
	NO. ASV-1	EMERG GEN 1B AIR START	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0019
 TILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING W

DESCRIPTION OF DISCREPANCY

SYSTEM EQUIPMENT STATUS IS NOT ALWAYS INFERRED BY ILLUMINATED INDICATORS.

COMMENTS

THERE ARE 'BRIGHT/DIM' WHITE INDICATOR LIGHTS THAT INDICATE DIFFERENT STATUS CONDITIONS WHEN THEY ARE LIT BRIGHTLY OR DIMLY. THE OPERATORS CANNOT ALWAYS TELL THE DIFFERENCE BETWEEN THE TWO CONDITIONS.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4235 REQUIRES AN EVALUATION OF THE PRESENT STATUS LIGHT DESIGN TO DETERMINE IF A REDESIGN OF THE SYSTEM IS JUSTIFIED. THIS HED HAS BEEN COMBINED WITH HED #58. THE EVALUATION WILL BE COMPLETED BY JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.3.1.C(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

WHITE STATUS LIGHTS (97)

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0020
ILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

NO PROVISION IS MADE TO PREVENT INTERCHANGING LENSES OF INDICATOR LAMPS.

COMMENTS

A PROCEDURE SHOULD BE INSTITUTED TO STATE THAT ONLY ONE REFLECTOR LENS BE REMOVED FROM A CONTROL PANEL AT A TIME. THIS WOULD PREVENT ACCIDENTLY PUTTING THE WRONG COLOR LENS ON A LAMP.

RESPONSE

THIS DOES NOT APPEAR TO BE A COMMON PROBLEM. COMMON PRACTICE (ACCORDING TO AN OPERATOR SURVEY) IS TO REMOVE ONLY ONE LENS AT A TIME. IS A RED/GREEN BOARD AND INDICATOR LENSES ARE ALWAYS LOCATED IN THE SAME RELATIVE POSITION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.3.1.C(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0021
TILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

LIGHTS ARE USED TO ALERT THE OPERATOR TO EMERGENCY CONDITIONS.

COMMENTS

LIGHT INDICATORS SHOULD NOT BE USED TO ALERT OPERATORS OF EMERGENCY CONDITIONS, THIS IS A FUNCTION OF THE ANNUNCIATOR SYSTEM.

RESOLUTION

LIGHTS ARE APPROPRIATE FOR USAGE AS EXPEDITIOUS MEANS FOR DETERMINING ISOLATION STATUS. THEY PROVIDE INFORMATION SIMILAR TO A CHECKLIST FORMAT AND AVAIL OPERATORS THE OPPORTUNITY TO CONFIRM PROPER SYSTEM RESPONSE AT A GLANCE. NO CHANGE IS DEEMED APPROPRIATE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.3.1.D

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		EH PANEL	
		VLV POSITION VENDOR PANEL	
		EXT STM TO 4A HTR	
		EXT STM TO 4B HTR	
		FW HTR NO. 5A	
		FW HTR NO. 5B	
	NO. CV-36		
	NO. CV-37		
	NO. CV-40		
	NO. CV-44		
	NO. CV-41		
	NO. CV-45		



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0022
UTILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

WHERE MEANING OF LIGHT IS NOT APPARENT LABELING IS NOT PROVIDED
TO SHOW INTENDED MESSAGE.

COMMENTS

THE MEANING OF COLORED INDICATOR LIGHTS ARE NOT CONSISTENT. THE
OPERATORS OFTEN TELL THE STATUS OF SYSTEMS/EQUIPMENTS BY THEIR
EXPERIENCE WITH THE COLORED LIGHTS.

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS
HUMAN FACTORS DISCREPANCIES PERTAINING TO CONTENT, SPACING AND
LETTER CHARACTERISTICS WILL BE IMPLEMENTED BY THE END OF THE 1987
REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.3.2.A(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HTR LEVEL INDICATOR LIGHTS



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0023
TILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

LEGENDS OF LEGEND LIGHT INDICATORS ARE NOT LEGIBLE UNDER AMBIENT ILLUMINATION WITH INDICATOR LIGHTS OFF.

COMMENTS

RESPONSE

LEGENDS ARE INTENDED TO PROVIDE INFORMATION ABOUT ACTIVATION STATUS. WHEN THE LIGHT IS OFF, THE SYSTEM FUNCTION IS DEENERGIZED AND INFORMATION IS NOT REQUIRED. LEGEND LIGHTS WILL NOT BE CHANGED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

5.3.3.A(2)
5.3.3.A(3)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

VENDOR PANEL 192 EH TURBINE CONTROL
INST BUS 1B BKR 8
INST BUS 1D BKR 9

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0024
 TILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/11/1984

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

LEGENDS CONTAIN MORE THAN THREE LINES OF TEXT ON LEGEND LIGHT INDICATORS.

COMMENTS

LEGEND LIGHT INDICATORS SHOULD CONTAIN NO MORE THAN THREE LINES OF TEXT TO FACILITATE THE OPERATOR READING THE LEGEND AT A GLANCE.

RESPONSE

WHILE IT IS PREFERABLE TO REDUCE LEGENDS TO THREE LINES, IT IS NOT ALWAYS POSSIBLE TO CONVEY NEEDED INFORMATION GIVEN THE SPACE RESTRICTIONS OF THE CONTROL ROOM. LEGENDS DO NOT NEED TO BE CHANGED IN THESE INSTANCES.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.3.3.B(5)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		VENDOR PANEL 192 EH TURBINE CONTROL VLV POSITION (VENDOR PANEL) INST BUS 1B BKR 8 INST BUS 1D BKR 9 PERMISSIVE (BANK OF 20 LEGEND LIGHTS)	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0025
UTILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

LEGEND INDICATOR LIGHTS CAN NOT BE DISTINGUISHED FROM PUSHBUTTON
LEGEND INDICATORS.

COMMENTS

OPERATORS SHOULD BE ABLE TO DISTINGUISH PUSHBUTTONS FROM LEGEND
LIGHTS. PUSHBUTTONS CAN BE MADE DISTINCT FROM LEGEND LIGHTS BY
USING AN INDENTED OR CURVED SURFACE, BORDERING AROUND THE BUTTON,
OR EVEN A SPOT ON SOME PART OF THE BUTTON.

RESPONSE

CONTROL ROOM OPERATORS ARE HIGHLY TRAINED INDIVIDUALS. THEY
LEARN WHICH LEGEND LIGHTS ARE PUSHBUTTONS AND WHICH ARE INDICATOR
LIGHTS. THERE IS NO PRESSING NEED TO PROVIDE REDUNDANT
INFORMATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.3.3.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0026
TILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL B
RATING W

DESCRIPTION OF DISCREPANCY

GREEN INK IS SMEARED ACROSS RECORDER PAPER.

COMMENTS

PENS, INK, AND PAPER FOR CHART RECORDERS SHOULD PROVIDE CLEAR
DISTINCT, AND RELIABLE MARKINGS.

RESPONSE

A BETTER INKING SYSTEM FOR THE CONCERNED RECORDER IS BEING
INVESTIGATED. THIS EVALUATION WILL BE COMPLETED BY 10/86.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.4.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	BA RMW		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0027
TILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

SCALE ON RECORDING PAPER IS NOT THE SAME AS SCALE SHOWN ON
RECORDER.

COMMENTS

RESPONSE

THE CHARTS THAT ARE IN SUPPLY FOR THESE RECORDERS DO MATCH THE
SCALE. AT THE TIME OF THE WRITING OF THIS RESPONSE, THE CHART ON
THE RECORDERS MATCHED THE SCALES OF THE RECORDERS. APPARENTLY,
AT THE TIME THAT THE CHECKLIST WAS PERFORMED, SOMEONE HAD
INADVERTENTLY INSTALLED THE WRONG CHART PAPER.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.4.1.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	FI-177		
	FI-178		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0028
 TILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

MARKING OF SCALES ON RECORDERS ARE INDISTINCT AND DIFFICULT TO READ. SCALE NUMBERS ARE MARKED ON RECORDER PAPER SO THAT IT MUST BE READ SIDWAYS.

COMMENTS

NUMBERS AND SCALE GRADUATION ON RECORDERS AND RECORDER PAPER SHOULD BE DISTINCT, COMPATIBLE AND EASY TO READ WITHOUT EXCESSIVE INTERPRETATION.

RESPONSE

I&C WILL INSPECT CONTROLLERS AND RECORDERS SCALES FOR DISTINCT NUMBERS AND PROPER GRADUATIONS, AND THEY WILL ORDER REPLACEMENTS AS DEEMED NECESSARY. THIS WILL BE IMPLEMENTED BY THE END OF 1987 REFUELING OUTAGE. RECORDER PAPER SCALE NUMBERS ARE INTENTIONALLY SIDWAYS, SO THEY ARE ON THE LINE THAT CORRESPONDS TO THAT VALUE. CHANGING THIS WOULD MAKE IT MORE DIFFICULT TO READ.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.4.1.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		A FF/SF	
		B FF/SF	
		BA RMW	
		DELTA T	
		DETECTOR VOLTS	
		LEVEL	
		PZR P	
		TAVG	



A420
FF-176
FI-175
FI-177
FI-178
TR-6330

REC 20

VLV MOVEMENT PERCENT
GEN GAS TEMP

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0029
UTILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

PAPER ON CHART RECORDERS IS DIFFICULT TO CHANGE AND REPLENISH.

COMMENTS

RESPONSE

CHART RECORDERS RK-29 AND RK-30A WILL BE REPLACED BY NEWER TYPE
RECORDERS IN THE SPRING 1986 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.4.1.P

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	RK-29		
	RK-30A		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0030
ILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

CHART RECORDERS DO NOT HAVE SPEED ADJUSTMENT.

COMMENTS

CHART RECORDERS SHOULD HAVE A HIGH PAPER SPEED OPTION TO RUN OUT RECORDS FOR DETACHMENT AND A LOWER SPEED TO PERMIT ADJUSTMENT OF THE TIME SCALE SO THAT RATE-OF-CHANGE INFORMATION CAN BE INDICATED.

RESPONSE

RECORDER CHART SPEED IS CALIBRATED FOR TIME SUCH THAT IT CORRESPONDS TO DIVISIONS ON CHART PAPER, THEREFORE TO PROVIDE ACCURATE TREND INFORMATION FOR EVENT EVALUATION CHART SPEED SHOULD NOT BE RANDOMLY CHANGED. IN ADDITION DURING AN ABNORMAL EVENT THE OPERATORS PROBABLY WON'T WASTE TIME CHANGING CHART SPEEDS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.4.1.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0031
 TILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

DATA IS NOT VISIBLE THROUGH WINDOW OF THE RECORDER.

COMMENTS

RECORDERS NOTED ARE ABOVE EYE LEVEL AND WINDOWS CAUSE GLARE TO
 MAKE READING DIFFICULT WITH DOOR CLOSED.

RESPONSE

THESE RECORDERS ARE ACTUATED BY HIGH RADIATION AND ARE ONLY USED
 IN THE POST-INCIDENT EVALUATION OF A STEAM GENERATOR TUBE
 RUPTURE. IT IS NOT NECESSARY FOR THE OPERATORS TO BE ABLE TO
 READ THESE RECORDERS FOR ANY OPERATIONAL AID.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.4.1.K

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
6	REC-47A		
6	REC-47B		
6	REC-47C		
6	REC-47D		
6	REC-47E		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0032
UTILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

LABELS ON CHART RECORDERS DO NOT ADEQUATELY MARK PARAMETERS BEING RECORDED. IN MANY INSTANCES THE LABELS PROVIDED ARE PAPER TAPED ON THE WINDOW OF THE RECORDER.

COMMENTS

RECORDERS SHOULD HAVE LABELS PERMANENTLY AFFIXED TO INDICATE PARAMETERS BEING RECORDED. CHANNEL RECORDERS SHOULD INDICATE PARAMETER FOR EACH CHANNEL AND DUAL PEN CONTINUOUS RECORDERS SHOULD INDICATE FUNCTION RECORDED BY EACH PEN.

RESPONSE

PERMANENT LABELS WILL BE DESIGNED AS PART OF THE CONTROL ROOM LABELING PACKAGE TO INDICATE PARAMETER DIMENSIONS. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.4.2.A(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	REC 32		
	REC-32		
	REC-77		
	REC-78		
	REC-79		

300 DEG LO ALARM
A FF/SF
B FF/SF
DETECTOR VOLTS (4)
LEVEL
PZR L

TAVG

A407 A410

FI-175

FI-176

PR 420

REC-76

REC-80

NO LABEL

RK 29

RK 29

RK 30

RK 30A



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0034
 UTILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

NUMBERS ON DRUM RECORDERS ARE NOT GROUPED.

COMMENTS

IF MORE THAN FOUR DIGITS ARE DISPLAYED ON A DRUM TYPE COUNTER
 THEY SHOULD BE GROUPED AND THE GROUPINGS SEPARATED BY COMMAS, A
 DECIMAL POINT, OR BY AN ADDITIONAL SPACE.

REMARKS

ALTHOUGH SEPARATING GROUPS OF NUMBERS BY USING COMMAS, DECIMAL
 POINTS OR ADDITIONAL SPACES IS DESIRABLE, THERE DOES NOT APPEAR
 TO BE A HIGH PROBABILITY OF ERROR ASSOCIATED WITH MISREADING
 THESE RECORDERS DUE TO EXTENSIVE OPERATOR TRAINING.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.5.1.A(3)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0035
 TILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

NUMBERS ON DRUM TYPE COUNTERS CHANGE BY CONTINUOUS MOVEMENT.

COMMENTS

NUMBERS ON DRUM TYPE COUNTERS SHOULD CHANGE BY SNAP ACTION RATHER THAN THROUGH CONTINUOUS MOVEMENT.

RESPONSE

ALTHOUGH DISCRETE MOVEMENTS ARE PREFERRED BECAUSE THEY AID IN READABILITY, THIS IS NOT A SIGNIFICANT PROBLEM AND IS NOT TIME CRITICAL. THERE IS NO NEED TO CHANGE THESE RECORDERS BECAUSE THEY ARE NORMALLY USED AS HISTORICAL RECORDS, NOT FOR PLANT OPERATING VALUES.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.5.1.A(3)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		CALIBRATION (4) EMERGENCY AND STORAGE (4)	
	BA RMW		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0036
ILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 12/12/1984

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

OPERATORS ARE NOT AWARE OF ANY CAPABILITY TO SELECT SINGLE
CHANNEL ON ANY DISCRETE MULTIPOINT CHART RECORDERS.

COMMENTS

PROVISION SHOULD BE MADE ON DISCRETE CHART RECORDERS TO SELECT
ANY SINGLE CHANNEL FOR IMMEDIATE DISPLAY WITHOUT AWAITING
COMPLETION OF A SAMPLING CYCLE.

RESPONSE

THE SEQUENCE ON MULTIPOINT RECORDERS CAN BE COMPLETED QUICKLY
ENOUGH TO PRECLUDE THE NECESSITY OF INDIVIDUAL POINT SELECTION.
NO ACTION SHOULD BE TAKEN.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.5.1.C(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



#37

This page intentionally left blank.

#38

This page intentionally left blank.



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0039
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/20/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR A ROD STOP (AUTO STOP) WHEN BANK D REACHES 225 STEPS. THIS WOULD PREVENT OVERSTEPPING RODS (GREATER THAN 230), THUS INVALIDATING THE BANK OVERLAP.

COMMENTS

OPERATIONS INVOLVING THE RODS ARE SENSITIVE AND AN AUTOMATIC STOP WOULD CONTRIBUTE TO SAFE AND RELIABLE OPERATIONS. SUCH A STOP IS IN CONFORMANCE TO THE HUMAN FACTORS PRINCIPLE THAT OPERATIONS ARE ASSURED OF TIMELY AND COMPLETE COVERAGE OF CONTROLS.

RESPONSE

THIS HED IS BEING EVALUATED. IF IT IS DETERMINED THAT ROD STOP INDICATION IS NECESSARY, THIS WILL BE IMPLEMENTED BY 6-30-88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERATOR SURVEY

A1.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0040
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/20/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

IN THE OPERATOR SURVEY SEVEN OPERATORS EXPRESSED THE NEED FOR CONTROLS ON THE MAIN CONTROL BOARD TO THROTTLE MOTOR OPERATED VALVES 73B (COMPONENT COOLING WATER) A&B TO CONTROL RHR HX TEMPERATURE WITHOUT WAITING FOR AN OPERATOR TO MANUALLY POSITION THE VALVES.

COMMENTS

THESE VALVES CONTROL COMPONENT COOLING WATER TO THE RESIDUAL HEAT SYSTEM HEAT EXCHANGER. AT PRESENT THIS VALVE CONTROL IS IN THE CRUISE IS THROTTLEABLE. CONTROL IS NOT AS FINE AS DESIRED. A CONTROLLER MIGHT BE OF BENEFIT.

RESPONSE

FOR SEVERAL DESIGN BASES ACCIDENTS, ANALYSES ARE BASED UPON THE COOLING RATE OF THE RHR HEAT EXCHANGES UTILIZING MAXIMUM COMPONENT COOLING WATER FLOW AS THE COOLING MEDIUM. TO INSTALL MODULATING VALVES IN THE COOLANT STREAM FOR THE RHR SYSTEM COULD RESTRICT COOLANT MEDIUM FLOW IN THE EVENT OF A VALVE FAILURE AT LESS THAN 100% OPEN. ALTHOUGH IT IS RECOGNIZED THAT MANUAL MANIPULATION OF THESE VALVES DURING COOLDOWN OF THE PLANT IS INCONVENIENT, ACCIDENT CONSIDERATIONS PRECLUDE THE CHANGE OUT OF THESE VALVES FOR OPERATORS CONVENIENCE AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A1.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0041
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/20/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN THE OPERATOR SURVEY FIVE OPERATORS STATED A NEED FOR A MANUAL CONTROL ON THE MAIN CONTROL BOARD TO CONTROL HEATER DRAIN TANK LEVEL. THIS WOULD ALLOW MANUAL OPERATION TO STABILIZE OSCILLATIONS IN THE CONDENSATE/FEEDWATER SYSTEM.

COMMENTS

THE CONDENSATE/FEEDWATER SYSTEM IS IMPORTANT TO RELIABLE AND SAFE OPERATIONS AND SUCH MANUAL CONTROL WOULD ENHANCE OPERATOR CONTROL OF THE SYSTEM FROM THE MAIN CONTROL BOARD. THE HUMAN FACTORS PRINCIPLE INVOLVED IS THAT OPERATORS DO NOT HAVE TO LEAVE THE PRIMARY OPERATING AREA WHEN CONTINUOUS MONITORING OR TIMING OF CONTROL ACTIONS MAY BE CRITICAL.

RESPONSE

A MANUAL CONTROL WAS INSTALLED TO ENABLE OPERATIONS PERSONNEL TO CONTROL HEATER DRAIN TANK LEVEL FROM THE CONTROL ROOM.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A1.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0042
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/20/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR A MAIN STEAM ISOLATION VALVE BYPASS VALVE CONTROLLER IN THE MAIN CONTROL ROOM.

COMMENTS

INSTALLATION OF THIS CONTROLLER WOULD GIVE THE OPERATORS FINER CONTROL OF THE STEAM SYSTEM WITHOUT BEING DEPENDENT ON COMMUNICATION WITH AN OPERATOR OUTSIDE THE CONTROL ROOM.

RESPONSE

THE MAIN STEAM BYPASS VALVES ARE NOT FREQUENTLY USED. THERE ARE NO REQUIREMENTS FOR EMERGENCY OPERATION OF THESE VALVES, AND THEREFORE NO CORRECTIVE ACTION APPEARS JUSTIFIABLE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A1.7

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0043
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/20/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING W

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY, SEVEN OPERATORS STATED A NEED FOR AN ALL VOLATILE TREATMENT BYPASS VALVE CONTROLLER WITH INDICATION IN THE CONTROL ROOM. THEY STATED THAT IF THERE IS A CONDENSATE SYSTEM PERTURBATION, IT WOULD BE USEFUL TO KNOW IF THE VALVE OPERATED. PRESENTLY AN AUXILIARY OPERATOR HAS TO BE SENT DOWN TO CHECK IT OUT. OTHER REASONS GIVEN INCLUDE: 1) BEING ABLE TO TELL IF THE PROCESS OF GOING OPEN/CLOSED IS A CAUSE OF NPSH PROBLEMS OF MFP; AND 2) ON A STEAM GENERATOR TUBE RUPTURE, THE OPERATOR CAN BYPASS ALL VOLATILE TREATMENT BEDS TO USE STEAM DUMP WITHOUT HAVING AN AUXILIARY OPERATOR GOING TO ANOTHER PLACE OUTSIDE THE CONTROL ROOM TO DO IT.

COMMENTS

THE CONTROL AND INDICATIONS NEEDED TO DETECT ABNORMAL CONDITIONS, AND TO CORRECT THE CONDITIONS SHOULD BE AVAILABLE ON THE MAIN CONTROL BOARD.

RESPONSE

AN EVALUATION WILL BE PERFORMED AND IF DEEMED REQUIRED, INDICATION WILL INSTALLED BY 6-30-88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A1.9

EQUIPMENT ID NUMBER EQUIPMENT NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0044
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/20/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED TO HAVE ONE SWITCH PER VALVE ON THE CONDENSER WATER BOX INLET AND OUTLET VALVES TO PROVIDE FOR BETTER CONTROL OF THE SYSTEM. IT WAS ALSO INDICATED THAT THE SWITCHES SHOULD BE THROTTLEABLE.

COMMENTS

RESPONSE

THE ONLY INTENDED FUNCTIONS OF THESE VALVES IS FOR ISOLATION PURPOSES NECESSARY FOR MAINTENANCE SUCH AS THAT WHICH IS PERFORMED AT REFUELING OUTAGES. THEREFORE, THE INFREQUENT USE OF THESE VALVES DOES NOT WARRANT THE CHANGES SUGGESTED BY THIS HED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A1.11

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0045
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE LOW LEVEL PRESSURE ALARM IS SET AT 10.6%. THE SUGGESTION WAS MADE TO ESTABLISH THE SETPOINT FOR THE ALARM AT GREATER THAN 12% PZR TO ALERT THE OPERATOR TO BEING OUTSIDE TECHNICAL SPECIFICATIONS AND TO GIVE TIME TO AVERT LETDOWN ISOLATION.

COMMENTS

RESPONSE

THE PRESSURIZER LOW LEVEL SETPOINT WILL BE CHANGED TO 13%, CONSISTENT WITH TECHNICAL SPECIFICATIONS SECTION 3.1.1.5. THIS CHANGE WILL ELIMINATE THE NEED TO READ THIS METER IN TENTHS OF A PERCENT. PROCEDURE CHANGE NOTICES WILL ALSO BE INITIATED TO INSERT THIS NEW VALUE IN APPROPRIATE PROCEDURES. THESE CHANGES WILL BE IMPLEMENTED BY 4-86.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY
 TASK ANALYSIS

A1.12
 6

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0046
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY FOUR OPERATORS STATED THAT THE 13A BENCH BOARD IS SELDOM IF EVER USED, AND IT IS UNNECESSARY IN ITS PRESENT LOCATION.

COMMENTS

REMOVAL OF THE BENCH BOARD WOULD MAKE ROOM FOR THE OPERATORS.

RESOLUTION

THE 13A BENCH BOARD WILL BE REMOVED BY THE END OF THE SPRING 1986 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A2.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0047
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY OPERATORS INDICATED THAT IT IS UNNECESSARY TO HAVE THE SPING UNIT AND ITS CONTROLS IN THE CONTROL ROOM.

COMMENTS

ESF

THE SPING UNIT WILL NOT BE REMOVED FROM THE CONTROL ROOM AT THIS TIME DUE TO ITS INVOLVEMENT WITH EMERGENCY RESPONSE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERATOR SURVEY	A2.4
PERATOR SURVEY	A4.1
ISTORICAL REVIEW	B8.2
ISTORICAL REVIEW	B8.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0048
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE RPI COIL VOLTAGE READOUT AND SELECTOR SWITCHES WERE UNNECESSARY ON THE FRONT OF THE MAIN CONTROL BOARD AND COULD BE LOCATED ELSEWHERE.

COMMENTS

TAKING THE RPI COIL VOLTAGE READOUT AND SELECTOR SWITCHES OFF THE MAIN CONTROL BOARD AND LOCATING THEM ELSEWHERE WILL MAKE ROOM ON THE MCB FOR MORE IMPORTANT CONTROLS AND INDICATORS.

RESPONSE

THE RPI COIL VOLTAGE READOUT AND SELECTOR SWITCHES WILL BE REMOVED FROM THE MAIN CONTROL BOARD. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERATOR SURVEY
 PERATOR SURVEY

A2.5
 B7.29

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0049
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 1
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY 10 OPERATORS INDICATED A NEED FOR A CONTAINMENT TEMPERATURE/HUMIDITY RECORDER OR A COMPUTER ADDRESS IN THE CONTROL ROOM ON THE MCB. THE REASON GIVEN IS THAT THESE TWO PARAMETERS ARE A VERY FAST AND RELIABLE MEANS OF DETECTING HIGH ENERGY LEAKS IN THE CONTAINMENT VESSEL AND FOR USE IN ACCIDENT ANALYSIS. CURRENTLY THEY USE RECORDERS FOR DEW POINTS AND TEMPERATURE THAT ARE LOCATED ELSEWHERE.

COMMENTS

PLACING THESE INDICATIONS ON THE MCB WILL GIVE THE OPERATORS IMMEDIATE FEEDBACK OF INFORMATION CRITICAL TO THE SAFE OPERATION OF THE PLANT. THE HUMAN FACTORS PRINCIPLE INVOLVED IS THAT VISUAL DISPLAYS PROVIDED IN THE CR GIVE OPERATORS ALL THE INFORMATION ABOUT SYSTEM STATUS AND PARAMETER VALVES THAT IS NEEDED TO MEET TASK REQUIREMENTS IN EMERGENCY SITUATIONS.

RESPONSE

CONTAINMENT TEMPERATURE AND HUMIDITY AS REQUIRED FOR INPUT INTO THE SAS WILL BE INCLUDED IN THE NEW PLANT COMPUTER SYSTEM. IMPLEMENTATION WILL OCCUR BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.1

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

AS

PPPS-MULTI-POINT

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0050
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY NINE OPERATORS INDICATED A NEED FOR A T HOT METER AND TREND RECORDERS FOR THE RCS LOOP AND RX COOLANT SYSTEM TEMPERATURE. THESE WOULD PROVIDE VERY GOOD DIAGNOSTIC TOOLS. CURRENTLY THE VALUES HAVE TO BE VERY CAREFULLY CALCULATED.

COMMENTS

THESE COOLANT SYSTEMS ARE CRITICAL BECAUSE THE SAFE AND RELIABLE OPERATION OF THE PLANT WOULD BE SIGNIFICANTLY IMPROVED THROUGH IMMEDIATE FEEDBACK TO THE OPERATORS PROVIDED BY THE METER AND RECORDER. THE HUMAN FACTORS PRINCIPLE INVOLVED IS THAT VISUAL DISPLAYS PROVIDED IN THE CR GIVE OPERATORS ALL THE INFORMATION ABOUT SYSTEM STATUS AND PARAMETER VALUES THAT IS NEEDED TO MEET TASK REQUIREMENTS IN EMERGENCY SITUATIONS.

RESPONSE

A T-HOT METER HAS BEEN INSTALLED. REACTOR COOLANT SYSTEM TEMPERATURES AND RESIDUAL HEAT REMOVAL SYSTEM TEMPERATURE WILL BE INCLUDED IN THE NEW PLANT COMPUTER SYSTEM. EACH OF THESE PARAMETERS MAY BE SELECTIVELY PUT IN A TREND MODE AT THE OPERATOR'S REQUEST. IMPLEMENTATION WILL OCCUR BY JUNE 30, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.2

EQUIPMENT ID NUMBER

EQUIPMENT NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0051
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR A WIDE RANGE
T AVERAGE RECORDER THAT IS COMPUTER DEPENDENT.

COMMENTS

A T AVERAGE RECORDER WOULD ENABLE OPERATORS TO MONITOR TREND IN T
AVERAGE WHILE THE COMPUTER WOULD PROVIDE THE PRECISE CURRENT T
AVERAGE. THIS IS IMPORTANT DATA TO THE OPERATOR ON THE S/G
OPERATION AND PLANT CONDITION.

RESPONSE

THE NEW PLANT COMPUTER SYSTEM WILL HAVE THE CAPABILITY OF
TRENDING WIDE-RANGE T AVE. IMPLEMENTATION WILL OCCUR BY THE END
OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0052
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR AN INDICATION FOR AVERAGE DELTA FLUX SINCE CURRENTLY ONLY THE COMPUTER GIVES THE OPERATOR A READOUT. SUGGESTION WAS THAT SPACE MAY BE AVAILABLE ON MCB IF DETECTOR VOLT RECORDERS (4) ARE REMOVED.

COMMENTS

RESPONSE

AVERAGE DELTA FLUX CAN BE SELECTED FOR READOUT WITH TRENDING CAPABILITY ON THE NEW COMPUTER SYSTEM. BASED ON THE FREQUENCY OF NEED FOR THIS PARAMETER, THIS CAPABILITY IS ADEQUATE. THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.8

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0053
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/21/1983

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR AN INDICATION OF LUBE OIL RESERVOIR VAPOR EXTRACTOR #1B SINCE THERE IS CURRENTLY NO INDICATION ON THE MCB. THERE IS AN INDICATION OF OPERATION FOR 1A BUT NOT FOR 1B.

COMMENTS

HUMAN FACTORS GUIDELINES RECOMMEND CONTROL ROOM INSTRUMENTATION FOR ALL DISPLAYS NEEDED FOR DETECTING ABNORMAL CONDITIONS. THE PROPOSED INDICATION WOULD PROVIDE IMPORTANT INFORMATION ON GENERATOR BEARINGS.

RESPONSE

THERE DOES NOT APPEAR TO BE JUSTIFICATION TO WARRANT A MODIFICATION AT THIS TIME. HOWEVER, FURTHER EVALUATION OF THIS NEED WILL BE CONDUCTED TO DETERMINE IF AN ADDITIONAL PROCESS COMPUTER INPUT WOULD BENEFIT OPERATORS IN THE PERFORMANCE OF THEIR DUTIES. THE EXPECTED COMPLETION DATE OF THE EVALUATION IS JUNE 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.13

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0054
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR AN ALARM IN THE CONTROL ROOM FOR LOSS OF GENERATOR BEARINGS VAPOR PRESSURE.

COMMENTS

RESPONSE

THERE IS PRESENTLY AN ALARM FOR THE GENERATOR BEARING DRAIN VAPOR EXTRACTOR ON THE HYDROGEN PANEL. THERE IS A MASTER ALARM FOR THE HYDROGEN PANEL ON THE CONTROL BOARD. FROM PAST EXPERIENCE, THERE IS SUFFICIENT TIME TO ASSESS THE LOCAL ALARM PANEL AND THEN PERFORM THE REQUIRED ACTION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.14

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0055
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR SPENT FUEL
PIT TEMPERATURE AND LEVEL INDICATION IN THE CR. IT WAS STATED
THAT TEMPERATURE INDICATION IS A TECHNICAL SPECIFICATION
REQUIREMENT.

COMMENTS

ESF

ADMINISTRATIVE PROCEDURES ARE ALREADY IN PLACE WHICH ENSURE THAT
SPENT FUEL PIT TEMPERATURE AND/OR LEVEL ARE WITHIN TECHNICAL
SPECIFICATION REQUIREMENTS. LOCAL VERIFICATION OF PARAMETERS IS
PERFORMED ON A REGULAR BASIS AND THIS METHOD MAY BE MORE
DESIRABLE THAN REMOTE INDICATIONS BECAUSE IT REQUIRES ON-SITE
INSPECTION OF THE AREA.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.15

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0056
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/21/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR A PRESSURE
 RELIEF TANK PRESSURE WIDE RANGE INDICATOR-UP TO RUPTURE DISC
 PRESSURE IN THE CONTROL ROOM ON THE CONTROL BOARD UP FRONT.

COMMENTS

ESP

PRESSURE INDICATION FOR THE PRT UP TO THE RUPTURE DISK RATING OF
 100 PSIG WILL BE INSTALLED PER EWR 4346 BY 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERATOR SURVEY A3.18
 PERATOR SURVEY B7.16

ANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0057
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR A LAMP TEST ON BISTABLE STATUS PANEL IN ORDER TO CHECK FOR BURNED OUT LIGHTS.

COMMENTS

THE HUMAN FACTORS PRINCIPLE INVOLVED IS THAT WHEN THE PRESENCE OF A LIGHT IS THE PRIMARY MEANS BY WHICH LIGHT INDICATORS COMMUNICATE A MESSAGE, IT BECOMES ESSENTIAL THAT THE LIGHT SIGNAL BE PHYSICALLY RELIABLE, THAT IT BE SENSED UNAMBIGUOUSLY AND THAT IT NOT BE MISINTERPRETED. A LAMP TEST WOULD PROVIDE A RELIABLE SYSTEM FOR CHECKING THE LIGHTS ON THE PANEL.

RESPONSE

ADMINISTRATIVE PROCEDURES ARE IN PLACE THAT REQUIRE DAILY CHECKING OF ALL INDICATING STATUS LIGHTS. IF LIGHTS ARE NOT FUNCTIONING PROPERLY, BULBS ARE REPLACED IMMEDIATELY. IF BULB REPLACEMENT DOES NOT CORRECT THE PROBLEM, A WORK REQUEST IS WRITTEN AND A CAUTION CARD ATTACHED TO THE MALFUNCTIONING INDICATOR. CURRENT PROCEDURES PRECLUDE THE NECESSITY OF LAMP TEST EQUIPMENT.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.19

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0058
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR SAFEGUARD VALVES STATUS LIGHTS (BRIGHT-DIM) THAT SHOULD BE BETTER. A SUGGESTION WAS MADE THAT SAFEGUARD POSITION WHITE LIGHTS SHOULD BE CHANGED TO GREEN-RED IN AS MUCH AS PRESENT LIGHTS ARE CONFUSING AND OFTEN TIME CONSUMING WHEN TRYING TO DETERMINE VALVE STATUS. KNOWLEDGE OF VALVE STATUS IS IMPORTANT FOR OPERATIONS.

COMMENTS

THE LIGHT SYSTEM CURRENTLY USED IS NOT EASILY DISCRIMINABLE. THE PRINCIPLE INVOLVED IS THAT THE PRESENCE OF A LIGHT IS THE PRIMARY MEANS BY WHICH LIGHT INDICATORS COMMUNICATE A MESSAGE, AND IT IS ESSENTIAL THAT THE LIGHT SIGNAL BE PHYSICALLY RELIABLE, THAT IT BE SENSED UNAMBIGUOUSLY AND THAT IT NOT BE MISINTERPRETED.

RESPONSE

"SEE HED #19"

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.20

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0059
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR A PRESSURE GAUGE TO INDICATE DIFFERENCE IN PRESSURE BETWEEN THE REACTOR COOLANT SYSTEM AND THE STEAM GENERATORS. IT WOULD PROVIDE REACTOR COOLANT PUMP TRIP CRITERIA DATA.

COMMENTS

THE HUMAN FACTORS PRINCIPLE INVOLVED IS THAT VISUAL DISPLAYS PROVIDED IN THE CONTROL ROOM GIVE OPERATORS ALL THE INFORMATION ABOUT SYSTEM STATUS AND PARAMETER VALUES THAT IS NEEDED TO MEET THE REQUIREMENTS IN EMERGENCY SITUATIONS.

RESPONSE

EWR 4345 HAS BEEN INITIATED WHICH REQUIRES THAT THE RCS AND S/G PRESSURE SIGNALS ARE TO BE INPUTTED INTO THE NEW COMPUTER SYSTEM AND THE COMPUTER PROGRAMMED TO TREND THE DELTA P. THIS WILL BE ACCOMPLISHED BY 6/30/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.21

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0060
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR WIDE RANGE PRESSURE INDICATORS FOR THE REACTOR COOLANT SYSTEM. THE CURRENT RECORDER CHARTS ARE DIFFICULT TO READ.

COMMENTS

THERE MAY BE ALTERNATIVE METHODS FOR PROVIDING REDUNDANT WIDE RANGE PRESSURE INDICATIONS, E.G. METERS, COMPUTER, ETC. THE PRINCIPLE INVOLVED IS THAT PRESENTATION OF INFORMATION TO THE OPERATOR BE UNAMBIGUOUS AND EASILY INTERPRETABLE PARTICULARLY IN AN EMERGENCY.

RESPONSE

WIDE-RANGE REACTOR COOLANT SYSTEM PRESSURE CAN BE DISPLAYED WITH TREND CAPABILITY ON THE NEW PLANT COMPUTER SYSTEM. THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987. THIS CAPABILITY, IN CONJUNCTION WITH THE EXISTING RECORDER CHARTS, PROVIDES ADEQUATE INDICATION OF THE PARAMETER.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY A3.22
 OPERATOR SURVEY A3.30

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0061
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR TWO (2) ANALOG TREND RECORDERS (2 PENS EACH) MOUNTED INTO THE CONTROL BOARD. THEY WOULD PROVIDE A MEANS TO CALL UP PARAMETERS AND FOLLOW THEIR TRENDS.

COMMENTS

RECORDERS ALREADY EXIST IN THE CR.

RESPONSE

THERE ARE CURRENTLY 2 PORTABLE DUAL PEN ANALOG RECORDERS IN THE CONTROL ROOM. ADDITIONALLY THE NEW SPDS SYSTEM WILL PROVIDE CRT DISPLAYS FOR TRENDING INFORMATION AND WILL HAVE THE CAPABILITY OF MONITORING ANY PARAMETER SELECTED BY THE PLANT PROCESS COMPUTER. THESE CAPABILITIES ADEQUATELY SATISFY THE NEEDS OF THIS HED. THIS WILL BE IMPLEMENTED BY THE 1987 OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.25

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0062
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR AMP METERS ON THE CONTROL BOARD FOR RCP, RHR, SAFETY INJECTION AND OTHER MAJOR PUMPS. THIS WOULD PROVIDE ADDITIONAL INFORMATION ON PUMP STATUS WHEN STARTING OR STOPPING.

COMMENTS

THIS INVOLVES PROVIDING VISUAL DISPLAYS IN THE CONTROL ROOM THAT GIVE OPERATORS ALL THE INFORMATION ABOUT SYSTEM STATUS AND PARAMETER VALUES THAT IS NEEDED TO MEET TASK REQUIREMENTS IN EMERGENCY SITUATIONS.

RESPONSE

BUS AMP. METERS ARE PRESENTLY AVAILABLE AND ARE USED TO INDICATE IN-RUSH AND RUNNING CURRENT FOR PUMP OPERATORS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.26

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0063
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR AN INDICATION OF THE TEMPERATURE OF THE STEAM GENERATOR. SUCH AN INDICATION WOULD BE USEFUL WHEN STARTING THE REACTOR COOLANT PUMPS DURING SOLID PLANT OPERATION.

COMMENTS

THIS INVOLVES INSURING THAT THE OPERATORS HAVE READILY AVAILABLE TO THEM THE INFORMATION NECESSARY TO RELIABLY AND SAFELY OPERATE THE PLANT. (COULD BE ON CHART)

RESPONSE

INVESTIGATION INTO THIS HED REVEALED THAT THESE INDICATIONS ARE NOT TIME CRITICAL ENOUGH TO REQUIRE INSTRUMENTATION IN THE CONTROL ROOM. SENDING AN AUXILAIRY OPERATOR TO READ AND THEN COMMUNICATE THESE INDICATIONS DO NOT COMPROMISE OPERATIONS PERSONNEL IN CRITICAL SITUATIONS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.27

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0064
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED A NEED FOR AN INDICATION
OF SEAL INJECTION FLOW AS A GOOD DIAGNOSTIC TOOL.

COMMENTS

THIS DISPLAY WOULD PROVIDE INFORMATION ABOUT SYSTEM STATUS AND
PARAMETER VALUES THAT ARE NEEDED BY THE OPERATOR.

RESOLUTION

EWR 4118 HAS BEEN ISSUED TO INSTALL FLOW INDICATION BY 6/30/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.28

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0065
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED A NEED FOR AN ACTUAL VALVE POSITION INDICATION FOR MAIN FEEDWATER AND BYPASS CONTROL VALVES. THERE ARE DEMAND SIGNAL INDICATIONS ON BOTH OF THESE VALVES, BUT THE OPERATORS NEED ACTUAL POSITION INFORMATION FOR LOW FLOW CONDITIONS. DURING A REACTOR TRIP THESE WOULD BE VERY USEFUL.

COMMENTS

THERE SHOULD BE A VISUAL DISPLAY OF ACTUAL SYSTEM/EQUIPMENT STATUS FOR ALL IMPORTANT PARAMETERS OF SYSTEMS.

RESPONSE

A FEASIBILITY STUDY HAS BEEN INITIATED. IF A CHANGE IS DETERMINED NECESSARY, IT WILL BE IMPLEMENTED BY 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.29

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0066
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR TANK LEVEL INDICATIONS FROM AUXILIARY BLDG. (I.E. CVS HUT, WHUT AND GAS TANK PRESSURES). CURRENTLY AN AUXILIARY OPERATOR MUST BE SENT THERE TO GET THE READINGS AND COMMUNICATE THEM TO THE OPERATOR IN MCR, CREATING SLOW FEEDBACK TO THE OPERATOR IN CRITICAL SITUATIONS.

COMMENTS

RESPONSE

INVESTIGATION INTO THIS HED REVEALED THAT THESE INDICATIONS ARE NOT TIME CRITICAL ENOUGH TO REQUIRE INSTRUMENTATION IN THE CONTROL ROOM. SENDING AN AUXILIARY OPERATOR TO READ AND THEN COMMUNICATE THESE INDICATIONS DOES NOT COMPROMISE OPERATIONS PERSONNEL IN CRITICAL SITUATIONS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A3.30

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0067
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE FROM FIVE OPERATORS TO THE OPERATOR SURVEY INDICATED THAT THE ROD INSERTION LIMIT RECORDER IS UNRELIABLE. THE ROD INSERTION SYSTEM IS CRITICAL AND OPERATORS MUST HAVE IMPORTANT INFORMATION ON THE SYSTEM.

COMMENTS

IF THE OPERATORS HAVE SUFFICIENT INFORMATION FROM OTHER INDICATORS OF THE ROD INSERTION SYSTEM, THE PRINCIPLE OF NOT DISPLAYING EXTRANEIOUS INFORMATION IN THE PRIMARY OPERATING AREA APPLIES.

RESPONSE

THE ROD INSERTION LIMIT WILL BE INCLUDED IN THE NEW PLANT COMPUTER SYSTEM. THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A4.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0068
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THREE RESPONSES TO THE OPERATOR SURVEY STATED THAT THE PH RECORDER ON THE BACK OF THE MCB IS NOT NEEDED AND IS NOT REALLY CHECKED UNLESS A PH ALARM COMES IN. A SUGGESTION WAS MADE TO TAKE THE PH RECORDER OFF THE BACK BOARD AND PLACE IT DOWN ON THE TURBINE PLANT SAMPLING PANEL WITH THE REST OF THE CHEMISTRY EQUIPMENT.

COMMENTS

EXTRANEIOUS INFORMATION SHOULD NOT BE DISPLAYED IN THE PRIMARY OPERATING AREA.

RESPONSE

SHOULD ADDITIONAL SPACE BE REQUIRED ON THE PANEL THIS RECORDER WILL BE CONSIDERED FOR REMOVAL. NO CHANGE IS DEEMED NECESSARY AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERATOR SURVEY

A4.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY -----

ED NUMBER: 0069
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY -----

RESPONSES (9) FROM THE OPERATOR SURVEY INDICATED THAT THE (HAGAN) POWER RANGE DETECTOR VOLTAGE CHART RECORDERS ARE USED ONLY DURING PERIODIC TESTING OF POWER RANGES. IT WAS SUGGESTED THAT THESE CHARTS COULD BE REMOVED AND PLACED ON THE BACK OF THE MCB OR ON THE NIS POWER RANGE STACKS THEMSELVES.

COMMENTS -----

EXTRANEIOUS INFORMATION SHOULD NOT BE DISPLAYED IN THE PRIMARY OPERATING AREA, THUS SAVING ROOM FOR DISPLAY OF MORE CRITICAL INFORMATION.

RESPONSE -----

SHOULD ADDITIONAL SPACE BE REQUIRED ON THE PANEL THIS RECORDER WILL BE CONSIDERED FOR REMOVAL . NO CHANGE IS DEEMED NECESSARY AT THIS TIME.

SOURCE OF DISCREPANCY -----

EXPLANATORY INFORMATION -----

OPERATOR SURVEY

A4.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0070
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE 115 KV PANEL IS UNNECESSARY.

COMMENTS

EXTRANEIOUS INFORMATION SHOULD NOT BE DISPLAYED IN THE PRIMARY OPERATING AREA.

RESPONSE

THIS PANEL WILL BE REMOVED BY THE END OF SPRING 1986 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A4.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0071
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY SIX OPERATORS INDICATED THAT SOME VITAL CONTROLS ARE LOCATED BEHIND THE CONTROL BOARDS. THESE INCLUDE THE DIESEL GENERATOR, THE OVER-PRESSURE PROTECTION SYSTEM AND THE SAFETY AUXILIARY FEEDWATER SYSTEM.

COMMENTS

THE PRINCIPLES INVOLVED INCLUDE PROVIDING PROCEDURES AND EQUIPMENT FOR HANDLING COMMUNICATIONS WITH THE MAIN CONTROL BOARD OF THE REACTOR DURING AN EMERGENCY.

RESPONSE

THERE ARE SOME VITAL CONTROLS BEHIND THE CONTROL BOARD, HOWEVER, THESE CONTROLS ARE SELDOM USED DURING NORMAL OPERATIONS AND ARE NOT ANTICIPATED FOR USE DURING EMERGENCY CONDITIONS.

THE OVER-PRESSURE PROTECTION SYSTEM CONTROLS ARE USED ONLY WHEN ALIGNING THE SYSTEM FOR SCHEDULED COOLDOWN.

THE DIESEL GENERATOR CONTROLS ARE OPERATED ONLY WHEN PERFORMING PERIODIC TEST PROCEDURES PT-12.1 AND 12.2 (ONCE MONTHLY) WHICH REQUIRE THE DIESEL GENERATORS TO BE PARALLELED TO THE RG&E ELECTRIC TRANSMISSION GRID, LOADED TO 2,000 KW FOR AN HOUR, THEN TAKEN OFF THE LINE AND ALIGNED FOR EMERGENCY AUTOMATIC OPERATION. IN THIS MODE OF OPERATION, IT IS NOT NECESSARY TO MANIPULATE ANY CONTROLS AND ALL INDICATORS NECESSARY FOR MONITORING PERFORMANCE ARE LOCATED AT THE FRONT OF THE CONTROL BOARD.

THE STANDBY AUXILIARY FEEDWATER SYSTEM IS A BACKUP TO THE AUXILIARY FEEDWATER SYSTEM AND UNLIKELY TO BE USED EXCEPT FOR TESTING.

BASED ON THE FREQUENCY OF NEED FOR THE SYSTEMS MENTIONED ABOVE, THE PRESENT LOCATION OF THE CONTROLS IS ADEQUATE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION



OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0072
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 3
LEVEL A
RATING Y

DESCRIPTION OF DISCREPANCY

THE OPERATOR SURVEY INDICATED THAT DIRECT VOICE COMMUNICATION IS DIFFICULT DURING SHUTDOWN WHEN WORK IS BEING DONE IN THE CONTROL ROOM. A SUGGESTION WAS MADE THAT ONE CHANNEL ON THE INTERCOM BE DEDICATED TO OPERATIONS.

COMMENTS

RESPONSE

THE EXISTING PHONE SYSTEM HAS SELECTED PHONE EXTENSIONS THROUGHOUT THE PLANT THAT ARE CAPABLE OF OVERRIDING THE PAGE SYSTEM. FIVE OF THESE EXTENSIONS ARE LOCATED IN THE CONTROL ROOM. BASED ON THIS, THE NEED FOR A DEDICATED CHANNEL ON THE INTERCOM IS NOT NECESSARY. ADDITIONAL TRAINING WILL BE PROVIDED TO OPERATIONS PERSONNEL ON PHONE USAGE, COMPLETED BY 1-1-86.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A5.9

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0073
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/22/1985

ASSESSMENT CATEGORY 3
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

DURING THE OPERATOR SURVEY TEN OPERATORS STATED THAT TEMPERATURE CONTROL IS VERY POOR IN THE CONTROL ROOM. AT THE TIME THEY ANSWERED THE QUESTIONNAIRE THEY WERE WITHOUT HEAT. IN THE SUMMER THE AIR CONDITIONING CANNOT HANDLE BOTH THE COMPUTER ROOM AND CONTROL ROOM AT THE SAME TIME. CONSEQUENTLY IN ORDER TO PROTECT THE COMPUTER THE CONTROL ROOM RUNS HOT.

COMMENTS

THE CLIMATE IN THE CONTROL ROOM SHOULD BE MAINTAINED WITHIN THE COMFORT ZONE AS GIVEN IN NUREG-0700. TEMPERATURE (WET-BULB AND DRY-BULB) IS A MAJOR VARIABLE IN COMFORT.

RESPONSE

THE HEATING AND/OR AIR CONDITIONING OF THE CONTROL ROOM HAS BEEN MODIFIED SUCH THAT THE COMFORT ZONE IS ADEQUATE. NO FURTHER CORRECTIVE ACTION IS NECESSARY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A6.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0074
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY FIVE OPERATORS STATED THAT HUMIDITY CONTROL IS INADEQUATE AND THAT STATIC SHOCKS ARE PREVALENT. THEY ALSO INDICATED THAT MICROPROCESSORS; E.G., THE SPING UNIT; ARE VERY MUCH AFFECTED BY THIS.

COMMENTS

THE CLIMATE IN THE CONTROL ROOM SHOULD BE MAINTAINED WITHIN THE COMFORT ZONE AS GIVEN IN NUREG-0700. HUMIDITY IS AN IMPORTANT VARIABLE IN COMFORT.

RESPONSE

CARPETING THAT HAS BEEN INSTALLED IN THE CONTROL ROOM. UPON QUESTIONING SEVERAL OPERATORS, THE STATIC SHOCK PROBLEM NO LONGER SEEMS TO BE A CONCERN.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A6.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0075
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 3
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY ELEVEN OPERATORS STATED THAT THEY NORMALLY RUN WITH THE CENTER GROUP OF LIGHTS OUT, AND THAT DOING THIS GIVES THEM A LOT OF GLARE AND REFLECTIONS OFF THE CENTER SECTION INDICATORS. IT ALSO RESULTS IN UNEVEN LIGHTING, TOO DARK AREAS AND TOO BRIGHT AREAS. IT IS DIFFICULT TO ADJUST THE LIGHTS SO ONE CAN SEE EVERYTHING WITHOUT SQUINTING.

COMMENTS

THE HUMAN FACTORS PRINCIPLES INVOLVED ARE 1) THE LEVEL OF ILLUMINATION SHOULD NOT VARY GREATLY OVER A GIVEN WORK STATION AND 2) GLARE SHOULD NOT INTERFERE WITH THE READABILITY OF DISPLAYS, LABELS OR INDICATORS.

RESPONSE

LIGHTING WILL BE CORRECTED AND OPTIMIZED TO ENSURE THE CONDITIONS NECESSARY FOR A PROPER FIELD OF VISION FOR OPERATIONS PERSONNEL. A CRITERION OF 10 FOOT CANDLES MAY NOT BE DEEMED NECESSARY. THE SCHEDULED COMPLETION DATE FOR THIS WORK IS 6\30\87\.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERATOR SURVEY

A7.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME
-------	------------------------	-------------------

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0076
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 3
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT NO EMERGENCY LIGHTING IS AVAILABLE IN SOME AREAS TO READ OR PERFORM EMERGENCY OPERATIONS, E.G. 1) AUXILIARY RELAY CABINET AND THE SPING CATHODE TUBE AREA, 2) RADIATION MONITORING SYSTEM AREA, 3) PROTECTION RACK AREA.

COMMENTS

THE HUMAN FACTORS PRINCIPLE APPLICABLE IS THAT THE CONTROL ROOM EMERGENCY LIGHTING SYSTEM PROVIDES A MINIMUM ILLUMINATION LEVEL OF 10 FOOT CANDLE AT ALL WORK STATIONS IN THE PRIMARY OPERATING AREA.

RESPONSE

LIGHTING WILL BE CORRECTED AND OPTIMIZED TO ENSURE THE CONDITIONS NECESSARY FOR A PROPER FIELD OF VISION FOR OPERATIONS PERSONNEL. THE SCHEDULED COMPLETION DATE FOR THIS WORK IS 6/30/87. A CRITERION OF A 10 FOOT CANDLES MAY NOT BE DEEMED NECESSARY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

A7.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0077
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE MAIN FEEDWATER BYPASS VALVE SHOULD BE OPERATED IN AUTO DURING STARTUP. IT WAS STATED THAT IN AUTO IT SEEMS TO RESPOND TOO SLOWLY FOR AN OPERATOR TO FEEL COMFORTABLE WITH IT. DURING START UP, IT IS OPERATED FOR A RELATIVELY SHORT TIME, AND SINCE FEEDWATER CONTROL TAKES A DEDICATED OPERATOR ANYWAY, IT MIGHT AS WELL BE IN MANUAL FOR THAT BRIEF PERIOD.

COMMENTS

CONTROLS SHOULD BE SELECTED TO ENSURE EASE OF OPERATION AND TO MINIMIZE OPERATOR ERRORS.

RESPONSE

AUTOMATIC STEAM GENERATOR LEVEL CONTROL DURING LOW POWER OPERATIONS IS A GENERIC PROBLEM TO ALL PWR PLANTS. TWO WESTINGHOUSE RECOMMENDED MODIFICATIONS TO THE F.W. BYPASS VALVE CONTROL SYSTEM WERE TRIED AT GINNA IN AN ATTEMPT TO ANTICIPATE LEVEL CHANGES DUE TO COMPRESSION AND/OR EXPANSION OF THE STEAM CONTENT OF THE STEAM GENERATORS. THE TWO ANTICIPATION SIGNALS TRIED WERE NUCLEAR POWER AND STEAM GENERATOR PRESSURE. IN BOTH CASES THE RESULTS WERE UNSATISFACTORY. MANUAL STEAM GENERATOR LEVEL CONTROL MUST CONTINUE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B1.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0078
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE
BORATION/DILUTION SYSTEM REQUIRES AN OPERATOR TO TAKE ACTION
EVERY TIME IT ACTIVATES.

COMMENTS

WHEN USING LOWER FLOW RATES, THE BORIC ACID FLOW CONTROL VALVE
MUST BE OPERATED IN MANUAL TO PROVIDE THE PROPER RATE. IF THE
VALVE IS OPERATED IN AUTO AT LOW FLOW RATES, BORIC ACID FLOW
OSCILLATES SEVERELY. APPLICABLE PRINCIPLE IS THAT CONTROLS SHOULD
BE SELECTED TO ENSURE EASE OF OPERATION AND TO MINIMIZE OPERATOR
ERRORS.

RESPONSE

A NEW CONTROLLER WILL BE INSTALLED PER EWR 4375 DURING THE 1988
REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B1.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0079
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY BY FOUR OPERATORS INDICATED THAT AUXILIARY FEEDWATER CAN BE AN OVERFEED OR UNDERFEED SITUATION DEPENDING ON THE ACCIDENT SCENARIO OR OPERATOR ACTIONS. LOW FLOW S/G FEEDWATER FROM AUXILIARY FEEDWATER PUMPS REQUIRES EXTENSIVE OPERATOR ATTENTION DURING CHANGING PLANT CONDITIONS (I.E. HV, CD, STM FLOW CHANGES). IT IS A PROBLEM IN ALL MODES OF PLANT OPERATION TO USE THESE THROTTLEABLE VALVES.

COMMENTS

EA CONTROL SHOULD BE NECESSARY AND SHOULD BE THE SIMPLEST EFFECTIVE CONTROL FOR THE EMERGENCY TASKS REQUIRED.

RESPONSE

AUXILIARY FEEDWATER DOES NOT REQUIRE CONTINUOUS ATTENTION EXCEPT WHEN INCREASING POWER AND PREPARING TO TRANSFER TO MAIN FEEDWATER. UNDER THESE CONDITIONS AUX. FEEDWATER SHOULD BE UNDER DIRECT CONTROL OF AN OPERATOR. IN EMERGENCY CONDITIONS, PUMPS START AND FLOW AUTOMATICALLY THROTTLES BACK TO ABOUT 200 GPM. THIS IS ACCEPTABLE AS IS.

FEEDWATER CONTROL DURING STARTUP IS A GENERIC PROBLEM FOR WESTINGHOUSE PLANTS. GINNA STATION STAFF AND THE WESTINGHOUSE OWNERS GROUP ARE LOOKING INTO THIS ISSUE. ACTION ON THIS ITEM WILL FOLLOW UPON RECOMMENDATIONS OF THE WOG WHEN THEY ARE ISSUED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PER OPER SURVEY

B2.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0080
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE V-300A AND V-300B SEAL INJECTION VALVES TO THE REACTOR COOLANT PUMPS ARE A PROBLEM DURING AN EMERGENCY AS IN OTHER MODES OF OPERATION AS WELL.

COMMENTS

EACH CONTROL SHOULD BE NECESSARY AND SHOULD BE THE SIMPLEST EFFECTIVE CONTROL FOR THE EMERGENCY TASKS REQUIRED.

RESPONSE

REACTOR COOLANT PUMP SEAL INJECTION SUPPLY THROTTLE VALVES ARE MANUAL VALVES LOCATED IN THE AUXILIARY BUILDING BASEMENT NEAR THE CONTAINMENT PENETRATION. FLOW INDICATION IS LOCATED NEAR THE VALVES.

DURING NORMAL OPERATION THESE VALVES ARE THROTTLED AND FLOW RATES ARE MONITORED PERIODICALLY BY THE AUXILIARY OPERATORS DURING ROUNDS. THESE VALVES VERY SELDOMLY NEED ADJUSTING; HOWEVER, IF REQUIRED IT WOULD BE ACCOMPLISHED WHEN THE FLOW RATES WERE CHECKED.

EMERGENCY PROCEDURES REQUIRE THESE VALVES TO BE CLOSED PRIOR TO RESTORING SEAL INJECTION IF THERE HAS BEEN A LOSS OF CHARGING AND COMPONENT COOLING TO PREVENT RAPID COOLING OF THE SEALS. IF THIS SITUATION WERE TO OCCUR DURING A LOCA WHERE RADIATION LEVELS MAY BE HIGH, WE WOULD NOT NEED TO RESTORE CHARGING TO MITIGATE THE ACCIDENT. DURING OTHER ACCIDENTS THIS IS NOT A TIME DEPENDENT STEP AND THEREFORE LOCALLY OPERATED VALVES ARE ACCEPTABLE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B2.3

EQUIPMENT

EQUIPMENT

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0081
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY THREE OPERATORS INDICATED THAT WHEN IN MANUAL THE FEEDWATER CONTROLS REQUIRE CONSTANT ATTENTION. MOREOVER, DUE TO POOR FEEDWATER FLOW AND STEAM FLOW INDICATION THE MAIN FEEDWATER REGULATION VALVE AND BYPASS VALVE CONTROL IS DIFFICULT TO OPERATE AT LOW POWER (20%).

COMMENTS

VISUAL DISPLAYS PROVIDED IN THE CONTROL ROOM SHOULD GIVE OPERATORS ALL THE INFORMATION ABOUT SYSTEM STATUS AND PARAMETER VALUES THAT IS NEEDED TO MEET TASK REQUIREMENTS IN EMERGENCIES. EACH CONTROL SHOULD BE SELECTED TO ENSURE EASE OF OPERATION AND TO MINIMIZE OPERATOR ERRORS.

RESPONSE

THE STEAM AND FEEDWATER FLOW TRANSMITTERS ARE SCHEDULED TO BE RECALIBRATED DURING THE 1986 SPRING REFUELING OUTAGE. DURING THIS RECALIBRATION, PARTICULAR ATTENTION WILL BE GIVEN TO TRANSMITTER RESPONSE AT THE LOW END OF THE TRANSMITTER SPAN WHICH SHOULD ALLEVIATE SOME OF THE PROBLEMS WITH LOW POWER STEAM GENERATOR LEVEL CONTROL. IN ADDITION, THE WESTINGHOUSE OWNERS GROUP IS DEVELOPING START UP OPERATION PROCEDURES THAT EMPLOY TECHNIQUES THAT REDUCE THE SEVERITY OF STEAM GENERATOR LEVEL CONTROL PROBLEMS AT LOW POWER. THESE PROCEDURES WILL BE IMPLEMENTED UPON SATISFACTORY DEMONSTRATION.

SOURCE OF DISCREPANCY

OPERATOR SURVEY

EXPLANATORY INFORMATION

B2.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0082
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSES TO THE OPERATOR SURVEY (6) INDICATED THAT THE HYDROGEN TEMPERATURE CONTROLS ARE CURRENTLY BEHIND THE BOARDS AND THAT THEY SHOULD BE ON THE FRONT BOARDS. THE OPERATOR COULD THEN READILY SEE THEM WHEN THE CONTROLLER IS OVER RANGED. IT AFFECTS CONDENSATE PRESSURE AND TURBINE VIBRATION, BOTH IMPORTANT SYSTEMS.

COMMENTS

RESPONSE

THE CONSENSUS OF THE OPERATORS SURVEYED WAS THAT THE CONTROLLER SHOULD BE LEFT IN ITS PRESENT LOCATION. HOWEVER, AN EWR HAS BEEN SUBMITTED TO CHANGE ALARM WINDOW H-22 TO PROVIDE INDICATION THAT THE CONTROLLER OUTPUT IS GREATER THAN 70%. IT WAS ALSO REQUESTED THAT THE ALARM WINDOW BE CHANGED TO READ "H2 TEMP CONTROLLER HI OUTPUT 70%". THIS SHOULD PROVIDE ADEQUATE INDICATION OF CONTROLLER PROBLEMS. THIS WILL BE IMPLEMENTED BY THE END OF THE 1988 REFUELLING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY	B2.6
OPERATOR SURVEY	B3.4
OPERATOR SURVEY	B7.1

EQUIPMENT ID NUMBER	EQUIPMENT NAME
------------------------	-------------------

OTHER

HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0083
 IDILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE BY FIVE OPERATORS TO THE OPERATOR SURVEY INDICATED THAT THE SCREEN HOUSE RECIRCULATION GATE (CIR. H20) SHOULD BE MOVED FROM THE BACK TO THE FRONT CONTROL BOARD SO THAT THE CONTROL AND INDICATOR ARE TOGETHER AND THE OPERATOR CAN MONITOR AND CONTROL POSITIONS MORE READILY. THE RECIRCULATION GATE IN MANUAL OPERATION REQUIRES HUNDREDS OF TURNS AND IS A PROBLEM IN ALL MODES OF OPERATION.

COMMENTS

RESPONSE

THE SCREENHOUSE RECIRCULATION GATE IS USED QUITE INFREQUENTLY AND IS NOT CRITICAL TO SAFE OPERATION OF THE PLANT. ITS LIMITED USE DOES NOT WARRANT RELOCATION TO THE FRONT OF THE CONTROL BOARD.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY
 VALIDATION
 OPERATOR SURVEY

A1.14
 B2.7
 B7.5

PANEL EQUIPMENT ID NUMBER EQUIPMENT NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0085
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY OPERATORS INDICATED THAT CHARGING PUMP FLOW, PRESSURE AND TEMPERATURE INDICATORS ARE ON A DIFFERENT PANEL THAN THE CONTROLS. THUS, WHEN ADJUSTING CHARGING FLOW WITH THE CHARGING CONTROLLER, THE OPERATOR IS 8-10 FEET AWAY FROM THE FLOW INDICATOR. IN LOOKING FROM THE SIDE AT THAT DISTANCE THERE IS A LOT OF PARALLAX.

COMMENTS

CONTROLS AND DISPLAYS SHOULD BE ASSIGNED TO WORK STATIONS TO MINIMIZE OPERATOR MOVEMENTS. MOREOVER, THE MAXIMUM LATERAL SPREAD OF CONTROLS AND DISPLAYS AT A SINGLE OPERATOR WORK LOCATION SHOULD NOT EXCEED 72 INCHES. FINALLY, WITHIN CONSTRAINTS OF GROUPING BY TASK SEQUENCE, CONTROLS AND DISPLAYS ARE ASSIGNED TO PANELS IN FUNCTIONAL GROUPS RELATED TO SYSTEM STRUCTURE. COMBINE WITH HED #84.

RESPONSE

THE RECOMMENDED FIX FOR THESE HEDS IS TO INSTALL AT LEAST ONE FLOW METER AND A REPEATER OF LETDOWN FLOW ON PANEL 6 (POSSIBLY WHERE T AVG USED TO BE LOCATED). LOCATING THESE INDICATIONS ON PANEL 6 WOULD PROVIDE BETTER CONTROL DISPLAY RELATIONSHIP FOR THE CVCS SYSTEM AND ALSO WOULD PROVIDE CHARGING/LETDOWN DIFFERENTIAL ON PANEL 6 WHERE THE MAJORITY OF RCS INDICATION IS LOCATED. THIS WOULD BE HELPFUL DURING RCS LEAK INVESTIGATION AS IT WOULD PROVIDE SOME INDICATION OF RCS LEAKRATE WHEN USED IN CONJUNCTION WITH PRZR LEVEL TREND. THE CONTROL BOARD LABELING AND ENHANCEMENT PACKAGE SHOULD ALSO ADDRESS THIS CONTROL DISPLAY PROBLEM. SEE HED, 309, 310, 345, 451. BACKGROUND SHADING TO DEMONSTRATE FUNCTIONAL RELATIONSHIPS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE. METERS WILL BE INSTALLED BY SEP 1988.

SOURCE OF DISCREPANCY

OPERATOR SURVEY

EXPLANATORY INFORMATION

B3.1



PERATOR SURVEY
PERATOR SURVEY

B3.2
B4.8

ANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0086
 ILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY IT WAS REPORTED THAT THE CIRCULATING WATER DISCHARGE VALVES ARE SEPARATED FROM THE CIRCULATING WATER PUMP CONTROL SWITCHES BY THE CONDENSATE BOOSTER PUMP CONTROLLERS.

COMMENTS

WITHIN THE CONSTRAINTS OF GROUPING BY TASK SEQUENCE, CONTROLS AND DISPLAYS ARE ASSIGNED TO PANELS IN FUNCTIONAL GROUPS RELATED TO SYSTEM STRUCTURE.

RESPONSE

CIRC WATER PUMP CONTROL SWITCHES AND THE CIRC WATER DISCHARGE VALVES WILL HAVE THEIR FUNCTIONAL RELATIONSHIP DEMONSTRATED VIA BACKGROUND SHADING. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY
 OPERATOR SURVEY

B3.6
 B4.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0088
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT CONTAINMENT VESSEL SUMP LEVELS ARE ON A SIDE PANEL (DIVERSE ISOLATION PANEL, W RACK) IN THE BACK OF THE CONTROL ROOM.

COMMENTS

CONTAINMENT VESSEL CONTROLS AND DISPLAYS SHOULD BE ASSIGNED TO PANELS IN FUNCTIONAL GROUPS RELATED TO SYSTEM STRUCTURE.

RESPONSE

THE 1A IS LOCATED ON PANEL 25, IN THE FRONT CONTROL AREA. THE RECIRC SUMP LEVEL 1B IS ON THE 7 PANEL. THE 1A HAS AN ANNUNCIATOR ON THE 7 PANEL. SAFEGUARDS OPERATION IS SATISFIED BY 1B INDICATION ON THE MCB.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B3.15

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0089
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE ROD BOTTOM
LIGHTS ARE ABOVE THE CONTROL ROD BANKS WHEN THEY SHOULD BE BELOW
THE BANKS.

COMMENTS

DISPLAYS WHICH ARE OBSERVED IN A SPECIFIED SEQUENCE ARE GROUPED
TOGETHER. THEY ARE POSITIONED SO THAT THEY ARE NORMALLY USED IN A
LEFT-TO-RIGHT, TOP-TO-BOTTOM OR OTHER NATURAL SEQUENCE.

RESPONSE

PER EWR 3797 THIS SYSTEM WILL BE REPLACED AND THE PROBLEM
CORRECTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B3.18

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0090
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE CONTAINMENT VESSEL SPRAY FLOWS (F931A AND 931B) WOULD BE BETTER LOCATED ABOVE SPRAY PUMP SWITCHES. IT WAS SUGGESTED THAT THEY COULD BE SWAPPED IN POSITION WITH INDICATORS OF REFUELING WATER STORAGE TANK LEVELS.

COMMENTS

CONTROL AND DISPLAYS SHOULD BE LOCATED SO THAT DISPLAYS ARE NOT OBTURED DURING CONTROL OPERATION.

RESPONSE

THESE FLOW METERS ARE IN THE DISCHARGE LINES FROM RHR HX'S TO THE SAFETY INJECTION PUMP AND CORE SPRAY PUMP SUCTIONS. THEY WILL INDICATE FLOW ONLY WHILE ON HIGH HEAD RECIRCULATION OR LOW HEAD RECIRC WITH SPRAY. MORE APPROPRIATE LABELING WOULD BE SI OR CS FLOW DURING RECIRCULATION.

BACKGROUND SHADING AND LABELING WILL HELP TO ALLEVIATE PROBLEMS ASSOCIATED WITH THIS INSTRUMENTATION. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B3.19

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0091
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE MOTOR DRIVEN AUXILIARY FEED PUMP AND THE TURBINE AUXILIARY FEED PUMP DISCHARGE PRESSURE AND FLOWS ARE VERY POORLY CONFIGURED AND DESIGNED. WHILE THEY ARE IN THE CORRECT AREA ON THE CONTROL BOARD, CONFIGURATION AND GROUPING IS POOR.

COMMENTS

MULTIPLE CONTROLS OR DISPLAYS RELATED TO THE SAME FUNCTION ARE GROUPED TOGETHER.

RESPONSE

A LABEL-LOCATION EVALUATION OF THE GINNA CONTROL IS BEING PERFORMED. UPON COMPLETION OF THIS TASK RECOMMENDED FIXES RELATIVE TO THIS HED WILL BE SUBMITTED TO RG&E FOR EVALUATION OF INCORPORATION. THIS WILL BE IMPLEMENTED VIA BACKGROUND SHADING BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B3.20

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0092
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE 4160 BUSES AND
TIE BREAKER BUSES FOR THEIR RESPECTIVE BUS SHOULD BE GROUPED
TOGETHER.

COMMENTS

WITHIN THE CONSTRAINTS OF GROUPING BY TASK SEQUENCE, CONTROLS AND
DISPLAYS ARE ASSIGNED TO PANELS IN FUNCTIONAL GROUPS RELATED TO
SYSTEM STRUCTURE. ALSO MULTIPLE CONTROLS OR DISPLAYS RELATED TO
THE SAME FUNCTION ARE GROUPED TOGETHER.

RESPONSE

A LABEL-LOCATION EVALUATION OF THE GINNA CONTROL IS BEING
PERFORMED. UPON COMPLETION OF THIS TASK RECOMMENDED FIXES
RELATIVE TO THIS HED WILL BE SUBMITTED TO RG&E FOR EVALUATION OF
INCORPORATION. THIS WILL BE IMPLEMENTED VIA BACKGROUND SHADING
BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B4.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0093
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT SYNCHROSCOPE SWITCH POSITIONS TO THE BREAKER SWITCH POSITIONS ARE DIFFERENT IN LAYOUT.

COMMENTS

CONTROL-DISPLAY OR CONTROL-CONTROL RELATIONSHIP SHOULD BE LAID OUT CONSISTENTLY SO THAT THE OPERATOR EXPECTATIONS ARE NOT CONFUSED.

RESPONSE

AFTER A THOROUGH EVALUATION OF THIS PROBLEM IT WAS DEEMED INCONSEQUENTIAL. NO CORRECTIVE ACTION IS NECESSARY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B4.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0094
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY FIVE OPERATORS REPORTED THAT THE B MAIN FEEDWATER PUMP PISTOL GRIP CONTROLLER IS RIGHT NEXT TO THE A AUXILIARY FEEDWATER PUMPS. WITH SUCH AN ARRANGEMENT THE B MAIN FEEDWATER PUMPS COULD ACCIDENTALLY BE STOPPED BY AN OPERATOR REACHING TO SHUT DOWN THE A AUXILIARY FEEDWATER PUMPS.

COMMENTS

CONTROLS SHOULD BE LOCATED AND ORIENTED SO THAT THE OPERATOR IS NOT LIKELY TO STRIKE OR MOVE THEM ACCIDENTALLY IN ANY IDENTIFIED SENCE OF MOVEMENTS. USE OF DIFFERENTLY SHAPED HANDLES FOR DIFFERENT CONTROLS TO MAXIMIZE DISCRIMINABILITY MAY BE A USEFUL SOLUTION.

RESPONSE

THIS WILL BE BE CORRECTED BY IMPLEMENTING BACKGROUND SHADING BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

BS.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0095
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT AOV-4297 AND AOV-4298 HAVE INDICATORS WHICH MOVE ON THE SCALE FROM 0 TO 100 AS THE VALVES GO FROM OPEN TO SHUT. THIS IS NON-CONVENTIONAL.

COMMENTS

SCALES SHOULD BE GRADUATED AND NUMBERED SO THAT READINGS ARE RELATED IN A DIRECT AND PRACTICAL WAY TO THE OPERATOR'S TASK.

RESPONSE

THE CONCERNED CONTROLLERS ARE FOR FAILED OPEN VALVES. THE FOXBORO COMPANY DOES NOT OFFER AN ALTERNATIVE FOR THESE CONTROLLERS. ALL OF THE CONTROLLERS WITH THE EXCEPTION OF THE SPRAY VALVE CONTROLLER HAVE INDICATON FOR THE PARAMETER BEING EFFECTED, SO THAT OPERATIONS PERSONNEL CAN OBSERVE WHEN MAKING A CONTROLLER CHANGE. THE CONTROLLERS WILL BE CLEARLY LABELED TO INDICATE THE EXPECTED VALVE RESPONSE TO A CHANGE IN CONTOLLER OUTPUT.

SEVERAL OPERATORS HAVE STATED THAT THE PRESENT CONTROLLER ACTION AND LABELING IS USEFUL IN INDICATING THE DESIGNED FAILURE MODE OF THE VALVE. THE SPRAY ADDITIVE VALVE CONTROLLER IS SPECIAL IN THAT THE OUTPUT CIRCUIT OF THE CONTROLLER OPENS ON RECEIPT OF A SAFEGUARD SIGNAL CAUSING THE VALVE TO OPEN. USE OF THIS CONTROLLER IS MINIMAL DURING NORMAL OPERATIONS AND DOES NOT REQUIRE IMMEDIATE RESPONSE BY OPERATIONS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B5.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0096
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSES TO THE OPERATOR SURVEY INDICATED THAT ALL CONTROLLERS ARE GROUPED TOGETHER AND THEY ARE VERY SIMILAR IN PHYSICAL APPEARANCE. ONE COULD EASILY TURN THE WRONG KNOB (E.G., CHARGING PUMP SPEED CONTROLLERS ARE RIGHT NEXT TO SPRAY VALVE CONTROLLER).

COMMENTS

CODING METHOD FOR APPLICATION HERE SHOULD BE DETERMINED BY THE RELATIVE ADVANTAGES AND DISADVANTAGES OF EACH TYPE OF CODING, E.G., LOCATION, SIZE, SHAPE, LABELING, COLOR.

RESPONSE

A BACKGROUND SHADING ON CONTROLLERS WILL BE DEVELOPED WHICH INCREASES AN OPERATORS ABILITY TO DISCRIMINATE. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B5.6

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0097
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT SWITCHES RUN TOGETHER FROM ONE SYSTEM TO ANOTHER DUE TO LACK OF SEPARATION BY TAPE, COLOR, MIMIC BUS, ETC. THERE IS NO SECTIONALIZING.

COMMENTS

USE LINES OF DEMARCATION TO ENCLOSE FUNCTIONALLY RELATED CONTROLS.

RESPONSE

WHERE APPROPRIATE, LINES OF DEMARCATION WILL BE ADDED TO EXISTING PANELS IN ORDER TO MAKE THE SEPARATION OF SYSTEMS CLEAR. IN ADDITION, BACKGROUND SHADING WILL BE IMPLEMENTED TO DEMONSTRATE FUNCTIONAL RELATIONSHIPS. THESE CORRECTIVE ACTIONS WILL BE COMPLETED BY THE END OF THE 1987 OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B5.7

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0098
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE AUTO/MANUAL TOGGLE SWITCHES FOR THE MAIN FEEDWATER REGULATING VALVES ARE LOCATED AT THE BOTTOM OF THE APRON OF THE CENTER SECTION OF THE CONTROL BOARD. OPERATOR WAS SURPRISED THAT THEY HAVE NEVER BEEN ACCIDENTALLY BUMPED INTO MANUAL.

COMMENTS

CONTROLS SHOULD BE PLACED IN AN AREA BETWEEN 34 AND 53 INCHES ABOVE THE FLOOR ON VERTICAL PANELS. CONTROLS SHOULD BE SET BACK 3 INCHES FROM THE FRONT EDGE OF A CONSOLE.

RESPONSE

TASK ASSIGNMENT TA OPS 85-84 HAS BEEN ISSUED TO PROVIDE COVERS TO INSURE THAT THESE TOGGLE SWITCHES ARE NOT INADVERTANTLY ACTIVATED. THIS TASK WILL BE COMPLETED 4/86.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY
 CHECKLIST

B5.9
 1.2.2.B.1-2/1.2.2.D.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0099
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE BORIC ACID LO-
 LO RESET BUTTON IS TOO CLOSE TO S.I. RESET AND MANUAL S.I.
 BUTTONS. MOREOVER THE S.I. RESET AND MANUAL S.I. BUTTONS DO NOT
 HAVE TUBES AROUND THEM. ACCIDENTAL ACTIVATION OF THE WRONG
 BUTTON IS POSSIBLE.

COMMENTS

ACCIDENTAL ACTIVATION OF CONTROLS SHOULD BE MINIMIZED BY ONE OR
 MORE OF THE FOLLOWING METHODS :1) PROPER LOCATION, 2) FIXED
 PROTECTIVE STRUCTURES, 3) MOVEABLE COVERS OR GUARDS, INTERLOCKING
 CONTROLS, 4) RESISTANCE TO MOVEMENT, 5) SEQUENTIAL ACTIVATION, 6)
 CHOICE OF ACTION.

RESPONSE

TASK ASSIGNMENT TA OPS 85-85 HAS BEEN ISSUED TO PROVIDE COVERS TO
 INSURE THAT THESE TOGGLE SWITCHES ARE NOT INADVERTANTLY
 ACTIVATED. THIS TASK WILL BE COMPLETED BY 4/86.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B3.10

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0100
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT MANUAL CONTAINMENT SPRAY BUTTONS ARE TOO FAR APART FOR A SHORT OPERATOR TO BE ABLE TO REACH BOTH AT THE SAME TIME.

COMMENTS

THE DISTANCE BETWEEN CONTROLS THAT MUST BE OPERATED AT THE SAME TIME SHOULD NOT EXCEED THE SPAN OF REACH OF A 5TH PERCENTILE FEMALE.

RESPONSE

THE ACTUAL DISTANCE BETWEEN THESE CONTROLS IS 36". ALTHOUGH NOT AN OPTIMAL PLACEMENT, GINNA'S SMALLEST OPERATOR HAS DEMONSTRATED THAT THESE CONTROLS CAN BE ACTUATED WITHOUT UNDUE EFFORT. NO CHANGE APPEARS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

BS.11

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0101
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT HCV-624 AND HCV-625 ARE BACKWARDS TO LOGICAL THINKING. THESE ARE RESIDUAL HEAT SYSTEM OUTLETS FROM THE HEAT EXCHANGER.

COMMENTS

CONTROLS SHOULD BE THE TYPE NORMALLY ANTICIPATED FOR THE OPERATION CONCERNED. THIS MEANS CONFORMING TO OPERATOR EXPECTATIONS. MATCHING TO OTHER CONTROLS FOR THE SAME FUNCTION, AND GENERALLY CONFORMING TO CONVENTIONAL PRACTICE.

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WILL BE IMPLEMENTED IN THE CONTROL ROOM. WHERE APPROPRIATE, AND WHERE SPACE CONSIDERATIONS ALLOW LEFT-TO-RIGHT READING ORDER WILL BE SELECTED. WHERE DIFFERENCES FROM THIS STANDARD OCCUR, IT IS BECAUSE THE COMPONENTS ARE ACTUALLY NUMBERED THAT WAY. FOR EXAMPLE, "B" PUMP MAY BE ASSOCIATED WITH SYSTEM 1 AND 'A' PUMP MAY BE ASSOCIATED WITH SYSTEM 2. IF SYSTEM 1&2 ARE LOCATED ON THE BOARDS IN NORMAL READING ORDER, THE PUMP DESIGNATIONS ARE BACKWARDS.

IN ORDER TO CORRECT THIS PROBLEM HUNDREDS OF PAGES OF PROCEDURES WOULD HAVE TO BE CHANGED, CONTROLLED DRAWINGS WOULD HAVE TO BE ALTERED, OPERATORS WOULD HAVE TO BE RETRAINED, CONTROLS WOULD HAVE TO BE MOVED OR LABELS WOULD HAVE TO BE CHANGED, AND ANNUNCIATORS WOULD HAVE TO BE ALTERED. THE GAIN IS SIMPLY NOT WORTH IT CONSIDERING THE FACT THAT WE WOULD BE CORRECTING ONLY A RELATIVELY INSIGNIFICANT PROBLEM AND THE EXTREME MEASURES REQUIRED TO BRING ABOUT A POSITIVE CHANGE. PROCEDURAL CHANGES AND RETRAINING MAY ALSO CAUSE NEW ERRORS.

SOURCE OF DISCREPANCY

OPERATOR SURVEY

EXPLANATORY INFORMATION

B5.13

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

PANEL



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0102
FILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY OF EIGHT OPERATORS INDICATED THAT THE CONTROL ROD ANALOG INDICATORS ARE TOO HIGH AND THE NUMBERING IS POOR. THEY ARE ALMOST IMPOSSIBLE TO READ ACCURATELY FROM FLOOR LEVEL. THEY READ IN STRANGE INCREMENTS AND ONE NEEDS A LADDER TO SEE THEM. UPPER CONTROL ROD POSITION INDICATIONS ARE HARD TO READ BECAUSE OF POSITION OF METERS, GLARE OFF LIGHTS AND INCREMENTATIONS OF METERS.

COMMENTS

FOR VERTICAL PANELS, DISPLAYS ARE PLACED IN AN AREA BETWEEN 41 AND 80 INCHES ABOVE THE FLOOR. DISPLAYS THAT ARE READ FREQUENTLY OR PRECISELY DURING EMERGENCY OPERATIONS ARE PLACED IN AN AREA BETWEEN 50 AND 65 INCHES ABOVE THE FLOOR. CHARACTER HEIGHT SHOULD SUBTEND A VISUAL ANGLE OF 15 MINUTES (.004*X VIEWING DISTANCE.) A VISUAL ANGLE OF 20 MINUTES (.006*X VIEWING DISTANCE) IS PREFERRED.

RESPONSE

NEW EQUIPMENT WILL BE INSTALLED TO CORRECT THESE PROBLEMS BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERATOR SURVEY

B6.2

PANEL EQUIPMENT ID NUMBER EQUIPMENT NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0103
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED THAT MOST OF THE INDICATORS ON THE TOP OF THE VERTICAL SECTION OF THE CONTROL BOARD ARE DIFFICULT TO READ ACCURATELY WITHOUT A STEP STOOL.

COMMENTS

FOR VERTICAL PANELS, DISPLAYS ARE PLACED IN AN AREA BETWEEN 41 AND 80 INCHES ABOVE THE FLOOR. THOSE READ FREQUENTLY AND PRECISELY DURING EMERGENCY OPERATIONS ARE PLACED IN AN AREA BETWEEN 50 AND 65 INCHES ABOVE THE FLOOR. A VIEWING CHARACTER HEIGHT SHOULD SUBTEND 15 MINUTES OR .004X VIEWING DISTANCE. A VIEWING ANGLE OF 20 MINUTES, OR .006X VIEWING DISTANCE IS PREFERRED.

RESPONSE

READING DIFFICULTY IS THE RESULT OF THE COMBINATION OF A NUMBER OF VARIABLES. VIEWING DISTANCE AND PLACEMENT IN THESE INSTANCES ARE INCONSEQUENTIAL TO OTHER PROBLEMS. THESE MAY INCLUDE SUCH FACTORS AS LIGHTING, GLARE, POOR LABELING, LACK OF UNITS OF MEASUREMENT, ETC. THE PLACEMENT OF THESE DISPLAYS DOES NOT APPEAR TO BE SUFFICIENTLY PROBLEMATIC TO WARRANT CHANGE BECAUSE OF THOSE CRITERIA. THE METERS IN QUESTION WILL NOT BE MOVED. WHERE HUMAN ENGINEERING DISCREPANCIES EXIST BECAUSE OF OTHER CRITERIA, THEY ARE EVALUATED ON A CASE BY CASE BASIS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B6.12

PANEL EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0104
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE OVERPRESSURIZATION SYSTEM VALVE CONTROLS ARE LOCATED TOO CLOSE TO THE FLOOR AND ONE MUST KNEEL TO OPERATE THEM.

COMMENTS

CONTROLS ARE PLACED IN AN AREA BETWEEN 34 INCHES AND 70 INCHES ABOVE THE FLOOR. EMERGENCY CONTROLS, AS IDENTIFIED IN THE TASK ANALYSIS, ARE PLACED IN AN AREA BETWEEN 34 INCHES AND 53 INCHES ABOVE THE FLOOR.

RESPONSE

INFREQUENT USE OF THESE CONTROLS IS JUSTIFICATION FOR NOT RELOCATING THEM. IF KNEELING WERE REQUIRED FOR EXTENDED PERIODS OF TIME DURING OPERATION (WHICH IT IS NOT) RELOCATION WOULD BE IN ORDER.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B6.13

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0105
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE CONDENSATE COOLER DELTA PRESSURES AND TEMPERATURE CONTROLLER SHOULD BE ON FRONT OF THE CONTROL BOARD, INASMUCH AS THE TEMPERATURE OF THE LAKE CAN SWING THESE PARAMETERS VERY QUICKLY. IT WOULD CONTRIBUTE TO THE EFFICIENCY AND RELIABILITY OF OPERATION TO HAVE THEM IN AN AREA WHERE THEY COULD BE MONITORED CONSTANTLY.

COMMENTS

CONTROL ROOM INSTRUMENTATION SHOULD INCLUDE CONTROLS AND DISPLAYS NEEDED FOR THE DETECTION OF ABNORMAL CONDITIONS.

RESPONSE

DURING PERIODS WHEN LAKE TEMPERATURE IS SWINGING, IT CAN BE PLACED ON THE ANALOG RECORDER. WHEN LARGE LAKE TEMPERATURE SWINGS ARE NOTED, THE OPERATOR CAN CHECK H2 COOLER AND CONDENSATE COOLER DELTA P'S PERIODICALLY. ALARM H-22 IS ALSO AVAILABLE TO INFORM THE OPERATOR WHEN THE H2 COOLER BYPASS VALVE IS 70% SHUT.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B7.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0106
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE BORIC ACID RECIRCULATION VALVE CONTROLLERS AND THE PUMP DISCHARGE PRESSURE INDICATOR SHOULD BOTH BE ON THE FRONT CONTROL BOARD. AT PRESENT THE PRESSURE INDICATOR IS ON A BACK BOARD.

COMMENTS

CONTROLS AND DISPLAYS SHOULD BE PLACED WITHIN THE CONTROL ROOM AT LOCATIONS WHICH PROMOTE EFFICIENT PROCEDURES, SAFE OPERATIONS AND MAXIMUM OPERATOR AWARENESS OF CURRENT SYSTEM CONDITION.

RESPONSE

THESE CONTROLLERS ARE USED ONLY DURING RECIRCULATION FOR THE BASTS. THIS IS AN INFREQUENT EVENT. THEREFORE, IT IS NOT NECESSARY FOR THESE CONTROLLERS TO BE ON THE FRONT OF THE MCB.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY B3.14
OPERATOR SURVEY B7.11

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0107
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE AIR COMPRESSOR CONTROLS WOULD BE MORE ACCESSIBLE UNDER ABNORMAL CONDITIONS IF THEY WERE ON THE FRONT CONTROL BOARD.

COMMENTS

CONTROLS AND DISPLAYS SHOULD BE PLACED WITHIN THE CONTROL ROOM AT LOCATIONS WHICH PROMOTE EFFICIENT PROCEDURES, SAFE OPERATIONS AND MAXIMUM OPERATOR AWARENESS OF THE CURRENT SYSTEM CONDITION. IMPORTANCE AND FREQUENCY OF USE DURING EMERGENCY CONDITIONS IS INSTANT IN DETERMINING LOCATION.

RESPONSE

BECAUSE OF THE INFREQUENCY OF THE USE OF THESE CONTROLLERS DURING NORMAL AND ABNORMAL CONDITIONS AND THE SPACE LIMITATION ON THE MCB FRONT, THE LOCATION OF THESE CONTROLS IS SATISFACTORY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY
 OPERATOR SURVEY

A1.1
 B7.14

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0108
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE CIRCULATION FAN COOLER LEVELS AND DUMP SWITCHES, WHICH ARE USED FREQUENTLY, SHOULD BE ON THE FRONT CONTROL BOARD.

COMMENTS

CONTROLS AND DISPLAYS SHOULD BE PLACED IN THE CONTROL ROOM AT LOCATIONS WHICH PROMOTE EFFICIENT PROCEDURES, SAFE OPERATIONS AND MAXIMUM OPERATOR AWARENESS OF THE CURRENT SYSTEM CONDITION. IMPORTANCE AND FREQUENCY OF USE DURING EMERGENCY OPERATIONS ARE INSTANT IN DETERMINING LOCATION.

RESPONSE

THE COMMITTEE REVIEWED THIS ITEM AND DETERMINED THAT THE LOCATION OF THE RECIRCULATION FAN COOLER DUMP IS SATISFACTORY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY A3.17
OPERATOR SURVEY B7.15

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0109
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE SUBCOOLING METERS SHOULD BE MOVED TO THE FRONT OF THE CONTROL BOARD FROM THE CURRENT LOCATION ON THE AUXILIARY PANEL.

COMMENTS

CONTROLS AND DISPLAYS SHOULD BE PLACED WITHIN THE CONTROL ROOM AT LOCATIONS WHICH PROMOTE EFFICIENT PROCEDURES, SAFE OPERATIONS AND MAXIMUM OPERATOR AWARENESS OF THE CURRENT SYSTEM CONDITION. THE METHODS FOR ACHIEVING THIS ARE 1) GROUPING BY TASK SEQUENCE, 2) GROUPING BY SYSTEM FUNCTION, AND 3) GROUPING BY IMPORTANCE AND FREQUENCY OF USE.

RESPONSE

BOTH CORE SUBCOOLING AND TOP OF REACTOR VESSEL HEAD SUBCOOLING CAN BE DISPLAYED ON THE SAS AT ANY TIME AT THE OPERATOR'S CRT. THIS CAPABILITY NEGATES THE NEED FOR MOVING THE SUBCOOLING METERS TO THE FRONT OF THE BOARD. THIS WILL BE IMPLEMENTED BY JUNE 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY	B3.7
OPERATOR SURVEY	B4.7
OPERATOR SURVEY	B7.20

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0110
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE RCS PRESSURE INDICATOR SHOULD BE LOCATED ON THE BACK CONTROL BOARDS NEAR THE OVERPRESSURE SYSTEM IN THE EVENT AN OPERATOR NEEDS TO OPERATE PORV WITH THIS SYSTEM. THERE WAS ALSO REFERENCE TO MOVING EVERYTHING TO THE FRONT CONTROL BOARD. IN EITHER CASE INDICATORS AND CONTROLLERS WOULD BE GROUPED TOGETHER.

COMMENTS

CONTROLS AND DISPLAYS SHOULD BE PLACED IN THE CONTROL ROOM AT LOCATIONS WHICH PROMOTE EFFICIENT PROCEDURES, SAFE OPERATION AND MAINTAIN OPERATOR AWARENESS OF CURRENT SYSTEM CONDITIONS.

RESPONSE

A NEW REACTOR COOLANT SYSTEM PRESSURE INDICATOR WILL BE INSTALLED ON THE REAR OF THE MCB NEAR THE OVER PRESSURIZATION SYSTEM UNDER EWR-3067 AND TSR 81-03. THIS WILL BE IMPLEMENTED BY MAY, 1986.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY	B2.4
OPERATOR SURVEY	B3.3
OPERATOR SURVEY	B4.6
OPERATOR SURVEY	B7.2
OPERATOR SURVEY	B7.21

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0111
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED THAT THE NIS DETECTOR
 VOLTS RECORDERS ARE USELESS AND TAKE UP A LOT OF ROOM ON
 THE FRONT OF THE MAIN CONTROL BOARD THAT COULD BE USED FOR MORE
 USEFUL THINGS, E.G. DIGITAL TREND RECORDERS OR A CRT. THEY SHOULD
 BE PLACED ANYWHERE ELSE IN THE CR.

COMMENTS

IMPORTANCE AND FREQUENCY OF USE, PARTICULARLY IN EMERGENCY
 CONDITIONS, IS IMPORTANT IN DETERMINING LOCATION OF DISPLAYS AND
 CONTROLLERS WITHIN THE CR.

RESPONSE

SEE HED #69.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY
 OPERATOR SURVEY

A4.4
 B7.23

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0112
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE TURBINE DRAINS SHOULD BE ON THE BACK CONTROL BOARDS.

COMMENTS

IMPORTANCE AND FREQUENCY OF USE, PARTICULARLY DURING EMERGENCY OPERATIONS, ARE IMPORTANT FOR DETERMINING LOCATION OF DISPLAYS AND CONTROLS WITHIN THE CONTROL ROOM. GROUPING BY TASK SEQUENCE AND BY SYSTEM FUNCTION ARE ALSO IMPORTANT CONSIDERATIONS.

RESPONSE

SHOULD ADDITIONAL SPACE BE REQUIRED ON THE PANEL THIS RECORDER WILL BE CONSIDERED FOR REMOVAL. NO CHANGE IS DEEMED NECESSARY AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

B7.24

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0113
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY IT WAS RECOMMENDED THAT S/G
LEVEL INDICATORS AT STANDBY AUXILIARY FEEDWATER STATION CAN GO ON
BACK CONTROL BOARDS WITH CONTROLLERS.

COMMENTS

LOCATION OF CONTROLS AND DISPLAYS WITHIN THE CONTROL ROOM SHOULD
PROMOTE EFFICIENT PROCEDURES, SAFE OPERATIONS AND MAXIMUM
OPERATOR AWARENESS OF CURRENT SYSTEM CONDITION. METHODS FOR
GROUPING CONTROLS AND DISPLAYS INCLUDE 1) BY TASK SEQUENCE, 2) BY
SYSTEM-FUNCTION AND 3) BY IMPORTANCE AND FREQUENCY OF USE. SEE
HE 162.

RESPONSE

THE STANDBY AUXILIARY FEEDWATER PUMPS AND CONTROLS ARE ON THE
REAR OF THE MAIN CONTROL BOARD. THERE IS NO STEAM GENERATOR
LEVEL INDICATION ON THE REAR OF THE MAIN CONTROL BOARD.

DURING NORMAL OPERATIONS THE STANDBY AUXILIARY FEEDWATER PUMPS
ARE ONLY RUN FOR TESTING. THE FLOW IS TO THE STEAM GENERATORS;
HOWEVER, LEVEL CONTROL IS MAINTAINED BY THE MAIN FEEDWATER
CONTROL SYSTEM. STEAM GENERATOR LEVEL INDICATION IS NOT
NECESSARY.

THE STANDBY AUXILIARY FEEDWATER SYSTEM WOULD ONLY BE USED
FOLLOWING A COMPLETE LOSS OF MAIN FEEDWATER AND ALL THREE
AUXILIARY FEEDWATER PUMPS. IF STANDBY AUXILIARY FEEDWATER SYSTEM
OPERATION WERE REQUIRED, THE PLANT WOULD PROBABLY BE IN HOT
SHUTDOWN WHERE LEVEL CONTROL RESPONSE IS MUCH SLOWER ALLOWING
OPERATOR SUFFICIENT TIME TO RECOGNIZE LEVEL CHANGE ON THE FRONT
OF THE CONTROL BOARD AND MAKE FLOW ADJUSTMENTS ON THE REAR.

DUE TO THE LOW PROBABILITY OF USE AND PLANT MODE OF OPERATION
WHEN REQUIRED THE LOCATION ON THE REAR OF THE CONTROL BOARD
WITHOUT STEAM GENERATOR LEVEL INDICATION IS ACCEPTABLE AS IS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERATOR SURVEY
 PERATOR SURVEY
 PERATOR SURVEY

B3.9
 B4.2
 B7.26

PANEL EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0114
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED THAT THE FIRE SYSTEM BELL AND SONALERT SOUND DROWN OUT THE MAIN CONTROL BOARD AUDITORY ALARMS WHEN THEY ARE GOING OFF.

COMMENTS

SPECIFIC PRINCIPLES FOR THE AUDITORY ALERT SYSTEM THAT APPLY ARE 1) THE SIGNAL INTENSITY DOES NOT EXCEED 90 DB (A) AND 2) ALL AUDITORY SIGNALS ARE WITHIN (+/- 2.5 DB) OF THE AVERAGE OF ALL ANNUNCIATOR AUDITORY SIGNALS.

RESPONSE

THE FIRE ALARM BELL HAS BEEN MODIFIED TO BE WITHIN THE GUIDELINES OF NUREG 0700 AND IS PRESENTLY ACCEPTABLE TO THE OPERATOR. THE FIRE SONALERT HAS A FREQUENCY OF APPROXIMATELY 2500 CYCLES. THE SIGNAL TO NOISE RATIO IS 15 DB ONE FOOT FROM THE FIRE PANEL AND 7 DB AT THE OPERATOR STATION. THESE VALUES FALL WITHIN THE NUREG GUIDELINES HOWEVER. THE ALARM IS STILL UNACCEPTABLE TO THE OPERATORS. BASED ON THIS, THE SONALERT IS INCLUDED IN EWR-4347 WHICH REQUIRES THAT ALL CONTROL ROOM ALARMS BE EVALUATED AND MODIFIED TO ACCEPTABLE LEVELS OF INTENSITY. THIS PROBLEM WILL BE RECTIFIED BY 6/30/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

C1.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0115
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT OTHER ALARMS (I.E. SPING, FIRE PANEL, FIRE SYSTEM, RADIATION MONITOR) ARE TOO LOUD AND SOMETIMES COVER THE EXCESSIVELY LOUD ANNUNCIATOR ALARM.

COMMENTS

PRINCIPLES OF AUDITORY ALERT SYSTEMS THAT APPLY ARE 1) SIGNAL HAS A VALUE OF AT LEAST 10 DB (A) ABOVE AVERAGE AMBIENT NOISE, 2) SIGNAL INTENSITY DOES NOT EXCEED 90 DB (A), 3) ALL AUDITORY SIGNALS ARE WITHIN (+/-2.5 DB) OF THE AVERAGE OF ALL ANNUNCIATOR AUDITORY SIGNALS.

RESPONSE

ANNUNCIATOR ALARM SIGNALS WILL BE ADJUSTED OR CONVERTED TO CONFORM TO STANDARDS SUCH THAT THE MASKING OF ALARMS SHOULD NOT OCCUR, PER EWR 4347. THIS WILL BE COMPLETED BY 6/30/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

C1.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0116
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THERE WAS NO EFFECTIVE WARNING SYSTEM FOR LOOP LEVEL CHANGE DURING LOW LOOP LEVEL MAINTENANCE CONDITIONS. IT WAS STATED THAT THE RHR LOOP WAS BLOWN TO THE REACTOR DURING S/G PRIMARY MAINTENANCE (DECONTAMINATION JOB).

COMMENTS

THE PRINCIPLE INVOLVED IS THAT PLANT PARAMETERS SELECTED FOR INDICATION IN THE ANNUNCIATOR WARNING SYSTEM AND THE LIMITS OR ALARM SETPOINTS FOR THOSE PARAMETERS SHOULD BE ESTABLISHED TO ENSURE COMPLIANCE WITH TECHNICAL SPECIFICATIONS AND TO ALLOW THE OPERATOR TO MONITOR THE STATUS OF PLANT AND RESPOND TO OUT-OF-TOLERANCE CONDITIONS EFFECTIVELY.

RESPONSE

IN CONJUNCTION WITH A REACTOR VESSEL LEVEL INSTALLATION, A COMPUTER ALARM FOR THIS PARAMETER WILL BE GENERATED. THIS WILL BE IMPLEMENTED BY THE 1987 OUTAGE.

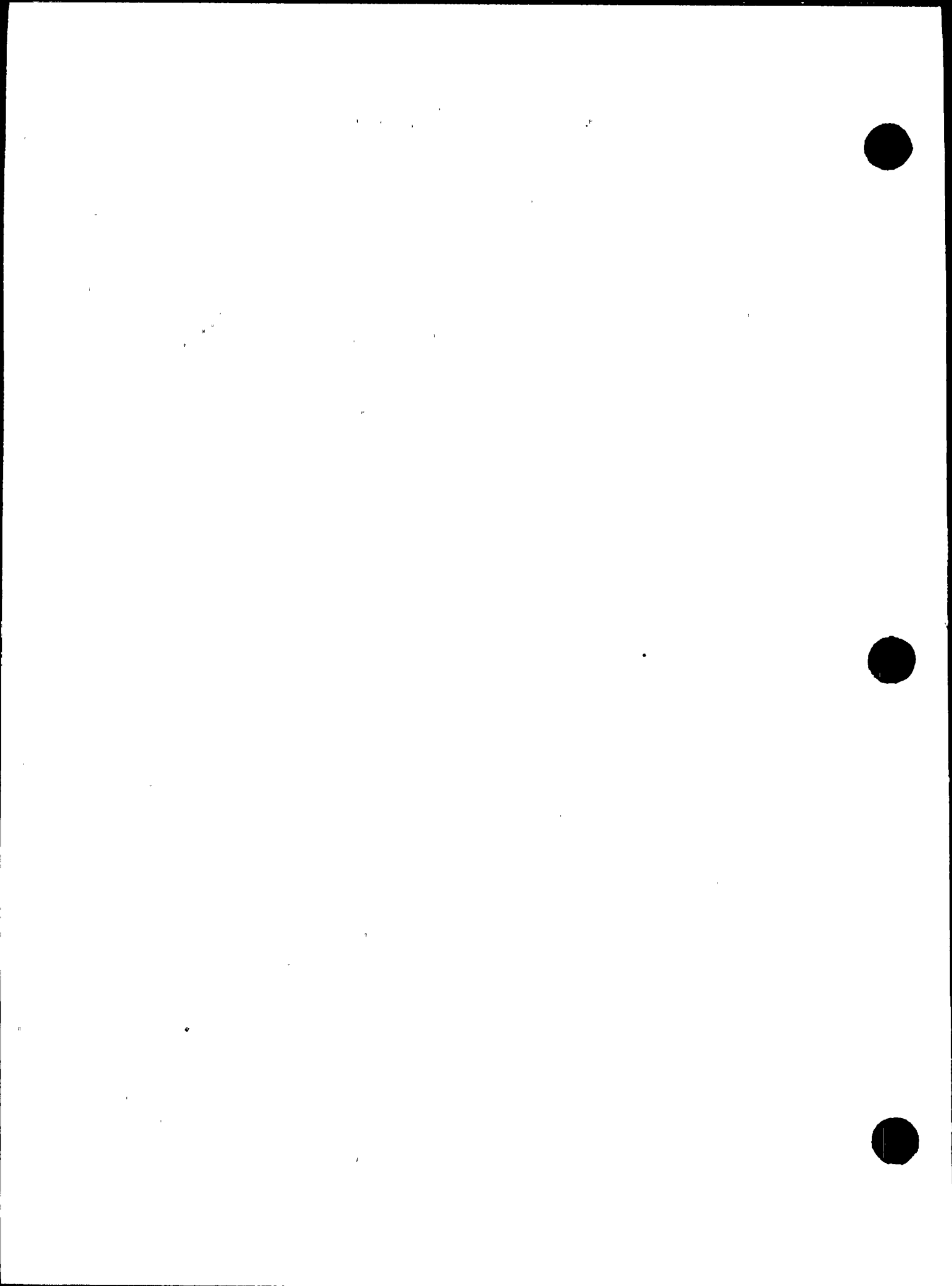
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C2.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0117
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED THAT THE ANNUNCIATOR WARNING SYSTEM WAS INEFFECTIVE ONCE WHEN OPERATORS LOST POWER TO ANNUNCIATOR PANELS G AND H AND LEARNED ABOUT IT ONLY AFTER DOING AN ALARM BOARD CHECK. IT WAS SUGGESTED THAT A LIGHT OR HORN BE INSTALLED SO THAT WHEN A PANEL'S POWER SUPPLY IS LOST, A WARNING IS GIVEN.

COMMENTS

TWO PRINCIPLES APPLY HERE: 1) A CONTROL TO TEST THE AUDITORY SIGNAL AND FLASHING ILLUMINATION OF ALL TILES IN A PANEL IS PROVIDED AND 2) PERIODIC TESTING OF ANNUNCIATORS IS REQUIRED AND CONTROLLED BY ADMINISTRATIVE PROCEDURE. ADDITIONALLY, CUES FOR PROMPT RECOGNITION OF AN OUT-OF-SERVICE ANNUNCIATOR ARE DESIGNED INTO THE SYSTEM.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED REQUIRING AN EVALUATION OF THE EXISTING ANNUNCIATOR DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND SEVERAL OTHER HEDS.

AN "ANNUNCIATOR POWER LOST" ANNUNCIATOR ALREADY EXISTS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C2.3

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
PANE		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0118
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THERE IS ONLY ONE BUZZER TO ALL SECTIONS OF THE MCB. WHEN AN ANNUNCIATOR BUZZES, THE OPERATOR HAS TO SCAN ALL PANELS TO DETERMINE WHICH WINDOW IS ALARMING. IF THE WINDOW IS NOT IN THE FLASH MODE, HE WILL PASS BY IT AND START ALL OVER AGAIN. IT WAS SUGGESTED THAT A DIFFERENT TONE FOR EACH SECTION WOULD BE VERY HELPFUL.

COMMENTS

THE PRINCIPLE INVOLVED IS THAT THE OPERATOR SHOULD BE ABLE TO IDENTIFY THE WORK STATION OR THE SYSTEM WHERE THE AUDITORY ALERT SIGNAL ORIGINATED. SEPARATE AUDITORY SIGNALS AT EACH WORK STATION WITHIN THE PRIMARY OPERATING AREA ARE RECOMMENDED.

RESPONSE

THE PRIMARY OPERATING AREA AT GINNA IS A SMALL WORKING SPACE. EVEN THOUGH THE PRESENT SYSTEM REQUIRES THE OPERATOR TO SCAN EACH OF THE PANELS AFTER AN ALARM SIGNAL IS HEARD, ONLY A MINUTE AMOUNT OF TIME ELAPSES BEFORE ALL ANNUNCIATOR TILES ARE REVIEWED. A CHANGE WOULD NOT RESULT IN A SUFFICIENT GAIN.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C2.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ED NUMBER: 0119
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THERE IS NO EARTHQUAKE ANNUNCIATOR TO INDICATE THAT THE MONITOR HAS ACTIVATED.

COMMENTS

PLANT PARAMETERS SELECTED FOR INCLUSION ON THE ANNUNCIATOR WARNING SYSTEM AND THE LIMITS OF ALARM SETPOINTS FOR THOSE PARAMETERS SHOULD BE ESTABLISHED TO ENSURE COMPLIANCE WITH TECHNICAL SPECIFICATIONS AND TO ALLOW THE OPERATOR TO MONITOR THE STATUS OF THE PLANT AND RESPOND TO OUT-OF-TOLERANCE CONDITIONS EFFECTIVELY.

RESPONSE

AN ANNUNCIATOR IS NOT REQUIRED. EVIDENCE OF AN EARTHQUAKE WOULD BE PHYSICALLY OBVIOUS TO PLANT PERSONNEL AND THE MONITOR COULD BE CHECKED (LOCALLY) AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C2.6

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0120
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED THAT A POOR FEATURE OF THE ANNUNCIATOR SYSTEM IS THAT WHEN AN ALARM WINDOW IS LEFT FLASHING AFTER THE HORN IS ACKNOWLEDGED, ANY OTHER ALARM IN THAT SECTION WILL NOT GENERATE THE AUDIBLE ALARM (HORN). ANNOYING ALARM NOISE SOMETIMES CAUSES AN OPERATOR NOT TO ACKNOWLEDGE ALARMS (ALLOW TO FLASH) DURING FREQUENT ALARMING, THUS NOT BEING ALERT TO THE OTHER ALARMS OCCURRING.

COMMENTS

IF AUTOMATICALLY CLEARED ALARM FEATURE IS NOT PROVIDED, A CONTROL IS PROVIDED TO RESET THE SYSTEM AFTER AN ALARM HAS CLEARED. ALSO, A RESET CONTROL SILENCES ANY AUDIBLE SIGNAL INDICATING CLEARANCE AND ALSO EXTINGUISHES TILE ILLUMINATION.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED (SEE HED 117). THIS REQUIRES AN EVALUATION OF THE EXISTING ANNUNCIATOR DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND SEVERAL OTHER HEDS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW
HISTORICAL REVIEW

C2.7
C2.5

PANE EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0121
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED A DESIRE TO SEE THE ALARM PANEL SYSTEM MODIFIED SO THAT WHEN AN ALARM CONDITION CLEARS, THE PANEL WILL FLASH AND GIVE A TONE. PRESENTLY, AFTER AN ALARM IS ACKNOWLEDGED, THE PANEL LIGHT GOES OUT WITH NO WARNING TO THE OPERATOR.

COMMENTS

HUMAN FACTORS PRINCIPLES RECOMMEND THAT A CONTROL BE PROVIDED TO TERMINATE THE FLASHING OF A VISUAL TILE AND HAVE IT CONTINUE AT STEADY ILLUMINATION UNTIL THE ALARM IS CLEARED.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED (SEE HED 117). THIS REQUIRES AN EVALUATION OF EXISTING ANNUNCIATOR DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND SEVERAL OTHER HEDS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C2.12

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0122
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED AN INAPPROPRIATE SETPOINT FOR THE HEAT TRACE ALARM WHICH IS SET AT 145 DEGREES F. CIRCUITS ARE SUPPOSED TO BE BETWEEN 145-200 DEGREES F.

COMMENTS

PRINCIPLES INVOLVED ARE 1) ALARMS DO NOT OCCUR SO FREQUENTLY AS TO BE CONSIDERED A NUISANCE BY THE OPERATORS AND 2) SETPOINTS ARE ESTABLISHED TO GIVE OPERATORS ADEQUATE TIME TO RESPOND TO THE WARNING CONDITION BEFORE A SERIOUS PROBLEM DEVELOPS.

RESPONSE

THE SETPOINT OF THE HEAT TRACING TEMPERATURE ALARM (145oF) IS ADEQUATE SINCE IT IS DESIGNED TO INDICATE WHETHER HEAT TRACING CIRCUITS ARE OPERATING PROPERLY. IF A HEAT TRACING CIRCUIT WERE LOST, THIS WOULD RESULT IN A SLOW DECREASE IN TEMPERATURE DUE TO AMBIENT LOSS. IN THIS CASE, THERE WOULD BE AMPLE TIME FROM RECEIPT OF THE ALARM TO ALLOW AN OPERATOR TO ENTER AUX. BLDG. AND ENERGIZE THE BACKUP CIRCUIT. IF THE ALARM WERE DUE TO COLD WATER ENTERING THE PIPE, THE TEMPERATURE WOULD DROP RAPIDLY AND THE ALARM POINT WOULD MAKE LITTLE DIFFERENCE. IN ADDITION, THE WATER ENTERING THE PIPE WOULD DILUTE THE FLUID IN THE LINE AND PRECIPITATION WOULD NOT BE A CONCERN.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C3.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

IDENTIFICATION NUMBER: 0123
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE SETPOINT FOR THE SAFETY INJECTION ACCUMULATOR PRESSURE ANNUNCIATOR IS INAPPROPRIATE.

COMMENTS

SETPOINTS ARE ESTABLISHED TO GIVE OPERATORS ADEQUATE TIME TO RESPOND TO THE WARNING CONDITION BEFORE A SERIOUS PROBLEM DEVELOPS. ALSO ALARMS SHOULD NOT OCCUR SO FREQUENTLY AS TO BE CONSIDERED A NUISANCE BY THE OPERATOR.

RESPONSE

THE LOW PRESSURE ALARM OF 720 PSIG ON THE SI ACCUMULATORS PROVIDES AN ADEQUATE MARGIN TO THE TECH. SPEC. LIMIT OF 700 PSIG. IF AN ACCUMULATOR PRESSURE WERE DECREASING SO RAPIDLY THAT IT REACHED 700 PSIG BEFORE AN AUXILIARY OPERATOR COULD MANUALLY ALIGN FOR CHARGING, THEN, EITHER THE N2 LEAK IS LARGE ENOUGH TO DECLARE THE ACCUMULATOR INOPERABLE, OR THE ACCUMULATOR IS DUMPING TO THE RCS (OR SOMEWHERE).

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C3.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ED NUMBER: 0124
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED THAT THE SETPOINT FOR AA-30 (150#) IS INAPPROPRIATE. THE PURPOSE OF THIS ALARM IS TO WARN OF A CONDENSATE BOOSTER PUMP START.

COMMENTS

ALARMS SHOULD NOT OCCUR SO FREQUENTLY AS TO BE CONSIDERED A NUISANCE BY THE OPERATOR. SETPOINTS SHOULD BE ESTABLISHED TO GIVE THE OPERATORS ADEQUATE TIME TO RESPOND TO THE WARNING CONDITION BEFORE A SERIOUS PROBLEM DEVELOPS.

RESPONSE

ALARM AA-30 IS NOT A NUISANCE ALARM. IT WILL NORMALLY SOUND ONLY DURING STARTUP AND SHUTDOWN POWER TRANSIENTS. IT PROVIDES VALUABLE INFORMATION. NO CHANGE IS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C3.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0125
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE SETPOINT FOR AA-25 (350#) IS INAPPROPRIATE. THE PURPOSE OF THIS ALARM IS TO WARN OF A POSSIBLE CONDENSATE BOOSTER PUMP START.

COMMENTS

ALARMS SHOULD NOT OCCUR SO FREQUENTLY AS TO BE CONSIDERED A NUISANCE BY THE OPERATOR. SETPOINTS SHOULD BE ESTABLISHED TO GIVE THE OPERATORS ADEQUATE TIME TO RESPOND TO THE WARNING CONDITION BEFORE A SERIOUS PROBLEM DEVELOPS.

RESPONSE

THE SETPOINT FOR ALARM AA-25 IS ACTUALLY 300 PSIG AND SHOULD NOT BE CONSIDERED A NUISANCE ALARM. THERE MAY BE TIMES DURING POWER CHANGES WHEN THIS ALARM COMES IN AND OUT BUT IT SHOULD BE GIVING VALID INFORMATION THAT CONDENSATE PRESSURE IS APPROACHING AUTO START PRESSURE FOR THE STANDBY CONDENSATE PUMP AND SOME ACTION SHOULD BE TAKEN TO CORRECT THE SITUATION.

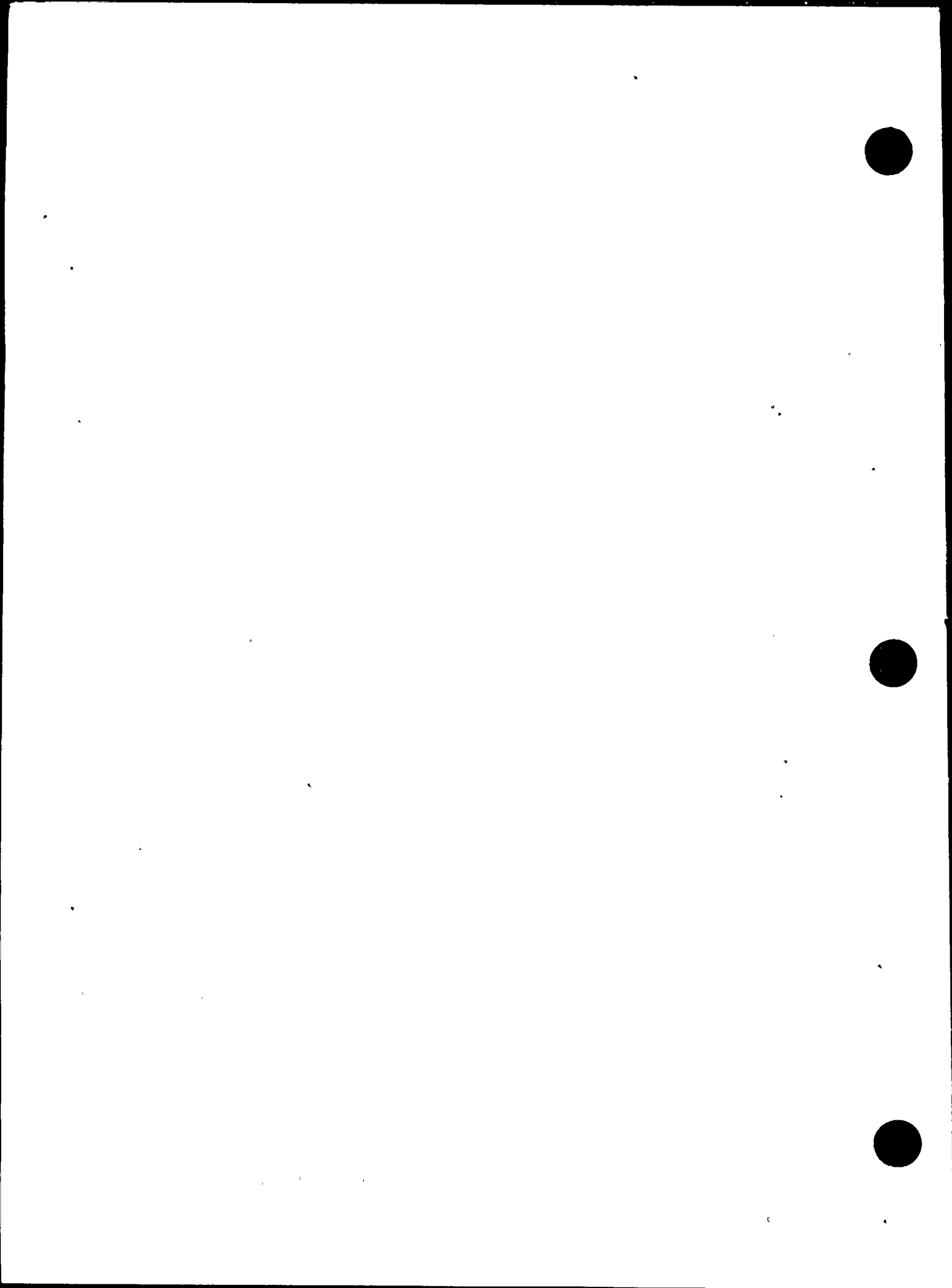
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C3.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0126
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY: 2
LEVEL: C
RATING: Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE SETPOINT FOR A-12 (140 DEGREES) IS INAPPROPRIATE. THE PURPOSE OF THE ALARM IS TO WARN OF REACHING A LIMIT.

COMMENTS

ALARMS SHOULD NOT OCCUR SO FREQUENTLY AS TO BE CONSIDERED A NUISANCE BY THE OPERATOR. SEPTPOINTS SHOULD BE ESTABLISHED TO GIVE THE OPERATORS ADEQUATE TIME TO RESPOND TO THE WARNING CONDITION BEFORE A SERIOUS PROBLEM DEVELOPS.

RESPONSE

THE SETPOINT FOR ALARM A-12 NRHX OUTLET TEMPERATURE 145oF IS APPROPRIATE. THIS IS TO INFORM THE OPERATOR THAT TCV 145 SHOULD HAVE DIVERTED TO BYPASS THE DI'S. (OPERATOR SHOULD VERIFY THIS.) ONCE THE DI BYPASS IS VERIFIED THE OPERATOR CAN THEN RECTIFY THE TEMPERATURE PROBLEM.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C3.6

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0127
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE SETPOINT FOR F-11 (15%) IS INAPPROPRIATE. THIS ALARM WARNS OF APPROACHING A LOW LEVEL LIMIT.

COMMENTS

ALARMS SHOULD NOT OCCUR SO FREQUENTLY AS TO BE CONSIDERED A NUISANCE BY THE OPERATOR. SETPOINTS SHOULD BE ESTABLISHED TO GIVE THE OPERATORS ADEQUATE TIME TO RESPOND TO THE WARNING CONDITION BEFORE A SERIOUS PROBLEM DEVELOPS.

RESPONSE

THE PRESSURIZER LOW LEVEL SETPOINT WILL BE CHANGED TO 13%, CONSISTENT WITH TECHNICAL SPECIFICATIONS SECTION 3.1.1.5. THIS CHANGE WILL ELIMINATE THE NEED TO READ THIS METER IN TENTHS OF A PERCENT. PROCEDURE CHANGE NOTICES WILL ALSO BE INITIATED TO INSERT THIS NEW VALUE IN APPROPRIATE PROCEDURES. THESE CHANGES WILL BE IMPLEMENTED BY 4-86

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C3.7

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0128
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE SETPOINT FOR H-11 (SOMETHING GREATER THAN 15") IS INAPPROPRIATE. THIS IS AN ALARM ASSOCIATED WITH THE CONDENSATE BOOSTER PUMP (CBP).

COMMENTS

ALARMS SHOULD NOT OCCUR SO FREQUENTLY AS TO BE CONSIDERED A NUISANCE BY THE OPERATOR. SETPOINTS SHOULD BE ESTABLISHED TO GIVE THE OPERATORS ADEQUATE TIME TO RESPOND TO THE WARNING CONDITION BEFORE A SERIOUS PROBLEM DEVELOPS.

RESPONSE

ALARM WINDOW H-11 IS THE FEEDWATER PUMP SEAL WATER BOOSTER PUMP LOW DIFFERENTIAL ALARM. A SURVEY OF THE OPERATORS INDICATED THAT THIS WAS NOT A NUISANCE ALARM. NO CHANGE IS INTENDED AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C3.8

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0129
 ILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT LOW RCS PRESSURE SETPOINT MAY BE INAPPROPRIATE. DURING SOLID PLANT OPERATIONS WITH RCP RUNNING COLD SHUTDOWN, THE 1ST INDICATION OF LOW RCS PRESSURE IS 200 PSIG #1 SEAL. THERE SHOULD BE LOW RCS PRESSURE ALARM AT 275-300 PSIG.

COMMENTS

SETPOINTS SHOULD BE SET TO GIVE OPERATORS ADEQUATE TIME TO RE ID TO THE WARNING CONDITION BEFORE A SERIOUS PROBLEM DE OPS.

RESPONSE

ENGINEERING WORK REQUEST 4344 HAS BEEN INITIATED TO INSTALL OR MODIFY AN ALARM AT AN APPROPRIATE SETPOINT. THIS WORK WILL BE SCHEDULED FOR THE REFUELING OUTAGE OF 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0130
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT E-20, R10A OR B TRIP ALARM HAS MULTIPLE INPUTS, BUT R10A IS NORMALLY TRIPPED AND THEREFORE BLOCKS ALARM SHOULD R10 TRIP. ALARM E-20, R10 A AND B PUMP TRIP SHOULD HAVE A SEPARATE ALARM FOR EACH PUMP.

COMMENTS

WHEN MULTI-INPUT ANNUNCIATORS ARE USED, AN ALARM PRINTOUT CAPABILITY SHOULD BE PROVIDED. IN THE CURRENT EXAMPLE THIS IS NOT DO OR POSSIBLE.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED (SEE HED 117). THIS REQUIRES AN EVALUATION OF THE EXISTING ANNUNCIATOR DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND SEVERAL OTHER HEDS.

ENGINEERING WORK REQUEST (EWR) NO. 4236 HAS BEEN ISSUED (SEE HED #53). THIS REQUIRES A REVIEW EACH OF THE ABOVE HEDS TO DETERMINE THE FEASIBILITY AND NECESSITY OF INPUTING THE PARAMETER DESCRIBED BY EACH HED INTO THE PLANT COMPUTER OR SAFETY ASSESSMENT SYSTEM. THESE WILL BE COMPLETED BY THE END OF 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.1

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ED NUMBER: 0131
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL B
RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THERE ARE REMOTE ALARM STATIONS FOR WASTE PANEL, HYDROGEN, WATER TREATMENT, AYT AND 115 KV BUS - BUT THE ONLY RESPONSE IS TO SEND AN AUXILIARY OPERATOR TO CHECK LOCAL INDICATIONS, WHICH SOMETIMES RESULTS IN UNACCEPTABLE TIME DELAY.

COMMENTS

PRINCIPLE INVOLVED STATES THAT ALARMS THAT REQUIRE THE CONTROL ROOM OPERATOR TO DIRECT AN AUXILIARY OPERATOR TO A GIVEN PLANT LOCATION FOR SPECIFIC INFORMATION ARE AVOIDED.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED (SEE HED 117). THIS EWR REQUIRES AN EVALUATION OF THE EXISTING ANNUNCIATOR DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND SEVERAL OTHER HEDS.

ENGINEERING WORK REQUEST (EWR) NO. 4236 HAS BEEN ISSUED (SEE HED #53). THIS REQUIRES A REVIEW OF EACH OF THE ABOVE HEDS TO DETERMINE THE FEASIBILITY AND NECESSITY OF INPUTTING THE PARAMETER DESCRIBED BY EACH HED INTO THE PLANT COMPUTER OR SAFETY ASSESSMENT SYSTEM. THESE WILL BE COMPLETED BY THE END OF 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.2

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0132
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE K-27 DRAINAGE PH PANEL ALARM COULD BE TRIGGERED BY ANY OF FOUR FACTORS. THERE IS NO READY METHOD FOR DETERMINING WHICH IS CAUSING THE ALARM. THE CAUSES COULD BE 1) RETENTION TANK LEVEL, 2) RETENTION TANK PH 3) LAKE PH, OR 4) RADIATION WASTE STORAGE BUILDING SUMP LEVEL.

COMMENTS

WHEN MULTI-INPUT ANNUNCIATORS ARE USED, AN ALARM PRINTOUT CAPABILITY IS PROVIDED.

RESPONSE

ENGINEERING WORK REQUEST (CWR) NO. 4234 HAS BEEN ISSUED (SEE HED 117). THIS REQUIRES AN EVALUATION OF THE EXISTING ANNUNCIATOR DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND SEVERAL OTHER HEDS.

ENGINEERING WORK REQUEST (EWR) NO. 4236 HAS BEEN ISSUED (SEE HED #53). THIS REQUIRES REVIEW EACH OF THE ABOVE HEDS TO DETERMINE THE FEASIBILITY AND NECESSITY OF INPUTTING THE PARAMETER DESCRIBED BY EACH HED INTO THE PLANT COMPUTER OF SAFETY ASSESSMENT SYSTEM. THESE WILL BE COMPLETED BY THE END OF 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.7

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0133
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE K-28 WASTE PANEL ALARM COULD BE CAUSED BY ANY OF APPROXIMATELY 100 ALARMS. AS A RESULT FOR WHEN IT COMES ON, THE AUXILIARY OPERATOR HAS TO INVESTIGATE FOR FIVE MINUTES TO DETERMINE WHICH IT IS. THE CURRENT COMPUTER SYSTEM COULD TELL OPERATORS IN CONTROL ROOM WHICH ALARM IT IS, BUT THE COMPUTER IS IN THE T.S.C.

COMMENTS

ALARMING WHICH REQUIRE THAT THE CONTROL ROOM OPERATOR SEND AN ALARMARY OPERATOR TO A GIVEN PLANT LOCATION FOR SPECIFIC INFORMATION ARE AVOIDED.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED (SEE HED 117). THIS REQUIRES AN EVALUATION OF EXISTING ANNUNCIATOR DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND SEVERAL OTHER HEDS.

ENGINEERING WORK REQUEST (EWR) NO. 4236 HAS BEEN ISSUED (SEE HED #53). THIS REQUIRES A REVIEW OF EACH OF THE ABOVE HEDS TO DETERMINE THE FEASIBILITY AND NECESSITY OF INPUTING THE PARAMETER DESCRIBED BY EACH HED INTO THE PLANT COMPUTER OR SAFETY ASSESSMENT SYSTEM. THESE WILL BE COMPLETED BY THE END OF 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.8

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ED NUMBER: 0134
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL B
RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED OPERATORS HAD
DIFFICULTY IN DETERMINING WHICH BUS ASSOCIATED WITH ANNUNCIATOR L-
8 WAS THE SOURCE OF THE ALARM.

COMMENTS

WHEN MULTI-INPUT ANNUNCIATORS ARE USED, AN ALARM PRINTOUT
CAPABILITY IS PROVIDED TO THE OPERATORS.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4236 HAS BEEN ISSUED (SEE HED
#53). THIS REQUIRES A REVIEW OF EACH OF THE ABOVE HEDS TO
DETERMINE THE FEASIBILITY AND NECESSITY OF INPUTTING THE PARAMETER
DESCRIBED BY EACH HED INTO THE PLANT COMPUTER OR SAFETY
ASSESSMENT SYSTEM.

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED (SEE HED
117). THIS REQUIRES AN EVALUATION OF THE EXISTING ANNUNCIATOR
DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND
SEVERAL OTHER HEDS. THESE WILL BE COMPLETED BY THE END OF 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.10

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0135
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT ANNUNCIATOR H-29
 PRESEPARATOR TANK LEVEL, DOES NOT INDICATE WHICH OF TWO SEPARATOR
 TANKS, HEATER DRAIN TANKS, OR FEEDWATER HEATER IS ALARMING.

COMMENTS

REFERENCE

WHEN MULTI-INPUT ANNUNCIATORS ARE USED, AN ALARM PRINTOUT
 CAPABILITY IS PROVIDED, NO CHANGE IS REQUIRED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.12

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0136
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THERE ARE MULTIPLE INPUTS ON K-14. THE ANNUNCIATOR FOR EMERGENCY SHUTDOWN LOCAL CONTROL. THERE IS NO WAY TO IDENTIFY WHICH LOCAL CONTROL HAS BEEN PUT IN LOCAL POSITION ON K-14. A COMPUTER ALARM WOULD SOLVE THIS.

COMMENTS

WHEN MULTI-INPUT ANNUNCIATORS ARE USED, AN ALARM PRINTOUT CAPABILITY IS PROVIDED.

RESPONSE

THE ONLY TIME A CONTROL SWITCH FOR EQUIPMENT WHICH ACTIVATES THIS ALARM WOULD BE PLACED IN THE ALARMING POSITION WOULD BE FOR MAINTENANCE OR TEST PURPOSES. THIS INFREQUENT USE DOES NOT WARRENT ADDITIONAL SPECIFIC ALARM ANNUNCIATIONS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.13

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0137
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT MULTIPLE TRANSFORMER ALARMS APPEAR ON ANNUNCIATORS, BUT THERE IS NO WAY OF DETERMINING THE SPECIFIC CAUSE OF THE ALARMS.

COMMENTS

WHEN MULTI-INPUT ANNUNCIATORS ARE USED, AN ALARM PRINTOUT CAPABILITY IS PROVIDED.

RESPONSE

ALL LOCAL INDIVIDUAL ALARMS PROVIDED FOR THE TRANSFORMERS HAVE SETPOINTS WHICH ALLOW FOR A CERTAIN TIME LAPSE BETWEEN RECEIPT OF THE COMMON ALARM AND IDENTIFICATION OF THE SPECIFIC ALARM. ALSO, THESE INDIVIDUAL ALARMS REQUIRE EVALUATION OF LOCAL TRANSFORMER INDICATIONS (PUMPS/FANS RUNNING, OIL TEMPERATURES, PRESSURE, ETC.) ANY PROBLEM WHICH REQUIRES IMMEDIATE ACTION HAS PROTECTIVE RELAYING MONITORING ON THE PARAMETER INVOLVED. NO CHANGE IS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.14

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0138
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1983

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE 480V GROUND INVOLVES A MULTIPLE INPUT ALARM WHERE IT IS DIFFICULT TO DETERMINE THE SPECIFIC CAUSE.

COMMENTS

WHEN MULTI-INPUT ANNUNCIATORS ARE USED, AN ALARM PRINTOUT CAPABILITY IS PROVIDED.

RESPONSE

THIS HED DEALS WITH THE FACT THAT THE OPERATOR CAN NOT DETERMINE THE FAULTED BUS SINCE ALL 480 BUS ALARMS INPUT ONLY ONE ANNUNCIATOR ALARM. HOWEVER, THIS INFORMATION IS PROVIDED LOCALLY AT THE INDIVIDUAL BUSES. KNOWLEDGE OF THE FAULTED BUS CAN DO LITTLE TO AID IN THE OPERATION OF THE PLANT SINCE IT REQUIRES A QUALIFIED ELECTRICIAN TO REMEDY PROBLEMS OF THIS NATURE. OPERATORS ARE REQUIRED TO CONTACT AN ELECTRICIAN WHEN THIS ALARM IS ANNUNCIATED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C4.15

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0139
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE L-32, 24, AND 16 A,B,C, CVCS HOLD UP TANK HIGH LEVEL ALARMS COULD BE PUT ON THE WASTE PANEL IN THE AUXILIARY BUILDING.

COMMENTS

IF GENERAL ALARMS ARE USED, THEY ARE ONLY USED FOR CONDITIONS THAT ALLOW ADEQUATE TIME FOR AUXILIARY OPERATOR ACTION AND SUBSEQUENT CONTROL ROOM OPERATOR ACTION.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4236 HAS BEEN ISSUED (SEE HED #53). THIS REQUIRES A REVIEW OF EACH OF THE IDENTIFIED HEDS TO DETERMINE THE FEASIBILITY AND NECESSITY OF INPUTTING THE PARAMETER DESCRIBED BY EACH HED INTO THE PLANT COMPUTER SYSTEM OR THE SAFETY ASSESSMENT SYSTEM.

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED (SEE HED 117). THIS REQUIRES EVALUATION OF THE EXISTING ANNUNCIATOR DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND SEVERAL OTHER HEDS. THESE WILL BE COMPLETED BY THE END OF 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

CS.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0140
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING W

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY RECOMMENDED THAT AA16, AA24 AND AA32 BE PLACED IN THE GUARD HOUSE OR THE CENTRAL ALARM STATION.

COMMENTS

IF GENERAL ALARMS ARE USED, THEY ARE ONLY USED FOR CONDITIONS THAT ALLOW ADEQUATE TIME FOR AUXILIARY OPERATOR ACTION AND SUBSEQUENT CONTROL ROOM OPERATOR ACTION.

ENGINEERING WORK REQUEST (EWR) NO. 4236 HAS BEEN ISSUED (SEE HED #53). THIS REQUIRES A REVIEW OF EACH OF THE ABOVE HEDS TO DETERMINE THE FEASIBILITY AND NECESSITY OF INPUTING THE PARAMETER DESCRIBED BY EACH HED INTO THE PLANT COMPUTER OR SAFETY ASSESSMENT SYSTEM.

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED (SEE HED 117). THIS REQUIRES AN EVALUATION OF THE EXISTING ANNUNCIATOR DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND SEVERAL OTHER HEDS. THESE WILL BE COMPLETED BY THE END OF 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C5.7

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ED NUMBER: 0141
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY RECOMMENDED THAT THE 6-24 PH
RECORDER BE RELOCATED TO TURBINE PLANT SAMPLE RACK AND TIE INTO
K-30, TURBINE PLANT SAMPLE RACK TROUBLE.

COMMENTS

IF GENERAL ALARMS MUST BE USED, THEY ARE ONLY USED FOR CONDITIONS
THAT ALLOW ADEQUATE TIME FOR AUXILIARY OPERATOR ACTION AND
SUBSEQUENT CONTROL ROOM OPERATOR ACTION.

RESPONSE

SHOULD ADDITIONAL SPACE BE REQUIRED ON THE PANEL THIS
ANNOUNCIATOR WILL BE CONSIDERED FOR REMOVAL. NO CHANGE IS
DEEEMED NECESSARY AT THIS TIME.

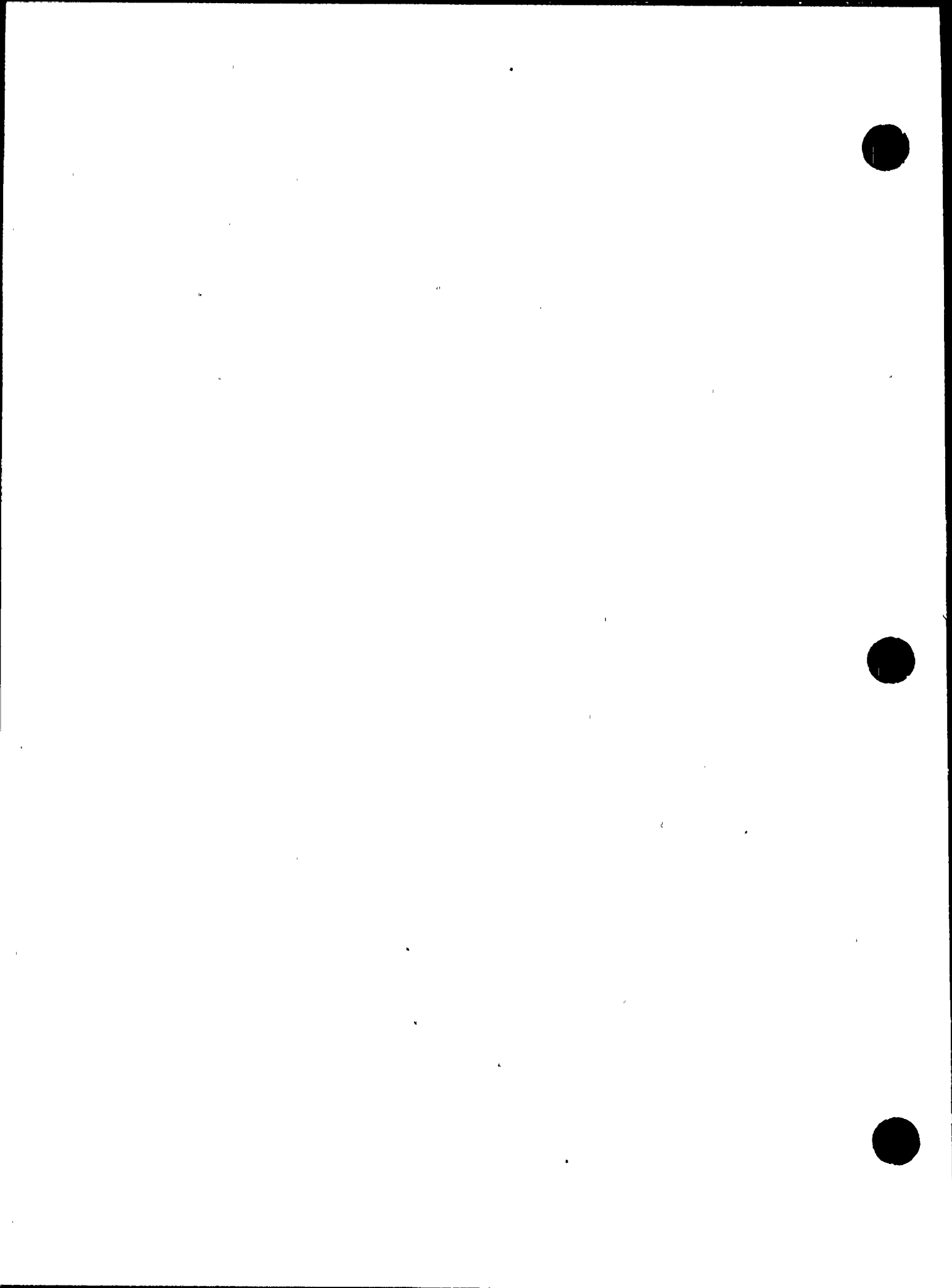
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C5.12

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0142
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THE FOLLOWING CONFUSING ALARM ENGRAVINGS: THE A25 CONTAINMENT VENTILATION DUCT ISOLATION SAFETY INJECTION MANUAL, AND A26 CONTAINMENT ISOLATION SAFETY INJECTION MANUAL. THESE ARE CONFUSING BECAUSE SETPOINT IS ANY SAFETY INJECTION FOR A25 BUT ONLY AUTO SAFETY INJECTION FOR A26.

COMMENTS

VISUAL TILE LEGENDS ARE SPECIFIC AND UNAMBIGUOUS. WORDING IS IN SH CONCISE MESSAGES.

RESPONSE

THE ALARM WINDOWS HAVE BEEN MODIFIED AS FOLLOWS: A-25, CONTAINMENT VENTILLATION ISOLATION, AND A-26, CONTAINMENT ISOLATION. THESE NEW WINDOWS HAVE BEEN INSTALLED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C6.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ED NUMBER: 0143
UTILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY THAT G2 STM FLOW IS LESS THAN
FEEDWATER FLOW LOOP A (.8X106) AND G18 SF IS LESS THAN FW.8X106 W
S/G LVL LESS THAN 30% SIG CHANL ALERT ARE OFTEN CONFUSED.

COMMENTS

VISUAL TILE LEGENDS ARE SPECIFIC AND UNAMBIGUOUS. WORDING IS IN
CONCISE, SHORT MESSAGES.

RESPONSE

THE ENGRAVING FOR ALARM WINDOWS G-2 AND G-19 HAVE BEEN CHANGED TO
READ AS FOLLOWS: G-2, FF>SF LOOP A .8X10(6) LB/HR, AND G-19, S/G
A LO FW FLOW CHANNEL .8X10(6) LB/HR. THESE ARE MORE CLEAR.
HOWEVER, DUE TO THE SIMILARITY OF THE MONITORS RELATIONSHIPS,
OPERATOR TRAINING WILL BE USED TO EMPHASIZE DIFFERENCES TO REDUCE
CONFUSION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C6.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0144
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY REVEALED THAT AS SETPOINTS ARE CHANGED, DYNO TAPE IS USED TO CHANGE ALARM WINDOWS. SUGGESTION WAS THAT NEED TO HAVE A SYSTEM WHEREBY NEW WINDOWS ARE ENGRAVED AS WINDOWS CHANGE.

COMMENTS

LEGENDS SHOULD BE ENGRAVED. THEY SHOULD BE DARK LETTERING ON A LIGHT BACKGROUND.

RESPONSE

ALL NEW ALARM WINDOWS HAVE RECENTLY BEEN INSTALLED IN THE GINNA CONTROL BOARD ELIMINATING ALMOST ALL THE DYNOTAPE LABELS ALLUDED TO BE IN THIS HED. A STANDARDIZED ABBREVIATIONS LIST HAS BEEN DEVELOPED. THIS WILL ESTABLISH A LETTERING SCHEME THAT WILL SATISFY THE GUIDELINES OF NUREG 0700. UPON IMPLEMENTING THE RECOMMENDATIONS, ALL DYNOTAPE LABELS WILL BE REMOVED. IF IN THE FUTURE SETPOINTS ARE CHANGED, THE ELECTRICAL FOREMAN WILL ORDER NEW WINDOWS FOR PERMANENT SETPOINT DISPLAY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C6.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0145
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE FOLLOWING
 ENGRAVINGS ARE CONFUSING AND DIFFICULT TO UNDERSTAND. C-5 PLUS OR
 MINUS COMPUTER ALARM ROD DEV. & SEG. NIS PWR RANGE 7.5 TILTS IN.

COMMENTS

VISUAL TILE LEGENDS SHOULD BE SPECIFIC AND UNAMBIGUOUS.

RESPONSE

ALARM WINDOW C-5 WILL BE CHANGED IN CONJUNCTION WITH THE PPCS
 INSTALLATION. IT WILL READ: PPCS ROD SEQUENCE OR ROD DEVIATION.
 THIS IS MUCH LESS CONFUSING THAN THE PREVIOUS ENGRAVING. THIS
 WILL BE IMPLEMENTED BY 6/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

C.6.8

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY -----

ED NUMBER: 0146
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY -----

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE ENGRAVINGS OF G-26 AND G-31 DO NOT REFLECT ALL OF THE CONDITIONS THAT TRIGGER THE ALARM (I.E., HI SF W/O TAVG OR HI-HI SF).

COMMENTS -----

VISUAL TILE LEGENDS ARE SPECIFIC AND UNAMBIGUOUS.

RESPONSE -----

AN ANNUNCIATOR EVALUATION OF THE GINNA CONTROL ROOM IS BEING PERFORMED. UPON COMPLETION OF THIS TASK RECOMMENDED FIXES RELATIVE TO THIS HED WILL BE SUBMITTED TO RG&E FOR EVALUATION AND INCORPORATION. THIS HED WILL BE CORRECTED BY JULY 1986.

SOURCE OF DISCREPANCY -----

EXPLANATORY INFORMATION -----

HISTORICAL REVIEW

C6.5

PANEL -----

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER -----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0147
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY FIVE OPERATORS FOUND THE FOLLOWING AUDITORY SIGNALS, OTHER THAN ANNUNCIATOR ALARMS, CONFUSING. FIRE SYSTEM HAS TWO BELLS DEPENDING ON PANEL. IT IS DIFFICULT TO TELL WHICH ONE IS RINGING AND WHAT IT IS FOR. SOMETIMES ONE WILL RING FOR JUST A SECOND AND THE OPERATOR WILL NOT KNOW FOR SURE WHICH ONE RANG. THESE ALSO INTERFERE WITH NORMAL PLANT ALARMS. FIRE SYSTEM SOUNDS SIMILAR TO SPING SYSTEM.

COMMENTS

THE MEANING OF EACH AUDITORY SIGNAL SHOULD BE CLEAR AND UNAMBIGUOUS. AUDITORY SIGNALS SHOULD BE SELECTED TO AVOID CONFUSION WITH AMBIENT CONTROL ROOM NOISES. AUDITORY SIGNALS SHOULD BE SELECTED TO AVOID INTERFERENCE WITH OTHER AUDITORY SOURCES, INCLUDING VERBAL COMMUNICATION.

RESPONSE

AN ENGINEERING WORK REQUEST (EWR 4347) HAS BEEN ISSUED AND WILL ADDRESS THIS CONCERN. THIS WILL BE COMPLETED BY THE END OF 6/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

D1.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0148
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT IT IS HARD TO DISTINGUISH BETWEEN CONTAINMENT EVACUATION AND PLANT EVACUATION. IT WAS SUGGESTED THAT MOST OF PLANT PERSONNEL RECOGNIZE THESE PLANT ALARMS BECAUSE THEY ARE TOLD WHAT THEY ARE BEFORE THE ALARM IS SOUNDED.

COMMENTS

THE MEANING OF EACH AUDITORY SIGNAL SHOULD BE CLEAR AND UNAMBIGUOUS.

RESPONSE

THE AUDITORY SIGNALS ASSOCIATED WITH THESE EVACUATIONS ARE INDEED CLEAR AND DISTINCT. RETRAINING IS PROVIDED ON AN ANNUAL BASIS FOR ALL BADGED PLANT PERSONNEL. LOUDSPEAKERS ALSO ARE UTILIZED TO PROVIDE VERBAL ADVISORIES. NO CHANGE IS DEEMED APPROPRIATE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

D1.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0149
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THREE RESPONSES TO THE OPERATOR SURVEY REVEALED THAT MESSAGES PRESENTED OVER THE PAGING SYSTEM CANNOT BE HEARD CLEARLY IN THE BATHROOM.

COMMENTS

THE COMMUNICATION SYSTEM SHOULD PROVIDE RAPIDLY INTELLIGIBLE MESSAGES TO ALL AREAS WHERE PERSONNEL SUBJECT TO PAGE MAY BE LOCATED.

RESPONSE

OPERATORS WHO ARE RELIEVED ARE GIVEN UPDATE STATUS INFORMATION UPON THEIR RETURN TO THE PRIMARY OPERATING AREA. IN EXTREME EMERGENCIES THE PROXIMITY OF THE RESTROOM TO THE MAIN CONTROL PANELS IS SUCH THAT VERBAL COMMUNICATION AND/OR INTERRUPTION IS POSSIBLE. NO ADDITIONAL PAGING IS NECESSARY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

D2.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0150
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT , CATEGORY 2
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY, SIXTEEN OPERATORS REPORTED THAT THE GREY PAGE IS VULNERABLE TO ABUSE BY NON-OPERATING PERSONNEL. OPERATORS CAN OVERRIDE THE PLANT PAGE USING EXT. 231, BUT THEY HAVE NO CONTROL OVER THE NORMAL PAGE. ALSO WITH ALL THE DIFFERENT PHONES, IT IS CONFUSING AS TO HOW TO OVERRIDE OTHERS. THE BASIC PROBLEM IS THAT THE PAGING SYSTEMS ARE THE SAME FOR OPERATIONS AND THE REST OF PLANT PERSONNEL. DURING OUTAGES AND NORMAL DAY SHIFTS, IT IS SOMETIMES DIFFICULT TO USE THE PAGE AS IT IS ALWAYS BUSY. ALSO THE PHONE SYSTEM IS USED FOR TESTING, CREVICE CLEANING LEADING TO OVERCROWDING. THE PAGE ALSO CANNOT BE HEARD IN SOME PLANT LOCATIONS DURING OPERATION. THE HEADSET SYSTEM IS A LITTLE BETTER, BUT AGAIN THERE IS NO DEDICATED SYSTEM FOR OPERATIONS.

COMMENTS

PRIORITY PROCEDURES SHOULD BE PROVIDED FOR THE TRANSMISSION OF EMERGENCY MESSAGES FROM THE CONTROL ROOM BY ANY OF THE COMMUNICATION SYSTEMS. ALSO WHERE MULTIPLE PHONES ARE LOCATED CLOSE TOGETHER, THEY ARE CODED TO INDICATE CIRCUIT OR FUNCTION.

RESPONSE

EVALUATION OF THIS HED REVEALED THAT THIS IS A TRAINING PROBLEM. THE TRAINING DEPARTMENT ISSUED UPDATED TRAINING MATERIAL (LETTER B. BUTLER TO S. SPECTOR, DATED 11/1/85) TO ALL OPERATORS. FOR NEW OPERATORS, CURRENT TRAINING MATERIAL WILL BE UPDATED TO REFLECT THE NEW INFORMATION RESULTING FROM A MEETING WHICH WAS CONDUCTED ON THE MATTER. THIS WILL BE IMPLEMENTED BY 1-86.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

D4.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0151
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY OPERATORS REPORTED IT IS VERY HARD FOR OPERATOR IN THE FIELD TO HEAR INSTRUCTIONS OVER THE GREY PAGE OR DIAL PHONE SYSTEM BECAUSE THE BACKGROUND NOISE IS TOO HIGH. THERE ARE MANY AREAS OF THE PLANT WHERE PAGES CANNOT BE HEARD DUE TO EITHER LOUD NOISE OR MALFUNCTIONING SPEAKERS (TURBINE HALL, FUEL PUMP ROOM).

COMMENTS

WHATEVER SYSTEM IS USED IT SHOULD PROVIDE INTELLIGIBLE MESSAGES TO ALL AREAS WHERE OPERATORS IN THE FIELD MUST COMMUNICATE WITH THE OPERATORS IN THE CR.

RESPONSE

A SURVEY HAS BEEN CONDUCTED TO DETERMINE THE AREAS IN THE PLANT WHERE THE PAGE SYSTEM IS DIFFICULT TO HEAR. ADDITIONAL SPEAKERS OR RAISING VOLUME WILL BE IMPLEMENTED TO CORRECT THIS HED. THIS WILL BE IMPLEMENTED BY 12/86. THERE MAY BE SOME AREAS OF THE PLANT. EG. FEEDPUMP ROOM WHERE OPTIMAL CONDITIONS MAY NOT BE ACHIEVABLE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

DS.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0152
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY REPORTED THAT WITHIN THE LAST YEAR, THE PLANT PHONE SYSTEM COMPLETELY BROKE DOWN. THERE IS A NEED TO ISOLATE CONTROL ROOM PHONES WITH A BACKUP SYSTEM.

COMMENTS

INSTRUCTIONS SHOULD BE PROVIDED FOR USE OF EACH COMMUNICATION SYSTEM, INCLUDING SUGGESTED ALTERNATIVES IF A SYSTEM BECOMES INOPERABLE.

RESPONSE

THIS IS AN ISOLATED OPINION. IN FACT, THERE ARE SEVERAL BACKUP COMMUNICATIONS SYSTEMS AVAILABLE TO THE CONTROL ROOM OPERATORS. TO AVOID FUTURE MISUNDERSTANDINGS, THE TRAINING DEPARTMENT ISSUED A MEMO TO ALL OPERATORS DESCRIBING THE CAPABILITIES OF THE NORMAL AND BACKUP COMMUNICATIONS SYSTEMS. GINNA COMMUNICATIONS CAPABILITIES WILL BE EMPHASIZED IN TRAINING CLASSES FOR NEW OPERATORS. RETRAINING WILL BE COMPLETED BY 1-1-86.

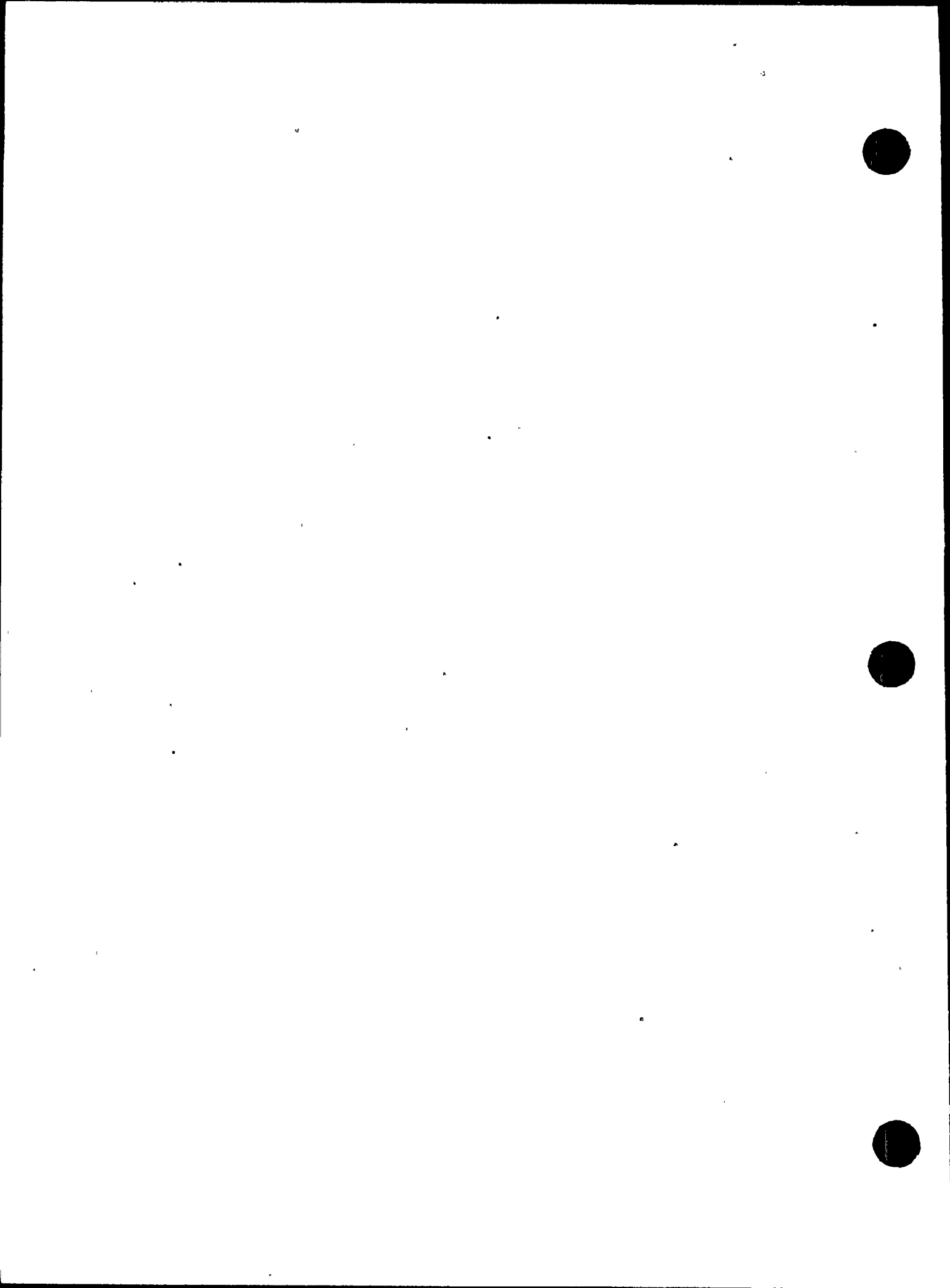
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

DS.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0153
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THERE MAY BE DIFFICULTIES FOR OPERATORS IN COMMUNICATING TO THE TECH SUPPORT CENTER.

COMMENTS

PERIODIC TESTING SHOULD BE PERFORMED ON ALL COMMUNICATIONS SYSTEMS TO ENSURE THAT THE SYSTEMS ARE OPERABLE.

RESPONSE

AT PRESENT THERE ARE THREE IN-HOUSE EXTENSIONS (280, 281, 399) THAT ARE LOCATED ONLY IN THE CONTROL ROOM, TECHNICAL SUPPORT CENTER, AND THE PLANT SUPERINTENDENT'S OFFICE. THESE ARE "DEDICATED LINES" FROM THE CONTROL ROOM TO THE TECHNICAL SUPPORT CENTER. IN ADDITION, THERE IS A SOUND POWER PHONE LINE BETWEEN THE CONTROL ROOM AND THE TECHNICAL SUPPORT CENTER. OPERATORS WILL BE ALERTED TO THESE FACTS DURING TRAINING, TO BE COMPLETED BY 1-1-86.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

D5.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ED NUMBER: 0154
ILITY: RGE

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY FIVE OPERATORS SUGGESTED THAT INFORMATION OR CALCULATIONS WOULD BE MORE USEFUL IF THEY WERE PROVIDED ON A COMPUTER GENERATED DISPLAY. THESE INCLUDE ROUTINE CALCULATIONS, ECP'S, HEAT BALANCES, LEAKAGES, BORATION/DILUTION, SYSTEM LAYOUT, TANK CONCENTRATION HOLD STATUS ON SYSTEMS, FLOW PRINTS, INCORE MAP, SUBCOOLING MAP RADIATION MONITOR, STEAM DUMP STATUS, AND THERMOCOUPLE READINGS ON A MAPLIKE DISPLAY.

COMMENTS

THEY RESPONSE TO OPERATOR INPUTS CAN BE AN IMPORTANT FACTOR IN REDUCTION OF OPERATOR ERRORS, AS WELL AS FOR ACHIEVEMENT OF OPERATOR ACCEPTANCE OF COMPUTER SYSTEMS. IT MAY BE APPROPRIATE EFFECTIVE TO ALLOCATE THE ABOVE FUNCTIONS TO THE COMPUTER.

RESPONSE

A RECENT REVIEW OF GINNA'S PROCESS COMPUTER RESULTED IN A MAJOR MODIFICATION OF ITS CAPABILITIES. SOME OF THE REQUESTED DISPLAY/CALCULATIONS ARE PLANNED FOR INCLUSION WHEN A NEW SYSTEM WILL BE IMPLEMENTED 6/30/87. THE CAPABILITY FOR OTHERS TO BE ADDED ON AN "AS DESIRED" BASIS WILL ALSO BE PROVIDED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

E1.1

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1983

ED NUMBER: 0155
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY, FOUR OPERATORS RECOMMENDED THAT IF A COMPUTER GENERATED DISPLAY IS MADE AVAILABLE AT THE OPERATOR'S CONSOLE, SPECIFIC INFORMATION ON ANY POINTS MONITORED SHOULD BE ABLE TO DISPLAY ANY TREND VALUE WITH "OPERATOR SET" LIMITS ON THE COMPUTER.

COMMENTS

TIMELY RESPONSE TO OPERATOR INPUTS CAN BE AN IMPORTANT FACTOR IN REDUCTION OF OPERATOR ERRORS, AS WELL AS FOR ACHIEVEMENT OF OPERATOR ACCEPTANCE OF THE COMPUTER SYSTEM.

RESPONSE

THE CAPABILITY TO APPLY LIMIT POINTS TO TREND DISPLAYS WILL BE AVAILABLE ON THE NEW COMPUTER SYSTEM. THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

E1.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0156
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THE CRT'S AT OPERATOR DISPOSAL WOULD BE VERY USEFUL FOR S/G LEVEL, TC MAPS DURING ACCIDENTS, PZR PRESSURE LEVEL.

COMMENTS

TIMELY RESPONSE TO OPERATOR INPUTS CAN BE AN IMPORTANT FACTOR IN REDUCTION OF OPERATOR ERRORS, AS WELL AS FOR ACHIEVEMENT OF OPERATOR ACCEPTANCE. ALSO THE FORMAT USED IN PRESENTING DATA TO OPERATORS IS AN IMPORTANT FACTOR IN PREVENTING READING AND SELECTION ERRORS AND IN REDUCING SEARCH TIME.

RESPONSE

STEAM GENERATOR LEVEL, THERMOCOUPLE MAPS, AND PRESSURIZER LEVEL WILL BE AVAILABLE ON THE NEW PLANT COMPUTER SYSTEM. THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

E1.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ED NUMBER: 0157
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY, TWO OPERATORS REPORTED INFORMATION PRESENTED ON THE COMPUTER PRINTER MAY NOT BE USEFUL WHEN THEY ARE UNNECESSARILY TIED TO COMPUTER ALARM TYPEWRITER AND MAY MISS AN IMPORTANT ALARM, SUCH AS WHEN RUNNING FLUX MAP.

COMMENTS

A COLLECTION DEVICE FOR PRINTED MATERIALS SHOULD BE PROVIDED WHICH REQUIRES LITTLE OR NO OPERATOR ATTENTION AND WHICH HAS A CAPACITY AT LEAST EQUAL TO THE FEED SUPPLY.

RESPONSE

THE NEW PLANT COMPUTER SYSTEM WILL UTILIZE TWO CONTROL ROOM NEC LINE PRINTERS CAPABLE OF PRINTING 300 LINES PER MINUTE. ONE OF THESE PRINTERS IS DEDICATED TO ALARMS WHILE THE OTHER IS INTENDED FOR DEMAND TYPE OF REPORTING. IN ADDITION, ONE OF THE CRT DISPLAYS LOCATED IN THE CONTROL ROOM WILL HAVE AN ALARM PRINTOUT DISPLAY. IT IS UNLIKELY THAT AN ALARM WILL BE LOST BECAUSE OF OTHER FUNCTIONS BEING PERFORMED BY THE COMPUTER. THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

E2.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0158
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

TWO RESPONSES TO THE OPERATOR SURVEY STATED A NEED FOR A HARD COPY
 PRINTER IN THE CONTROL ROOM OTHER THAN THE LOG-ALARM-TREND
 TYPEWRITERS.

COMMENTS

PRINTERS ARE PART OF THE PROCESS COMPUTER SYSTEM AND SHOULD BE
 LOCATED IN THE PRIMARY OPERATING AREA.

RESPONSE

A HARD COPY PRINTER WILL BE AVAILABLE IN THE CONTROL ROOM WITH
 THE NEW PLANT COMPUTER SYSTEM. THIS WILL BE IMPLEMENTED BY THE
 END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

E2.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0159
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED DIFFICULTY WITH CALLING UP THE THERMOCOUPLE MAP. THE SHORT FORM GOES TO THE CONTROL ROOM WHILE THE LONG FORM COMES OUT DOWNSTAIRS, AND THE INFORMATION DOWNSTAIRS IS OUTDATED BY THE TIME THE CONTROL ROOM OPERATOR GETS IT.

COMMENTS

PRINTERS ARE PART OF THE PROCESS COMPUTER SYSTEM AND SHOULD BE LOCATED IN THE PRIMARY OPERATING AREA.

RESPONSE

THE NEW PLANT PROCESS COMPUTER SYSTEM WILL PROVIDE THE CONTROL ROOM WITH TWO HIGH SPEED PRINTERS (300 LINES/MIN). BOTH THE LONG FORM AND SHORT FORM THERMOCOUPLE MAPS WILL BE AVAILABLE ON THESE PRINTERS. THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987. IN ADDITION, THIS INFORMATION IS AVAILABLE ON THE CONTROL ROOM CRT'S INSTANTANEOUSLY UPON "CALLUP" AND IS PERIODICALLY UPDATED ON THE ORDER OF SECONDS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

E3.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0160
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY FIVE OPERATORS REPORTED THAT SUPPLIES FOR REPLACING EQUIPMENT SUCH AS FUSES, BULBS, INK, CHART PAPER, ETC. ARE KEPT IN THE STOCKROOM. IF OPERATORS RUN OUT OF SUPPLIES ON A BACK SHIFT THEY DO NOT HAVE ACCESS TO THEM, SINCE SUPPLIES ARE AVAILABLE ONLY DURING THE DAY SHIFT. THE SHIFT SUPERVISOR IS ENTRUSTED WITH THE CARE OF THE ENTIRE NUCLEAR PLANT ON WEEK DAYS, YET NOT WITH THE STOCK ROOM KEYS.

COMMENTS

SPARE PARTS, OPERATING EXPENDABLES AND ANY TOOLS THAT ARE NEEDED BY OPERATING PERSONNEL ARE STORED IN A SUITABLE, DESIGNATED SPACE (S) WITHIN THE CONTROL ROOM.

RESPONSE

A CONTROL ROOM SUPPLY CABINET HAS BEEN INSTALLED OUTSIDE OF THE CONTROL ROOM AND STOCKED WITH THE REQUIRED CONTROL ROOM SPARE PARTS. THE INVENTORY LIST IS COMPLETED AND THE OPERATIONS DEPARTMENT IS MAINTAINING THE INVENTORY ON A WEEKLY BASIS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

F2.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0161
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR A BULB LIST
FOR ALL LIGHTS IN THE CONTROL ROOM.

COMMENTS

ALL NECESSARY OR SPECIAL REPLACEMENT TOOLS NEEDED TO INSTALL
EXPENDABLES AND SPARE PARTS ARE AVAILABLE. (SEE HED #160).

RESOLUTION

A BULB LIST IS AVAILABLE IN THE CONTROL ROOM SPARE PARTS CABINET.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

F2.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0162
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/23/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY IT WAS STATED THAT THE STANDBY AUXILIARY FEEDWATER CONTROLS SHOULD BE WITH THE STEAM GENERATOR LEVEL INDICATORS, PREFERABLY ON THE FRONT OF THE CONTROL BOARD.

COMMENTS

MULTIPLE CONTROLS OR DISPLAYS RELATED TO THE SAME FUNCTION SHOULD BE GROUPED TOGETHER. (SEE HED #113)

RESPONSE

THE STANDBY AUXILIARY FEEDWATER PUMPS AND CONTROLS ARE ON THE REAR OF THE MAIN CONTROL BOARD. THERE IS NO STEAM GENERATOR LEVEL INDICATION ON THE REAR OF THE MAIN CONTROL BOARD.

DURING NORMAL OPERATIONS THE STANDBY AUXILIARY FEEDWATER PUMPS ARE ONLY RUN FOR TESTING. THE FLOW IS TO THE STEAM GENERATORS; HOWEVER, LEVEL CONTROL IS MAINTAINED BY THE MAIN FEEDWATER CONTROL SYSTEM. STEAM GENERATOR LEVEL INDICATION IS NOT NECESSARY.

THE STANDBY AUXILIARY FEEDWATER SYSTEM WOULD ONLY BE USED FOLLOWING A COMPLETE LOSS OF MAIN FEEDWATER AND ALL THREE AUXILIARY FEEDWATER PUMPS. IF STANDBY AUXILIARY FEEDWATER SYSTEM OPERATION WERE REQUIRED, THE PLANT WOULD PROBABLY BE IN HOT SHUTDOWN WHERE LEVEL CONTROL RESPONSE IS MUCH SLOWER ALLOWING OPERATOR SUFFICIENT TIME TO RECOGNIZE LEVEL CHANGE ON THE FRONT OF THE CONTROL BOARD AND MAKE FLOW ADJUSTMENTS ON THE REAR.

DUE TO THE LOW PROBABILITY OF USE AND PLANT MODE OF OPERATION WHEN REQUIRED THE LOCATION ON THE REAR OF THE CONTROL BOARD WITH OUT STEAM GENERATOR LEVEL INDICATION IS ACCEPTABLE AS IS.



HISTORICAL REVIEW

B4.2

NAME

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0163
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 3
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT INDEXING IS
DIFFICULT TO FOLLOW FOR ALL PROCEDURES .

COMMENTS

REFERENCE DOCUMENTS IN THE CONTROL ROOM SHOULD BE ACCESSIBLE.
INDEXING IS ONE ASPECT OF MAKING PROCEDURES READILY ACCESSIBLE.

RESERVE

THE PROCEDURE INDEX SYSTEM HAS BEEN UPDATED WITHIN THE LAST YEAR.
ALL INDICES FOR PROCEDURES NECESSARY FOR THE OPERATION OF THE
PLANT HAVE BEEN CONSOLIDATED IN ONE MASTER VOLUME IN THE CONTROL
ROOM. THE ONLY EXCEPTION TO THIS (AT THE OPERATOR'S REQUEST) IS
THE E (EMERGENCY PROCEDURES) AND THE MAJOR SC (SITE CONTINGENCY
PROCEDURES), WHICH ARE LOCATED IN A DISTINCT RED COLORED
NOTEBOOK. A POLL OF OPERATORS HAS INDICTED THAT THE PRESENT
INDEXING SYSTEM IS ACCEPTABLE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

G1.6

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0164
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THERE ARE TOO MANY EMERGENCY PROCEDURES. EVEN WITH THE RESHUFFLE TO NEW PROCEDURES THERE WILL BE FAR TOO MANY EMERGENCY PROCEDURES WHERE THERE SHOULD BE MORE SUPPLEMENTALS OR NORMAL PROCEDURES MADE UP FROM MANY OF THE EMERGENCY PROCEDURES.

COMMENTS

ORGANIZATION, NUMBER, AND REDUNDANCY MAY AFFECT THE ACCESSIBILITY AND USEABILITY OF PROCEDURES. THERE SHOULD BE A GOOD RATIONALE AND JUSTIFICATION FOR EACH PROCEDURE.

RESPONSE

THE EOP UPGRADE PROJECT WILL BRING GINNA'S PROCEDURES INTO LINE WITH CURRENT WESTINGHOUSE AND NRC GUIDANCE ON EMERGENCY OPERATING PROCEDURES. NO FURTHER ACTION IS REQUIRED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW G1.5
 HISTORICAL REVIEW G1.7

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ORIGINATOR:
PLANT: GINNA

DATE: 2/25/1985

ED NUMBER: 0165
ILITY: RGE

ASSESSMENT CATEGORY 1
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE PRINT SYSTEMS AND ELECTRICAL SYSTEMS ARE DIFFICULT TO LOCATE AND USE.

COMMENTS

THESE DOCUMENTS ARE NECESSARY TOOLS AND SHOULD BE READILY ACCESSIBLE TO AND USABLE BY THE CONTROL ROOM OPERATORS. THE DOCUMENTS SHOULD BE KEPT UP TO DATE.

RESPONSE

A SURVEY OF THE OPERATORS INDICATED THAT SYSTEM FLOW DIAGRAMS AND ELECTRICAL DIAGRAMS ARE LOCATED IN THE CONTROL ROOM AND NOT DIFFICULT TO LOCATE. THE PROBLEM, RATHER, WAS THE OUTDATED PRINTS AND THE DIFFICULTY IN USING AND UNDERSTANDING THE ELECTRICAL PRINTS. A PROGRAM IS CURRENTLY IN PLACE TO UPGRADE THE SYSTEM FLOW DIAGRAMS AS DESCRIBED IN THE RESPONSE TO HED #166. TRAINING IN THE USE OF ELEMENTARIES IS SCHEDULED FOR THE SPRING OF 1986; HOWEVER, THE INTENT IS TO MAKE OPERATORS FAMILIAR, NOT EXPERTS, WITH THE USE OF THEM.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

62.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0166
FILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 1
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY TWO OPERATORS INDICATED THAT ALL SYSTEM FLOW PRINTS NEED UPDATING.

COMMENTS

FLOW PRINTS ARE IMPORTANT TOOLS OF THE TRADE. WHEN THEY ARE OUT OF DATE THEY ARE ESSENTIALLY INACCESSABLE FOR USE IN ANY EFFICIENT AND RELIABLE MANNER.

RESPONSE

ENGINEERING WORK REQUEST (EWR) #3391 WAS ISSUED TO ADDRESS THIS CONCERN. THIS EWR REQUIRES THE REVIEW, WALKDOWN AND UPDATE OF ALL P&ID DRAWINGS (43) OF THE SIXTEEN SAFETY RELATED SYSTEMS AS DEFINED BY APPENDIX A OF THE GINNA QA MANUAL. PHASE II INCLUDES THE UPDATE OF THE REMAINING BALANCE OF PLANT P&ID DRAWINGS (40) WHICH INVOLVE ANOTHER 17 SYSTEMS. PHASE I HAS BEEN RECENTLY COMPLETED WITH "AS-BUILT" DRAWINGS ISSUED TO THE PLANT FOR USE. PHASE II IS CURRENTLY IN PROGRESS AND IS EXPECTED TO BE COMPLETED ABOUT 9/1/86.

ENGINEERING PROCEDURE QE-303 AND QE-323 INSURE THAT FUTURE AND CURRENT MODIFICATIONS TO SYSTEMS ARE REFLECTED IN THE P&ID DRAWINGS OF THOSE SYSTEMS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

62.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0167
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE CYCLE 14
GRAPHS ARE VERY HARD TO READ.

COMMENTS

THE USEFULNESS OF POORLY LEGIBLE GRAPHS REDUCES THE EFFICIENCY
AND RELIABILITY OF OPERATOR PERFORMANCE.

RES

AT PRESENT GINNA IS IN ITS 15TH CYCLE. CYCLE 15 WESTINGHOUSE
CURVES APPEAR TO BE ADEQUATE AND EASY TO READ.

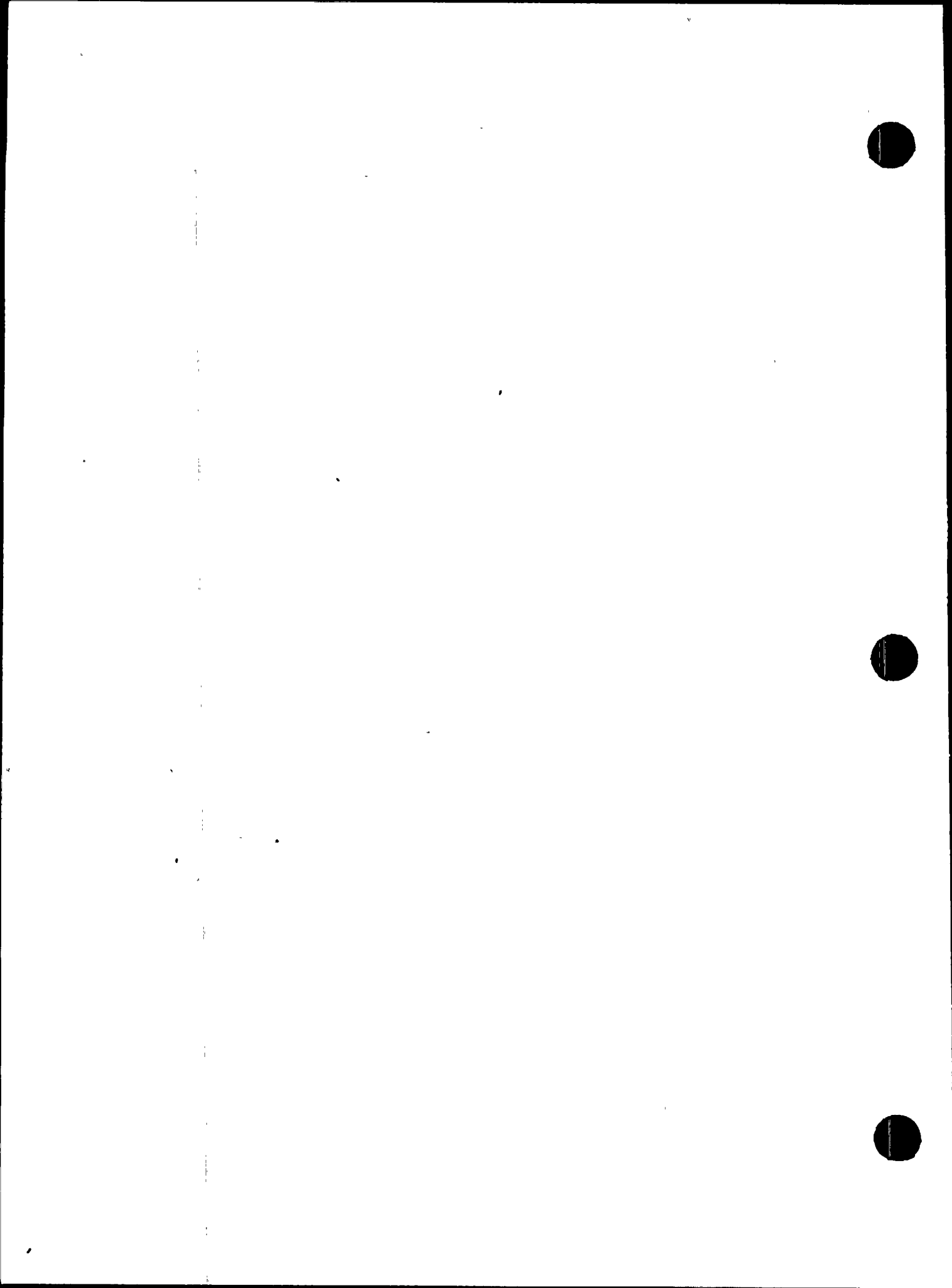
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

G2.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0168
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY FOUR OPERATORS REPORTED THAT IT WOULD BE USEFUL IF OPERATORS WERE ALLOWED TO HAVE GRAPHS, TABLES AND SUCH THAT ARE HELPFUL IN CALCULATING LIMITS, OPERATING MARGINS OR SATURATION CURVES. THESE COULD BE PLACED ON THE MAIN CONTROL BOARD AND ON THE DESKS OF THE HEAD CONTROL AND CONTROL OPERATOR'S DESKS (EG. TURBINE BACK PRESSURE, TECHNICAL SPECIFICATION CURVES). SMALL DRAWINGS COULD BE PLACED ON THE MAIN CONTROL BOARD. IN PLACE OF RIL, A RECORDER COULD HAVE FLOW PRINTS THAT WOULD BE USEFUL DURING STARTUP. MANY OF THE AIDS NOW USED ARE PAPER NOTES. IT WOULD BE NICE TO HAVE PERMANENT PLATES INSTALLED BY GLUE SO THAT THEY COULD BE REMOVED LATER IF DESIRED.

COMMENTS

ACCESSIBILITY OF ALL DOCUMENTS NECESSARY TO THE SAFE, EFFICIENT AND RELIABLE OPERATION SHOULD BE AVAILABLE TO THE OPERATOR IN THE CONTROL ROOM. IN SOME INSTANCES THEY MAY PROVIDE BACK UP FOR SYSTEM FAILURE, EX. COMPUTER. AIDS THAT ARE REQUIRED SHOULD NOT BE PAPER NOTES AND SHOULD BE PRINTED AND PROTECTED BY PLASTIC COATING WHEN PUT ON THE CONTROL BOARD, DESKS, ETC.

RESPONSE

OPERATOR AIDS SUCH AS FLOW PRINTS, CURVES, ETC. WILL BE AVAILABLE ON THE NEW PLANT COMPUTER SYSTEM. THIS WILL BE IMPLEMENTED BY THE END OF 6/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

G2.7

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0169
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED A NEED FOR A GOOD
OVERALL PLANT STATUS BOARD. SUGGESTION WAS THAT CURRENT PRIMARY
CHEMISTRY BOARD COULD BE REMOVED AND AN EQUIPMENT STATUS BOARD
PUT UP. THEN A SMALL CHEMISTRY BOARD OF PLASTIC COULD BE MADE AND
PLACED AT THE AREA OF THE ROD CONTROL AND MAKE UP SYSTEMS.

COMMENTS

STATUS BOARDS PROVIDE CONVENIENT MEANS OF KEEPING OPERATORS
INFORMED OF EQUIPMENT STATUS AND A MEANS OF LETTING NEW SHIFTS
KNOW CURRENT PLANT STATUS.

RESPONSE

THE COMMITTEE DETERMINED THAT THERE WAS NOT SUFFICIENT INTEREST
IN THIS ITEM TO WARRANT INSTALLING SUCH A STATUS BOARD.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

G2.8

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0170
TILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/24/1985

ASSESSMENT CATEGORY 1
LEVEL A
RATING Y

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY FOUR OPERATORS INDICATED THAT THE FIRE SYSTEM DEFEATS AND RESTORATION SHOULD BE PERFORMED BY FIRE AND SAFETY GROUP PERSONNEL. THEY FELT OPERATORS SHOULD BE OUT OF THE FIRE BUSINESS AND THE FIRE PROTECTION STAFF SHOULD OPERATE THE FIRE SYSTEMS INASMUCH AS THE FIRE SYSTEM IS TOO COMPLICATED FOR AUXILIARY OPERATORS TO HANDLE. IT ALSO DISTRACTS FROM THEIR JOB AND BRINGS ON TECHNICAL SPECIFICATION VIOLATIONS BECAUSE THEY DO NOT ALWAYS UNDERSTAND WHAT IS NEEDED. A SUGGESTION WAS MADE THAT THE FIRE SYSTEM BE ALLOCATED TO THE INSTRUMENT AND CONTROL SHOP.

COMMENTS

THE FIRE SYSTEM IS CRITICAL TO PLANT SAFETY AND SHOULD HAVE PERSONNEL DEDICATED TO INSURING IT IS ALWAYS OPERABLE. UNDER EMERGENCY CONDITIONS IF A FIRE OCCURRED OPERATORS MAY BE NEEDED IN CONTROL ROOM OR AT CONTROLS AND INDICATORS IN AUXILIARY BUILDINGS. THERE SHOULD BE WRITTEN, ADMINISTRATIVELY APPROVED PROCEDURES FOR EACH TYPE OF EMERGENCY OR COMBINATION OF EMERGENCIES (FIRE, RADIATION, RESCUE EQUIP.). OPERATORS WILL BE TRAINED IN USE OF ALL EMERGENCY EQUIPMENT.

RESPONSE

RG&E MANAGEMENT HAS MADE THE DECISION THAT OPERATORS BE INVOLVED IN THE OPERATION OF THE PLANT FIRE SYSTEM. SEE HED 251.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

H1.11

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0171
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY THREE OPERATORS INDICATED THAT REGENERATION OF PRIMARY DEMINERALIZERS AND AVT DI'S SHOULD BE DONE BY PLANT CHEMIST. IT TAKES AWAY ONE AND, AT TIMES, TWO OF THE AUXILIARY OPERATORS FOR A WHOLE TRICK.

COMMENTS

CONTROL ROOM MANNING AND TASK ASSIGNMENTS SHOULD ENSURE COMPLETE AND TIMELY COVERAGE OF CONTROLS, DISPLAYS AND OTHER EQUIPMENT REQUIRED DURING ALL MODES OF OPERATION. IF THE AUXILIARY OPERATOR IS DEEDED IN THE CONTROL ROOM OR AT OTHER CONTROLS AND DISPLAYS IN THE AUXILIARY BUILDING, ALLOCATION OF ABOVE DUTIES TO PLANT CHEMIST MAY BE APPROPRIATE.

RESPONSE

IT IS THE POLICY OF THE RG&E TO SCHEDULE ADDITIONAL OPERATORS FOR THOSE PERIODS WHEN THE AVT SYSTEM REQUIRES MANUAL ATTENTION. IN THE FUTURE, HOWEVER, THE REQUIREMENTS OF THE AVT SYSTEM WILL BENEFIT FROM A NEWLY IMPLEMENTED SIXTH "SHIFT" COMPLEMENT OF PERSONNEL. THIS "SHIFT" WILL HELP ALLEVIATE DEMANDS ON AUXILIARY OPERATORS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

H1.12

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0172
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY ELEVEN OPERATORS INDICATED THERE IS UNNECESSARY TRAFFIC IN THE CONTROL ROOM. THIS IS ESPECIALLY TRUE DURING SHUTDOWNS AND WHEN THEY HAVE A PLANT PROBLEM. MOREOVER A CERTAIN AMOUNT OF SOCIALIZATION TAKES PLACE IN EVERY WORK AREA INCLUDING NUCLEAR POWER PLANT CONTROL ROOMS AND EACH OPERATOR MUST DECIDE FOR HOW LONG OR HOW MUCH HIS ATTENTION WILL BE REMOVED FROM MONITORING VITAL EQUIPMENT. AN UNUSUAL NUMBER OF PEOPLE SEEM TO GATHER IN THE CONTROL ROOM DURING THE DAY ESPECIALLY WHEN I&C AND RESULTS AND TESTS ARE IN THE CONTROL ROOM. HP'S COME AND GO. NO ONE PAYS ATTENTION TO THE SIGNS WHICH REQUEST THAT PERMISSION BE ASKED BEFORE ENTERING. MOREOVER MANY PEOPLE ARE COMING INTO CONTROL ROOM TO HAVE SWP'S SIGNED BY SHIFT SUPERVISOR.

COMMENTS

PROVISIONS SHOULD BE MADE TO LIMIT THE ACCESS AND MOVEMENT OF NONESSENTIAL BUT AUTHORIZED PERSONNEL TO PRESCRIBED AREAS WITHIN THE CONTROL ROOM. ALL OTHER PERSONNEL SHOULD BE KEPT OUT. THE POLICY MUST BE ENFORCED BY PERSONS AUTHORIZED TO DO SO.

RESPONSE

IN AN EFFORT TO REDUCE THE AMOUNT OF CONTROL ROOM TRAFFIC, AN ADVANCE REQUEST SYSTEM HAS BEEN DEVELOPED IN THE PAST TWO YEARS. RECENT REFINEMENT TO THIS SYSTEM REQUIRES PERSONNEL TO OBTAIN AUTHORIZATION FROM THE SHIFT SUPERVISOR FOR PERFORMANCE OF A TASK (EG. STATION "HOLDS", SPECIAL WORK PERMITS, ETC.) BEFORE ENTERING THE CONTROL ROOM. ADDITIONALLY, DURING THE 1986 REFUELING OUTAGE, A MANNED CONTROL STATION WILL BE IMPLEMENTED AT THE ENTRANCE TO THE CONTROL AREA WITH THE INTENT OF SCREENING PERSONNEL BEFORE ENTRANCE. THE ABOVE SHOULD REDUCE THE TRAFFIC IMPACT ON THE CONTROL ROOM, HOWEVER MEANS TO IMPROVE THIS SITUATION ARE CONTINUALLY ONGOING.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION



ANEL -----	EQUIPMENT ID NUMBER -----	EQUIPMENT NAME -----	OTHER -----
---------------	---------------------------------	----------------------------	----------------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0173
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE STAFF
 TECHNICAL ADVISOR IS NOT REQUIRED TO BE IN THE CONTROL ROOM;
 HOWEVER, IF THE PLANT HAS AN EVENT, OPERATORS WOULD HAVE TO PAGE
 HIM AND BRIEF HIM WHEN HE GETS TO CONTROL ROOM. THIS DECREASES
 HIS EFFECTIVENESS SINCE HE IS SUPPOSED TO BE AN INDEPENDENT
 OBSERVER, ABLE TO MAKE HIS OWN DECISIONS BASED ON HIS
 OBSERVATIONS.

COMMENTS

PROCEDURES SHOULD ENSURE THAT TECHNICAL ADVISOR HAS ACCESS TO ALL
 PERTINENT INFORMATION IN CASE OF AN EVENT.

RESPONSE

GINNA STATION POLICY IS TO HAVE THE STA AVAILABLE TO PERFORM
 ENGINEERING STAFF DUTIES CONCURRENT WITH THE STA OPERATIONAL
 DUTIES. THIS NECESSITATES THE STA BEING ABSENT FROM THE CONTROL
 ROOM FOR EXTENDED PERIODS OF TIME. NO POLICY CHANGE IS INTENDED
 AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

H4.8

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0174
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THERE WAS NOT ENOUGH TRAINING IN SITE CONTINGENCY PLANS AND EMERGENCY COORDINATOR FUNCTIONS. THESE ARE CRITICAL SAFETY AREAS.

COMMENTS

TRAINING IS AN IMPORTANT METHOD FOR IMPROVING SAFETY, RELIABILITY AND EFFICIENCY OF OPERATION. THE TRAINING ABOVE IS CRITICAL FOR EMERGENCY OPERATIONS.

RESPONSE

EMERGENCY RESPONSE PROCEDURES ARE CONTINUALLY ADDRESSED DURING OPERATOR TRAINING. THIS TRAINING IS ATTEMPTED IN SMALL SEGMENTS WHERE THE DUTIES OF SPECIFIC INDIVIDUALS AND TITLES ARE ADDRESSED. THIS TRAINING WILL BE PERFORMED AGAIN IN THE NEAR FUTURE BY A SELF-STUDY MODULE. OPERATOR REQUALIFICATION TRAINING PRESENTLY BEING CONDUCTED DISCUSSES THE NOTIFICATION AND TIMELINESS OF NOTIFICATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

11.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0175
 UTILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 3
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY SIX OPERATORS INDICATED THAT MORE TIME SHOULD BE SPENT IN TRAINING ON THE SIMULATOR WORKING THROUGH SITUATIONS ON ALL TYPES OF EMERGENCIES. THEY ALSO FELT THEY NEEDED MORE TIME PRACTICING ROUTINE STARTUPS AND SHUTDOWNS AND OTHER ROUTINE SITUATIONS INSTEAD OF JUST ACCIDENTS.

COMMENTS

TRAINING ON SIMULATORS IS IMPORTANT TO INSURE THE SAFE, RELIABLE AND EFFICIENT OPERATION OF A PLANT. IN TIMES OF STRESS TRAINING CAN BE EXTREMELY VALUABLE FOR ELICITING THE CORRECT RESPONSE TO THE SITUATION.

RESPONSE

IN THE PAST, OPERATORS WITH LICENSES HAVE SPENT ONE FIVE DAY WEEK EACH YEAR AT THE WESTINGHOUSE SIMULATOR. THIS INCLUDED 30 HOURS OF SIMULATOR TIME WHICH IS MORE THAN MOST UTILITIES WITHOUT A SITE-SPECIFIC SIMULATOR. THE RGE HAS PURCHASED A SITE-SPECIFIC SIMULATOR TO ARRIVE DURING 1986. TRAINING TIME ON THE SIMULATOR WILL BE INCREASED TO A LEVEL THAT WILL FURTHER INSURE OPERATOR PROFICIENCY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

I1.4

PAN	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0176
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

IN RESPONSE TO THE OPERATOR SURVEY THREE OPERATORS FELT THEY HAD NOT RECEIVED SUFFICIENT TRAINING ON HOW TO DEAL WITH A SITUATION IN WHICH THERE IS A LOSS OF ALL ALTERNATING CURRENT.

COMMENTS

TRAINING SHOULD BE GIVEN FOR ALL POTENTIAL TYPES OF EMERGENCY SITUATIONS.

RESPONSE

THIS AREA HAD BEEN COVERED IN TRAINING DURING PREVIOUS YEARS. APPROXIMATELY 2 YEARS AGO GINNA EXPERIENCED A LOSS OF OFFSITE POWER EMERGENCY. DURING THE COURSE OF THIS INCIDENT, THE OPERATORS DEMONSTRATED SUFFICIENT UNDERSTANDING BY MAINTAINING THE PLANT IN OPERATION.

DURING 1985 WE INCLUDED LOSS OF ALL AC IN THE TRAINING ON EOPS AND AGAIN DURING MITAGATION CORE DAMAGE COURSES BETWEEN JULY AND NOVEMBER.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

11.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0177
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE SATURATION
 CURVE SHOULD BE PERMANENTLY MOUNTED IN THE CONTROL ROOM.

COMMENTS

VISUAL DISPLAYS PROVIDED IN THE CONTROL ROOM SHOULD GIVE
 OPERATORS ALL THE INFORMATION ABOUT SYSTEM STATUS AND PARAMETER
 VALVES THAT IS NEEDED TO MEET TASK REQUIREMENTS IN EMERGENCY
 SITUATIONS. THE SATURATION CURVE IS AN AID TO ENSURE THAT
 OPERATORS EVALUATE SUCH INFORMATION EFFECTIVELY.

RESPONSE

A SATURATION CURVE WILL BE AVAILABLE FOR DISPLAY ON THE
 NEW PLANT COMPUTER SYSTEM AND SHOULD BE ADEQUATE FOR THIS NEED.
 THIS WILL BE IMPLEMENTED BY 6/30/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

J1.7

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0178
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 2/25/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY STATED IT WOULD BE HELPFUL IN
ABNORMAL SITUATIONS TO KNOW WHICH INSTRUMENT BUS POWERS EACH
CONTROL AND METER.

COMMENTS

VISUAL DISPLAYS PROVIDED IN THE CONTROL ROOM GIVE OPERATORS ALL
THE INFORMATION ABOUT SYSTEM STATUS AND PARAMETER VALUES THAT IS
NEEDED TO MEET TASK REQUIREMENTS IN EMERGENCY SITUATIONS.

RESPONSE

REDUNDANT CHANNELS OF ALL VITAL INSTRUMENTATION ARE POWERED FROM
A & C INSTRUMENT BUSES WITH BATTERY BACKUP. ALL VITAL
CONTROLS ARE ALSO POWERED FROM THESE BUSES. ADDITIONAL
INFORMATION PERTAINING TO CURRENT SOURCE. WILL BE IMPLEMENTED BY
4-1-87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

J1.25

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



#179

This page intentionally left blank.



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0180
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

ANNUNCIATOR CONTROLS ARE NOT DISTINCTIVELY SEPARATED FROM OTHER CONTROLS (BY COLOR CODING; COLOR SHADING; DEMARCATION OR SHAPE CODING).

COMMENTS

RESPONSE

THE ANNUNCIATOR PUSHBUTTONS ARE COLOR CODED RED, YELLOW, AND GREEN. BACKGROUND SHADING OR LINES OF DEMARCATION WILL BE IMPLEMENTED BY THE END OF THE REFUELING OUTAGE 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.4.2.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0181
TILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE CONFIGURATION OF THE ANNUNCIATOR CONTROL BUTTONS (TEST, SILENCE, ACKNOWLEDGE) IS DIFFERENT FOR PANELS 5 AND 7.

COMMENTS

RESPONSE

FRQUENCY OF USE FOR THESE CONTROLS IS HIGH. NO SIGNIFICANT PROBLEMS HAVE BEEN NOTED OVER LONG TERM USE. ALTHOUGH IT IS A TRUE STATEMENT THAT AN OPERATOR MUST ATTEND TO THE DISPERATE CONFIGURATIONS DIFFERENTLY, TRAINING AND FAMILIARITY ARE OF SUFFICIENT QUALITY SUCH THAT IT IS NOT NECESSARY TO MOVE THESE CONTROLS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.4.2.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0182
UTILITY: RGE

ORIGINATOR:
PLANT: GINNA

DATE: 12/26/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING W

DESCRIPTION OF DISCREPANCY

THE SPACE BETWEEN LINES IS LESS THAN ONE HALF THE CHARACTER HEIGHT FOR CHARACTERS WHOSE HEIGHT IS .28 INCHES.

COMMENTS

RESPONSE

NINETY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS RELATING TO CONTENT, LETTER HEIGHT, FONT, ETC. A STUDY IS NOW UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.D.6

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0183
 UTILITY: RGE

ORIGINATOR: CFW
 PLANT: GINNA

DATE: 12/26/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING W_X

DESCRIPTION OF DISCREPANCY

SPACE BETWEEN WORDS IS LESS THAN THE WIDTH OF ONE CHARACTER.

COMMENTS

RESPONSE

NINETY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS RELATING TO CONTENT, LETTER HEIGHT, FONT, ETC. A STUDY IS NOW UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.D.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: CFW
PLANT: GINNA

DATE: 12/26/1985

ED NUMBER: 0184
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL C
RATING W_X

DESCRIPTION OF DISCREPANCY

THE SPACE BETWEEN CHARACTERS IS LESS THAN ONE STROKE WIDTH FOR CHARACTERS WITH A STROKE WIDTH OF .06 INCHES.

COMMENTS

RESPONSE

NINETY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS RELATING TO CONTENT, LETTER HEIGHT, FONT, ETC. A STUDY IS NOW UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.D.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0185
 TILITY: RGE

ORIGINATOR: CFW
 PLANT: GINNA

DATE: 12/26/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING W_X

DESCRIPTION OF DISCREPANCY

LETTER WIDTH TO HEIGHT RATIO IS NOT BETWEEN 1:1 AND 3:5 FOR
 LETTERS THAT ARE .28 INCHES HIGH AND ARE .22 INCHES WIDE (7:9).

COMMENTS

RESPONSE

NINETY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE
 REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS
 RELATING TO CONTENT, LETTER HEIGHT, FONT, ETC. A STUDY IS NOW
 UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY
 FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF
 NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN
 CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A
 RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL
 EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.D.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0186
 UTILITY: RGE

ORIGINATOR: CFW
 PLANT: GINNA

DATE: 12/26/1984

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING W_X

DESCRIPTION OF DISCREPANCY

STROKE WIDTH TO CHARACTER HEIGHT RATIO IS NOT BETWEEN 1:6 AND 1:8
 FOR LETTERS THAT ARE .28 INCHES HIGH AND HAVE A STROKE WIDTH OF
 .03 INCHES (1:9.3).

COMMENTS

RESPONSE

NINETY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE
 REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS
 RELATING TO CONTENT, LETTER HEIGHT, FONT, ETC. A STUDY IS NOW
 UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY
 FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF
 NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN
 CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A
 RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL
 EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.D.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0187
 UTILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

SOME ANNUNCIATOR TILES CONTAIN LIGHT LETTERS ON A DARK (RED) BACKGROUND.

COMMENTS

RESPONSE

THE BEST COLOR COMBINATIONS FOR LEGENDS AND LABELS INVOLVED DARK LETTERS ON LIGHT BACKGROUNDS. WHEREAS THESE ANNUNCIATOR TILES USE THE REVERSE COMBINATION, IT IS BECAUSE THE LIGHT BACKGROUND IS ILLUMINATED BETTER WHEN THE ANNUNCIATOR IS ACTIVATED. IN THIS CASE, THE LIGHT BACKGROUND IS PREFERRED TO EMPHASIZE WHICH TILE IS POSITIVE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.C.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
6E	A6		
6E	B6		
6E	C6		
6E	D6		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0188
 TILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING W_X

DESCRIPTION OF DISCREPANCY

TYPE STYLE FOR ANNUNCIATORS IS NOT CONSISTENT.

COMMENTS

RESPONSE

ONLY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE
 RE-ED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS
 RELATING TO CONTENT, LETTER HEIGHT, FONT ETC. A STUDY IS NOW
 UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY
 FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF
 NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN
 CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A
 RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL
 EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

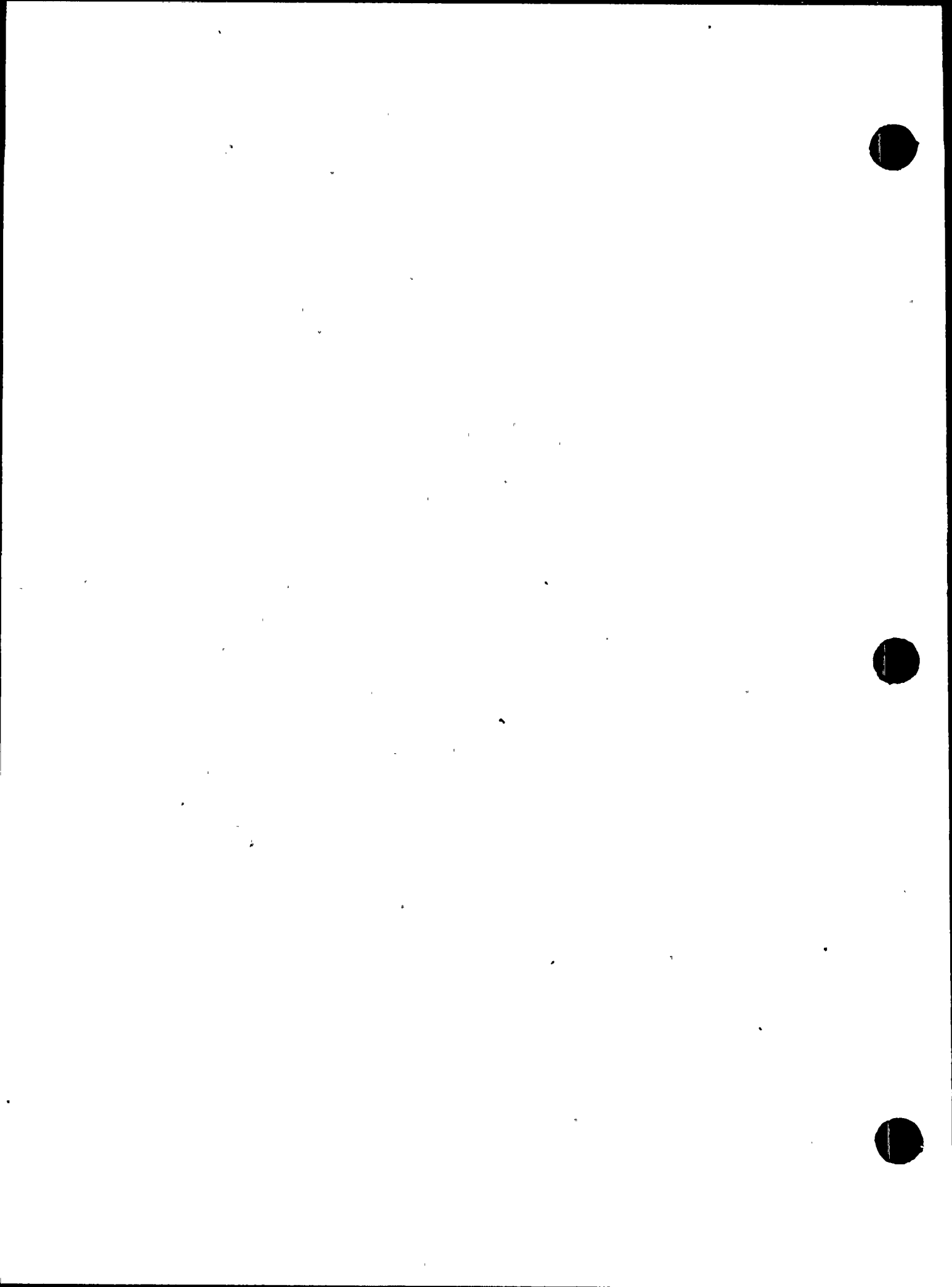
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0189
 TILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING W_X

DESCRIPTION OF DISCREPANCY

LETTER HEIGHT IS NOT IDENTICAL FOR ALL TILES. THERE ARE TWO TYPES OF LETTERS USED ON ANNUNCIATORS (HEIGHTS OF .28 INCHES AND .1875 INCHES).

COMMENTS

RESPONSE

NINETY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS RELATING TO CONTENT, LETTER HEIGHT, FONT ETC. A STUDY IS NOW UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.A.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0190
UTILITY: RGE

ORIGINATOR:
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING W_X

DESCRIPTION OF DISCREPANCY

LETTER HEIGHT (THERE ARE TWO HEIGHTS, .28 AND .1875 INCHES) OF THE SMALLER LETTERS ON ANNUNCIATORS SUBTENDS A VISUAL ANGLE OF LESS THAN 15 MINUTES AT A VIEWING DISTANCE OF 54 INCHES.

COMMENTS

RESPONSE

NINETY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS RELATING TO CONTENT, LETTER HEIGHT, FONT ETC. A STUDY IS NOW UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

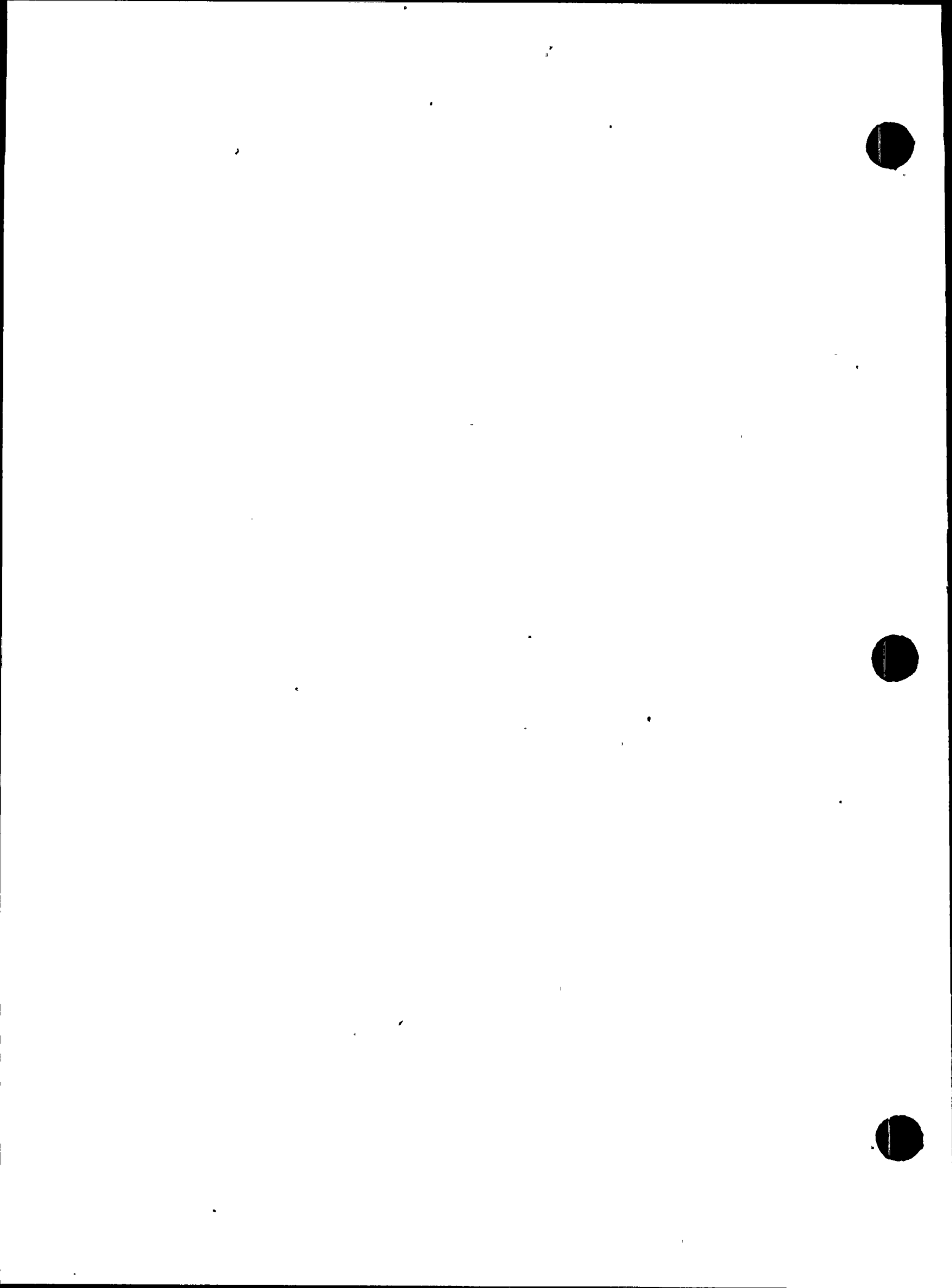
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.A.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0191
TILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

SOME VISUAL TILE LEGENDS ARE NOT SPECIFIC AND ARE AMBIGUOUS.

COMMENTS

RESPONSE

NINE FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS RELATING TO CONTENT, LETTER HEIGHT, FONT, ETC. A STUDY IS NOW UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.4.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
7-A	D2	CONTAINMENT ISOLATION S.I. MAN.	
7-C	A5	PLUS OR MINUS COMPUTER ALARM ROD DEV & SEQ. NIS PWR RANGE 7.5 TILTS IN	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0192
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE VERTICAL AND HORIZONTAL AXES OF ANNUNCIATOR PANELS ARE NOT
LABELED WITH ALPHANUMERICS FOR READY COORDINATE DESIGNATION OF A
PARTICULAR TILE.

COMMENTS

RESPONSE

EACH ANNUNCIATOR TILE MATRIX IS KNOWN BY OPERATIONS PERSONNEL TO
BE NUMBERED 1-32 LEFT TO RIGHT, TOP TO BOTTOM. THIS IS COVERED
IN TRAINING. SINCE EACH MATRIX IS IDENTIFIED BY AN ALPHABETIC
CHARACTER, EACH TILE CAN BE READILY IDENTIFIED IN ANNUNCIATOR
PROCEDURES. THERE IS NO REQUIREMENT TO NUMBER EACH ONE
INDIVIDUALLY WITH A LABEL.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.3.C.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0193
TILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

ANNUNCIATOR TILES ARE NOT GROUPED BY FUNCTION OR SYSTEM WITHIN EACH ANNUNCIATOR PANEL.

COMMENTS

RESPONSE

ALTHOUGH GROUPING BY FUNCTION IS DESIRABLE IN MOST CASES, WHEN CONTROL ROOM ANNUNCIATORS ARE ACTIVATED, IT IS THE MESSAGE THAT IS IMPORTANT, NOT THE GROUPING OF TILES. ANNUNCIATORS SERVE TO ALERT THE OPERATOR ABOUT THE STATUS OF A PARTICULAR EVENT. IN THIS CASE, THERE IS NOT SUFFICIENT REASON TO CHANGE THE ORGANIZATION OF THE TILES SINCE EACH EVENT MAY BE MUTUALLY EXCLUSIVE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.3.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
6E	B3		
6E	D1		
6E	D8		
7-AA	A1		
7-AA	A2		
7-AA	A3		
7-AA	A4		
7-AA	A5		
7-AA	A6		
7-AA	A7		
7-AA	A8		
7-AA	B1		
7-AA	B2		



-AA	B3
-AA	B4
-AA	B5
-AA	B6
-AA	B7
-A	B8
-A	C1
-AA	C2
-AA	C3
-AA	C4
-AA	C5
-AA	C6
-AA	C7
-AA	C8
-AA	D1
-AA	D2
-AA	D3
-AA	D4
-AA	D5
-AA	D6
-AA	D7
-AA	D8

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0194
UTILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

ANNUNCIATOR TILES WHICH ARE ILLUMINATED DURING NORMAL OPERATION ARE NOT DISTINCTIVELY CODED FOR POSITIVE RECOGNITION DURING THIS PERIOD.

COMMENTS

RESPONSE

OPERATORS ARE TRAINED TO IDENTIFY THE VERY SMALL NUMBER OF ANNUNCIATORS THAT ARE ILLUMINATED DURING NORMAL CONDITIONS. NO CHANGE APPEARS WARRANTED AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.2.F.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0195
ILITY: RGE

ORIGINATOR:
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

IN CASE OF FLASHER FAILURE OF AN ALARMED TILE, THE TILE LIGHT
DOES NOT ILLUMINATE AND BURN STEADILY; THE TILE MERELY REMAINS
DARK.

COMMENTS

RES

ANNUNCIATORS ARE TESTED FOR BULB AND FLASHER OPERABILITY ONCE PER
SHIFT. IF PROBLEMS ARE EVIDENT THEY ARE FIXED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.2.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0196
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE FLASH RATE OF ANNUNCIATORS IS APPROXIMATELY TWO FLASHES PER SECOND WITH APPROXIMATELY EQUAL ON AND OFF TIMES INSTEAD OF THE RECOMMENDED RATE OF FROM THREE TO FIVE FLASHES PER SECOND.

COMMENTS

RESPONSE

THE FLASH RATE OF THE ANNUNCIATORS IS THE STANDARD RATE FOR THE MODEL AN-100 STATIC ANNUNCIATOR SYSTEM AND IS SATISFACTORY TO THE OPERATORS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.2.B

PANEL

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER



HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ED NUMBER: 0197
ILITY: RGE

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

NO OPERATOR AIDS ARE PROVIDED FOR LAMP REPLACEMENT.

COMMENTS

OPERATOR AIDS ARE USEFUL IN PROVIDING INFORMATION THAT IS NEEDED
ON AN OCCASIONAL BASIS.

RESPONSE

AIDS FOR LAMP REPLACEMENT HAVE BEEN LOCATED IN THE CONTROL ROOM
SUPPLY CABINET.

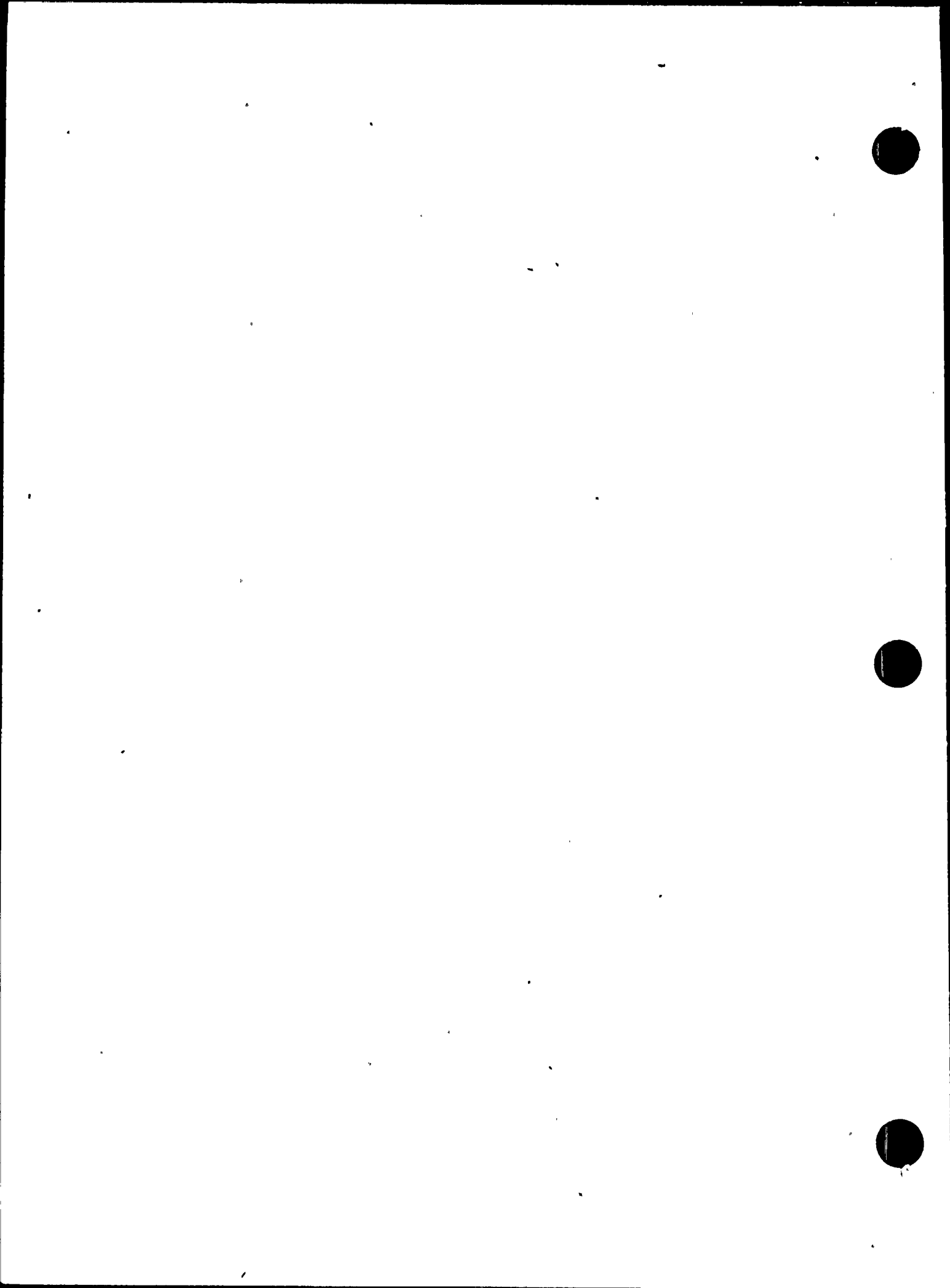
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.1.C.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0198
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

LAMP REPLACEMENT MAY SUBJECT THE OPERATOR TO A SHOCK HAZARD.

COMMENTS

RESPONSE

THIS IS NOT A PROBLEM AT GINNA. THE DESIGN OF THE SOCKETS IS SUCH THAT THE OPERATORS CANNOT GET THEIR FINGERS IN FAR ENOUGH TO BE SHOCKED. THE OPERATORS HAVE AN INSULATED TOOL FOR LAMP REMOVAL, AND IF A LAMP IS BROKEN OFF IN THE SOCKET A PLANT ELECTRICIAN SHOULD BE NOTIFIED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.1.C.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0199
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

LAMP REPLACEMENT REQUIRES LEGEND TILE REMOVAL AND THERE ARE NO PROVISIONS TO ENSURE THAT THE TILE IS REPLACED IN THE PROPER LOCATION.

COMMENTS

RESPONSE

OPERATOR TRAINING IS SUFFICIENT TO INSURE THAT ONLY ONE TILE AT A TIME IS REMOVED DURING LAMP REPLACEMENT. THERE IS NO JUSTIFICATION TO REPLACE HARDWARE. IF, FOR SOME REASON, MORE THAN ONE TILE WAS REMOVED, THE OPERATOR COULD REFER TO THE ALARM RESPONSE BOOK TO DETERMINE CORRECT ALARM WINDOW PLACEMENT.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.1.C.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0200
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

ANNUNCIATOR PANEL IDENTIFICATION LETTER HEIGHT SUBTENDS A VISUAL
ANGLE OF LESS THAN 15 MINUTES WHEN VIEWED FROM A CENTRAL POSITION
WITHIN THE PRIMARY OPERATING AREA.

COMMENTS

LETTER HEIGHT IS .665 INCHES. VIEWING DISTANCE USED WAS 160
INCHES. VISUAL ANGLE IS 14.28 MINUTES.

RESPONSE

THE PRESENT VISUAL ANGLE IS SATISFACTORY. NO CHANGE IS DEEMED
WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.1.B.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ED NUMBER: 0201
TILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

OPERATORS ARE NOT ABLE TO IDENTIFY THE WORK STATION OR THE SYSTEM WHERE ANNUNCIATOR AUDITORY SIGNALS ORIGINATE. SEPARATE AUDITORY SIGNALS AT EACH WORK STATION WITHIN THE PRIMARY OPERATING AREA ARE NOT USED.

COMMENTS

RESPONSE

THE PRIMARY OPERATING AREA AT GINNA IS A SMALL WORKING SPACE. EVEN THOUGH THE PRESENT SYSTEM REQUIRES THE OPERATOR TO SCAN EACH OF THE PANELS AFTER AN ALARM SIGNAL IS HEARD, ONLY A MINUTE AMOUNT OF TIME ELAPSES BEFORE ALL ANNUNCIATOR TILES ARE REVIEWED. A CHANGE WOULD NOT RESULT IN A SUFFICIENT GAIN.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.2.1.F

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ED NUMBER: 0202
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

ALL AUDITORY SIGNALS ARE NOT WITHIN 2.5 dB OF THE ANNUNCIATOR
AUDITORY SIGNAL. THE FIRE SYSTEM ALARM IS MUCH LOUDER THAN OTHER
AUDITORY SIGNALS.

COMMENTS

RESPONSE

SEE HED 115.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.2.1.D

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0203
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE ANNUNCIATOR AUDITORY SIGNAL IS OF AN INTENSITY LESS THAN 10 dB(A) ABOVE AVERAGE AMBIENT NOISE (AVERAGE AMBIENT = 56 dB(A), READING WITH ANNUNCIATOR = 62 dB(A)).

COMMENTS

RESPONSE

ANNUNCIATORS PROVIDE A VISUAL ALARM AS WELL AS AN AUDITORY ALARM TO CAPTURE THE ATTENTION OF THE CONTROL ROOM OPERATOR. ALTHOUGH SLIGHTLY LESS THAN THE 10 dB STANDARD, THESE AUDITORY ALARMS ARE SUFFICIENT TO DO THE JOB.

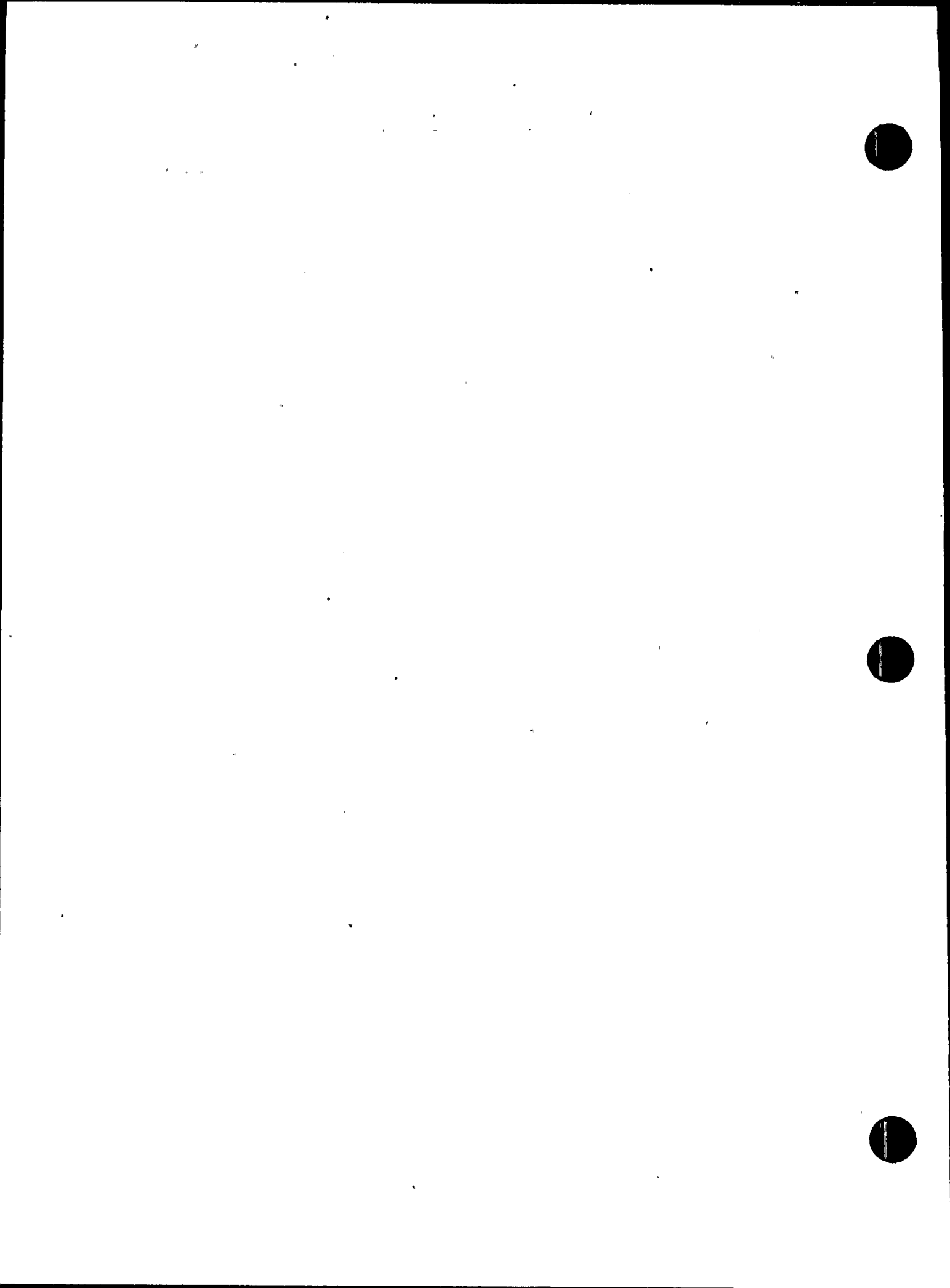
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.2.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0204
 TILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

CLEARED ALARMS DO NOT HAVE A DEDICATED DISTINCTIVE AUDIBLE SIGNAL WHICH IS OF A FINITE DURATION.

COMMENTS

RESPONSE

WHEN AN ANNUNCIATOR HAS BEEN RESET BY AN OPERATOR, THE TILE DE-ENERGIZES (LIGHT GOES OUT) IF THE INITIATING SIGNAL IS BELOW ITS SETPOINT. AN AUDIBLE SIGNAL MAY CREATE MORE STIMULUS THAT THE OPERATOR MUST CONTEND WITH UNNECESSARILY. THERE IS INSUFFICIENT REASON TO WARRANT AN AUDIBLE SIGNAL BECAUSE OF THE LIGHT CUE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.1.5.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0205
 TILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

LOGICAL PRIORITIZATION OF ALARMS IS NOT USED. FIRST-OUT ALARMS ARE GROUPED TOGETHER. OTHERWISE, NO DIFFERENTIATION BETWEEN MORE SERIOUS AND LESS SERIOUS ALARMS IS MADE.

COMMENTS

RESPONSE

THE PRIORITIZATION OF ALARMS (ANNUNCIATORS) BASED ON SEVERITY IS BY NATURE RELATIVE AND SITUATIONALLY SPECIFIC. CATAGORIZATION BY LEVELS (1 TO 4) ON EACK GRID MATRIX MAY APPEAR TO BE DESIREABLE BUT COULD EASILY LEAD TO FALSE CONCLUSIONS ABOUT THE NATURE OF THE MESSAGE AND ITS INTERACTION WITH OTHER MESSAGES. RELATIONSHIPS BETWEEN PROBLEM WARNINGS SHOULD BE EVALUATED BY OPERATIONS PERSONNEL ON A CASE BY CASE BASIS RATHER THAN FOLLOWING A PRE-STRUCTURED FORMAT. NO CHANGE IS RECOMMENDED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.1.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0206
UTILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING W

DESCRIPTION OF DISCREPANCY

A REFLASH CAPABILITY IS NOT PROVIDED TO ALLOW SUBSEQUENT ALARMS
(ON SHARED ALARMS) TO ACTIVATE THE AUDITORY ALERT MECHANISM EVEN
THOUGH THE FIRST ALARM HAS NOT BEEN CLEARED.

COMMENTS

ON MULTI-CHANNEL OR SHARED ALARMS, THE FIRST ALARM MUST BE
ACKNOWLEDGED AND CLEARED BEFORE SUBSEQUENT AUDITORY ALARMS CAN
OCCUR.

RESPONSE

ENGINEERING WORK REQUEST (EWR) NO. 4234 HAS BEEN ISSUED (SEE HED
117). THIS REQUIRES AN EVALUATION OF THE EXISTING ANNUNCIATOR
DESIGN TO DETERMINE IF A REDESIGN IS JUSTIFIED BASED ON THIS AND
SEVERAL OTHER HEDS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.1.2.C.3

PANEL -----	EQUIPMENT ID NUMBER -----	EQUIPMENT NAME -----	OTHER -----
----------------	---------------------------------	----------------------------	----------------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0207
 ILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

NOT ALL ANNUNCIATOR TILE LEGENDS ARE ENGRAVED. SOME TILE LEGENDS
 MAKE USE OF DYNO-TAPE.

COMMENTS

RESPONSE

ALL NEW ALARM WINDOWS HAVE RECENTLY BEEN INSTALLED IN THE GINNA
 CONTROL BOARD ELIMINATING ALMOST ALL THE DYNOTAPE LABELS ALLUDED
 TO BE IN THIS HED. A STANDARDIZED ABBREVIATIONS LIST HAS BEEN
 DEVELOPED. THIS WILL ESTABLISH A LETTERING SCHEME THAT WILL
 SATISFY THE GUIDELINES OF NUREG 0700. UPON IMPLEMENTING THE
 RECOMMENDATIONS, ALL DYNOTAPE LABELS WILL BE REMOVED, IF IN THE
 FUTURE SETPOINTS ARE CHANGED, THE ELECTRICAL FOREMAN WILL ORDER
 NEW WINDOWS FOR PERMANENT SETPOINT DISPLAY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.5.C.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
5-J	D7		
5-K	A3		
5-K	A6		
5-K	B3		
5-K	D5		
5-L	A1		
5-E	A3		
5-E	C7		
5-F	C3		
5-G	A2		
5-G	A7		

-H
-H
-B
-B
-D
-D

A8
D5
C1
C2
B5
B6

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0208
UTILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

SOME TILE LEGENDS DO NOT ADDRESS ONE SPECIFIC CONDITION.

COMMENTS

RESPONSE

ALARMS LISTED ON PANELS 6 AND 7 HAVE ASSOCIATED INDICATION ON THE CONTROL BOARD TO DETERMINE WHETHER THE ALARM IS HIGH OR LOW. THE MFW PUMP OIL SUMP LEVEL ON 5-L IS BACKED UP BY AN OIL PRESSURE ALARM; THEREFORE, AN OPERATOR MAY BE DISPATCHED TO CHECK THE LEVEL. THE SPENT FUEL PIT LEVEL ALARM IS ALWAYS ASSUMED TO BE LOW UNTIL THE ACTUAL LEVEL IS CHECKED. THE PENETRATION TEMPERATURE ALARM SHOULD BE A RESULT OF GRADUALLY CHANGING TEMPERATURES WHICH WOULD ALLOW TIME FOR INVESTIGATION. NO CHANGE AT THIS TIME APPEARS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.4.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
5-K	C4		
5-K	C5		
5-L	C5		
5-F	C1		
7-A	C8		
7-A	D8		
7-B	A8		
7-B	B7		
7-C	A3		
7-C	A4		

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0209
 UTILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

A "DARK" ANNUNCIATOR PANEL CONCEPT IS USED. HOWEVER, SEVERAL
 ANNUNCIATORS ARE LIT DURING NORMAL OPERATION.

COMMENTS

RESPONSE

OPERATORS ARE TRAINED TO IDENTIFY THE VERY SMALL NUMBER
 ANNUNCIATORS THAT ARE ILLUMINATED DURING NORMAL CONDITIONS. NO
 CHANGE APPEARS WARRANTED AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.2.E

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
6-E	A2		
6-E	C4		
6-E	D5		
7-A	D7		
7-AA	A1		
7-AA	C6		
7-AA	C7		
7-AA	D7		
7-B	C3		
7-E	C4		
7-G	C1		



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0210
 TILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

SOME ANNUNCIATORS ARE NOT LOCATED ABOVE THE RELATED CONTROLS AND DISPLAYS WHICH ARE REQUIRED FOR CORRECTIVE OR DIAGNOSTIC ACTION IN RESPONSE TO EACH ANNUNCIATOR.

COMMENTS

RESPONSE

DUE TO THE SIZE OF THE GINNA CONTROL ROOM, THIS DOES NOT APPEAR TO BE A PROBLEM. HOWEVER, IN CONJUNCTION WITH THE ANNUNCIATOR DESIGN EVALUATION, THESE ANNUNCIATOR/DISPLAY RELATIONS WILL ALSO BE EVALUATED. ALL EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.3.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-F	C5		
-AA	B1		
-AA	B2		
-AA	B5		
-AA	C1		
-AA	C5		
-AA	D1		
-A	D5		
-AA	D6		
-C	B5		



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0211
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 1/12/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

ALARMS THAT REQUIRE THE CONTROL ROOM OPERATOR TO DIRECT AN AUXILIARY OPERATOR TO A GIVEN PLANT LOCATION FOR SPECIFIC INFORMATION ARE NOT AVOIDED. THE SPECIFIED ALARMS DO NOT GIVE SPECIFIC INDICATION OF PROBLEMS.

COMMENTS

ESR

INVESTIGATION INTO THIS HED REVEALED THAT THESE INDICATIONS ARE NOT TIME CRITICAL ENOUGH TO REQUIRE INSTRUMENTATION IN THE CONTROL ROOM. SENDING AN AUXILIARY OPERATOR TO READ AND THEN COMMUNICATE THESE INDICATIONS DOES NOT COMPROMISE OPERATIONS PERSONNEL IN CRITICAL SITUATIONS. NINETY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS RELATING TO CONTENT, LETTER HEIGHT, FONT ETC. A STUDY IS NOW UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

3.1.2.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

5-I	B3		
5-I	C8		
5-I	D7		
5-I	A1		



-J	R1
-J	R8
-J	C1
-J	C8
-J	D1
-J	D5
-K	A3
-K	A8
-K	E3
-K	E6
-K	E8
-K	C4
-K	C6
-K	C8
-K	D3
-K	D4
-K	D6
-L	A8
-L	C3
-E	C7
-E	D1
-H	A5
-H	B8
-H	D8
-AA	A2
-AA	A4
-AA	B8
-AA	C8
-AA	D8



HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0212
UTILITY: RGE

ORIGINATOR:
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE FIRE PROTECTION SYSTEM IS SUSCEPTIBLE TO FALSE ALARMS. FOR EXAMPLE, SMOKE MAY BE DRAWN FROM AREAS IN WHICH WELDING IS TAKING PLACE AND INADVERTENTLY ACTIVATE ANOTHER SENSOR ELSEWHERE IN THE PLANT.

COMMENTS

GIVEN THE IMPORTANCE OF THIS SYSTEM TO OVERALL PLANT INTEGRITY, A CERTAIN LEVEL OF FALSE ALARMS MAY BE TOLERABLE.

RESPONSE

THE CAUSE OF FREQUENT FALSE ALARMS MAY BE ATTRIBUTED TO THE PRESENT SMOKE DETECTOR DESIGN. THESE DETECTORS ARE SCHEDULED TO BE REPLACED BY DETECTORS OF IMPROVED DESIGN BY 6/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

2.2.7.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0213
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

THE FIRE SYSTEM ALARM BELL HAS AN INTENSITY WHICH EXCEEDS 90dB(A)
AND CAUSES OPERATOR DISCOMFORT WHEN SOUNDED.

COMMENTS

RESPONSE

SE #114.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

2.2.6.B
2.2.6.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0214
UTILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE MEANING OF AUDITORY SIGNALS IS NOT CLEAR; THERE IS CONFUSION BETWEEN VARIOUS AUDITORY SIGNALS (E.G. THE FIRE SYSTEM AND SPING SYSTEM ALARMS ARE SIMILAR, AS ARE THE CONTAINMENT EVACUATION AND PLANT EVACUATION SIGNALS).

COMMENTS

RESPONSE

ANNUNCIATOR ALARM SIGNALS WILL BE ADJUSTED OR CONVERTED TO CONFORM TO STANDARDS SUCH THAT THE MASKING OF ALARMS SHOULD NOT OCCUR, PER EWR 4347. THIS WILL BE COMPLETED BY 6/30/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

2.2.2.a

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0215
 UTILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

AUDITORY SIGNALS INTERFERE WITH OTHER AUDITORY SOURCES, INCLUDING
 VERBAL COMMUNICATION. THE FIRE PROTECTION SYSTEM ALARM IS SO LOUD
 THAT IT IS DIFFICULT FOR OPERATORS TO SPEAK IN THE PRIMARY
 OPERATING AREA OF THE CONTROL ROOM.

COMMENTS

RESPONSE

SEE HED 115.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

2.2.1.C.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0216
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

AUDITORY SIGNALS DO NOT PROVIDE LOCALIZATION CUES THAT DIRECT OPERATORS TO THOSE CONTROL ROOM WORK STATIONS WHERE THEIR ATTENTION IS REQUIRED.

COMMENTS

IT IS DIFFICULT TO DISCRIMINATE BETWEEN THE ALARMS FOR THE FIRE PROTECTION SYSTEM AND THE SPING SYSTEM. ALSO, NO LOCALIZATION OF ANNUNCIATOR TONES TO THE APPROPRIATE PANEL.

RESPONSE

ANNUNCIATOR ALARM SIGNALS WILL BE ADJUSTED OR CONVERTED TO CONFORM TO STANDARDS PER EWR 4347 SUCH THAT THE MASKING OF ALARMS SHOULD NOT OCCUR. THIS WILL BE COMPLETED BY 6/30/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

2.2.1.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0217
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

CONTROL ROOM INPUTS TO THE PLANT ANNOUNCING SYSTEM DO NOT HAVE
PRIORITY OVER OTHER INPUTS. OPERATORS MUST STAY ON THE PAGING
SYSTEM TO KEEP THE CHANNEL OPEN.

COMMENTS

RESPONSE

THIS SHOULD NOT BE A PROBLEM IF THE OPERATORS USE THEIR PAGE
OVERRIDE CAPABILITY TO REQUEST A CALL BACK ON ONE OF THE MANY
EXTENSIONS AVAILABLE TO THEM.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

2.1.6.F

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0218
 UTILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

SPEAKER PLACEMENT FOR THE PLANT PAGING SYSTEM RESULTS IN AN UNINTELLIGIBLE LEVEL OF SIGNAL IN SOME AREAS (E.G. FEED PUMP ROOM AND UPPER FLOOR OF TURBINE BLDG.).

COMMENTS

RESPONSE

A SURVEY HAS BEEN CONDUCTED TO DETERMINE THE AREAS IN THE PLANT WHERE THE PAGE SYSTEM IS DIFFICULT TO HEAR. ADDITIONAL SPEAKERS OR RAISING VOLUME WILL BE IMPLEMENTED TO CORRECT THIS HED. THIS WILL BE COMPLETED BY 12/86. THERE MAY BE SOME AREAS OF THE PLANT.EG. FEEDPUMP ROOM WHERE OPTIMAL CONDITIONS MAY NOT BE ACHIEVABLE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

2.1.6.C.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ED NUMBER: 0219
TILITY: RGE

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

PRIORITY PROCEDURES ARE NOT PROVIDED FOR THE TRANSMISSION OF EMERGENCY MESSAGES FROM THE CONTROL ROOM TO THE TSC. THERE IS NO DEDICATED LINE TO THE TSC.

COMMENTS

RESPONSE

AT PRESENT THERE ARE THREE IN-HOUSE EXTENSIONS (280, 281, 599) THAT ARE LOCATED ONLY IN THE CONTROL ROOM, TECHNICAL SUPPORT CENTER, AND THE PLANT SUPERINTENDENT'S OFFICE. THESE ARE "DEDICATED LINES" FROM THE CONTROL ROOM TO THE TECHNICAL SUPPORT CENTER. IN ADDITION, THERE IS A SOUND POWER PHONE LINE BETWEEN THE CONTROL ROOM AND THE TECHNICAL SUPPORT CENTER.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

2.1.1.C.1

ANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0220
UTILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

PERIODIC TESTING IS NOT PERFORMED ON ALL COMMUNICATION SYSTEMS TO ENSURE THAT THE SYSTEMS ARE OPERABLE.

COMMENTS

SUCH TESTING WOULD HELP TO IMPROVE SYSTEM READABILITY.

RESPONSE

BASED ON THE CONTINUOUS USE OF THE NORMAL PLANT COMMUNICATIONS SYSTEM, PERIODIC TESTING IS NOT NECESSARY. OTHER SYSTEMS THAT MIGHT BE USED IN AN EMERGENCY SUCH AS WALKIE TALKIES, TECHNICAL SUPPORT CENTER TELEPHONES, ETC. ARE CHECKED MONTHLY BY THE PLANT HEALTH PHYSICS DEPARTMENT IN ACCORDANCE WITH PLANT PROCEDURE #PC-410.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

2.1.1.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0221
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

FOOT ROOM CLEARANCE OF FOUR INCHES HORIZONTALLY IS PROVIDED, BUT
THE VERTICAL CLEARANCE IS 3 INCHES.

COMMENTS

RESPONSE

WH VERTICAL CLEARANCE OF 4 INCHES WOULD BE PREFERABLE FOR FOOT
ROOM, ONE INCH DEVIATION IS MINIMAL, DOES NOT DETRACT FROM
OPERATOR PERFORMANCE AND DOES NOT NEED TO BE CHANGED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.2.2.6

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0222
TILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE OBLIQUE ANGLE FROM THE LINE OF SIGHT TO SOME DISPLAYS LOCATED TO EITHER SIDE OF THE WORKING POSITION FROM WHICH THE DISPLAYS MUST BE READ IS LESS THAN 45 DEGREES FOR SOME DISPLAYS.

COMMENTS

THE FOLLOWING INDICATORS ARE ASSOCIATED WITH RCP A: PI-131; TI-132; PI-173; TI-181. FOR RCP B: PI-124; TI-125; PI-174; TI-182. FOR CHARGING PUMPS: TI-126; FI-128; PI-128. THE LISTED ANNUNCIATORS CAN NOT BE READ FROM ANY OF THE ACKNOWLEDGE BUTTONS.

RESPONSE

OPERATORS CAN READILY WALK TO EACH DISPLAY PANEL TO ACCURATELY READ VISUAL DISPLAYS. GENERALLY, OPERATORS ARE ON THEIR FEET WALKING BETWEEN THE PANELS. THE SHORT TIME IT WOULD TAKE FOR AN OPERATOR TO ACCOMPLISH THIS IS MINIMAL. NO ACTION IS REQUIRED.

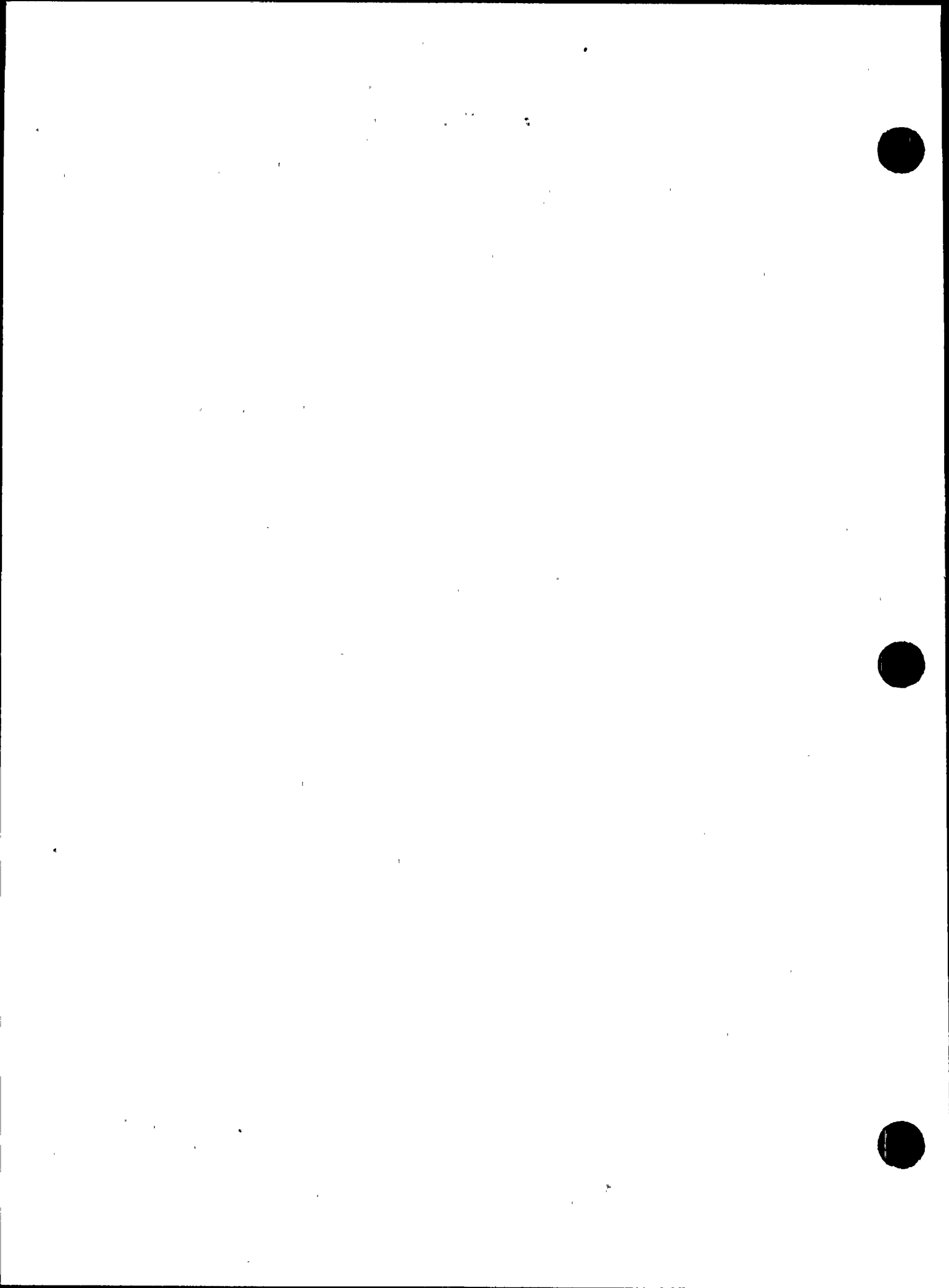
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.2.2.E.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0223
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

NOT ALL DISPLAYS ARE MOUNTED SO THAT THEY ARE WITHIN THE UPPER
LIMIT OF THE VISUAL FIELD (I.E. ANNUNCIATOR PANEL AA ON PANEL 7).

COMMENTS

A VIEWING DISTANCE OF 35 INCHES FROM THE VERTICAL PORTION OF THE
BENCHBOARD PANELS WAS USED IN OUR CALCULATIONS.

RESPONSE

ALTHOUGH NOT OPTIMAL, THE VIEWING OF PANEL AA IS POSSIBLE WITHOUT
UNDUE STRAIN. ALL TILES ARE DISCERNABLE. NO ACTION IS
SUGGESTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.2.2.E.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0224
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE MINIMUM SEPARATION OF 50 INCHES BETWEEN FACING PANELS (IF BOTH PANELS ARE WORKED BY A SINGLE OPERATOR) IS VIOLATED. THE INCORE INSTRUMENTATION PANEL TO NUCLEAR INSTRUMENTATION PANEL DISTANCE IS 39 INCHES.

COMMENTS

RESOLUTION

THE PROBLEM IS NOT OF SUFFICIENT MAGNITUDE TO WARRANT CHANGE, ESPECIALLY IF FREQUENCY OF USE IS TAKEN INTO CONSIDERATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.1.3.F.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0225
ILITY: RGE

ORIGINATOR: RCM
PLANT: SINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE MINIMUM SEPARATION OF 8 FEET BETWEEN FACING PANELS IS VIOLATED IN THE CASE OF THE NUCLEAR INSTRUMENTATION AND INCORE INSTRUMENTATION PANELS (39").

COMMENTS

TASK ANALYSIS SHOULD DETERMINE IF MORE THAN ONE PERSON MUST WORK AT THESE PANELS SIMULTANEOUSLY OR IF KNEELING, BENDING, OR USE OF TEST EQUIPMENT IS NECESSARY.

RESPONSE

THE PROBLEM IS NOT OF SUFFICIENT MAGNITUDE TO WARRANT CHANGE, ESPECIALLY IF FREQUENCY OF USE IS TAKEN INTO CONSIDERATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.1.3.F.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0226
 UTILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THERE IS A SUPPLY OF EXPENDABLES AND SPARE PARTS BUT THESE ITEMS ARE STORED IN THE STOCK ROOM. THE STOCK ROOM IS NOT CONVENIENT TO THE CONTROL ROOM (AT LEAST 15 MINUTES ROUND TRIP).

COMMENTS

RESPONSE

A CONTROL ROOM SUPPLY CABINET HAS BEEN INSTALLED OUTSIDE OF THE CONTROL ROOM AND STOCKED WITH THE REQUIRED CONTROL ROOM SPARE PARTS. THE INVENTORY LIST IS COMPLETED AND THE OPERATIONS DEPARTMENT IS MAINTAINING THE INVENTORY ON A WEEKLY BASIS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
 CHECKLIST

1.1.5.A
 1.1.5.D

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0227
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

EXPENDABLES AND SPARE PARTS ARE NOT READILY ACCESSIBLE. THE STOCK ROOM IS NOT LOCATED CONVENIENTLY TO THE CONTROL ROOM. MOREOVER, NONE OF THE OPERATING CREW (INCLUDING THE SHIFT SUPERVISOR) HAS A KEY TO THE STOCK ROOM. IN ORDER TO GET SPARE PARTS, THE OPERATOR MUST SUMMON A STOCK KEEPER TO OPEN THE STOCK ROOM.

COMMENTS

THIS PROBLEM MAY BE CRITICAL DURING AN EMERGENCY. IT IS NOT CLEAR IF STOCK KEEPER IS AVAILABLE ON ALL SHIFTS.

RESPONSE

A CONTROL ROOM SUPPLY CABINET HAS BEEN INSTALLED OUTSIDE OF THE CONTROL ROOM AND STOCKED WITH THE REQUIRED CONTROL ROOM SPARE PARTS. THE INVENTORY LIST IS COMPLETED AND THE OPERATIONS DEPARTMENT IS MAINTAINING THE INVENTORY ON A WEEKLY BASIS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.1.5.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0228
 TILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

DIFFERENT TYPES, SIZES OR STYLES OF EXPENDABLES AND SPARE PARTS ARE NOT CLEARLY AND DISTINCTIVELY MARKED TO AVOID MISAPPLICATION. FOR EXAMPLE, DIFFERENT VOLTAGE BULBS (I.E. DIFFERENT LIFE RATINGS) ARE FREQUENTLY CONFUSED.

COMMENTS

RESOLUTION

A CONTROL ROOM SUPPLY CABINET HAS BEEN INSTALLED OUTSIDE OF THE CONTROL ROOM AND STOCKED WITH THE REQUIRED CONTROL ROOM SPARE PARTS. THE INVENTORY LIST IS COMPLETED AND THE OPERATIONS DEPARTMENT IS MAINTAINING THE INVENTORY ON A WEEKLY BASIS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.1.5.E

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0229
UTILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

PROVISIONS (I.E. SIGNS POSTED) HAVE BEEN MADE TO LIMIT THE ACCESS OF MOVEMENT OF NONESSENTIAL BUT AUTHORIZED PERSONNEL TO THE PRIMARY OPERATING AREA. HOWEVER, THIS AREA TENDS TO BE CROWDED AS NONESSENTIAL PERSONNEL CONGREGATE THERE.

COMMENTS

PERHAPS MORE VIGEROUS ENFORCEMENT OF THE EXISTING PROCEDURES FOR ACCESS WOULD ALLEVIATE THIS PROBLEM.

RESPONSE

SEE HED #172

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.1.7

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0230
 UTILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE MINIMUM SEPARATION OF 50 INCHES BETWEEN A PANEL AND AN
 OPPOSING SURFACE IS VIOLATED IN SEVERAL INSTANCES: PANEL 9 TO
 BETA AIR MONITORING CART (32.5"); PANEL 7 TO PRINTER CONSOLE
 (48"); PANEL 6 TO RO DESK (48"); PANEL 5 TO RO DESK (40").

COMMENTS

RESPONSE

THE RO DESK AND THE PRINTER CONSOLE WILL BE REPLACED AND
 CLEARANCES MAXIMIZED. THE BETA AIR MONITORING CART WILL BE
 REPOSITIONED. THIS WILL BE IMPLEMENTED BY THE END OF OCTOBER,
 1986.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.1.3.F.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0231
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE SEPARATION BETWEEN THE BACK OF THE STA DESK AND PANEL 25 IS 28.5".

COMMENTS

ESP

THE REAR OF PANEL 25 FACES THE STA DESK. NO CONTROLS ARE OPERATED FROM THIS POSITION. THIS PROBLEM IS NOT OF SUFFICIENT MAGNITUDE TO WARRANT CHANGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.1.3.E.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0232
 TILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y_X

DESCRIPTION OF DISCREPANCY

OPERATORS' ACCESS TO, AND MOVEMENT BETWEEN, WORK STATIONS IS
 IMPEDED BY A WOODEN PLATFORM UNDER THE RUG IN FRONT OF PANELS 5,
 6, AND 7. IN ADDITION, DANGLING HEADSET CORDS POSE PROBLEMS OF
 TRIPPING.

COMMENTS

RESPONSE

1. THE RAISED WOODEN AREA UNDER THE RUG (IN FRONT OF CB) IS A
 MINOR NUISANCE INITIALLY, BUT IS QUICKLY DISREGARDED AS ONE
 BECOMES FAMILIAR WITH THE CONTROL ROOM.
2. RESULTS AND TEST DEPARTMENT HAVE RECENTLY INSTALLED 2 NEW
 PHONE JACKS IN THE CONTROL ROOM. ONE IS LOCATED AT THE BOTTOM
 CENTER OF THE MIDDLE CONTROL PANEL (PANEL #6) AND ONE IN THE
 VICINITY OF THE FIRE PANELS. THIS HAS ELIMINATED MANY OF THE
 PROBLEMS WITH "DANGLING" HEAD SET CORDS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.1.3.C.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

#233

This page intentionally left blank.

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0234
ILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE COMPUTER PANEL/DESK HAS A WORK SPACE AREA THAT IS USED AS A
DESK. THERE IS LESS THAN 18" OF KNEE ROOM DEPTH BECAUSE OF THE
ANGLED VERTICAL PANEL.

COMMENTS

RESPONSE

THIS PANEL WILL BE REPLACED BY OCTOBER, 1986.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.2.7.D.6

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		COMPUTER PANEL/DESK	



HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0235
 FACILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE CONTROLS LISTED FOR VERTICAL PANELS 8, 9, AND 10 ARE OUTSIDE
 THE RECOMMENDED CONTROL HEIGHT ENVELOPE OF 34-70 INCHES.

COMMENTS

RESPONSE

THESE ARE BACK PANELS AND CONTAIN LOW FREQUENCY OF USE CONTROLS.
 EVEN THOUGH THEY ARE OUTSIDE OF THE RECOMMENDED CONTROL HEIGHT
 ENVELOPE THERE DOES NOT APPEAR TO BE SUFFICIENT JUSTIFICATION TO
 MODIFY THESE PANELS. IMPACT ON PERFORMANCE IS MINIMAL.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.2.5.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
0	100		LO
0	101		LO
0	110		LO
0	111		LO
0	139		LO
0	140		LO
0	141		LO
0	16		HI
0	171		LO
0	303		LO
0	378		LO
0	87		LO
0	88		-
0	94		LO
0	95		LO
0	145		LO



146
147
148
149
150
151
152
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
2

[illegible]

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0236
TILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE DISPLAYS LISTED FOR VERTICAL PANELS 8, 9, AND 10 OUTSIDE THE
RECOMMENDED DISPLAY HEIGHT ENVELOPE OF 41-80 INCHES.

COMMENTS

RESPONSE

THESE ARE BACK PANELS AND CONTAIN LOW FREQUENCY OF USE DISPLAYS.
EVEN THOUGH THEY ARE OUTSIDE OF THE RECOMMENDED DISPLAY HEIGHT
ENVELOPE THERE DOES NOT APPEAR TO BE SUFFICIENT JUSTIFICATION TO
MODIFY THESE PANELS. IMPACT ON PERFORMANCE IS MINIMAL.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.2.5.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
0	105		LO
0	107		LO
0	108		LO
0	109		LO
0	112		LO
0	64		LO
0	65		LO
0	66		LO
0	67		LO
0	68		LO
0	69		LO
0	70		LO
0	72		LO
0	76		LO
0	77		LO
0	78		LO



၁
၂
၃
၄
၅
၆
၇
၈
၉
၁၀

[illegible]

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0237
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

BACKGROUND NOISE IMPAIRS VERBAL COMMUNICATIONS IN SOME PORTIONS OF THE EMERGENCY SHUTDOWN AREA (BACKGROUND NOISE IS AS HIGH AS 96 DB(A) IN SOME AREAS).

COMMENTS

RESPONSE

THE EMERGENCY SHUTDOWN AREA IS PHYSICALLY LOCATED IN THE PLANT. GIVEN THAT OPERATIONS PERSONNEL MUST ENTER THE PLANT TO RESPOND TO A REMOTE SHUTDOWN SITUATION THERE DOES NOT APPEAR TO BE MUCH THAT CAN BE DONE TO REDUCE NOISE LEVELS. WHERE COMMUNICATION IS NECESSARY, HEADPHONES OR AMPLIFIED SOUND WILL BE UTILIZED. TO DATE, WALK-THROUGHS HAVE NOT DEMONSTRATED COMMUNICATION PROBLEMS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 1.5.5

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0238
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

IN THE REMOTE SHUTDOWN AREA CONTROLS AND THEIR ASSOCIATED
DISPLAYS ARE SEPARATED BY MORE THAN 72 INCHES (E.G. MOTOR-DRIVEN
AUX FW CONTROLS AND METERS.

COMMENTS

RESPONSE

REMOTE SHUTDOWN REQUIRES OPERATIONS INTERFACE AT A COMPONENT AND
CONTROL LEVEL. CRITERIA SUITABLE FOR MAIN CONTROL ROOMS WITH
HIGH FREQUENCY OF USE ARE SIMPLY NOT APPROPRIATE FOR INFREQUENTLY
USED BALANCE OF PLANT INSTRUMENTATION. ALL LICENSED PERSONNEL
ARE TRAINED IN REMOTE SHUTDOWN CAPABILITY AND ARE DEEMED ABLE TO
PERFORM THESE DUTIES SATISFACTORILY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 1.2.2.F

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0239
 TILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

IN THE REMOTE SHUTDOWN AREA THE OBLIQUE ANGLE FROM THE LINE OF SIGHT TO DISPLAYS LOCATED TO EITHER SIDE OF THE WORKING POSITION FOR CONTROLS IS LESS THAN 45 DEGREES (E.G. MOTOR-DRIVEN AUX FW CONTROLS AND METERS).

COMMENTS

RESPONSE

REMOTE SHUTDOWN REQUIRES OPERATIONS INTERFACE AT A COMPONENT AND CONTROL LEVEL. CRITERIA SUITABLE FOR MAIN CONTROL ROOMS WITH HIGH FREQUENCY OF USE ARE SIMPLY NOT APPROPRIATE FOR INFREQUENTLY USED BALANCE OF PLANT INSTRUMENTATION. ALL LICENSED PERSONNEL ARE TRAINED IN REMOTE SHUTDOWN CAPABILITY AND ARE DEEMED ABLE TO PERFORM THESE DUTIES SATISFACTORILY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 1.2.2.E.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0240
ILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

CONTROLS IN THE REMOTE SHUTDOWN AREA LOCATED WELL ABOVE THE REACH OF THE 5TH PERCENTILE FEMALE AND WELL BELOW THE REACH OF THE 95TH PERCENTILE MALE.

COMMENTS

RESPONSE

REMOTE SHUTDOWN REQUIRES OPERATIONS INTERFACE AT A COMPONENT AND CONTROL LEVEL. CRITERIA SUITABLE FOR MAIN CONTROL ROOMS WITH HIGH FREQUENCY OF USE ARE SIMPLY NOT APPROPRIATE FOR INFREQUENTLY USED BALANCE OF PLANT INSTRUMENTATION. ALL LICENSED PERSONNEL ARE TRAINED IN REMOTE SHUTDOWN CAPABILITY AND ARE DEEMED ABLE TO PERFORM THESE DUTIES SATISFACTORILY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 1.2.2.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0241
 IDILITY: RGE

ORIGINATOR: RCM
 PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

THERE IS A LACK OF PROCEDURES OR DOCUMENTATION IN THE REMOTE SHUTDOWN AREA.

COMMENTS

RESPONSE

CONTROLLED COPIES OF THOSE PROCEDURES NECESSARY TO BRING THE PLANT TO THE "HOT SHUTDOWN" CONDITION CURRENTLY ARE LOCATED AT THE REMOTE SHUTDOWN AREAS. NEW EOP PROCEDURES REQUIRE THE OPERATORS TO REMOVE ALL APPROPRIATE PROCEDURES FOR PLANT OPERATION FROM THE CONTROL ROOM WHEN EXITING IN THE EVENT OF A CONTROL ROOM EVACUATION INCIDENT. IF THIS IS NOT POSSIBLE, THE OPERATORS ARE AWARE OF CONTROLLED COPY PROCEDURE LOCATION THROUGHOUT THE PLANT THAT ARE AVAILABLE AT ALL TIMES. NO FURTHER ACTION IS DEEMED NECESSARY AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 1.1.4

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0242
UTILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THERE IS LESS THAN 50 INCHES BETWEEN PANELS AND OPPOSING SURFACES
IN THE REMOTE SHUTDOWN AREA (LESS THAN 36" IN SOME CASES).

COMMENTS

RESPONSE

ALTHOUGH A 50 INCH CLEARANCE BETWEEN PANEL WOULD BE PREFERABLE,
THE EFFECT IS NEGLIGABLE BECAUSE OF INFREQUENT USE. CONTROLS CAN
STILL BE MANIPULATED AND DISPLAYS READ WITHOUT UNDUE DELAY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 1.1.3.F.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0243
UTILITY: RGE

ORIGINATOR: RCM
PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

OPERATORS HAVE DIFFICULTY IN ACCESSING AND OPERATING CONTROLS AND DISPLAYS IN THE REMOTE SHUTDOWN AREAS. ACCESS IS LIMITED BY SCAFFOLDING AND OTHER STRUCTURAL SUPPORTS. ALSO IT IS DIFFICULT FOR OPERATORS TO MOVE ABOUT IN THE REMOTE SHUTDOWN AREAS.

COMMENTS

RESOLUTION

THE SCAFFOLDING HAS BEEN REMOVED. THE PROBABLE USE OF THE REMOTE SHUTDOWN PROCEDURE IS LOW, AND WHEN THE REMOTE SYSTEM IS ACTIVATED, OPERATORS MUST CONTROL THE COMPONENTS DIRECTLY WHERE THEY ARE LOCATED IN THE PLANT, RATHER THAN BY SWITCHES AND CONTROLS LOCATED ON PANELS IN THE CONTROL ROOM. DUE TO THE FACT THAT SUCH ACTIONS ARE PERFORMED OUTSIDE OF THE CONTROL ROOM USING THE ACTUAL COMPONENTS, THE REMOTE SHUTDOWN PROCEDURE SHOULD NOT BE RATED BY THE CRITERIA USED TO ASSESS PROCEDURES PERFORMED IN THE CONTROL ROOM.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

REF 1.1.3.C
REF 1.1.3.D

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0244
TILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

ALL ANNUNCIATOR ALARMS ARE NOT RECORDED BY THE ALARM PRINTER. ALL IMPORTANT ALARMS WHERE FURTHER INFORMATION IS NEEDED ARE PRINTED. HOWEVER THERE ARE SOME ALARMS, SUCH AS FAN ALARMS, WHICH ARE NOT PRINTED.

COMMENTS

RESPONSE

THE FACT THAT EXTRANEIOUS ALARMS ARE EXCLUDED FROM PRINTING IS A POSITIVE FEATURE OF THE SYSTEM. THIS ENSURES A TIMELY PRINTER RESPONSE TIME AND HELPS TO DECREASE INFORMATION PRESENTED TO THE OPERATOR WHICH MIGHT CONFUSE OR DELAY HIM.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 7.3.2.a.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0245
 TILITY: RGE

ORIGINATOR: VJF
 PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

EACH FUNCTION CONTROL IS NOT CLEARLY LABELED. SOME OF THE
 PRINTING OF THE LABELS (WHITE LETTERING ON COLORED BUTTONS) HAVE
 BEEN WORN OFF WITH USE. SOME OF THE PRINTING IS HARD PRINTED WITH
 WHITE PAINT.

COMMENTS

REMARKS

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS
 HUMAN FACTORS DISCREPANCIES PERTAINING TO CONTENT, SPACING AND
 LETTER CHARACTERISTICS WILL BE IMPLEMENTED BY THE END OF THE
 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 7.1.5.D.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

PROCESS COMPUTER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0246
 TILITY: RGE

ORIGINATOR: VJF
 PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

WHEN THE PRINTER IS DOWN DURING RELOADING, DATA AND INFORMATION WHICH WOULD NORMALLY BE PRINTED OUT ON THE ALARM DATA PRINTER IS PRINTED ON THE TREAD DATA PRINTER. HOWEVER INFORMATION TO BE PRINTED ON THE TREND DATA PRINTER IS LOST AND NOT STORED, WHEN THE PRINTER IS DOWN.

COMMENTS

RESPONSE

THIS CONDITION WILL NOT EXIST WHEN THE NEW PLANT PROCESS COMPUTER SYSTEM IS INSTALLED. THIS PROBLEM WILL BE AVOIDED BY TWO MEANS:

1. ALL LOGS AND REPORTS WILL HAVE A SUFFICIENT BUFFER (STORAGE) SIZE TO ALLOW THE INFORMATION TO BE MAINTAINED IN THE COMPUTER UNTIL THE PRINTER IS AVAILABLE FOR OUTPUTING DATA.
2. AN ARCHIVAL STORAGE PACKAGE IS INCLUDED IN THE NEW PPCS WHICH WILL SAVE 'ALL' DATA ON DISK AND MAGNETIC TAPE. A USER MAY THEN EASILY RETRIEVE ANY HISTORIC DATA FOR TRENDING OR ANALYSIS.

THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

HEC ST

REF 7.3.1.E.4

ANAL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0247
ILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

GUIDELINES STATE THAT ALL DISPLAYS, CONTROLS AND OTHER EQUIPMENT ITEMS SHOULD BE APPROPRIATELY, CLEARLY AND CONSISTENTLY LABELED.

COMMENTS

RESPONSE

DIV. CAY FORMATS HAVE BEEN REVIEWED FOR APPROPRIATE CONSISTENCY ON THE NEW PLANT COMPUTER SYSTEM, OPERABLE BY JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 7.3.1.E.3

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		PROCESS COMPUTER	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0248
UTILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THERE IS NO POSITIVE INDICATION OF THE REMAINING SUPPLY OF RECORDING MATERIALS FOR THE PRINTER OPERATIONS. THE OPERATOR MUST OPEN UP THE BACK OF THE PRINTER TO CHECK ON THE LEVEL OF PAPER. WHEN THE RIBBON WEARS OUT, THERE IS NO PRINTING ON THE PAPER.

COMMENTS

RESPONSE

AS EXPERIENCE IS GAINED WITH THE NEW PLANT COMPUTER SYSTEM, IT IS EXPECTED THAT THE OPERATORS WILL DEVELOP A SENSE OF TIMING RELEVANT TO PAPER RUNOUT AND RIBBON WEAROUT. IT IS NOT INTENDED AT THIS TIME, TO PROVIDE A SYSTEM THAT WILL FOREWARN THE OPERATOR OF THESE CONDITIONS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 7.3.1.E.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

PROCESS COMPUTER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0249
ILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

TABLES - WHEN TABLE COLUMNS ARE LONG, NUMBERS ARE NOT SEPARATED
INTO GROUPS BY PROVIDING SPACE BETWEEN GROUPS OF FIVE.

COMMENTS

RESPONSE

FOR THE NEW COMPUTER SYSTEM, A COMPUTER SOFTWARE SPECIALIST
POLLED ALL " OPERATORS" FOR THE MOST ACCEPTABLE FORMAT IN WHICH
TO PRESENT LOGS AND REPORTS. THE FORMATS TO BE USED ARE THOSE
SELECTED BY THE MAJORITY. THIS WILL BE IMPLEMENTED BY THE END OF
JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 7.3.3.D.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0250
ILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 3/ 4/1985

ASSESSMENT CATEGORY 3
 LEVEL A
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO OPERATOR SURVEY INDICATED THAT ALL VOLATILE TREATMENT OPERATIONS DEPLETES AUXILIARY OPERATORS AWAY FROM OTHER NEEDED TASKS. SHUTDOWN REQUIRES THAT A PERSON OR TWO BE HELD AS WELL AS MORE AUXILIARY OPERATORS FOR VERIFICATION AND RESTORATION OF PLANT OPERATIONS.

COMMENTS

OPERATORS NEED ALL INFORMATION ABOUT SYSTEM STATUS AND PARAMETER VALUES THAT IS NEEDED TO MEET TASK REQUIREMENTS IN EMERGENCY SITUATIONS. AUXILIARY OPERATORS ARE CRITICAL TO GETTING THIS INFORMATION IN REMOTE LOCATIONS IF INFORMATION IS NOT PRESENTED IN CONTROL ROOM.

RESPONSE

IT IS THE POLICY OF THE RG&E TO SCHEDULE ADDITIONAL OPERATORS FOR THOSE PERIODS WHEN THE AVT SYSTEM REQUIRES MANUAL ATTENTION. IN THE FUTURE, HOWEVER, THE REQUIREMENTS OF THE AVT SYSTEM WILL BENEFIT FROM A NEWLY IMPLEMENTED SIXTH "SHIFT" COMPLEMENT OF PERSONNEL. THIS "SHIFT" WILL HELP ALLEVIATE DEMANDS ON AUXILIARY OPERATORS.

SOURCE OF DISCREPANCY

OPERATOR SURVEY

EXPLANATORY INFORMATION

REF H.4.5

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0251
 TILITY: RGE

ORIGINATOR: RD
 PLANT: GINNA

DATE: 3/ 4/1985

ASSESSMENT CATEGORY 3
 LEVEL A
 RATING Y

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT IF THE PLANT HAD A FIRE REQUIRING ALL AUXILIARY OPERATORS TO RESPOND AS FIRE BRIGADE MEMBERS, THERE WOULD BE NO ONE IN THE FIELD TO DO MANUAL OPERATION OF EQUIPMENT OR VALVES SHOULD AN EMERGENCY ARISE.

COMMENTS

OPERATORS MUST BE ASSIGNED TO PRIMARY AREAS ON THE CONTROL BOARDS IN AN EMERGENCY AND ARE DEPENDENT ON AUXILIARY OPERATORS FOR READING INDICATORS AND CLOSING AND OPENING CONTROLS IN REMOTE LOCATIONS. ASSIGNMENT OF TASK RESPONSIBILITY SHOULD ENSURE THAT ALL CRITICAL TASKS NEEDED BY OPERATORS IN THE CONTROL ROOM DURING AN EMERGENCY CAN BE CARRIED OUT IN A TIMELY MANNER.

RESPONSE

A SAFE SHUTDOWN ANALYSIS HAS BEEN PERFORMED WHICH IDENTIFIES SHUTDOWN METHODS AND EQUIPMENT THAT CAN BE USED TO BRING THE PLANT TO A SAFE SHUTDOWN CONDITION. PROCEDURES HAVE BEEN WRITTEN WHICH IDENTIFY ALL REQUIRED OPERATOR ACTIONS FOR FIRES IN EACH FIRE AREA INCLUDING THE CONTROL ROOM. ALL THE ACTIONS CAN BE ACCOMPLISHED USING THE MINIMUM SHIFT CREW AND WITHOUT USING ANY AUXILIARY OPERATORS IN THE FIRE BRIGADE. EACH OPERATING SHIFT HAS BEEN TRAINED ON THE PROCEDURES AND WALK-THROUGHS HAVE VERIFIED THAT THE ACTIONS CAN BE COMPLETED IN A TIMELY MANNER.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERFORM SURVEY

REF H.4.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

FILED NUMBER: 0252
UTILITY: RGE

ORIGINATOR: RD
PLANT: GINNA

DATE: 3/ 4/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

RESPONSE TO THE OPERATOR SURVEY INDICATED THAT THE SATURATION CURVE SHOULD BE PERMANENTLY MOUNTED. THIS CURVE IS CRITICAL TO RELIABLE AND SAFE OPERATION OF THE PLANT.

COMMENTS

THE CONTROL ROOM SHOULD HAVE ALL EQUIPMENT, INSTRUMENTS, DOCUMENTS ESSENTIAL FOR DETECTING ABNORMAL CONDITIONS AND FOR BRINGING THE PLANT TO A SAFE SHUTDOWN CONDITION. THE FREQUENTLY USED SATURATION CURVE SHOULD BE HIGHLY ACCESSABLE TO THE OPERATORS SINCE IT IS CRITICAL FOR DETECTING ABNORMAL CONDITIONS.

RESPONSE

THERE WILL BE AN OFFICIAL CURVE BOOK GENERATED IN CONJUNCTION WITH IMPLEMENTATION OF THE NEW EOPS (DEC, 1985). IN ADDITION, AN OPTION WILL BE AVAILABLE ON THE NEW PLANT COMPUTER. THIS WILL BE OPERABLE BY JUNE 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

OPERATOR SURVEY

REF J.1.26

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

DETAILED CONTROL ROOM DESIGN REVIEW
R.E. GINNA NUCLEAR POWER PLANT
FINAL SUMMARY REPORT
PROGRAM IMPLEMENTATION
VOLUME 2, PART 2
HEDs 253-489

Submitted by
Rochester Gas and Electric
December 1985

4377r



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0253
ILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

LABELS OF DIFFERENT SIZE ARE USED FOR THE SAME COMPONENT LEVELS. ALSO, DARK COLORED LABELS AND A NON-HIERARCHICAL LABELING SCHEME IS USED IN THE GINNA CONTROL ROOM.

COMMENTS

GUIDELINES STATE THAT ALL DISPLAYS, CONTROLS AND OTHER EQUIPMENT ITEMS SHOULD BE APPROPRIATELY, CLEARLY AND CONSISTENTLY LABELED.

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS HUMAN FACTORS DISCREPENCIES PERTAINING TO CONTENT, SPACING AND LETTER CHARACTERISTICS WILL BE IMPLEMENTED. THIS WILL BE IMPLEMENTED BY THE END OF THE PROJECTED FIRST REFUELING OUTAGE (4-1-87).

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.1.1

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0254
UTILITY: RGE

ORIGINATOR: BK
PLANT: SINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT A HIERARCHICAL SCHEME OF LABELING SHOULD BE USED TO REDUCE OPERATOR CONFUSION AND SEARCH TIME. MAJOR LABELS SHOULD IDENTIFY SYSTEMS OR WORKSTATIONS AND SUBORDINATE LABELS SHOULD IDENTIFY SUBSYSTEMS AND FUNCTIONAL GROUPS. THERE IS NO HIERARCHICAL LABELING EMPLOYED IN THE CONTROL ROOM. THERE ARE NO SYSTEMS LABELS AND THE ONLY SUBSYSTEM/FUNCTIONAL GROUP LABELS ARE TEMPORARY TAPE ON LABELS.

COMMENTS

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS HUMAN FACTORS DISCREPANCIES PERTAINING TO CONTENT, SPACING AND LETTER CHARACTERISTICS WILL BE IMPLEMENTED. WHERE APPROPRIATE, A HIERARCHICAL SCHEME WILL BE UTILIZED. THIS WILL BE IMPLEMENTED BY THE END OF THE PROJECTED FIRST REFUELING OUTAGE (4-1-87).

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

REF 6.1.2.A(1)
REF 6.1.2.A(2)

PANEL

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0255
UTILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT PANEL LABELING SHOULD HAVE SYSTEM LABELS AT THE TOP OF THE PANEL WITH SUBSYSTEM/FUNCTIONAL GROUPING LABELS ABOVE GROUPS OF CONTROLS AND DISPLAYS AND COMPONENT LABELS ABOVE EACH PANEL ELEMENT. THERE ARE NO PERMANENT SYSTEM OR SUBSYSTEM LABELS. THIS GUIDELINE IS STATED TO REDUCE OPERATOR CONFUSION AND OPERATOR SEARCHTIME. A SYSTEM OF HIERARCHICAL LABELS SHOULD BE DEVELOPED AND IMPLEMENTED.

COMMENTS

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS HUMAN FACTORS DISCREPANCIES PERTAINING TO CONTENT, SPACING AND LETTER CHARACTERISTICS WILL BE IMPLEMENTED. WHERE APPROPRIATE, A HIERARCHICAL SCHEME WILL BE UTILIZED. THIS WILL BE IMPLEMENTED BY THE END OF THE PROJECTED FIRST REFUELING OUTAGE (4-1-87).

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.2.1B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0256
UTILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT LABELS SHOULD BE MOUNTED IN SUCH A WAY AS TO PRECLUDE ACCIDENTAL REMOVAL. THERE ARE MANY TEMPORARY LABELS, DYNO TAPE LABELS AND TAPED ON LETTERING THAT COULD BE EASILY REMOVED.

COMMENTS

RES

TEMPORARY LABELS IN THE CONTROL ROOM WILL BE REPLACED WITH PERMANENT LABELS. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.2.2.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0257
UTILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT AN ADMINISTRATIVE PROCEDURE SHOULD BE IN PLACE FOR THE PERIODIC CLEANING OF LABELS. THE SRO WAS NOT AWARE OF ANY SUCH ADMINISTRATIVE PROCEDURE. THE LABELS WERE DIRTY WHEN OBSERVED. THIS GUIDELINE IS STATED TO ENSURE THE VISIBILITY AND LEGIBILITY OF THE LABELS.

COMMENTS

RESPONSE

THERE IS PRESENTLY AN OPERATIONS STANDING ORDER C-80-B WHICH STATES THAT CONTROL ROOM OPERATORS WILL CLEAN THE CONTROL BOARD. OPERATORS WILL BE RETRAINED ON THIS SUBJECT.

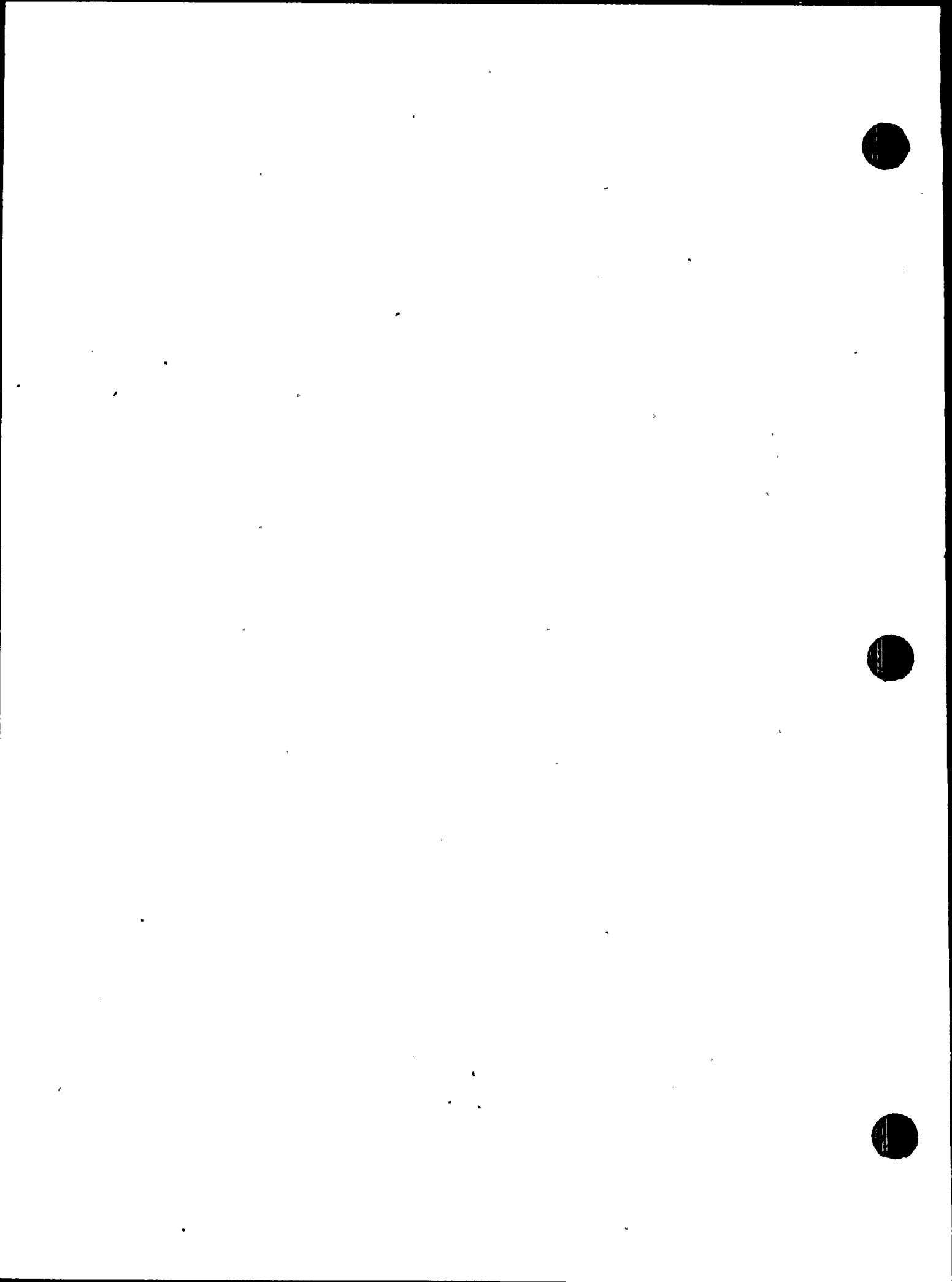
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.2.4.D

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0258
UTILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT LABELS SHOULD IDENTIFY FUNCTIONALLY GROUPED CONTROLS AND DISPLAYS. THE CONTROL ROOM HAS NO PERMANENT LABELING IDENTIFYING FUNCTIONAL GROUPS. THIS GUIDELINE IS STATED TO REDUCE OPERATOR SEARCHTIME AND CONFUSION.

COMMENTS

RESOLUTION

A COMPREHENSIVE PAINT, LABEL AND DEMARCATION PACKAGE WILL BE DEVELOPED AND IMPLEMENTED IN THE CONTROL ROOM. IT WILL INCORPORATE FUNCTIONAL GROUPING CONCEPTS SUCH AS BACKGROUND SHADING. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.3.7.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0259
ILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT THE LETTER HEIGHT SHOULD BE IDENTICAL FOR ALL LABELS WITHIN THE SAME HIERARCHICAL LEVEL. ACROSS THE CONTROL BOARDS THERE ARE SEVERAL DIFFERENT SIZE LABELS EMPLOYED. WITHIN THE SAME HIERARCHICAL LEVEL THERE ARE DIFFERENT SIZE LABELS.

COMMENTS

LABELS OF DIFFERENT SIZE ARE USED FOR THE SAME COMPONENT LEVELS. ALSO, DARK COLORED LABELS AND A NON-HIERARCHICAL LABELING SCHEME IS USED IN THE GINNA CONTROL ROOM.

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS HUMAN FACTORS DISCREPANCIES PERTAINING TO CONTENT, SPACING AND LETTER CHARACTERISTICS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.4.1.A(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0260
UTILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT LABELS SHOULD BE DARK CHARACTERS ON A LIGHT BACKGROUND. THE CONTROL ROOM EMPLOYS A COLOR CODING SYSTEM OF LABELS USING WHITE CHARACTERS ON COLORED (RED, BLUE, GREEN) LABELS. THE LABELS ON PANEL 7 ARE OF DIFFERENT COLORS. THE LABELS ON THE REMAINDER OF THE PANELS ARE WHITE LETTERING ON BLACK LABELS.

COMMENTS

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS HUMAN FACTORS DISCREPENCIES PERTAINING TO CONTENT, SPACING AND LETTER CHARACTERISTICS WILL BE IMPLEMENTED. WHERE APPROPRIATE, A HIERARCHICAL SCHEME WILL BE UTILIZED. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.4.1.B(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0261
 UTILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT TEMPORARY LABELS SHOULD BE USED ONLY WHEN NECESSARY. THERE ARE TEMPORARY LABELS USED THROUGHOUT THE CONTROL ROOM. THE SRO SAID THAT THE TEMPORARY LABELS HAVE BEEN UP FOR A LONG TIME, AND ARE USED IN PLACE OF HIERARCHICAL LABELS AND TO IDENTIFY COMPONENTS.

COMMENTS

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS HUMAN FACTORS DISCREPANCIES PERTAINING TO CONTENT, SPACING AND LETTER CHARACTERISTICS WILL BE IMPLEMENTED. WHERE APPROPRIATE, A HIERARCHICAL SCHEME WILL BE UTILIZED. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE. THIS WILL CORRECT THE TEMPORARY LABEL PROBLEM.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.5.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0262
UTILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT TEMPORARY LABELS SHOULD CONFORM TO GOOD HUMAN ENGINEERING PRINCIPLES. THE TEMPORARY LABELS THAT ARE EMPLOYED VIOLATE SEVERAL HUMAN ENGINEERING PRINCIPLES. THE TEMPORARY LABELS ARE DARK WITH WHITE LETTERING, THE LETTERS ARE NOT OF THE SIZE SPECIFIED IN THE GUIDELINE.

COMMENTS

RESPONSE

TEMPORARY LABELS IN THE CONTROL ROOM WILL BE REPLACED WITH PERMANENT LABELS. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.5.1.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0263
UTILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT TAG OUTS SHOULD BE SECURELY AFFIXED TO THE OUT-OF-SERVICE EQUIPMENT. THE TAG OUTS ARE AFFIXED BY WEDGING THE REPAIR CARD BETWEEN THE LABEL AND CONTROL. THEY COULD BE EASILY REMOVED OR ACCIDENTALLY REMOVED.

COMMENTS

RES

A NEW TAG HAS BEEN INTRODUCED AND IS PRESENTLY BEING USED FOR TAG-OUTS OF EQUIPMENT. THE TAG HAS A HOLE IN THE CENTER SO THAT IT CAN EASILY SLIP OVER A CONTROL SWITCH BUT CANNOT BE EASILY REMOVED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.5.1.E

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0264 .
UTILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT TAG OUTS SHOULD NOT OBSCURE THE LABEL ASSOCIATED WITH THE NON-OPERABLE DEVICE. THE TAG OUT CORDS ARE PLACED DIRECTLY OVER THE NON-OPERABLE EQUIPMENT LABEL, COMPLETELY BLOCKING IT.

COMMENTS

RES

NEW SMALLER TAGOUT CARDS ARE NOW IN USE WHICH DO NOT OBSCURE EQUIPMENT LABELS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.5.1.F

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0265
 UTILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT TEMPORARY LABELING SHOULD BE ADMINISTRATIVELY CONTROLLED. THERE SHOULD BE AN ADMINISTRATIVE REVIEW TO DETERMINE NEED, USE, CONTENT, INSTALLATION, DOCUMENTATION, AND REMOVAL OF TEMPORARY LABELS. THERE ARE NO ADMINISTRATIVE PROCEDURES IN PLACE TO DEAL WITH TEMPORARY LABELING WHICH IS USED EXTENSIVELY IN THE CONTROL ROOM.

COMMENTS

RESPONSE

GINNA STATION IMPLEMENTED AN OPERATOR AID SYSTEM IN MAY 1985. IN ADDITION, THIS PROBLEM WILL BE ADDRESSED IN THE HUMAN FACTORS MANUAL SCHEDULED FOR IMPLEMENTATION BY 1-88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST	REF 6.5.2.A
CHECKLIST	REF 6.5.2.B(1)
CHECKLIST	REF 6.5.2.B(2)
CHECKLIST	REF 6.5.2.B(3)
CHECKLIST	REF 6.5.2.B(4)
CHECKLIST	REF 6.5.2.B(5)
CHECKLIST	REF 6.5.2.B(6)
CHECKLIST	REF 6.5.2.B(7)
CHECKLIST	REF 6.5.2.B(8)
CHECKLIST	REF 6.5.2.B(9)

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0266
TILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT ALL DISCRETE FUNCTIONAL CONTROL POSITIONS SHOULD BE IDENTIFIED. LISTED ARE EXAMPLES OF CONTROLS THAT ARE NOT IN ACCORDANCE WITH THIS GUIDELINE. THIS GUIDELINE IS STATED TO AVOID OPERATOR ERROR AND DELAY IN OPERATOR RESPONSE. MOST OF THE STATED DEFICIENCIES KEY OPERATED CONTROLS.

COMMENTS

RESPONSE

TASK ASSIGNMENT OPS 85-86 ADDRESSES THE CONCERN OF THIS HED. NEW ESCUTCHEON PLATES WILL BE INSTALLED WHICH WILL UTILIZE NOMENCLATURE CONSISTENT WITH PROCEDURES. THERE IS ALSO AN ONGOING 2 1/2 YEAR REVIEW OF PROCEDURES WHICH WILL ENSURE CONSISTENCY AS WELL AS A REGULAR TRAINING SCHEDULES. THIS WILL BE IMPLEMENTED BY SPRING 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.3.8.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	CV70 KEY49		
	CV71 KEY49		
		CONTAINMENT ISOLATION REACT	
		CONTAINMENT VENT ISOL RESET	
	V852A		
	V852B		
	V896A		
	V896B		



HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ED NUMBER: 0267
TILITY: RGE

ASSESSMENT CATEGORY 1
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT CONTROL POSITION INFORMATION SHOULD BE VISIBLE TO THE OPERATOR DURING OPERATION OF THE CONTROL. LISTED ARE EXAMPLES OF CONTROLS THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE. THIS GUIDELINE IS STATED TO REDUCE THE POSSIBILITY OF OPERATOR ERROR.

COMMENTS

RESPONSE

TASK ASSIGNMENT OPS 85-84 ADDRESSES THE CONCERN TO THIS HED. NEW ESCUTCHEON PLATES WILL BE INSTALLED WHICH WILL UTILIZE NOMENCLATURE CONSISTENT WITH PROCEDURES. THERE IS ALSO AN ON GOING 2 1/2 YEAR REVIEW OF PROCEDURES WHICH WILL ENSURE CONSISTENCY AS WELL AS A REGULAR TRAINING SCHEDULE. THIS WILL BE IMPLEMENTED BY SPRING 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.3.B.E

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		FOXBORO CONTROLLERS	
		RECIRC COND VLVS	
	T508D	107 HOTWELL LEVEL	
		3359 DRAIN TANK COOLING WATER	
		FOXBORO CONTROLLERS	
		FOXBORO CONTROLLERS	
	AOV 830A		
	AOV 830B		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0268
 UTILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT THE LETTERING ON LABELS SHOULD SUBTEND A VISUAL ANGLE OF AT LEAST 15 MINUTES. A VIEWING DISTANCE OF 35 INCHES IS BASED ON THE LENGTH OF THE BENCHBOARD. WITH THIS VIEWING DISTANCE THE LABEL LETTERS SHOULD BE AT LEAST .14" TO SUBTEND THE PROPER VISUAL ANGLE.

COMMENTS

LISTED ARE EXAMPLES OF LABELS THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE. THERE ARE SEVERAL EXAMPLES OF EACH LISTED LABEL TYPE.

RESPONSE

THE SIZE OF LETTERS ON LABELS AFFECTS THE SPEED AND ACCURACY OF THE OPERATOR WHEN IDENTIFYING DISPLAYS AND CONTROLS. A COMPREHENSIVE LABELLING PACKAGE WHICH INCLUDES THIS ATTRIBUTE WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.4.1.A(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	AOV 550B SV591		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0269
 TILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT THE STROKE WIDTH-TO-CHARACTER HEIGHT RATIO SHOULD BE BETWEEN 1:6 AND 1:8 FOR ALL LABELS. LISTED ARE EXAMPLES OF LABEL TYPES THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINES. THERE ARE SEVERAL INSTANCES OF EACH LABEL TYPE IN THE CONTROL ROOM.

COMMENTS

THIS GUIDELINE IS STATED TO ENSURE LABEL LEGIBILITY.

RESPONSE

THE SIZE OF LETTERS ON LABELS AFFECTS THE SPEED AND ACCURACY OF THE OPERATOR WHEN IDENTIFYING DISPLAYS AND CONTROLS. A COMPREHENSIVE LABELLING PACKAGE WHICH INCLUDES THIS ATTRIBUTE WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.4.2.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	1597	ISOL VLV	
	AOV 296		
	AOV 550B		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0270
ILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/15/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT THE MINIMUM SPACE BETWEEN CHARACTERS ON LABELS SHOULD BE ONE STROKE WIDTH. LISTED ARE EXAMPLES OF LABEL TYPES THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE. THERE ARE SEVERAL INSTANCES OF EACH LABEL TYPE IN THE CONTROL ROOM. THIS GUIDELINE IS STATED TO ENSURE LABEL LEGIBILITY.

COMMENTS

RESPONSE

THE SIZE OF LETTERS ON LABELS AFFECTS THE SPEED AND ACCURACY OF THE OPERATOR WHEN IDENTIFYING DISPLAYS AND CONTROLS. A COMPREHENSIVE LABELLING PACKAGE WHICH INCLUDES THIS ATTRIBUTE WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 6.4.2.D(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	AOV 296	EMERGENCY GENERATOR	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0271
ILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT PUSHBUTTONS SHOULD PROVIDE SOME POSITIVE INDICATION OF ACTIVATION. NONE OF THE PUSHBUTTONS PROVIDE TACTILE FEEDBACK THAT THE BUTTON HAS BEEN ACTIVATED. THEY DO NOT SNAP OR CLICK.

COMMENTS

RESPONSE

OPERATORS ARE TRAINED TO ACTIVATE PUSHBUTTONS WITHOUT ANY TACTILE FEEDBACK. SINCE OPERATORS DO NOT EXPECT FEEDBACK, THIS HAS MINIMAL IMPACT AND DOES NOT NEED TO BE CORRECTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 4.3.1.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		ALL PUSHBUTTONS	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0272
 UTILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE GUIDELINES STATE THAT LEGEND PUSHBUTTONS SHOULD BE DISTINGUISHABLE FROM LEGEND LIGHTS. THERE IS NO WAY TO DISTINGUISH ANY OF THE LEGEND PUSHBUTTONS FROM LEGEND LIGHTS. LEGEND PUSHBUTTONS SHOULD PROVIDE SOME VISUAL AND TACTILE INDICATION THAT THEY ARE PUSHBUTTONS. AN INDICATION SUCH AS A RAISED BORDER AROUND THE OUTSIDE OF THE BUTTON OR AN INDENTATION FOR THE FINGER WOULD DISTINGUISH PUSHBUTTONS FROM LEGEND LIGHTS.

COMMENTS

RESPONSE

WHILE IT IS PREFERABLE FOR LEGEND LIGHTS TO BE DISTINGUISHABLE FROM PUSHBUTTONS BY FORM, SIZE OR OTHER FACTORS, IT IS NOT CRITICAL. OPERATORS LEARN WHICH BUTTONS ARE LEGENDS ONLY AND WHICH ACTIVATE EQUIPMENT. THE MINIMAL EFFECT DOES NOT WARRANT REPLACEMENT.

SOURCE OF DISCREPANCY

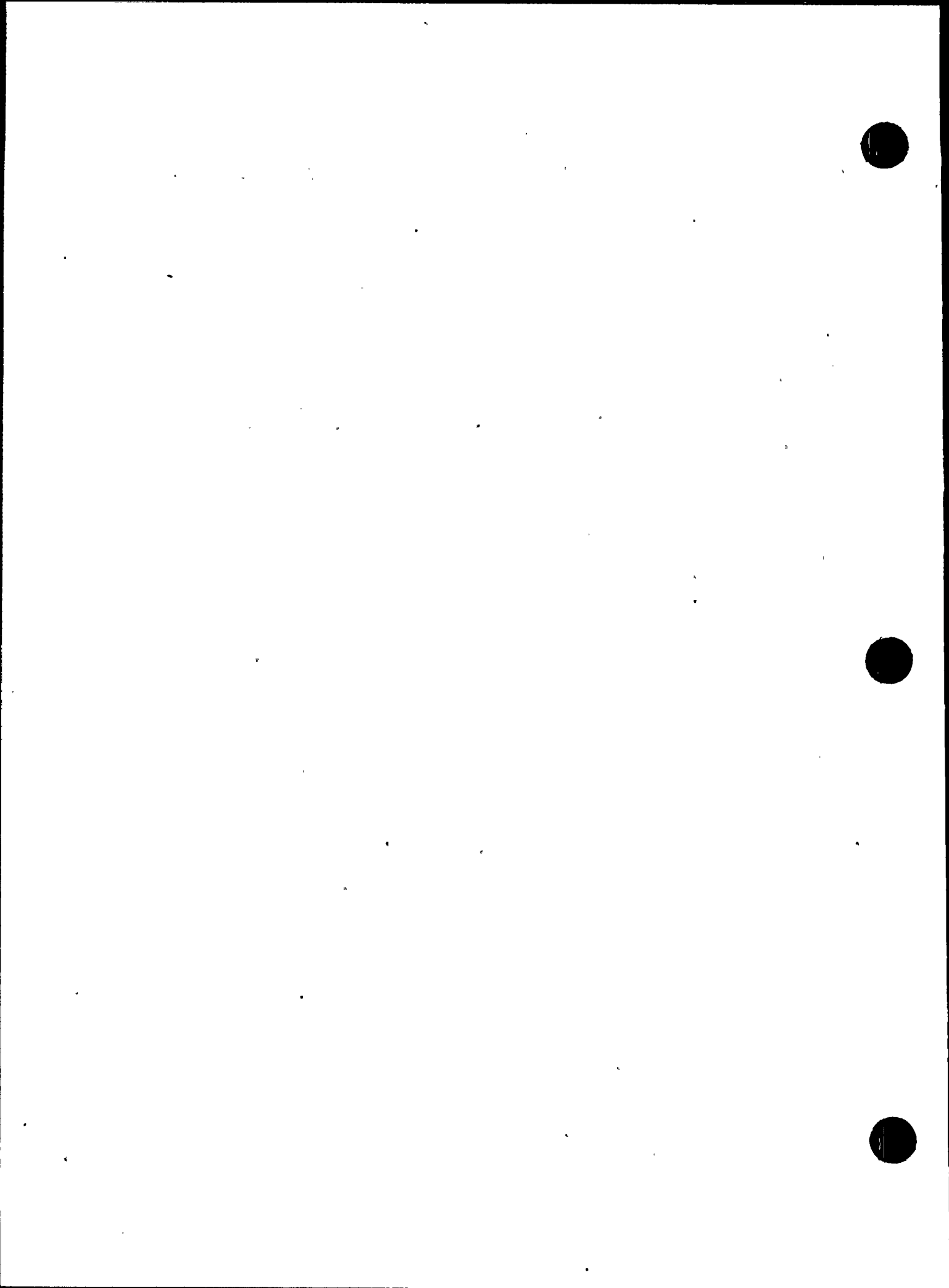
EXPLANATORY INFORMATION

CHECKLIST

REF 4.3.3.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

ALL LEGEND PUSHBUTTONS AND LEGEND LIGHTS



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0273
 ILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE GUIDELINES STATE THAT THE LEGEND MESSAGE ON LEGEND
 PUSHBUTTONS SHOULD CONTAIN NO MORE THAN THREE LINES OF TEXT. THE
 PUSHBUTTONS LISTED ARE NOT IN ACCORDANCE WITH THIS GUIDELINE.
 THIS GUIDELINE IS STATED TO ENSURE THE LEGIBILITY OF LEGEND
 PUSHBUTTONS.

COMMENTS

RESPONSE

WHILE READABILITY WOULD BE IMPROVED IF LEGENDS WERE LIMITED TO
 THREE LINES OF TEXT, IT IS NOT CRITICAL TO THE SAFE OPERATION OF
 THE PLANT. THE MINIMAL EFFECT OF THESE LEGENDS DOES NOT WARRANT
 REPLACEMENT.

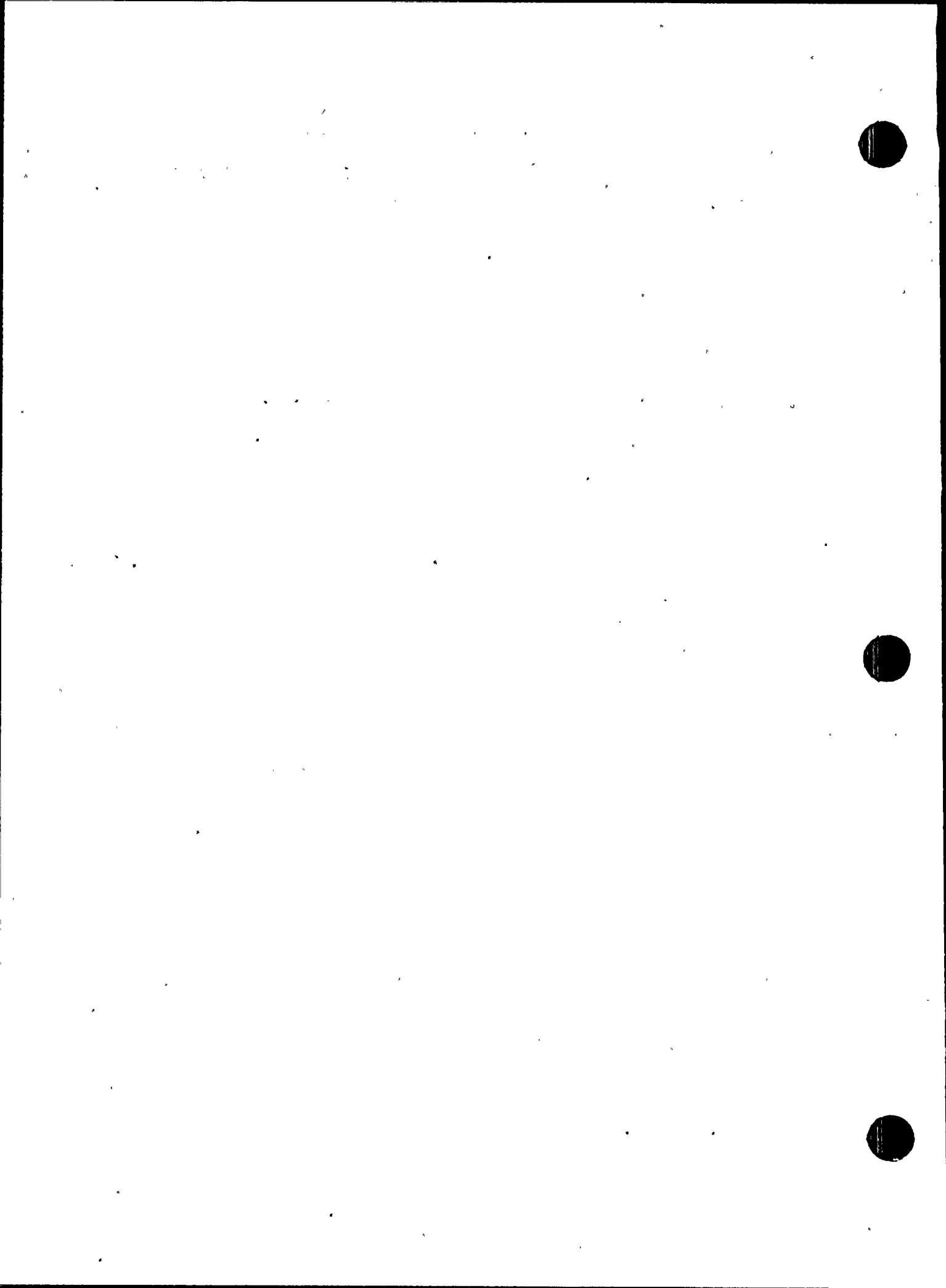
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 4.3.3.B(5)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		INSERT BUS 1B BKR 8	
		INST BUS 1D BKR 9	
		VALVE POSITION(VENDOR PANEL)	
		VENDOR PANEL 192 EH TURBINE CONTROL	
		RHR(BANK OF 20 LEGEND LIGHTS)	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0274
TILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT PROVISIONS SHOULD BE MADE TO PREVENT THE POSSIBILITY OF INTERCHANGING COVERS OF LEGEND PUSHBUTTONS. THIS COULD BE DONE AS AN ADMINISTRATIVE PROCEDURE TO PROHIBIT REMOVAL OF MORE THAN ONE LEGEND COVER AT A TIME OR KEYING THE COVERS IN SUCH A WAY THAT THEY WOULD ONLY FIT IN THE PROPER POSITION. THERE IS NO PROVISION MADE IN THE CONTROL ROOM TO PREVENT INTERCHANGE OF LEGEND PUSHBUTTON COVERS.

COMMENTS

RESPONSE

OPERATORS ARE TRAINED TO REMOVE LEGEND PUSHBUTTON COVERS ONLY WHEN LIGHT BULBS ARE BEING REPLACED AND ARE IMMEDIATELY RETURNED TO THEIR ORIGINAL STATE. THERE IS NO NEED TO CHANGE THE COVERS OR WRITE AN ADMINISTRATIVE PROCEDURE BECAUSE THE CHANCE OF INTERCHANGING COVERS IS MINIMAL. WRITING A PROCEDURE WOULD NOT CURE CARELESSNESS OR SUPPLANT SOUND OPERATING PRACTICE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 4.3.3 C. (4)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

ALL LEGEND PUSHBUTTONS

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0275
TILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT A LAMP TEST OR A DUAL LAMP/DUAL FILAMENT CAPABILITY SHOULD BE PROVIDED FOR LEGEND PUSHBUTTONS. NONE OF THE LEGEND PUSHBUTTONS HAVE THIS CAPABILITY, THERE IS NO LAMP TEST AND LIGHTS ARE NOT DUAL FILAMENT OR DUAL BULB. UNDER THESE CONDITIONS THE OPERATORS CANNOT TELL WHEN LAMPS HAVE FAILED.

COMMENTS

RESPONSE

LIGHT BULBS ARE REGULARLY CHECKED TO ASSURE THAT THEY ARE FUNCTIONING PROPERLY. IF DE-ENERGIZED, LIGHT BULBS WILL BE CHANGED. IF AFTER REMOVAL AND REPLACEMENT THE LIGHTS ARE STILL INOPERABLE, THEN A WORK REQUEST IS WRITTEN TO GET THE ITEM FIXED. LAMP TESTS ARE NICE TO HAVE BUT NOT REQUIRED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 4.3.3.C(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

ALL LEGEND PUSHBUTTONS

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0276
 TILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT ROTARY CONTROLS SHOULD HAVE A POINTER AND FIXED POSITION SETTINGS. THE INSTRUMENT LISTED BELOW FROM THIS GUIDELINE BY HAVING A FIXED POINTER AND MOVING POSITION SETTINGS.

COMMENTS

ESP

THE INCORE FLUX DETECTION PICO AMMETER REFERENCED BY THIS HED IS ONLY USED BY THE REACTOR ENGINEER DURING VERY LOW POWER OPERATIONS WHEN PERFORMING A FLUX MAP OPERATION. THE INFREQUENT USE OF THIS METER AND ITS RELAVANCE TO PLANT OPERATION DOES NOT WARRANT REPLACEMENT.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 4.4.5.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
BACK		MICRO-MICROAMMETER	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0277
FILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 12/10/1984

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT WHERE POSITION INDICATION IS CRITICAL, A CONTROL KNOB WITH A DISTINCTIVE POINTER SHOULD BE USED. IN THE EXAMPLES LISTED, J HANDLES AND STAR HANDLES ARE USED FOR DISCRETE SETTING POSITION CONTROLS.

COMMENTS

RESPONSE

POSITION CUES ARE PRESENTLY AN INTEGRAL PART OF THE CONTROL AND/OR THE ESCUTCHEON PLATE. THEY ARE IN THE FORM OF HANDLES, HASH MARKS OR GROOVES. ALTERNATIVES TO THOSE SUGGESTED APPEAR TO WORK EQUALLY AS WELL.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	160-1		
	180-0	REHEATER CONDENSER DUMP VLV CV24	
	181-0	REHEATER CONDENSER DUMP VLV CV24B	
	182-0	REHEATER CONDENSER DUMP VLV CV25	
	183-0	REHEATER CONDENSER DUMP VLV CV25B	
	186-1		
	187-1		
	188-1		
	198-0	2404	
	199-0	2412	
	200-0	2420	
	201-0	2428	
	202-1		
	203-1		

204-1	
205-1	
108-0	
109-0	
110-0	
111-0	
112-0	
113-0	
114-0	
115-0	
142-1	
143-0	
144-1	TAVG TREF
145-1	DELTA TEMP ACTUAL
146-1	
147-1	
148-1	PRESSURIZER PRESSURE RECORDER
149-1	PRESSURIZER LEVEL SETPOINT
150-1	BORIC ACID FLOW
151-2	STEAM FLOW
152-1	A S/G
153-1	STEAM FLOW
202-1	RMW
250-1	BA
276-1	FEEDWATER FLOW LOOP A HC 466
277-1	FEEDWATER FLOW LOOP B HC 476
282-1	HOTWELL LEVEL CONTROLLER
283-1	
284-1	
174-0	FAN 1A LOW AIR FLOW
175-0	CHARCOAL FILTER 1A DAMPERS CLOSED
176-0	FAN 1A VIBRATION
177-0	FAN 1B LOW AIR FLOW
225-0	RED RC PUMP LOOP A CONT
226-0	RED RC PUMP LOOP A CONT
227-1	
228-0	BLUE RC LOOP COLD LEG TEMP
360-1	
363-0	
364-0	
144-0	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0278
TILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT COMPONENT LABELS SHOULD BE AT LEAST 25% LARGER THAN CONTROL POSITION IDENTIFIERS. LISTED ARE EXAMPLES OF LABELS THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE. THIS GUIDELINE IS STATED TO ENSURE CONSISTENCY OF LABELING AND REDUCE OPERATOR CONFUSION.

COMMENTS

RESPONSE

WHERE APPLICABLE, LABELS WILL BE CHANGED TO MEET GUIDELINE STANDARDS AND HIERARCHICAL LABELING CONCERNS. LABELS MUST SOMETIMES DEVIATE FROM STANDARDS BECAUSE OF SPACING COMPROMISES. IN THESE CASES THE IMPACT OF THESE DEVIATIONS IS MINIMAL. THIS WILL BE IMPLEMENTED BY THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

SEC 8.1.2.B
6.1.2.B(3)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	279-0		
	313-0		
	252-0		
	253-0		
	254-0		
	255-0		
	256-0		
	257-0		
	258-0		
	259-0		
	260-0		



261-0
262-0
263-0
278-0
279-0
280-0
281-0
282-0
283-0
284-0
285-0
286-0
287-0
288-0
289-0
302-0
303-0
304-0
305-0
306-0
307-0
308-0
309-0
310-0
311-0
312-0
313-0

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0279
 TILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 3
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT LABELS SHOULD BE PLACED ABOVE THE PANEL ELEMENT THAT THEY DESCRIBE. LISTED ARE EXAMPLES OF CONTROLS AND DISPLAYS THAT ARE NOT IN ACCORDANCE WITH THIS GUIDELINE. THIS GUIDELINE IS STATED TO ENSURE THAT OPERATORS KNOW WHICH CONTROL/DISPLAY IS BEING DESCRIBED BY A LABEL.

COMMENTS

ESP

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS HUMAN FACTORS DISCREPANCIES PERTAINING TO CONTENT, SPACING, PLACEMENT AND LETTER CHARACTERISTICS WILL BE IMPLEMENTED BY THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST	6.2.1.A
CHECKLIST	6.2.1.A
CHECKLIST	6.2.1.A
CHECKLIST	6.2.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	006-1	TURBINE EXHAUST PRESS	
	007-1	TURBINE BEARING OIL PRESS	
	008-1	PI-485	
	009-1	TURBINE FIRST STAGE PRESS	
		PI-486	
	010-1	TI-2091	
	011-9	TI-2091	
	012-0	HYDROGEN PRESSURE GENERATOR	
	013-0	GENERATOR STEAM SEAL PRESS	

027-1	STEAM SEAL PRESS
028-1	CIRC H2O PUMP 1A DISCH
029-1	SCREEN HOUSE LEVEL
030-0	CONDENSATE IN PSIG
	PI-4017
031-1	CONDENSATE %
032-0	CONDENSATE %
036-1	125 VOLTS DC BUS A
037-1	125 VOLTS DC BUS B
038-1	GENERATOR INCOMING VOLTMETER
039-1	SYNCHROSCOPE
040-1	SYSTEM
	RUNNING VOLTMETER
041-1	4160 BUS NO. 11A WATTMETER
042-1	4160 BUS NO D. 11B WATTMETER
042-1	4160 BUS NO D. 11B WATTMETER
044-0	4160 VOLT BUS NO. 12A WATTMETER
045-1	4160 VOLT BUS NO. 12B WATTMETER
046-1	STA SERV TRANS NO. 13 WATTMETER
047-1	STA SERV TRANS NO. 14 WATTMETER
048-1	
049-1	
050-1	
051-1	
052-1	
053-1	GENERATOR AMMETER PHASE B
054-1	GENERATOR AMMETER PHASE C
055-1	4160 VOLT BUS NO 11A AMMETER
056-1	4160 VOLT BUS NO. 11B AMMETER
057-1	34 KILOVOLT CIR NO.767 AMMETER
058-1	4160 VOLT BUS NO. 12A AMMETER
059-1	
060-1	STA SERV TRAN 13 AMMETER
061-1	STA SERV TRANS NO. 14 AMMETER
062-1	STA SERV TRANS NO.15 AMMETER
063-1	STA SERV TRANS NO. 16 AMMETER
064-1	STA SERV TRANS NO. 17 AMMETER
065-1	STA SERV TRANS NO. 18 AMMETER
066-1	GENERATOR FREQUENCY
067-1	GENERATOR VOLTMETER
068-1	EXCITER FIELD AMMETER
069-1	4160 VOLT BUS NO 11A VOLT METER
070-1	4160 VOLT BUS NO. 11B VOLTMETER
071-1	34 KILOVOLT BUS VOLTMETER
072-1	4160 VOLT BUS NO. 12A VOLTMETER
073-0	4160 VOLT BUS NO. 12A VOLTMETER
073-1	4160 VOLT BUS NO. 12B VOLTMETER
074-1	480 VOLT BUS NO. 13 VOLTMETER
075-1	480 VOLT BUS NO.14 VOLTMETER
076-1	480 VOLT BUS NO. 15 VOLTMETER
077-1	480 VOLT BUS NO. 16 VOLTMETER
078-1	480 VOLT BUS NO. 17 VOLTMETER
079-1	480 VOLT BUS NO. 18 VOLTMETER
080-1	GENERATOR VARMETER
081-1	GENERATOR GROSS WATTMETER
082-1	VOLTAGE REGULATOR MILLIAMPS
083-1	GENERATOR
084-1	GENERATOR NET WATTMETER
085-1	BUS #2
154-0	
155-1	
157-1	

174-1	
005-1	
006-1	
007-1	
008-1	PZR SAFETY VLV OUT TEMP 1A
009-1	
010-1	
011-1	
012-1	
013-1	
014-1	
015-1	
015-1	
016-1	REACTOR COOL SYS
016-1	REACTOR COOL SYS
017-1	B A EMERG BYPASS FLOW
018-1	DPM-SR #1 STARTUP RATE
019-1	DPM-SR #2 STARTUP RATE
020-1	DPM-INTERMEDIATE RANGE #1 STARTUP RATE
021-1	DPM-INTERMEDIATE RANGE #2 STARTUP RATE
022-1	TAVG LOOP 1A-1
023-1	TAVG LOOP 1A-2
024-1	DELTA TEMP SP-1 LOOP 1A-1
024-1	DELTA TEMP SP-1 LOOP 1A-1
025-1	DELTA TEMP LOOP 1A-1
026-1	
027-1	DELTA TEMP SP-1 LOOP 1A-2
028-1	DELTA TEMP LOOP 1A-2
029-1	DELTA TEMP SP-2 LOOP 1A-2
030-1	
031-1	
032-1	
033-1	PR 1% FLUX DIFFERENCE
034-1	PR #1 % FULL POWER
035-1	PR 2% FLUX DIFFERENCE
036-1	PR #2% FULL POWER
037-1	TAVG LOOP 1B-1
038-1	TAVG LOOP 1B-2
039-1	DELTA TEMP SPI LOOP 1B-1
040-1	DELTA TEMP LOOP 1B-1
041-1	DELTA TEMP SP-2 LOOP 1B-1
042-1	BDELTA TEMP SP-1 LOOP 1B-2
043-1	DELTA TEMP LOOP 1B-2
044-1	DELTA TEMP SP2 LOOP 1B-2
045-1	
046-1	
047-1	
048-1	
049-1	
050-1	
051-1	
052-1	
053-1	
054-1	
055-1	
056-1	
057-1	
058-1	
059-1	AUX METER PUMP 1A
060-1	FW FLOW AUX TURB PUMP 1A
061-1	FW AUX TURB PUMP X 10
	A
062-1	FW FLOW AUX TURB PUMP 1B

062-1	FW FLOW AUX TURB PUMP 1B
063-1	AUX METER PUMP 1B
064-1	
065-1	
066-1	
067-1	
068-1	
069-1	
070-1	
071-1	
072-1	
073-1	
074-1	
075-1	PR 3% FLUX DIFFERENCE
076-1	PR #3% FULL POWER
077-1	PR 4% FLUX DIFFERENCE
078-1	PR #4% FULL POWER
079-1	PRESS PRESSURIZER LEVEL
080-1	PRESS PRESSURIZER LEVEL
081-1	PRESS PRESSURIZER LEVEL
082-1	PRESS PRESSURIZER LEVEL
083-1	PRESS PRESSURIZER LEVEL
084-1	PRESS PRESSURIZER LEVEL
085-1	PRESS PRESSURIZER LEVEL
086-1	PRESS PRESSURIZER LEVEL
087-1	
088-1	
089-1	
090-1	
091-1	
092-1	
093-1	
094-1	
095-1	
096-1	
097-1	
098-1	
099-1	
100-1	AUX FW PUMP 1A DISCH PRESS
101-1	AUX FW PUMP DISCH PRESS
102-1	AUX FW PUMP 1B DISCH PRESS
103-1	
104-0	DRAIN TANK LEVEL
105-1	EAST HOTWELL LEVEL
106-1	HOTWELL LEVEL EAST
107-1	LEVEL AT CHANNEL ONE
266-1	VARIABLE HEATER CONTROL
266-1	VARIABLE HEATER CONTROL
267-1	2PVC-431A SPRAY VALVE CONTROL (2HPC-431C)
268-1	2PCV-431B SPRAY VALVE CONTROL (2HPC-431H)
269-1	CHARGING PUMP #1 SPEED CONTROL
270-1	CHARGING PUMP #2 SPEED CONTROL
271-1	CHARGING PUMP #3 SPEED CONTROL
272-1	MAKE-UP H2O BORIC ACID BLENDER
273-1	BORIC ACID FLOW CONTROL BLENDER
117-0	DEG F EXCESS LTDN HX OUT TEMP TI-122
118-0	PSIG EXCESS LTDN HX OUT PRESS PI-121
119-0	OF REGEN HX LTDN TEMP TI-127

Y

120-0	GPM LTDN LINE FLOW
121-0	% COMP CLG SURGE TK LEVEL LI-618
122-0	H2O RCP 1A LABR SEAL DIFF PRESS PI-131
123-0	DEG F RCP 1A SEAL H2O INLET TEMP TI-132
124-0	PSIG 1A NO 1 SEAL DIFF PRESS PI-173
125-0	DEG F RCP 1A NO1 SEAL OUT TEMP TI-181
126-0	IN H2O RCP 1B LABR SEAL DIFF PRESS PI-124
127-0	DEG F RCP 1B SEAL H2O INLET TEMP TI-125
128-0	PSIG RCP 1B NO1 SEAL DIFF PRESS PI-174
129-0	TI-182
130-0	% BORIC ACID TK LEVEL 1A-1 LI-102
131-0	% BORIC ACID TK LEVEL 1A-2 TI-172
132-0	% BORIC ACID TK LEVEL 1B-1 ;I-106
133-0	% BORIC ACID TK LEVEL 1B-2 LI-171
134-0	GPM RESID HT REMOVAL LOOP FI-626
135-0	GPM (SIS LINE LOOP 1A FLOW) FI-925
136-0	SIS LINE LOOP 1B FLOW FI-924
137-0	SIS PUMP DISCHARGE PRESSURE PI-923
138-0	SIS PUMP DISCH PRESS 2 PI-922
139-0	CONTAINMENT PRESS 1A PI-945
140-0	CONTAINMENT PRESS 3A PI-949
141-0	PI-949
142-0	CONTAINMENT PRESS PI-944
143-1	LI-157A
144-0	FI-930
145-0	LI-903
146-0	TI-126
147-0	FI-128
148-0	PI-128
149-0	PI-135
150-1	
151-0	TI-140
152-0	PI-139



153-0	LI-112
153-0	LI-112
154-0	FI-411
155-0	FI-413
156-1	
158-0	FI-415
159-0	FI-416
160-0	PI-420
161-0	FI-931B
162-0	FI-931A
163-0	LI-938
164-0	LI-934
165-0	ACC TANK 1A-1 PRESSURE
166-0	PI-936
361-1	NON-RUN HX LETDOWN TEMP CONTROLLER TCV 130
362-1	LTDN LINE CONTROLLER PCV 135
367-1	RESIDUAL HT REMOVAL LOOP RC RETURN HCV 626
001-0	EMERGENCY GEN 1A POWER FACTOR
002-0	
003-0	SYNCHROSCOPE
004-0	EMERG GEN 1B POWER FACTOR
005-0	EMERG GEN NO 1A FREQUENCY
006-0	EMERG GEN NO 1A VOLTMETER
007-0	EMERG GEN NO 1B VOLTMETER
008-0	EMERG GEN NO 1B FREQ
009-0	EMERG GEN NO 1A WATTMETER
010-0	EMERG GEN NO 1A AMMETER
011-0	EMERG GEN NO 1B AMMETER
012-0	EMERG GEN NO 1B WATTMETER
021-0	CONTAINMENT / PI 946
	PSIA CONTAINMENT PRESS 1B
022-0	CONTAINMENT (PI 948)
	PSIA CONTAINMENT PRESS 2B
023-0	CONTAINMENT/PI 950
	PSIA CONTAINMENT PRESS 3B
024-1	PSIG PRZR RELIEF TK PRESS PI 440B
025-0	
026-0	
027-0	BA PRESS / PI-108
	PSIG BA TRANSPF PMP DISCH PRESS
028-1	ACCUMULATORS/%ACC TK 1A-2 LEVEL LOOPB/LI 939
029-0	ACCUMULATORS /LOOP A/ LI-935
	% ACC TK 1B-2 LEVEL
030-0	ACCUMULATORS /LOOP B/ PI-941
	PSIG ACC TK 1A-2 PRESS
031-0	ACCUMULATORS /LOOP A/ PI-937

032-1	PSIG ACC TK 1B-2 PRESS
	CC TEMP/ CC HX OUTLET TEMP
	TI 621
033-1	FLANGE TEMP/ DEG F REAC FLANGE LEAKOFF
	TEMP TI 41B
052-0	EMERG GEN 1A AIR START VLV NO ASV-1
053-0	EMERG GEN 1A AIR START VLV NO ASV-2
054-0	EMERG GEN 1A START REL NO R-1
055-0	EMERG GEN 1A START REL NO R-2
056-0	EMERG GEN 1B AIR START VLV NO ASV-1
057-0	EMERG GEN 1B AIR START VLV NO ASV-2
058-0	EMERG GEN 1B START REL NO R-1
059-0	EMERG GEN 1B START RELAY NO R-2
104-1	HAND IND CONTROL VALVE 104
	TANK A
105-1	HAND IND CONTROL VALVE 105
	TANK B
013-0	GENERATOR STEAM SEAL PRESS
	STEAM SEAL PRESS

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0280
TILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 3
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT LABELS FOR ELEMENTS LOCATED ABOVE EYE LEVEL SHOULD BE POSITIONED TO ENSURE PANEL VISIBILITY. THE EXAMPLES LISTED ARE NOT IN ACCORDANCE WITH THIS GUIDELINE. THE LABELS ARE APPROXIMATELY 80" ABOVE THE FLOOR, AND ABOVE THE BENCHBOARD. THE LETTERING ON THESE LABELS IS VERY SMALL AND CANNOT BE EASILY READ.

COMMENTS

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS HUMAN FACTORS DISCREPANCIES PERTAINING TO CONTENT, POSITION, SPACING AND LETTER CHARACTERISTICS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

6.2.1.C
6.2.1.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	119-0	AUX STEAM GENERATOR FW PUMP NO. 1A	
	120-0	TURBINE DVN AUX FEEDWATER PUMP GOVERNOR VALVE	
	121-0	AUX STEAM GENERATOR FEEDWATER PUMP NO. 1 B AC OIL PUMP	
	127-0	FEEDWATER HEATER NO.1A LEVEL	
	128-0	FEEDWATER HEATER NO.1B LEVEL	
	129-0	FEEDWATER HEATER 2A LEVEL	
	130-0	FEEDWATER HEATER NO.2B LEVEL	
	132-0	FEEDWATER HEATER NO. 3B LEVEL	
	133-0	FEEDWATER HEATER 4A/ PRESEP TANK LEVEL	

134-0	FEEDWATER HEATER 4B/ PRESEP TANK LEVEL
135-0	FEEDWATER HEATER NO.5A LEVEL
136-0	FEEDWATER HEATER NO.5B LEVEL
006-0	ISOLATION VLV 921
006-0	ISOLATION VLV 921
007-0	ISOLATION VLV 922
008-0	PRESSURE RELIEF TANK GAS ANALYSIS AOV 53
	9 CLOSED
009-0	REACTOR COOLANT DRAIN TANK GAS ANAL AOV
	1789 CLOSED
010-0	CONTAINMENT VENT HEADER AOV 1786 CLOSED
011-0	CONTAINMENT VENT HEADER AOV 1787 CLOSED
012-0	REACTOR COOLANT DRAIN TANK OUTLET AOV 17
	21 CLOSED
013-0	RCDT PUMP 1A SUCT AOV 1003A CLOSED
014-0	RCDT PUMP 1B SUCT ADV 1003B CLOSED
015-0	CONT AIR OUT ISOL VLV CLOSED
016-0	R11 R12 RETURN A. O. V. 1598 CLOSED
016-0	R11 R12 RETURN A. O. V. 1598 CLOSED
017-0	
018-0	REAC SUP CLG ISOL V813 CLOSED
019-0	REAC SUP ISOL V814 CLOSED
020-0	SUMP A DSCHG A.O.V. 1723 CLOSED
021-0	SUMP A DSCHG A.O.V. 1728 CLOSED
022-0	SI PUMP 1C SUCT M.O.V. 1851A OPEN
023-0	REACT VES DEL M.O.V.852A OPEN
024-0	REACT VES DEL M.O.V. 852B OPEN
025-0	ACCUM DSCHG LOOP B M.O.V. 841 OPEN
026-0	ACCUM DSCHG LOOP A M.O.V. 865 OPEN
027-0	RWST-SI PUMP SUCT M.O.V. 825A OPEN
028-0	RHR P 1A SUCT 704A
029-0	RHR P 1B SUCT 704B
030-0	S.I. PUMP C DSCHG. M.O.V. 871A OPEN
031-0	S.I. PUMP C DISCH. M.O.V. 871B OPEN
032-0	CHARCOAL FILT DOUS M.O.V.875A CLOSED
033-0	CHARCOAL FILT DOUS M.O.V.875B CLOSED
034-0	CHARCOAL FILT DOUS M.O.V. 876A CLOSED
035-0	CHARCOAL FILT DOUS M.O.V. 876B CLOSED
036-0	C SPRAY P 1A M.O.V. 860A OPEN
037-0	C SPRAY P 1A M.O.V. 860B OPEN
039-0	C SPRAY P 1B M.O.V. 860D OPEN
040-0	ISOLATION VALVE 923
041-0	ISOLATION VALVE 924
042-0	LTDN LINE ISOL A.O.V. 371 CLOSED
043-0	RCP SEAL RTN M.O.V. 313 CLOSED
044-0	PZR STM SAMP A.O.V. 951 IN CLOSED
049-0	PZR LIG SAMP A.O.V. 966B OUT CLOSED
050-0	HOT LEG SAMP A.O.V.966C OUT
051-0	
052-0	
054-0	
055-0	C.V. HX OUTLET FCV CV 58
056-0	SI PUMP 1C SUCT M.O.V. 1815B OPEN
057-0	SI B HOT LEG M.O.V. 878A OPEN
058-0	SI B COLD LEG M.O.V. 878B OPEN
059-0	SI A HOT LEG M.O.V. 878C OPEN
060-0	SI A COL LEG M.O.V. 878D OPEN
061-0	RWST-SI PUMP SUCT M.O.V. 825B OPEN
062-0	RCDT PUMP SUCT SUMP M.O.V. 1813A CLOSED
063-0	RCDT PUMP SUCT SUMP M.O.V. 1813B CLOSED
064-0	SI PUMP RECIR A.O.V. 897 OPEN
065-0	RHR PUMP SUCT SUMP M.O.V. 850A CLOSED
066-0	RHR PUMP SUCT SUMP M.O.V.851A CLOSED
067-0	RWST OUTLET M.O.V. 896A OPEN
069-0	CONT DEPRESS OUT A.O.V.7971

070-0	CONT DEPRESS IN A.O.V. 7970	
071-0	SG A BLOWDOWN A.O.V. 70 CLOSED	
072-0	SG B BLOWDOWN A.O.V. 71 CLOSED	
073-0	CONTAINMENT INSTRUMENT AIR CLOSED	
074-0	CONTAINMENT PURGE EXHAUST PEV/IN CLOSED	
075-0	CONTAINMENT PURGE EXHAUST PEV/OUT CLOSED	
076-0	CONTAINMENT PURGE SUP PSV/IN CLOSED	
077-0	CONTAINMENT PURGE SUP PSV/OUT CLOSED	
078-0	ACC N2 SUPPLY A.O.V. 846 CLOSED	Y
079-0	CONTAINMENT LEAK TEST SUPPLY M.O.V. 7443 CLOSED	
080-0	CONTAINMENT LEAK TEST DISCH M.O.V. 7445 CLOSED	
081-0	CONTAINMENT LEAK TEST DISCHARGE M.O.V. 7 444 CLOSED	
082-0		
083-0		
084-0		
085-0		
086-0		
087-0	CONT HOSE REEL SUPPLY OUT ISO V9227	
088-0	RWST-RHR PUMP SUCT M.O.V. 856 OPEN	
089-0	BA TANK SI PUMP SUCT M.O.V. 826A OPEN	
090-0	BA TANK SI PUMP SUCT M.O.V. 826B OPEN	
091-0	BA TANK SI PUMP SUCT M.O.V. 826C OPEN	
092-0	BA TANK SI PUMP SUCT M.O.V. 826D OPEN	
093-0	SI PUMP RECIR A.O.V. 898 OPEN	
094-0	RHR PUMP SUCT SUMP M.O.V. 850B CLOSED	
095-0	RHR PUMP SUCT SUMP M.O.V. 851B CLOSED	
096-0	RHR-SI PUMP SUCT M.O.V. 857A CLOSED	
097-0	RHR-SI PUMP SUCT M.O.V. 857B CLOSED	
098-0	RHR-SI PUMP SUCTION M.O.V. 857C CLOSED	
099-0	RMW TO CV A.O.V. 508 CLOSED	
100-0	STEAM GENERATOR A SAMPLE A.O.V. 76 CLOSE D	
101-0	STEAM GENERATOR B SAMPLE A.O.V 77 CLOSED CV-77	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0281
TILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT LABELS SHOULD BE VISIBLE TO THE OPERATOR DURING CONTROL ACTUATION. LISTED ARE EXAMPLES OF CONTROL LABELS THAT ARE NOT IN ACCORDANCE WITH THIS GUIDELINE. THIS GUIDELINE IS STATED TO ENSURE THAT THE OPERATOR ACTUATES THE PROPER CONTROL.

COMMENTS

RESPONSE

AS PART OF A COMPREHENSIVE LABELING PACKAGE FOR THE CONTROL ROOM, LABELS WILL BE DESIGNED AND IMPLEMENTED SO THAT THEY ENHANCE THE READABILITY OF THE DISPLAYS AND CONTROLS THEY IDENTIFY, ATTRIBUTES OF COLOR SIZE, FONT AND APPLICATION OF HIERARCHICAL LABELING SCHEME WILL BE CONSIDERED. THIS WILL BE IMPLEMENTED BY THE 1987 REFUELING OUTAGE.

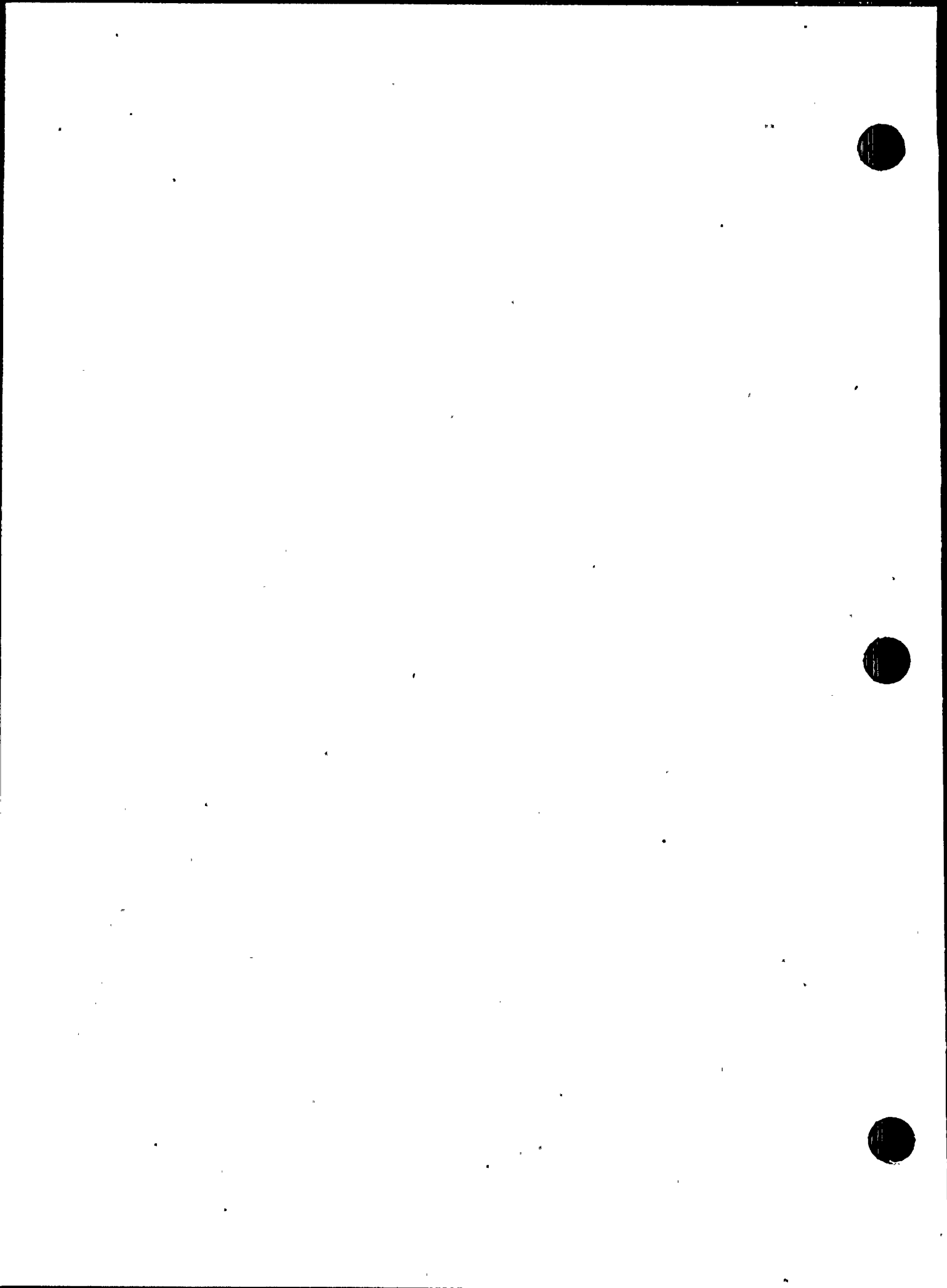
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

6.2.4.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	253-1	ATM STEAM DUMP PRESS CONT LOOP A	
	254-1	STEAM GENERATOR COND STEAM DUMP	
	255-1	ATM STM DUMP PRESS CONT LOOP B	
	262-1	DRAIN TANK COOLING WATER CONTROL	
	266-1	VARIABLE HEATER CONTROL	
	267-1	2PVC-431A SPRAY VALVE CONTROL (2HPC-431C)	
	268-1	2PCV-431B SPRAY VALVE CONTROL (2HPC-431H)	
	269-1	CHARGING PUMP #1 SPEED CONTROL	
	270-1	CHARGING PUMP #2 SPEED CONTROL	



272-1	MAKE-UP H2O BORIC ACID BLENDER *
273-1	BORIC ACID FLOW CONTROL BLENDER
275-1	FW FLOW BYPASS VLV HCV 480 LOOP A
278-1	FEEDWATER FLOW BYPASS LOOP B HCV 481
361-1	NON-RUN HX LETDOWN TEMP CONTROLLER TCV 130
362-1	LTIN LINE CONTROLLER PCV 135
367-1	RESIDUAL HT REMOVAL LOOP RC RETURN HCV 626
A	SPRAY METERS

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0282
TILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/14/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

THIS GUIDELINE IS STATED THAT THE DIRECTION OF MOTION SHOULD BE IDENTIFIED FOR CONTINUOUS ROTARY CONTROLS. LISTED ARE EXAMPLES OF CONTROL LABELS THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE. THE FOXBORO CONTROLLERS INCLUDE CONTINUOUS ROTARY CONTROL WITH NO INDICATION OF DIRECTION OF MOTION.

COMMENTS

ESF

DIRECTION OF MOTION IS INDIRECTLY INDICATED BY THE OPEN/CLOSE OR CLOSE/OPEN DESIGNATIONS ON THE DEMAND METER OR ON THE SETPT DIAL (HIGHER VS LOWER DIVISIONS).

NO CHANGE IS DEEMED APPROPRIATE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

6.3.8.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	253-1	ATM STEAM DUMP PRESS CONT LOOP A	
	254-1	STEAM GENERATOR COND STEAM DUMP	
	255-1	ATM STM DUMP PRESS CONT LOOP B	
	262-1	DRAIN TANK COOLING WATER CONTROL	
	266-1	VARIABLE HEATER CONTROL	
	267-1	2PVC-431A SPRAY VALVE CONTROL (2HPC-431C)	
	268-1	2PCV-431B SPRAY VALVE CONTROL (2HPC-431H)	
	269-1	CHARGING PUMP #1 SPEED CONTROL	
	270-1	CHARGING PUMP #2 SPEED CONTROL	
	271-1	CHARGING PUMP #3 SPEED CONTROL	



272-1	MAKE-UP H2O BORIC ACID BLENDER
273-1	BORIC ACID FLOW CONTROL BLENDER
275-1	FW FLOW BYPASS VLV HCV 480 LOOP A
278-1	FEEDWATER FLOW BYPASS LOOP B HCV 481
361-1	NON-RUN HX LETDOWN TEMP CONTROLLER
	TCV 130
362-1	LTDN LINE CONTROLLER
	PCV 135
367-1	RESIDUAL HT REMOVAL LOOP RC RETURN
	HCV 626

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0283
 UTILITY: RGE

ORIGINATOR:
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT LABELS SHOULD DESCRIBE THE FUNCTION OF EQUIPMENT ITEMS. LISTED ARE EXAMPLES OF LABELS THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE. THESE LABELS LIST ONLY AN IDENTIFYING NUMBER OF THE COMPONENT.

COMMENTS

REFERENCE

A COMPREHENSIVE LABELING PACKAGE WHICH ADDRESSES AND CORRECTS HUMAN FACTORS DISCREPANCIES PERTAINING TO CONTENT, SPACING AND LETTER CHARACTERISTICS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

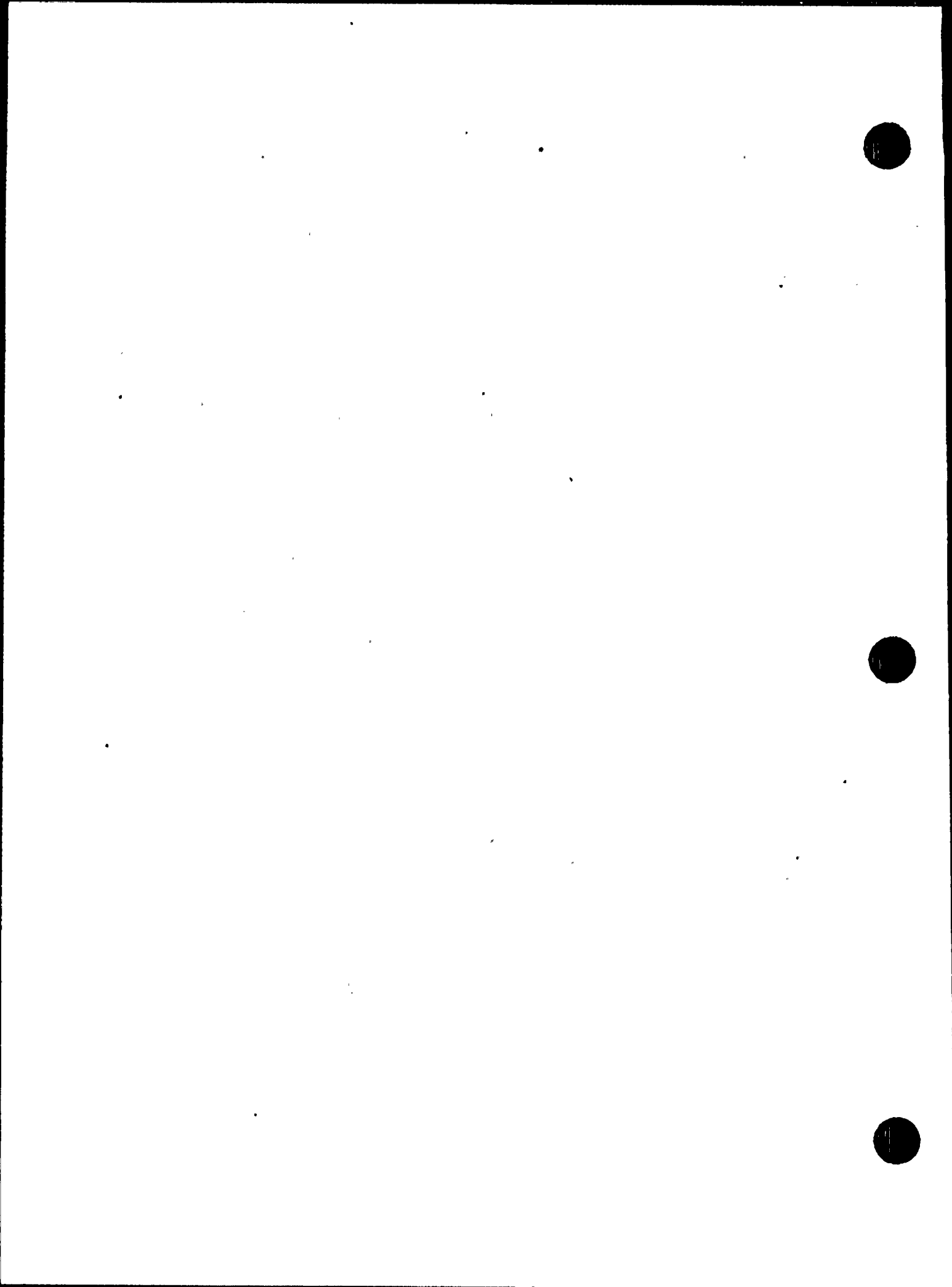
CHECKLIST

6.3.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	000-0	BDELTA TEMP SP-1 LOOP 1B-2	
	005-1		
	006-1		
	007-1		
	008-1	PZR SAFETY VLV OUT TEMP 1A	
	009-1		
	010-1		
	011-1		Y
	012-1		
	013-1		
	014-1		
	015-1		
	016-1	REACTOR COOL SYS	
	017-1	B A EMERG BYPASS FLOW	



018-1	DPM-SR #1 STARTUP RATE
019-1	DPM-SR #2 STARTUP RATE
020-1	DPM-INTERMEDIATE RANGE #1 STARTUP RATE
021-1	DPM-INTERMEDIATE RANGE #2 STARTUP RATE
022-1	TAVG LOOP 1A-1
023-1	TAVG LOOP 1A-2
024-1	DELTA TEMP SP-1 LOOP 1A-1
025-1	DELTA TEMP LOOP 1A-1
026-1	
027-1	DELTA TEMP SP-1 LOOP 1A-2
031-1	
032-1	
033-1	PR 1% FLUX DIFFERENCE
034-1	PR #1 % FULL POWER
035-1	PR 2% FLUX DIFFERENCE
036-1	PR #2% FULL POWER
037-1	TAVG LOOP 1B-1
038-1	TAVG LOOP 1B-2
039-1	DELTA TEMP SPI LOOP 1B-1
040-1	DELTA TEMP LOOP 1B-1
041-1	DELTA TEMP SP-2 LOOP 1B-1
042-1	BDELTA TEMP SP-1 LOOP 1B-2
117-0	DEG F EXCESS LTDN HX OUT TEMP TI-122,
118-0	PSIG EXCESS LTDN HX OUT PRESS PI-121
119-0	OF REGEN HX LTDN TEMP TI-127
120-0	GPM LTDN LINE FLOW
121-0	% COMP CLG SURGE TK LEVEL LI-618
122-0	H2O RCP 1A LABR SEAL DIFF PRESS PI-131
123-0	DEG F RCP 1A SEAL H2O INLET TEMP TI-132
124-0	PSIG 1A NO 1 SEAL DIFF PRESS PI-173
125-0	DEG F RCP 1A NO1 SEAL OUT TEMP TI-181
126-0	IN H2O RCP 1B LABR SEAL DIFF PRESS PI-124
127-0	DEG F RCP 1B SEAL H2O INLET TEMP TI-125
128-0	PSIG RCP 1B NO1 SEAL DIFF PRESS PI-174
129-0	TI-182
130-0	% BORIC ACID TK LEVEL 1A-1 LI-102
131-0	% BORIC ACID TK LEVEL 1A-2 TI-172
132-0	% BORIC ACID TK LEVEL 1B-1 ; I-106
133-0	% BORIC ACID TK LEVEL 1B-2 LI-171
134-0	GPM RESID HT REMOVAL LOOP FI-626
135-0	GPM (SIS LINE LOOP 1A FLOW) FI-925
136-0	SIS LINE LOOP 1B FLOW FI-924
137-0	SIS PUMP DISCHARGE PRESSURE PI-923
138-0	SIS PUMP DISCH PRESS 2 PI-922
139-0	CONTAINMENT PRESS 1A



140-0	PI-945
	CONTAINMENT PRESS 3A
	PI-949
141-0	
	PI-949
142-0	CONTAINMENT PRESS
	PI-944
143-1	
	LI-157A
144-0	
	FI-930
145-0	
	LI-903
146-0	
	TI-126
147-0	
	FI-128
148-0	
	PI-128
149-0	
	PI-135
150-1	
151-0	
	TI-140
152-0	
	PI-139
153-0	
	LI-112
154-0	
	FI-411
155-0	
	FI-413
156-1	
157-0	
	FI-414
158-0	
	FI-415
159-0	
	FI-416
192-0	
195-0	
291-0	
334-0	
355-0	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0284
 TILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

THE CONTROLS ARE NOT APPROPRIATE FOR THE FUNCTION. THE CONTROL IS A DISCRETE ROTARY CONTROL TO OPEN AND CLOSE A VALVE. THE SRO EXPRESSED A DESIRE TO HAVE A CONTROL THAT WOULD ALLOW THEM TO OPEN THE VALVE TO A CERTAIN DEGREE.

COMMENTS

ESP

FOR SEVERAL DESIGN BASES ACCIDENTS, ANALYSES ARE BASED UPON THE COOLING RATE OF THE RHR HEAT EXCHANGERS UTILIZING MAXIMUM COMPONENT COOLING WATER FLOW AS THE COOLING MEDIUM. TO INSTALL MODULATING VALVES IN THE COOLANT STREAM FOR THE RHR SYSTEM COULD RESTRICT COOLANT MEDIUM FLOW IN THE EVENT OF A VALVE FAILURE AT LESS THAN 100% OPEN. ALTHOUGH IT IS RECOGNIZED THAT MANUAL MANIPULATION OF THESE VALVES DURING COOLDOWN OF THE PLANT IS INCONVENIENT, ACCIDENT CONSIDERATIONS PRECLUDE THE CHANGE OUT OF THESE VALVES FOR OPERATORS CONVENIENCE AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

4.1.1.C. (2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	294-0		
	295-0		



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0285
ILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

THIS GUIDELINE IS STATED TO ENSURE THAT OPERATORS KNOW WHEN A
SWITCH HAS BEEN ACTUATED.

COMMENTS

RESPONSE

THE CONTROL HAS BEEN REPAIRED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

4.1.1.E.(3)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	249-1	REACTOR MAKE-UP CONTROL SWITCH	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0286
 TILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/12/1983

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT THE CLOSE POSITION SHOULD BE A CONTROL ACTION TOWARD THE LEFT. THE CONTROLS THAT ARE LISTED ARE J-HANDLES WITH THE SWITCH POSITIONS OF 'TRIP' TO THE LEFT AND 'CLOSE' TO THE RIGHT.

COMMENTS

REFERENCE

NEW ESCUTCHEON PLATES WILL BE INSTALLED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

4.2.1.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
5	121-1		
5	122-1		
5	123-1		
5	124-1		
5	125-1		
5	128-1		
5	133-1		
5	134-1		
5	135-1		
5	136-1		
5	137-1		
5	138-1		
5	139-1		
5	140-1		
5	141-1		
5	142-1		



143-1
144-1
145-1
146-1
154-0
155-1
156-1
157-1
158-1

EDGE WISE VERT. METERS

6

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0287
 UTILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT WHERE POSITION INDICATION IS CRITICAL, A CONTROL KNOB WITH A DISTINCTIVE POINTER SHOULD BE USED. IN THE EXAMPLES LISTED, J HANDLES AND STAR HANDLES ARE USED FOR DISCRETE SETTING POSITION CONTROLS.

COMMENTS

RESPONSE

J-HANDLES PROVIDE VISUAL FEEDBACK OF POSITION INDICATION ON DISCRETE/"AS IS" CONTROLS. WHERE APPROPRIATE, ADDITIONAL DISTINCTIVE POINTERS (PAINT) WILL BE ADDED ON STAR OR J-HANDLES IN ORDER TO DECREASE THE POSSIBILITY OF CONTROL POSITION AMBIGUITY. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
 CHECKLIST

4.2.2.E. (3)
 4.4.5.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	031-9		
	087-1		
	088-1		
	089-1		
	090-1		
	091-1		
	092-1		
	093-1		
	094-1		
	095-1		
	096-1		



097-1
099-1
100-1
101-1
102-1
103-1
104-1
105-1
106-1
107-1
108-1
109-1
231-1
232-1
233-1
249-1

ROTARY SELECTOR CONTROLS

264-0
290-0
338-0
076-0
077-0
078-0
079-0



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0288
 TILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

THE GUIDELINE STATES THAT PUSHBUTTONS IN A ROW OR MATRIX SHOULD BE POSITIONED IN A LOGICAL ORDER, OR IN AN ORDER RELATED TO THE PROCEDURAL SEQUENCE. THE EXAMPLE GIVEN IS OF A PUSH BUTTON THAT IS NOT IN A POSITION RELATED TO THE PROCEDURAL SEQUENCE. THE SRO SAID THAT THE PUSHBUTTON SHOULD BE AT ANOTHER PORTION OF THE PANEL RELATED TO ITS ACTUATION.

COMMENTS

RESPONSE

INVESTIGATION OF THIS HED PROBLEM WITH THE OPERATOR RESULTED IN AN ADEQUATE SOLUTION THAT REQUIRES THE CHANGE OUT OF THE PUSHBUTTONS TO A COLOR CORRESPONDING TO THE COLOR CODE OF THE SYSTEM INVOLVED. THIS CHANGE WILL OCCUR DURING THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

4.3.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
7	204	MANUAL CONTAINMENT SPRAY AND VENT ISOLATION	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0289
 TILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

BARRIERS SHOULD BE USED WHEN LEGEND PUSHBUTTONS ARE SIDE BY SIDE.
 EXAMPLES OF LEGEND PUSHBUTTONS THAT ARE NOT IN ACCORDANCE WITH
 THIS GUIDELINE ARE GIVEN.

COMMENTS

THE GUIDELINE STATES THAT LABELS SHOULD BE VISIBLE TO THE
 OPERATOR DURING CONTROL ACTUATION. LISTED ARE EXAMPLES OF
 CONTROL LABELS THAT ARE NOT IN ACCORDANCE WITH THIS GUIDELINE.
 THIS GUIDELINE IS STATED TO ENSURE THAT THE OPERATOR ACTUATES THE
 PROPER CONTROL.

RESPONSE

WHILE GUARDS AND OTHER PREVENTIVE BARRIERS WILL ENSURE THAT ONLY
 ONE PUSHBUTTON CAN BE ACTIVATED AT A TIME, TRAINING CAN ENSURE
 THE SAME RESULT. OPERATORS ARE TRAINED TO EXERT CARE WHEN
 ACTIVATING A PUSHBUTTON. ADDING A PHYSICAL FEATURE IS
 UNNECESSARY.

SOURCE OF DISCREPANCY

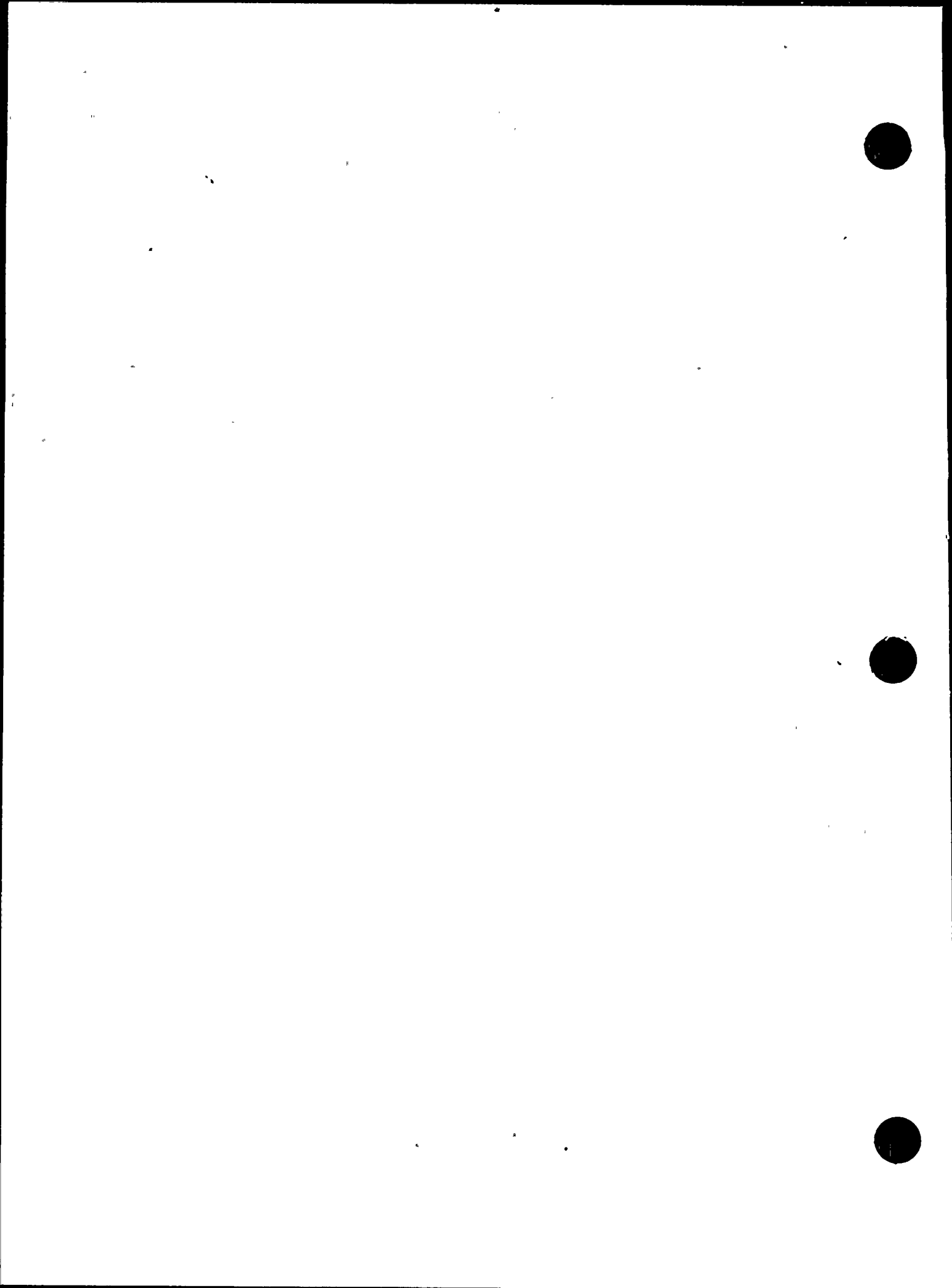
EXPLANATORY INFORMATION

CHECKLIST

4.3.3.D. (1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

111-1



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0290
 UTILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

KEY-OPERATED CONTROLS SHOULD HAVE THE LOCK ORIENTED SUCH THAT THE SWITCH IS IN THE OFF OR SAFE POSITION WHEN THE KEY IS IN THE VERTICAL POSITION. LISTED ARE EXAMPLES OF KEY OPERATED CONTROLS THAT ARE NOT IN ACCORDANCE WITH THIS GUIDELINE.

COMMENTS

THIS GUIDELINE IS STATED FOR CONSISTENCY OF SWITCH OPERATION.

RESPONSE

THE ORIENTATION OF THE SWITCH POSITION FOR KEY OPERATED SWITCHES IS CONSISTANT WITH POSITIONS OF OTHER SWITCHES ON THE CONTROL BOARD. NO CHANGE IS DEEMED WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

4.4.3.D

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	208-0		
	210-0		
	192-0		
	195-0		
	245-0		
	246-0		
	334-0		
	355-0		
	160-0		
	161-0		
	164-0		
	165-0		
	168-0		

169-1



HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/12/1985

ED NUMBER: 0291
TILITY: RGE

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

KEYS SHOULD NOT BE ABLE TO BE REMOVED FROM A KEY OPERATED CONTROL UNLESS THE SWITCH IS IN THE OFF POSITION. LISTED ARE EXAMPLES OF KEY OPERATED CONTROLS THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE.

COMMENTS

THIS GUIDELINE IS STATED THAT THE DIRECTION OF MOTION SHOULD BE IDENTIFIED FOR CONTINUOUS ROTARY CONTROLS. LISTED ARE EXAMPLES OF CONTROL LABELS THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE. THE DOWBORO CONTROLLERS INCLUDE CONTINUOUS ROTARY CONTROL WITH NO INDICATION OF DIRECTION OF MOTION.

RESPONSE

CONTROL ROOM OPERATORS ARE TRAINED NOT TO REMOVE KEYS FROM CONTROLS BECAUSE OF THIS POSSIBILITY. THERE IS NO NEED TO CHANGE THE PHYSICAL ARRANGEMENT.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

4.4.3.E

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	208-0		
	210-0		
	195-0		
	245-0		
	246-0		
	334-0		
	355-0		
	160-0		
	161-0		
	164-0		

165-0

166-0

167-1

168-0

169-1

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0292
 TILITY: RGE

ORIGINATOR: BK
 PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

KEYS FOR KEY OPERATED CONTROLS WITH TEETH ON BOTH EDGES SHOULD FIT INTO THE LOCK WITH EITHER SIDE FORWARD. LISTED ARE EXAMPLES OF KEYS THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE.

COMMENTS

THE GUIDELINE STATES THAT LABELS SHOULD DESCRIBE THE FUNCTION OF EQUIPMENT ITEMS. LISTED ARE EXAMPLES OF LABELS THAT ARE NOT IN ACCORDANCE WITH THE GUIDELINE. THESE LABELS LIST ONLY AN IDENTIFYING NUMBER OF THE COMPONENT.

RESPONSE

THIS IS INSIGNIFICANT AND DOES NOT WARRANT CHANGE.

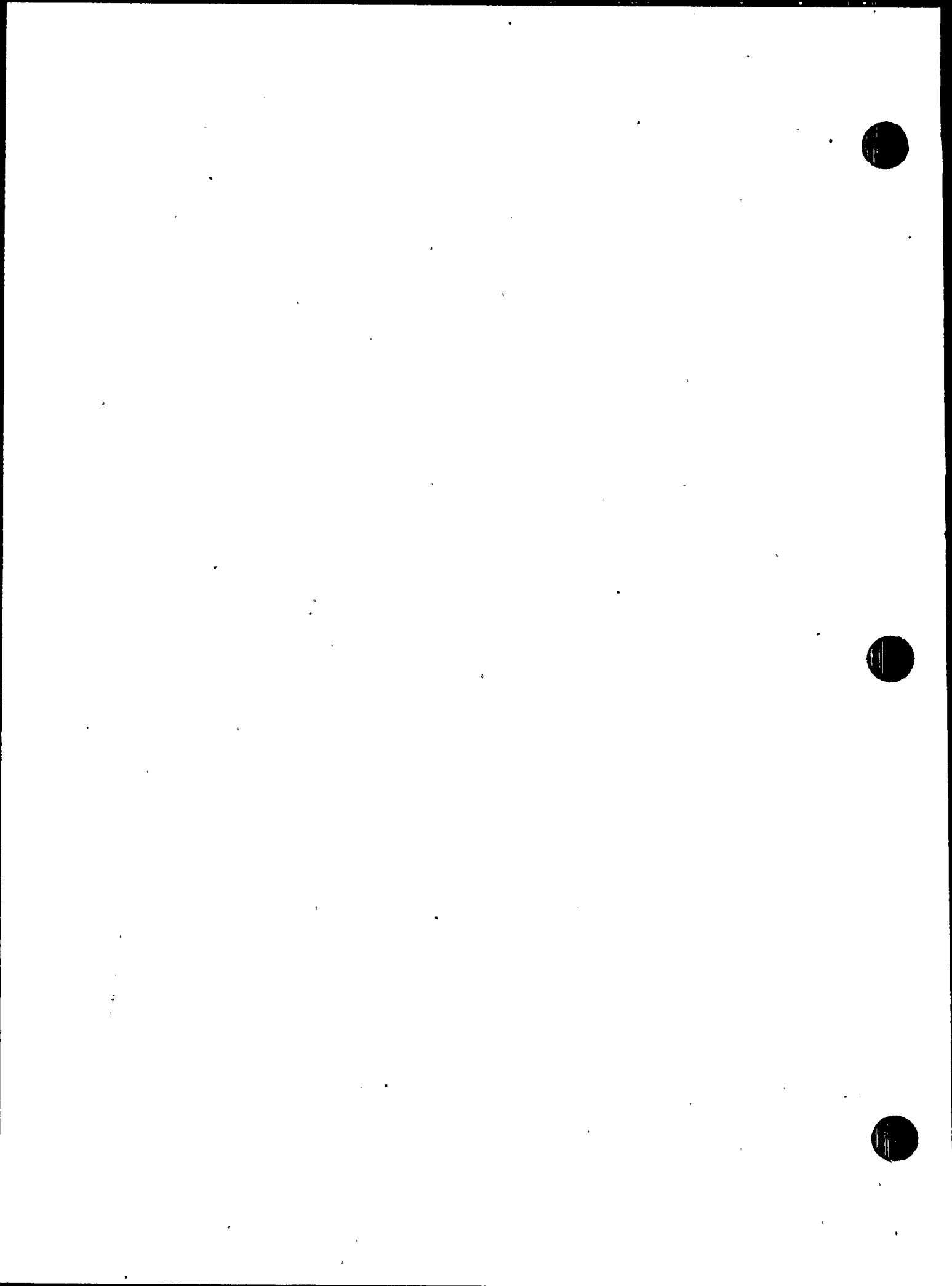
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

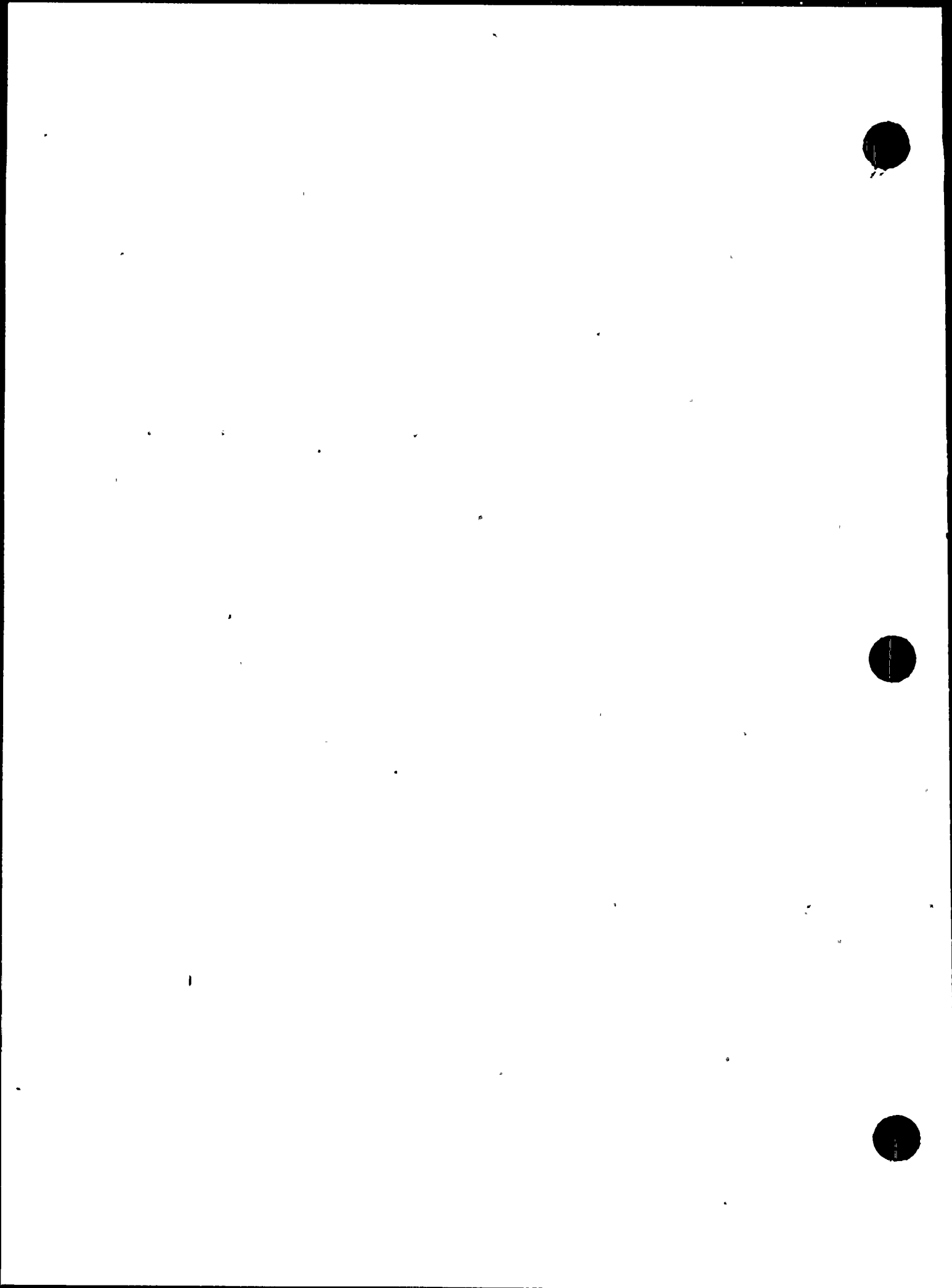
CHECKLIST

4.4.3.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	208-0		
	210-0		
	192-0		
	195-0		
	245-0		
	246-0		
	334-0		
	355-0		
	160-0		
	161-0		
	164-0		
	165-0		
	166-0		
	167-0		



168-0
169-1



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0293
ILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/13/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

TOGGLE SWITCHES SHOULD EMIT AN AUDIBLE CLICK OR PROVIDE SOME FEEDBACK THAT THE SWITCH HAS BEEN ACTUATED. LISTED ARE SOME EXAMPLES OF TOGGLE SWITCHES THAT SRO SAID ARE NOT IN ACCORDANCE WITH THE GUIDELINE.

COMMENTS

THIS GUIDELINE IS STATED TO ENSURE THAT OPERATORS KNOW WHEN A SWITCH HAS BEEN ACTUATED.

RESPONSE

WHILE AUDITORY FEEDBACK WOULD ENHANCE THE INITIATION OF A TOGGLE SWITCH, IT IS NOT NECESSARY. OPERATORS RECEIVE TACTILE FEEDBACK AND DO NOT REQUIRE REDUNDANT INFORMATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

4.5.3.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	110-1	RECIRC CONT VALVES 9508D AND 9508G	
	262-1	DRAIN TANK COOLING WATER CONTROL	
	276-1	FEEDWATER FLOW LOOP A HC 466	
	277-1	FEEDWATER FLOW LOOP B HC 476	
	282-1	HOTWELL LEVEL CONTROLLER	
	359-0		
	368-1		

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0294
UTILITY: RGE

ORIGINATOR: BK
PLANT: GINNA

DATE: 2/12/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

POSITION INDICATION FOR ROTARY CONTROLS SHOULD CONSIST OF A LINE ENGRAVED AT THE TOP AND DOWN THE SIDE OF THE CONTROL OR A POINTER SHAPE. THE EXAMPLES LISTED ARE STAR HANDLES WHERE THE POINTER POSITION IS ENGRAVED ON THE TOP OF THE HANDLE BUT IS NOT COLORED TO MAKE THE INDICATION VISIBLE. THERE IS A RAISED RIDGE ON THE SIDE OF THE CONTROL BUT THAT IS ONLY VISIBLE FROM A SIDE VIEW. ROTARY CONTROLS WITH MORE POSITIVE INDICATION OF POSITION SHOULD BE PROVIDED.

COMMENTS

RESPONSE

J-HANDLES PROVIDE VISUAL FEEDBACK OF POSITION INDICATION ON DISCRETE/"AS IS" CONTROLS. WHERE APPROPRIATE, ADDITIONAL DISTINCTIVE POINTERS (PAINT) WILL BE ADDED ON STAR OR J-HANDLES IN ORDER TO DECREASE THE POSSIBILITY OF CONTROL POSITION AMBIGUITY. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

4.4.5.D. (1) (B) AND (C)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
5	087-1		
5	088-1		
5	089-1		
5	090-1		
5	091-1		
5	092-1		
5	093-1		
5	094-1		

095-1
096-1
097-1

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0295
ILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 12/10/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

SPACING OF CONTROL/DISPLAY GROUPS AS AN EFFECTIVE ENHANCEMENT
TECHNIQUE FOR "SETTING" APART INDIVIDUAL GROUPS OF RELATED
CONTROLS/DISPLAYS IS NOT CONSISTENTLY USED IN THE CONTROL ROOM.

COMMENTS

THIS IS A GENERIC HED. SPACING BETWEEN INDIVIDUAL CONTROLS IS
ADEQUATE, BASED ON MINIMUM SEPARATION DISTANCES.

RESPONSE

ENHANCEMENT OR "SETTING APART" OF ELEMENTS CAN BE ACHIEVED
THROUGH BACKGROUND SHADING. THIS TECHNIQUE USES DIFFERENTLY
COLORED PAINTS TO ACHIEVE FUNCTIONAL ORGANIZATION OF A PANEL.
BACKGROUND SHADING WILL BE IMPLEMENTED BY THE END OF THE 1987
REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 8.1.2.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0296
ILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 12/10/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

DEMARCATON LINES ARE NOT USED TO ENHANCE RECOGNITION AND
IDENTIFICATION OF CONTROL/DISPLAY GROUPS.

COMMENTS

THIS IS A GENERIC HED.

RESPONSE

BACKGROUND SHADING AND LINES OF DEMARCATION WILL BE IMPLEMENTED
TO ENHANCE THE FUNCTIONAL ARRANGEMENTS OF CONTROL ROOM PANELS.
THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING
OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.1.2.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

ENTIRE CR



HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0297
UTILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 12/10/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

COLOR SHADING IS NOT USED AS AN ENHANCEMENT TECHNIQUE TO DEMONSTRATE THE FUNCTIONAL RELATIONSHIPS IN THE CONTROL ROOM.

COMMENTS

THIS IS A GENERIC HED.

RESPONSE

BACKGROUND AND COLOR SHADING WILL BE IMPLEMENTED IN THE CONTROL ROOM TO ENHANCE FUNCTIONAL GROUPING OF CONTROLS AND INFORMATION. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.1.2.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0298
ILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 12/10/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

NO DISTINCTIVE ENHANCEMENT TECHNIQUES ARE PRESENTLY USED TO
HIGHLIGHT EMERGENCY CONTROLS.

COMMENTS

BEFORE AN APPROPRIATE TECHNIQUE IS DECIDED ON FOR ENHANCING THE
LOCATION/IDENTIFICATION OF EMERGENCY CONTROLS, THE TASK ANALYSIS
SHOULD BE REVIEWED TO DETERMINE WHAT A STRICTLY EMERGENCY CONTROL
IS. THIS IS A GENERIC HED AND APPLIES TO THE WHOLE CONTROL ROOM.

RESPONSE

AS PART OF THE BACKGROUND SHADING PACKAGE, CONTROLS AND DISPLAYS
WILL BE GROUPED TOGETHER ON A FUNCTIONAL BASIS. THIS WILL BE
IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
VALIDATION

8.1.2.D

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0299
ILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 12/12/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

ORDER AND LABELING OF SOME COMPONENT AND COMPONENT GROUPS VIOLATE THE PRINCIPLES OF STANDARD READING ORDER, LEFT-TO-RIGHT, TOP-TO-BOTTOM (ALPHABETIC, NUMERIC).

COMMENTS

THIS HED LISTS TWO BASIC TYPES OF PROBLEMS DEALING WITH LABELING/ORDER OF STANDARD READING ORDER VIOLATION. THE FIRST TYPE DEALS WITH ACTUAL LABEL DESIGNATIONS. EXAMPLES OF THIS WOULD BE RHR PUMP A, RHR PUMP B; HX-1A, HX-1B, ETC. THE SECOND TYPE DEALS WITH EQUIPMENT DESIGNATIONS. EXAMPLES OF THIS WOULD BE NI-41C, NI-41D; VLV-3505A, VLV 3505B, ETC. OF THESE TWO TYPES THE FIRST IS MORE IMPORTANT, AS THE FIRST IS THE "SYSTEM" DESIGNATION. THE ORDERING OF THE EQUIPMENT NUMBER DESIGNATIONS SHOULD BE REVIEWED AND PLACED IN AN ORDER AS CONSISTENT AS POSSIBLE WITH NORMAL READING ORDER, BUT SHOULD REMAIN A SECONDARY CONCERN WHEN MEASURED AGAINST ORDERING OF "SYSTEM" COMPONENTS.

RESPONSE

A COMPREHENSIVE LABELING PACKAGE WILL BE IMPLEMENTED IN THE CONTROL ROOM. WHERE APPROPRIATE, AND WHERE SPACE CONSIDERATIONS ALLOW, LEFT-TO-RIGHT READING ORDER WILL BE SELECTED. WHERE DIFFERENCES FROM THIS STANDARD OCCUR, IT IS BECAUSE THE COMPONENTS ARE ACTUALLY NUMBERED THAT WAY. FOR EXAMPLE, "B" PUMP MAY BE ASSOCIATED WITH SYSTEM 1 AND 'A' PUMP MAY BE ASSOCIATED WITH SYSTEM 2. IF SYSTEM 1&2 ARE LOCATED ON THE BOARDS IN NORMAL READING ORDER, THE PUMP DESIGNATIONS ARE BACKWARDS.

IN ORDER TO CORRECT THIS PROBLEM HUNDREDS OF PAGES OF PROCEDURES WOULD HAVE TO BE CHANGED, CONTROLLED DRAWINGS WOULD HAVE TO BE ALTERED, OPERATORS WOULD HAVE TO BE RETRAINED, CONTROLS WOULD HAVE TO BE MOVED OR LABELS WOULD HAVE TO BE CHANGED, AND ANNUNCIATORS WOULD HAVE TO BE ALTERED. THE GAIN IS SIMPLY NOT WORTH IT CONSIDERING THE FACT THAT WE WOULD BE CORRECTING ONLY A RELATIVELY INSIGNIFICANT PROBLEM AND THE EXTREME MEASURES REQUIRED TO BRING ABOUT A POSITIVE CHANGE. RETRAINING MAY ALSO CAUSE NEW ERRORS.



SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION
CHECKLIST

8.2.2.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	SG/11A	TRANS LO REL SWITCHES	
	SG/12A	TRANS LO REL SWITCHES	
		CIRC WATER PUMP 1A DISCH	
		CONDENSATE METERS	
		GENERATOR METERS	
	11A-12A	4160V BUS TIE	
	11B-12B	4160V BUS TIE	
		AIR METERS	
		AUX FD PUMPS (LEFT SCALE)	
		AUX FD PUMPS (RIGHT SCALE)	
		HEATER METERS	
		HTR DRAIN TANK METERS	
		POWER RANGE METER	
		PRZR TEMP METERS	
		SG-A METERS	
		SG-B METERS	
		TURB BYPASS METERS	
	3504A	TURBINE DRIVEN AUX FW PUMP SUPPLY VLV	
	3505A	TURBINE DRIVEN AUX FW PUMP SUPPLY VLV	
	AFPSV-1A	MOV SWITCHES	
	AFPSV-1B	MOV SWITCHES	
	AFPSV-1C	MOV SWITCHES	
		ACCUMULATOR METERS	
		CONTAINMENT METERS	
		CR POSITION METERS	
		EXCESS METERS	
		RWST METERS	
		SI PUMP METERS	
		SPRAY METERS	
		VCT METERS	
	1A	FOXBORO CONTROLLERS HCV 625	
	1B	FOXBORO CONTROLLERS HCV 624	
	B	SPRAY METERS	
	LOOP A	SI DISCHARGE TO HOT LEG VLV	
	LOOP A	SI DISCHARGE TO HOT LEG VLV	
	LOOP B	SI DISCHARGE TO HOT LEG VLV	
	LOOP B	SI DISCHARGE TO HOT LEG VLV	
	LOOP B	SI PUMP DISCH 1C SELECTOR SWITCHES	
		ACCUMULATOR METERS	
		STANDBY AUX FLOW METERS	
		SUBPANEL IN LOWER RIGHT CORNER	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0300
TILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 2/11/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE LAYOUT OF A FUNCTIONAL CONTROL GROUP WHICH IS REPEATED SEVERAL TIMES IN THE CONTROL ROOM IS INCONSISTENT.

COMMENTS

THIS HED CONCERNS THE ANNUNCIATOR CONTROL GROUP. THIS GROUP OF CONTROLS IS THE ONLY FUNCTIONAL GROUP WHICH IS REPEATED IN THE CONTROL ROOM. HOWEVER, THE REPEATED LAYOUT OF THESE CONTROLS IS INCONSISTENT. THE CONTROL GROUP CONSISTS OF THREE PUSHBUTTONS. TWICE THESE CONTROLS ARE LAIDOUT IN A HORIZONTAL ORIENTATION (PANELS 5,7), HOWEVER, ONCE THEY ARE LAID OUT IN A VERTICAL ORIENTATION (PANEL 6)

RESPONSE

WHILE IT IS PREFERABLE TO MAINTAIN CONSISTENCY IN THE LAYOUT OF REPEATED CONTROLS, SPACE CONSIDERATIONS DO NOT ALWAYS PERMIT ADHERENCE TO THIS PRINCIPLE. DEVIATION FROM HORIZONTAL TO VERTICAL IS AN INSIGNIFICANT DIFFERENCE. HIGHLY TRAINED OPERATIONS PERSONNEL HAVE HAD NO HISTORY OF PROBLEMS ASSOCIATED WITH THIS HED. CONTROLS ARE ALSO COLOR CODED AND NO CHANGE IS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.2.3.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		ANNUNCIATOR CONTROLS (HORIZ. ORIENTATION)	
		ANNUNCIATOR CONTROLS (VERT. ORIENTATION)	
		ANNUNCIATOR CONTROLS (HORIZ. ORIENTATION)	

5
6
7



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0301
ILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 12/10/1984

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

SEVERAL INSTANCES OF MIRROR IMAGING OCCUR IN THE GINNA CONTROL ROOM. THIS OCCURS ON BOTH THE SYSTEM LEVEL AND PANEL/SUB-PANEL/VENDOR PANEL LEVEL.

COMMENTS

MIRROR IMAGING OCCURS ON SEVERAL PANELS AT GINNA. ON SOME PANELS, NOT ALL 6, ALMOST THE ENTIRE PANEL IS MIRRORED. MIRROR IMAGERY ALSO OCCURS ON A SMALLER SCALE AS IN THE EXAMPLE OF THE REHEATER COND. DUMP VALVE VENDOR PANEL ON PANEL 5. FURTHER ELABORATION OF THE EXAMPLES ON PANELS 6, 8 AND 10 ARE AS FOLLOWS. A MIRROR IMAGE OCCURS ON THE CENTER SECTION OF PANEL 6 FROM JUST BELOW THE DIGITAL CLOCK TO THE BOTTOM OF THE SLOPED PORTION OF THE PANEL. THE AREA WIDTH FOR THIS EXAMPLE IS DEFINED BY THE VERTICAL METERS FOR SG-A AND SG-B DOWN TO WIDTH OF THE SG FW PUMP (DC OIL PUMPS). ALSO, A MIRROR IMAGE OCCURS ON PANEL 6 JUST BELOW ANNUNCIATOR GROUP 1, FROM PRT VERTICAL METERS DOWN TO THE FOXBORO CHART RECORDERS. AREA WIDTH IS DEFINED BY THE CHART RECORDERS. THE MIRROR ON PANEL 8 OCCURS FROM THE TOP OF CIRC. METERS TO PANEL BOTTOM. AREA WIDTH IS DEFINED BY AN AREA AS WIDE AS THE CIRCULAR METER GROUP. THE MIRROR ON PANEL 10 OCCURS FROM THE TOP OF THE CONDENSER VALVES 1A1, 1A2 DOWN TO VERTICAL METERS AT THE PANEL BOTTOM.

RESPONSE

MIRROR IMAGING CAN HAVE ADVERSE IMPACT ON DUAL UNIT PLANTS WHERE THERE IS A POSSIBILITY THAT AN OPERATOR CAN 'FORGET' WHICH UNIT HE IS WORKING ON. GINNA, HOWEVER, IS A SINGLE UNIT POWER PLANT AND IS IMMUNE FROM THIS PROBLEM. OPERATOR TRAINING IS SUFFICIENT TO ACCURATELY LOCATE CONTROLS AND DISPLAYS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

REF 8.2.3.B

EQUIPMENT

EQUIPMENT

2

PANEL -----	ID NUMBER -----	NAME -----	OTHER -----
----------------	--------------------	---------------	----------------

TOP OF COND VLVS TO BOTTOM METERS
REHEATER COND DUMP VLV VENDOR PANEL
TURBINE DRAIN VLVS
TURBINE EHC UPPER PANEL
CENTER SECTION BELOW CLOCK
TOP BOARD/BELOW ANN GROUP 1
STANDBY AUX FLOW PANEL
TOP OF CIRC METERS TO PANEL BOTTOM



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0302
 ILITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 12/10/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

STRINGS OF SIMILAR COMPONENTS HAVE A "VERTICAL" ORIENTATION (OR EFFECT) RATHER THAN THE PREFERRED EFFECT OF HORIZONTAL DISPLAY ORIENTATION.

COMMENTS

THE CITATION ON PANEL 10 HAS A VERTICAL STACK OF 3 SIMILAR DISPLAYS. THE CITATION FROM PANEL 5 IS A 3 COLUMN X 50 ROW MATRIX WHICH RESULTS IN A VERTICAL "EFFECT". THIS IS CAUSED BY MORE HORIZONTAL ROWS THAN VERTICAL COLUMNS.

RESPONSE

ALTHOUGH NOT IN COMPLIANCE WITH BASIC HUMAN FACTORS PRINCIPLES THE CONSEQUENCE OF THIS HED IS MINIMAL. THERE IS NO HISTORIC CONFUSION ASSOCIATED WITH THIS "EFFECT". NO CHANGE APPEARS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.3.2.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	37,61,82		
	38,39,40		
	52,53,54		
	66,67,68	284	
	80,81,82		
	83,84,85		



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0303
 TILITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 2/11/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

A STRING OF SMALL DISPLAY/INDICATORS (STATUS LIGHTS) IS GREATER THAN 20 INCHES IN LENGTH.

COMMENTS

THIS HED OCCURS ON PANEL 7. THE GROUPING/MATRIX OF WHITE STATUS LIGHTS IN THE UPPER LEFT SIDE OF THE VERTICAL PART OF PANEL 7 ARE ARRANGED IN STRINGS GREATER THAN 20 INCHES. THIS HED SHOULD BE REVIEWED ALONG WITH SEVERAL OTHERS WHICH PERTAIN TO THESE PARTICULAR WHITE STATUS LIGHT GROUPINGS.

RESPONSE

THE LENGTH OF THE STRING OF SMALL STATUS LIGHTS DOES NOT ADVERSELY AFFECT THEIR FUNCTION. THE GROUPING OF THESE LIGHTS DOES NOT NEED TO BE CHANGED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.3.2.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

WHITE STATUS LIGHTS





HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0304
UTILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 12/10/1984

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

SIMILAR COMPONENTS ARE ARRANGED IN STRINGS OF GREATER THAN 5 ITEMS.

COMMENTS

THE CITED EXAMPLES OF THIS HED CONTAIN NUMEROUS PIECES OF EQUIPMENT. THE TYPICAL FORM OF THIS HED IS "A STRING OF (X) J-HANDLES", WHERE (X) IS SOME NUMBER GREATER THAN 5. THE NUMBER (X) FOR EACH CITATION IS LISTED IN THE "OTHER" COLUMN BELOW. (EQUIPMENT #'S FOR EACH ITEM ARE NOT LISTED).

RESPONSE

REACTION TIME IS INCREASED WHEN AN OPERATOR MUST DISCRIMINATE AMONG A NUMBER OF SIMILAR CONTROLS. TO REDUCE THIS PROBLEM, BACKGROUND SHADING TECHNIQUES IN WHICH CONTROLS ARE GROUPED FUNCTIONALLY AND LABELING WILL BE USED TO HIGHLIGHT INDIVIDUAL CONTROLS. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING ONTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.3.2.C(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
10		J-HANDLES (VERT. ORIENTATION)	6
25		LEGEND P/B'S (2 GROUPS, 5 ROW/GP)	10
5		CIRCULAR METERS (3 ROWS)	11
5		J-HANDLES (BOTTOM ROW)	11
5		J-HANDLES (TOP ROW)	6
5		STAR-HANDLES (BOTTOM ROW)	11
6		STAR-HANDLES (TOP ROW)	11
5		TURBINE DRAIN VLVS STATUS LIGHTS	6
6		FOXROBO CONTROLLERS	8

J-HANDLES	6
STATUS LIGHTS-RED-FW HTRS	6
VERTICAL METERS-SG	7
VERTICAL METERS-SG	7
CONTROL ROD POSITION METERS	8
INST BUS BREAKER LIGHTS	20
J-HANDLES (2 ROWS)	7
ROTARY SELECTOR CONTROLS	
WHITE STATUS LIGHTS	
J-HANDLES (OCCURS 3 TIMES)	6
EDGE WISE VERT. METERS	6



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0305
 TILITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 12/10/1984

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

FOR GROUPS WHERE MORE THAN 5 SIMILAR ITEMS MUST BE GROUPED TOGETHER, THERE ARE NO DEMARCATION LINES, SPACING TECHNIQUES, OR OTHER MEANS OF ENHANCING IDENTIFICATION OF INDIVIDUAL COMPONENTS.

COMMENTS

MANY OF THE ITEMS CITED HERE WERE CITED IN THE PREVIOUS HED. HOWEVER, ITEMS LISTED HERE COULD BE LEFT IN STRINGS OF GREATER THAN 5 COMPONENTS IF SOME FORM OF DEMARCATION, OR ALTERNATE METHOD OF PROVIDING INDIVIDUAL COMPONENT OR GROUP IDENTIFICATION WAS USED.

RESPONSE

LINE OF DEMARCATION WILL BE USED IN CONJUNCTION WITH BACKGROUND SHADING TO ENHANCE COMPONENT IDENTIFICATION. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.3.2.C(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		J-HANDLES	
		CIRCULAR METERS	
		J-HANDLES	
		STAR HANDLES	
		TURBINE DRAIN VLV STATUS LIGHTS	
		EDGEWISE METERS (SG'S) (HTRS)	
		FOXBORO CONTROLLERS	
		J-HANDLES	
		CONTROL ROD POSITION METERS	
		J-HANDLES	
		WHITE STATUS LIGHTS	



J-HANDLES

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0306
 UTILITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 12/10/1984

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE LISTED MATRICES OF COMPONENTS HAVE NO COORDINATE AXES, OR LABELING SYSTEM FOR IDENTIFICATION OF SINGLE COMPONENTS WITHIN THE GRID. ALSO LARGE MATRICES ARE NOT SUBDIVIDED BY ANY MEANS OF DEMARCATION LINES.

COMMENTS

THESE CITATIONS ARE LISTED ON ONE OR BOTH OF THE TWO PREVIOUS HEDS. HOWEVER BECAUSE THEY ARE IN MATRIX FORMAT, THE MOST USEFUL ENHANCEMENT TECHNIQUE WOULD BE TO CONSIDER THEM AS "MINI-ANNUNCIATOR" STYLE PANELS.

RESPONSE

WHERE APPLICABLE, DEMARCATION LINES WILL SHOW FUNCTIONAL RELATIONS WITHIN MATRICES AND LABELING WILL BE IMPROVED TO CORRECT THIS PROBLEM. THIS WILL BE DONE BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.3.2.D(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
25		AUX RELAY CABINET-TRAIN A(5X10 ARRAY)	
25		AUX RELAY CABINET-TRAIN B(5X10 ARRAY)	
7		INST. BUS BKR LIGHTS(2 PNLS,4X20 ARRAY)	
7		LEGEND LIGHT ARRAY(5X5 ARRAY)	
7		WHITE STATUS LIGHTS	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0307
 UTILITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 3/ 4/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

SOME CONTROLS AND DISPLAYS ARE ARRANGED SUCH THAT THE DISPLAY IS
 OBSCURED DURING CONTROL MANIPULATION.

COMMENTS

THIS OCCURS ON THE MAJORITY OF FOXBORO VALVE CONTROLLERS
 THOUGHOUT THE CONTROL ROOM. THE PROBLEM ARISES FROM THE SETPOINT
 CONTROL KNOB BEING SET ABOVE THE CONTROLLER OUTPUT/VALVE POSITION
 METER WHILE THE SETPOINT CONTROL IS RARELY USED TO "MANUALLY"
 ADJUST CONTROLLER OUTPUT, THE CONSEQUENCES OF THIS HED SHOULD
 ST BE REVIEWED.

RESPONSE

THIS IS AN INFREQUENT PROBLEM THAT IS MINOR IN CONSEQUENCE.
 THERE DOES NOT APPEAR TO BE SUFFICIENT JUSTIFICATION TO WARRANT
 CHANGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
 CHECKLIST

9.1.1.B
 9.1.2.B(7)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	110	RECIRC CONTROL VLVS 9508 D&G	
	253	ATM. STM. DUMP PRESS. CONT. LOOP A	
	254	STM. GEN. CON. STM. DUMP	
	255	ATM. STM. DUMP PRESS. CONT. LOOP B	
	262	HTR. DRAIN TANK COOLER TCV FROM COND.	
	266	VARIABLE HTR CONTROL	
	267	PCV-431A SPRAY VLV CONTROL	
	268	PCV-4431B SPRAY VLV CONTROL	
	269	CHARGING PUMP #1 SPEED CONTROL	
	270	CHARGING PUMP #2 SPEED CONTROL	

271	CHARGING PUMP #3 SPEED CONTROL
272	MAKE-UP WATER TO BA BLENDER
273	BORIC ACID FLOW CONTROL BLENDER
275	FW FLOW BYPASS VLV LOOP A
276	FW FLOW LOOP A MAIN FCV
277	FW FLOW LOOP B MAIN FCV
278	FW FLOW BYPASS VLV LOOP B
280	AUX FW CONTROL VLV LOOP A
281	AUX FW CONTROL VLV LOOP B
282	HOTWELL LEVEL CONTROLLER
283	AUX FW BYPASS VLV LOOP A
284	AUX FW BYPASS VLV LOOP B
360	CHARGING FLOW CONTROLLER
361	NON-RUN HX LETDOWN OUT TEMP
362	LETDOWN PRESSURE CONTROLLER
363	HCV-123
364	HCV-133
365	HCV-624 RHR HX OUTLET.
366	HCV-625 RHR HX OUTLET
367	RHR REMOVAL LOOP RETURN
102	ACCUMULATOR VENT VALVE
104	HAND IND CONTROL VLV
105	HAND IND CONTROL VLV
21	HYDROGEN TEMP. CONTROL
22	BEARING OIL TEMP CONTROL



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0308
 TILITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 3/ 4/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

CERTAIN CONTROL/DISPLAY GROUPS DO NOT CLEARLY RELATE THE
 ASSOCIATION BETWEEN CONTROL AND DISPLAY.

COMMENTS

THIS HED IS "GENERIC" TO THE FOXBORO CONTROLLERS AT GINNA. DUE
 TO POOR LABELING, AND POOR "POSITIONING" THESE CONTROLLERS ARE
 NOT EASILY RELATED TO THEIR ASSOCIATED DISPLAY.

RESPONSE

A COMPREHENSIVE BACKGROUND SHADING PACKAGE WILL BE IMPLEMENTED
 WHICH WILL DEMONSTRATE THE RELATIONSHIP BETWEEN RESPONSE METERS
 AND CONTROLLERS FUNCTIONALLY RELATED TO THEM. THIS WILL BE
 IMPLEMENTED BY THE END OF THE PROJECTED 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

9.1.1.C(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0309
UTILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 3/ 4/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

A SINGLE CONTROL, MULTIPLE DISPLAY RELATIONSHIP EXISTS WHERE THE DISPLAYS ARE LOCATED TOO FAR FROM THE CONTROLS. ALSO NO FORM OF ENHANCEMENT IS USED TO "ASSOCIATE" THE CONTROLS AND DISPLAYS.

COMMENTS

THE PRIMARY EXAMPLE OF THIS HED IS THE CHARGING PUMP SYSTEM. THE CONTROLS FOR THE CHARGING PUMP(S) ARE LOCATED IN THE CENTER OF PANEL 6, WHILE THE METERS FOR CHARGING PUMP FLOW, DISCHARGE PRESS, AND TEMPERATURE ARE ON THE FAR LEFT OF PANEL 7. ALSO BECAUSE THE CONTROL FOR THE CHARGING PUMP IS A FOXBORO CONTROLLER, NO ASSOCIATION BETWEEN CONTROLLER AND DISPLAY(S) IS APPARENT. (SEE HED # REFERRING TO SEC 9.1.1.C.(1))

RESPONSE

SEE HED #84.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST	9.1.2.B(1)
CHECKLIST	9.1.2.B(2)
CHECKLIST	9.1.2.B(4)
CHECKLIST	9.1.2.B(6)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
6	269	CHARGING PUMP 1A	
6	270	CHARGING PUMP 1B	
6	271	CHARGING PUMP 1C	
7	146	REG HX CHARGING OUTLET TEMP	
7	147	CHARGING LING FLOW	
7	148	CHARGING PUMP DISCHARGE PRESS	
7	192-0		



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0310
TILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 3/ 5/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

CONTROLS AND DISPLAYS RELATED TO THE SAME FUNCTION ARE NOT GROUPED TOGETHER.

COMMENTS

THE CHARGING PUMPS AND ASSOCIATED DISPLAYS ARE A GOOD EXAMPLE OF THIS HED. THE CONTROLS ON PANEL 6, WHILE THE DISPLAYS ARE ON PANEL 7.

RESPONSE

THE FIX FOR THESE HEDS IS TO INSTALL AT LEAST ONE FLOW METER AND A REPEATER OF LETDOWN FLOW ON PANEL 6 (POSSIBLY WHERE T AVG USED TO BE LOCATED). LOCATING THESE INDICATIONS ON PANEL 6 WOULD PROVIDE BETTER CONTROL DISPLAY RELATIONSHIPS FOR THE CVCS SYSTEM AND ALSO WOULD PROVIDE CHARGING/LETDOWN DIFFERENTIAL ON PANEL 6 WHERE THE MAJORITY OF RCS INDICATION IS LOCATED. THIS WOULD BE HELPFUL DURING RCS LEAK INVESTIGATION AS IT WOULD PROVIDE SOME INDICATION OF RCS LEAKRATE WHEN USED IN CONJUNCTION WITH PRZR LEVEL TREND. THE CONTROL BOARD LVELING AND ENHANCEMENT PACKAGE SHOULD ALSO ADDRESS THIS CONTROL DISPLAY PROBLEM. SEE HED 84, 309, 310, 345, 451. BACKGROUND SHADING TO DEMONSTRATE FUNCTIONAL RELATIONSHIPS WILL BE IMPLENENTED BY THE END OF THE 1987 REFUELING OUTAGE. METERS WILL BE INSTALLED BY SPRING 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

9.2.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
6	269	CHARGING PUMP 1A	
6	270	CHARGING PUMP 1B	
6	271	CHARGING PUMP 1C	
7	146	REG HX CHARGING OUTLET TEMP	



147

148

CHARGING LINE FLOW

CHARGING PUMP DISCHARGE PRESS



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0311
ILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 3/ 5/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

DISPLAYS ARE NOT LOCATED DIRECTLY ABOVE THEIR ASSOCIATED CONTROLS. ALSO DISPLAY/CONTROL PAIRS ARE OFTEN NOT ARRANGED IN ROWS WHEN PLACED ON THE SAME UPPER OR SAME LOWER PANEL.

COMMENTS

FEW CONTROLS/DISPLAYS ARE LOCATED ON THE SAME LOWER PANEL FOR THE FRONT BOARDS (PANEL 5,6,7). HOWEVER, THIS IS A GENERIC PROBLEM ON PANEL 8. PANELS 5,6, AND 7 UPPER PANELS HAVE SEVERAL PROBLEMS IN THIS AREA.

RESPONSE

BACKGROUND SHADING WILL BE IMPLEMENTED TO DEMONSTRATE FUNCTIONAL RELATIONSHIPS BETWEEN DISPLAYS AND CONTROLS. THIS WILL BE IMPLEMENTED BY THE END OF THE PROJECTED 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

9.2.2.A(1)
9.2.2.A(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

HED NUMBER: 0312
UTILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 3/ 5/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

CONTROLS AND RELATED DISPLAYS DO NOT OCCUPY THE SAME
RELATIVE POSITION ON UPPER AND LOWER BOARDS AND
OFTEN DO NOT HAVE CORRESPONDING LABELS.

COMMENTS

THIS IS A GENERIC HED AND APPLYS THROUGHOUT MOST OF THE GINNA
CONTROL ROOM. PANEL 5 TENDS TO CONFORM WELL WITH THESE
QUALIFICATIONS, HOWEVER, PANELS 6 AND 7 HAVE NUMEROUS VIOLATIONS
OF THE LISTED QUALIFICATIONS. PRIMARY VIOLATIONS OCCUR BECAUSE
OF GROUPINGS OF FOXBORO CONTROLLERS ON PANEL 6, AND GROUPINGS OF
THAT-BUSTER SWITCHES ON PANEL 7.

RESPONSE

BACKGROUND SHADING WILL BE IMPLEMENTED TO DEMONSTRATE FUNCTIONAL
RELATIONSHIPS BETWEEN DISPLAYS AND CONTROLS. THIS WILL BE
IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

9.2.2.B(1)
9.2.2.B(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0313
 UTILITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 3/ 4/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

ARRANGEMENT OF FUNCTIONALLY SIMILAR CONTROLS IS INCONSISTENT.

COMMENTS

THE ONLY REPEATED FUNCTIONAL GROUP OF CONTROLS IN THE CONTROL ROOM IS THE ANNUNCIATOR CONTROL GROUP. HOWEVER, THIS GROUP IS LAID OUT INCONSISTENTLY. IN TWO CASES THE GROUP IS LAID OUT HORIZONTALLY, WHILE A THIRD CASE HAS THE GROUP BEING LAID OUT VERTICALLY. ALSO THE TWO GROUPS ARRANGED HORIZONTALLY ARE LOCATED ON OPPOSITE CORNERS OF THEIR RESPECTIVE PANEL.

RESPONSE

COMBINE WITH HED #300.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

9.2.2.D

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	169	AL TEST	P/B
	170	HORN SILENCE	P/B
	171	AL ACK	P/B
	285	AL TEST	P/B
	286	HORN SILENCE	P/B
	287	AL ACK	P/B
	339	AL TEST	P/B
	340	HORN SILENCE	P/B
	341	AL ACK	P/B



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0314
ILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 3/ 4/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

FOR SOME CONTROL/DISPLAY PAIRS THE CLOCKWISE ROTATION OF A CONTROL (INCREASE DIRECTION) RESULTS IN A RIGHT-TO-LEFT MOVEMENT (DECREASE DIRECTION) ON THE CORRESPONDING METER.

COMMENTS

THIS PROBLEM ARISES SEVERAL TIMES ON THE FOXBORO CONTROLLERS. THE CONTROLLER OUTPUT CONTROL IS ROTATED CLOCKWISE TO CAUSE AN INCREASE. HOWEVER, THE CORRESPONDING VALVE POSITION/CONTROLLER OUTPUT METER DISPLAYS A DECREASING INDICATION OF RIGHT-TO-LEFT. THE "OUTPUT" OR VALVE POSITION IS ACTUALLY INCREASING, BUT THE BECAUSE OF THE METER ARRANGEMENT, A DECREASE IS PERCEIVED. THIS PROBLEM ARISES ON CONTROLLERS WITH OUTPUT METERS USING AN OPEN TO CLOSE METR MOVEMENT INSTEAD OF A CLOSE TO OPEN PATTERN.

RESPONSE

THE CONCERNED CONTROLLERS ARE FOR FAILED OPEN VALVES. THE FOXBORO COMPANY DOES NOT OFFER AN ALTERNATIVE FOR THESE CONTROLLERS. ALL OF THE CONTROLLERS WITH THE EXCEPTION OF THE SPRAY VALVE CONTROLLER HAVE INDICATION FOR THE PARAMETER BEING EFFECTED, SO THAT OPERATIONS PERSONNEL CAN OBSERVE WHEN MAKING A CONTROLLER CHANGE. THE CONTROLLERS WILL BE CLEARLY LABELED TO INDICATE THE EXPECTED VALVE RESPONSE TO A CHANGE IN CONTROLLER OUTPUT.

SEVERAL OPERATORS HAVE STATED THAT THE PRESENT CONTROLLER ACTION AND LABELING IS USEFUL IN INDICATING THE DESIGNED FAILURE MODE OF THE VALVE. THE SPRAY ADDITIVE VALVE CONTROLLER IS SPECIAL IN THAT THE OUTPUT CIRCUIT OF THE CONTROLLER OPENS ON RECEIPT OF A SAFEGUARD SIGNAL CAUSING THE VALVE TO OPEN. USE OF THIS CONTROLLER IS MINIMAL DURING NORMAL OPERATIONS AND DOES NOT REQUIRE IMMEDIATE RESPONSE BY OPERATIONS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION



CHECKLIST

9.3.1.A(1)

ANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	273	BORIC ACID FLOW BLENDER	
	280	AUX FW CONTROL VLV LOOP A	
	281	AUX FW CONTROL VLV LOOP B	
	359	CONTAINMENT SPRAY NAOH ADD.	
	360	CHARGING FLOW CONTROLLER	
	361	NON-RUN HX LETDOWN OUT TEMP	
	362	LETDOWN PRESS CONTROLLER	
	365	RHR HX OUTLET	
	366	RHR HX OUTLET	
	368	CONTAINMENT SPRAY NAOH ADD.	
	22	BEARING OIL TEMP CONTROL	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0315
 TILITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 3/ 5/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

THE WIDE RANGE PRESSURIZER PRESSURE RECORDER ON PANEL 5 DOES NOT PROVIDE THE ABILITY TO DISTINGUISH SIGNIFICANT LEVELS OF SYSTEM PRESSURE AS IT IS BEING CONTROLLED.

COMMENTS

RESPONSE

WIDE-RANGE REACTOR COOLANT SYSTEM PRESSURE CAN BE DISPLAYED WITH TREND CAPABILITY ON THE NEW PLANT COMPUTER SYSTEM. THIS CAPABILITY IS IN CONJUNCTION WITH THE EXISTING RECORDER CHARTS AND PROVIDES ADEQUATE INDICATION OF THE PARAMETER. THE NEW PLANT COMPUTER SYSTEM WILL BE IMPLEMENTED BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

9.3.2.B

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
5	148	WR-PZR PRESS RECORDER (DUAL PEN)	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0316
 TILITY: RGE

ORIGINATOR: RK
 PLANT: GINNA

DATE: 4/11/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

DURING FILM ANALYSIS OF THE WALK-THROUGH VALIDATION IT WAS NOTED THAT THE OPERATORS LEFT THE PRIMARY OPERATING AREA ON OCCASION TO ACCESS CONTROLS AND DISPLAYS ON THE BACK PANELS.

COMMENTS

RESPONSE

THE GINNA CONTROL ROOM IS PHYSICALLY A VERY SMALL OPERATING AREA. EVEN THOUGH BACK PANELS MUST OCCASIONALLY BE ACCESSED DURING EMERGENCY SCENARIOS, THERE DOES NOT APPEAR TO BE A NEGATIVE IMPACT OF SIGNIFICANT MAGNITUDE TO WARRANT A NEW DESIGN.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0317
ILITY: RGE

ORIGINATOR: RK
PLANT: GINNA

DATE: 4/11/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

DURING THE FILM ANALYSIS OF THE WALKTHROUGH VALIDATION EXCESSIVE OPERATOR MOVEMENT WAS NOTED. OPERATORS OFTEN WALKED TO A DIFFERENT PART OF THE CONTROL ROOM TO CHECK A SINGLE DISPLAY.

COMMENTS

RESPONSE

THE GINNA CONTROL ROOM IS PHYSICALLY A VERY SMALL OPERATING AREA. EVEN THOUGH BACK PANELS MUST OCCASIONALLY BE ACCESSED DURING EMERGENCY SCENARIOS, THERE DOES NOT APPEAR TO BE A NEGATIVE IMPACT OF SIGNIFICANT MAGNITUDE TO WARRANT A NEW DESIGN.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ED NUMBER: 0318
ILITY: RGE

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

CHARACTER HEIGHTS FOR INDICATOR LIGHT LABELS ON THE UPPER VERTICAL PORTION OF PANEL 7 ARE BELOW THE RECOMMENDED HEIGHT TO AFFORD A VISUAL ANGLE OF 15 MINUTES. THESE SAME CHARACTERS HAVE A POOR STROKE WIDTH OF HEIGHT RATIO FOR READABILITY.

COMMENTS

ACTUAL CHARACTER HEIGHT = 0.175, RECOMMENDED = 0.192. THESE ALSO HAVE OTHER READABILITY PROBLEMS WHICH MAKE THESE LABELS DIFFICULT TO READ.

RESPONSE

A COMPREHENSIVE LABELING PACKAGE FOR THE CONTROL ROOM WILL BE IMPLEMENTED. ATTRIBUTES OF LABELS INCLUDING LETTER SIZE, HEIGHT, SPACING AND ORIENTATION WILL BE ENHANCED TO IMPROVE READABILITY. THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

5.1.3.A
5.1.3.D

PANEL EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0319
TILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE USE OF THE COLOR RED ON THE ANNUNCIATOR TILE CAN MEAN EITHER
A 1ST OUT ANNUNCIATOR OR A LOSS OF INSTRUMENT BUS ANNUNCIATOR.

COMMENTS

THESE COLOR USES ARE VISUALLY DIFFERENT IN THAT THE LOSS OF
INSTRUMENT BUS ANNUNCIATOR IS A PERMANENTLY SOLID RED PLASTIC
WHERE AS THE 1ST OUT IS A RED BLACKLIT CLEAR TILE.

RESPONSE

THE MEANING ATTACHED TO A PARTICULAR COLOR SHOULD BE CONSISTENT
ACROSS VARIOUS USES TO SPEED READABILITY. IN THIS CASE, THE TWO
REDS ARE VISUALLY DIFFERENT. A SOLID RED PLASTIC TILE INDICATES
THE LOSS OF INSTRUMENT BUS ANNUNCIATORS WHILE A BACK LIT CLEAR
TILE INDICATES THE 1ST OUT ANNUNCIATOR. THERE IS NO NEED TO
CHANGE THIS ARRANGEMENT.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.6.C(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0322
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE AREA MONITORS ON THE DIGITAL RATE METERS USE GREEN TO
INDICATE POWER ON, YELLOW TO INDICATE FAILURE ALARM, AND RED TO
INDICATE HIGH ALARM.

COMMENTS

VENDOR EQUIPMENT.

ESP

SEE 321

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

5.1.6.C(2)
5.3.2.A(2)

PANEL

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0323
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

THERE CURRENTLY IS NO SINGLE STANDARD ABBREVIATION LIST. MANY
TERMS HAVE MORE THAN ONE ABBREVIATION IN USE.

COMMENTS

RESPONSE

A STANDARD ABBREVIATION LIST HAS RECENTLY BEEN COMPLETED.
IMPLEMENTATION OF THIS LIST WILL BEGIN JANUARY 1986 AND BE
COMPLETED JANUARY 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST
CHECKLIST

5.1.4.D
5.3.3.B(6)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0324
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THE USE OF COLOR IS THE ONLY MEANS BY WHICH CHANNELS ARE
IDENTIFIED IN THE PROTECTION BI-STABLE LIGHT BOX.

COMMENTS

THERE IS NO REDUNDANT MEANS SUCH AS LABEL PROVIDED.

RESPONSE

A LABEL WILL BE PROVIDED TO IDENTIFY THE CHANNELS AS "1,2,3,4".
THIS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING ONTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

5.1.6.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0325
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 3
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

THE WORKSTATIONS AT PANELS 5 AND 6 HAVE EMERGENCY LIGHTING LEVELS BELOW THE RECOMMENDED STANDARD OF 10 FC. THE EMERGENCY LIGHTING LEVELS AT THE OPERATOR DESK IS MODERATELY BELOW THE STANDARD.

COMMENTS

LEVELS AT PANEL 5 AND 6 ARE 1 FC. LEVELS AT OPERATORS DESK IS 8 FC. SUBJECTIVELY, EMERGENCY LIGHTING APPEARED ADEQUATE FOR GENERAL VIEWING.

RESPONSE

LIGHTING WILL BE CORRECTED AND OPTIMIZED TO ENSURE THE CONDITIONS NECESSARY FOR A PROPER FIELD OF VISION FOR OPERATING PERSONNEL. THE SCHEDULE COMPLETION DATE FOR THIS WORK IS 6/30/87. A CRITERION OF 10 FOOT CANDLES MAY NOT BE DEEMED NECESSARY.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.5.4.C

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0326
 FACILITY: RGE

ORIGINATOR: VJF
 PLANT: GINNA

DATE: 4/16/1985

ASSESSMENT CATEGORY 3
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

ON THE TOP LEVEL SAS DISPLAYS, PARAMETERS DISPLAYED WITH A NUMERIC DIGITAL VALUE (E.G. CORE EXIT TEMPERATURE, CORE SUBCOOLING, TOP OF HEAD SUBCOOLING, CONTAINMENT RADIATION, SECONDARY RADIATION, AND CONTAINMENT RADIATION) ARE NOT PROVIDED WITH INDICATION OF THE ACCEPTABLE VALUES OVER WHICH THESE PARAMETERS CAN RANGE. THEREFORE, INTERPRETATION OF THE PROXIMITY OF THESE VALUES TO THEIR ALARM SETPOINTS IS DEPENDENT UPON OPERATORS' MEMORY.

COMMENTS

OPERATORS CAN CALL UP SECONDARY TREND GRAPH DISPLAYS WHICH PROVIDE THE MAGNITUDE RANGE OF THESE PARAMETERS; HOWEVER, SETPOINTS ARE NOT PROVIDED ON THESE GRAPHS EITHER. THE IMPORTANCE OF PROVIDING THE OPERATORS WITH RANGE AND SETPOINT INFORMATION FOR THESE PARAMETERS MUST BE WEIGHED AGAINST THE DISADVANTAGES OF CLUTTERING THE SCREEN WITH ADDITIONAL INFORMATION.

RESPONSE

THESE CONCERNS WERE CONSIDERED. HOWEVER, THE DESIRE TO MAINTAIN A CLEAN, EASY TO READ DISPLAY NECESSITATE KEEPING THE APPROACH TAKEN.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PDS REVIEW
 PDS REVIEW

4.4.3.B.2
 4.4.4.A.1

PANEL EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

SAS

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: VJF
PLANT: GINNA

DATE: 4/16/1985

ED NUMBER: 0327
ILITY: RGE

ASSESSMENT CATEGORY 3
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

DATE AND TIME ARE NOT CONSISTENTLY LOCATED ON ALL SAS DISPLAYS. ON THE NORMAL OPERATION AND HEAT UP/COOLDOWN TOP LEVEL DISPLAYS, AS WELL AS THE AIDS DISPLAYS, THE DATE AND TIME ARE LOCATED IN THE LEFT CENTRAL REGION OF THE DISPLAY PAGE. ON ALL OTHER DISPLAYS, THE DATE AND TIME ARE SHOWN IN THE LOWER LEFT HAND CORNER OF THE SCREEN. IT IS NOT APPARENT ON THE PROPOSED SSRM AND CSF DISPLAYS WHERE THE DATE AND TIME WILL BE LOCATED.

COMMENTS

THE UPDATING OF THE TIME ON THESE DISPLAYS ACTS AS A "PULSE" THAT CONFIRMS THAT THE COMPUTER IS OPERATING NORMALLY. INCONSISTENCY IN THE PLACEMENT OF THIS INFORMATION MAY DELAY THE OPERATORS IN DETERMINING COMPUTER SYSTEM STATUS.

RESPONSE

THE DISCREPANCY DESCRIPTION IS NOT ENTIRELY CORRECT. ON THE TREND DISPLAYS THE DATE AND TIME IS DISPLAYED IN THE LOWER LEFT CORNER. THIS INCONSISTENCY WAS NECESSARY BECAUSE OF THE DIFFERENCES BETWEEN THE INFORMATION BEING DISPLAYED. IN ANY CASE, IT IS FELT THAT ON ALL DISPLAYS THE DATE AND TIME IS EASILY VIEWED AND IN EVERY CASE, THE DATE AND TIME WILL ALWAYS BE IN ONE OF TWO POSSIBLE AREAS BOTH BEING ON THE LEFT SIDE OF THE DISPLAY.

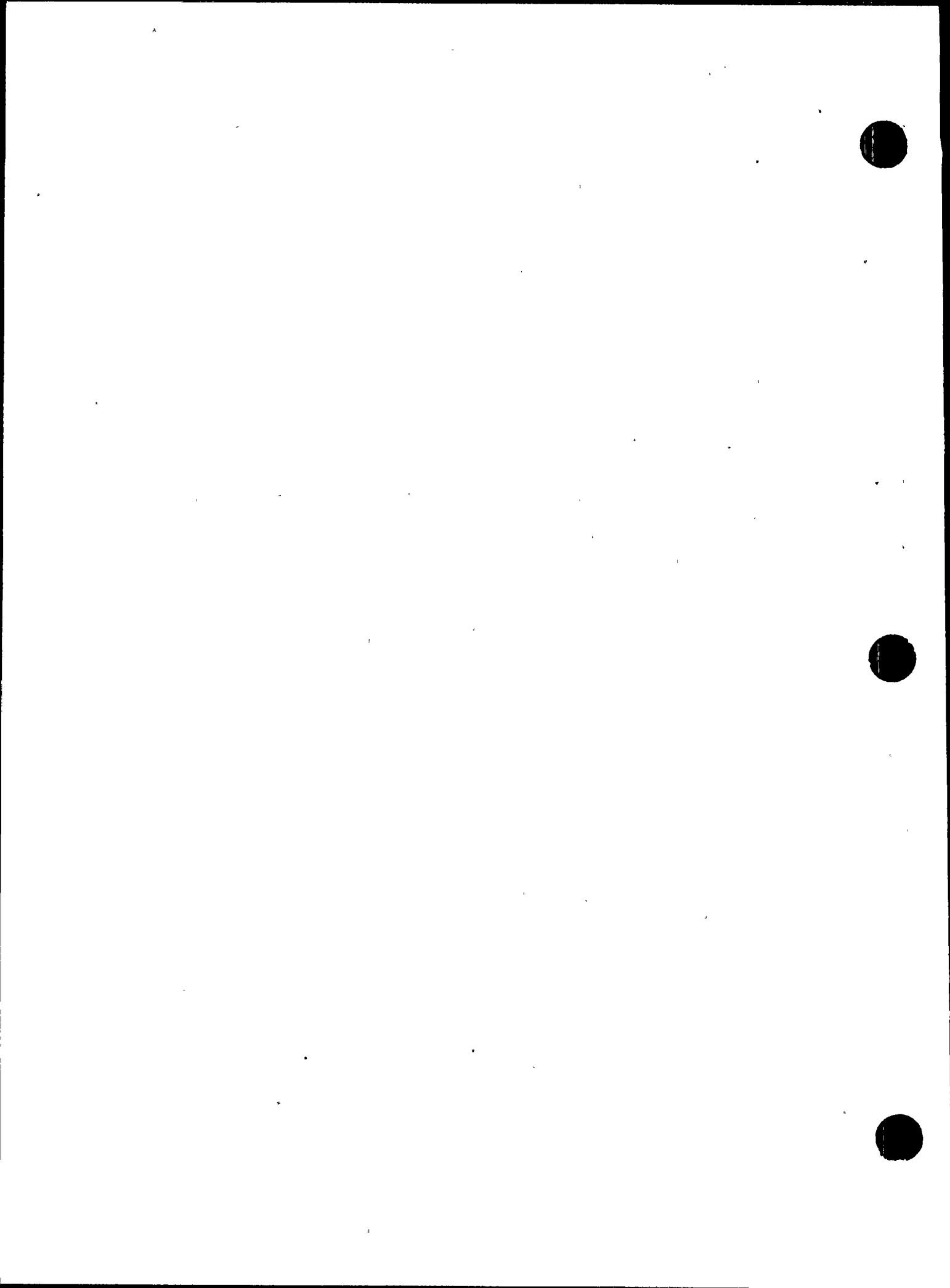
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

SPDS REVIEW

4.7.1.B.2

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	SAS	



#328

This page intentionally left blank.

© 2004 Blackwell Publishing Ltd *Journal of Internal Medicine* 255: 101–108

DATE: 4/16/1985

CATEGORY 3
LEVEL B
RATING Y

Abstract

4.4.3.B.2
7.2.4.E(2)

ANEL	ID NUMBER	NAME	OTHER
------	-----------	------	-------

SAS

#330

This page intentionally left blank.



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0331
TILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 4/15/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

CHARACTERS DISPLAYED ON THE CRTS PLANNED FOR THE SAFETY ASSESSMENT SYSTEM ARE COMPOSED OF A 5X7 DOT MATRIX INSTEAD OF A 7X9 MATRIX AS RECOMMENDED BY NUREG-0700.

COMMENTS

FOR THE VIEWING DISTANCES AT WHICH OPERATORS WILL READ THE SAS DISPLAYS, THE 5X7 DOT MATRIX SHOULD PROVIDE SUFFICIENT RESOLUTION. THE CHECKLIST DERIVED FROM NUREG-0835, IN FACT, USES A 5X7 DOT MATRIX AS AN ACCEPTABLE CRITERIA.

RESPONSE

THE SAFETY ASSESSMENT SYSTEM WILL USE THE MODEL 7900 CHROMATICS COLOR-GRAPHIC CRT WHICH IS A HIGH RESOLUTION CRT. THIS IS SUFFICIENT FOR MONITORING PURPOSES.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

SPDS REVIEW

7.2.2.6(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		SAS	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0332
ILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 4/16/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

ABBREVIATIONS ARE NOT USED CONSISTENTLY ON SOME OF THE PROPOSED TREND GRAPH AND SSRM DISPLAY. ON THE TANK LEVEL TREND GRAPH DISPLAY, ONE BAR GRAPH LABEL IS ABBREVIATED RWST (REFUELING WATER STORAGE TANK) WHILE AN ADJACENT GRAPH LABEL IS NOT ABBREVIATED (CONDENSATE STORAGE TANK). ON MANY OF THE SSRM DISPLAYS (SAFETY INJECTION SYSTEM, DIESEL GENERATOR SYSTEMS, 480 VOLT POWER, COMPONENT AND COOLING, CONTAINMENT AIR RECIRC AND AUXILIARY FEEDWATER) ABBREVIATIONS COULD BE USED TO MINIMIZE SCREEN DENSITY AS WELL AS PROVIDE COSISTENCY BETWEEN SAS DISPLAYS, PPCS DISPLAYS AND PANEL LABELS.

COMMENTS

RESPONSE

THE ABBREVIATION FOR REFUELING WATER STORAGE TANK (RWST) WAS UNAVOIDABLE BECAUSE THE COMPLETE NAME SIMPLY WOULD NOT FIT. AS A GENERAL RULE, SAS AVOIDED THE USE OF ABBREVIATIONS UNLESS THEY WERE ACCEPTED ABBREVIATIONS IN DAY-TO-DAY USE BY THE OPERATORS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

BPDS REVIEW

7.1.2.C(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0333
 UTILITY: RGE

ORIGINATOR: VJF
 PLANT: GINNA

DATE: 4/15/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

ON THE PROPOSED AIDS SECONDARY DISPLAYS FOR THE SAS, THE LIST OF PARAMETERS ASSESSED ARE NOT LEFT-JUSTIFIED. THIS OCCURS ON 3 DISPLAYS; LOCA, SGTs, AND LOsc. THE READABILITY OF ALPHANUMERIC LISTS IS ENHANCED BY LEFT-JUSTIFICATION.

COMMENTS

ESP

RIGHT-JUSTIFYING THESE LISTS WOULD ENHANCE THE READABILITY OF THE DISPLAYS. NO CHANGE APPEARS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

SPDS REVIEW

7.2.4.6(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0334
 ID NUMBER: RGE

ORIGINATOR: VJF
 PLANT: GINNA

DATE: 4/16/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

UNIT LABELS ARE NOT DISPLAYED IN A CONSISTANT MANNER ON THE TOP LEVEL, AIDS AND TREND GRAPH DISPLAYS. ON SOME OF THE PROPOSED DISPLAYS, UNIT LABELS ARE DISPLAYED IN ALL UPPERCASE LETTERS, WHILE ON OTHER DISPLAYS, THE UNIT LABELS ARE IN UPPER AND LOWER CASE LETTERS. ALSO, TEMPERATURE UNITS ARE LISTED AS F RATHER THAN DEG F. PRESENTING UNITS CONSISTENTLY IN ALL UPPERCASE LETTERS, AND WITH TEMPERATURE DESIGNATED AS DEG F, WOULD ENHANCE THE READABILITY OF THE DISPLAYS.

COMMENTS

RESPONSE

SAS DISPLAYS WILL BE MODIFIED SO THAT ALL UNITS ARE EXPRESSED WITH CAPITAL LETTERS. THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PDS REVIEW

7.2.4.E(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		SAS	

#335

This page intentionally left blank.

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0336
UTILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 4/16/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING X

DESCRIPTION OF DISCREPANCY

ON THE SECONDARY TREND GRAPH DISPLAYS, THE FIRST TREND GRAPH SELECTED IS PRESENTED ON THE BOTTOM HALF OF THE DISPLAY PAGE. THE TOP HALF REMAINS BLANK, SO THAT THE OPERATOR CAN CALL UP AN ADDITIONAL DISPLAY FOR COMPARISON. POPULATION STEREOTYPES DICTATE THAT INFORMATION SHOULD BE DISPLAYED IN A LEFT TO RIGHT, TOP TO BOTTOM SEQUENCE.

COMMENTS

RESPONSE

ORIGINALLY THERE WAS A REASON FOR DISPLAYING THE TRENDS ON THE BOTTOM. AS A RESULT OF THE EVOLUTION OF SAS THIS REASON IS NO LONGER VALID. THEREFORE, SAS WILL BE CHANGED SO THAT THE FIRST TREND APPEARS ON THE TOP. THIS WILL BE IMPLEMENTED BY THE END OF JUNE, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

SPDIS REVIEW

7.2.5.A(1)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		SAS	
		SAS	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0337
 ILITY: RGE

ORIGINATOR: VJF
 PLANT: GINNA

DATE: 4/16/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE PLACEMENT OF THE UNITS FOR THE BAR GRAPHS ON THE SECONDARY TREND GRAPH DISPLAYS ARE NOT CONSISTENTLY LOCATED. SOME GRAPHS SHOW THE UNITS ABOVE THE BAR GRAPH LABEL, OTHER GRAPHS (INCLUDING SOME ON THE SAME DISPLAYS) SHOW THE UNITS BELOW THE LABEL. ON OTHERS, THE UNITS ARE ADJACENT TO THE DIGITAL READOUT OF THE PARAMETER VALUE, WHILE ON STILL OTHERS, ONE UNIT PERTAINS TO ALL BAR GRAPHS. CONSISTENT PLACEMENT OF THE UNITS WILL MINIMIZE OPERATOR SEARCH TIME AND POSSIBLE CONFUSION.

COMMENTS

IT IS RECOMMENDED THAT UNITS BE CONSISTENTLY PLACED ON ALL BAR GRAPHS DISPLAYED ON THE SECONDARY TREND GRAPH DISPLAYS. ALSO UNIT LABELS SHOULD ALL BE THE SAME HEIGHT.

RESPONSE

THE PRIMARY CRITERION FOR THE TREND DISPLAYS WAS TO MAKE THEM AS EASY TO READ AS POSSIBLE. AS A RESULT, DUPLICATION OF INFORMATION WAS AVOIDED. THE RECOMMENDATION, FOR THE SAKE OF CONSISTENCY, WOULD INTRODUCE SUCH DUPLICATION AND UNNECESSARILY PUT MORE INFORMATION ON THE DISPLAY MAKING IT MORE DIFFICULT TO VIEW.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

SPDS REVIEW
 SPDS REVIEW

7.2.4.N
 7.2.4.E(2)

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

SAS

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0338
ILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 4/19/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

SOME OF THE SSRM DISPLAYS APPEAR TO BE OVERLY DENSE AND CLUTTERED. THE NUMBER OF ILLUMINATED PIXELS APPEARS TO BE GREATER THAN THE RECOMMENDED MAXIMUM OF 25% OF THE TOTAL AVAILABLE PIXELS (E.G. 125 VOLT D.C., CONTAINMENT ISOLATION RESET, STATION SERVICE WATER, SAFETY INJECTION SYSTEM, AND DIESEL GENERATOR SYSTEMS DISPLAYS).

COMMENTS

CONSIDERATION SHOULD BE GIVEN TO SEPARATING THE DC PANEL 1A AND DC PANEL 1B INFORMATION ON THE 125 VOLT DC DISPLAY INTO TWO DISPLAY PAGES, AND TO SEPARATING THE A-TRAIN PANEL AND THE B-TRAIN PANEL INFORMATION ON THE CONTAINMENT ISOLATION RESET PUSHBUTTON PANEL ONTO TWO DISPLAY PAGES. THE SAFETY INJECTION SYSTEM, DIESEL GENERATOR SYSTEM, AND SERVICE WATER DISPLAYS ARE MIMICS AND THE PROBLEM COULD BE REDUCED BY ABBREVIATING ALL THE LABELS IN A CONSISTENT MANNER (SEE GUIDELINE 7.1.2.C(1)).

RESPONSE

THESE P&ID AND SINGLE LINE DISPLAYS HAVE ALREADY UNDERGONE CONSIDERABLE SIMPLIFICATION FROM THE EXISTING DRAWINGS THAT THEY WERE DERIVED FROM. THE CONCERN IS THAT FURTHER SIMPLIFICATION MAY MAKE THE DISPLAYS OF LITTLE VALUE TO OPERATIONS PERSONNEL.

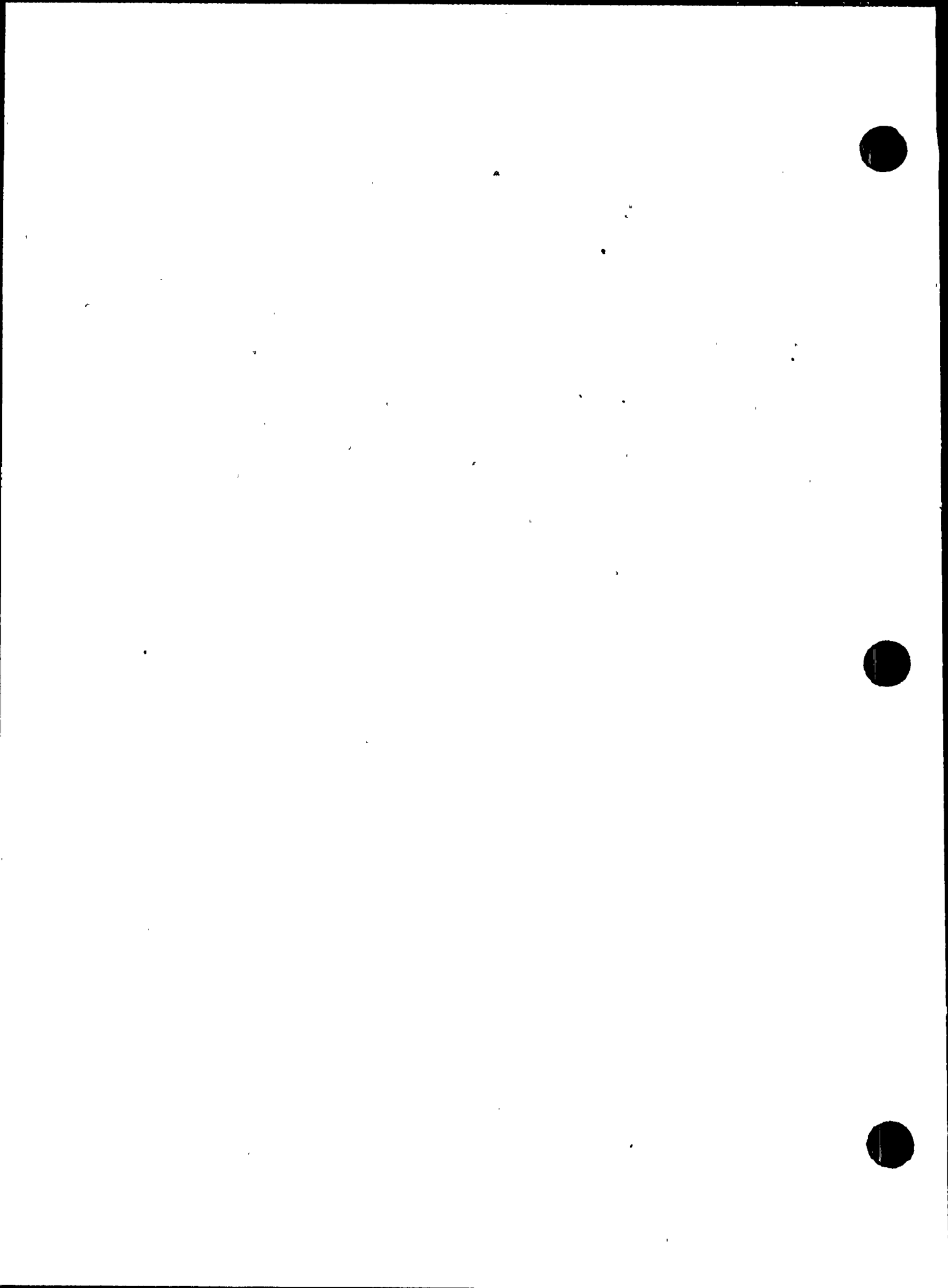
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PDS REVIEW

7.2.5.M

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		SAS	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0339
ILITY: RGE

ORIGINATOR: VJF
PLANT: GINNA

DATE: 4/16/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE MANNER IN WHICH LOGARITHMIC SCALE VALUES ARE DISPLAYED ON TWO TREND GRAPH DISPLAYS ARE INCONSISTENT WITH EACH OTHER. ON ONE DISPLAY (NUCLEAR INSTRUMENT), LOGARITHMIC SCALE VALUES ARE SHOWN IN EXPONENTIAL FORM, WHILE ON THE OTHER DISPLAY (CONTAINMENT (LPR)), LOGARITHMIC SCALE VALUES ARE SHOWN IN ABSOLUTE FORM.

COMMENTS

RESPONSE

THE VALUES ARE DISPLAYED SO THAT THEY ARE CONSISTENT WITH EXISTING CONTROL ROOM INDICATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PDS REVIEW

7.2.4.E(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

#340

This page intentionally left blank.

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0341
 UTILITY: RGE

ORIGINATOR: VJF
 PLANT: GINNA

DATE: 4/16/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE FOLLOWING ALPHANUMERIC LISTS OF ITEMS ARE DISPLAYED WITHOUT AN APPARENT LOGICAL OR FUNCTIONAL GROUPING OF THE ITEMS: THE LIST OF DISPLAY PAGES ON THE SSRM SUMMARY PAGE, THE LIST OF BUS LINES ON THE 125 VOLT DC DISPLAY PAGE, THE LIST OF PARAMETERS ON THE AIDS DISPLAYS. APPROPRIATE GROUPING OF ITEMS WILL INCREASE THE SPEED AND ACCURACY WITH WHICH OPERATORS CAN USE THESE DISPLAYS.

COMMENTS

THE SSRM SUMMARY PAGE SHOULD BE LOGICALLY ARRANGED (E.G. BY FREQUENCY OF USE); THE BUS LINES ON THE 125 VOLT DC DISPLAY SHOULD BE ORGANIZED IN A SEQUENCE THAT IS MEANINGFUL TO THE OPERATORS (E.G. TO SCHEMATICALLY REFLECT THE ORDER IN WHICH THE LINES TIE INTO THE BUS IN THE PLANT); THE AIDS PARAMETERS SHOULD BE FUNCTIONALLY GROUPED. INSERTING A BLANK LINE AFTER EVERY FIVE LINES OF AN ARBITRARY LIST IS ANOTHER TECHNIQUE FOR ENHANCING READABILITY.

RESPONSE

THE ORDERING OF PARAMETERS IS EITHER BY ORDER OF IMPORTANCE (AIDS) OR TO BE CONSISTENT WITH EXISTING P&ID DRAWINGS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

SPDS REVIEW
 SPDS REVIEW

7.3.3.C(1)
 7.2.4.D

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

SAS

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0342
 UTILITY: RGE

ORIGINATOR: VJF
 PLANT: GINNA

DATE: 4/16/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

ON SOME OF THE SSRM MIMIC PAGES, THE ADDITION OF ARROWS TO INDICATE DIRECTION OF FLOW WOULD INCREASE OPERATOR ABILITY TO INTERPRET SYSTEM STATUS, AND REDUCE CONFUSION BETWEEN THE LINES WHICH DESIGNATE FLOW AND THOSE WHICH REPRESENT EQUIPMENT OR BOUNDARY LINES WHICH DELINEATE ONE MIMIC FROM ANOTHER.

COMMENTS

ESF

INITIALLY, THE SSRM DISPLAYS WILL BE COMPLETELY STATIC. THAT IS, THERE WILL NOT BE ANY DYNAMIC CHANGES TO THE DISPLAY TO INDICATE PUMP, BREAKER OR VALVE STATUS. THEREFORE, IT IS NOT ADVISABLE TO INDICATE ANY PARTICULAR FLOW PATH SINCE IT COULD DIFFER FROM THE ACTUAL PLANT CONFIGURATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PDS REVIEW

7.2.7.6

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		SAS	

#343

This page intentionally left blank.

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0344
UTILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/16/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

RELATED DISPLAY LOCATION --- THE ANNUNCIATOR FOR BUS
11,12,13,16,14,17,15,18 UNDERVOLT ARE NOT IN AN ORDER FOR EASY
IDENTIFICATION.

COMMENTS

RESPONSE

THESE DISPLAYS ARE NOT FUNCTIONALLY RELATED. A CHANGE WOULD NOT
ACCOMPLISH A SIGNIFICANT IMPROVEMENT.

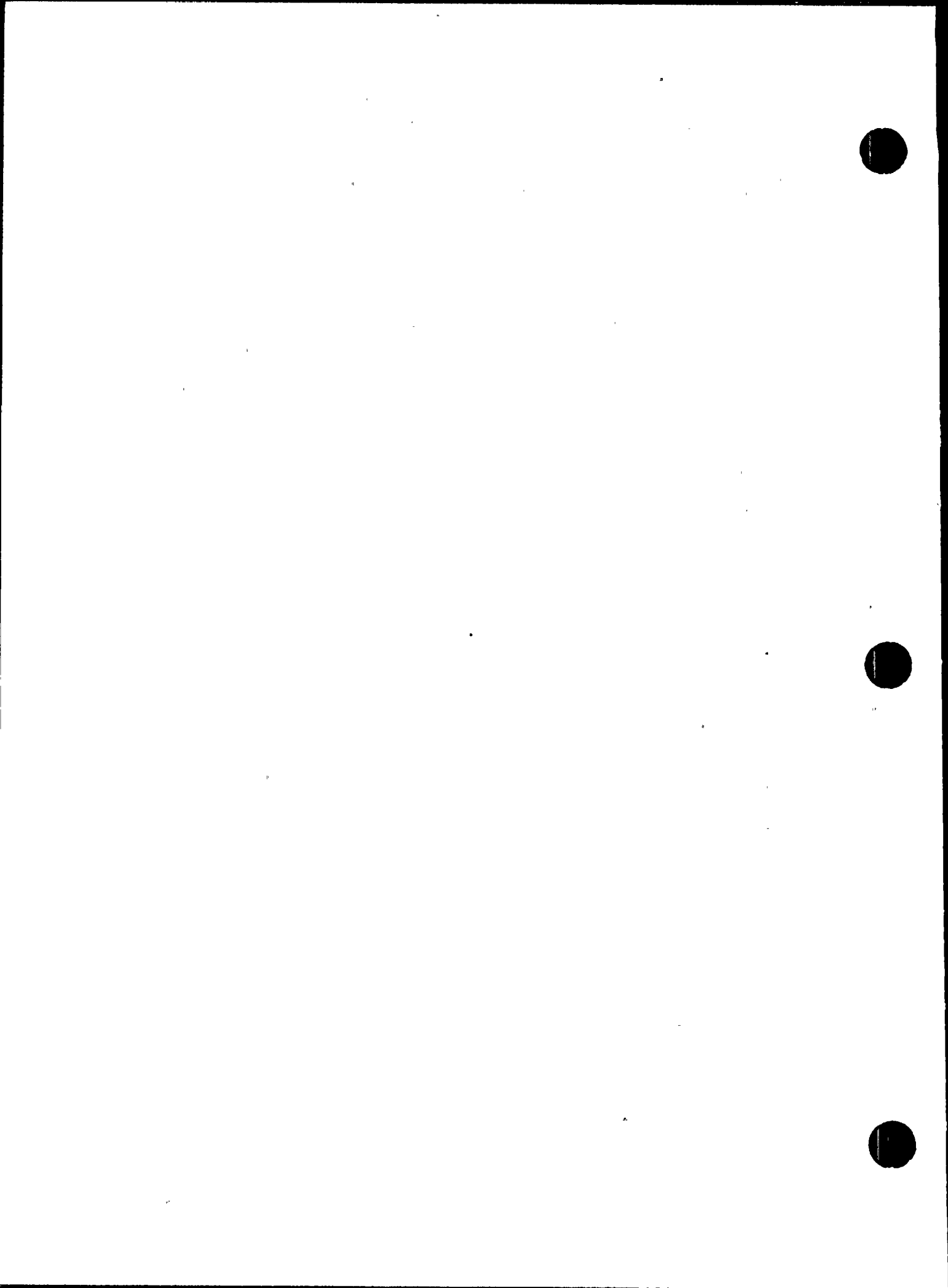
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

157.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		BUS 11 UNDERVOLT	
		BUS 12 UNDERVOLT	
		BUS 14 UNDERVOLT	
		BUS 16 UNDERVOLT	
		BUS 17 UNDERVOLT	
	4-16	BUS 13 UNDERVOLT	
	4-36	BUS 15 UNDERVOLT	
	4-36	BUS 15 UNDERVOLT	
	4-36	BUS 18 UNDERVOLT	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0345
 TILITY: RGE

ORIGINATOR: DFT
 PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

CHARGING FLOW AND PRESSURE NEEDED FOR FEEDBACK FOR TASK 11 ARE LOCATED ON PANEL 7 WHILE THE CHARGING PUMPS AND CONTROLLERS ARE LOCATED ON PANEL 6. TASK GROUPING IS NOT APPROPRIATE.

COMMENTS

RESPONSE

THE FIX FOR THESE HEDS IS TO INSTALL AT LEAST ONE FLOW METER AND A REPEATER OF LETDOWN FLOW ON PANEL 6 (POSSIBLY WHERE T AVG USED TO BE LOCATED). LOCATION OF THESE INDICATIONS ON PANEL 6 WOULD PROVIDE BETTER CONTROL DISPLAY RELATIONSHIP FOR THE CVCS SYSTEM AND ALSO WOULD PROVIDE CHARGING/LETDOWN DIFFERETIAL ON PANEL 6 WHERE THE MAJORITY OF RCS INDICATION IS LOCATED. THIS WOULD BE HELPFUL DURING RCS LEACK INVESTGATION AS IT WOULD PROVIDE SOME INMDICATION OF RCS LEAKRATE WHEN USED IN CONJUNCTION WITH PRZR LEVEL TREND. THE CONTROL BOARD LABELING AND ENHANCEMENT PACKAGE SHOULD ALSO ADDRESS THIS CONTROL DISPLAY PROBLEM. SEE HED 84,309,310,345,451. BACKGROUND SHADING TO DEMONSTRATE FUNCTIONAL RELATIONSHIPS WILL BE IMPLEMENTED BY THE END OF THE 1987 REFUELING OUTAGE. METERS WILL BE INSTALLED BY SPRING 1988.

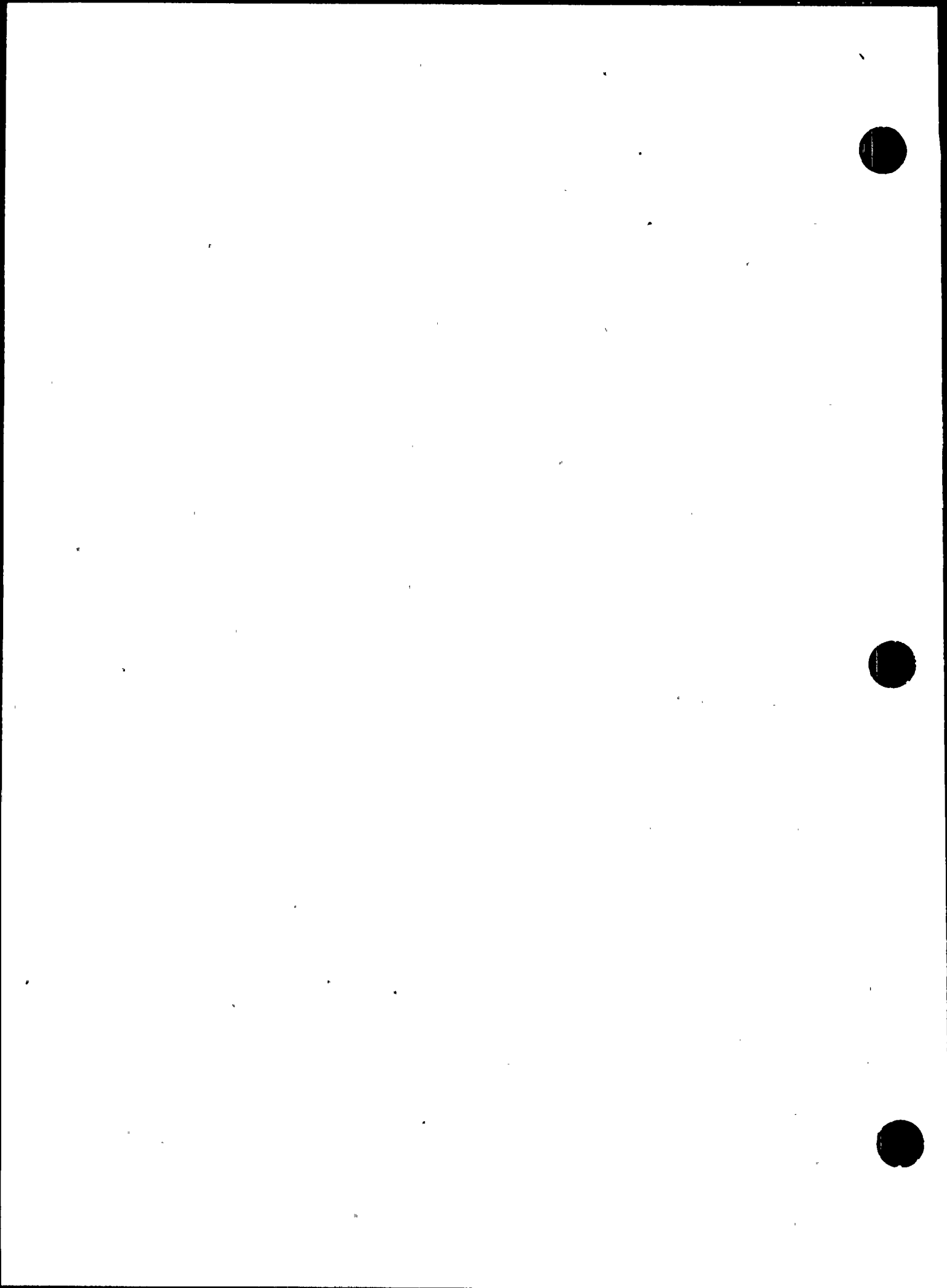
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

TASK #11

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	199	CHARGING PUMP	
	200	CHARGING PUMP	
	201	CHARGING PUMP	
	269	CHARGING PUMP SPEED CONTROLLER	
	270	CHARGING PUMP SPEED CONTROLLER	
	271	CHARGING PUMP SPEED CONTROLLER	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0346
ILITY: RGE

ORIGINATOR:
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

POOR TASK GROUPING --- THE CONTROL AIR PRESSURE IS LOCATED ON PANEL 6 WHILE THE AIR COMPRESSION CONTROLS ARE LOCATED ON PANEL 8, AND THE INSTRUMENT AIR TO CONTAINMENT ISOLATION VALVES ARE LOCATED ON PANEL 7. THESE ARE ALL NEEDED TO VERIFY CHARGING FLOW.

COMMENTS

ESF

THIS HED STATES THAT INSTRUMENT AIR CONTROLS AND INDICATIONS ON PANELS 6,7,& 8 ARE REQUIRED TO VERIFY CHARGING FLOW. THIS IS NOT REALLY TRUE. ALL THAT IS REQUIRED IS TO CHECK INSTRUMENT AIR PRESSURE AVAILABLE. THE INSTRUMENT AIR COMPRESSOR CONTROLS ON PANEL 8 ARE A LAST RESORT METHOD FOR STARTING COMPRESSORS IF THE STANDBY COMPRESSOR FAILS TO START IN AUTO. THIS IS NOT A CRITICAL GROUPING AND THE COMPRESSOR CONTROLS SHOULD REMAIN ON PANEL 8.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

TASK #12

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	69	CONTROL AIR PRESSURE	
	191	INSTR AIR TO CONT ISOL VLV	
	67	AIR COMPRESSION CONTROLS	
	68	AIR COMPRESSION CONTROLS	
	87	AIR COMPRESSION CONTROLS	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0347
TILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

UNAVAILABLE INFORMATION --- CONTAINMENT SPRAY FLOW CAN BE
UNAVAILABLE WHEN THE DISCHARGE VALVES FROM RHR TO SUCTION OF
SPRAY AND SI PUMP ARE CLOSED (THIS IS A NORMAL LINEUP ON RECIRC).

COMMENTS

RESPONSE

THIS HED RESULTED FROM A MISUNDERSTANDING DURING THE VALIDATION
PROCESS AND THE FACT THAT THE RHR FLOW INDICATION TO THE SUCTION
OF THE CONTAINMENT SPRAY AND SAFETY INJECTION PUMPS DURING HIGH
HEAD SAFETY INJECTION WAS MISLABELED. THE LABELING OF THIS
INDICATION WILL BE CORRECTED BY MAY, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

19.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0348
TILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE LISTED COMPONENTS ARE ORDERED TOP-TO-BOTTOM.

COMMENTS

TASK GROUPING/ORDER --- THE NORMAL CONVENTION FOR ORDER OF
RELATED OR COMMON COMPONENTS IS FROM LEFT-TO-RIGHT.

RESPONSE

WHILE HORIZONTAL LABELING IS PREFERABLE, VERTICAL ARRANGEMENTS
ARE ACCEPTABLE WHEN SPACE LIMITATIONS EXIST. IN THESE CASES,
LABELS ARE MOST EASILY READ FROM TOP-TO-BOTTOM. IN ADDITION,
BACKGROUND SHADING TECHNIQUES WILL BE USED IN THE CONTROL ROOM TO
GROUP INSTRUMENTS AND CONTROLS BY FUNCTION, THEREBY ENHANCING
READABILITY AND USE OF THE COMPONENTS. THE SHADING PROGRAM WILL
BE IMPLEMENTED BY THE END OF THE REFUELING OUTAGE 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION
VALIDATION

33.0
64.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		RHR DISCHG TO RV	
		RHR DISCHG TO RV	
	244	LETDOWN ORIFACE ISOL VLV	
	268	LETDOWN ORIFACE ISOL VLV	
	293	LETDOWN ORIFACE ISOL VLV	
	324	RCP THERMAL BARRIER CCW RET ISOL VLV	
	325	RCP THERMAL BARRIER CCW RET ISOL VLV	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0349
 ILITY: RGE

ORIGINATOR: DFT
 PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

TASK GROUPING --- THE MAKEUP CONTROLS ARE LOCATED ON PANEL 7, WHILE
 THE MAKEUP CONTROLLERS ARE LOCATED ON PANEL 6.

COMMENTS

RESPONSE

THE FLOW PUMP AND BA PUMP CONTROL SWITCHES ARE NOT NORMALLY USED
 WHEN USING THE REACTOR MAKEUP CONTROLS ON PANEL 6. THE MAKEUP
 SYSTEM VALVES ON PANEL 7 ARE AT THE RIGHT END OF PANEL 7 AND ARE
 IN PROXIMITY TO THE MAKEUP CONTROLS ON PANEL 6. APPLICATION OF
 SOME SHADING TECHNIQUES, WHICH WILL BE ADDRESSED IN THE CONTROL
 BOARD POINT AND LABEL PROGRAM, WILL ALLEVIATE THE CONCERNS OF
 THIS DEFICIENCY. THIS WILL BE IMPLEMENTED BY THE END OF THE
 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

269.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	273	BORIC ACID FLOW	
	208	MAKEUP WTR PUMP	
	209	MAKEUP WTR PUMP	
	272	HCV-111	
	287	MAKEUP BLENDER TO CHG PUMP	
	289	MAKEUP WTR TO BLENDER	

HUMAN ENGINEERING DISCREPANCY -----

ID NUMBER: 0350
FILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY -----

PROCEDURE REFERS TO PLACING SWITCHES IN FULL-TO-LOCK WHEREAS THE EQUIPMENT ESCUTCHEONS ARE LABELED "FULL OUT".

COMMENTS -----

CONSISTENT NOMENCLATURE.

RESPONSE -----

TASK ASSIGNMENT OPS 85-84 ADDRESSES THE CONCERN OF THIS HED. NEW ESCUTCHEON PLATES WILL BE INSTALLED WHICH WILL UTILIZE NOMENCLATURE CONSISTENT WITH PROCEDURES. THERE IS ALSO AN ONGOING 2 1/2 YEAR REVIEW OF PROCEDURES WHICH WILL ENSURE CONSISTENCY AS WELL AS A REGULAR TRAINING SCHEDULE. THIS WILL BE IMPLEMENTED BY SPRING 1987.

SOURCE OF DISCREPANCY -----

EXPLANATORY INFORMATION -----

VALIDATION

255.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0351
 TILITY: RGE

ORIGINATOR: DFT
 PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE PROCEDURE REFERS TO PLACING SWITCHES IN "STANDBY", WHEREAS ACTUAL
 ESCUTCHEONS POSITION REFERRED TO IS "AUTO".

COMMENTS

CONSISTENT NOMENCLATURE.

RESPONSE

TASK ASSIGNMENT OPS 85-84 ADDRESSES THE CONCERN OF THIS HED. NEW
 ESCUTCHEON PLATES WILL BE INSTALLED WHICH WILL UTILIZE
 NOMEMCLATURE CONSISTENT WITH PROCEDURES. THER IS ALSO AN ONGOING
 2 1/2 YEAR REVIEW OF PROCEDURES WHICH WILL ENSURE CONSISTENCY AS
 WELL AS A REGULAR TRAINING SCHEDULE. THIS WILL BE IMPLEMENTED
 BY SPRING 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

257.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0352
 TILITY: RGE

ORIGINATOR: DFT
 PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

EOP REFERS TO RECIRCULATION FLOW WHEREAS THE INSTRUMENT REFERRED
 TO IS LABELED RHR FLOW.

COMMENTS

CONSISTENT NOMENCLATURE.

RESPONSE

THE RHR RECIRCULATION FLOW METER WILL BE PROPERLY LABELED AS
 SUCH. THIS WILL BE IMPLEMENTED BY 4-1-87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

221.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	134	RECIRC FLOW	

HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0353
 UTILITY: RGE

ORIGINATOR: DFT
 PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

THE COMPONENT COOLING TO RHR HX CANNOT BE ADJUSTED. THESE CAN ONLY BE OPENED OR CLOSED.

COMMENTS

CONTROL USABILITY/TYPE

RESPONSE

FOR SEVERAL DESIGN BASES ACCIDENTS, ANALYSES ARE BASED UPON THE COOLING RATE OF THE RHR HEAT EXCHANGERS UTILIZING MAXIMUM COMPONENT COOLING WATER FLOW AS THE COOLING MEDIUM. TO INSTALL MODULATION VALVES IN THE COOLANT STREAM FOR THE RHR SYSTEM COULD RESTRICT COOLANT MEDIUM FLOW IN THE EVENT OF A VALVE FAILURE AT LESS THAN 100% OPEN. ALTHOUGH IT IS RECOGNIZED THAT MANUAL MANIPULATION OF THESE VALVES DURING COOLDOWN OF THE PLANT IS INCONVENIENT, ACCIDENT CONSIDERATIONS PRECLUDE THE CHANGE OUT OF THESE VALVES FOR OPERATORS CONVENIENCE AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

162.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	294	COMPONENT COOLING TO RHR HX	
	295	COMPONENT COOLING TO RHR HX	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0354
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

THE PORV OUTLET TEMP AND PRZR SAFETY VLV OUTLET TEMP METERS ARE
SEPARATED BY PRZR SPRAY TEMP AND PRZR VAPOR AND LIQUID TEMP
METERS.

COMMENTS

RELATED DISPLAY LOCATION.

RESPONSE

THIS DEFICIENCY WAS DISCUSSED WITH SEVERAL OF THE CONTROL ROOM
OPERATORS. THE GENERAL CONSENSUS WAS THAT THE CURRENT LOCATION
IS DESIRABLE BECAUSE IT SEPARATES THE SAFETY VALVE TEMPERATURE
FROM THE PORV TEMPERATURE WHICH MAKES IT EASIER TO DISTINGUISH
BETWEEN THE TWO INDICATIONS. NO CHANGE IS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

B3.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	15	PORV OUTLET TEMP	
	8	PRZR SAFETY VLV OUTLET TEMP	
	9	PRZR SAFETY VLV OUTLET TEMP	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0355
TILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE LETDOWN LOOP B COLD LEG TO REGEN HX AOV 427 IS LOCATED ON
PANEL 6 WHILE OTHER RELATED LETDOWN CONTROLS AND INSTRUMENTATION
ARE LOCATED ON PANEL 7.

COMMENTS

TASK GROUPING.

ESP

THE SWITCH FOR THE LETDOWN ISOLATION VALVE FROM B COLD LEG, AOV-
427, WILL REMAIN IN ITS PRESENT LOCATION. RELOCATING IT TO PANEL
5 WITH OTHER LETDOWN VALVES WOULD REQUIRE RELOCATION OF MANY
OTHER CONTROLS. THIS COULD RESULT IN EXCESSIVE CONFUSION AS
EXPERIENCED OPERATORS WOULD HAVE TO RELEARN THE LOCATIONS OF MANY
CONTROLS ON THE LEFT END OF PANEL 7. AOV-427 IS NORMALLY
OPERATED IN AUTOMATIC AND OPERATORS ARE PRESENTLY AWARE OF ITS
LOCATION.

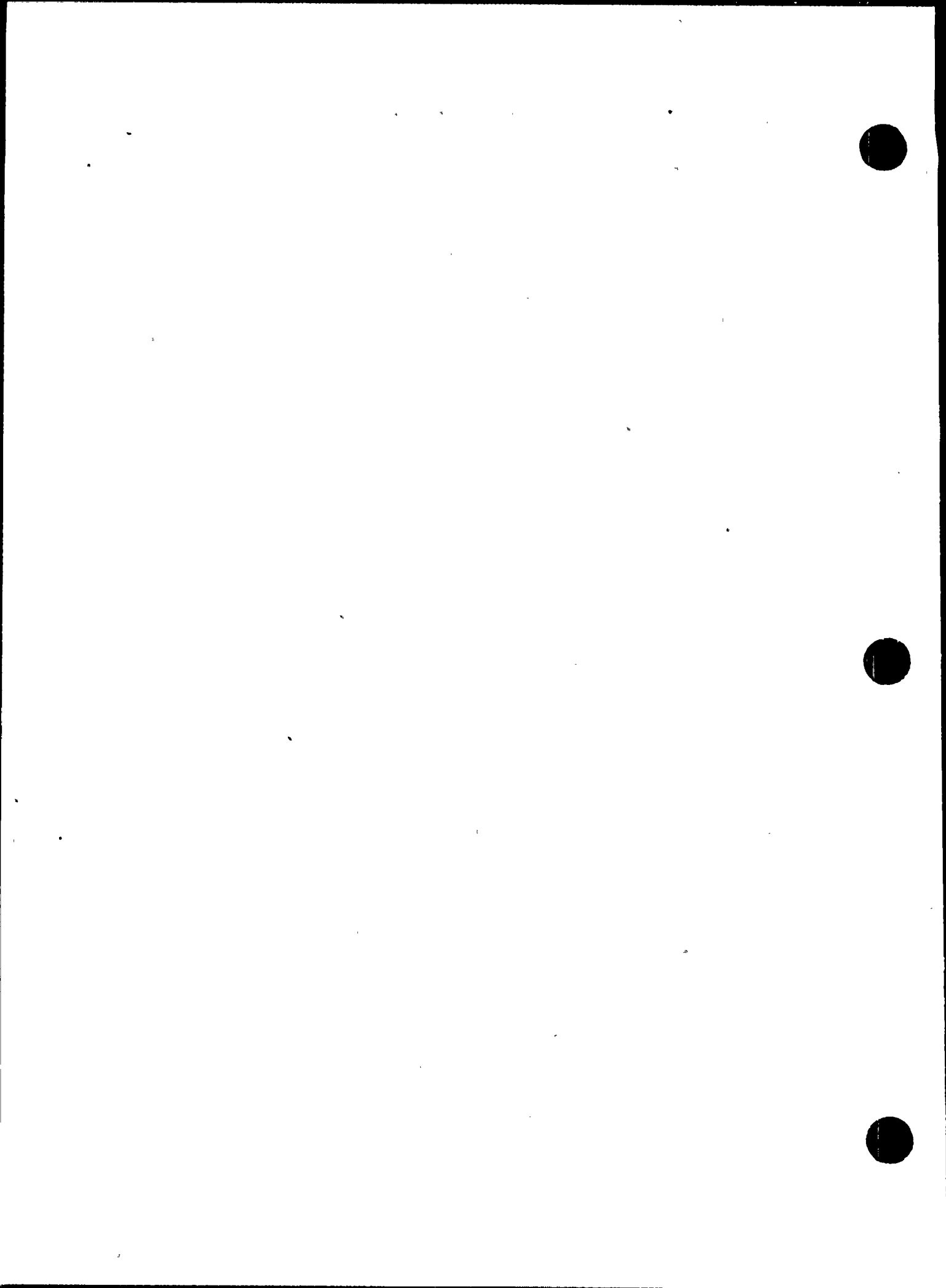
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

B1.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	244	LETDOWN LOOP B COLD LEG TO REGEN HX	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0356
 TILITY: RGE

ORIGINATOR: DFT
 PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE ANNUNCIATOR FOR "SOURCE RANGE LOSS OF DETECTOR VOLTAGE" IS
 CONSTANTLY ON DURING NORMAL OPERATIONS.

COMMENTS

RESPONSE

FURTHER EVALUATION HAS DETERMINED THAT THIS IS NOT A NUISANCE
 ALARM. IT PROVIDES VALUABLE INFORMATION TO THE OPERATORS DURING
 START UP. NO CHANGE HAS BEEN RECOMMENDED.

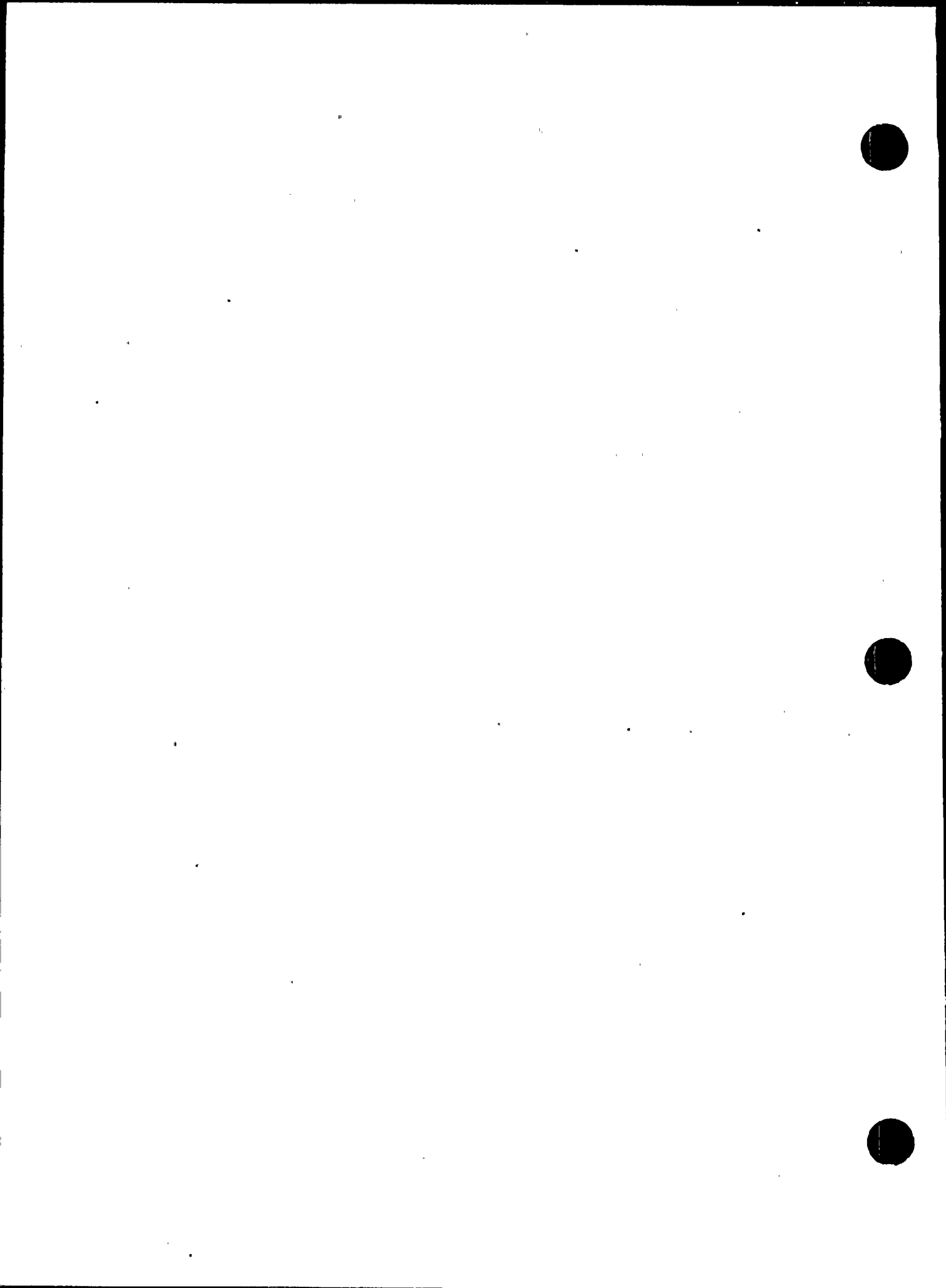
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

32.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	1-12	SOURCE RANGE LOSS OF DETECTOR VOL	



HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0357
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

SUMP LEVEL ANNUNCIATORS ARE LOCATED ON PANEL 7 WHILE MOST SUMP LEVELS ARE LOCATED ON PANEL 25.

COMMENTS

TASK GROUPING.

RESPONSE

THE PRIMARY DISPLAY FOR SUMP LEVEL IS "B". SUMP "B" LEVEL IS LOCATED ON PANEL SEVEN, THUS OBVIATING THE NEED FOR THE REST TO BE LOCATED ON A PRIMARY PANEL.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

80.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
		SUMP LEVEL A	
		SUMP LEVEL B	
	4-32	SUMP LEVEL PMP AUTO START	
	4-33	SUMP LEVEL HIGH	
	4-34	SUMP LEVEL HIGH	

HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0358
 UTILITY: RGE

ORIGINATOR: DFT
 PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE RCP UPPER AND LOWER BEARING LUBE OIL LEVEL UTILIZED IN RCP OPERATIONS ARE LOCATED ON PANEL 25 WHILE RELATED RCP CONTROLS AND INSTRUMENTATION ARE LOCATED ON PANEL 7.

COMMENTS

TASK GROUPING.

ESF

ANNUNCIATORS FOUND ON PANEL SEVEN ARE SUFFICIENT TO PROVIDE ADVISORY STATUS IF THERE ARE DIFFICULTIES ASSOCIATED WITH THESE PUMPS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

68.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
5	2	RCP1A UPPER BEARING LUBE OIL LEVEL	
5	2	RCP1B UPPER BEARING LUBE OIL LVL	
5	4	RCP1A LOWER BEARING LUBE OIL LEVEL	
5	5	RCP1B LOWER BEARING LUBE OIL LEVEL	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0359
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE LETDOWN FLOW METER NEEDED FOR FEEDBACK TO CONTROL PRESSURIZER LEVEL IS LOCATED ON PANEL 7 WHILE THE CHARGING PUMPS AND CONTROLLERS USED TO CONTROL LEVEL ARE LOCATED ON PANEL 6.

COMMENTS

TASK GROUPING.

ESF

THE SPECIFIC AMOUNT OF LETDOWN FLOW IS NOT REQUIRED FEEDBACK FOR CONTROLLING PRZR LEVEL. IF LETDOWN IS IN SERVICE IT WILL BE AT A FIXED RATE, AND ALL THAT IS REQUIRED TO CONTROL PRZR LEVEL IS PRZR LEVEL INDICATION CHARGING PUMP SPEED CONTROL, CHARGING FLOW, AND INDICATION OF WHETHER LETDOWN IS IN OR OUT OF SERVICE. PRESENT INDICATION LOCATION IS ADEQUATE FOR THIS TASK.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

48.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	120	LETDOWN FLOW	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0360
TILITY: RGE

ORIGINATOR:
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE BATTERY A CHARGING CURRENT IS LOCATED ON PANEL 25 BUT IS ASSOCIATED WITH 125 V-DC BUS A AND B VOLTMETERS AND AN ANNUNCIATOR "VITAL BATTERY MONITORING SYSTEM" BOTH ON PANEL 5.

COMMENTS

TASK GROUPING.

CONSEQUENCE

THE CONSEQUENCE OF THIS HED IS INSIGNIFICANT SINCE THE ONLY USEFUL INFORMATION FOR PURPOSES OF OPERATION OF THE PLANT IS THE FACT THAT THE BATTERY IS DISCHARGING. THIS CONDITION IS ALARMED AND A QUICK GLANCE AT THE CHARGING METER A SHORT DISTANCE AWAY MERELY CONFIRMS THE FACT. NO CORRECTIVE ACTION IS INTENDED AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASKS 27, 302

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
25	27	BATTERY A CHARGING CURRENT	
25	28	BATTERY B CHARGING CURRENT	

HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0361
 ILITY: RGE

ORIGINATOR: DFT
 PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

THERE IS NO RC PRESSURE LOCATED NEAR THE RV HEAD VALVES.

COMMENTS

TASK GROUPING.

RESPONSE

A REACTOR COOLANT SYSTEM PRESSURE INDICATOR WILL BE INSTALLED
 ON THE REAR OF THE MCB NEAR THE OVER PRESSURIZATION SYSTEM UNDER
 EWR-3067 AND TSR 81-03. SEE HED 110. THIS WILL BE IMPLEMENTED
 BY MAY, 1986.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

23.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----
	162	RV HEAD VENT VLVS	
	163	RV HEAD VENT VLVS	
	167	RV HEAD VENT VLVS	
	168	RV HEAD VENT VLVS	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0362
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE NAOH FLOW METER HAS DUAL INDICATIONS, ONE FOR WATER FLOW (BLACK), AND A SECOND FOR NAOH FLOW (RED). THE INDICATIONS CAN BE CONFUSED WITH ONE ANOTHER.

COMMENTS

METER SUITABILITY.

ESP

SPECIFIC INFORMATION IS NOT GENERALLY REQUIRED FROM THIS METER. RATHER, ACTION OR DEGREE OF CHANGE ARE WHAT OPERATORS UTILIZE. THERE IS NO NEED TO CHANGE THE METER BECAUSE IT CURRENTLY MEETS INFORMATION REQUIREMENTS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

19.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	144	NAOH FLOW	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0363
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

CONTAINMENT PRESSURE A IS PROVIDED IN UNITS OF PSIG WHEREAS THE
UNITS FOR CONTAINMENT PRESSURE B IS IN PSIA.

COMMENTS

RESPONSE

THE PURPOSE OF THE CONTAINMENT PRESSURE INDICATOR B IS TO MEASURE
VACUUM WHICH IS A VERY IMPORTANT PARAMETER IN THAT THE INTEGRITY
OF THE CONTAINMENT STRUCTURE IS MUCH MORE SENSITIVE TO VACUUM
THAN TO PRESSURE. FURTHER, THE EXISTENCE OF A VACUUM CONDITION
IN THE CONTAINMENT IS NOT UNCOMMON.

THE CONTAINMENT PRESSURE A INDICATION IS REQUIRED TO MONITOR
CONTAINMENT PRESSURE UNDER SOME DBA ACCIDENT CONDITIONS.

NO ACTION IS PLANNED FOR THIS HED AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

17.0

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	139	CONTAINMENT PRESSURE 1A	
	140	CONTAINMENT PRESSURE 2A	
	141	CONTAINMENT PRESSURE 3A	
	21	CONTAINMENT PRESSURE 1B	
	22	CONTAINMENT PRESSURE 2B	
	23	CONTAINMENT PRESSURE 3B	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0364
ILITY: RGE

ORIGINATOR: DFT
PLANT: GINNA

DATE: 4/18/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE HYDROGEN SYSTEM ISOLATION VALVES ARE ON PANEL 8 WHILE THE HYDROGEN CONCENTRATION INDICATION IS ON PANEL 26.

COMMENTS

TASK GROUPING

RESPONSE

THE HYDROGEN ANALYZER ISOLATION VALVES AND INDICATION ARE NOT REQUIRED TO BE ON THE SAME PANEL BECAUSE THE VALVES WILL BE OPENED AT THE REQUEST OF THE HP TECHNICIAN WHO THEN OPERATES THE SYSTEM AT THE LOCAL PANEL AND HE THEN INFORMS THE CONTROL ROOM OPERATOR WHEN THE INDICATION IS CORRECT. THE VALVES ON PANEL 8 DO NOT REQUIRE OPERATOR ADJUSTMENT, THEY ARE MERELY ISOLATION VALVES AND SHOULD BE LEFT AT THEIR PRESENT LOCATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VALIDATION

TASK #14

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
26	303	H2 CONCENTRATION H2 MONITORING SYS ISOL VLVS	

HUMAN ENGINEERING DISCREPANCY

ED NUMBER: 0365
ILITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 4/ 9/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

CONTROLS/DISPLAYS IN THE REMOTE SHUTDOWN AREA ARE NOT GROUPED BY TASK SEQUENCE.

COMMENTS

GROUPING BY TASK SEQUENCE SHOULD MAKE IT POSSIBLE FOR THE OPERATOR TO PERFORM ALL FREQUENTLY OCCURRING ROUTINE TASKS AND TIME-SENSITIVE EMERGENCY TASKS WITH A MINIMUM OF HUMAN MOVEMENT FROM PANEL TO PANEL. AT PRESENT THE REMOTE SHUTDOWN AREA CONSISTS OF SEVERAL WORK "STATIONS" OR CONTROL/DISPLAY BOXES, LOCATED IN MANY PLACES WITHIN THE "REMOTE SHUTDOWN ROOM". THESE "WORK STATIONS" ARE WIDELY DISTRIBUTED AND THEIR LOCATION DOES NOT TAKE INTO ACCOUNT TASK SEQUENCING WHICH WOULD ALLOW THE OPERATOR TO MOVE FROM STATION TO STATION AROUND THE ROOM, IN A PRE-SET LOGICAL ORDER.

RESPONSE

AT PRESENT, IN ORDER TO ACCOMPLISH A SAFE SHUTDOWN OUTSIDE OF THE MAIN CONTROL ROOM, A NUMBER OF AREAS, ROOMS, AND/OR PANELS MUST BE ACCESSED. ALTHOUGH NOT OPTIMALLY CONFIGURED FOR REMOTE SHUTDOWN, IT IS ADEQUATE FOR THE PURPOSE. RE: GINNA HAS SUCCESSFULLY DEMONSTRATED THE VIABILITY AND VALIDITY OF ITS CURRENT SHUTDOWN PROCEDURE. BECAUSE THE PROJECTED USE OF THE EQUIPMENT IN THIS MODE IS AT AN EXTREMELY LOW PROBABILITY OF USE, NO WHOLESALE DESIGN MODIFICATIONS ARE PLANNED AT THIS TIME. WHERE AFFECTED BY EXISTING PROGRAMS OR NEW MODIFICATIONS (E.G. THE INPO SPONSORED COMPONENT LABELING PROGRAM), HUMAN FACTORS DESIGN IMPROVEMENTS WILL BE IMPLEMENTED AS PART OF A NEW ADMINISTRATIVE PROCEDURE TIED TO THE USE OF NEW HUMAN FACTORS DESIGN MANUAL, TO BE IMPLEMENTED BY THE END OF 1-88.

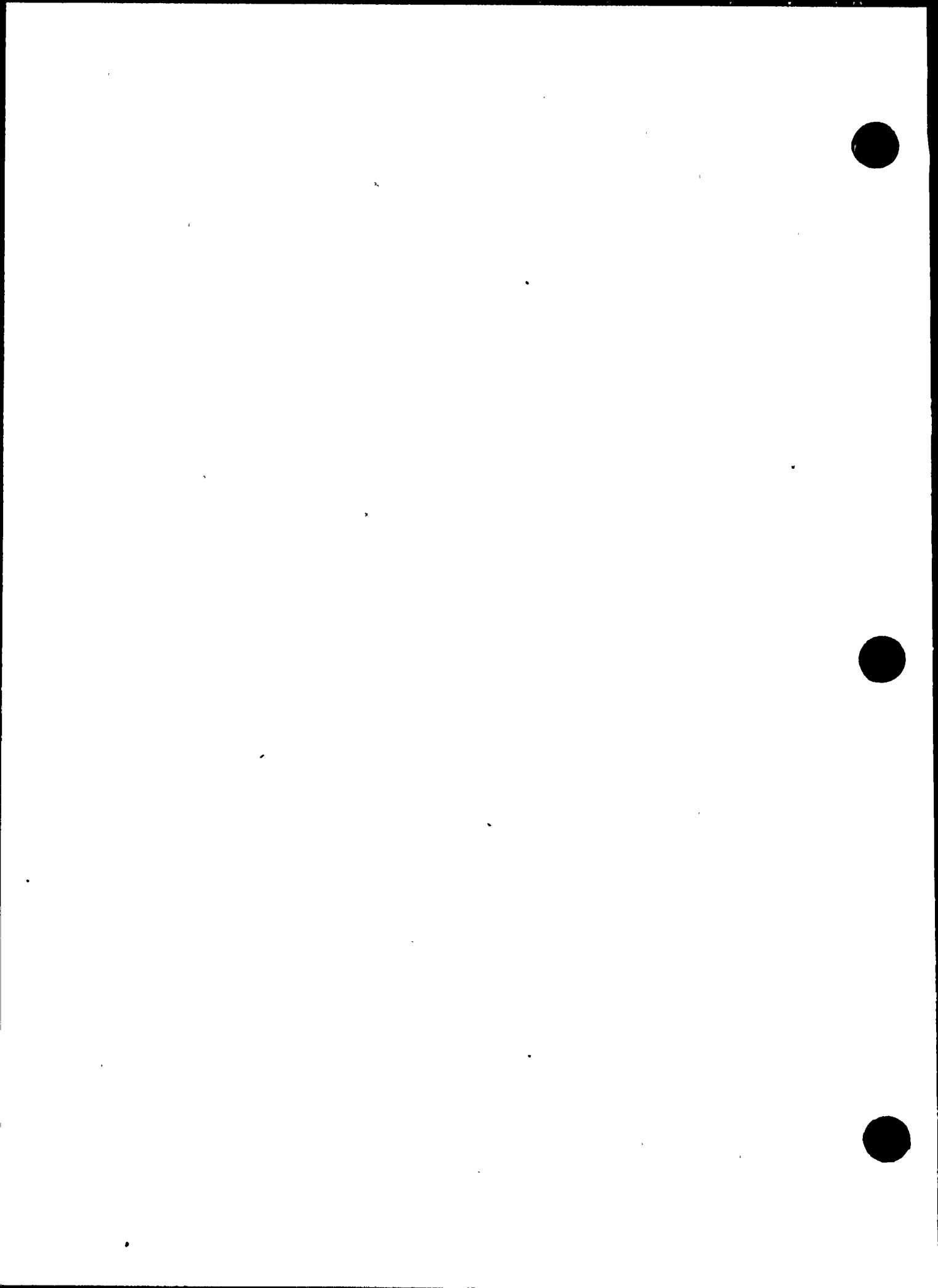
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.1.1.A

REL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	J	REMOTE SHUTDOWN AREMOTE SHTDOWN	DDDDDD



HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0366
DISCREPANCY TYPE: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 4/ 9/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

NO METHODS OF ENHANCING RECOGNITION AND IDENTIFICATION ARE USED AT THE REMOTE SHUTDOWN AREAS. SPACING BETWEEN C/D'S IS ADEQUATE, BUT NO FORMS OF DEMARCATION LINES OR COLOR CODING BY EMERGENCY SYSTEMS ARE USED.

COMMENTS

WHILE ALL CONTROLS IN THE REMOTE SHUTDOWN "ROOM" ARE EMERGENCY RELATED, AND THEREFORE REQUIRE NO DISTINCTIVE ENHANCEMENT TECHNIQUE TO SET THEM APART AS EMERGENCY ORIENTED, CONTROLS/DISPLAYS SHOULD STILL BE ENHANCED FOR RECOGNITION OF INDIVIDUAL SYSTEM CONTROL; SG'S, EFW PUMP, CONTROL ROD CONTROL, ETC. THIS IS ESPECIALLY IMPORTANT, DUE TO THE WIDE SPACING OF LOCATIONS FOR REMOTE SHUTDOWN CONTROLS.

RESPONSE

AT PRESENT, IN ORDER TO ACCOMPLISH A SAFE SHUTDOWN OUTSIDE OF THE MAIN CONTROL ROOM, A NUMBER OF AREAS, ROOMS, AND/OR PANELS MUST BE ACCESSED. ALTHOUGH NOT OPTIMALLY CONFIGURED FOR REMOTE SHUTDOWN, IT IS ADEQUATE FOR THE PURPOSE. RE: GINNA HAS SUCCESSFULLY DEMONSTRATED THE VIABILITY AND VALIDITY OF ITS CURRENT SHUTDOWN PROCEDURE. BECAUSE THE PROJECTED USE OF THE EQUIPMENT IN THIS MODE IS AT AN EXTREMELY LOW PROBABILITY OF USE, NO WHOLESALE DESIGN MODIFICATIONS ARE PLANNED AT THIS TIME. WHERE AFFECTED BY EXISTING PROGRAMS OR NEW MODIFICATIONS (E.G. THE INPO SPONSORED COMPONENT LABELING PROGRAM), HUMAN FACTORS DESIGN IMPROVEMENTS WILL BE IMPLEMENTED AS PART OF A NEW ADMINISTRATIVE PROCEDURE TIED TO THE USE OF NEW HUMAN FACTORS DESIGN MANUAL, WHICH WILL BE IMPLEMENTED IN 1/88.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.1.2

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

REMOVED SHUTDOWN

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0367
CATEGORY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 4/ 9/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING W

DESCRIPTION OF DISCREPANCY

CONTROLS/DISPLAYS WITHIN THE REMOTE SHUTDOWN AREA ARE NOT GROUPED BY SEQUENCE OF USE.

COMMENTS

NO EFFORT WAS MADE WHEN DESIGNING THE REMOTE SHUTDOWN STATIONS TO GROUP C/D'S BY SEQUENCE OF USE. THIS WILL NEED TO BE REVIEWED CLOSELY TO DETERMINE IF A NEED FOR SEQUENCE OF USE GROUPING FOR THESE C/D'S IS JUSTIFIED. AT PRESENT C/D'S ARE GROUPED ONLY BY FUNCTIONAL CONSIDERATION.

RESPONSE

SEE HED 368.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.2.1.A

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-------	------------------------	-------------------	-------

REMOTE SDS

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0368
CATEGORY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 4/ 9/1985

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

CONTROLS/DISPLAYS WITHIN THE REMOTE SHUTDOWN AREA ARE NOT
POSITIONED SO AS TO BE EASILY IDENTIFIED.

REMARKS

C/D STATIONS WITHIN THE REMOTE SHUTDOWN AREA ARE NOT POSITIONED
SO AS TO BE EASILY IDENTIFIED BY USE. SOME FORM OF ENHANCING
SUCH AS COLOR CODING, OR MAJOR LABELING COULD HELP REDUCE THIS
PROBLEM.

RESPONSE

AT PRESENT, IN ORDER TO ACCOMPLISH A SAFE SHUTDOWN OUTSIDE OF THE
MAIN CONTROL ROOM, A NUMBER OF AREAS, ROOMS, AND/OR PANELS MUST
BE ACCESSED. ALTHOUGH NOT OPTIMALLY CONFIGURED FOR REMOTE
SHUTDOWN, IT IS ADEQUATE FOR THE PURPOSE. RE: GINNA HAS
SUCCESSFULLY DEMONSTRATED THE VIABILITY AND VALIDITY OF ITS
CURRENT SHUTDOWN PROCEDURE. BECAUSE THE PROJECTED USE OF THE
EQUIPMENT IN THIS MODE IS AT AN EXTREMELY LOW PROBABILITY OF USE,
NO WHOLESALE DESIGN MODIFICATIONS ARE PLANNED AT THIS TIME.
WHERE AFFECTED BY EXISTING PROGRAMS OR NEW MODIFICATIONS (E.G.
THE INPO SPONSORED COMPONENT LABELING PROGRAM), HUMAN FACTORS
DESIGN IMPROVEMENTS WILL BE IMPLEMENTED AS PART OF A NEW
ADMINISTRATIVE PROCEDURE TIED TO THE USE OF NEW HUMAN FACTORS
DESIGN MANUAL.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.2.1.B(2)

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME
-------	------------------------	-------------------

OTHER

REMOTE SDS

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0369
 DISCREPANCY CATEGORY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 4/ 8/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

ORDERING AND LABELING OF COMPONENTS WITHIN THE RSA VIOLATE THE STANDARD READING ORDER ARRANGEMENT OF LEFT-TO-RIGHT, TOP-TO-BOTTOM, ALPHABETIC OR NUMERIC SEQUENCE.

COMMENTS

CONTROL BOXES FOR MOTOR DRIVEN AUX FEED PUMPS 1A AND 1B ARE LAID OUT IN REVERSE ORDER. ALSO FEEDWATER FLOW AUX PUMP METERS 1A AND 1B ARE LAID OUT IN REVERSE ORDER. ALSO POWER CABINETS 2AC AND 1AC ARE IN REVERSE ORDER.

RESPONSE

THE CONTROL BOXES ARE LOCATED IN THE SAME ROOM AS THE PUMPS. THEY ARE PLACED IN THE SAME ORDER AS THE PUMPS ARE PLACED IN THE ROOM WITHOUT REGARD TO READING ORDER. THIS WAS DONE TO ENSURE THAT THE CONTROLS AND AND DISPLAYS WERE FUNCTIONALLY MATCHED TO THE PUMPS IN ORDER TO REDUCE OPERATOR ERROR.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

8.2.2.A

CHANNEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-SDS		FDW FLOW AUX MTR PP METERS (1A,1B)	
-SP		MOTOR DRIVEN AUX FD PP CNTL BOXES(1A,1B)	
-S		POWER CABINETS 2AC,1AC	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0370
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR THESE VALVES TO BE THROTTLEABLE FROM THE CONTROL ROOM.

COMMENTS

AT PRESENT THESE VALVES MUST BE THROTTLED LOCALLY.

SOURCE

FOR SEVERAL DESIGN BASES ACCIDENTS, ANALYSES ARE BASED UPON THE COOLING RATE OF THE RHR HEAT EXCHANGERS UTILIZING MAXIMUM COMPONENT COOLING WATER FLOW AS THE COOLING MEDIUM. TO INSTALL MODULATING VALVES IN THE COOLANT STREAM FOR THE RHR SYSTEM COULD RESTRICT COOLANT MEDIUM FLOW IN THE EVENT OF A VALVE FAILURE AT LESS THAN 100% OPEN. ALTHOUGH IT IS RECOGNIZED THAT MANUAL MANIPULATION OF THESE VALVES DURING COOLDOWN OF THE PLANT IS INCONVENIENT, ACCIDENT CONSIDERATIONS PRECLUDE THE CHANGE OUT OF THESE VALVES FOR OPERATORS CONVENIENCE AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 162

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	294	COMP COOLING TO RHR HX A (738A)	
	295	COMP COOLING TO RHR HX B (738B)	

HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0371
 ILITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/11/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR THIS CONTROL TO HAVE A SWITCH POSITION "VCT".

REMARKS

THIS CONTROL HAS THIS SWITCH POSITION BUT IT IS IN DYNOTAPE.
 SWITCH POSITIONS SHOULD HAVE PERMANENT LABELS ENGRAVED ON THE
 FACEPLATE.

DISPOSITION

A PERMANENT LABEL "VCT" WILL BE INSTALLED, BY THE END OF THE
 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 12

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----
	266	EXCESS LETDOWN HT EXCH OUTLET TO RCOT OR VCT	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0372
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/11/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR THESE PUMPS TO HAVE COVER PROTECTION.

REMARKS

THEY HAVE NO COVERS AT PRESENT.

RESPONSE

MAGNETIC COVER PROTECTORS WILL BE INSTALLED FOR THESE PUMPS BY
 MAY, 1986.

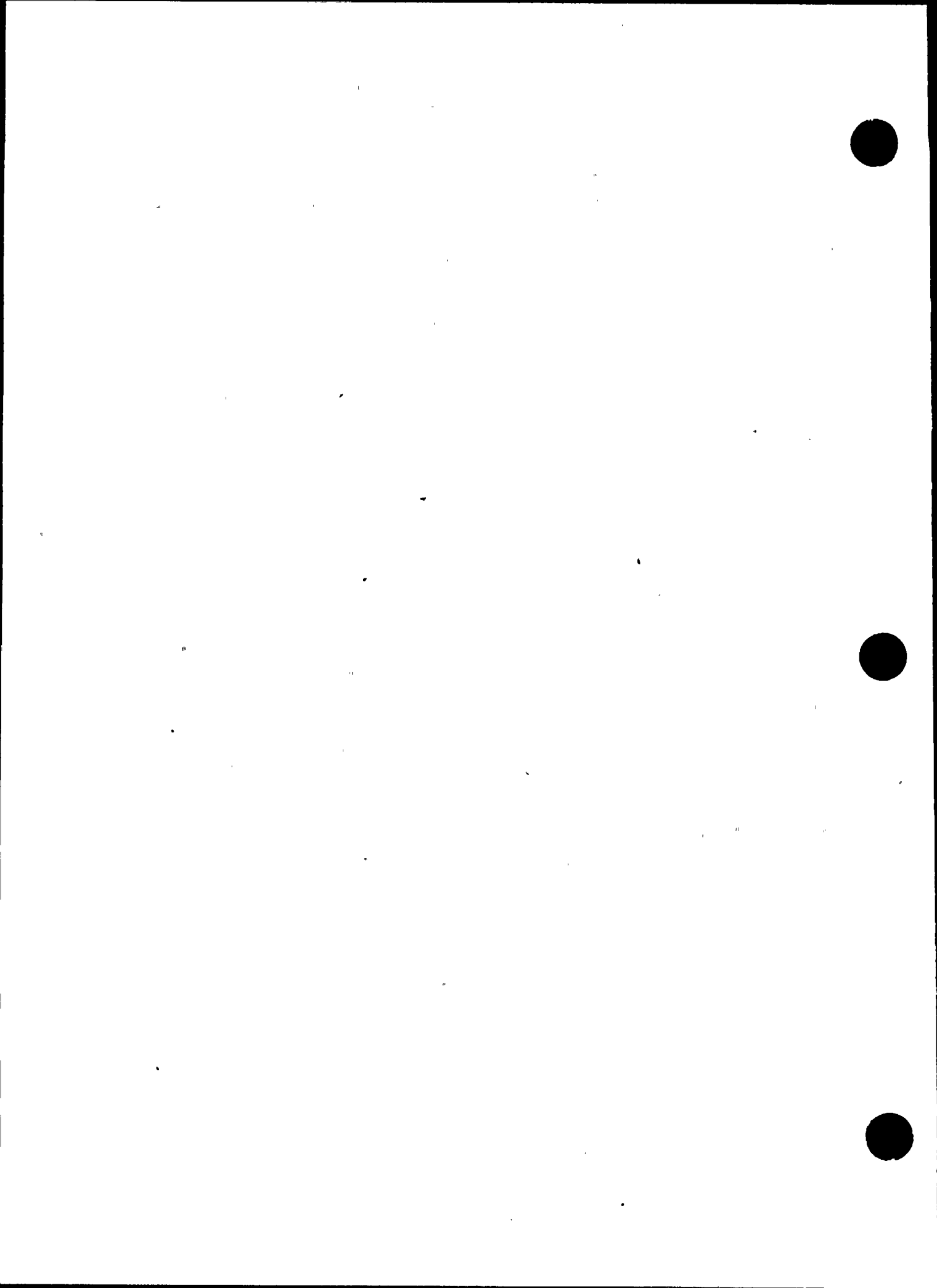
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 68

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	249	RCP PUMP 1A	
	250	RCP PUMP 1B	



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0373
 QUALITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/11/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR RCS PRESSURE TO BE MEASURED IN PSIG, RANGE 0-2500, IN DIVISIONS OF 20.

REMARKS

THE GREEN PEN (RCS PRESSURE) READS IN PSIG, RANGE 0-3000, DIVISIONS OF 50.

SOLUTION

EWR 4345 HAS BEEN INITIATED TO PROVIDE RCS-S/G DELTA P ON THE PPCS. UPON IMPLEMENTATION OF THE EWR, THE NEED FOR PROVIDING INDICATION AS FINE AS THOSE SUGGESTED BY THIS HED IS NEGATED. SEE HED 59.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 68, 263, 285

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	229	RHR FLOW/RCS PRESS RECORDER	

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: JBW
PLANT: GINNA

DATE: 7/11/1985

ID NUMBER: 0374
ILITY: RGE

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR THIS RECORDER TO READ IN DEGREES FAHRENHEIT,
RANGE 0-650, DIVISIONS OF 5.

COMMENTS

THE ACTUAL RECORDER HAS A RANGE OF 50-650 IN DIVISIONS OF 10.

RESPONSE

THE RANGE OF THE T COLD INDICATION DOES NOT HAVE TO BE CHANGED AS
T COLD SHOULD NEVER BE LESS THAN 50oF. DIVISIONS OF LESS THAN
10oF WOULD CLUTTER UP THE SCALE AND POSSIBLY MAKE THE RECORDER
AND INDICATOR MORE DIFFICULT TO READ. T COLD ACCURACY OF WITHIN
5oF IS SUFFICIENT FOR ALL EVALUATIONS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 76, 93, 176, 198

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	228	RCS LOOP A&B COLD LEG TEMP REC.	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0375
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/11/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR THIS RECORDER TO READ FLOW IN GPM IN DIVISIONS OF (.01) OR (.1)

COMMENTS

THE ACTUAL DIVISIONS ARE (.02). THE TASK IS TO DETERMINE IF RCP'S MUST BE STOPPED.

SPECIFICATIONS

THE DIVISIONS ON THE METER ARE IN DIVISIONS OF (.02). THE DIVISIONS PROVIDED ARE SUFFICIENT SINCE READING TO AN ACCURACY OF 0.1 GPM IS MORE THAN ADEQUATE FOR DETERMINING SEAL MALFUNCTIONS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 285, 58

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	226	RCP 1A SEAL LEAK OFF FLOW NR	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0376
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR SWITCH POSITIONS TO INCLUDE 'START'. AT
 PRESENT THE SWITCH POSITION READS 'CLOSE'.

REMARKS

'START' IS MORE APPROPRIATE AS A SWITCH POSITION BECAUSE ITS
 MEANING IS MORE CLOSELY RELATED TO FUNCTION.

SOLUTION

TASK ASSIGNMENT OPS 85-84 ADDRESSES THE CONCERN OF THIS HED. NEW
 ESCUTCHEON PLATES WILL BE INSTALLED WHICH WILL UTILIZE
 NOMENCLATURE CONSISTENT WITH PROCEDURES. THERE IS ALSO AN
 ONGOING 2 1/2 YEAR REVIEW OF PROCEDURES WHICH WILL ENSURE
 CONSISTENCY AS WELL AS A REGULAR TRAINING SCHEDULE. THIS WILL BE
 IMPLEMENTED BY SPRING 1987.

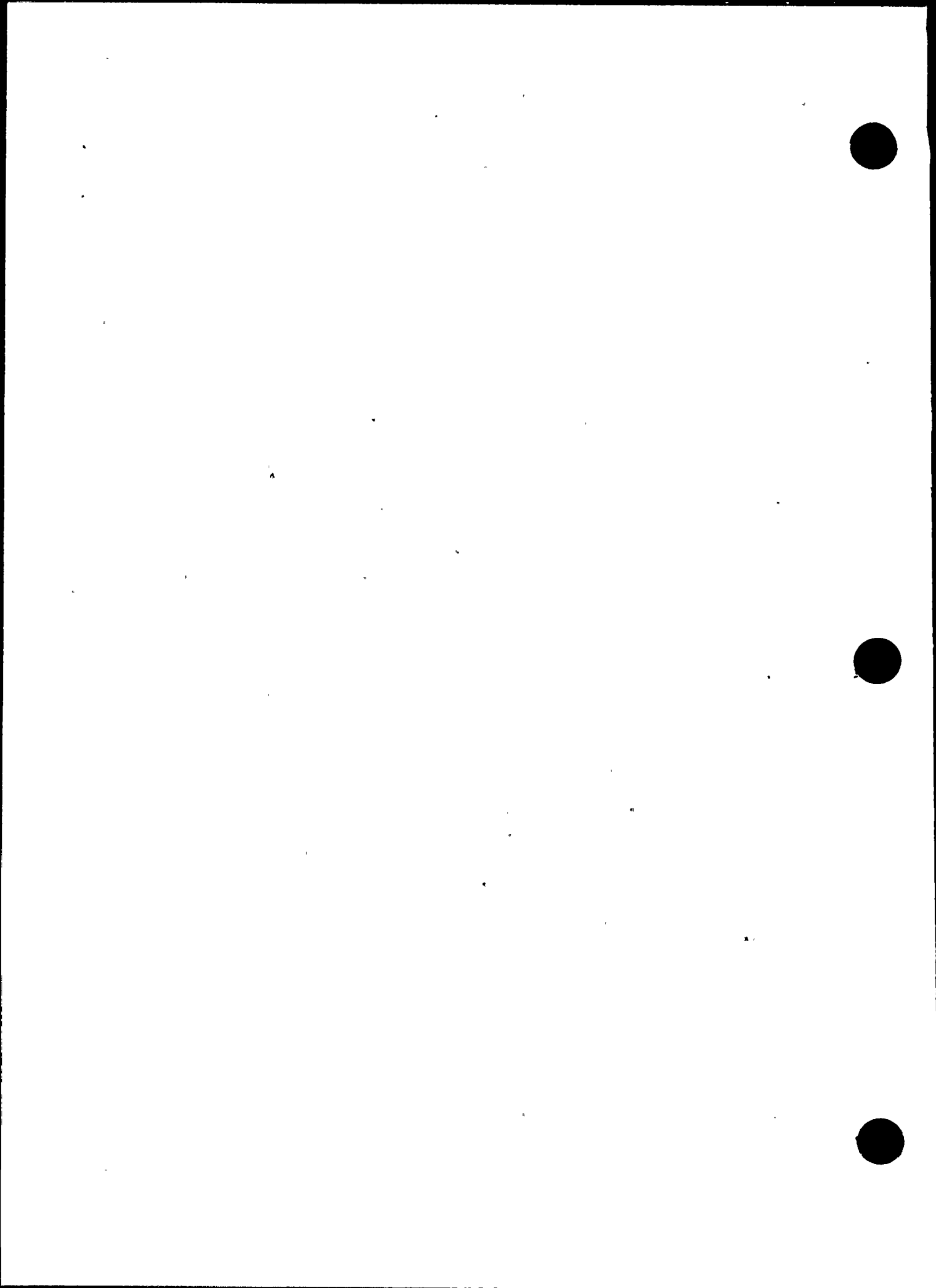
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 3, 19, 147, 221, 265, 328

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	203	CONT SPRAY PUMP 1A	
	218	SI PUMP 1A	
	219	SI PUMP 1B	
	220	SI PUMP 1C (BUS 14 TRAIN A)	
	221	SI PUMP 1C (BUS 16 TRAIN B)	
	222	CONT SPRAY PUMP 1B	



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0377
 IDENTITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR SWITCH POSITIONS TO INCLUDE 'START'. AT
 PRESENT THE SWITCH POSITIONS ARE 'CLOSE', 'AUTO', 'TRIP',
 'PULLOUT'.

REMARKS

THE 1A PUMP (THE 1B'S COUNTERPART) HAS SWITCH POSITIONS OF
 'START', 'AUTO', 'STOP', 'PULLOUT'. THESE TWO PUMPS SHOULD BE
 CONSISTENT IN THEIR SWITCH POSITIONS. 'START' IS MORE
 APPROPRIATE THAN 'CLOSE'. THIS IS APPLICABLE TO BOTH PUMPS
 LIST

RESPONSE

TASK ASSIGNMENT OPS 85-84 ADDRESSES THE CONCERN OF THIS HED. NEW
 ESCUTCHEON PLATES WILL BE INSTALLED WHICH WILL UTILIZE
 NOMENCLATURE CONSISTENT WITH PROCEDURES. THERE IS ALSO AN
 ONGOING 2 1/2 YEAR REVIEW OF PROCEDURES WHICH WILL ENSURE
 CONSISTENCY AS WELL AS A REGULAR TRAINING SCHEDULE. THIS WILL BE
 IMPLEMENTED BY SPRING 1987.

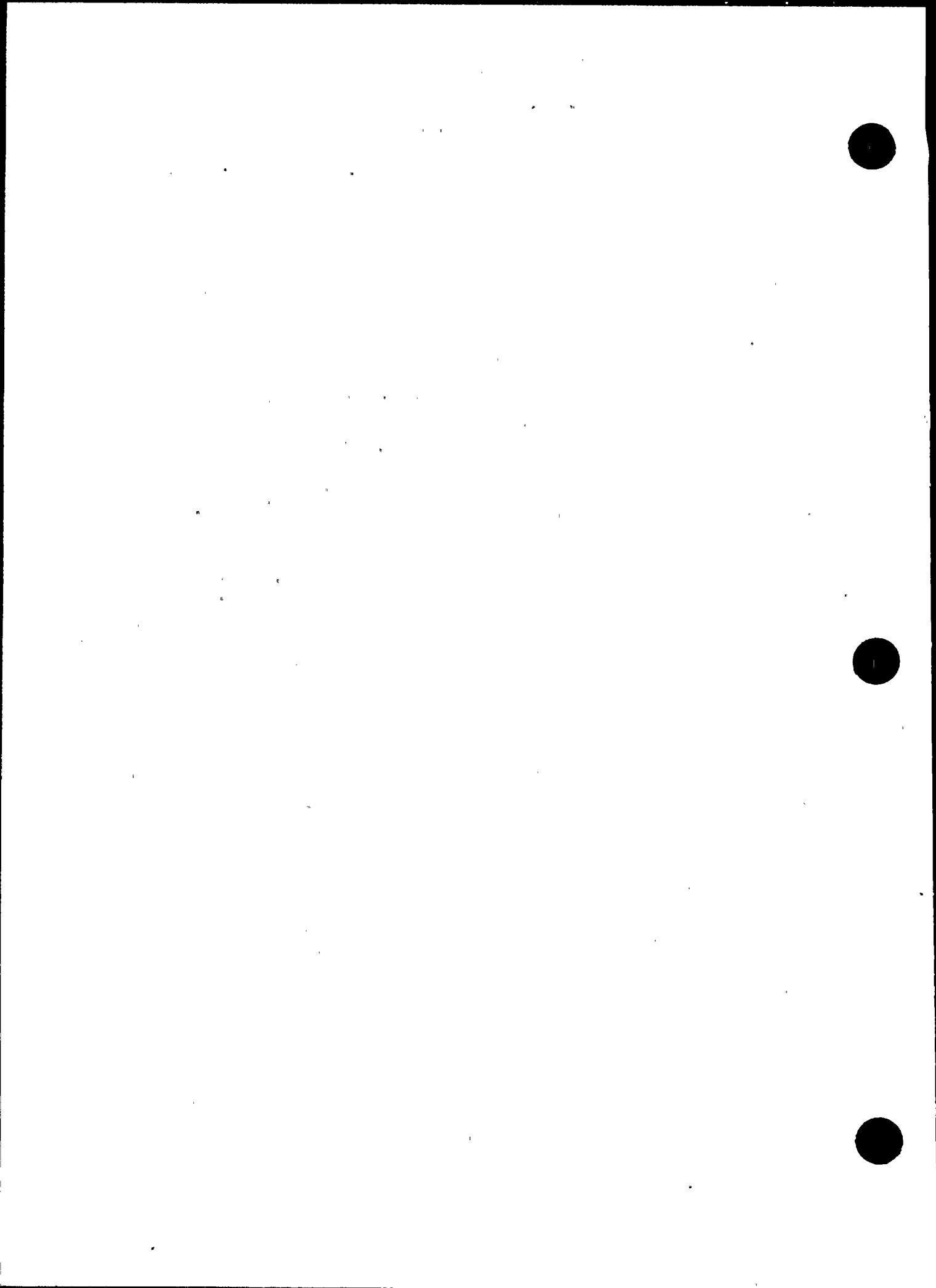
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 32, 5, 95, 221, 328

ANALYSIS	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	189	BORIC ACID PUMP 1B	
	198	RHR PUMP 1B	



HUMAN ENGINEERING DISCREPANCY

Q NUMBER: 0378
 ILITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR FLOW TO BE MEASURED IN PCT, RANGE 0-120
 (HIGHEST VALUE) IN DIVISIONS OF 2 OR 5.

COMMENTS

THE ACTUAL RANGE IS 0-110 IN DIVISIONS OF 2, IN PCT.

RESPONSE

THE ACTUAL RANGE OF 0-110% IS ADEQUATE AND DIVISIONS OF 2% ARE
 ACCEPTABLE. NO CHANGE IS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 23

INSTRUMENT	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	154	RCP FLOW 1A-1	
	155	RCP FLOW 1A-2	
	156	RCP FLOW 1A-3	
	157	RCP FLOW 1B-1	
	158	RCP FLOW 1B-2	
	159	RCP FLOW 1B-3	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0379
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR LEVEL TO BE MEASURED IN PCT, RANGE 0-100 IN DIVISIONS OF 1.

COMMENTS

THE ACTUAL METER IS IN DIVISIONS OF 2.

RESPONSE

VCT LEVEL INDICATION IN DIVISIONS OF 2% IS ADEQUATE AS 1% IS 1/2 THE SMALLEST DIVISION AND VCT LEVEL SHOULD NOT NEED TO BE READ MORE ACCURATELY THAN THE NEAREST 1%.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 13

PANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	153	VCT LEVEL	

HUMAN ENGINEERING DISCREPANCY

Q. NUMBER: 0380
 ILITY: RGE

ORIGINATOR:
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR A VALUE OF PRESSURE MEASURED IN PSIG. THIS
 RECORDER DOES NOT HAVE PSIG ASSOCIATED WITH THE PEN SCALE.

REMARKS

PARAMETER UNITS SHOULD BE DISPLAYED ON THE RECORDER SCALE.

RESPONSE

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE
 INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 285

NEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	148	PRZR PRESS RECORDER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0381
 IDENTITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR FLOW TO BE MEASURED IN GPM, RANGE 0-200 IN DIVISIONS OF 2.

REMARKS

THE ACTUAL RANGE IS 0-75 GPM IN DIVISIONS OF 1.

RESPONSE

THE CHARGING FLOW RATE FOR NORMAL OPERATION IS 25 GPM. IN RARE CIRCUMSTANCES OF PLANNED ACCELERATED DILUTION OF THE REACTOR COOLANT SYSTEM, CHARGING FLOW MAY GET AS HIGH AS 60 GPM. A FLOW RATE GREATER THAN 60 GPM WOULD BE THE FIRST INDICATION OF A LEAK IN THE PRIMARY SYSTEM. BASED ON THIS, A CHARGING FLOW INDICATION OF 75 GPM IS ADEQUATE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 179, 215, 226, 305

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	147	CHARGING LINE FLOW	

HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0382
 ILITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR A METER MEASURING TEMPERATURE IN DEGREES
 FAHRENHEIT, RANGE 0-600 IN DIVISIONS OF 10.

COMMENTS

THE ACTUAL METER HAS A MINIMUM VALUE OF 100, NOT 0.

RESPONSE

MINIMUM VALUE OF LESS THAN 100 OF IS NOT CRITICAL FOR CONTROLLING
 ANY SYSTEM FUNCTION. A MINIMUM RANGE VALUE OF 0 IS NOT REQUIRED.
 NO CHANGE APPEARS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 173, 176, 179

INEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	146	REGEN HX CHARGING OUTLET TEMP	

HUMAN ENGINEERING DISCREPANCY

ID NUMBER: 0383
 ILITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR THIS METER TO HAVE A RANGE OF 0-75 OR 0-70 PSIG
 IN DIVISIONS OF 1.

COMMENTS

THE ACTUAL METERS HAVE RANGES OF 0-60.

RESPONSE

A WIDE RANGE INDICATION IS AVAILABLE WHICH COVERS CONTAINMENT
 PRESSURE AT 75 PSIG. NO EXTENSION OF THE RANGE FOR THESE METERS
 APPEARS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 3, 17

ANEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	139	CNTMT PRESS 1A	
	140	CNTMT PRESS 2A	
	141	CNTNT PRESS 3A	

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: JBW
PLANT: GINNA

DATE: 7/10/1985

ID NUMBER: 0384
ILITY: RGE

ASSESSMENT CATEGORY 1
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR A VARIETY OF RANGES TIED TO SPECIFIC TASKS, THE LARGEST OF WHICH WAS 0-600 GPM, DIVISIONS OF 10 (SMALLEST).

COMMENTS

THE ACTUAL METERS ARE 0-1000 GPM IN DIVISIONS OF 20. OPERATIONS PERSONNEL QUESTIONED DURING THE VERIFICATION PROCESS FOUND SMALLER DIVISIONS TO BE OF NO SIGNIFICANT CONSEQUENCE.

SPO

THE ACTUAL METERS HAVE DIVISIONS OF 20. SMALLER DIVISIONS HAVE NO SIGNIFICANT CONSEQUENCE BECAUSE THEY ARE NOT ACTUALLY USED BY THE OPERATORS. THERE IS INSUFFICIENT REASON TO CHANGE THESE RANGES.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 3, 221, 265, 318, 368

PERSONNEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	135	SI LINE LOOP 1A FLOW	
	136	SI LINE LOOP 1B FLOW	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0385
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR FLOW TO BE MEASURED IN GPM, RANGE 0-3000 IN DIVISIONS OF 50.

REMARKS

THE ACTUAL METER IS IN GPM, RANGE 0-4000 IN DIVISIONS OF 100.

RESPONSE

RHR FLOW METER RANGE OF 0-4000 GPM IS MORE THAN ADEQUATE, AND DIVISIONS OF 100 GPM PROVIDE INDICATION TO THE NEAREST 50 GPM (1/2 THE SMALLEST DIVISION) WHICH IS ADEQUATE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 75

CHANNEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	134	RHR FLOW METER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0386
 IDENTITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLS FOR dP TO BE MEASURED IN PSID, RANGE 100-300 IN DIVISIONS OF 10.

REMARKS

THE ACTUAL METER READS IN PSIG, RANGE 0-400, IN DIVISIONS OF 10.

RESPONSE

PROCEDURES REQUIRE THAT A MINIMUM OF 300 POUNDS SEAL DIFFERENTIAL BE ESTABLISHED FOR RCP OPERATIONS. ANY DIFFERENTIAL ABOVE 300 POUNDS IS ADEQUATE. THE 0-400 PSIG SCALE OF THIS METER ADEQUATELY PROVIDES THAT INFORMATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 6B, 5B

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	124	RCP 1A #1 SEAL DP	
	128	RCP 1B #1 SEAL DP	

#387

This page intentionally left blank.

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0388
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR FLOW TO BE MEASURED IN GPM, RANGE 0-150 IN DIVISIONS OF 2.

COMMENTS

THE ACTUAL RANGE OF THIS METER IS 0-100.

RESPONSE

LETDOWN FLOW SHOULD NOT NORMALLY EXCEED 100 GPM, AS THIS WOULD POSSIBLY RESULT IN DAMAGE TO THE DEMINERALIZERS. THEREFORE, THE 0-100 GPM RANGE IS ADEQUATE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 179, 215, 226

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	120	LETDN FLOW METER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0389
 QUALITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR DEGREES FAHRENHEIT IN DIVISIONS OF 5, RANGE 0-500.

REMARKS

THE ACTUAL RANGE ON THIS METER IS 100-600 AND THE DIVISIONS ARE 10.

SOURCE

REGEN HX LETDOWN TEMPERATURE INDICATION LESS THAN 100°F WOULD NOT BE REQUIRED FOR ANY EOP RESPONSES. DIVISIONS OF 10 ARE ADEQUATE FOR ALL TASKS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 226

INSTRUMENT	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	119	REG HX LTDN TEMP	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0390
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR VOLTS IN DIVISIONS OF 5. RANGE 0-600.

COMMENTS

THE PRESENT METER IS IN DIVISIONS OF 10 WITH ONLY ONE HASH MARK BETWEEN 0 AND 100.

RESPONSE

THE PRESENT VOLTAGE INDICATION IS ADEQUATE SINCE INDICATION OF VOLTAGE LESS THAN 300 VOLTS IS NOT REQUIRED. VOLTAGE DEGRADED TO LESS THAN 300 VOLTS IS NOT ADEQUATE FOR SAFEGUARDS MOTOR OPERATION. DIVISIONS OF 10 VOLTS ARE ADEQUATE FOR ALL TASKS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 282

CHANNEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	108	EMERG GEN 1A VOLTMETER	
	111	EMERG GEN 1B VOLTMETER	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0391
 QUALITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TA CALLED FOR KW IN DIVISIONS OF 50 WITH A RANGE OF 0-3000.

COMMENTS

THE PRESENT RANGE IS 0-2500.

RESPONSE

THE PRESENT RANGE OF 0-2500 KW IS SUFFICIENTLY GREATER THAN THE
 MAXIMUM LOAD EXPECTED FROM SAFEGUARDS MOTORS AND THE MAXIMUM LOAD
 RATING OF THE D/G (2250 KW). IT IS ACCEPTABLE AS IS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 63

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	109	EMERG GEN 1A WATT METER	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0392
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE T.A. (TASK ANALYSIS) CALLED FOR A RANGE OF 0-3000 IN
 DIVISIONS OF 50.

REMARKS

PRESSENT RANGE IS 0-2500.

RESPONSE

THE PRESENT RANGE OF 0-2500 KW IS SUFFICIENTLY GREATER THAN THE
 MAXIMUM LOAD EXPECTED FROM SAFEGUARDS MOTORS AND THE MAXIMUM LOAD
 RATING OF THE D/G (2250 KW). IT IS ACCEPTABLE AS IS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 63

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	109	EMERG GEN 1B WATT METER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0393
CATEGORY: RGE

ORIGINATOR: JBW
PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING W

DESCRIPTION OF DISCREPANCY

SEPARATE ANNUNCIATORS WERE REQUESTED IN THE FOLLOWING FORM:

"THERMAL BARRIER 'A' LOW FLOW"
"THERMAL BARRIER 'B' LOW FLOW"

COMMENTS

AT PRESENT ANNUNCIATOR TILES READ AS FOLLOWS:

*****	*****
* HI TEMP 125 *	* "HI TEMP 125 *
* RC PUMP 1A *	* RC PUMP 1B *
* COMP. COOL WTR *	* COMP. COOL WTR *
* RETURN HI TEMP *	* RETURN HI TEMP *
* OR LOW FLOW *	* OR LOW FLOW *
* LO FLOW 165" *	* LO FLOW 165" *
* *	* *
*****	*****

GENERALLY IT IS BEST TO SEPARATE DIFFERENT PARAMETERS ON ANNUNCIATOR TILES.

RESPONSE

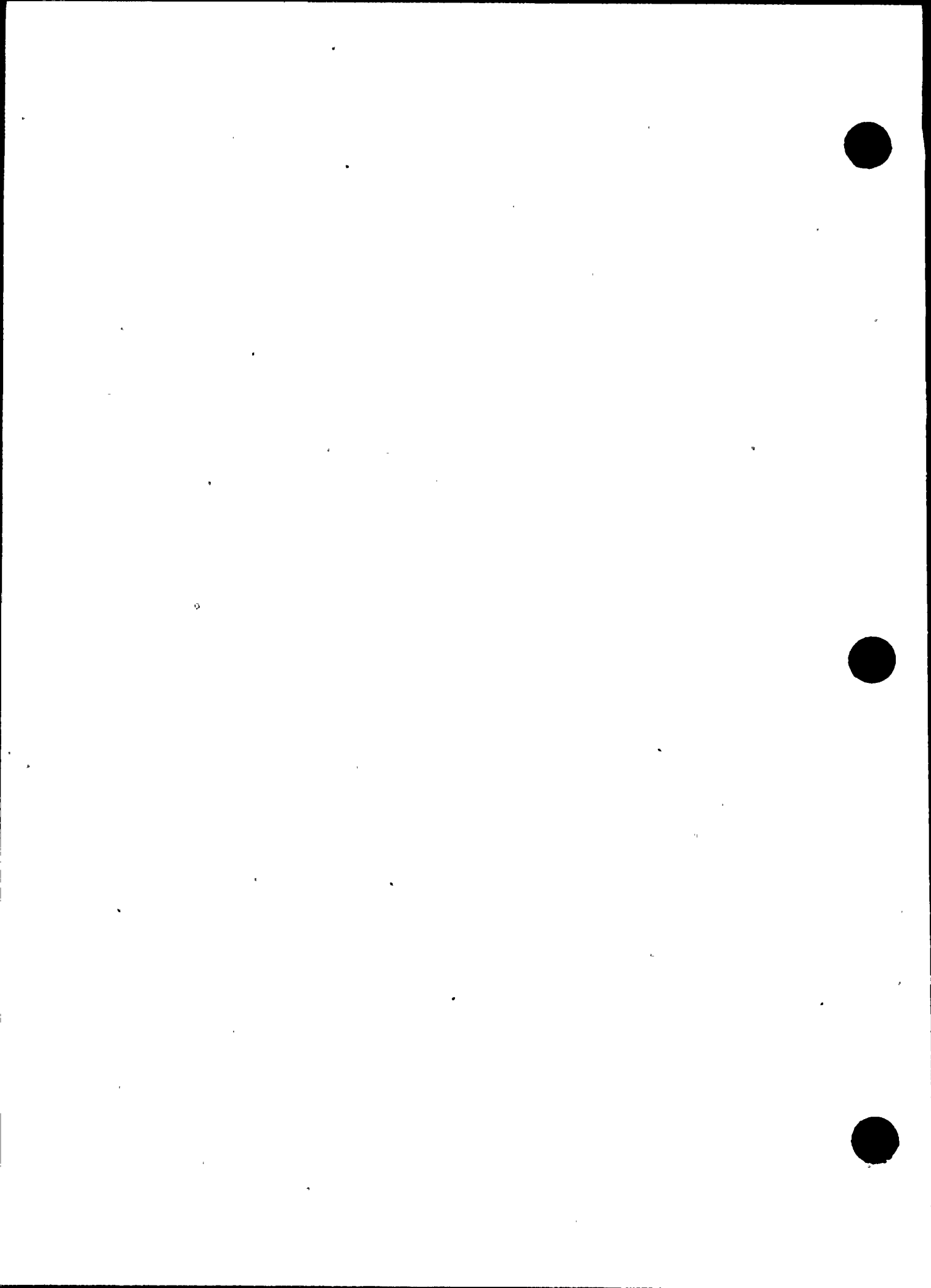
NINETY FIVE PERCENT OF THE CONTROL ROOM ANNUNCIATOR TILES WERE REPLACED IN NOVEMBER, 1985. THIS MODIFICATION CORRECTED MANY HEDS RELATING TO CONTENT, LETTER HEIGHT, FONT, ETC. A STUDY IS NOW UNDERWAY WHICH WILL PROVIDE ADDITIONAL RECOMMENDATIONS NECESSARY FOR MODIFICATION, ASSESSMENT, AND CONFORMANCE WITH THE INTENT OF NUREG 0700 GUIDELINES. THIS EVALUATION WILL ASSESS MAJOR DESIGN CHANGES BEING CONSIDERED TO ADDRESS OTHER ANNUNCIATOR HEDS. A RATIONALE WILL BE PROVIDED FOR CHOSEN IMPROVEMENTS. ALL EVALUATIONS ARE TO BE COMPLETED BY JUNE, 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

IFICATION OF AVAILABILITY TASK 285

EL ---	EQUIPMENT ID NUMBER -----	EQUIPMENT NAME -----	OTHER -----
	Ø	ANNUNCIATORS	



HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0394
 DISCREPANCY TYPE: RGE

ORIGINATOR:
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

A METER WAS REQUESTED FOR SUMP 'B' LEVELS. AT PRESENT RED INDICATING LIGHTS ARE TIED TO AN ANNUNCIATOR FOR HI LVL WHICH ARE ENERGIZED AT 214, 180, 113, 78 AND 8 INCHES FOR TWO CHANNELS. THE REQUESTED METER WOULD READ IN INCHES, RANGE = 0-250 IN DIVISIONS OF 5.

REMARKS

DISCREPANCY

ON DUTY OPERATIONS PERSONNEL NOTED DURING THE VERIFICATION PROCESS THAT THE EXISTING DISPLAY WAS SUFFICIENT AND ALSO BROUGHT THEIR ATTENTION TO THIS PARAMETER. NO CHANGE APPEARS WARRANTED. THE LEVEL MEASUREMENT UTILIZES DISCREET SWITCHES, THEREFORE A CONTINUOUS INDICATOR WOULD BE INAPPROPRIATE.

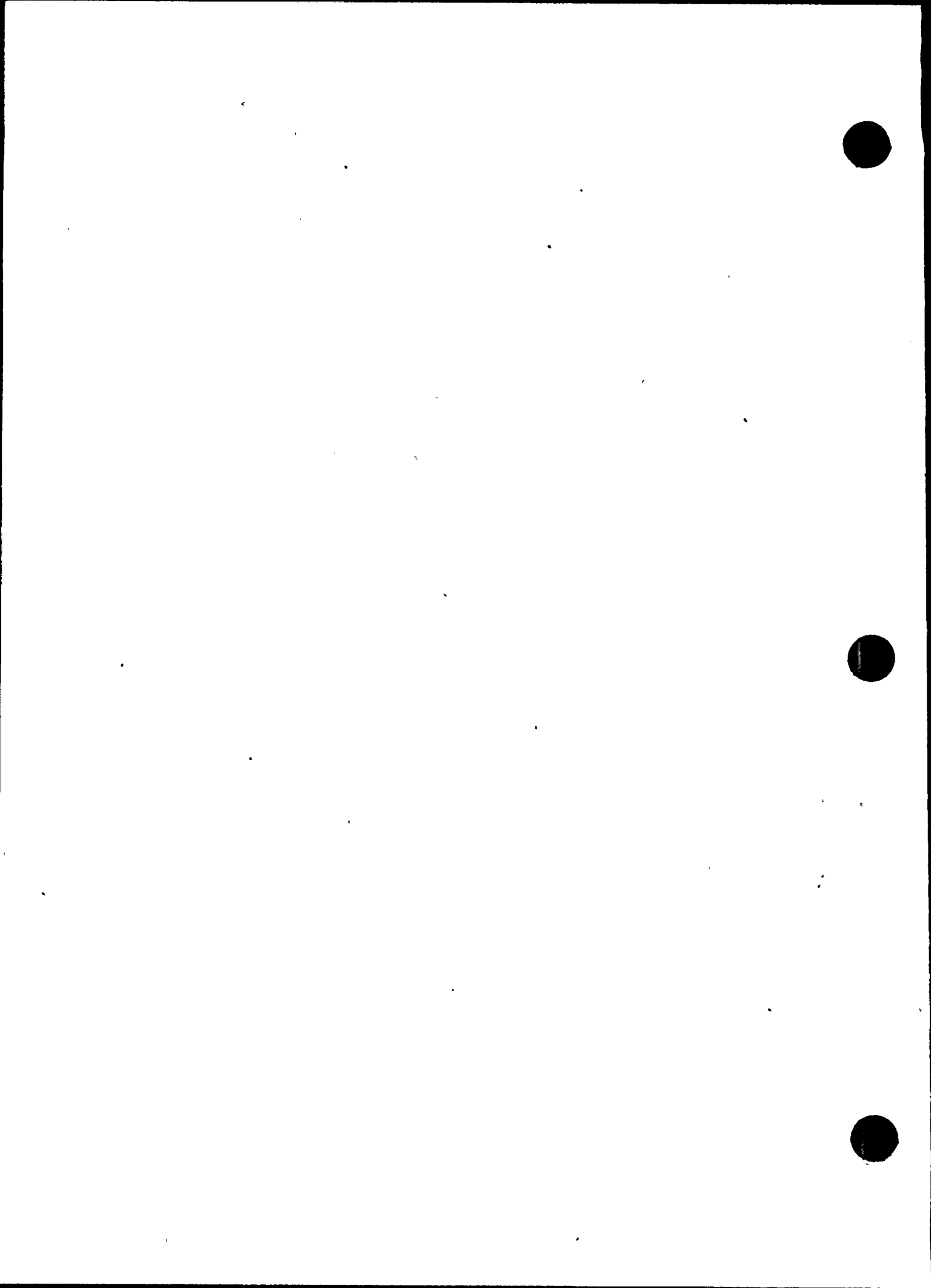
SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 80

PERSONNEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	374	MULTI-LIGHTS SUMP B	



HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0395
 DISCREPANCY TYPE: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 2
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

THE SETPOINT DIAL AND THE DEMAND SIGNAL METER HAVE NO UNITS OF MEASUREMENT.

REMARKS

'PCT DEMAND SIG' AND 'PSIG' ARE APPROPRIATE UNITS OF MEASUREMENT. UNITS SHOULD APPEAR ON CONTROLS AND METERS.

DISPOSITION

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 173, 51, 56, 82

ANALYSIS	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	266	PZR SPRAY CONTROLLER	
	267	PZR SPRAY CONTROLLER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0396
 LITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

SWITCH POSITIONS OF 'RESET', 'AUTO' AND 'PULL TO LOCK' WERE
 LISTED AS REQUIRED.

REMARKS

ACTUAL SWITCH POSITIONS ARE 'PULL LAMP CUTOUT', 'TRIP' AND
 'CLOSE'. SWITCH POSITIONS SHOULD REFLECT ACTUAL FUNCTION.

DISPOSITION

TASK ASSIGNMENT OPS 85-84 ADDRESSES THE CONCERN OF THIS HED. NEW
 DISCUTCHEON PLATES WILL BE INSTALLED WHICH WILL UTILIZE
 NOMENCLATURE CONSISTENT WITH PROCEDURES. THERE IS ALSO AN
 ONGOING 2 1/2 YEAR REVIEW OF PROCEDURES WHICH WILL ENSURE
 CONSISTENCY AS WELL AS A REGULAR TRAINING SCHEULE. THIS WILL BE
 IMPLEMENTED BY SPRING 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 6, 48, 173, 256

INSTRUMENT	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	264	PZR HTR CNTL GROUP	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0397
 QUALITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/10/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THERE ARE NO UNITS OF MEASUREMENT ON THE OUTPUT DEMAND METER FACE. THERE ARE NO UNITS OF MEASUREMENT ON THE SETPOINT DIAL. TRENDING INFORMATION WAS REQUESTED ON THE ATM STM DUMPS, AND A COVER SUGGESTED FOR THE SETPOINT DIAL.

REMARKS

'PCT DEMAND SIGNAL' AND 'PSIG' ARE THE PROPER UNITS OF MEASUREMENT. METER FACES SHOULD HAVE UNITS CLEARLY LABELED ON THEM. A COMPUTER ALARM IS AVAILABLE FOR THE LOOP A & B ATM STM DUMPS.

RESPONSE

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE. ALSO, TRENDING INFORMATION IS ALREADY AVAILABLE ON A RECORDER THAT IS ACTIVATED IF THERE IS A DANGER OF RADIOACTIVE RELEASE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 176, 198, 67, 73, 189, 222

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	253	PORV'S ATM STM DUMP PRESS LOOP A CONTROLLER	
	254	SG CONDENSER STM DUMP CONTROLLER	
	255	PORV'S ATM STM DUMP PRESS LOOP B CONTROLLER	

HUMAN ENGINEERING DISCREPANCY

DISCREPANCY NUMBER: 0398
FACILITY: RGE

ORIGINATOR: JBW
PLANT: GINNA

DATE: 7/15/1985

ASSESSMENT CATEGORY 1
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

SOME FOXBORO CONTROLLERS HAVE VALVE DEMAND SIGNAL METERS CLOSING ON THE RIGHT AND OPENING ON THE LEFT. OTHERS ARE THE OPPOSITE.

COMMENTS

THIS IS A GENERAL HED. THE REASON FOR THIS APPEARS TO BE THE DESIRE TO HAVE ALL METERS ON FOXBORO CONTROLLERS TO FAIL TO THE LEFT. THEY SHOULD BE CONSISTENT AND FOLLOW THE PRINCIPLE OF OPENING TO THE RIGHT AND CLOSING TO THE LEFT.

RESPONSE

THE CONCERNED CONTROLLERS ARE FOR FAILED OPEN VALVES. THE FOXBORO COMPANY DOES NOT OFFER AN ALTERNATIVE FOR THESE CONTROLLERS. ALL OF THE CONTROLLERS WITH THE EXCEPTION OF THE SPRAY VALVE CONTROLLER HAVE INDICATION FOR THE PARAMETER BEING EFFECTED, SO THAT OPERATIONS PERSONNEL CAN OBSERVE WHEN MAKING A CONTROLLER CHANGE. THE CONTROLLERS WILL BE CLEARLY LABELED TO INDICATE THE EXPECTED VALVE RESPONSE TO A CHANGE IN CONTROLLER OUTPUT.

SEVERAL OPERATORS HAVE STATED THAT THE PRESENT CONTROLLER ACTION AND LABELING IS USEFUL IN INDICATION THE DESIGNED FAILURE MODE OF THE VALVE. THE SPRAY ADDITIVE VALVE CONTROLLER IS SPECIAL IN THAT THE OUTPUT CIRCUIT OF THE CONTROLLER OPENS ON RECEIPT OF A SAFEGUARD SIGNAL CAUSING THE VALVE TO OPEN. USE OF THIS CONTROLLER IS MINIMAL DURING NORMAL OPERATIONS AND DOES NOT REQUIRE IMMEDIATE RESPONSE BY OPERATIONS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

PERSONNEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----	-----



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0399
 LITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/11/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THERE ARE NO UNITS OF MEASUREMENT ON THE OUTPUT DEMAND METER FACE
 OR ON THE SETPOINT DIAL. (PCT AND GPM RESPECTIVELY).

REMARKS

METER FACES SHOULD HAVE THE PROPER UNITS OF MEASUREMENT ON IT.

RESPONSE

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE
 INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 73, 162

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
367	RHR HX BYPASS FLOW CONTROLLER	
368	CNTMT SPRAY NAOH ADDITIVE FLOW CONT 836B	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0400
 IDENTITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/11/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THESE FOXBORO CONTROLLERS HAVE NO UNITS ON THE OUTPUT DEMAND METER FACES. GENERALLY THESE ARE MILLIAMP AND/OR AIR SIGNALS TO VALVE. PERCENT VALVE DEMAND SIGNAL IS THE PROPER UNIT OF MEASUREMENT.

REMARKS

IT SHOULD BE NOTED THAT ANY METER FACE SHOULD HAVE THE PROPER UNITS OF MEASUREMENT ON IT. TRAINING OF OPERATIONS PERSONNEL SHOULD ALSO FOCUS ON THE FACT THAT THIS IS A DEMAND SIGNAL, NOT A RESPONSE. THIS IS A COMMON MISPERCEPTION. PROPER RESPONSE TO I.E. FLOW, SHOULD ALSO BE SCRUTINIZED FOR VERIFICATION OF VALVE OPERATION. SUGGEST PLACING "PCT DEMAND SIG" ON THE METER FACE.

RESPONSE

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF SUITABILITY

TASK 3, 214

EQUIPMENT	ID NUMBER	EQUIPMENT NAME	OTHER
	359 362	CONT SPRAY NAOH ADDITIVE FLOW CONT 836A LTDN PRESS CONTROLLER	

#401

This page intentionally left blank.

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0402
 LITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/11/1985

ESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THIS CONTROLLER HAS NO UNITS OF MEASUREMENT LISTED ON THE
 SETPOINT DIAL. THE TASK ANALYSIS CALLED FOR UNITS OF PERCENT
 IN DIVISIONS OF 2.

RECOMMENDATIONS

ANY METER OR DIAL SHOULD HAVE THE PROPER UNITS OF MEASUREMENT ON
 IT. SUGGEST PLACING THE PROPER UNITS OF MEASUREMENT ON THE DIAL.

DISCUSSION

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING
 THE INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF SUITABILITY

TASK 62

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
360 2	CHARGING FLOW CONTROLLER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0403
 QUALITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/11/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THIS INDICATOR DOES NOT HAVE UNITS OF MEASUREMENT ON THE METER FACE. THE TASK ANALYSIS CALLED FOR "PCT".

RECOMMENDATIONS

ANY METER SHOULD HAVE THE PROPER UNITS OF MEASUREMENT ON IT. SUGGEST PLACING "PCT" ON THE METER FACE.

DISPOSITION

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF SUITABILITY

TASK 33

EQUIPMENT ID NUMBER	EQUIPMENT NAME		OTHER
361	5	NON-REGEN HX LETDOWN OUT TEMP	

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: JBW
PLANT: GINNA

DATE: 7/11/1985

NUMBER: 0404
CATEGORY: RGE

CATEGORY 1
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

THESE CONTROLLERS HAVE NO UNITS OF MEASUREMENT ON THE SETPOINT DIAL OR ON THE OUTPUT DEMAND METER FACE. TRENDING INFORMATION WAS REQUESTED FOR FLOW.

RECOMMENDATIONS

METER FACES SHOULD HAVE THE PROPER UNITS OF MEASUREMENT ON THEM. PLACE "PCT-DEMAND SIG" ON THE METER FACE AND THE PROPER FLOW PARAMETER (EITHER GPM OR PCT FLOW) ON THE SETPOINT DIAL. CONSIDER A SEPARATE METER FOR FLOW TRENDING.

RESPONSE

PART OF THIS HED DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO CORRECT THE SITUATION BY THE END OF THE 1987 REFUELING OUTAGE. TRENDING INFORMATION FOR THE RHR HX 1A, 1B FLOW WILL BE MADE AVAILABE ON THE NEW PROCESS COMPUTER SYSTEM WHICH WILL BE IMPLEMENTED 6/30/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF SUITABILITY

TASK 73, 162

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
365	RHR HX 1B OUTLET FLOW CONTROLLER	
366	RHR HX 1A OUTLET FLOW CONTROLLER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0405
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE BUS VOLTAGE METERS HAVE
 INADEQUATE SCALE DIVISIONS BETWEEN 0 AND 100 VOLTS. PRESENTLY
 ONLY 1 DIVISION GRADUATION EXISTS BETWEEN 0 AND 100. TASK
 ANALYSIS SME'S SUGGEST THAT THE METER SHOULD HAVE DIVISIONS OF 10
 VOLTS FROM 0 TO 600. DIVISIONS OF 5 VOLTS HAVE ALSO BEEN
 SUGGESTED FOR SOME TASKS.

REMARKS

RESPONSE

INDICATION OF 480 VOLT BUSES TO LESS THAN 100 VOLTS IS NOT
 NECESSARY AS BY THAT POINT VOLTAGE IS DEGRADED TOO FAR TO BE OF
 ANY USE. DIVISION OF 10 VOLTS IS ADEQUATE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 16
VERIFICATION OF AVAILABILITY	TASK 7
VERIFICATION OF AVAILABILITY	TASK 224
VERIFICATION OF AVAILABILITY	TASK 282
VERIFICATION OF AVAILABILITY	TASK 287
VERIFICATION OF AVAILABILITY	TASK 302
VERIFICATION OF AVAILABILITY	TASK 8
VERIFICATION OF AVAILABILITY	TASK 308

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
74	BUS 13 VOLTMETER	
75	BUS 14 VOLTMETER	
76	BUS 15 VOLTMETER	
77	BUS 16 VOLTMETER	
78	BUS 17 VOLTMETER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0406

ORIGINATOR: DKB

DATE: 7/ 9/1985

LITY: RGE

PLANT: GINNA

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UPPER RANGE AND METER SCALE DIVISIONS FOR THE PRT LIQUID TEMPERATURE METER ARE CURRENTLY INADEQUATE. UPPER RANGE IS CURRENTLY 300 DEG-F WITH DIVISIONS OF 1. SME'S HAVE SUGGESTED AN UPPER RANGE OF 400 DEG-F WITH DIVISIONS OF 2.

REMARKS

RESPONSE

UPON CONSULTING THE STEAM TABLES, THERE APPEARED TO BE NO SITUATION FOR WHICH THE PRZR PORV OR SAFETY VALVE OUTLET TEMPERATURES SHOULD EXCEED 400oF, THEREFORE, THIS RANGE IS ACCEPTABLE. AS A RESULT OF AMBIENT LOSSES AND THE WATER VOLUME IN THE PRT, THE 0-300oF RANGE OF PRT TEMPERATURES SHOULD BE MORE THAN ADEQUATE ALSO.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 55

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
5	PRT LIQUID TEMPERATURE	

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR:
PLANT: GINNA

DATE: 7/ 9/1985

NUMBER: 0407
LITY: RGE

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UPPER RANGE FOR THE PRT GAS
PRESSURE METER IS CURRENTLY INADEQUATE. AT PRESENT THE UPPER
RANGE IS 12 PSIG. SME'S HAVE SUGGESTED THAT AN UPPER RANGE OF
00 PSIG IS NEEDED.

REMARKS

RESPONSE

SEE HED #56.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY TASK 55
VERIFICATION OF AVAILABILITY TASK 83

ANALYST	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	6	PRT GAS PRESSURE	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0408
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT A TRENDING FEEDBACK IS NEEDED,
 FOR PRT LEVEL. THE CURRENT METER IS NOT CAPABLE OF PROVIDING
 TRENDING INFORMATION.

REMARKS

RESPONSE

THE NEW PLANT COMPUTER SYSTEM WILL HAVE PRT LEVEL TREND
 CAPABILITY. THIS WILL BE IMPLEMENTED BY 6/30/87.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 40

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
7	PRT LEVEL	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0409
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE PRESSURIZER SAFETY VALVE
 OUTLET TEMPERATURE METER CURRENTLY HAS INADEQUATE METER SCALE
 DIVISIONS AND UPPER RANGE.

REMARKS

THE CURRENT METER HAS AN UPPER RANGE OF 400 DEG-F WITH DIVISIONS
 OF 10. SME'S SUGGEST AN UPPER RANGE OF 500 WITH DIVISIONS OF 5
 DEG-F.

RESPONSE

UPON REVIEWING THE STEAM TABLES FOR ALL POSSIBLE EXTREME
 CONDITIONS THAT MIGHT EXIST AT THE OUTLET OF THE PRESSURIZER
 SAFETY VALVES, IT WAS DETERMINED THAT A TEMPERATURE GREATER THAN
 400 DEGREES WAS NOT POSSIBLE. THEREFORE, NO SCALE CHANGE IS
 INTENDED AT THIS TIME.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 83

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
8	PZR SAFETY VLV OUTLET TEMP	
9	PZR SAFETY VLV OUTLET TEMP	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0410
 LITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UPPER RANGE AND METER SCALE
 DIVISIONS FOR THE PORV OUTLET TEMPERATURE METER ARE INADEQUATE.

REMARKS

THE CURRENT METER HAS AN UPPER RANGE OF 400 DEG-F WITH DIVISIONS
 OF 10. SME'S SUGGEST AN UPPER RANGE OF 500 WITH DIVISIONS OF 5
 DEG-F.

CONCLUSION

UPON REVIEWING THE STEAM TABLES FOR ALL POSSIBLE EXTREME
 CONDITIONS THAT MIGHT EXIST AT THE OUTLET OF THE PRESSURIZER
 SAFETY VALVES, IT WAS DETERMINED THAT A TEMPERATURE GREATER THAN
 00 DEGREES WAS NOT POSSIBLE. THEREFORE, NO SCALE CHANGE IS
 INTENDED AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 83

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
15	PORV OUTLET TEMP	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0411
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE LOWER RANGE FOR THE SOURCE RANGE AND INTERMEDIATE RANGE METERS IS INADEQUATE. AT PRESENT THE LOW RANGE IS -0.5 DPM. HOWEVER THE NEGATIVE SIGN (-) IS NOT MARKED ON THE METER. FOR SOME TASKS A LOW RANGE OF -1.0 IS NEEDED.

REMARKS

NOTE: THE NEGATIVE SIGN SHOULD BE EXPLICITLY LABELLED ON THE METERS

RESPONSE

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 94
VERIFICATION OF AVAILABILITY	TASK 152
VERIFICATION OF AVAILABILITY	TASK 153
VERIFICATION OF AVAILABILITY	TASK 312
VERIFICATION OF AVAILABILITY	TASK 315

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
18	(STARTUP) SOURCE RANGE #1	
19	(STARTUP) SOURCE RANGE #2	
20	INTERMEDIATE RANGE #1	
21	INTERMEDIATE RANGE #2	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0412
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT. CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UPPER AND LOWER RANGES ON THE T-AVERAGE METERS IS INADEQUATE. THE CURRENT METERS HAVE A RANGE OF 540 TO 615 DEG-F. SME'S SUGGEST A RANGE OF 520 TO 620 DEG-F.

REMARKS

NOTE: THE POSITION OF THESE METERS HAVE BEEN PHYSICALLY MOVED SINCE INVENTORY DATA WAS TAKEN.

RESPONSE

REQ NO. 412 SUGGESTED THE RANGE OF TAVG BE INCREASED FROM 540 TO 615 TO A RANGE OF 520 TO 620.

THIS CHANGE WOULD REQUIRE NEW INDICATORS PLUS AN EVALUATION OF THE CURRENT INSTRUMENTATION COMPONENTS TO SEE IF THEY COULD OPERATE WITH A 1000 SPAN VERSUS A 750 SPAN.

TAVG RANGES FROM 547 TO 573.50 WHICH IS ADEQUATELY COVERED BY THE CURRENT RANGE. THERE APPEARS TO BE NO TECHNICAL JUSTIFICATION TO INCREASE THE INDICATION RANGE TO 520 TO 620.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 30

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
22	T-AVG LOOP 1A1	
23	T-AVG LOOP 1A2	
37	T-AVG LOOP 1B1	
38	T-AVG LOOP 1B2	

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

NUMBER: 0413
CATEGORY: RGE

ASSESSMENT CATEGORY 1
LEVEL A
RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT TRENDING INFORMATION IS NEEDED FOR T-AVERAGE. THE CURRENT METERS CAN PROVIDE STATE AND VALUE INFORMATION BUT ARE INADEQUATE TO PROVIDE TRENDING INFORMATION.

REMARKS

NOTE: THE LOCATION OF THESE METERS HAS BEEN PHYSICALLY MOVED SINCE INVENTORY DATA WAS TAKEN.

RESPONSE

THE NEW PLANT COMPUTER SYSTEM WILL HAVE T-AVE TRENDING CAPABILITY. THIS WILL BE IMPLEMENTED BY 6/30/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY TASK 89
VERIFICATION OF AVAILABILITY TASK 198

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
22	T-AVG LOOP 1A1	
23	T-AVG LOOP 1A2	
37	T-AVG LOOP 1B1	
38	T-AVG LOOP 1B2	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0414
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE HIGH RANGE ON THE DELTA-T
 METERS (RCS) IS INADEQUATE.

REMARKS

CURRENTLY THE HIGH RANGE IS 75 DEG- F. SME'S SUGGEST A HIGH
 RANGE OF 100 DEG-F.

RESPONSE

REQ NO. 414 SUGGESTED THE RANGE OF dt BE INCREASED FROM 75
 DEGREES TO 100 DEGREES.

THIS CHANGE WOULD REQUIRE NEW INDICATORS PLUS AN EVALUATION OF
 THE CURRENT INSTRUMENTATION COMPONENTS TO SEE IF THEY COULD
 OPERATE WITH A 1000 SPAN.

CURRENTLY AT 100% POWER dt IS APPROXIMATELY 56.40. AT 109% POWER
 IT WOULD BE APPROXIMATELY 61.50. THIS IS THE MAXIMUM POSSIBLE
 dt WHICH IS WITHIN THE CURRENT RANGE OF dt. THERE DOES NOT
 APPEAR TO BE ANY TECHNICAL REASON TO INCREASE THE dt RANGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY TASK 176
 VERIFICATION OF AVAILABILITY TASK 198

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
25	DELTA-T METER 1A1	
28	DELTA-T METER 1A2	
40	DELTA-T METER 1B1	
43	DELTA-T METER 1B2	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0415
 LITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT TRENDING INFORMATION IS NEEDED ON
 SOURCE RANGE MEASUREMENTS. THE CURRENT METERS CAN PROVIDE STATE
 IN LEVEL INFORMATION BUT ARE INADEQUATE TO PROVIDE TRENDING
 INFORMATION.

REMARKS

REMARKS

THE NEW PLANT COMPUTER SYSTEM WILL HAVE SOURCE RANGE TRENDING
 CAPABILITY. THIS WILL BE IMPLEMENTED BY 6/30/87.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 94

REL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	31	SOURCE RANGE #1	
	32	SOURCE RANGE #2	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0416
 CATEGORY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UPPER RANGE FOR STEAM
 GENERATOR FEED FLOW IS INADEQUATE.

COMMENTS

THE CURRENT METER HAS A HIGH RANGE OF 3.8. SME'S HAVE SUGGESTED
 HIGH RANGE OF 4.0.

RESPONSE

ED NO. 416 SUGGESTED THE UPPER RANGE OF SG FEED FLOW SHOULD BE
 INCREASED FROM 3.8 X 10(6) LBS/HR.

AT 100% POWER, STEAM FLOW SHOULD EQUAL FEED FLOW. THE 100% STEAM
 FLOW IS APPROXIMATELY 3.0 X 10(6) LBS/HR. THE MAXIMUM VALUE OF
 3.8 X 10(6) REPRESENTS 127% FEED FLOW. THIS PROVIDES SUFFICIENT
 MARGIN TO MAXIMIZE EXPECTED FEED FLOW. THERE IS NO TECHNICAL
 REASON TO INCREASE THE INDICATED RANGE OF FEED FLOW.

STATEMENT OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 276

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
45	SG FEED FLOW	
46	SG FEED FLOW	
52	SG FEED FLOW	
53	SG FEED FLOW	



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0417
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UPPER RANGE ON THE STEAM
 GENERATOR PRESSURE METERS IS INADEQUATE.

REMARKS

WE SUGGEST AN UPPER RANGE OF 1400 PSIG. THE HIGHEST NUMERAL
 CURRENTLY LABELLED IS 1200 PSIG. THE METER CURRENTLY GOES TO 1400
 PSIG, BUT THE HED ARISES BECAUSE THE HIGHEST NUMERAL MARKING IS
 ONLY 1200 PSIG.

RESPONSE

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE
 INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 35
VERIFICATION OF AVAILABILITY	TASK 61
VERIFICATION OF AVAILABILITY	TASK 106
VERIFICATION OF AVAILABILITY	TASK 111
VERIFICATION OF AVAILABILITY	TASK 118
VERIFICATION OF AVAILABILITY	TASK 126
VERIFICATION OF AVAILABILITY	TASK 176
VERIFICATION OF AVAILABILITY	TASK 198
VERIFICATION OF AVAILABILITY	TASK 265

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
49	SG PRESSURE 1A1	
50	SG PRESSURE 1A2	
51	SG PRESSURE 1A3	
56	SG PRESSURE 1B1	



57
58

SG PRESSURE 182
SG PRESSURE 183

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0418
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT TRENDING INFORMATION ON STEAM GENERATOR PRESSURE IS REQUIRED. THE CURRENT METERS CAN PROVIDE STATE AND VALUE INFORMATION, BUT ARE INADEQUATE AT PROVIDING TRENDING DATA.

REMARKS

FOR

THE NEW PLANT COMPUTER SYSTEM WILL HAVE STEAM GENERATOR TREND CAPABILITY. THIS WILL BE IMPLEMENTED BY 6/30/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 68
VERIFICATION OF AVAILABILITY	TASK 126
VERIFICATION OF AVAILABILITY	TASK 265

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
49	SG PRESSURE 1A1	
50	SG PRESSURE 1A2	
51	SG PRESSURE 1A3	
56	SG PRESSURE 1B1	
57	SG PRESSURE 1B2	
58	SG PRESSURE 1B3	



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0419
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL A
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT FOR SOME TASKS, SCALE DIVISIONS ON THE STEAM GENERATOR PRESSURE METERS ARE INADEQUATE.

REMARKS

THE CURRENT METERS HAVE DIVISIONS OF 20 PSIG. SME'S HAVE SUGGESTED THAT FOR SOME TASKS DIVISIONS OF 10 PSIG ARE NEEDED.

DISPOSITION

WORK 4345 HAS BEEN INITIATED TO PROVIDE RCS-S/G DELTA P ON THE PCS. UPON IMPLEMENTATION OF THE EWR, THE NEED FOR PROVIDING INDICATION AS FINE AS THOSE SUGGESTED BY THIS HED IS NEGATED. SEE EDR 59.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 68
VERIFICATION OF AVAILABILITY	TASK 199
VERIFICATION OF AVAILABILITY	TASK 222

REL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	49	SG PRESSURE 1A1	
	50	SG PRESSURE 1A2	
	51	SG PRESSURE 1A3	
	56	SG PRESSURE 1B1	
	57	SG PRESSURE 1B2	
	58	SG PRESSURE 1B3	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0420
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT THE SCALE DIVISION FOR MSIV BYPASS
 FLOW ARE INADEQUATE.

REMARKS

CURRENT DIVISIONS ARE 0.1. SME'S SUGGEST THAT DIVISIONS OF 0.01
 TIMES 10 TO THE SIXTH ARE NEEDED.

CONCLUSION

AFTER FURTHER EVALUATION OF THIS HED, THE CONCLUSION IS THAT
 ADEQUATE INSTRUMENTATION IS PRESENTLY AVAILABLE FOR THE EMERGENCY
 RESPONSE. NO MODIFICATION APPEARS WARRANTED.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 160

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
54	MSIV BYPASS FLOW	
55	MSIV BYPASS FLOW	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0421
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE METER SCALE DIVISIONS FOR THE TURBINE DRIVEN AUX FEED FLOW TO STEAM GENERATOR METERS ARE INADEQUATE.

REMARKS

AT PRESENT THE METERS HAVE DIVISIONS OF 10 GPM. SME'S SUGGEST A NEED FOR DIVISIONS OF 5 GPM.

RESPONSE

IT IS POSSIBLE TO READ THESE METERS TO 1/2 OF THE SMALLEST SCALE DIVISIONS (10 GPM). THEREFORE, IT IS NOT NECESSARY TO ADD FINER DIVISIONS ON THESE METERS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 111
VERIFICATION OF AVAILABILITY	TASK 118
VERIFICATION OF AVAILABILITY	TASK 190
VERIFICATION OF AVAILABILITY	TASK 291

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
60	TDIAF FLOW TO SG-A	
61	TDIAF FLOW TO SG-A	
62	TDIAF FLOW TO SG-B	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0422
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UNITS ON THE METER FOR
 CONDENSATE HEADER DISCHARGE PRESSURE ARE INADEQUATE.

REMARKS

THE UNITS SHOULD BE PSIG, HOWEVER THE CURRENT METER IS LABELLED
 PSI ONLY.

RECOMMENDATIONS

THIS HED DEALS WITH METER AND/OR RECORDER SCALES THAT ARE
 INAPPROPRIATE FOR CONVEYING THE INFORMATION REQUIRED OF A
 PARAMETER. THESE SCALES WILL BE CHANGED TO REFLECT THE NEED
 DESCRIBED BY THE HED. THIS WORK WILL BE UNDER GINNA TASK
 ASSIGNMENT MAINT 85-02 WITH COMPLETION SCHEDULED FOR THE END OF
 THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 159

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
67	COND HEADER DISCH PRESS	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0423
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UNITS ON THE INSTRUMENT AIR
 PRESSURE METERS ARE INADEQUATE.

REMARKS

THE CURRENT METER IS LABELLED PSI, WHEN PSIG IS WHAT IS BOTH
 INTENDED AND REQUIRED.

DISPOSITION

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE
 INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 16
VERIFICATION OF AVAILABILITY	TASK 12
VERIFICATION OF AVAILABILITY	TASK 211
VERIFICATION OF AVAILABILITY	TASK 283

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
69	INSTRUMENT AIR PRESSURE	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0424
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UNITS ON THE SERVICE WATER
 HEADER PRESSURE METER IS INADEQUATE.

REMARKS

UNITS OF PSIG ARE NEEDED, HOWEVER THE LABELLED UNITS ARE PSI.
 PSIG IS IMPLIED, BUT IS NOT EXPLICITLY LABELLED.

DISPOSITION

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE
 INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 276

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
70	SERV WATER HEADER PRESS	
71	SERV WATER HEADER PRESS	



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0425
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT TRENDING INFORMATION IS NEEDED
 FOR INTERMEDIATE RANGE FEEDBACK. THE METERS CURRENTLY USED FOR
 INTERMEDIATE RANGE FEEDBACK CAN PROVIDE STATE AND VALUE.
 INFORMATION, HOWEVER, THEY ARE INADEQUATE FOR PROVIDING TRENDING
 INFORMATION.

REMARKS

CONCLUSIONS

THE NEW PLANT COMPUTER SYSTEM WILL HAVE INTERMEDIATE RANGE
 TRENDING CAPABILITY. THIS WILL BE IMPLEMENTED BY 6/30/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 94
VERIFICATION OF AVAILABILITY	TASK 312

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
73	INTERMEDIATE RANGE #1	
74	INTERMEDIATE RANGE #2	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0426
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT TRENDING INFORMATION IS DESIRED FOR
 PRESSURIZER PRESSURE. THE CURRENT METERS CAN PROVIDE STATE AND
 VALUE INFORMATION, BUT ARE INADEQUATE FOR PROVIDING TRENDING
 INFORMATION.

REMARKS

REASON

THE NEW PLANT COMPUTER SYSTEM WILL HAVE PRESSURIZER PRESSURE
 TRENDING CAPABILITY. THIS WILL BE IMPLEMENTED BY 6/30/87.

CAUSE OF DISCREPANCY	EXPLANATORY INFORMATION
----------------------	-------------------------

VERIFICATION OF AVAILABILITY	TASK 10
VERIFICATION OF AVAILABILITY	TASK 56
VERIFICATION OF AVAILABILITY	TASK 68
VERIFICATION OF AVAILABILITY	TASK 81
VERIFICATION OF AVAILABILITY	TASK 95
VERIFICATION OF AVAILABILITY	TASK 176
VERIFICATION OF AVAILABILITY	TASK 179
VERIFICATION OF AVAILABILITY	TASK 263

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
79	PZR PRESS 1-1	
80	PZR PRESS 1-2	
81	PZR PRESS 1-3	
82	PZR PRESS 1-4	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0427
 LITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE DIVISIONS ON METER SCALES
 OR PRESSURIZER PRESSURE ARE INADEQUATE FOR SOME TASKS.

REMARKS

THE CURRENT METERS HAVE DIVISIONS OF 20 PSIG. SME'S HAVE
 SUGGESTED THAT DIVISIONS OF 10 PSIG WOULD BE MORE APPROPRIATE FOR
 SOME TASKS.

CONCLUSIONS

CS-S/G DELTA P WILL BE PROVIDED ON THE PLANT PROCESS COMPUTER
 PPCS) SYSTEM DURING THE 1987 REFUELING OUTAGE. UPON
 IMPLEMENTATION OF THE EWR, THE NEED FOR PROVIDING INDICATION AS
 LINE AS THOSE SUGGESTED BY THIS HED IS NEGATED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY TASK 55
 VERIFICATION OF AVAILABILITY TASK 56

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
79	PZR PRESS 1-1	
80	PZR PRESS 1-2	
81	PZR PRESS 1-3	
82	PZR PRESS 1-4	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0428
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT THE LOWER RANGE OF THE CURRENT
 PRESSURIZER PRESSURE METERS IS OFTEN INADEQUATE FOR SOME TASKS.

REMARKS

THE CURRENT METERS HAVE A LOWER RANGE OF 1700 PSIG. SME'S HAVE
 SUGGESTED LOWER RANGES OF 0 PSIG, 500 PSIG, AND 1000 PSIG,
 DEPENDING ON THE TASK.

BOTH WIDE AND NARROW RANGE PZR PRESSURE METERS SHOULD BE
 PROVIDED.

RESPONSE

WIDE-RANGE REACTOR COOLANT SYSTEM PRESSURE CAN BE DISPLAYED WITH
 TRENDS CAPABILITY ON THE NEW PLANT COMPUTER SYSTEM. THIS
 CAPABILITY IS IN CONJUNCTION WITH THE EXISTING RECORDER CHARTS
 AND PROVIDES ADEQUATE INDICATION OF THE PARAMETER. THE NEW PLANT
 COMPUTER SYSTEM WILL BE IMPLEMENTED BY 6/30/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 10
VERIFICATION OF AVAILABILITY	TASK 49
VERIFICATION OF AVAILABILITY	TASK 67
VERIFICATION OF AVAILABILITY	TASK 81
VERIFICATION OF AVAILABILITY	TASK 82
VERIFICATION OF AVAILABILITY	TASK 87
VERIFICATION OF AVAILABILITY	TASK 91
VERIFICATION OF AVAILABILITY	TASK 95
VERIFICATION OF AVAILABILITY	TASK 102
VERIFICATION OF AVAILABILITY	TASK 176
VERIFICATION OF AVAILABILITY	TASK 101
VERIFICATION OF AVAILABILITY	TASK 263
VERIFICATION OF AVAILABILITY	TASK 138

L
-
ID NUMBER

NAME

OTHER

79

PZR PRESS 1-1

80

PZR PRESS 1-2

81

PZR PRESS 1-3

82

PZR PRESS 1-4



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0429
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT THE METER SCALE DIVISIONS FOR THE
 PRESSURIZER LEVEL METERS MAY BE INADEQUATE FOR SOME TASKS.

REMARKS

THE METERS CURRENTLY HAVE DIVISIONS OF 2.0 PCT. THE SME HAS
 SUGGESTED THAT FOR SOME TASK, DIVISIONS OF 1.0 PCT ARE NEEDED.

CONCLUSION

THE PRESSURIZER LOW LEVEL SETPOINT WILL BE CHANGE TO 13%,
 CONSISTENT WITH TECH. SPECS. SECTION 3.1.1.5. THIS CHANGE WILL
 ELIMINATE THE NEED TO READ THIS METER IN TENTHS OF A PERCENT.
 PROCEDURE CHANGE NOTICES WILL ALSO BE INITIATED TO INSERT THIS
 NEW VALUE IN APPROPRIATE PROCEDURES. THESE CHANGES WILL BE
 IMPLEMENTED BY 4-86.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY TASK 43
 VERIFICATION OF AVAILABILITY TASK 48

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
83	PZR LEVEL 1-1	
84	PZR LEVEL 1-2	
85	PZR LEVEL 1-3	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0430
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT THE LABELLED UNITS ON THE FEED WATER
 PUMP SUCTION PRESSURE METERS ARE INAPPROPRIATE. THE UNITS SHOULD
 BE PSIG, BUT ARE CURRENTLY LABELLED PSI ONLY.

REMARKS

NOTE: PSI HERE MEANS PSIG, BUT SHOULD BE EXPLICITLY LABELLED.

DISPOSITION

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE
 INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 159

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
88	FWP SUCTION PRESS	
97	FWP SUCTION PRESS	

HUMAN ENGINEERING DISCREPANCY

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

NUMBER: 0431
CATEGORY: RGE

ASSESSMENT CATEGORY 2
LEVEL C
RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT THE LABELLED UNITS FOR FEEDWATER PUMP DISCHARGE PRESSURE ARE INAPPROPRIATE. THE METER SHOULD BE LABELLED PSIG, BUT IS CURRENTLY LABELLED PSI ONLY.

REMARKS

NOTE: PSI IN THIS CASE IMPLIES PSIG, BUT SHOULD BE EXPLICIT ON THE METER.

DISPOSITION

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 159

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
89	FWP DISCH PRESS	
98	FWP DISCH PRESS	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0432
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT THE UNITS NEEDED ON THE HOTWELL LEVEL
 METER ARE NOT AVAILABLE. THE METER SHOULD BE LABELLED IN INCHES,
 HOWEVER AT THE PRESENT NO UNITS ARE LABELLED ON THE METER.

REMARKS

RESPONSE

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE
 INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 159

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
105	HOTWELL LEVEL	
106	HOTWELL LEVEL	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0433
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THE UPPER RANGE ON THE HOTWELL LEVEL
 METER IS INADEQUATE.

REMARKS

THE CURRENT HIGH RANGE IS 40. SME'S SUGGEST A HIGH RANGE OF 50.

RESPONSE

THE CURRENT RANGE OF HOTWELL LEVEL INDICATION IS ACTUALLY 0-48
 INCHES WHICH IS ADEQUATE FOR ALL OPERATION REQUIREMENTS. NO
 CHANGE IS INTENDED AT THIS TIME.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 159

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
105	HOTWELL LEVEL	
106	HOTWELL LEVEL	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0434
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UPPER RANGE AND METER SCALE DIVISIONS FOR THE CST LEVEL METER ARE INADEQUATE.

REMARKS

THE CURRENT METER HAS AN UPPER RANGE OF 24 WITH DIVISIONS OF 1.0 FT. SME'S SUGGEST THAT AN UPPER RANGE OF 25 FT WITH DIVISIONS OF .5 FT MAY BE NEEDED FOR SOME TASK.

CONCLUSION

THE CONDENSATE STORAGE TANKS OVERFLOW AT A LEVEL BETWEEN 23 AND 24 FEET, THEREFORE ANY INDICATION ABOVE 24 FEET IS UNNECESSARY. CURRENT MINIMUM DIVISIONS OF 1 FOOT ARE ADEQUATE AS THIS ALLOWS ACCURATE INDICATION TO THE NEAREST 1/2 FOOT.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY TASK 272
 VERIFICATION OF AVAILABILITY TASK 224

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
107	CST LEVEL	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0435
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT LABELLING PROBLEMS EXIST WITH
 THE METER SCALE FOR RCS T-AVG. AT PRESENT UNITS ARE NOT LABELLED ON
 THE METER, AND THE HIGHEST LABELLED NUMERAL IS 610 DEG-F.

REMARKS

THE UPPER RANGE SHOULD BE 615 DEG-F AND HAVE UNITS OF DEG-F.

REMARKS

UNITS ARE LABELED ON THE METER. THE HIGH END OF THE RANGE CAN BE
 INFERRED. NO CHANGE APPEARS WARRANTED.

REASON FOR DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 89

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
144	RCS T-AVG	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0436
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT LABELLED UNITS ARE NOT AVAILABLE ON
 THE RCS PRESSURE RECORDER. THIS RECORDER SHOULD HAVE UNITS OF
 1000 LBS LABELLED ON THE RECORDER.

REMARKS

CONSEQUENCE

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE
 INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 10
VERIFICATION OF AVAILABILITY	TASK 55
VERIFICATION OF AVAILABILITY	TASK 68
VERIFICATION OF AVAILABILITY	TASK 75
VERIFICATION OF AVAILABILITY	TASK 88
VERIFICATION OF AVAILABILITY	TASK 81
VERIFICATION OF AVAILABILITY	TASK 95
VERIFICATION OF AVAILABILITY	TASK 96
VERIFICATION OF AVAILABILITY	TASK 82
VERIFICATION OF AVAILABILITY	TASK 106
VERIFICATION OF AVAILABILITY	TASK 86
VERIFICATION OF AVAILABILITY	TASK 320
VERIFICATION OF AVAILABILITY	TASK 136
VERIFICATION OF AVAILABILITY	TASK 263
VERIFICATION OF AVAILABILITY	TASK 46
VERIFICATION OF AVAILABILITY	TASK 49
VERIFICATION OF AVAILABILITY	TASK 54

EQUIPMENT	EQUIPMENT
ID NUMBER	NAME
_____	_____

OTHER

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0437
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE SCALE DIVISIONS FOR THE WIDE RANGE SCALE OF THE RCS PRESSURE RECORDER ARE INADEQUATE FOR SOME TASKS.

REMARKS

THE CURRENT WIDE RANGE SCALE HAS DIVISIONS OF 50. SME'S SUGGEST DIVISIONS OF 20, 25, AND 5 FOR VARIOUS TASKS. THE NARROW RANGE SCALE ON THE SAME RECORDER HAS DIVISIONS OF 10.

RESPONSE

WR 4345 HAS BEEN ISSUED IN RESPONSE TO THIS NEED. THE EWR REQUIRES THAT THE RCS AND S/G PRESSURE SIGNALS ARE TO BE INPUTED INTO THE NEW COMPUTER SYSTEM AND THE COMPUTER PROGRAMMED TO TREND THE DELTA P. THIS WILL BE ACCOMPLISHED BY 6/30/87.

SOURCE OF DISCREPANCY	EXPLANATORY INFORMATION
-----	-----

IDENTIFICATION OF AVAILABILITY	TASK 68
IDENTIFICATION OF AVAILABILITY	TASK 95
IDENTIFICATION OF AVAILABILITY	TASK 263
IDENTIFICATION OF AVAILABILITY	TASK 82
IDENTIFICATION OF AVAILABILITY	TASK 86
IDENTIFICATION OF AVAILABILITY	TASK 136

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----
148	RCS PRESSURE RECORDER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0438
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT THE RECORDER SCALE AND RECORDER PAPER SCALE DO NOT MATCH ON THE PRESSURIZER LEVEL RECORDER.

REMARKS

BOTH SHOULD HAVE SCALES WITH A RANGE OF 0-100 PCT IN DIVISIONS OF 1 PCT.

CONCLUSION

INVESTIGATION REVEALED THAT THE PROPER CHART PAPER WAS ON THE RECORDER. A POSSIBLE EXPLANATION TO THE GENERATION OF THIS HED IS THAT FOR ANY ONE OF SEVERAL POSSIBLE REASONS, A TEMPORARY CHART PAPER WAS INSTALLED AT THE TIME OF THIS HED WRITE UP.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 226
VERIFICATION OF AVAILABILITY	TASK 263
VERIFICATION OF AVAILABILITY	TASK 285
VERIFICATION OF AVAILABILITY	TASK 46

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
149	PZR LEVEL RECORDER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0439
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UPPER RANGE ON THE WIDE
 RANGE STEAM GENERATOR LEVEL RECORDER-LOOP A&B IS INADEQUATE. AN
 UPPER RANGE OF 530 INCHES IS SUGGESTED BY THE SME.

COMMENTS

PRESENT THIS SCALE HAS AN UPPER RANGE OF 520, WITH 500 BEING
 THE HIGHEST LABELLED NUMERAL.

CONCLUSIONS

THE UPPER LEVEL TAP FOR THE S/G LEVEL INDICATION IS AT 518" FROM
 THE TUBE SHEET, THEREFORE, A WIDE RANGE LEVEL SCALE OF GREATER
 THAN 518" IS UNNECESSARY. PRESENT RANGE IS ADEQUATE.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 132

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
152	WR-SG LOOP A&B RECORDER	

#440

This page intentionally left blank.

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0441
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE UPPER RANGE FOR THE BORIC
 ACID TO BLENDER FLOW CONTROLLER SETPOINT DIAL SCALE IS
 INADEQUATE.

COMMENTS

THE PRESENT UPPER RANGE IS 10 GPM. SME'S SUGGEST AN UPPER RANGE
 OF 40 GPM.

REASON

10 GPM FLOW THROUGH THE BORIC ACID BLENDER IS MORE THAN THAT
 WHICH IS NECESSARY FOR NORMAL OPERATION. A FLOW RATE GREATER THAN
 10 GPM WOULD BE INDICATION OF AN EMERGENCY BORATION CONDITION
 IN WHICH CASE AN ALTERNATE FLOW PATH IS UTILIZED WHICH HAS FLOW
 INDICATION UP TO 150 GPM. NO CHANGE IS WARRANTED.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 158

LEVEL	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	273-3	BA TO BLDR FLOW	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0442
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THE STATUS LIGHT COLOR ON THE
 LOW FLOW CSL IS INAPPROPRIATE.

REMARKS

PRESENT THIS IS A WHITE CSL. IT SHOULD BE A RED CSL ACCORDING
 TO THE SME.

RECOMMENDATIONS

IT IS THE RECOMMENDATION OF THE OPERATION DEPT. TO KEEP THE FAN
 LOW FLOW CSL WHITE. THIS MEANS AN ABNORMAL CONDITION TO THE
 OPERATORS.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 161

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
112	LOW AIR FLOW CSL	
114	LOW AIR FLOW CSL	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0443
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT THE POSITION LABELS FOR THE EMERGENCY
 GENERATOR GOVERNOR ARE INADEQUATE. THIS CONTROL SHOULD HAVE
 PERMANENT LABELS "RAISE" AND "LOWER". AT PRESENT THESE ARE DYNO-
 TYPE LABELS.

REMARKS

CONCLUSIONS

PERMANENT LABELS WILL BE INSTALLED AS PART OF A COMPREHENSIVE
 LABELLING PACKAGE FOR THE CONTROL ROOM. THIS WILL BE IMPLEMENTED
 DURING THE 1987 REFUELING OUTAGE.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 29

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
127	EDG #1A GOVERNOR	
140	EDG #1B GOVERNOR	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0444
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS SHOWN THAT A POSITION LABEL PLATE IS NOT
 AVAILABLE FOR THE EDG #1A AND EDG #1B AUTO VOLT CONTROL RHEOSTAT.
 THIS IS A CONTINUOUS CONTROL AND SHOULD HAVE A POSITION
 "BACKPLATE" TO INDICATE CURRENT RHEOSTAT SETTING.

REMARKS

CONCLUSIONS

WORK ASSIGNMENT OPS 85-84 ADDRESSES THE CONCERN OF THIS HED. NEW
 CUTCHION PLATES WILL BE INSTALLED WHICH WILL UTILIZE
 NOMENCLATURE CONSISTENT WITH PROCEDURES. THERE IS ALSO AN
 ONGOING 2 1/2 YEAR REVIEW OF PROCEDURES WHICH WILL ENSURE
 CONSISTENCY AS WELL AS A REGULAR TRAINING SCHEDULE. THIS WILL BE
 COMPLETED BY SPRING 1987.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 29

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
149	EDG #1A AUTO VOLT RHEOSTAT	
150	EDG #1B AUTO VOLT RHEOSTAT	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0445
 IDENTITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/15/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING X

DESCRIPTION OF DISCREPANCY

THE TASK ANALYSIS CALLED FOR THE SWITCH POSITION TO GO TO
 "START".

REMARKS

THE ACTUAL SWITCH POSITION READS "CLOSE". SWITCH POSITIONS
 SHOULD FOLLOW FUNCTION.

CAUSE

NEW ESCUTCHEON PLATES WILL BE INSTALLED WHICH WILL UTILIZE
 NOMENCLATURE CONSISTENT WITH PROCEDURES. IN ADDITION, A HUMAN
 FACTORS MANUAL WILL BE PROVIDED THAT ADMINISTRATIVELY DICTATES
 ABBREVIATIONS AND ACRONYMS USED IN THE PLANT. THERE IS ALSO AN
 ONGOING 2 1/2 YEAR REVIEW OF PROCEDURES WHICH WILL ENSURE
 CONSISTENCY AS WELL AS A REGULAR TRAINING SCHEDULE. THIS WILL BE
 COMPLETED BY THE END OF THE 1987 REFUELING OUTAGE.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 12,16,211,283

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
87	INST AIR COMP 1C	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0446
 IDENTITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/15/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TASK ANALYSIS CALLED FOR THESE METERS TO READ IN DIVISIONS OF 1 OR 2, UNITS OF PSIG, AND TO HAVE A RANGE OF 0-200 (MAXIMUM).

COMMENTS

THE ACTUAL METER READS IN PSIA, NOT PSIG. THE ACTUAL DIVISIONS ARE 5, NOT 1 OR 2. THE LOW RANGE IS 10, NOT 0.

RESPONSE

WIDE RANGE CONTAINMENT PRESSURE INDICATION IS AVAILABLE IN THE CONTROL ROOM WITH A RANGE OF THREE TIMES THE DESIGN PRESSURE OF THE CONTAINMENT BUILDING. THIS AND OTHER EXISTING CONTAINMENT PRESSURE INDICATION (SEE HED#363) PRECLUDE A NEED FOR ADDITIONAL INSTRUMENTATION.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 17,19,20,35,80,196,300

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
21	CTNT PRESS 1B	
22	CTNT PRESS 2B	
23	CTNT PRESS 3B	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0447
 ID: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/15/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

E.T.A. CALLED FOR THESE METERS TO BE IN UNITS OF PSIG AND GPM
 RESPECTIVELY. IN ADDITION, NEITHER ARE LABELED, BOTH JUST HAVE
 INSTRUMENT # LABELS E.G. PI4086B.

COMMENTS

UNITS OF MEASUREMENT ARE NOT SHOWN ON THE METER FACES. METERS
 SHOULD ALSO BE CLEARLY LABELED.

SOLUTIONS

THIS DEALS WITH SCALES THAT ARE INAPPROPRIATE FOR CONVEYING THE
 INFORMATION REQUIRED OF A PARAMETER. IT WILL BE MODIFIED TO
 REFLECT THE NEED DESCRIBED BY THE HED. COMPLETION OF THE
 MODIFICATION WILL OCCUR BY THE END OF THE 1987 REFUELING OUTAGE.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 159

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

13	STBY AUX FEED DISCH PRESS
14	STBY AUX FEED FLOW
15	STBY AUX FEED DISCH PRESS
16	STBY AUX FEED FLOW

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0448
 ID: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/15/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TASK ANALYSIS CALLED FOR THESE METERS TO BE IN VOLTS, RANGE
 500 IN DIVISIONS OF 5.

EVIDENCE

THE ACTUAL METERS ARE IN DIVISIONS OF 10.

CONSEQUENCE

INCREASING OF 10 VOLTS ARE ADEQUATE FOR EMERGENCY D/G VOLTMETER.
 VOLTAGE DOESN'T NEED TO BE READ MORE ACCURATELY THAN THE NEAREST
 VOLTS.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 282

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
6	EMERG GEN #1A VOLTMETER	
7	EMERG GEN #1B VOLTMETER	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0449
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT AN ANNUNCIATOR FOR SI ACTUATION
 IS NEEDED AND IS NOT PRESENTLY AVAILABLE.

REMARKS

THIS ANNUNCIATOR WOULD PROVIDE DIRECT FEEDBACK TO THE OPERATOR
 THAT A SI HAS OCCURED.

REASON

THE INTENT HERE WAS TO HAVE AN ANNUNCIATOR TO PROVIDE INDICATION
 THAT THE SAFEGUARDS SEQUENCE HAS BEEN SATISFACTORILY COMPLETED.
 THIS IS REALLY NOT DESIRABLE SINCE AN ALARM SHOULD INDICATE A
 MALFUNCTION RATHER THAN A SUCCESSFUL COMPLETION OF A PROCESS.
 CURRENTLY THERE ARE ALARMS TO INDICATE THAT AN SI SIGNAL IS
 PRESENT, THAT CV ISOLATION AND VENTILATION HAVE OCCURED. THERE
 ARE SAFEGUARDS VALVE STATUS LIGHTS C.V. ISOLATION STATUS LIGHTS
 AND C.V. ISOLATION RELAY STATUS PANEL LIGHTS), PUMP RUNNING
 LIGHTS AND OTHER INSTRUMENTATION TO VERIFY SI.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY
 VERIFICATION OF AVAILABILITY
 VERIFICATION OF AVAILABILITY
 VERIFICATION OF AVAILABILITY
 VERIFICATION OF AVAILABILITY

TASK 1 (ACTUATE SI)
 TASK 50 (CK PZR PRESS. CONTROL)
 TASK 63 (CK RCP SEAL COOLING)
 TASK 135 (CK IF SI IS ACTUATED)
 TASK 151 (CK SI SIGNAL STATUS)

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

SI ACTUATION (ANNUNCIATOR)

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0450
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT AN INDICATION FOR REACTOR VESSEL
 LEVEL IS NEEDED AND IS NOT PRESENTLY AVAILABLE.

REMARKS

RESPONSE

REACTOR VESSEL LEVEL INDICATION WILL BE AVAILABLE IN THE CONTROL
 ROOM. THE DESIGN AND IMPLEMENTATION OF A SYSTEM TO PROVIDE THIS
 INDICATION IS CURRENTLY AUTHORIZED BY EWR #2799. THIS WILL BE
 OPERABLE BY 7/87.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 6

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
------------------------	-------------------	-------

RX VESSEL LEVEL

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0451
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT . CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED A NEED FOR A TOTAL CHARGING FLOW
 INDICATION. THIS INDICATION IS NOT CURRENTLY AVAILABLE.

REMARKS

RESPONSE

WORK ORDER 4117 HAS BEEN ISSUED TO INSTALL FLOW INDICATION BY 6/30/88.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 12
VERIFICATION OF AVAILABILITY	TASK 44
VERIFICATION OF AVAILABILITY	TASK 244

EQUIPMENT	EQUIPMENT	OTHER
ID NUMBER	NAME	
-----	-----	-----

TOTAL CHARGING FLOW

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0452
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

ANALYSIS HAS DETERMINED A NEED FOR COMPONENT COOLING WATER
 FLOW TO THE RCP THERMAL BARRIER. THIS INDICATION IS NOT
 PRESENTLY AVAILABLE.

REMARKS

THIS INDICATION SHOULD HAVE A RANGE OF 0-100 GPM IN DIVISIONS OF

CONCLUSION

THERE DOES NOT APPEAR TO BE JUSTIFICATION TO WARRANT A
 RE-EVALUATION AT THIS TIME. HOWEVER, FURTHER EVALUATION OF THIS
 INDICATION WILL BE CONDUCTED TO DETERMINE IF AN ADDITIONAL PROCESS
 COMPUTER INPUT WOULD BENEFIT OPERATORS IN THE PERFORMANCE OF
 THEIR DUTIES. THE EXPECTED COMPLETION DATE OF THE EVALUATION IS
 JUNE 1988.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

DEFICIENCY OF AVAILABILITY TASK 12
 DEFICIENCY OF AVAILABILITY TASK 63

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
------------------------	-------------------	-------

CCW FLOW TO RCP-A THERMAL BARRIER
 CCW FLOW TO RCP-B THERMAL BARRIER

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0453
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT AN INDICATION IS NEEDED FOR
 DELTA-P BETWEEN RCS AND STEAM GENERATORS. THIS INDICATION IS NOT
 PRESENTLY AVAILABLE.

REMARKS

THESE INDICATIONS SHOULD HAVE A RANGE OF 0-500 PSID IN DIVISIONS
 OF 10.

RESPONSE

WORK 4345 HAS BEEN INITIATED WHICH REQUIRES RCS AND S/G PRESSURE
 TO BE INPUTTED INTO THE PPCS AND THE PPCS PROGRAMMED TO DISPLAY
 RCS-S/G DELTA P. THIS WILL BE DONE JUNE 30, 1987.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 61

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	DELTA-P BETWEEN RCS AND SG-A	
	DELTA-P BETWEEN RCS AND SG-B	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0454
ITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

SSMENT CATEGORY 2
LEVEL C
RATING Y

RIPTION OF DISCREPANCY

RIFICATION HAS DETERMINED A NEED FOR CONDENSATE FLOW
DICATIONS.

MENTS

ONSE

HAVE BEEN DETERMINED BY THE REVIEW COMMITTEE THAT HAVING THIS
LOW INDICATION ADDS MINIMAL, IF ANY, OPERABILITY TO THE PLANT.
CHANGE IS INTENDED AT THIS TIME.

RCE OF DISCREPANCY

EXPLANATORY INFORMATION

RIFICATION OF AVAILABILITY

TASK 159

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
------------------------	-------------------	-------

CONDENSATE FLOW

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0455
ITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

SSMENT CATEGORY 2
LEVEL B
RATING W

RIPTION OF DISCREPANCY

RIFICATION HAS DETERMINED A NEED FOR VALVE POSITION METERS FOR
V738A AND MOV738B.

ENTS

ESE DO NOT EXIST. RECOMMENDED PLACEMENT IS PANEL 7.

ONSE

E HED #40.

CE OF DISCREPANCY

EXPLANATORY INFORMATION

FICATION OF AVAILABILITY

TASK 162 (CONT.RCS COOLDOWN TO CLD SHUT)

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	RHR HX A MOV738A	
	RHR HX B MOV738B	



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0456
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED A NEED FOR A PORV OPEN ANNUNCIATOR
 ARM.

REMARKS

RESPONSE

THERE DOES NOT APPEAR TO BE JUSTIFICATION TO WARRANT A
 MODIFICATION AT THIS TIME. HOWEVER, FURTHER EVALUATION OF THIS
 DISCREPANCY WILL BE CONDUCTED TO DETERMINE IF AN ADDITIONAL PROCESS
 COMPUTER INPUT WOULD BENEFIT OPERATORS IN THE PERFORMANCE OF
 THEIR DUTIES. THE EXPECTED COMPLETION DATE OF THE EVALUATION IS
 JUNE 1988.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

LOCATION OF AVAILABILITY TASK 83

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
------------------------	-------------------	-------

(ANNUNCIATOR) PORV OPEN

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0457
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED A NEED FOR CONTROLS IN THE CR FOR RCP
 SEAL INJECTION ISOLATION VALVES. THIS CONTROL SHOULD HAVE A
 METER ASSOCIATED WITH IT TO INDICATE PERCENT OF VALVE OPENING.

REMARKS

THE ASSOCIATED METER SHOULD HAVE A RANGE OF 0-100 PCT IN
 DIVISIONS OF 2.

RESPONSE

OPS E-1 AND ECA-0.2 REQUIRE THE ISOLATION VALVES TO BE CLOSED
 PRIOR TO STARTING A CHARGING PUMP AFTER CCW IS LOST TO THE SEALS.
 THIS IS REQUIRED TO PREVENT RCP SHAFT DAMAGE. SINCE THE
 ISOLATION VALVES ARE MANUAL, THERE IS NO NEED FOR POSITION
 INDICATION IN THE CONTROL ROOM, ESPECIALLY 0-100% OPEN.

REASON FOR DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 64

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
------------------------	-------------------	-------

RCP SEAL INJECTION ISOLATION VALVES

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0458
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THE NEED FOR INDICATIONS OF KW'S FOR
 THE PRESSURIZER HEATERS AND PRESSURIZER BACKUP HEATERS.

REMARKS

THESE METERS SHOULD HAVE A RANGE OF 0-400 KW IN 10 KW DIVISIONS.

RESPONSE

SURVEY OF THE OPERATORS HAS DETERMINED THAT THIS INDICATION
 WOULD BE NICE TO HAVE, BUT NOT NECESSARY. FURTHER, THIS
 INDICATION IS AVAILABLE LOCALLY AT THE BUSES.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 173

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
	KW METER FOR PRZ B/U HTRS	
	KW METER FOR PRZ HTRS	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0459
ITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

SSMENT CATEGORY 1
LEVEL C
RATING Y

RIPTION OF DISCREPANCY

RIFICATION HAS DETERMINED THAT AN INDICATION FOR CONTAINMENT
MP LEVEL IS NEEDED.

ENTS

IS INDICATION SHOULD HAVE A RANGE OF 0-232 INCHES IN 2 INCH
VISIONS.

ONS

ERE PRESENTLY EXISTS TWO CONTAINMENT SUMP INDICATORS IN THE
NTROL ROOM WITH A RANGE 0-30FT. ADDITIONAL INSTRUMENTATION IS
T REQUIRED.

CE OF DISCREPANCY

EXPLANATORY INFORMATION

FICATION OF AVAILABILITY

TASK 155

L EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

CONT SUMP LEVEL

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0460
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THE NEED FOR A WIDE RANGE PRESSURIZER
 METER. THIS INDICATION IS NOT CURRENTLY AVAILABLE.

EFFECTS

THIS METER SHOULD HAVE A RANGE OF 0-2500 PSIG IN DIVISIONS OF 50.

RESPONSE

THE NEW PLANT COMPUTER WILL HAVE PRESSURE WIDE-RANGE CAPABILITY.
 THIS WILL BE IMPLEMENTED BY 6/30/87.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 61
VERIFICATION OF AVAILABILITY	TASK 68
VERIFICATION OF AVAILABILITY	TASK 75
VERIFICATION OF AVAILABILITY	TASK 96
VERIFICATION OF AVAILABILITY	TASK 98
VERIFICATION OF AVAILABILITY	TASK 106
VERIFICATION OF AVAILABILITY	TASK 173
VERIFICATION OF AVAILABILITY	TASK 258
VERIFICATION OF AVAILABILITY	TASK 318
VERIFICATION OF AVAILABILITY	TASK 368
VERIFICATION OF AVAILABILITY	TASK 320
VERIFICATION OF AVAILABILITY	TASK 265.01
VERIFICATION OF AVAILABILITY	TASK 305
VERIFICATION OF AVAILABILITY	TASK 285

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

PRZR WIDE RANGE PRESS

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0461
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

ANALYSIS HAS DETERMINED A NEED FOR LOOP T-HOT INDICATIONS.

REMARKS

THESE INDICATIONS SHOULD HAVE A RANGE OF 500 TO 650 DEG-F WITH
 TOLERANCES OF 1 DEG-F.

CONCLUSION

THE T-HOT INDICATORS HAVE BEEN INSTALLED IN THE CENTER SECTION OF
 THE MCB.

DESCRIPTION OF DISCREPANCY

EXPLANATORY INFORMATION

DEFICIENCY OF AVAILABILITY	TASK 68
DEFICIENCY OF AVAILABILITY	TASK 76
DEFICIENCY OF AVAILABILITY	TASK 77
DEFICIENCY OF AVAILABILITY	TASK 90
DEFICIENCY OF AVAILABILITY	TASK 91
DEFICIENCY OF AVAILABILITY	TASK 95
DEFICIENCY OF AVAILABILITY	TASK 96
DEFICIENCY OF AVAILABILITY	TASK 162
DEFICIENCY OF AVAILABILITY	TASK 198
DEFICIENCY OF AVAILABILITY	TASK 176
DEFICIENCY OF AVAILABILITY	TASK 320
DEFICIENCY OF AVAILABILITY	TASK 263

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

T-HOT LOOP-A
 T-HOT LOOP-B

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0462
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT AN INDICATION OF RCS HOT LEG
 TEMPERATURE IS NEEDED. THIS INDICATION IS NOT PRESENTLY
 AVAILABLE.

REMARKS

RESPONSE

RCS T-HOT INDICATORS HAVE BEEN INSTALLED IN THE CENTER SECTION OF
 THE MCB.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY TASK 22
 VERIFICATION OF AVAILABILITY TASK 60

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
------------------------	-------------------	-------

RCS HOT LEG TEMPERATURE

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0463
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING Y

DESCRIPTION OF DISCREPANCY

ANALYSIS HAS DETERMINED THAT SEVERAL MAJOR TREND MAPS AND INDICATIONS ARE NEEDED ON A SAFETY PARAMETER DISPLAY SYSTEM (SPDS).

REQUIREMENTS

THE FOLLOWING SPDS INDICATIONS ARE NEEDED:

- . CCW FLOW TO MAJOR COMPONENTS
- . CCW TOTAL FLOW
- . CCW FLOW FROM SEAL RETURN HX
- . TEMPERATURE COUPLE TREND MAP
- . SUBCOOLING TREND MAP
- . SG RADIATION INDICATION FOR BLOWDOWN
- . STEAM LINE RADIATION
- . COOLDOWN TREND MAP
- . CCW FLOW FROM RHR HX

RESPONSE

THE SPDS PARAMETER SELECTION HAS BEEN REVIEWED AND HAS BEEN DEEMED ADEQUATE. NO MAJOR CHANGES APPEAR WARRANTED AT THIS TIME. TREND MAPS WILL BE PROVIDED ON THE NEW PLANT COMPUTER SYSTEM. THIS WILL BE IMPLEMENTED 6/30/87.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

FIGURE 62 ON OF AVAILABILITY	TASK 62.
FIGURE 66 ON OF AVAILABILITY	TASK 66
FIGURE 68 ON OF AVAILABILITY	TASK 68
FIGURE 91 ON OF AVAILABILITY	TASK 91
FIGURE 95 ON OF AVAILABILITY	TASK 95
FIGURE 107 ON OF AVAILABILITY	TASK 107
FIGURE 162 ON OF AVAILABILITY	TASK 162
FIGURE 176 ON OF AVAILABILITY	TASK 176



FICATION OF AVAILABILITY	TASK 199
FICATION OF AVAILABILITY	TASK 198
FICATION OF AVAILABILITY	TASK 320
FICATION OF AVAILABILITY	TASK 296
FICATION OF AVAILABILITY	TASK 263

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

SPDS

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0464
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT AN INDICATION FOR CORE EXIT
 THERMOCOUPLE TEMPERATURE IS NEEDED. THIS INDICATION IS NOT
 PRESENTLY AVAILABLE.

EFFECTS

CONSEQUENCE

TO NEW DIGITAL CORE EXIT THERMOCOUPLE INDICATORS WITH AUTOMATIC
 FUNCTION TEMPERATURE COMPENSATION HAVE BEEN INSTALLED IN THE
 CORE RACKS IN THE CONTROL ROOM.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY TASK 22
 VERIFICATION OF AVAILABILITY TASK 23.

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

CORE EXIT TC

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0465
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT AN INDICATION OF EXCESS LETDOWN
 HEAT EXCHANGER OUTLET FLOW IS NEEDED. THIS IS NOT CURRENTLY
 AVAILABLE.

REMARKS

RESPONSE

THERE DOES NOT APPEAR TO BE JUSTIFICATION TO WARRANT A MODIFI
 CATION AT THIS TIME. HOWEVER, FURTHER EVALUATION OF THIS
 ISSUE WILL BE CONDUCTED TO DETERMINE IF AN ADDITIONAL PROCESS
 COMPUTER INPUT WOULD BENEFIT OPERATORS IN THE PERFORMANCE OF
 THEIR DUTIES. THE EXPECTED COMPLETION DATE OF THE EVALUATION IS
 JUNE 1988.

SOURCE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY
 VERIFICATION OF AVAILABILITY

TASK 12
 TASK 277

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

EXCESS LETDOWN HX OUTLET FLOW

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0466
ITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

SSMENT CATEGORY 2
LEVEL C
RATING Y

RIPTION OF DISCREPANCY

IFICATION HAS DETERMINED A NEED FOR AN INDICATION OF CCW FLOW
OM EXCESS LETDOWN. THIS INDICATION IS NOT PRESENTLY AVAILABLE.

ENTS

ONSE

INDICATION OF CCW FLOW FROM EXCESS LETDOWN IS DEEMED NECESSARY
THIS TIME.

CE OF DISCREPANCY

EXPLANATORY INFORMATION

IFICATION OF AVAILABILITY

TASK 12

	EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
--	------------------------	-------------------	-------

CCW FLOW FROM EXCESS LETDOWN

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0467
ITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

SSMENT CATEGORY 1
LEVEL A
RATING X

RIPTION OF DISCREPANCY

RIFICATION HAS DETERMINED A NEED FOR CONTAINMENT TEMPERATURE
ICATION AND IS NOT PRESENTLY AVAILABLE.

ENTS

IS METER SHOULD HAVE A RANGE OF 0-400 DEG-F IN DIVISIONS OF 10.

ONSE

NTAINMENT TEMPERATURE WILL BE AVAILABLE ON THE NEW PLANT
MPUTER SYSTEM. THIS WILL BE IMPLEMENTED BY 6/30/87.

CE OF DISCREPANCY

EXPLANATORY INFORMATION

IFICATION OF AVAILABILITY

TASK 61

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

CONTAINMENT TEMPERATURE

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0468
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

ANALYSIS HAS DETERMINED A NEED FOR STATUS LIGHT INDICATIONS
 FOR MSIV BYPASS VALVES.

EFFECTS

RED AND GREEN CSL'S ARE NEEDED.

RESPONSE

THE MSIV BYPASS VALVES ARE MANUAL VALVES WHICH ARE CONTROLLED BY
 STANDARD PROCEDURE. THESE VALVES ARE ONLY USED DURING SECONDARY SIDE HEAT
 EXCHANGE DURING THE STARTUP PROCESS. THERE IS NO NEED FOR CONTROL ROOM
 INDICATION.

DESCRIPTION OF DISCREPANCY

EXPLANATORY INFORMATION

ANALYSIS OF AVAILABILITY	TASK 36
ANALYSIS OF AVAILABILITY	TASK 73
ANALYSIS OF AVAILABILITY	TASK 160
ANALYSIS OF AVAILABILITY	TASK 238

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

MSIV BYPASS A
 MSIV BYPASS B

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0469
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL A
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT THERE SHOULD BE A DIRECT
 INDICATION OF RCS TEMPERATURE.

REMARKS

THIS INDICATION SHOULD HAVE A RANGE OF 50 TO 400 DEG-F IN
 DIVISIONS OF 5.

CONCLUSIONS

THIS SITUATION HAS BEEN CORRECTED BY A NEW INSTALLATION.
 SEE HED 461.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 74
VERIFICATION OF AVAILABILITY	TASK 102
VERIFICATION OF AVAILABILITY	TASK 143

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
-----	-----	-----

RCS TEMPERATURE



HUMAN ENGINEERING DISCREPANCY

NUMERICAL ID: 0470
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT AN INDICATION FOR RCP AMPERAGE
 IS NEEDED. THIS INDICATION IS NOT PRESENTLY AVAILABLE.

REMARKS

THIS SHOULD HAVE A RANGE OF 0-1000 AMPS IN 20 AMPS.

RESPONSE

DURING THE DEVELOPMENT OF THE RCP TRIP CRITERION, IT WAS
 SUGGESTED THAT RCP AMPERAGE MIGHT PROVIDE AN INDICATION OF WHEN A
 PUMP IS PUMPING TWO-PHASE FLOW. LATER STUDIES SHOWED THAT OTHER
 CRITERIA WERE MORE DESIRABLE. (RCS-S/G dP) THEREFORE, THERE IS
 NO NEED FOR RCP AMPERAGE INDICATION.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY	TASK 23
VERIFICATION OF AVAILABILITY	TASK 61
VERIFICATION OF AVAILABILITY	TASK 68

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

RCP 1A AMPS
 RCP 1B AMPS

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0471
ITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

SSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT AN INDICATION FOR SEAL INJECTION
FLOW IS NEEDED.

REMARKS

THIS INDICATION SHOULD HAVE A RANGE OF 0-50 GPM IN DIVISIONS OF
10.

REVISIONS

REVISION #40.

DESCRIPTION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY
VERIFICATION OF AVAILABILITY

TASK 62
TASK 285

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

SEAL INJECTION FLOW

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0472
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING W

DESCRIPTION OF DISCREPANCY

ANALYSIS HAS DETERMINED A NEED FOR A METER INDICATION OF FEED
 WATER VALVE POSITION AND FEEDWATER BYPASS VALVE POSITION.

REMARKS

THIS METER SHOULD HAVE A RANGE OF 0-100 PCT IN DIVISIONS OF 2

CONCLUSIONS

SEE HED # 65.

DESCRIPTION OF DISCREPANCY

EXPLANATORY INFORMATION

ANALYSIS OF AVAILABILITY TASK 241
 ANALYSIS OF AVAILABILITY TASK 303

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

FCV-466
 FCV-467
 FD REG VLV POSITION
 V-4271
 V-4272

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0473
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT INDICATIONS OF MAKEUP WATER PUMP
 DISCHARGE PRESSURE IS NEEDED.

REMARKS

THIS METER SHOULD HAVE A RANGE OF 0-100 PSIG IN 2 PSIG DIVISIONS.

RESPONSE

IT HAS BEEN DETERMINED THAT REACTOR MAKEUP WATER PUMP DISCHARGE
 PRESSURE IS NOT REQUIRED SINCE PROPER OPERATION OF THIS PUMP
 CAN BE DETERMINED MONITORING BY FLOW INDICATION PRESENTLY
 AVAILABLE IN THE CONTROL ROOM. ADDITIONALLY, TWO SPARE PUMPS ARE
 AVAILABLE IN THE EVENT OF A FAILURE OF THE OPERATING PUMP TO
 PRODUCE REQUIRED FLOW.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 269

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
------------------------	-------------------	-------

MAKEUP WATER PUMP DISCH PRESS



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0474
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED A NEED FOR A METER INDICATION OF BAST TEMPERATURE.

REMARKS

THIS METER SHOULD HAVE A RANGE OF 50 TO 200 DEG-F WITH DIVISIONS OF 2 DEG-F.

CONCLUSIONS

THERE IS NO NEED FOR CR INDICATION OF BAST TEMP. THERE CURRENTLY EXISTS A BAST TEMP ALARM (AR-B-31) WHICH WARNS THE CONTROL BOARD OPERATORS OF A COOLING TREND OF THE BAST.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 247

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

BAST TEMPERATURE

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0475
 IDENTITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED A NEED FOR A CONTROL FOR STEAM TO THE
 UPSTREAM TRAPS.

REQUIREMENTS

THIS SHOULD BE A DISCRETE CONTROL WITH OPEN, CLOSE POSITIONS AND
 GREEN STATUS LIGHTS.

DISCUSSION

NO. 475 REQUESTED A CONTROL FOR STEAM TO THE UPSTREAM TRAPS.

URING THE GINNA SGTR THE TRAPS WERE ISOLATED TO PREVENT THE
 READ OF CONTAMINATION TO THE CONDENSER. THE ISOLATION IS A
 MANUAL OPERATION. THE REQUEST IS FOR REMOTE OPERATED ISOLATION
 VALVES.

THE NEW PROCEDURES AND IMPROVED OPERATOR TRAINING WILL RESULT IN
 TERMINATION OF THE SGTR BEFORE STEAM GENERATOR OVERFILL OCCURS.
 IN ANY CASE, MANUAL ISOLATION CAN BE ACCOMPLISHED WELL BEFORE THE
 STEAM GENERATOR OVERFILLS. THEREFORE, REMOTE ISOLATION IS NOT
 NECESSARY.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 241

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

STEAM TO UPSTREAM TRAPS

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0476
 CITY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

ANALYSIS HAS DETERMINED THE NEED FOR STEAM GENERATOR SAFETY
 VALVE POSITION STATUS LIGHTS.

REMARKS

RED AND GREEN CSL'S ARE REQUIRED.

RESPONSE

ANALYSIS RECORDERS 47B AND 47C WHICH ARE ACTUATED BY STEAM LINE
 RADIATION MONITORS R-31 AND R-32 INDICATE SAFETY VALVE POSITION.
 THIS SYSTEM WAS INSTALLED SPECIFICALLY FOR A TUBE RUPTURE
 INCIDENT FOR THE PURPOSE OF DETERMINING THE AMOUNT OF RADIOACTIVE
 RELEASES. IN ANY OTHER SITUATION THE POSITION OF THE SAFETY
 VALVES IS MUCH LESS SIGNIFICANT AND, SINCE THE OPENING OF A
 SAFETY VALVE CAN BE HEARD IN THE CONTROL ROOM, IT IS NOT
 NECESSARY TO INSTALL ANY ADDITIONAL MONITORING DEVICES AT THIS
 TIME.

DESCRIPTION OF DISCREPANCY

EXPLANATORY INFORMATION

DESCRIPTION OF AVAILABILITY

TASK 229

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

SG SAFETY VALVES

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0477
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

ANALYSIS HAS DETERMINED THAT A CONTROL IS NEEDED FOR STEAM
 GENERATOR BLOWDOWN VALVE.

RECOMMENDATIONS

IT SHOULD BE A DISCRETE CONTROL WITH SPRING RETURN AND RED AND
 GREEN STATUS LIGHTS. IT SHOULD HAVE OPEN AND CLOSE POSITIONS.

CONCLUSIONS

THERE IS CURRENTLY NO CLOSING CONTROL FOR ALL BLOWDOWN AND SAMPLE
 LINES. THE INITIATION OF BLOWDOWN SHOULD BE PERFORMED MANUALLY
 IN THE FIELD TO MINIMIZE WATER HAMMER AND THERMAL STRESS ON THE
 BLOWDOWN LINES.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF AVAILABILITY

TASK 186

EQUIPMENT ID NUMBER	EQUIPMENT NAME	OTHER
------------------------	-------------------	-------

STM GEN BLOWDOWN VALVE

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0478
ITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

SSMENT CATEGORY 2
LEVEL C
RATING X

RIPTION OF DISCREPANCY

RIFICATION HAS DETERMINED A NEED FOR A CONTROL IN THE CR FOR
NTAINMENT AIR OUTLET ISOLATION VALVE 1599.

ENTS

NTROL SHOULD BE DISCRETE WITH OPEN, CLOSE POSITIONS AND RED,
EEN STATUS LIGHTS.

ONS

CONTAINMENT AIR OUTLET ISOLATION VALVE CONTROL HAS BEEN
STALLED IN THE CONTROL ROOM.

CE OF DISCREPANCY

EXPLANATORY INFORMATION

FICATION OF AVAILABILITY

TASK 301

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

CONT AIR OUTLET ISOL VLV

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0479
 ID: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

VERIFICATION HAS DETERMINED THAT AN INDICATION OF BORIC ACID
 PUMP DISCHARGE PRESSURE IS NEEDED.

REMARKS

THIS METER SHOULD HAVE A RANGE OF 0-100 PSIG IN DIVISIONS OF 5
 PSIG.

CONCLUSIONS

THERE IS PRESENTLY INDICATION OF BORIC ACID PUMP DISCHARGE
 PRESSURE ON PANEL 8. THE RANGE AND DIVISIONS OF THE METER ARE
 ADEQUATE.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

VERIFICATION OF AVAILABILITY

TASK 305

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

BORIC ACID PUMP DISCH PRESS



HUMAN ENGINEERING DISCREPANCY

NUMBER: 0480
 TYPE: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/ 9/1985

ASSESSMENT CATEGORY 1
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

ANALYSIS HAS DETERMINED THAT AN INDICATOR OF RHR PUMP
 PERFORMANCE IS NEEDED.

REMARKS

RESPONSE

RHR PUMPS HAVE FLOW INDICATION ON THE CONTROL BOARD. THERE
 IS LITTLE INFORMATION THAT PUMP CURRENT COULD PROVIDE THAT PUMP
 FLOW COULD NOT.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

LOCATION OF AVAILABILITY

TASK 32B

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

RHR PUMP AMMETER

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0481
ITY: RGE

ORIGINATOR: DKB
PLANT: GINNA

DATE: 7/ 9/1985

SSMENT CATEGORY 1
LEVEL C
RATING Y

RIPTION OF DISCREPANCY

RIFICATION HAS DETERMINED THAT AN INDICATION OF SI PUMP
PERAGE IS NEEDED.

ENTS

ONSE

PER INDICATION IS NOT NECESSARY ON THE SI PUMPS, BECAUSE
ERE IS SI FLOW INDICATION AVAILABLE ON THE CONTROL BOARD.

TITLE INFORMATION WOULD BE GAINED THAT PUMP FLOW DOES NOT
READY PROVIDE.

CE OF DISCREPANCY

EXPLANATORY INFORMATION

FICATION OF AVAILABILITY

TASK 328

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

SI PUMP AMMETER

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0482
 ID: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/11/1985

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TASK ANALYSIS SUGGESTED THAT THE RHR PUMP SUCTION FROM CONT
 SUMP VALVES 850A&B SHOULD HAVE KEYLOCKS.

COMMENTS

THESE VALVES ARE VERY IMPORTANT UNDER EMERGENCY CONDITIONS. AT
 PRESENT THEY HAVE COVERS OVER THE SWITCH CONTROLS.

CONCLUSION

THE ASSESSMENT COMMITTEE HAS DETERMINED THAT COVERS ARE ADEQUATE
 PROTECTION. NO CHANGE IS WARRANTED.

TYPE OF DISCREPANCY

EXPLANATORY INFORMATION

CLASSIFICATION OF SUITABILITY

TASK 5

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

329
 330

RHR PUMP SUCTION FROM CNTMT SUMP 850A
 RHR PUMP SUCTION FROM CNTMT SUMP 850B

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0483
 TY: RGE

ORIGINATOR: DKB
 PLANT: GINNA

DATE: 7/15/1985

SSMENT CATEGORY 1
 LEVEL B
 RATING Y

DESCRIPTION OF DISCREPANCY

TASK ANALYSIS CALLED FOR H2 CONCENTRATION TO BE MEASURED IN
 RANGE 0-100 IN DIVISIONS OF 2.

COMMENTS

ACTUAL RECORDER (#78) HAS A RANGE OF 0-20%.

RESPONSE

RE DOES NOT APPEAR TO BE A SUFFICIENT REASON TO MONITOR
 HYDROGEN IN CONTAINMENT ABOVE THE 20% LEVEL. NO CHANGE IS
 WARRANTED.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

IDENTIFICATION OF AVAILABILITY

TASK 14

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

303
 403

H2 CONCENTRATION
 H2 CONCENTRATION

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0485
 CITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/15/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

TASK ANALYSIS CALLED FOR THESE METERS TO READ IN DEGREES
 FAHRENHEIT, RANGE FROM 0-150 IN DIVISIONS OF 2.

REMARKS

ACTUAL METERS HAVE A RANGE OF 0-100.

RESPONSE

PROCESS COMPUTER PROVIDES THE REQUESTED RANGE. NO
 MODIFICATION APPEARS WARRANTED.

DESCRIPTION OF DISCREPANCY

EXPLANATORY INFORMATION

DESCRIPTION OF AVAILABILITY

TASK 169

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

18
 20

LOOP A TSAT-THOT MARGIN
 LOOP B TSAT-THOT MARGIN

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0486
 IDENTITY: RGE

ORIGINATOR: JBW
 PLANT: GINNA

DATE: 7/15/1985

ASSESSMENT CATEGORY 2
 LEVEL C
 RATING Y

DESCRIPTION OF DISCREPANCY

THE TASK ANALYSIS CALLED FOR THESE METERS TO READ IN DIVISIONS OF .5 INCHES, RANGE -3 TO +3.

REMARKS

THE ACTUAL METERS READ IN DIVISIONS OF .75.

CONSEQUENCE

EXACT MEASUREMENTS OF LUBE OIL LEVEL IS NOT NECESSARY FOR SAFE OPERATION. GENERALLY THE OPERATORS ARE LOOKING FOR TREND INFORMATION AND DIVISIONS OF .75 ARE SUFFICIENT FOR THAT PURPOSE.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

IDENTIFICATION OF AVAILABILITY

TASK 68

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

2	RCP 1A UPPER BEARING LUBE OIL LEVEL	
3	RCP 1B UPPER BEARING LUBE OIL LEVEL	
4	RCP 1A LOWER BEARING LUBE OIL LEVEL	
5	RCP 1B LOWER BEARING LUBE OIL LEVEL	

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0487
 CITY: RGE

ORIGINATOR: LAC
 PLANT: GINNA

DATE: 10/ 1/1983

ASSESSMENT CATEGORY 1
 LEVEL B
 RATING X

DESCRIPTION OF DISCREPANCY

RESULTS FROM THE LIGHTING SURVEY SHOW ILLUMINANCE LEVELS BELOW
 THE CHECKLIST RECOMMENDED MINIMUM OF 20 FOOTCANDLES IN THE
 CONTROL ROOM. AREAS ON THE MAIN CONTROL PANELS 5,6, AND 7
 REGISTER BETWEEN 8 AND 14 FOOTCANDLES. ONE OPERATOR STATION
 REGISTERS 12 FOOTCANDLES.

EFFECTS

EFFICIENT LIGHTING IS AVAILABLE IN THE CONTROL ROOM. HOWEVER,
 OPERATORS ROUTINELY TURN OFF SIX ROWS OF OVERHEAD FLOURESCENT
 LIGHTS TO REDUCE GLARE AND ITS ASSOCIATED VISUAL DISCOMFORT. AS
 RESULT, MAIN CONTROL PANELS 5,6, AND 7 ARE ILLUMINATED UNEVENLY
 AND SOME OPERATOR STATIONS ARE DARK.

CONSEQUENCE

SEE HED #76.

LOCATION OF DISCREPANCY

EXPLANATORY INFORMATION

CHECKLIST

1.5.3

EQUIPMENT
 ID NUMBER

EQUIPMENT
 NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

NUMBER 0488
CITY: RGE

ORIGINATOR:
PLANT: GINNA

DATE: 3/15/1985

ASSESSMENT CATEGORY 2
LEVEL C
RATING Y

DESCRIPTION OF DISCREPANCY

D.C. COOK LER REPORTS AN EVENT WHERE THE BLOWDOWN SAMPLING
ISOLATION VALVES WERE INADVERTENTLY LEFT CLOSED. GINNA IS
REPORTED TO HAVE HAD A SIMILAR PROBLEM DURING THE LAST OUTAGE.

REMARKS

GINNA SHOULD CONSIDER PROCEDURE UPGRADES AS WELL AS INTERLOCKS
NEEDED TO PREVENT THIS PROBLEM.

CONCLUSION

THIS IS NOT AN EMERGENCY ORIENTED PROBLEM AS CLOSED VALVES ARE
THE DESIRED RESULT DURING AN ISOLATION. BETTER ADHERANCE TO
PROCEDURES HAVE NEGATED THIS PROBLEM AT R.E. GINNA STATION.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

D.C. COOK LER 81-042

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

HUMAN ENGINEERING DISCREPANCY

NUMBER: 0489
ID: RGE

ORIGINATOR:
PLANT: GINNA

DATE: 3/15/1985

ASSESSMENT CATEGORY 2
LEVEL B
RATING Y

DESCRIPTION OF DISCREPANCY

FARLEY LER REPORTS THAT AN OPERATOR MISTAKENLY CLOSED THE WRONG
ALARM. THE ROOT PROBLEM OF THIS OCCURRENCE WAS THAT DUE TO
NUISANCE ALARMS THE OPERATORS WERE ACKNOWLEDGING ALARMS WITHOUT
ACTUALLY OBSERVING THEM.

RECOMMENDATIONS

GINNA SHOULD REVIEW AND REMOVE ALL NUISANCE ALARMS TO PREVENT
THIS OCCURRENCE.

RESPONSE

ALARM ANNUNCIATOR SETPOINTS HAVE BEEN STUDIED. SETPOINTS HAVE BEEN
CHANGED WHERE DEEMED APPROPRIATE. NO FURTHER ACTION
IS WARRANTED.

CAUSE OF DISCREPANCY

EXPLANATORY INFORMATION

HISTORICAL REVIEW

FARLEY LER 82-021

EQUIPMENT
ID NUMBER

EQUIPMENT
NAME

OTHER

