DCRDR IN-PROGRESS AUDIT REPORT
FOR
WISCONSIN PUBLIC SERVICE CORPORATION'S
KEWAUNEE NUCLEAR POWER PLANT

May 31, 1984

Prepared by:

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Contract NRC-03-82-096

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DCRDR IN-PROGRESS AUDIT REPORT
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This report documents the findings of the Nuclear Regulatory Commission (NRC) audit team during the in-progress audit of the detailed control room design review (DCRDR) for Wisconsin Public Service Corporation's (WPSC's) Kewaunee nuclear power plant. The DCRDR audit was conducted May 1 through May 4, 1984. The NRC audit team consisted of a representative from the NRC Division of Human Factors Safety, Human Factors Engineering Branch (HFEB), and consultants from Science Applications, Inc. (SAI), and Comex Corporation. The audit was conducted on-site at WPSC's Kewaunee nuclear power plant. This report was prepared by SAI, but is intended to reflect the consolidated observations, conclusions and recommendations of the NRC audit team members. An outline of the audit meetings and a list of attendees are included as Enclosure 1 of this report.

NRC Position

Item I.D.1, "Control Room Design Reviews," of Section I.D., "Control Room Design," of the NRC Action Plan (NUREG-0660) developed as a result of the TMI-2 accident (Reference 1) states that the operating licensees and applicants for operating licenses will be required to perform a Detailed Control Room Design Review (DCRDR) to identify and correct design discrepancies. Supplement 1 to NUREG-0737 (Reference 2), dated December 17, 1982, confirmed and clarified the DCRDR requirement in NUREG-0660. As a result of Supplement 1 to NUREG-0737, each applicant or licensee is required to conduct their DCRDR on a schedule negotiated with NRC.

NUREG-0700 (Reference 3) describes four phases of the DCRDR to be performed by the applicant and licensee. The phases are:

1. Planning
2. Review
3. Assessment and implementation, and
4. Reporting.

NUREG-0801 (Reference 4) Draft "Evaluation Criteria for Detailed Control Room Design Review," provides the necessary criteria for evaluating each phase.

As a requirement of Supplement 1 to NUREG-0737, the applicants and licensees are required to submit a program plan that describes how the following elements of the DCRDR will be accomplished.

1. Establishment of a qualified multidisciplinary review team,

2. Function and task analyses to identify control room operator tasks and information and control requirements during emergency operations,

3. A comparison of display and control requirements with a control room inventory,

4. A control room survey to identify deviations from accepted human factors principles,

5. Assessment of human engineering discrepancies (HEDs) to determine which HEDs are significant and should be corrected,

6. Selection of design improvements,

7. Verification that selected design improvements will provide the necessary correction,

8. Verification that improvements will not introduce new HEDs, and

9. Coordination of control room improvements with changes from other programs such as SPDS, operator training, Reg. Guide 1.97 (Reference 5) instrumentation, and upgrade of emergency operating procedures.

The NRC requires each applicant and licensee to submit a summary report at the end of the DCRDR. The report should describe the proposed control

room changes, implementation schedules, and provide justification for leaving safety significant HEDs uncorrected or partially corrected.

Discussion

WPSC submitted the DCRDR Program Plan for the Kewaunee nuclear power plant (Reference 6) by letter dated April 15, 1983. In addition, WPSC submitted a Clarification of Supplement 1 to NUREG-0737 Implementation Plan (Reference 7) by letter dated August 4, 1983. SAI, who assisted the NRC staff in their review of the WPSC Program Plan, submitted an evaluation of the Kewaunee Program Plan (Reference 8) to the staff dated September 22, 1983. The NRC comments on the Kewaunee Program Plan (Reference 9), dated October 6, 1983, were forwarded to WPSC.

Kewaunee was selected by the staff for an in-progress audit of the DCRDR. A draft In-Progress Audit Plan (Reference 10) was sent from the NRC to WPSC by letter dated March 2, 1984. The audit plan defined the main elements of the in-progress audit of the Kewaunee DCRDR. The audit plan also defined the appropriate elements of NUREG-0737 Supplement 1 which would be used by the NRC audit team to evaluate the licensee's review activities.

The purpose of the in-progress audit was to check Kewaunee's DCRDR compliance with the Program Plan and requirements of NUREG-0737 Supplement 1. The efforts of the NRC audit team were directed at an evaluation of the content and products of the DCRDR rather than the form of the process. The form of the DCRDR process as described in the Program Plan had been reviewed (Reference 9) and found acceptable.

At the time of the audit, Kewaunee's DCRDR Team had completed their operating experience review, task analysis (partially completed) and control room survey. The evaluation of human engineering observations (HEOs) for assessment and, if appropriate, their conversion to human engineering discrepancies (HEDs) is scheduled to commence in the latter part of May, 1984.

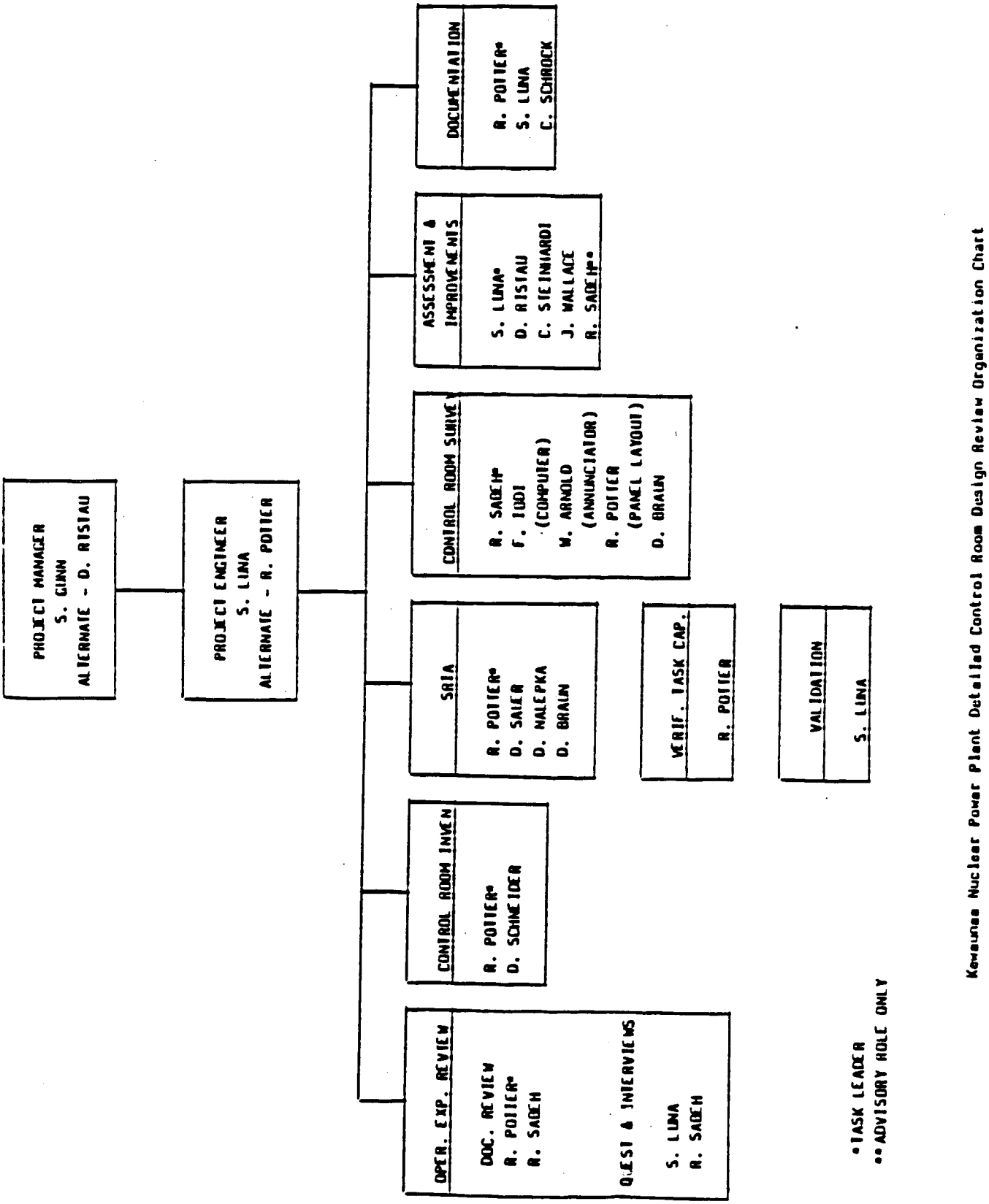
Following a brief entrance meeting with the licensee on 1 May 1984 where the schedule for the in-progress audit was presented to the licensee, the NRC audit team embarked on an agenda that addressed itself to a review of the following elements of the DCRDR process:

1. Qualifications and structure of the DCRDR team,
2. Operating experience review,
3. Function and task analysis,
4. Control room inventory,
5. Control room survey,
6. Assessment of HEOs/HEDs,
7. Selection of design improvements,
8. Verification that the improvements will provide the necessary corrections,
9. Verification that control room modifications do not introduce new HEDs,
10. Coordination of the DCRDR with other improvement programs.

The NRC audit team's review and evaluation of the above elements was accomplished through interviews with the DCRDR project manager (Stephen A. Gunn) and several of the WPSC DCRDR participants, the licensee's retained consultant(s) who acted as project engineer (Sal Luna, et. al., of Torrey Pines Technology), reviews of completed documents, and simulator review and walk-through of DCRDR results. The following comments are arranged according to the above listed elements and describe the strengths and weaknesses of the Kewaunee DCRDR project. Where appropriate, recommendations are included to assist in achieving a more satisfactory result.

1. Qualifications and structure of the DCRDR team

The Kewaunee DCRDR team organization was found to be as described in the Program Plan. Under the DCRDR project engineer, DCRDR task review teams were formed and were specifically structured with the disciplines needed to perform the task. The teams consisted of management, operations, human engineering, nuclear engineering, instrumentation and control engineering, and administrative talent. The resumes of key WPSC and contractor personnel are provided as Enclosure 2 of this report. Exhibit 1 illustrates the DCRDR staffing organization. The DCRDR task review teams evaluated the task to be performed, wrote a formal procedure to govern its activities, evaluated additional personnel requirements, and after formal approval of its procedures, embarked on the activity. Where appropriate, for example - the



Kewaunee Nuclear Power Plant Detailed Control Room Design Review Organization Chart

Exhibit 1. Kewaunee DCRDR staffing organization (Reference 11)

control room survey, a human factors engineer (consultant) was a participating member of the team.

The NRC review team found the WPSC management and control of the DCRDR task teams to be thorough. In addition, the DCRDR teams were specifically structured with the appropriate disciplines. In summary, the NRC audit team found the qualifications and structure of the multidisciplinary DCRDR review teams to be adequate.

2. Operating experience review

A review of operating experience is not explicitly required by NUREG-0737 Supplement 1. However, NUREG-0700 Subsection 3.3, "Operating Experience Review," recommends a review of operating experiences to make sure that problems encountered in plant operation are addressed. In accordance with Kewaunee Program Plan Section 4.1, the DCRDR team conducted a review of operating experience.

The first part of the operator experience review included the use of questionnaires and interviews. A questionnaire was formulated and distributed to 50 people, consisting of operators, shift supervisors, shift technical advisors, operations management and the plant manager. In order to maintain confidentiality the completed questionnaires were sent directly to the DCRDR contractor, Torrey Pines Technology. Torrey Pines personnel reviewed the completed questionnaires and selected a set of questions to be used in the operator interviews. Of the 50 questionnaires distributed, 40 were completed and sent to Torrey Pines Technology.

Approximately 40 interviews were conducted in accordance with the 5-step process described on page 4-5 of the Program Plan (Reference 6). The interviews were conducted by professional interviewers from Torrey Pines Technology.

The results from questionnaires and interviews produced 56 human engineering observations (HEOs). The HEOs with NUREG-0700 relevance were transferred directly to the survey checklists for HEO integration across DCRDR

activities. Questionnaire or interview comments which did not have NUREG-0700 guidelines associated with them were forwarded to the appropriate WPSC training and procedures personnel.

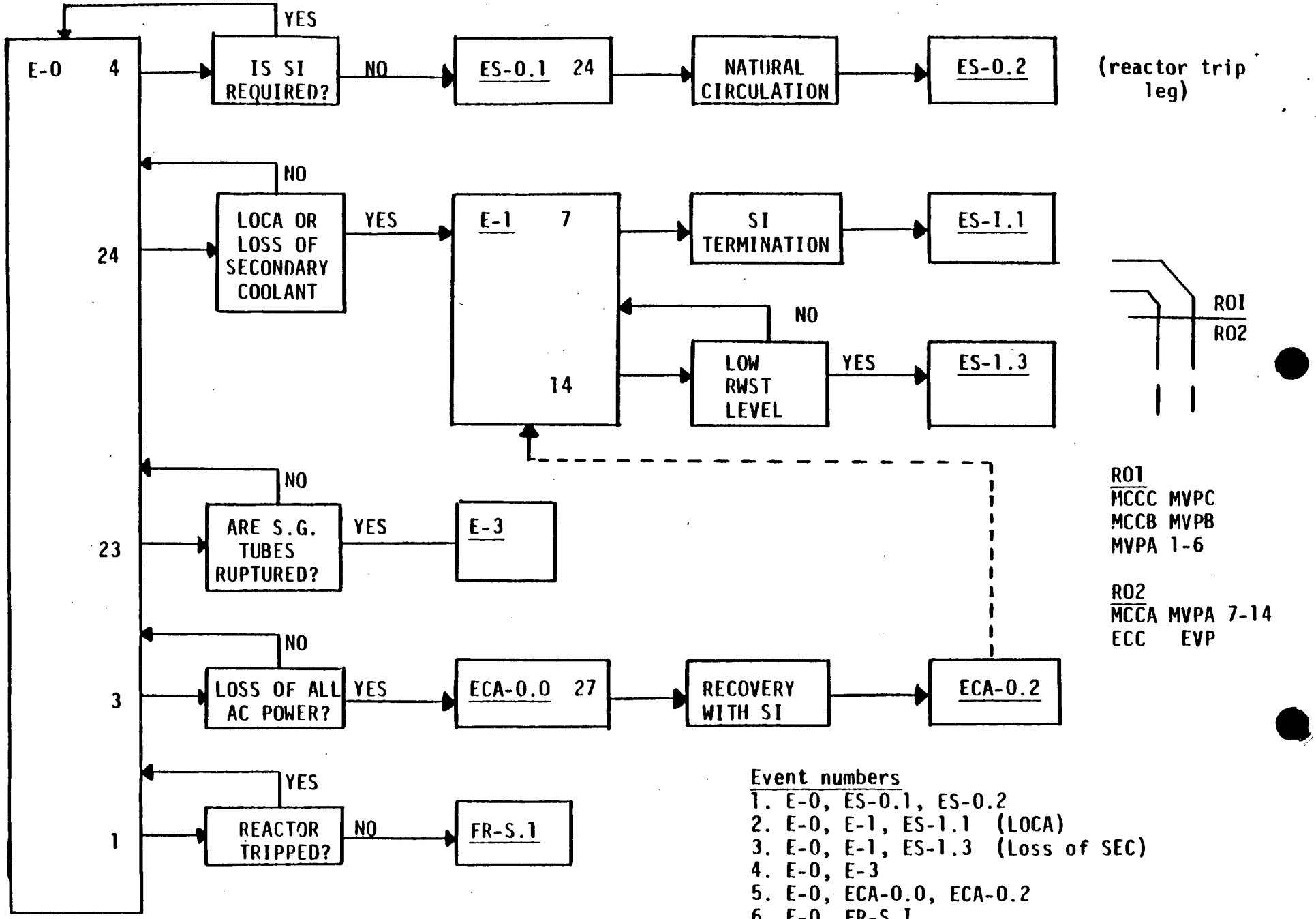
The second part of the operating experience review consisted of a review of Licensee Event Reports (LERs). The DCRDR team reviewed approximately 1000 LERs covering a period from 1973 to 1983. Of the LERs reviewed, only about 10 were identified as having human engineering implications in the control room. These were treated as HEOs on the Survey checklists.

In summary, the Kewaunee operating experience review was conducted in accordance with the DCRDR Program Plan. The results, particularly of the questionnaires and interviews, provided valuable inputs to the survey checklists.

3. Function and task analysis

The NRC audit team reviewed Task Analysis procedure 4.2.1 in the Detailed Control Room Design Review Procedures (Reference 11) and the partially completed task analysis documentation for a loss of coolant accident (LOCA) analysis. As a result of this review, the NRC audit team determined that the Kewaunee task analysis approach in its present form does not satisfy the requirement in NUREG-0737 Supplement 1. In addition, the task analysis documentation indicates that the DCRDR review team did not follow the Licensee's Program Plan as interpreted by previous NRC/Contractor evaluations (References 8 and 9). The detailed findings of the NRC audit team are listed below.

The DCRDR team identified 7 event sequences which cover many major functions and operator tasks that are required to implement the emergency operations and startup (see Exhibit 2). NUREG-0737 Supplement 1 requires that all operator functions and tasks needed to implement the emergency procedures be analyzed. This does not mean that every task has to be analyzed every time it occurs. NUREG-0700 Subsection 3.4.2.4 states that in many cases the set of operator tasks associated with the operator function/system interface will be identical for more than one sequence. In those cases, the analysis of the task requirements need not be repeated for each sequence. However, the NRC audit team could not substantiate that all



ERG PROCEDURES

Exhibit 2. Emergency Event Sequences Selected for Task Analysis

operator functions and tasks were covered at least once in the 7 events selected. As a result, the NRC audit team recommended that a more systematic approach be developed and implemented to substantiate that all operator functions have been identified and evaluated in the task analysis.

As a result of the 29 March 1984 NRC/Westinghouse Owners' Group Meeting (Reference 12) it was determined that Revision 1 of the ERG and background documents do provide adequate basis for generically identifying information and control needs. However, the licensee must describe the characteristics of needed instrumentation and controls. The Kewaunee Program Plan indicates on page 4-7 that Instrumentation Requirements Tables would be developed as a product of the task analysis. The NRC audit team review of the task analysis documentation revealed that this was not done independent of the existing simulator/control room instrumentation and controls. Since the instrumentation and control requirements and characteristics needed to meet the information and control requirements were not independently defined, uncertainty was created when the DCRDR task analysts identified the required operator instruments and controls. For example, procedure E-0, Step 1-d instructs the operator to check neutron flux in order to verify that it is decreasing with time. The entries on the Task Data Form for this task indicated that the operator is required to check the Power Range Meter, Intermediate Range Meter, % Delta Flux Meter, and Source Range Meter. If the instrumentation and control requirements and characteristics had been identified independent of the the control room the DCRDR task analyst would have known that % Delta Flux and Source Range indications are not required to verify neutron flux decreasing immediately following a reactor trip. The information supporting this example is provided in Kewaunee Program Plan (see Exhibit 3). In addition, since the instrumentation and control requirements and characteristics were not identified independently, the DCRDR task analyst for the above example failed to note that the operator would require the use of a Nuclear Instrumentation Chart Recorder to verify that neutron flux was decreasing with time. As a result, the NRC audit team recommended that the DCRDR team identify the instrumentation and control requirements and characteristics independent of the existing instruments and controls in the control room.

The entry symptoms for each of the operating procedures selected were not identified on the Task Data Forms. The instrumentation required to

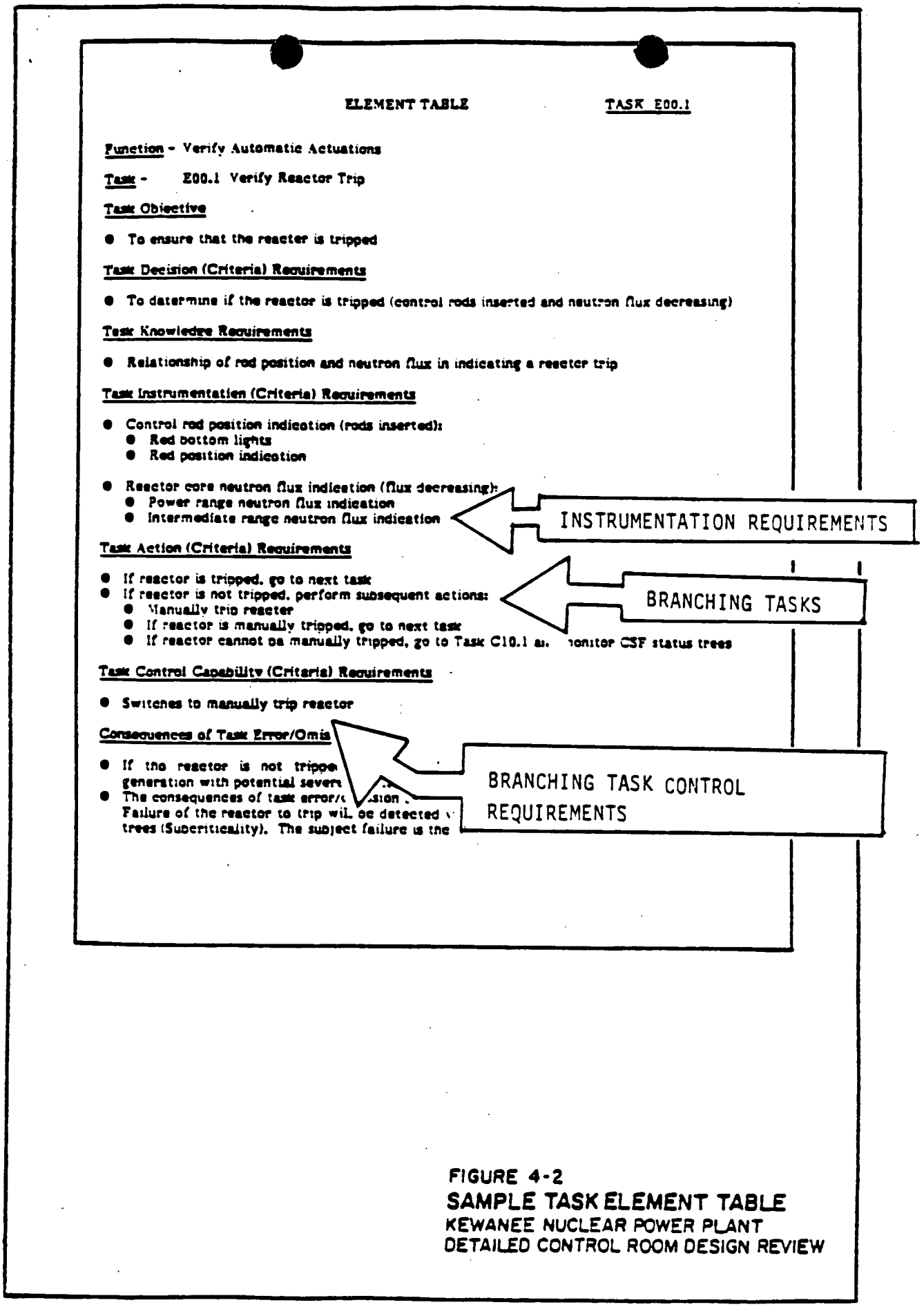


FIGURE 4-2
SAMPLE TASK ELEMENT TABLE
KEWANEE NUCLEAR POWER PLANT
DETAILED CONTROL ROOM DESIGN REVIEW

Exhibit 3. Sample Task Element Table
(Reference 6)

evaluate the entry symptoms is just as important as the instrumentation used in the procedure steps. The NRC audit team recommended that the DCRDR team include an analysis of the emergency procedure entry symptoms in the task analysis.

Branching tasks were not identified on the Task Data Forms. The Kewaunee emergency operating procedures supply the operators with instructions for expected responses and response-not-obtained instructions. The response-not-obtained instructions are branching tasks (see Exhibit 3). For example, the first operator task in procedure E-0 is to verify that the reactor is tripped. If the reactor is not tripped, the operator must go to the branching task of manually tripping the reactor by using the appropriate instrumentation and controls. An analysis of operator functions and tasks during emergency events is not complete until these branching tasks have been analyzed. The NRC audit team recommended that the DCRDR team include the branching tasks in the task analysis.

Communications tasks were not identified on the Task Data Forms. For example, operator communications between the technical support center, balance of plant operator, etc. were not analyzed. These tasks include the use of communication equipment and other control room instrumentation. The NRC audit team recommended that the DCRDR team include communication tasks in their task analysis.

Annunciator tasks were not identified on the Task Data Forms. The Kewaunee Program Plan indicated on page 4-18 that the DCRDR team would evaluate "time needed by operators to respond to alarms which initiate task sequences chosen for the system review and task analysis." The Program Plan also stated that the DCRDR team would "define the requirements for alarms needed to initiate event sequences evaluated in the system review and task analysis and compare them with the actual alarms provided." The NRC audit team review of the LOCA documentation indicated that alarm requirements and operator response times were not being included in the task analysis. The NRC audit team recommended that an analysis of annunciator tasks be included in the task analysis.

In conclusion, the NRC audit team review of the partially completed DCRDR task analysis data indicated that there were a number of areas that

could be significantly improved. In this regard, the NRC audit team made the following recommendations:

1. Perform an assessment of the selected operating procedures to ensure that all major safety related functions and operator tasks are identified.

2. Analyze the information and control requirements in order to define the instrumentation and control requirements and characteristics independent of the existing control room hardware.

3. Identify and analyze the tasks used to evaluate the entry symptoms that guide the operators into each of the emergency operating procedures.

4. Identify and analyze each type of branching task in the emergency operating procedures.

5. Identify and analyze each type of communications task used in the emergency operating procedures.

6. Identify and analyze each of the annunciator tasks that are performed during the emergency operating procedures.

4. Control room inventory

The control room inventory was produced by merging the existing computer based instrument list and valve list on a single data base. The inventory data sheets contain:

1. Diagram numbers,
2. Vendor instrument numbers,
3. Function title,
4. Calibrated range,
5. Resolution,
6. Nomenclature/model number,
7. Location.

The inventory data base was not complete at the time of the NRC audit. For example, the NRC audit team noted that the Radiation Monitoring System was not included in the data base. In addition, a verification of the instrument and valve lists had not been conducted. The NRC audit team recommended including the Radiation Monitoring System in the inventory, and to verifying the valve and instrument list in the control room.

In summary, the NRC audit of the control room inventory indicated that improvements to the existing DCRDR procedures would enhance the inventory results. In that regard, the NRC audit team made the following recommendations:

1. Perform a check to ensure that all instrumentation and controls are included in the control room inventory,

2. Verify that the control room inventory identification and characteristics data accurately reflect the existing control room.

5. Control room survey

In order to facilitate performance of the control room survey, checklists based on Section 6.0 of NUREG-0700 were prepared. The checklists consisted of 9 bound volumes corresponding to the sections in the NUREG. Each volume contained a title page, a detailed description of the guidelines (a duplication of the NUREG-0700 page), and a reference/comment form to permit entries. In addition, a criteria report consisting of numerous "criteria matrices" (matrix for each NUREG-0700 evaluation criteria) was prepared. This report summarized the applicable criteria for each NUREG-0700 entry (e.g., INPO criteria, or 0700, etc.), and the method of data collection, i.e., operator experience review (OER), control room survey (CRS), or systems review and task analysis (SRTA). Additional space was provided for comments concerning findings. The collective volumes provide for a well documented survey.

The NRC audit team evaluated eight of the nine volumes completed by the licensee (Volume 6.7 Process Computers, was not completed because the equipment was not installed) and performed a sample survey to validate the

findings of the licensee. The purpose of the sample survey was to independently evaluate the licensee's decision about whether the subject display/control was or was not in compliance with the established guideline.

Although the NRC audit concurred with most of the licensee's evaluations, they noted several discrepancies. For example, the licensee said "in compliance" with NUREG-0700 Guideline 6.5.1.1.b. This Guideline states that all information status and parameter values should be provided on the displays. However, no parameter units were provided on the TURB OIL meter, RSVR LVL meter, FW HTR 13B LEVEL meter, and OVERPOWER chart recorder. Another example of this same problem was noted during the NRC team evaluation of Guideline 6.6.6.4.b(4) which states that all mimic origin points should begin and end at labeled components. The mimic for the PASS system does not have labels for the reactor vessel and the pressurizer. Since these and other deviations from the guidelines were not identified during the survey, the NRC audit team concluded that the survey results were less than 100% correct.

The DCRDR team was provided with a procedure to identify Human Engineering Observations (HEOs) which were to be evaluated and assessed to determine if a Human Engineering Discrepancy (HED) existed. But, it was noted by the NRC review team that several HEO entries made on the Survey Checklists appeared to have been preassessed. For example, the Survey Checklist entry for guideline 6.3.1.2.b appeared to have been preassessed as a non-HED without being submitted to the formal assessment process. This circumvented the purpose of the HEO/HED procedure.

During the survey, which was conducted primarily in the simulator, the DCRDR survey team referred to excellent photographs of the control room to assure that the observed conditions of HEOs truly existed in the control room. Where appropriate, actual observations were made in the control room. Each HEO was photographed with excellent quality to aid in the assessment process.

Based on their review of the survey results, the NRC audit team recommended that the licensee:

1. Validate the survey checklist entries to ensure accuracy,

2. Validate and document any HEOs that were prematurely "assessed," and evaluate them during the assessment phase of the DCRDR.

6. Assessment of HEOs/HEDs

The assessment of HEOs and the conversion to HEDs is to commence 21 May 1984 according to the licensee. The licensee informed the NRC audit team that Assessment Technique #3 referred to in the Program Plan (page 5-10), "Assessment by Review Team Judgement," will be the methodology used for the assessment. The NRC audit team reviewed the categorization process with the licensee and concluded that the categorization techniques will be the same as described in the Program Plan and are adequate. In addition, the NRC audit team was advised that all HEOs assessed as non-HEDs will be justified on HEO ASSESSMENT AND HED IMPROVEMENT forms.

In summary, the NRC audit team concluded that the methods for the assessment of HEOs and HEDs conforms to the requirement in NUREG-0737 Supplement 1.

7. Selection of design improvements

The NRC audit team reviewed the licensee's Program Plan for the selection of design improvement adequacy and noted the following during interviews with the licensee. Three categories of improvements are to be considered: 1) design enhancement, 2) design change, 3) procedure change. It is noteworthy that enhancement and design changes will both be implemented by the normal plant procedure for all design changes, notwithstanding the source of the changes. The Design Change Group within WPSC will be responsible for scheduling and fabricating all design changes. But the NRC audit team noted that no procedure currently exists for "tracking" those HEDs that are resolved by procedural change.

In summary, the procedure for selection of design improvements appears to be adequate based on the information in the Program Plan and the information presented to the NRC audit team by the licensee. The NRC audit team

recommended that procedures for tracking the completion of procedural type improvements should be developed and implemented.

8. Verification that improvements provide the necessary corrections

The NRC audit team was unable to evaluate the licensee's method for verifying that improvements provide the necessary corrections since none was described in the Program Plan and no procedures existed at the time of the audit. The licensee indicated that procedures would be developed for this activity.

9. Verification that the control room modifications do not introduce new HEDs

The licensee did not describe a method for verifying that no new HEDs would be introduced into the control room as a result of correcting identified HEDs in the Program Plan and procedures had not been developed at the time of the audit. The licensee indicated that procedures would be developed for this activity.

10. Coordination of the DCRDR with other improvement programs

The NRC audit team noted that the program managers for other NUREG-0737 initiatives, e.g., symptom based EOPs, Reg. Guide 1.97 instrumentation, and SPDS development, were members of the various subtask review teams of the DCRDR effort. This membership appeared to promote the desired coordination of the DCRDR with all the other initiatives.

The licensee advised the NRC audit team that one of the responsibilities of the DCRDR team would be to modify existing design change procedures to assure that all future design changes undergo a human engineering review. At present, design changes other than those initiated as a result of the DCRDR are being reviewed by the DCRDR project manager for incorporation of human engineering principles.

In summary, the NRC audit team concluded that the coordination of the DCRDR with other programs is thorough and does satisfy the requirement in NUREG-0737 Supplement 1.

Summary and Conclusion

In summary, the purpose of the in-progress audit was to check Kewaunee DCRDR compliance with their Program Plan and requirements of NUREG-0737 Supplement 1. The efforts of the NRC audit team were directed at an evaluation of the content and products of the DCRDR process, rather than the form of the process. The form of the Kewaunee DCRDR process as described in the Program Plan had been reviewed (Reference 9) and found acceptable.

At the time of the audit, Kewaunee had completed their operating experience review, task analysis (partially completed), and control room survey. The evaluation of HEOs and HEDs was scheduled to commence in the latter part of May 1984.

Following a brief entrance meeting with the licensee on 1 May 1984 where the schedule for the in-progress audit was presented to the licensee, the NRC audit team embarked on an agenda that addressed the 9 DCRDR requirements of NUREG-0737 Supplement 1 and the operating experience review.

The NRC audit team review of the DCRDR documentation and interviews with DCRDR team members produced the following conclusions:

1. Completed DCRDR documentation has been developed and maintained in an excellent permanent form.

2. The methodology for preparing formal procedures by the DCRDR task review teams prior to embarking on the task appears to have enhanced the results of the DCRDR.

3. The qualifications and structure of the DCRDR team are satisfactory.

4. The operating experience review results were integrated into the survey beforehand and served to enhance the results of the survey.

5. The results of the function and task analysis indicate that more effort will be required to satisfy this requirement in NUREG-0737 Supplement 1. The NRC audit team recommendations are provided in the Function and Task Analysis section of this report.

6. The review of the control room inventory indicated that it was incomplete at the time of the audit. The NRC audit team recommendations are provided in the Control Room Inventory section of this report.

7. The control room survey documentation and NRC review team sample survey indicated that the technical execution of the survey checklists resulted in potential accuracy and preassessment problems. The NRC audit team recommendations are provided in the Control Room Survey section of this report.

8. The HEO/HED assessment methodology conforms to the requirement in NUREG-0737 Supplement 1.

9. The methodology for the selection of design improvements is adequate. However, the NRC audit team recommended the development of a procedure to track procedure-type improvements.

10. No procedure for verifying that improvements provide the necessary corrections existed at the time of the audit, but the licensee plans to develop this procedure.

11. No procedure for verifying that control room modifications do not introduce new HEDs existed at the time of the audit, but the licensee plans to develop this procedure.

12. The coordination of the DCRDR activities with other control room improvement programs conforms to the requirement in NUREG-0737 Supplement 1.

The main elements of these conclusions were presented to the licensee by the NRC audit team during the 4 May 1984 exit briefing.

References

1. NUREG-0660, Vol. 1, "NRC Action Plan Developed as a Result of the TMI-2 Accident," U.S. Nuclear Regulatory Commission, May 1980; Revision 1, August 1980.

2. NUREG-0737, Supplement 1, "Clarification of TMI Action Plan Requirements," U.S. Nuclear Regulatory Commission, December 1982.

3. NUREG-0700, "Guidelines for Control Room Design Reviews," U.S. Nuclear Regulatory Commission, September 1981.

4. NUREG-0801 Draft, "Evaluation Criteria for Detailed Control Room Design Reviews," U.S. Nuclear Regulatory Commission, October 1981.

5. Regulatory Guide 1.97 "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," U.S. Nuclear Regulatory Commission, May 1983.

6. "Program Plan Report, Detailed Control Room Design Review, Kewaunee Nuclear Power Plant, Wisconsin Public Service Corporation," Wisconsin Public Service Corporation, 15 April 1983.

7. "Clarification of Supplement 1 to NUREG-0737 Implementation Plan," Wisconsin Public Service Corporation, 4 August 1983.

8. "DCRDR Program Plan Evaluation for Kewaunee Nuclear Power Plant," Science Applications, Incorporated, 22 September 1983.

9. "Review Comments on Kewaunee's Detailed Control Room Design Review Program Plan Report," U.S. Nuclear Regulatory Commission, 6 October 1983.

10. "Draft Audit Plan for the Staff's In-Progress Audit of Kewaunee's Detailed Control Room Design Review (DCRDR)," U.S. Nuclear Regulatory Commission, 2 March 1984.

11. "Detailed Control Room Design Review Procedures for Kewaunee Nuclear Power Plant," Wisconsin Public Service Corporation (At site only, this was not docketed.).

12. Memorandum For: Dennis L. Ziemann, NRC, from Brent Clayton, NRC, Subject: Meeting Summary - Task Analysis Requirements Of Supplement 1 To NUREG-0737, March 29, 1984 meeting with Westinghouse Owners' Group (WOG) Procedures Subcommittee and Other Interested Persons, April 5, 1984.

ENCLOSURE 1

OUTLINE OF AUDIT MEETINGS AND LIST OF ATTENDEES

KEWAUNEE IN-PROGRESS AUDIT AGENDA

Tuesday, May 1, 1984

0730-0830.	Overview of NRC In-Progress audit activities Overview of Kewaunee audit team activities
0830-1000.	Conformation of multidisciplinary DCRDR team structure .management responsibilities .review team structure and qualifications .utilization of specialists
1000-1045.	Lunch/NRC caucus
1045-1100.	Question and answer period
1100-1500.	System Review and Task Analysis evaluation is the simulator .approach .procedures .documentation .detailed walk-through of LOCA event .verification of availability process .verification of suitability process
1500-1600.	Inventory .procedures .documentation

Wednesday, May 2, 1984

0730-0930.	Survey .procedures .checklists .documentation .HED documentation
0930-1000.	Definition of control room conventions
1000-1100.	Lunch/NRC caucus
1100-1500.	Survey evaluation in the simulator .workspace .communications .annunciators .controls .displays .labels

Wednesday, May 2, 1984 (continued)

.panel layout
.control display integration
.photographs of HEDs

1500-1600. Review of operating experience
.operator questionnaires
.operator interview results
.LER results

Thursday, May 3, 1984

0730-0830. Review of HED assessment methodology

0830-0930. Review of coordination
.data management
.procedures
.SPDS
.other control room improvements

0930-1000. Resolution of open issues

1000-1100. Lunch/NRC caucus

1100-1400. In simulator evaluations
.selection of design improvements
.verification that the improvements provide the necessary corrections
.methodology to verify that improvements do not introduce new HEDs
.control room validation as an integrated system

1400-1500. Resolution of open issues

Friday, May 4, 1984

0730-0900. Exit Briefing

List of Attendees (Entrance Briefing)

Name	Company
Stephan H. Gunn	WPSC
David S. Nalepka	WPSC
David J. Ristau	WPSC
Charles A. Schrock	WPSC
Dick Potter	TPT
Sal F. Luna	TPT
R.L. Nilson	SRI-NRC
Leo Beltracchi	NRC
David Schultz	NRC (Battelle/PNL)
Joseph DeBor	NRC (SAI)
Charles Luoma	SPs

List of Attendees (Exit Briefing)

Name	Title
Dave Sauer	Nuclear Lic. Supervisor
David H. Schultz	NRC (SAI)
Joseph DeBor	NRC SAI
David Nalepka	WPS
Stephan Gunn	WPS
Charles Luoma	WPS
Kenneth H. Weinhailor	WPSC NWC Serv Supv.
R.L. Nilson	NRC SRI
Sal F. Luna	TPT
Mark Marchi	WPS
Clark Steinbardt	WPS
Don Hintz	WPS
Dick Potter	TPT
Leo Beltracchi	NRC

ENCLOSURE 2

RESUMES OF DCRDR TEAM MEMBERS

DAVID T. BRAUN

Education:

High School Diploma
Navy Machinist Mate School
Basic Nuclear Power School
Naval Nuclear Prototype Training
Naval Submarine School
Other Service Connected Technical Schools
KNP 60 Hour HP Course
Westinghouse EH Simulator Training
Westinghouse Senior Review Lecture Series
Westinghouse 27 Week On-site Training
Westinghouse Zion Simulator

Approved for enrollment in the University of Maryland baccalaureate degree program in Nuclear Science.

Employment:

United States Navy

Assistant Maintenance Petty Officer
Mechanical Leading Petty Officer/Instructor
Mechanical Operator - Engineering Watch Supervisor

Wisconsin Public Service

March 1973 - June 1974	Auxiliary Operator
June 1974 - October 1974	Control Operator 'B' (RO)
October 1974 - January 1983	Shift Supervisor (SRO)
January 1983 - Present	Operations Supervisor (SRO)

DAVID J. RISTAU

Education:

High School Diploma
Navy Electricians Mate School
Basic Nuclear Power School
Naval Nuclear Prototype Training
Naval Submarine School
Other Service Connected Technical Schools
KNP 60 Hour HP Course
Westinghouse EH Simulator Training
Westinghouse Senior Review Lecture Series
Westinghouse 27 Week On-site Training
Westinghouse Zion Simulator

Employment:

Wisconsin Public Service

1973	Licensed Cold SRO - KNPP
1973 - 1975	Shift Supervisor (SRO)
1975 - 1979	Training Supervisor (SRO)
1979 - Present	Nuclear Technical Review Supervisor

Other Work Related Activities

Project Manager - KNPP Simulator
Project Manager - TSC
Project Manager - Appendix R Modifications
Chairman WPSC - TMI Task Force

DONN P. SCHNEIDER

Education: BSc - Computer Science
Michigan Technological University - Houghton

Employment: Wisconsin Public Service

1976 - 1980	Programmer - Engineering
1980 - 1983	Systems Analyst - Nuclear
1984 - Present	Nuclear Software Supervisor

CLARK R. STEINHARDT

Education: BSc - Applied Mathematics and Engineering Physics
University of Wisconsin - Madison

Employment: Wisconsin Public Service

December, 1967-January 1975	Reactor Supervisor
January 1975-December 1983	Operations Superintendent (SRO)
January 1984 - Present	Plant Manager Designate (SRO)

Employed by WPSC (KNPP) since construction
KNPP SRO since 1973

JOHN J. WALLACE

Education:

BSc - Electrical Engineering
Michigan State University - East Lansing

Polytechnic Institute of Brooklyn

University of Wisconsin

Employment:

ITT - Data Services Division
1968 - 1971 Computer Systems Analyst/Programmer

Westinghouse - Bettis, Pittsburgh
1971 - 1975 Instrument & Control Engineer

Cognizant Engineer, Steam Generator Water Level Control System

Backup Engineer, Primary Plant Instrumentation System

Idaho National Engineering Labs, Nuclear Power School and Training Staff
(Qualified EOOW)

Wisconsin Public Service Corporation

1975 - 1980	Nuclear Engineer, Operations Engineer (SRO)
1980 - 1982	Nuclear Systems Supervisor
1982 - Present	Nuclear Computer Supervisor