OCT 2 3 1984

Docket Nos. 50-361
and 50-362

LICENSEES: Southern California Edison Company (SCE)
San Diego Gas and Electric Company
City of Anaheim, California
City of Riverside, California

FACILITY: San Onofre Nuclear Generating Station, Units 2 and 3

SUBJECT: SUMMARY OF MEETING TO DISCUSS THE DETAILED CONTROL ROOM DESIGN REVIEW

Enclosed are the minutes of the subject meeting between the NRC staff and the San Onofre 2 and 3 licensees, held on August 30, 1984. At the conclusion of the meeting, the NRC staff requested that the licensees submit a supplement to the SONGS 2 and 3 DCRDR Program Plan and Summary Report dated January 31, 1984. The staff also requested that the licensees provide a date for submittal of the supplement.

The supplement should include the type of documentation suggested in the enclosed meeting minutes. The staff's decision regarding an on-site audit of the licensee's DCRDR will be postponed pending receipt of this supplement.

The staff also stated that if necessary, based upon the adequacy of the licensee's supplement, a post-implementation audit will be scheduled and conducted by the staff.

ORIGINAL SIGNED BY

H. Rood, Project Manager
Licensing Branch No. 3
Division of Licensing

Enclosure:
As stated

cc: See next page

DL:LB#3
HRood
10/19/84

DL:LB#3
GWKnighton
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MINUTES OF MEETING

BETWEEN NRC AND SCE

ON THE

DETAILED CONTROL ROOM DESIGN REVIEW (DCRDR)

FOR

SAN ONOFRE, UNITS 2 AND 3

The following are minutes of a meeting held on August 30, 1984 between the NRC and Southern California Edison (SCE). Also in attendance were staff from Science Applications, Inc. (SAI) and Combustion Engineering. Specific attendees and organizations which they represented are shown in Attachment 1.

The meeting was held to provide SCE the opportunity to address and clarify issues which had surfaced as a result of the NRC review of the SCE combined DCRDR Program Plan and Summary Report submittals for San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, dated January 31, 1984. Based on its review, the NRC believes that SCE's work, conducted between 1980-1981, although sufficient for a Preliminary Design Analysis (PDA) and licensing, does not address all of the requirements of Supplement 1 to NUREG-0737 for conducting a DCRDR. Specific NRC concerns and issues were documented and transmitted to the licensee by letter dated August 9, 1984. At this meeting, SCE, by addressing and clarifying those issues relevant to DCRDR requirements, attempted to demonstrate to the NRC's satisfaction that its previous activities were extensive enough to satisfy both the licensing and Supplement 1, NUREG-0737 DCRDR requirements.

As a result of the meeting, the NRC determined that most of the work performed to meet the PDA requirement satisfies several of the DCRDR requirements of Supplement 1 to NUREG-0737. However, many requirements have not been satisfied.

Establishment of a Multidisciplinary Team

SCE elaborated on the expertise and task assignments of DCRDR team members and supplemental staff (see page 7 of Attachment 2). SCE provided information on organizations responsible for completion of DCRDR activities (see page 5 of Attachment 2). Although not reflected in the Summary Report, the licensee indicated that it relied heavily on SROs in the conduct of its efforts and utilized staff with extensive I&C expertise in a variety of fields including aerospace and the military. The licensee also addressed concerns raised in the evaluation of the Summary Report explaining that consultants from Whitston Associates provided human factors expertise. Whitston was also responsible for conducting an orientation program for review team staff which extended over a six month period of time. Throughout the entire effort, SCE management supported the effort and placed no constraints on the review team to complete its work.

As a result of the meeting, the NRC believes that SCE established a qualified multidisciplinary team to complete the work done in 1980 and 1981 to meet the requirements of a PDA for licensing. The information provided at the meeting should be documented and made available for audit. However, for work remaining to meet the requirements of Supplement 1 to NUREG-0737, the licensee should continue to have human factor professionals involved. The licensee should provide information or documentation to show that human factors expertise is being or will be utilized.

System Function and Task Analysis

The licensee described a function and task analysis process which relied on P&IDs and control panel drawings to identify operator tasks and associated information and control requirements. From the discussion, it appears that the licensee may have implemented a process for defining information and control needs necessary for system operation. Characteristics (e.g., scale range, trending needs, control modes, etc.) may have been identified. However, it is unclear whether this was accomplished in an objective and systematic fashion in which the design of the control room was questioned from the operator's perspectives rather than solely relying on the availability of existing equipment. The licensee agreed to document and make available information concerning the evaluative process that was used to conduct the system function and task analysis.

Inventory

SCE compiled an inventory which meets the requirements for the DCRDR. This includes, for each panel, a list of components cross-referenced to information provided by the manufacturer regarding each component. Although this constitutes a sufficient inventory, the licensee should document its methodology for comparing the inventory with the information and control needs identified from the task analysis.

Control Room Survey

SCE clarified that its survey was based on guidelines it developed from draft NUREG/CR-1580 and other sources prior to the publication of NUREG-0700. Quantitative criteria were developed for conducting measurements. Each control room panel was surveyed by a two-man team with expertise relevant to the panel. Findings were then presented to the entire review team. SCE compared its survey guidelines to those of NUREG-0700 and found them to be comparable, at least on a topical basis. Although draft NUREG/CR-1580 was sufficient to satisfy PDA requirements, it does not satisfy NUREG-0737, Supplement 1 requirements.

The licensee should describe the comparisons made and their results to ensure that this DCRDR requirement has been satisfied. The guidelines that were used should be compared to NUREG-0700 or equivalent human factors guidelines on an item by item basis. Should gaps in the guidelines and criteria exist,

the licensee should update the survey effort. Deviations from NUREG-0700 or equivalent guidelines should be documented and justified. The licensee should also describe the survey methodology in detail.

HED Assessment

Information provided by SCE clarified some, but not all, issues which surfaced from the review of its Summary Report. For example, safety significance was the primary criterion for assessing HEDs while potential for operator error was considered secondarily. As shown on page 9 of Attachment 2, application criteria also were used in the assessment process.

The HEDs which surfaced during the review included but were not limited to: identification of a few excess instruments, the identification of a few missing instruments, poor panel layout, and the need to adopt conventions such as labeling and color coding. How HEDs were assessed, individually and for aggregate effects, is unclear. The licensee should describe the formal HED assessment process in greater detail and provide relevant documentation. It should be noted that a more rigorous assessment process is envisioned by the NRC staff for a DCRDR, in contrast to HED assessment for a PDA.

The licensee described an evaluation process which was conducted to arrive at an ideal panel design that would correct panel layout HEDs. However, the licensee compromised its solution, and rather than implementing the ideal design which would have required extensive rework, the licensee decided that color coding, demarcation lines, mimics, training and operator familiarity would resolve most of these problems. Justification for these decisions and the process used to arrive at them should be provided (particularly for those HEDs with safety significance that were only partially corrected).

Selection and Verification of Improvements

SCE should describe and document the process that was used to resolve HEDs. As shown on pages 11 and 12 of Attachment 2, an HED disposition process was in place at the plant. However, the mechanism by which the review team arrived at final improvement selection for HED resolution is still unclear. Similarly, the method by which proposed solutions were verified using the mock-up should be described and documented.

Coordination

There may have been some coordination between DCRDR activities and other Supplement 1, NUREG-0737 activities. The DCRDR should be coordinated and integrated with all of the emergency response activities of Supplement 1, NUREG-0737. The licensee indicated that work on the development of the new, symptom-based emergency operating procedures was coordinated with the control room improvements. However, a recent NRC staff review of the SONGS Emergency Response Facilities revealed human engineering problems with the SPDS that should have been considered in the DCRDR. When questioned about this at the

meeting, the licensee indicated that they were not aware of these problems but would look into the matter. In order to satisfy the coordination requirement the licensee's specific coordination efforts should be described and documented.

Action Items

- The licensee should submit a Supplement to its Summary Report which provides the type of documentation suggested in the preceding paragraphs. The Supplement should also present the findings of the annunciator task force study and should present updated modifications made to the control room.

- A decision regarding an on-site audit of the licensee's DCRDR will be postponed pending receipt of the licensee's Summary Report Supplement. If necessary, based upon the adequacy of the licensee's Supplement, a post-implementation audit will be scheduled and conducted by the NRC.

Attachment 1

SAN ONOFRE - DCRDR MEETING
August 30, 1984

Name	Affiliation
Joel Kramer	NRC/DHFS/HFEB
Jerry Prickett	SCE/J&CENGRG
F.R. Nandy	SCE
H. Rood	NRC/DL
Bob Pierce	C&E Procedures
Bill Bromley	SCE Operations/Training
Clay E. Williams	SCE Licensing
Ray Ramirez	NRC/DHFS/HFEB
Dom Tondi	NRC/DHFS/HFEB
Robert Liner	SAIC/NRC Tech. Asst. Contractor
Phuoc Le	SAIC/NRC
Dennis Cox	SCE/Nuc. Proj. Development
Ellen Levine	SAIC/NRC
Carol Kain	SAIC/NRC

Attachment 2

AGENDA

CONTROL ROOM DESIGN REVIEW

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3

AUGUST 30, 1984

INTRODUCTION/BACKGROUND	F. R. NANDY
SUMMARY OF AUGUST 29,1984CEOG MEETING WITH NRC TO DISCUSS CEN-152 RELATIVE TO CRDR TASK ANALYSIS	B. PIERCE
RESPONSES TO AUGUST 9, 1984 NRC CONCERNS REGARDING:	NANDY/COX/PRICKETT/BROMLEY
CRDR STAFF/EXPERTISE CONTROL ROOM INVENTORY CRDR SURVEY CRITERIA/PROCEDURE ASSESSMENT OF HED's & DESIGN IMPROVEMENTS CRDR TASK ANALYSIS	
SUMMARY	F. R. NANDY

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

AUG 09 1984

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AUG 13 1984
NUCLEAR LICENSING

Docket Nos.: 50-361
and 50-362

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Gentlemen:

Subject: DETAILED CONTROL ROOM DESIGN REVIEW (DCRDR)
FOR SAN ONOFRE 2 AND 3

We have reviewed your submittal of January 31, 1984 on the San Onofre 2 and 3 DCRDR and find that it does not meet all the requirements of Supplement 1 to NUREG-0737.

Our major concern is with the Task Analysis requirement of Supplement 1 to NUREG-0737. The control room review that you conducted prior to licensing did not include a Task Analysis. Thus, this work still must be done. We also have significant concerns in the following areas:

-- Task assignments and level of effort of DCRDR team members

-- Composition and expertise of staff other than Working Group members

-- Methodology for conduct of Control room inventory and comparison with task requirements

-- Assurance that control room survey criteria were consistent with criteria from NUREG-0700

-- Control room survey procedures and sample data collection forms

-- Procedures for assessment of HEDs

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2pp

-- Procedures and criteria for selection of design improvements

-- Procedures for verifying that improvements provide necessary correction without introducing new HEDs

-- Coordination of DCRDR with other Supplement 1, NUREG-0737 activities

Because of the need to determine the level of task analysis conducted by the Combustion Engineering Owners Group (CEOG) for CE plants, we have delayed meeting formally with you to discuss our concerns. Contact has recently been made with the CEOG concerning the feasibility and desirability of meeting to discuss task analysis. A meeting with the CEOG has been scheduled for July 29, 1984. We would like to meet with you as soon as possible after the CEOG meeting. We will contact you in the near future to arrange a mutually acceptable date for such a meeting.

George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing

cc: J. Kramer

Item	Description	Report Reference Sections/Pages	Report Response/Content	NUREG-0700 plus NUREG-0737 Supplement 1 Requirements
1	Task assignments and level of effort	Sec. 2.0, pgs. 2-1 thru 2-7 plus 4-2	Description and organization chart; general task assignments.	Keyed on Mgmt/Staff and Operations staff and breakdown of experience. Note specific discipline for particular tasks.
2	Composition and expertise of staff	Sec. 2.0, pgs. 2-1 thru 2-6 plus 2-13	Have composition by organization.	
3	Control Room inventory methodology and comparison with task assignments	Sec. 4.3 thru 4.5, pgs.4-5, 4-12 & 4-13, fig. 4.5-1 & 4.6	Used panel drawings and Instrument Index (xref. Tag Nos.) traceable to Inst. Data Sheets. Operator inputs for tasks on a system by system basis; i.e., system function validation.	Checklist for inventory plus xref. to tasks. Relocation findings in Fig. 5.2-1 (documentation of HED's by exception).
4	Assure that Control Room HF survey criteria are consistent w/NUREG-0700	Sec. 4.3, pgs. 4-5 thru 4-10 plus chart fig. 4.3-1 and Sec. 5.0	Utilized panel drawings on wall for pseudo walkdowns of operator sequences plus the Whitson HF chart.	NUREG-0700 based on Woodson's HF Book (ref. 3.6 in NUREG-0700).
5	Control Room HF survey procedures and sample data collection forms	Same as above	Same as above plus fig. 5.2-1	Same as above
6	HED's assignment procedures	Sec. 5.2, pgs. 5-1 thru 5-11, 5-46, 5-48, 5-53, 5-60, 5-85 and 5-103	HF chart and task analysis result in tabulation on fig. 5.2-1 for relocations and list for DCP's. See pgs. 5-7 and 5-9 for 11 point criteria. Three categories or levels of HED's with cats. 1 and 2 identified for implementation.	NUREG-0700 pgs. 4-1 and 4-2. Four levels of HED's
7	Procedures and criteria for selection of design improvements	Sec. 5.2 thru 5.5, pgs. 5-4, 5-20, 5-30, 5-38, 5-42, 5-50, 5-63, 5-94, and 5-95	Criteria summarized in report was developed by the task force and is in file.	
8	Procedure for verification that improvements provide necessary correction w/o introducing new HED's	Sec. 4.7.9 , pg 4-31 EOI list on pgs. 4-32 and 33	EOI's, NOP's, simulator training.	
9	Coordination of DCRDR with other Supp. 1, NUREG-0737 activities	Sec. 4.7, pg 4-25 and Sec. 5.3, pgs 5-76 and 5-82	OSPDS & CFMS meet RG 1.97 and NUREG-0696 and 0737. HF engineering done by CE. SCE procedure in place for HF evaluation for ongoing work.	
10	Task analysis	Sec. 4.7.9 and 5.7 pg 5-111	See Flowchart handout.	

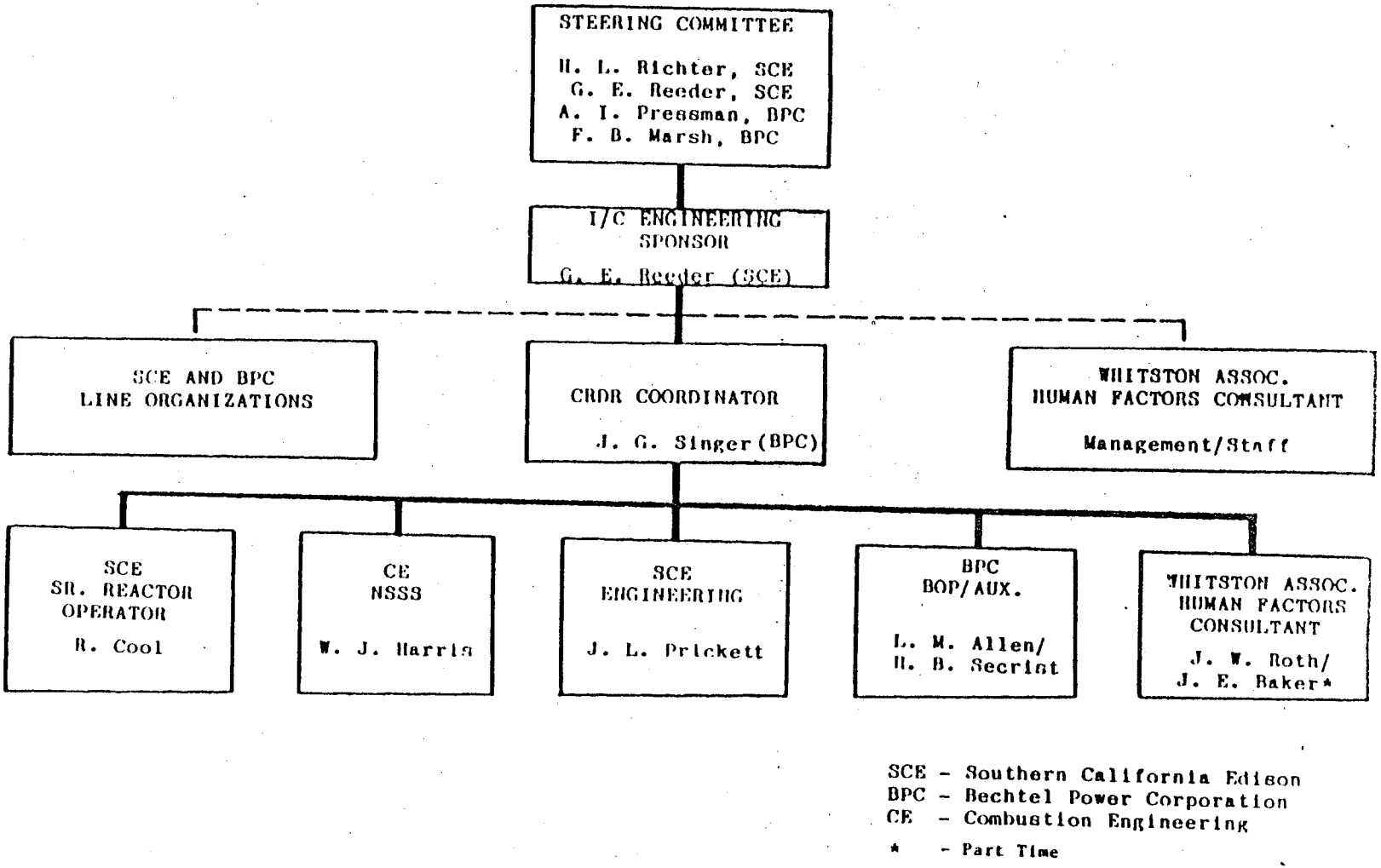


Figure 2.1-1 ORGANIZATION CHART OF THE CONTROL ROOM DESIGN REVIEW WORKING GROUP

CRDR WORKING GROUP ORGANIZATION
AND RESPONSIBILITIES

Bechtel Power Corporation (BCP) - CRDR Project Coordinator

The CRDR Project Coordinator will manage the CRDR program and coordinate the various participants' activities as required to provide a complete review of all areas related to the CRDR required by NUREG - 0585 and NUREG - 0660.

Combustion Engineering Corporation (CE) - NSSS

The CE representative's primary responsibility will be to provide technical support on all NSSS related items and input to the overall control room control and display analysis including the task (link) analysis.

Bechtel Power Corporation (BPC) - BOP/AUX

The BPC representative's primary responsibility will be to provide technical support on all BOP/AUX related items and input on the overall control room control and display analysis including the task (link) analysis.

Southern California Edison (SCE) - Operations

The SCE Nuclear Operator's primary responsibility will be to input the operator's philosophy of system operation for NSSS and BOP/AUX Systems and assist in the review of selected operating procedures. He will also be responsible for recommending the list of procedures from which a sample group will be selected for review during the three month CRDR.

Southern California Edison (SCE) - Consultant

The SCE Contracted Consultant's primary responsibility will be to provide the Human Factor's Engineering man/machine interface and related services. He will also be responsible for guidance in the preparation of the final CRDR report.

Southern California Edison (SCE) - I/C engineering

The SCE Engineering Representative's primary responsibility will be to assure the Project direction is maintained and that all SCE discipline inputs are integrated into the CRDR.

SAN ONOFRE UNITS 2 & 3

CONTROL ROOM DESIGN REVIEW TASK FORCE

RESPONSIBILITIES AND TASK ASSIGNMENTS

JERRY PRICKETT

Southern California Edison (SCE) - I/C engineering

The SCE Engineering Representative's primary responsibility will be to assure the Project direction is maintained and that all SCE discipline inputs are integrated into the CRDR.

SPECIFIC

1. Assist the Project Coordinator in development of the master work plan and work schedules, determination of key milestones, design reviews, and obtaining all necessary inputs from responsible SCE departments.

2. Control Panels:

   Responsible for demarcation, grouping, relocation recommendations, ETC., for the following:

   CR-57: Engineered Safety Features System

   CR-58, 50, 51: CVCS, RCS, RRS

   CR-52, 53: STM-GEN, FDWTR, Condensate

3. Criteria Development:

   Support to all leads on criteria development.

4. Procedures Review:

   Lead responsibility for all abnormal procedure reviews.

5. Final Report:

   Inputs to the final report as assigned by the Project Coordinator.

CONTROL ROOM DESIGN REVIEW

STAFF PARTICIPANTS - SCE, BPC, OTHER

NAME	ORGANIZATION/TITLE	CRDR FUNCTION
A. Pressamn	BPC/ Engrg. Manager	Steering Committee
F. Marsh	BPC/Project Engineer	Steering Committee
L. Delaney	BPC/Controls Supvr.	Design Implementation
J. Oliver	Whitson Assoc./Mgr.	Steering Committee
D. Chan	H.F. Consultant	Color Coding
G. Reeder	SCE/I&C Group Leader	Steering Committee
J. Powell	SCE/Staff	Sound
A. Chan	SCE/Staff	Lighting
M. Bin	SCE/I&C Engineer	Design Implementation
V. Fisher	SCE/Station Operations Supervisor/SRO	Operations Input
D. Lokker	SCE/Station Operations Watch Engineer/SRO	Operations Input
T. James	SCE/Station Operations Watch Engineer/SRO	Operations Input

Table 4.4-1
4.3

* CRITICAL SAFETY FUNCTIONS FOR MAINTAINING NUCLEAR POWER PLANT SAFETY

Control Room Design Review Records
San Onofre 2 and 3

HUMAN FACTORS EVALUATION CRITERIA	SAFETY CONTROL SYSTEMS: Annunciators	Containment Cooling	Containment Spray	Containment Isolation	Safety Injection	Cont. Sump Recirc.	Main Steam Isolation	Auxiliary Feedwater	Control Room Isolation	Toxic Gas Isolation	Fuel Handling Isolation	Conc. Purge Isolation	Cont. Comb. Gas	Nuclear Instrumentation	POWER PRODUCTION CONTROL SYSTEMS: Reactor Regulation	Feedwater Regulation	Reac. Chem. & Volume	Reactor Protection	Main Steam	Feedwater & Condensate	Main Turb. Hydraulic Cov.	OPERATING INSTRUCTIONS: SO23-2-1.0 Feedwater Pump Oper.	SO23-2-1.1 CVCS Chg. & Letdown	SO23-2-1.2 Main Stm. Isol. Valve Oper.	SO23-2-1.3 Safety Inj. Sys. Oper.	SO23-2-1.4 Aux. Feed Pump Oper.	SO23-2-1.5 Cont. Spray Sys.	SO23-2-1.6 Emerg. Plant Shut Down	SO23-2-1.7 Reac. Reg. Sys. Malfunc.	Control Room & Surroundings	Control Boards - Physical	Control Boards - Functional		
CONTROLS Location, Movement, Spacing, Coding, Accidental Activation			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓											
VISUAL DISPLAYS Orientation, Location, Viewing Distance, Coding, Scale Ranges, Scale Coding, Lamp Test	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓											
CONTROL/DISPLAY INTEGRATION Location, Grouping, Group Layout, Group Identification	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓											
LABELING Abbreviations, Consistency of Location, Functional, Viewing Distance, Coding	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓											
AUDITORY COMMUNICATIONS Types, Signal Variations, Discrimination	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓											
STATIC ANTHROPOMETRICS Structural, Passageway & Accesses, Reach, Movement, Position																															✓	✓	
ENVIRONMENT Ventilation, Temperature, Humidity, Dust, Odors, Illumination, Noise																															✓	✓	
WORKSPACE DESIGN Kickspace, Handles, Work Surface, Storage Space, Knee Room, Armrests																															✓	✓	
HAZARDS AND SAFETY Safety Labels, Emergency Exits, Stairs Obstructions, Access, Edge Rounding, Electrical, Mechanical, Toxic					✓					✓	✓	✓	✓																		✓	✓	
DESIGN FOR MAINTAINABILITY Malfunction Identification, Removal, Repair, Adjustments, Access, Instructions	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓									✓	✓	
INFORMATION ENTRY, ACCESS, STORAGE & RETRIEVAL Visual or Auditory, Type of Display, Stimulus Dimension	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓											
DESIGN FOR PERSONAL REQUIREMENTS Sensory/Perceptual, Intellectual, Output, Physical Skills	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

4-9/10

APPLICATION CRITERIA

All recommended component relocations are supported by one or more of the following:

1. Functional grouping of components within a common area or section.

2. Improved symmetry of demarcation boundaries for a functional group.

3. Left to right or top to bottom orientation for operational sequences.

4. Associated displays and controls in closer proximity.

5. Exact same relative location for identical controls and displays - Units 2 to Unit 3.

6. Layout of redundant channels to be identical (not mirror image).

7. Adjacent location of displays which are compared to each other.

8. Most important and/or most frequently used displays and controls should be in optimum viewing/use area.

9. Devices whose functions are duplicated by another device, which uses a more reliable format, should be removed and not relocated.

10. Devices should be relocated to local panels if their functions only pertain to local processes and controls.

11. Deleted.

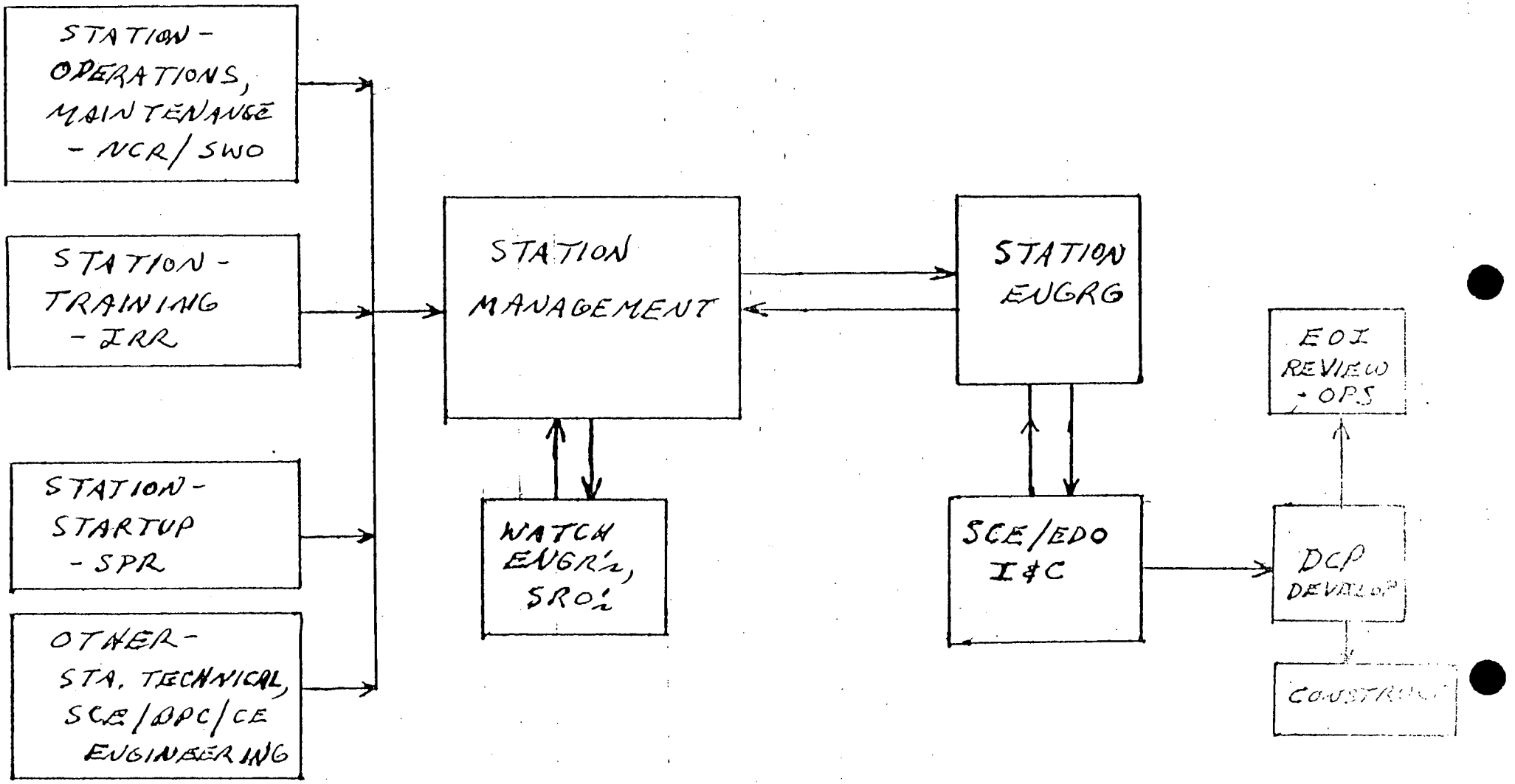
12. Device whose relocation is dictated by another device relocation.

SONGS UNIT 2 AND 3 PANEL SECTION: CR-58, 50, 51 PRIMARY ENERGY

	ITEM NO	NOT CHGD	LOCATION TO WHICH MOVED	CRITERIA WHICH SUPPORTS MOVE											RESULTANT PHYSICAL CHANGE TO PANEL			
				1	2	3	4	5	6	7	8	9	10	11	CUT-OUT MODIFIED	CUT-OUT NEW	COVER REQ'D	NONE
1	6		8	X														X
2	7		6	X														X
3	8		7	X														X
4	11		2 Spaces Left of 11		X											X		
5	9		1 Space Left of 11		X											X	X	
6	10		11							X								X
7	32		5							X								X
8	5		10			X				X								X
9																		
10	3		32			X				X							X	
*11	443		409							X								X
*12	444		410							X							X	
13	401		403	X		X												X
14	403		401	X		X												X
15																		
*16	409		407			X	X			X								X
*17	410		654			X	X			X								X
18																		
19																		
20																		

NOTE: Short-term items are identified by (*)

Figure 5.2-1 RECOMMENDED COMPONENT RELOCATIONS (TYPICAL)



SONG's - HED's IDENTIFICATION & DISPOSITION

LEVEL 1 - PANEL SECTION TITLE

LEVEL 2 - SYSTEM PROCESS

LEVEL 3 - SUBSYSTEM PROCESS (where applicable)

LEVEL 4 - PROCESS COMPONENT GROUPS (where applicable)

LEVEL 5 - COMPONENT

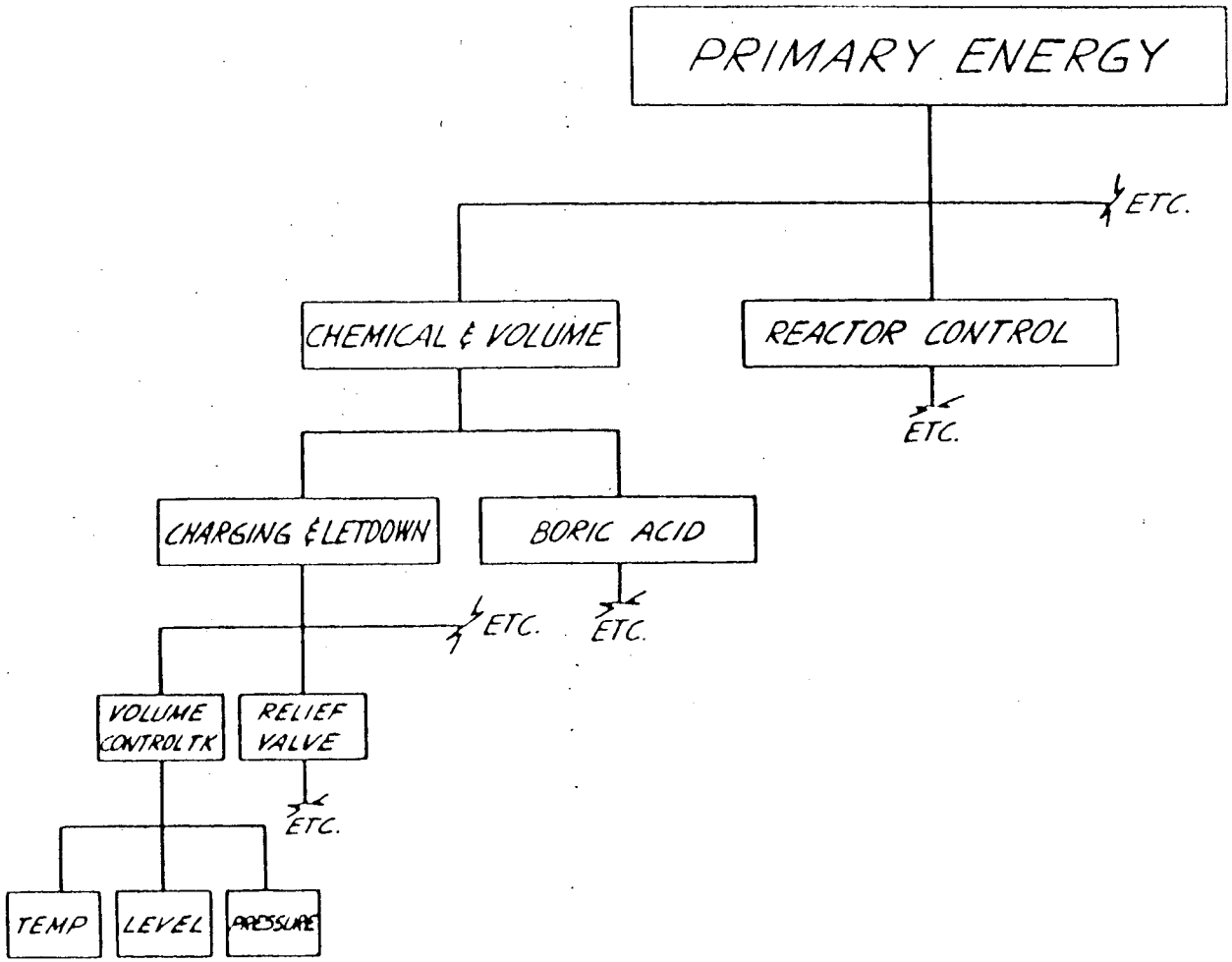
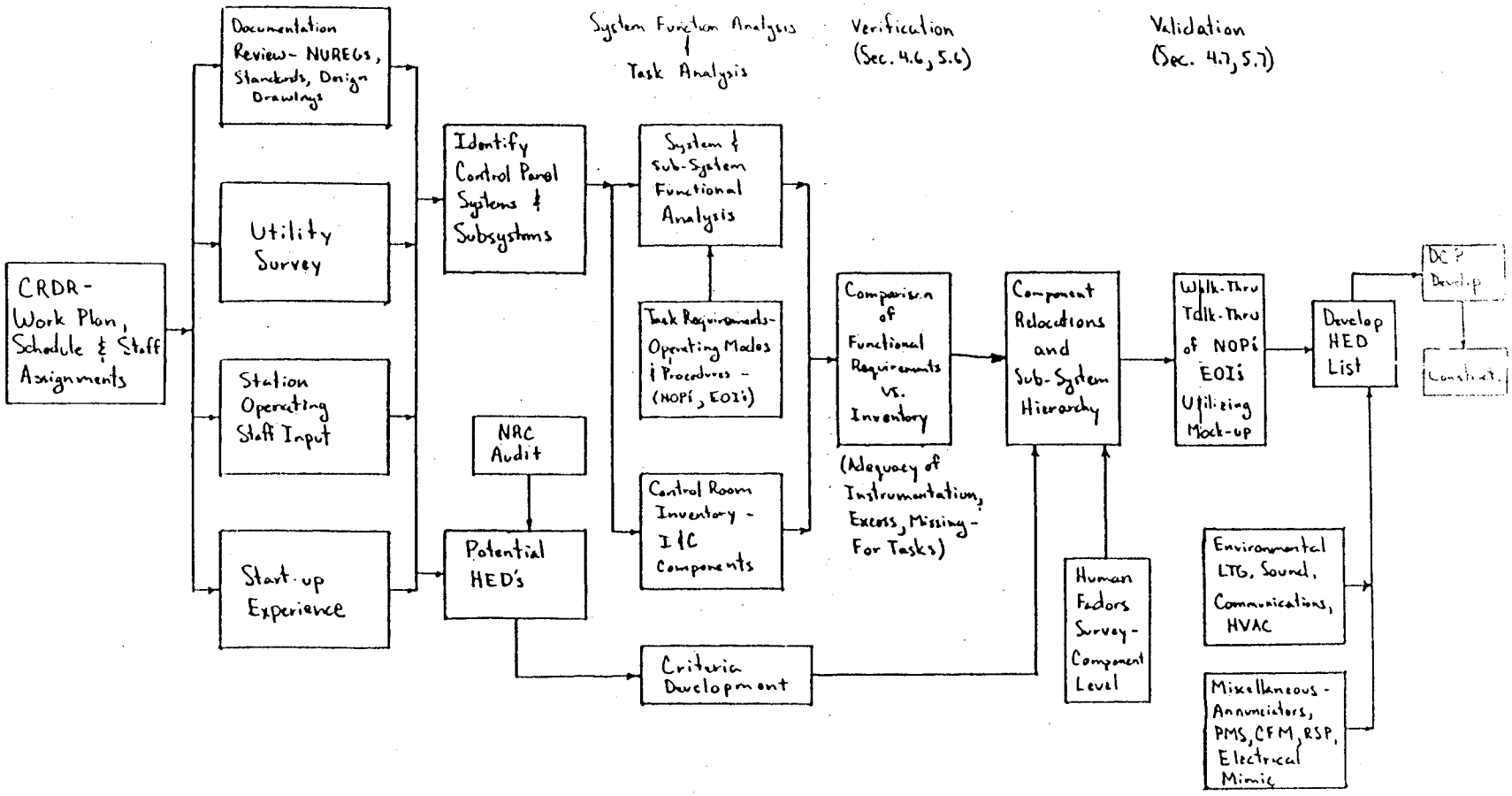


Figure 1 HIERARCHIAL NAMEPLATES


CRDR - Work Plan, Schedule & Staff Assignments
Documentation Review - NUREGs, Standards, Design Drawings
Utility Survey
Station Operating Staff Input
Start-up Experience
NRC Audit
Identify Control Panel Systems & Subsystems
Potential HED's
System & Sub-System Functional Analysis
Task Requirements - Operating Modes & Procedures - (NOP's, EOI's)
Control Room Inventory - I&C Components
Criteria Development
System Function Analysis
Task Analysis
Verification (Sec. 4.6, 5.6)
Validation (Sec. 4.7, 5.7)
Comparison of Functional Requirements vs. Inventory
(Adequacy of Instrumentation, Excess, Missing - For Tasks)
Component Relocations and Sub-System Hierarchy
Human Factors Survey - Component Level
Walk-Thru Talk-Thru of NOP's EOI's Utilizing Mock-up
Develop HED List
DCP Develop
Construct.
Environmental LTG, Sound, Communications, HVAC
Miscellaneous - Annunciators, PMS, CFM, RSP, Electrical Mimic

OCT 23 1984

MEETING SUMMARY DISTRIBUTION

~~Docket No(s): 50-361/362~~
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