

COMMONWEALTH EDISON COMPANY
FINAL SUMMARY REPORT OF THE
HUMAN FACTORS REVIEW FOR THE
QUAD CITIES STATION
EMERGENCY RESPONSE FACILITIES

October 25, 1985

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PREFACE

This document was prepared jointly by the Commonwealth Edison Company (CECo) and the Advanced Resource Development (ARD) Corporation. The ARD Corporation assisted CECo throughout all phases of the Emergency Response Facility (ERF) Review.

This report contains CECo's Final Summary Report for the human factors review of the Quad Cities ERF, which was conducted in July-September, 1985, as per CECo's April 14, 1983 response (Reference 1) to NUREG-0737, Supplement 1 (Reference 2) and the subsequent Nuclear Licensing Administration letter acknowledging "Receipt of the Confirmatory Order for both Dresden Units 2 and 3 and Quad Cities Units 1 and 2" (Reference 3).

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1.0 INTRODUCTION

Among the directives issued to the nuclear power industry by the Nuclear Regulatory Commission (NRC) in the aftermath of the accident at Three Mile Island Unit 2, was the need to establish Emergency Response Facilities (ERF) for each generating station. These facilities include an on-site Technical Support Center (TSC), from which plant management personnel would assist the control room personnel in mitigating emergency conditions, and an off-site Emergency Operations Facility (EOF), from which management personnel would coordinate the utility's overall response to the emergency. The functional criteria for these facilities were set forth in NUREG-0696 (Reference 4), and acceptance criteria were offered in NUREG-0814 (Reference 5).

Commonwealth Edison Company (CECo), as part of its April 14, 1983 response (Reference 1) to NUREG-0737, Supplement 1, committed to a human factors review of the ERFs at each of its nuclear stations. The purpose of this review was to examine the personnel/equipment interface within the TSC and EOF to determine whether these facilities provide system status information, feedback capabilities, communication capabilities and job performance aids necessary for the TSC/EOF personnel to accomplish their functions and tasks effectively.

The Quad Cities station ERF review was conducted concurrently with a similar review for the Dresden station. Because both the ERFs and Safety Parameter Display Systems (SPDSS) for these two stations are very similar, the information collected at each station served as a check against, and supplement to, the information collected at the other station.

2.0 OVERVIEW

Quad Cities' TSC is located in the owner's protected area and has been operational since 1982. Five emergency exercises have been performed with the facility since that time. The Quad Cities EOF is located at Morrison, approximately 18 miles from the station.

The human factors review of the ERFs evaluated each facility in terms of the effectiveness of:

- o organizational structure and staffing
- o facility layout; access to sources of information; traffic patterns
- o the information provided by displays and communication equipment
- o the environment -- ambient noise, air quality, lighting
- o procedures; availability of needed documentation and job performance aids

The ERF review was conducted as a three-phase process. The first phase consisted of several data collection activities that provided the basic data from which human factors problems were documented. As in the Detailed Control Room Design Review (DCRDR) project, this documentation took the form of Human Engineering Discrepancies (HEDs). The second phase consisted of an assessment of the HEDs by a Human Engineering Discrepancy Assessment Team (HEDAT). For those HEDs significant enough to warrant a corrective action, this team identified and defined

approaches for modifying the ERFs that would correct the problems described. The third phase consisted of reporting the results of the review. The present report is the product of this phase.

2.1 Data Collection Phase

There were several activities involved in the review that provided data for consideration:

- o Observation of the August, 1985 GSEP exercise at the Quad Cities station
- o A human factors Checklist Survey of the TSC/EOF, including the use of computers and CRTs
- o A Personnel Survey consisting of structured interviews of key TSC/EOF personnel
- o A job analysis/task analysis of key positions in the TSC/EOF to compile information needs and communication links based on the interview results and GSEP documentation
- o A follow-up interview with selected participants in the Personnel Survey to specifically query them as to their need for certain Reg. Guide 1.97 Information (see Reference 8)
- o An analysis of GSEP procedures for calculating release information, to determine the need for additional information regarding Reg. Guide 1.97 instrumentation in the ERFs
- o Reference to the data collected during the DCRDR task analysis and validation processes, to determine if these data contained any implications for TSC/EOF information needs

The checklist survey was performed separately for the Quad Cities TSC and EOF. The reference to the DCRDR task analysis data was, of course, also specific to the Quad Cities station.

Likewise, the follow-up interviews pertaining to the need for additional Reg. Guide 1.97 Information in the ERFs were conducted in the context of the Dresden and Quad Cities stations separately. However, because the TSC/EOF facilities and GSEP organizations are so similar between the Quad Cities and Dresden stations, and some of the same General Office personnel have participated in both stations' emergency drills, the interview and subsequent job/task analysis data were pooled and HEDs were written that, in most cases, applied to both.

A more detailed description of the methods employed in each activity and the findings that resulted are presented in Section 6.

2.2 HED Assessment Phase

The HEDAT was formed to evaluate the HEDs that resulted from the Data Collection phase. Because many of the HEDs applied to both the Quad Cities and Dresden stations, a single team with representatives from both sites collectively considered the HEDs that resulted from the reviews at the two stations. Both plant and General Office personnel were represented on this team. In addition to resolving the HEDs, the HEDAT also confirmed which HEDs applied to which sites, and which HEDs applied to the TSC and/or EOF at a given site.

Criteria were developed for categorizing the importance of these HEDs in terms of their significance to the ERF personnel in fulfilling their functions. Based on their categorization, the HEDAT recommended a resolution for each HED. The person responsible for accomplishing each corrective action determined the time frame within which it is to be performed. These implementation commitments are noted in Appendix C of the present report.

2.3 Reporting Phase

For the purposes of reporting the outcomes of the reviews at Quad Cities and Dresden, two separate reports were generated. Each report contains the HEDs that were pertinent to one of these stations. The present report represents the methodology, findings and conclusions from the Quad Cities Station ERF review. This report was prepared to show compliance with CECO's April 14, 1983 commitments to the NRC (Reference 1).

3.0 MANAGEMENT AND STAFFING

The human factors review of the Quad Cities TSC and EOF was conducted through the cooperative efforts of CECo and ARD personnel. The review team met or exceeded the CECo commitments in Reference 1 and included well qualified and experienced personnel in the areas of nuclear emergency planning, operations, engineering and human factors. Both CECo station and General Office personnel participated.

The lead human factors engineer and Project Director from ARD was a Senior Engineer with over three years of experience in human factors work in the nuclear industry and with previous experience in ERF reviews. He was supported by senior and staff-level human factors engineers with appropriate experience in nuclear industry human factors. In order to promote the integration of the ERF review with other 0737 initiatives, a number of the human factors personnel who supported the Quad Cities ERF review were selected from those who had previously supported the DCRDR at the Quad Cities station.

The CECo effort was headed by a Staff Engineer in the Technical Services Nuclear Division with over twenty years of experience in nuclear power operation and engineering. He has participated in human factors activities at each of CECo's nuclear power stations and had coordinated the DCRDR projects at both Quad Cities and Dresden. He was assisted by upper-level plant and General Office personnel with direct responsibilities for emergency planning and plant operations. Personnel from the

Quad Cities station supported the human factors team, as needed, as subject matter experts (SMEs). These SMEs included personnel familiar with the computer and communications systems in the ERFs.

The HEDAT consisted of senior staff and plant management personnel whose backgrounds and experience included directly relevant aspects of:

1. Emergency planning
2. Plant operations
3. I & C Engineering
4. Human Factors

4.0 DOCUMENTATION AND DOCUMENT CONTROL

4.1 Input Documentation

The review team used the following documents to support the review process:

1. Quad Cities Generating Station Emergency Plan (GSEP) manual
2. Drawings of the physical layout of the Quad Cities TSC and EOF
3. Notes from recent Emergency Exercises at Quad Cities, Dresden and other CECOs nuclear stations
4. Human Factors Checklist developed by CECO for use in the DCRDRs
5. The CECO Supplement 1 submittal letter to the NRC (Reference 1)
6. Clarification on Generic letter 82-83-Supplement 1 to NUREG-0737 (Reference 3)
7. NUREGs 0696 (Reference 4), 0814 (Reference 5), 0700 (Reference 6) and 0800 (Reference 7)
8. Summary Report (Quad Cities Station): Compliance to Reg. Guide 1.97 Revision 2, July 31, 1985 (Reference 8)
9. Reg. Guide 1.97 (Reference 9)
10. Documentation of communication lines in the TSC and EOF
11. Design specifications for the SPDS and Prime computer displays

4.2 Output Documentation

In addition to the present report and its companion document for the Dresden station, the following documents were generated during the review process:

1. Checklist derived from Input document #4, which was specific for CEC Co ERFs
2. Completed checklists for the Quad Cities TSC and EOF
3. Summary of responses to the Personnel Survey
4. Summary of Job Analysis information
5. Copy of HEDs in the form that they were presented to the HEDAT, including alternative corrective actions for the team's consideration
6. Report on "Evaluation of the Need for Additional Reg. Guide 1.97 Information at the Dresden and Quad Cities ERFs"

5.0 INTEGRATION WITH OTHER SUPPLEMENT 1, NUREG-0737 INITIATIVES

Commonwealth Edison Company has an integrated program to address each of the Supplement 1 to NUREG-0737 initiatives. This program extends throughout its system of nuclear generating stations and has specific provisions for each station. This program is headed by the CECo Station Nuclear Engineering Department which provides the necessary integration and support to ensure that a systematic approach is adopted for the inclusion of each of the recommended design changes resulting from these initiatives. Details of this process, including schedules were provided in Commonwealth Edison's April 14, 1983 submittal to the NRC (Reference 1).

At each station, the design of the Safety Parameter Display System (SPDS), the Regulatory Guide 1.97-based instrument displays, the development of function-oriented emergency operating procedures, the training of the operating staff, and the DCRDR are being integrated with the ERF reviews in a manner which takes full advantage of the scheduling of each of these initiatives. The human factors review of the ERFs is being conducted after the DCRDR at each station and after the operational date for the TSC/EOF. By performing the ERF review after the DCRDR, it is possible to better integrate the data collected and the findings derived from these two activities. By performing the ERF review after the operational date of the TSC/EOF, it is possible to obtain more meaningful input from TSC/EOF personnel, because by this time, they have had experience in the actual facilities during emergency drills.

As part of the integration effort, the applicability of Reg. Guide 1.97 variables to ERF activities was reviewed. These were identified in the original Reg. Guide 1.97 review (Reference 8). The variables not currently available in the ERF were to be reviewed for the need or lack of need in the ERFs based on the job analysis/task analysis of ERF personnel. The ERF job/task analysis data was reviewed for explicit references to currently unavailable Reg. Guide 1.97 variables, a follow-up interview was conducted with selected ERF personnel to question them specifically about their need for this information. An analysis of GSEP procedures on calculating release information was also performed to determine the need for this information. The results of these activities completed the Reg. Guide 1.97 review. Conclusions are being submitted separately as a revision to the previous Reg. Guide 1.97 report (Reference 8).

The ERF review for the Quad Cities station was also integrated with a human factors review of the Quad Cities Safety Parameter Display System (SPDS), which was conducted concurrently with the ERF review. The SPDS is available in the CECO ERFs, as well as in the control room at each station, and as such, it provides information to TSC/EOF personnel that is most critically needed. Findings related specifically to the use of the SPDS displays in the ERFs will be documented in the present report. Findings related to the use of the SPDS in the control room, or more generally to the use of the SPDS at all sites where it is available, will be documented in a separate report that focuses specifically on the SPDS. Findings related to CRT displays or computer-based information other than the SPDS, are documented in the present report. Although this information is available in both the ERFs and the control room, it is particularly relevant to the emergency response functions of the ERFs.

6.0 REVIEW PROCESSES

6.1 Checklist Survey

A checklist survey was conducted at both the EOF and the TSC to determine whether the facility layout and environment, as well as the communication and computer equipment available, met a standard set of human factors design guidelines. The checklist of guidelines was derived from, and is a subset of, those that CECO had developed and used to support the DCRDR. The CECO DCRDR checklist was derived from NUREG-0700 and the differences between this CECO checklist and NUREG-0700 have been documented.

One copy of the checklist was completed at each facility by a human factors engineer with assistance, as needed, by CECO subject matter experts. A human factors review of the Quad Cities SPDS was conducted concurrently with the ERF review and the two complemented each other. Checklist items and associated HEDs that pertain to the SPDS as implemented in the control room are documented in a separate report of the SPDS review. Checklist items and HEDs that pertain only to the use of the SPDS in the ERFs are documented in the present report. Checklist items and HEDs that pertain to CRT displays or interactive devices other than the SPDS displays, are documented herein.

6.2 Observation of GSEP Exercises

ARD personnel observed several GSEP exercises, including the one at the Quad Cities station in August, 1985. Observers were

stationed in the TSC and EOF during the exercise, and they attended the debriefings conducted by the CECO GSEP controllers and afterwards by the NRC. Attention was paid to such human factors issues as:

- o Workspace design; facility layout; traffic patterns
- o Use of CRTs, particularly the SPDS and rad/met displays
- o Use of communications systems
- o Use of status boards
- o Use of procedures; availability of critical information
- o Environmental issues -- noise, air quality, lighting
- o Organizational structure, are responsibilities well-defined?

In addition, human factors personnel reviewed CECO's files containing comments from the NRC and CECO controllers for other GSEP exercises in recent years. An emphasis was placed on identifying improvements for the present ERF facilities and GSEP organization to meet the information needs of the ERF staff members.

6.3 Personnel Survey

Structured interviews were conducted by human factors engineers on a one-to-one basis with key personnel who have staffed the TSC and EOF at Dresden and Quad Cities during recent drills (1984 and 1985), in order to draw upon their experience underoperational conditions. The questionnaire presented in Appendix A was used as a basis for the interviews. The interview, which lasted approximately one and one-half hours with each of forty-one individuals, was structured to provide information regarding the following areas:

- o Chain of command
- o Facility layout
- o Communications systems
- o Specific information pertaining to a given staff position including:
 - Duties and responsibilities
 - Communication links
 - Workstation design
 - Computer use
 - Information needs

Interviews were conducted with both station personnel who staff the TSC, and General Office personnel or station personnel from other stations who staff the EOF. The backgrounds and ERF experience of the participants are summarized in Appendix B. The interviewers recorded the responses and in most cases, after receiving interviewee permission, also recorded the responses on a tape recorder. The tapes were available for the later analysis of the data when the need arose for clarification of responses and were then destroyed. Care was taken at all stages to protect the confidentiality of the participants' responses.

Given the high degree of similarity between the ERFs at the Dresden and Quad Cities stations, there was a high probability that comments made by individuals at one site would pertain as well to the other site. By combining the responses to the Personnel Survey from the two sites and presenting all the resulting HEDs to the HEDAT, the possibility of overlooking the relevance of a particular HED to a particular facility was minimized.

Notes on the interview responses were transcribed and responses from all participants were compiled question by question. A content analysis was performed and a listing of issues was compiled. Frequency counts as to the number of participants

from a given ERF staff position who had mentioned each issue were derived. Each issue was then categorized by human factors personnel as:

- o a Human Engineering Discrepancy
- o a correct comment but not warranting an HED
- o an incorrect comment; this was based on inconsistencies with other comments and with additional information available to the review team from various sources
- o a general comment or opinion

6.4 Job/Task Analysis

Throughout the review process, the focus was on ensuring that the TSC/EOF staffs have the information needed in order to perform effectively. The job analysis was useful in encapsulating the information gathered relative to this focus. Summaries of the duties and responsibilities for the key positions in the TSC/EOF were extracted from the CEC Co GSEP manual. For each position, information from the Personnel Survey was then compiled with respect to the functions and tasks performed by each participant in executing these duties and responsibilities, communication links between personnel and facilities, information and communication needs, and the sources that presently are available to supply the needed information.

Compiling the job/task analysis information by staff position allowed the interview responses from the two or more people interviewed about each key position to be checked for consistency. It also served to highlight information needs that were not being met by the present ERF facilities and equipment.

6.5 Evaluation of Need for Reg. Guide 1.97 Information

Reg. Guide 1.97 variables are available in the ERF control room or elsewhere on-site. Readings of the unavailable variables can be obtained by ERF personnel with a phone call to the appropriate location. However, a review of the time critical need of this information was conducted to determine if the instrumentation also should be made available on the ERF CRTs.

Several task analytic techniques were used to determine the need for this information in the context of ERF staff members' duties and responsibilities. First, observations from the GSEP exercises were reviewed for any information deficiencies. Second, the responses to the open-ended questions in the ERF Personnel Survey were reviewed for references to the unavailable Reg. Guide 1.97 information. Third, a sample of ten key ERF personnel from the Dresden and Quad Cities stations were queried directly as to their need for this additional information at the ERF. Lastly, the GSEP procedures for calculating releases were reviewed by a human factors specialist and a subject matter expert from CECO to determine whether or not this additional information was needed in the ERFs in order to effectively perform these procedures. The details and conclusions from this evaluation of Reg. Guide 1.97 information is available under separate cover.

6.6 Reference to the DCRDR Task Analysis/Validation Data

The task analysis and validation data collected during the DCRDRs were reviewed to determine if they had any implication for the information needs of the TSC and EOF. There were no references to the TSC or EOF found in these data. This is not surprising because, while guidance from personnel in the TSC and EOF can be a valuable input to the control room operating crew, the assumption made in designing the procedures

and training programs for control room personnel is that they should be able to function without being dependent on such input.

7.0 HED ASSESSMENT

The HEDs compiled from the data collection activities included the following information:

1. The station and ERF facilities to which the HED applied
2. HED number
3. Human factors specialist who wrote the HED
4. Date the HED was written
5. Checklist guideline number that the HED violated
6. Data collection activity from which the HED resulted
7. Description of the problem
8. Human Factors comment
9. Alternative recommendations for the HEDAT's consideration
10. HEDAT's evaluation of the problem

Each HED was classified according to the following three sets of criteria:

Category

1. HED identifies a problem which could adversely affect the ability of ERF personnel to properly assess the safety status of the plant and/or could result in unacceptable radiological conditions.
2. HED identifies a problem which either delays or impedes an ERF person in the performance of a required task.
3. HED identifies a problem not included in Category 1 or 2.

Human Factors Importance Factor

- A. HED identifies a problem which has or is likely to cause an erroneous interpretation of essential information.
- B. HED identifies some other undesirable human factors problem.
- C. HED identifies a human factors discrepancy not included in A or B.

Recommended Corrective Action -- Status

- X -- HEDAT agrees problem should be fixed.
- Y -- HEDAT agrees problem does not require fixing.
- Z -- HEDAT cannot agree on whether or not to fix the problem.

In addition to collectively arriving at a classification for each HED, the team similarly determined to which station(s) and ERF facilities each HED applied.

HEDs that were classified as Z were further investigated by human factors personnel. The resulting information was added to the appropriate HED forms, a packet of these unresolved HEDs was sent to each HEDAT member, and final classifications for these items were solicited from the team by phone.

As the result of clarification or additional information that arose during the HEDAT review, it became apparent that some HEDs were not valid, either because of a misinterpretation of the data from which the HED had been written or because the problem specified in the HED had already been corrected. These HEDs were cancelled and are not included in Appendix C. However, they are being maintained, with notes justifying their cancellation, in a back-up document (Output Document #5) that lists all the HEDs considered by the HEDAT.

8.0 IMPLEMENTATION OF CORRECTIVE ACTIONS

The responsibility for assessing the HEDs discovered in the ERF review process rested with the Nuclear Services Technical, Station Operations, and Station Nuclear Engineering Departments. The HEDAT's recommendations with regard to the resolution of HEDs were reviewed by appropriate representatives of these departments, in conjunction with human factors personnel, and final decisions were made as to which HEDs warranted correction. Justifications were written for those HEDs that warrant no further action. These justifications are presented in Appendix C. For each HED for which a corrective action was agreed upon, a time frame for the implementation of the corrective action was determined and is documented in Appendix C.

9.0 REFERENCES

1. April 14, 1983 letter from Cordell Reed, Commonwealth Edison, to Harold Denton, U. S. Nuclear Regulatory Commission, regarding CECO's response to NUREG-0737, Supplement 1.
2. U. S. Nuclear Regulatory Commission, "Clarification of TMI Action Plan Requirements," USNRC Report NUREG-0737, Supplement 1 (Generic Letter 82-33), 1982.
3. Clarification on Generic letter 82-33-Supplement 1 to NUREG-0737, "B. Rybak NL-84-0765" acknowledging "Receipt of the Confirmatory Order for both Dresden Units 2 and 3 and Quad Cities Units 1 and 2.
4. U. S. Nuclear Regulatory Commission, "Functional Criteria for Emergency Response Facilities," USNRC Report NUREG-0696, February, 1981.
5. U. S. Nuclear Regulatory Commission, "Methodology for Evaluation of Emergency Response Facilities," USNRC Report NUREG-0814, August, 1981.
6. U. S. Nuclear Regulatory Commission, "Guidelines for Control Room Design Reviews," USNRC Report NUREG-0700, September, 1981.
7. U. S. Nuclear Regulatory Commission, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR Edition," USNRC Report NUREG-0800, Revision 0 of Appendix A to SRP Section 18.2, "Human Factors Review Guidelines for the Safety Parameter Display System (SPDS)," January, 1985.
8. Summary Report (Quad Cities Station). Compliance to Reg. Guide 1.97 Revision 2, July 31, 1985.
9. U. S. Nuclear Regulatory Commission, Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled-Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident, Revision 2., December, 1980.

APPENDIX A:

ERF QUESTIONNAIRE USED FOR ERF PERSONNEL SURVEY

ARD Corporation

ERF INTERVIEWS -- COVER LETTER

ARD Corporation is supporting Commonwealth Edison Company in a human factors review of the CECo Emergency Response Facilities (ERFs). The goal is to ensure:

- (1) that the ERFs provide staff members with all the information they need in order to accomplish their intended functions during an emergency and
- (2) that the organizational structure and physical environments of the ERFs allow the staff as a whole to perform effectively.

In this context, we are interviewing key CECo personnel who have staffed the Technical Support Center (TSC) and Emergency Operations Facility (EOF) at each station during recent emergency drills. Our immediate concern is with the TSCs for the Dresden and Quad Cities stations and with the corresponding EOFs at Mazon and Morrison.

The interviews will address the issues listed in the attached questionnaire. THERE IS NO NEED FOR YOU TO WRITE RESPONSES TO THESE QUESTIONS. We are distributing the questionnaire now so that, if your schedule permits, you can familiarize yourself with the issues that will be raised during the interviews.

Your input will be valuable to us in documenting what the staff views to be the strong points of the present ERFs, in identifying potential human factors problems, and in formulating recommendations that will both correct any problems and respond to recent Nuclear Regulatory Commission requirements.

We anticipate that each interview will last 1 to 1 1/2 hours. The interviewer will be making notes on your verbal replies to the items on the questionnaire. These notes will be transcribed and then combined and summarized, along with those of your colleagues, on a question-by-question basis.

Your responses will be strictly confidential. Only ARD personnel will have access to the transcribed notes, and the findings presented to CECo management will be based on the summaries. The demographic information that we request from you will be dissociated from your responses to the questionnaire.

Any potential human factors problems will be documented in the form of Human Engineering Discrepancies (HEDs). These HEDs will then be assessed and resolved by an HED Assessment Team consisting of CECo managers and a representative from ARD. ARD will also support CECo in preparing a final report to the NRC.

ARD-4494c

ARD Corporation

ERF INTERVIEW -- DEMOGRAPHICS

1. Present position: _____
How long? _____
2. How long with Commonwealth Edison? _____
3. How long in nuclear industry? _____
4. Previous industry positions: _____

5. Have you held a Reactor Operator (RO) license? _____
How long? _____
6. Have you held a Senior Reactor Operator (SRO) license? _____
How long? _____
7. Have you been involved in Emergency Planning? How?
8. What staff positions in the TSC or EOF have you filled during CECo
Emergency Drills? At which sites? When?

ARD Corporation

Date _____

Interviewer _____

Station _____

GENERAL INFORMATION

1. Is the chain of command clear in the TSC/EOF? Does it allow for effective functioning? If not, why?
2. Is the layout of the TSC/EOF conducive to effective operations? Traffic flow? Interactions between individuals who need to interact? Is there space for all participants? If not, why?
3. Do the communication systems (telephones, radios, loud speakers, etc.) provide for an adequate flow of information? If not, why?
4. Are the CRTs used effectively? Why or why not?
5. Do the status boards keep the staff updated as to plant conditions? event status? rad/met status? If not, why?
6. Does the TSC/EOF provide an adequate working environment (noise, air quality, lighting) for the staff? If not, why?

SPECIFIC INFORMATION PERTAINING TO A GIVEN STAFF POSITION

Responsibilities

7. What role would you play in the _____ TSC, _____ EOF during an emergency?
8. Have you played this role during emergency drills? How many? What station?
9. Briefly describe your duties and responsibilities.
10. In the TSC/EOF, to whom do you directly report? Is this person easily accessible to you (physical access, communications equipment)?
11. In the TSC/EOF, who directly reports to you? Are they easily accessible to you (physical access, communications equipment)?
12. With whom else in the TSC/EOF do you frequently interact? Are they easily accessible to you (physical access, communications equipment)?
13. Is there any tasks related to your job that takes too much of your time or attention?
14. Are the procedures you must follow clear and well-documented? If not, why?
15. Have you received adequate training to perform your job? If not, what areas should receive more emphasis?

Workstation

16. What equipment do you need to perform your job? Do you have all the equipment you need? Is there any equipment at your workstation that you consider extraneous?

ARD Corporation

16. (continued)

<u>Type of equipment</u>	<u>Readily available?</u>
telephones	
radios	
procedures	
other documentation	
maps	
status boards	
CRTs	
hardcopy printers	
other	

17. Do you have adequate workspace at your workstation? Is there enough storage and file space at the workstation? Is the workstation laid out in a manner that makes it easily usable?
18. Can you see all the status boards from your workstation and read the information written on them? Does the specific information presented and format of the status boards meet your needs? Would you prefer some other method be used to keep you posted on current conditions?
19. Do the communication systems (telephones, loud speaker, radios) in the TSC/EOF meet your needs? Adequate number of lines? Ease of use? Well labelled? Any confusion as to which lines active?

Computer use

20. Do you make use of the computer or CRT displays? If so:
21. Are the CRTs located conveniently?
22. What displays or programs do you use most frequently?
23. Are there any additional displays or programs that you would find useful?
24. Are the procedures and documentation for the CRTs easy to use?
25. Are the words and symbols that appear on the screen easy to understand?
26. Are the keys labelled clearly and unambiguously? Are they consistent with abbreviations and labels used elsewhere?
27. Do you need hardcopy outputs? Are they readily available?
28. If you have been involved in drills for more than one station, have the different display formats at the different stations caused any confusion for you?

Information Needs

29. What general types of information do you need in order to perform your job? How do you get that information at present? Can you think of any types of information that are not readily available?

ARD Corporation

29. (continued)

<u>Type of info</u>	<u>Source of info</u>	<u>If on a CRT, Preferred format</u>	<u>How often should be updated</u>
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30. What specific parameters do you need to track in order to perform your job? How do you get that information at present? Can you think of any parameters that are not readily available? (If appropriate, refer to scenarios and task analysis data) =.

<u>Parameter</u>	<u>Source of parameter</u>	<u>If on a CRT, Preferred format</u>	<u>How often should be updated</u>
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APPENDIX B:

DEMOGRAPHIC SUMMARY
OF PARTICIPANTS IN THE PERSONNEL SURVEY OF
THE DRESDEN AND QUAD CITIES ERFS

1.0 PERSONNEL DEMOGRAPHICS

1.1 Current Job Classification

Forty-one ERF personnel at Dresden and Quad Cities Stations were interviewed during August and September, 1985. Table 1 lists the current CECo position titles and the number of interviewees holding those positions.

Table 1. Job Classification of Interviewees

<u>Freq</u>	<u>Position</u>
4	Lead Health Physicist
4	Health Physicist
3	Services Supervisor
2	Assistant Supervisor, Technical Services
2	Rad-Chem Supervisor
2	Assistant Supervisor, Maintenance
2	Production Supervisor
2	Station Manager
2	Operating Engineer
2	Stores Supervisor
2	Staff Engineer
1	Technical Staff Supervisor
1	Assistant Supervisor, Operations
1	Industrial Relations Supervisor
1	Office Supervisor
1	Senior Project Health Physicist
1	Rad-Chem Foreman
1	Training Specialist
1	Manager, Nuclear Safety
1	Manager, Production
1	Environmental Health Physicist
1	Operating Plant Licensing Director
1	Radiation Protection Director
1	Emergency Planning Supervisor
1	Technical Manager

1.2 Nuclear Experience

The distribution of experience of the interviewees, both with CECo and in the nuclear industry in general, is presented in Table 2.

Table 2. Experience of Interviewees

I N T E R V I E W E E S	LENGTH OF EMPLOYMENT					
	1-5yr	6-10yr	11-15yr	16-20yr	20yr+	
	With CECo	9	10	11	5	6
	In Nuclear Industry	8	7	15	6	2
I N T E R V I E W E E S	LENGTH OF EMPLOYMENT					
	6mo	6-12mo	1-3yr	4-7yr	7yr	
	In Present Position	8	12	7	6	3

(Note - frequencies add to less than 41 because not all interviewees answered all questions.)

The average tenure in the current job classification was 2 years, 3.5 months.

Of the 41 personnel interviewed, 5 (12%) indicated that they have held a Reactor Operator's License, and 19 (46%) indicated that they have held a Senior Reactor Operator's License. The average tenure for holding a Reactor Operator's License is 3 years, 3 months. The average tenure for holding a Senior Reactor Operator's License is 7 years.

1.3 TSC/EOF Roles

Table 3 indicates positions in the TSC and EOF that inter- viewees have played in previous exercises.

Table 3. TSC/EOF Positions Played by Interviewees

<u>Position</u>	<u>TSC</u>	<u>EOF</u>
Station Director	3	-
Operations Director	4	-
Technical Director	6	-
Rad-Chem Director	7	-
Maintenance Director	2	-
Administrative Director	2	-
Stores Director	1	-
Recovery Manager	-	4
Advisory Support Director	-	2
Environmental Emergency Coordinator (EEC)	-	6
Recorder	-	4
Waste Systems Radiation Control Manager	-	3
Technical Support Manager	-	4
Enviroins Director	5	7
Environmental Communicator	1	2
Assistant EEC	2	4
Communicator	2	7
ODCS Operator	2	4

(Note - Total adds to more than 41 because some interviewees have filled more than one position in an ERF.)

APPENDIX C:

CORRECTIVE ACTIONS FOR
HEDS PERTAINING TO THE QUAD CITIES ERFS

The numbering of HEDs reflects the fact that the generation and review of HEDs from the Dresden and Quad Cities stations were done simultaneously. Thus, some of the HEDs generated by the present ERF review process pertained to the TSC and/or the EOF at Dresden only, some to the TSC and/or EOF at Quad Cities only, and some to the TSC and/or EOF at both stations. An integrated numbering scheme was adopted in order to more effectively track the HEDs through the various stages of revision and assessment.

The HEDs presented here are those that pertain to the Quad Cities station. The HEDs that are intermediate in number between those presented here either pertain only to the Dresden station or were canceled during the review process, as mentioned in Section 7 of the report.

To avoid confusion, lists of these Dresden-only and cancelled HEDs follow:

Dresden-only HEDs

1
15
16
18
39
42
44
46
61
77
100
102
103
104
105
107

Cancelled HEDs

47
48
49 (incorporated in HED #2)
67
72
73
74
79
80
81
86
87
93
95
99
101

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 2/49

GUIDELINE NO: 1.5.7a(5)/1.5.5

SOURCE: ERF CHECKLIST/INTERVIEW

CATEGORY: 3 LEVEL: B

FINDING:

Ambient noise is a problem in the EOF. Staff personnel have stated that the ambient noise level is sufficiently high to require personnel to raise their voices to be heard over a distance and interferes with telephone conversations.

RESPONSE:

The person in charge of the EOF has the authority to ask for quiet when conversations become loud. Ways of reducing other ambient noise will be considered and ambient noise will be reduced by determined appropriate method.

IMPLEMENTATION:

12/31/86

4609c/1

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 3

GUIDELINE NO: 2.1.2b(3)

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Phone cords are spiral (stretch) cords, not non-kink or self-retracting cords. Given the large number of phones and the need for many of the people using them to be somewhat mobile, there is a risk of cords becoming tangled.

RESPONSE:

The problem with cords becoming tangled is minimal and will have negligible influence on operators.

IMPLEMENTATION:

Accept as is.

4609c/2

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 4

GUIDELINE NO: 5.1.1a(3)

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

Some items on different status boards are redundant. There is a potential problem in that a failure to update a given piece of information in all places that it is displayed could lead to inconsistencies and confusion.

RESPONSE:

Some redundancy is needed to ensure that people have the basic information including GSEP status and RAD levels. However, unnecessary redundant information will be eliminated from the status boards.

IMPLEMENTATION:

7/15/86

4609c/3

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 5

GUIDELINE NO: 6.3.3

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: A

FINDING:

The sector location numbers between the CWE maps of the plant site and State maps of the surrounding countryside that are used for directing the movements of the radiation detection teams are inconsistent. This makes communication between CWE and State personnel difficult and could cause confusion in specifying both on-site and off-site dose levels.

RESPONSE:

The state works with their map (off-site) and, on occasion, for close-in activities, our (on-site) map. When transmitting information, the on-site and off-site designators are used. Training on this procedure receives adequate emphasis as demonstrated by performance in drills and exercise.

There is an inconsistency in the Quad Cities off-site map. The states are working on this problem. The inconsistency will be corrected by July 15, 1986.

IMPLEMENTATION:

7/15/86

4609c/4

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 6

GUIDELINE NO: 6.4.2

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

The size and spacing of some of the characters on EOF status boards make the boards difficult to read from a distance. Staff members must move in order to be close enough to read them, causing delays and congestion in certain parts of the room.

RESPONSE:

Status boards will be reviewed to determine which pertain to the recovery group as a whole, and which pertain only to key or selected individuals. Revisions will be in coordination with revision for HED #4.

IMPLEMENTATION:

7/15/86

4609c/5

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 7

GUIDELINE NO: 1.3.1.a
1.3.1.b

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Desk configuration of EOF is not conducive to effective communications among directors. Directors must walk around and through a tight maze of desks in order to reach one another.

RESPONSE:

Layouts of EOF's will be re-evaluated after publication of GSEP Revision 6.

IMPLEMENTATION:

12/31/86

4609c/6

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 8

GUIDELINE NO: 1.5.1b

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Humidity is not controlled in the EOF.

RESPONSE:

Humidity has not posed a significant problem for effective operation of the facility.

IMPLEMENTATION:

Accept as is.

4609c/7

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 9

GUIDELINE NO: 2.1.1a

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

In the EOF and TSC, there is no way to distinguish microwave phone lines from land lines. If land lines were to go down, the only way to find a microwave line would be by trial and error.

RESPONSE:

Telephone identification methods will be revised to functionally identify telephones.

IMPLEMENTATION:

12/31/86

4609c/8

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 10

GUIDELINE NO: 1.4.2a

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

The fire alarm system in the EOF has no regularly scheduled maintenance check.

RESPONSE:

A maintenance program for the fire alarm system will be established.

IMPLEMENTATION:

12/31/86

4609c/9

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 11

GUIDELINE NO: 2.2.1b

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

There are a number of single line phones in the EOF without lights to indicate which phone is ringing. Difficulty in identifying which phone is ringing may cause unnecessary delays and confusion in performing one's duties.

RESPONSE:

Single line phones will be equipped with beehive-style or similar indicating lights to eliminate confusion.

IMPLEMENTATION:

6/30/86

4609c/10

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 12

GUIDELINE NO: 6.2.2a

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

Labels on multi-line phones in the EOF are affixed beside the button with dynotape. The dynotape labels are bowed and coming off.

RESPONSE:

Status of telephone labels will be included in surveillance procedures. Labels will be replaced as necessary.

IMPLEMENTATION:

Accept as is.

4609c/11

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 13

GUIDELINE NO: 5.1.6.d(1)

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

There are three red phones in the NRC room at the EOF, only one of which is the emergency 'ring down' phone.

RESPONSE:

The red phone used for dedicated Emergency Notification System (NRC) will be the only red phone.

IMPLEMENTATION:

12/31/85

4609c/12

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 14

GUIDELINE NO: 5.1.6.d(1)

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

The use of color to label phones in the EOF is inconsistent. The yellow and grey phones are labeled with white on blue dynotape. The green phone is actually a beige phone with a beige cord and a green receiver/handle.

RESPONSE:

Telephone identification methods will be revised to functionally identify telephones. The color coded scheme will be discontinued in 1986. Concept will be developed by July 10, 1986 and implemented by December 31, 1986.

IMPLEMENTATION:

12/31/86

4609c/13

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 17

GUIDELINE NO: 1.2.8c

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Chairs (in the TSC) at the desks of directors do not have arm rests. Since these chairs could be occupied for a relatively long period of time, they may lead to unnecessary fatigue and discomfort.

RESPONSE:

Directors are sufficiently mobile that arm rests would not significantly increase comfort or decrease fatigue.

IMPLEMENTATION:

Accept as is.

4609c/14

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 19

GUIDELINE NO: 1.1.1

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

The status boards in the TSC are not readily accessible. There is no good central location to mount the status boards so that everyone can see them.

RESPONSE:

Accessibility of status boards has not been a problem in the past.

IMPLEMENTATION:

Accept as is.

4609c/15

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 20

GUIDELINE NO: 1.4.1d

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

There is no contamination checkpoint set up at the entrance to the EOF to prevent the admittance of contaminated materials by exposed personnel.

RESPONSE:

Health physics director procedures will be evaluated and updated if necessary to provide for contamination control when warranted by radiological situation.

IMPLEMENTATION:

12/31/86

4609c/16

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 21

GUIDELINE NO: 7.2.1b

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

The Ramtek CRTs used to display the SPDS in the TSC and EOF reflect glare from the overhead ceiling lights.

RESPONSE:

Personnel can position themselves to minimize glare. Glare has not prevented people from getting access to needed information.

IMPLEMENTATION:

Accept as is.

4609c/17

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 22

GUIDELINE NO: 7.1.3d/7.1.1c

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Point History data which are entered under options 1, 2 and 3, into the Prime Computer are processed one item at a time, rather than collected into a buffer area and processed collectively. Because of this, the system does not permit correction of individual errors without requiring re-entry of correctly entered data. The ability to call up appropriate Point History displays during emergency conditions is affected.

RESPONSE:

The Point History Program has been recently revised to make it more user friendly. The user must enter the point I.D. and other information to retrieve information from the database. Computer Systems personnel cannot identify the specific problem, however, Point History Programs will be reviewed for modification to make them more user friendly when the ODCS program is being updated.

IMPLEMENTATION:

12/31/87

4609c/77

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 23

GUIDELINE NO: 7.1.3d

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

It is not possible to correct ODCS data entry errors on the Prime computer without re-entry of correctly entered data.

RESPONSE:

User-system interactions will be reviewed and steps taken to minimize cumbersome procedures.

IMPLEMENTATION:

12/31/87

4609c/18

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 24

GUIDELINE NO: 7.1.4g

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

The Ampex keyboards in the TSC and EOF have a slope of 4° from the horizontal. This is less than the recommended 10° .

RESPONSE:

Tilt of the keyboards has not been a problem. User interaction with the keyboards is not of a data entry type activity, and therefore does not require continuous use of the keyboard.

IMPLEMENTATION:

Accept as is.

4609c/19

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 25

GUIDELINE NO: 7.1.8b(2)

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

There is not an up-to-date hard copy of point IDs available in the TSC/EOF. To access point history data and trends, the user must be able to reference specific point IDs. The lack of a hard copy reference may cause delay or confusion in accessing needed information.

RESPONSE:

An up-to-date alphabetic hardcopy of point IDs will be provided.

IMPLEMENTATION:

12/31/85

4609c/20

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 26

GUIDELINE NO: 7.2.1b

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

The Ampex D81 CRTs in the EOF and TSC reflect glare from the overhead ceiling lights.

RESPONSE:

Personnel can position themselves to minimize glare. Glare has not prevented access to needed information.

IMPLEMENTATION:

Accept as is.

4609c/21

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 27

GUIDELINE NO: 7.2.2g

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

The Ampex D81 CRTs use a 5 x 7 dot matrix, rather than the recommended 7 x 9 dot matrix.

RESPONSE:

Displays are readable with the present dot matrix.

IMPLEMENTATION:

Accept as is.

4609c/22

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 28

GUIDELINE NO: 7.2.4.j.2

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Numeric data in tabular form on the ODCS 'Execute C Model' display is not right justified with decimal points aligned.

RESPONSE:

Misalignment has not caused readability problems or confusion in interpreting values.

IMPLEMENTATION:

Accept as is.

4609c/23

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 29

GUIDELINE NO: 7.2.4m(1)

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Lists of Point History information available on the Catalog Search and Display program do not have descriptive column headings or legends for the several abbreviations that are used in the lists. Without descriptive titles and legends, the user, who only accesses this information one or several times a year, may not always know to what the information presented to him refers.

RESPONSE:

Column headings will be provided throughout the Point History programs. Legends cannot be provided at this time because of difference among stations. In addition, legends may require too much room on the screen to be a useful addition.

IMPLEMENTATION:

7/31/87

4609c/24

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 30

GUIDELINE NO: 7.2.4p(1)

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Labels on the ODCS and PT History displays are not highlighted or otherwise accentuated to facilitate operator scanning and recognition.

RESPONSE:

Lack of highlighting has not caused any problems with readability or interpretation of displayed values.

IMPLEMENTATION:

Accept as is.

4609c/25

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 31

GUIDELINE NO: 7.2.5c

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Organization and separation of information is not apparent to the user of the ODCS displays. Information and data appear to run into each other making it difficult to extract needed information.

RESPONSE:

Displays are readable and there has been no problem with confusion in their interpretation.

IMPLEMENTATION:

Accept as is.

4609c/26

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 32

GUIDELINE NO: 7.2.6h

SOURCE: ERF CHECKLIST

CATEGORY: 2 LEVEL: B

FINDING:

Operators do not always have the capability to correct individual errors without affecting adjacent valid entries. For example, in using the ODCS - Meteorological Polling Program, if the user enters a wrong choice, the program automatically logs him out. The user must then log back in and try again.

RESPONSE:

User-system interaction will be evaluated to minimize cumbersome procedures.

IMPLEMENTATION:

12/31/87

4609c/27

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 33

GUIDELINE NO: 7.2.6a

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Feedback messages are not provided to the operator to indicate changes in the status of computer system functioning. Some requests, particularly in ODCS, take a noticeable amount of time to process. If the computer goes down while it is servicing such a request, the user may not know that a change in computer functioning has occurred, and may be confused as to why the system has not responded.

RESPONSE:

Users do not have to wait long before it becomes apparent that system is down.

IMPLEMENTATION:

Accept as is.

4609c/28

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 34

GUIDELINE NO: 7.2.7.k1
7.2.7.11,12,13

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Colors used on the point history color displays are not consistent in use and meaning with all other color codes. Green, yellow and red are used as boundary lines, scale values and plotted lines. These three colors should be reserved to indicate normal, warning and alarm conditions in order to be consistent with their use in other displays and in the control room.

RESPONSE:

Boundary lines and magnitude values are not easily confused, even if they are displayed in the same color.

IMPLEMENTATION:

Accept as is.

4609c/29

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 35

GUIDELINE NO: 7.3.1d

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Printers used in the TSC do not have a printing capability of at least 300 lines a minute.

RESPONSE:

The computer buffers the information so there is no danger of losing it. The present printer speed is sufficient to provide needed information in a timely manner.

IMPLEMENTATION:

Accept as is.

4609c/30

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 36

GUIDELINE NO: 7.3.1c

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Instructions for reloading paper, ribbon, ink, etc., in the printers are not available in the TSC.

RESPONSE:

Instructions for reloading printer paper, ribbon and ink will be provided.

IMPLEMENTATION:

6/30/86

4609c/31

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 37

GUIDELINE NO: 7.3.3d(2)

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

Tabular columns of information on the ODCS displays are not separated into functional groups or grouped in formats that enhance readability.

RESPONSE:

There is no basis for grouping this information by function, and readability has not been a problem.

IMPLEMENTATION:

Accept as is.

4609c/32

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 38

GUIDELINE NO: 7.1.2a(1)

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

To transfer from a Point History program to the ODCS program (and vice-versa), the user of a CRT must log-off from one system, then log-on to the other. This is cumbersome and time-consuming. Since both sets of data are stored on the Prime computer, this procedure is unnecessary and inefficient.

RESPONSE:

Different people use these two programs, so it is rare that anyone has to exit from one program in order to enter the other.

IMPLEMENTATION:

Accept as is.

4609c/33

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 40

GUIDELINE NO: 1.1.4d

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

In the TSC, documents stored in manila folders in open-front filing cabinets are not protected from wear. These documents include technical manuals and other plant data that are used for reference purposes.

RESPONSE:

The type information that is stored in these files is used only for occasional reference and would be difficult to bind (e.g. instrument manuals). Frequently used information (e.g. tech specs, GSEP procedures) is already bound and a set of drawings is available on aperture cards.

IMPLEMENTATION:

Accept as is.

4609c/34

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 41

GUIDELINE NO: 1.4.2e

SOURCE: ERF CHECKLIST

CATEGORY: 3 LEVEL: C

FINDING:

There are no smoke detectors or other local automatic fire warning systems in the TSC. An alarm would be sounded only if someone noticed the fire and called the control room to initiate a general alarm.

RESPONSE:

The Quad Cities Station TSC is a separate building located relatively close to the main access facility. Security patrols view the outside of the building at least hourly. Since hazardous or highly flammable substances are not stored in the building, and equipment is usually powered down, when the building is unoccupied, no additional protection is considered necessary.

IMPLEMENTATION:

Accept as is.

4609c/35

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF AND TSC

HED NO.: 43

GUIDELINE NO: 7.3.1e

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Staff members are not trained on printer operations, nor are instructions readily available.

RESPONSE:

Instructions for printer operation will be provided.

IMPLEMENTATION:

6/30/86

4609c/36

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF AND TSC

HED NO.: 45

GUIDELINE NO: 5.1.1

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Labeling of parameters on CRT displays is not consistent across stations.

RESPONSE:

Labeling inconsistencies are inevitable due to plant-specific differences.

IMPLEMENTATION:

Accept as is.

4609c/37

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 50

GUIDELINE NO: 7.1.4.c

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

CRTs have different keyboards (i.e., RAMTEC and IBM). This has caused user confusion.

RESPONSE:

Different vendors supply different keyboards. These differences have not caused confusion for users in the past.

IMPLEMENTATION:

Accept as is.

4609c/39

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF AND TSC

HED NO.: 51

GUIDELINE NO: 7.2.2

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Reading powers of 10 on the CRT is difficult. Values may be misinterpreted due to confusion.

RESPONSE:

Displays are readable in their present form and have not caused problems in conveying needed information to users.

IMPLEMENTATION:

Accept as is.

4609c/40

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 52

GUIDELINE NO: Training

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

In the course in which one learns to use the off-site dose calculation system (ODCS), experienced and inexperienced personnel are in the same course. Participants stated that it is too basic for the experienced and overwhelms the inexperienced.

RESPONSE:

The training program for environmental positions requiring use of the ODCS will be divided into two sections. New personnel will attend a three day course which will explore subject matter in detail. Experienced personnel will attend a shorter refresher training course, or test out. A pilot refresher training program has already been conducted for a limited number of persons. Satisfactory examination results were produced.

IMPLEMENTATION:

12/31/86

4609c/41

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 53

GUIDELINE NO: 1.1.4.a

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

A number of the persons in the TSC indicated a need for checklists to help them with their job: Rad-Chem Director at Dresden TSC; Operations Director at Dresden TSC; Environmental Emergency Coordinator EOFs at Quad Cities and Dresden; Technical Support Manager at EOF Dresden.

RESPONSE:

Availability of job aid checklists will be confirmed.
Personnel will be made aware of their existence during training.

IMPLEMENTATION:

12/31/86

4609c/42

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 54

GUIDELINE NO: 1.1.4a(2)

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Participants stated that message forms are time consuming to complete. Sometimes personnel have to wait for Rad/Chemistry data.

RESPONSE:

Sufficient copies are available for appropriate personnel. Form is sufficiently flexible to facilitate all forms of data and message transfer.

IMPLEMENTATION:

Accept as is.

4609c/43

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 55

GUIDELINE NO: Training

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Several personnel involved in the TSC indicated a need for more specific training on the duties and responsibilities of their position and less generic training. They also wanted more drill and less classroom training.

RESPONSE:

This HED appears to be a direct contradiction to HED #58 with respect to generic training. If these two HEDs represent extremes of views held by persons receiving training, perhaps the program is about where it should be. The training program is updated as needed to reflect changes in procedure, feedback from students and drill participants, and performance observed during exercises. These two HED's do not provide a sufficient reason to change direction of training unless one would be confirmed by the other sources of training feedback.

IMPLEMENTATION:

Accept as is.

4609c/44

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 56

GUIDELINE NO: 7.2.4
7.2.5

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Different CRT display formats are used at different stations. The use of different CRT display formats may lead to user confusion, particularly among personnel who are on-call to several stations. The format used in presenting data is an important factor in preventing reading and selection errors and reducing search time.

RESPONSE:

Differences in display formats are inevitable due to plant-specific differences.

IMPLEMENTATION:

Accept as is.

4609c/45

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 57

GUIDELINE NO: 1.1.4a(2)

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

The GSEP log is maintained by all directors. Procedures do not specify how in-depth and detailed it should be.

RESPONSE:

Need for accurate logs has already been stressed repeatedly in training. Some of this problem may be due to the compression of time that is inevitable during drills.

IMPLEMENTATION:

Accept as is.

4609c/46

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF AND TSC

HED NO.: 58

GUIDELINE NO: Training

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Participants would like more GSEP training so all directors are aware of one another's duties and responsibilities. Also, need more information about relation of TSC to EOF.

RESPONSE:

This HED appears to be in direct contradiction to HED #55 with respect to generic training. If these two HED's represent extremes of views held by persons receiving training, perhaps the program is about where it should be. The generic GSEP provides a summation of the functions of the TSC and EOF as well as the duties of key positions. Revision 6 of the GSEP is scheduled for July 1986. Currently the plan is to specify a similar organizational structure for both TSC and EOF organizations.

IMPLEMENTATION:

Accept as is.

4609c/47

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 59

GUIDELINE NO: 1.1.7

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Participants stated that there is adequate space for CECO personnel in the ERF, however, the addition of NRC, State, Observer, Controller, and/or media personnel creates a crowded condition which distracts and impedes the movement of CECO personnel.

RESPONSE:

The presence of controllers, evaluators, observers and at times, media appears to create crowded conditions during some exercise periods. However, control over extraneous personnel is enforced during exercises to the extent where they do not create a serious problem. In an actual situation, observers, evaluators, controllers, and media would not be present in the ERF and any additional staff would use the entire facility.

IMPLEMENTATION:

Accept as is.

4609c/48

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 60

GUIDELINE NO: 2.1.1.a

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Phone lists are currently posted either on ERF walls or distributed with other memos. They are not always readily available when personnel need them.

RESPONSE:

Phone list will be updated regularly.

IMPLEMENTATION:

3/31/86

4609c/49

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 62

GUIDELINE NO: 5.1.1.b

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Update time on status boards may not be applicable to all information on the board.

RESPONSE:

Status boards will be reviewed to correct HED's #4 and #6. Update time will be eliminated, where possible, for all purposes other than a memory jogger for the recorder.

IMPLEMENTATION:

7/15/86

4609c/50

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 63

GUIDELINE NO: 2.1.1.a

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Emergency phone numbers are not listed in the company phone book. Participants suggested that an emergency phone list in the company phone book would provide an additional source of this information.

RESPONSE:

Emergency numbers should not be published in documents that are in the public domain.

IMPLEMENTATION:

Accept as is.

4609c/51

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 64

GUIDELINE NO: 7.1.8

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Access and use of computers and programs are confusing to most personnel.

RESPONSE:

Procedures for CRT use will be developed and made available near each terminal.

IMPLEMENTATION:

12/31/86

4609c/52

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF AND TSC

HED NO.: 65

GUIDELINE NO: 5.1.1.b

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Participants suggested that some information currently available by telephone from the control room, by radio from field teams, and from inventory listings (e.g., area rad monitors (ARMS), release rates, area temperatures, supply inventories) should be available on CRT displays.

RESPONSE:

While it would appear technically feasible to make area radiation monitor (ARM) readings and some area temperatures available in the CRT's, Quad Cities Station has not experienced difficulty with reporting this information from the control room on an as needed basis.

IMPLEMENTATION:

Accept as is.

4609c/53

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 66

GUIDELINE NO: Staffing

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Logging takes too much time and that an assistant may be needed to do nothing but log records.

RESPONSE:

Maintaining good logs is a necessary part of each director's duties. In addition, each Director has the authority to request additional support staff.

IMPLEMENTATION:

Accept as is.

4609c/54

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 68

GUIDELINE NO: 1.1.4.a

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Maintenance personnel have need for a print of on-line auxiliary power system.

RESPONSE:

A print showing normal and emergency electrical power distribution alignments has been mounted under plexiglass in the TSC/OSC building. The path in use can be indicated by a marker as systems are activated and de-activated.

IMPLEMENTATION:

Complete

4609c/55

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF AND TSC

HED NO.: 69

GUIDELINE NO: 1.3.1d

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Environmental Emergency Coordinator work station has a Black/White CRT and one color CRT. Participants identified a need for more CRTs to allow following trends.

RESPONSE:

The EOF layout will be reviewed to consider the organizational revisions proposed for Revision 6 to the GSEP scheduled for July 1986. One color CRT will be added to the environmental workstation in the EOF unless the function can be filled by combining workstations. The TSC is acceptable as is.

IMPLEMENTATION:

7/31/87

4609c/56

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 70

GUIDELINE NO: 1.1.5f

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Participants suggested that a regularly scheduled inventory should be conducted at the EOF to insure supply of up-to-date memo forms and NARS forms.

RESPONSE:

An adequate supply of all forms will be maintained by means of a surveillance checklist.

IMPLEMENTATION:

7/15/86

4609c/57

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 71

GUIDELINE NO: 1.1.4.a

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Participants suggested that TSC should have notes for Station Director and his directors that state in clear language (with pictorial flow perhaps) how to open up the TSC, set it up, and what to do. The first 10 minutes are the hardest part of an emergency and participants said they need a concise booklet on basic steps. Although there is some guidance provided in GSEP procedures and manual, in an emergency people do not have time to consult these.

RESPONSE:

A checklist for activating the TSC will be provided.

IMPLEMENTATION:

7/31/86

4597c/71

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 75

GUIDELINE NO: 1.1.2a

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Participants stated that using a call-list to staff the EOF may be slow, cumbersome and ineffective at times.

RESPONSE:

The present call list approach has proven workable; alternative procedures have already been investigated and rejected.

IMPLEMENTATION:

Accept as is.

4609c/59

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 76

GUIDELINE NO: 1.2.7.a

SOURCE: INTERVIEW

CATEGORY: 2 LEVEL: C

DESCRIPTION:

Several individuals reported there was insufficient room for maps in the TSC or the EOF at work stations. At the EOF the CRTs and manuals occupy much of table- or desk-top space. The maps are needed to plot radiation spread.

RESPONSE:

Layouts of TSC's and EOF's will be re-evaluated after publication of GSEP Revision 6. Additional map space will be provided if possible.

IMPLEMENTATION:

12/31/86

4609c/60

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 78

GUIDELINE NO: 1.2.6
1.2.7.a

SOURCE: INTERVIEW

CATEGORY: 2 LEVEL: C

FINDING:

ODCS operator has little workspace area on desk because of two computer CRTs. One operator stated that as a result he has to place procedures manual on chair to use it. Another operator reported he wrote on top of CRTs. There is insufficient space on which to write and calculate.

RESPONSE:

Layout of TSC's and EOF's will be re-evaluated after publication of GSEP Revision 6. Additional workspace will be provided for the ODCS operator, if possible.

IMPLEMENTATION:

12/31/86

4609c/61

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 82

GUIDELINE NO: Training

SOURCE: INTERVIEW

CATEGORY: 2 LEVEL: C

FINDING:

Participants identified a need for radiological chemists to understand operations and parameters for normal and emergency conditions. Formal system training did not emphasize radiological aspects and theory of what is happening in an emergency.

RESPONSE:

Rad chem training will be upgraded.

IMPLEMENTATION:

12/31/86

4609c/62

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 83

GUIDELINE NO: Training

SOURCE: INTERVIEW

CATEGORY: 2 LEVEL: C

FINDING:

Maintenance staff indicated that there is a need for more training at lower levels to insure adequate execution of work. There is a need for more emphasis on team work in maintenance.

RESPONSE:

Training Programs, as currently implemented, are adequate.

IMPLEMENTATION:

Accept as is.

4609c/63

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 84

GUIDELINE NO: 1.1.4.a

SOURCE: INTERVIEW

CATEGORY: 2 LEVEL: C

FINDING:

Participants stated that procedures are not adequate for a potential radiological accident. They are not sufficiently comprehensive for the purposes.

RESPONSE:

Scenarios involving radiological accidents other than LOCA have been exercised. Commonwealth Edison has NRC approved emergency plant implementing procedures for radiological accidents. Therefore, current procedures are adequate.

IMPLEMENTATION:

Accept as is.

4609c/64

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 85

GUIDELINE NO: Staffing

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

The Station Director in the TSC communicates a lot with the EOF Communicator, who relays this information to the Recovery Manager. Participants stated that the TSC needs a Communicator so the Station Director can devote maximum time to decision-making functions.

RESPONSE:

The Revision 6 to the GSEP proposes organizational changes that include a communicator for the station director. Quad Cities Station uses this concept now on an informal basis.

IMPLEMENTATION:

11/31/86

4609c/65

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 88

GUIDELINE NO: 7.1.8

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

On occasion, ODCS programs have not worked properly during drills. Program or system malfunction may lead to delay or loss of information.

RESPONSE:

The ODCS program resides on the Prime computers at each station and the corporate office. The station Prime may be accessed from the TSC or EOF. If the station Prime was not available, the corporate Prime may be accessed from the corporate command center or any other operational station Prime computer. In the unlikely event that all 14 Prime computers in the network would fail at one time, a manual calculation method is available in procedures.

IMPLEMENTATION:

accept as is

4609c/66

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 89

GUIDELINE NO: Training

SOURCE: INTERVIEW

CATEGORY: 2 LEVEL: C

FINDING:

Not all personnel are aware of what information is displayed on the CRTs. Some people still use the phone and memo forms to get information currently available through the computer.

RESPONSE:

Training on the use of information available on the CRTs will be upgraded for appropriate personnel.

IMPLEMENTATION:

12/31/86

4609c/67

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 90

GUIDELINE NO: 2.1.1.a
2.1.2.b.7

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Participants suggested that important telephone lines should be listed and posted. Directions are confusing for accessing different telephone exchanges, land lines versus microwave lines, and various handsets.

RESPONSE:

Documentation on the use of phone lines will be posted. In addition, phones will be appropriately identified.

IMPLEMENTATION:

12/31/86

4609c/68

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 91

GUIDELINE NO: 2.1.1.a
2.1.2.b(7)

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Telephones should be better labeled and designated. Participants stated that there has been some improvement, but more is needed. It is hard to remember the color scheme of phones.

RESPONSE:

Telephone identification methods will be revised to functionally identify telephones. The color coded scheme will be discontinued in 1986. Concept will be developed by July 10, 1986 and implemented by December 31, 1986.

IMPLEMENTATION:

12/31/86

4609c/69

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 92

GUIDELINE NO: 1.1.3.a
1.3.1.b

SOURCE: INTERVIEW

CATEGORY: 3 LEVEL: C

FINDING:

Participants noted that status boards are not readily visible from all positions in the TSC. Moreover, status board updates lag behind CRT data, which is current, since updates occur about every 15 minutes.

RESPONSE:

Status boards will undergo re-evaluation and revision to accommodate HED's #4 and #6. The re-evaluation will include a determination of which information is needed by all and which is needed by key individuals or selected groups. Revisions to status boards will be provided to the TSC for use. The time lag in updating status boards may be due to exercise conditions. In any event, valid data available on the CRT should be used as being more timely. Status boards should be used to convey the general situation and flag when trends are changing.

IMPLEMENTATION:

7/15/86

4609c/70

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 94

GUIDELINE NO: 1.5.3f

SOURCE: DRILL OBSERVATIONS

CATEGORY: 3 LEVEL: C

FINDING:

The status boards in the EOF reflect glare from the overhead lights.

RESPONSE:

Personnel can position themselves to minimize glare. Glare has not prevented personnel from getting needed information.

IMPLEMENTATION:

Accept as is.

4609c/71

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 96

GUIDELINE NO: 2.1.4b

SOURCE: DRILL OBSERVATIONS

CATEGORY: 1 LEVEL: B

FINDING:

Radios used by the Environs field team are "line-of-sight." When the team is in hilly terrain, radio transmissions are sometimes inadequate and they have had to find a pay phone from which to call in needed information.

RESPONSE:

Procedures for moving field teams in Iowa will be re-evaluated to improve radio communications. Identification of blind spots on maps or dispatch of radio relay vehicles, will be among the solutions considered. Selected option(s) will be implemented by July 15, 1986.

IMPLEMENTATION:

7/15/86

4609c/72

ERF CORRECTIVE ACTIONS
QUAD CITIES - EOF

HED NO.: 97

GUIDELINE NO: 1.1.3

SOURCE: DRILL OBSERVATIONS

CATEGORY: 3 LEVEL: C

FINDING:

The rectangular arrangement of desks for the Environs Group has not worked effectively during recent drills. The group attempted to rearrange their desks.

RESPONSE:

The EOF layout will be reviewed to consider the organizational revision proposed for Revision 6 to the GSEP scheduled for July, 1986. Workspace arrangements for the environs group will be considered. In the interm, rearrangement of desks to better accomodate the function will be permitted to the extent it is practical to do so.

IMPLEMENTATION:

12/31/86

4609c/73

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC

HED NO.: 98

GUIDELINE NO: 1.1.3b

SOURCE: DRILL OBSERVATIONS

CATEGORY: 3 LEVEL: C

FINDING:

There are no easily accessible phones near the CRTs or near the
Environs group area.

RESPONSE:

Additional phones will be installed.

IMPLEMENTATION:

7/31/86

4609c/74

ERF CORRECTIVE ACTIONS
QUAD CITIES - TSC AND EOF

HED NO.: 106

GUIDELINE NO: 5.1.3.1.B

SOURCE: Checklist

CATEGORY: 3 LEVEL: C

FINDING:

The time delay from when the sensors are sampled to when they are displayed on the Prime Computer-based SPDS display in the TSC and EOF is 60 seconds. This is more than the recommended 5 seconds and is considerably slower than the rate at which the Process Computer-based SPDS display in the Control Room is updated. Thus there is the possibility that conflicting information could be presented concurrently on the SPDS displays in the Control Room and the ERFs.

RESPONSE:

A 60 second updating of the SPDS in the ERFs is sufficient for the purpose of evaluating plant status and supporting the actions of the control room operators. The 5 to 10 second updating of the control room displays is necessary to provide the control room operators with a quick, accurate status to which they can respond as quickly. The key difference is in the ability to respond. The control room operators require more frequent updates to take their actions. The ERF teams require information to provide an overview and suggest less immediate actions. Therefore, the difference in updating times is acceptable.

IMPLEMENTATION:

Accept as is.

4609c/76