



Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

March 21, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station Units 2 and 3
Supplement 1 to NUREG-0737
Detailed Control Room Design
Review
NRC Docket Nos. 50-237 and 50-249

Reference (a): D. M. Crutchfield letter to B. Rybak
dated September 13, 1983.

Dear Mr. Denton:

As stated in the referenced letter, Commonwealth Edison Company committed to provide a program plan supplement for each plant which will include the specific qualifications of review team personnel. To comply with this commitment to the NRC for Dresden Station, Commonwealth Edison is submitting the names and qualifications of the individuals who comprise the Dresden Station DCRDR core team. The core team is comprised of both Commonwealth Edison and ARD Corporation personnel. The individuals meet or surpass the minimum qualifications for the positions they fill as specified in the Generic DCRDR Program Plan for Commonwealth Edison Company submitted to the NRC in April of 1983.

Also included as part of this supplement are DCRDR forms which were contained in the program plan at the time of its submittal but which have since been modified as part of the program.

A draft of this supplement was reviewed by members of the NRC Human Factors Engineering Branch during the in-progress audit of the Dresden Station DCRDR the week of January 31, 1984.

If you have any questions regarding this matter, please contact this office.

One signed original and forty (40) copies of this transmittal is provided for your use.

Very truly yours,

8404030364 840321
PDR ADOCK 05000237
F PDR

B. Rybak
B. Rybak

Nuclear Licensing Administrator

lm

cc: R. Gilbert - NRR
NRC Resident Inspector - Dresden

8319N

A003
1/1

1.0 SUPPLEMENT TO REVIEW PLANT

1.1 INTRODUCTION

To comply with the commitment to the NRC on June 14, 1983, Commonwealth Edison Company is submitting the names and qualifications of the individuals who comprise the Dresden Station DCRDR core team. The core team is comprised of those individuals that will remain as members of the DCRDR review team for each station. By having this core team it provides consistency in the review process at the different stations. The individuals include both Commonwealth Edison and outside contractor personnel. These individuals meet or surpass the minimum qualifications for the positions they fill as specified in the Generic DCRDR Program Plan for Commonwealth Edison Company submitted to the NRC in April of 1983.

Included are the forms which were contained in the program plan at the time of the submittal but which have since been modified. These forms are, Questionnaire Item Summary Form; Instrument/Control Form; System Review Summary Reference Form; Control Room Review Task Development Form; and Control Room Human Engineering Discrepancy Record. The original forms, the new forms, and the justifications for the modifications are contained in Attachment A.

2.0 SUPPLEMENT TO MANAGEMENT AND STAFFING

2.1 NO CHANGE

2.2 The Program Administrator position is being filled by Richard J. Squires, a CECO employe. Mr. Squires qualifications are as follows:

Education: M.S., Nuclear Engineering, University of Illinois, 1962.

B.S., Metallurgical Engineering, Illinois Institute of Technology, 1953.

Experience: For the past three years Mr. Squires has served as the CECO human factors program administrator and for the past four years, has participated in CECO control room design reviews. He has 29 years of engineering experience, of which 22 has been in the nuclear power area. Mr. Squires has held positions in engineering, construction, operations, quality assurance and training at CECO over the past 13 years. From 1975 to the present he has an SRO license at the Zion Station. Since 1977 he has a Professional Engineers License in the State of Illinois.

2.3 The position of DCRDR Coordinator is being filled by Phillip A. Lau of CECO. Mr. Lau's qualifications are as follows:

Education: Enrolled in Northern Illinois University B.S. in Nuclear Technology Program.

Experience: For the past two years Mr. Lau served as the CECO human factors group supervisor developing the program plan for the detailed control room design review. He has also spent the prior two years developing and conducting a job position task analysis for plant operating positions. He has 23 years of supervising and management experience, of which 20 years has been in the nuclear power area. Mr. Lau has been a reactor operator in the navy nuclear program. He has held positions in fuel handling, operating and training at CECO over the past 13 years. From 1971 to the present he has an SRO license at the Quad Cities Station.

2.4 The position of Document and Documentation Controller has been removed from the review team. The reason for this is that CECO will be utilizing a computerized data base management system (DBMS) which will provide the document control and security necessary to perform the DCRDR.

2.5 The individuals filling the Human Factors Engineering positions are made up of individuals from outside contractors and CECO.

2.5.1. The position of Lead Human Factors Specialist is being filled by Robert L. Kershner from ARD Corporation. Mr. Kershner's qualifications are as follows:

Education:

M.A., Human Factors Psychology, the Catholic University of America, Washington, D.C., 1977.

B.A., Applied Psychology, cum laude, University of Baltimore, Baltimore, Md., 1975.

Experience:

For the past three years Mr. Kershner, Director of Human Factors Technology for ARD Corporation has worked in the nuclear utility industry providing support in a number of human factors areas, to include program plan development, SPDS design and evaluation, control room design reviews and EOP validation. Prior to that time, he spent six years designing, conducting and evaluating human factors - research in vibrotactile codes, traffic management, driver information systems, low-fidelity simulation aids, information presentation to time critical materials, visual search patterns, and military systems design, analysis and improvement. Most recently Mr. Kershner participated in underwater acoustical testing of nuclear submarines serving as assistant trial director.

The Human Factors Specialist positions are being filled by both CECO and ARD Corporation personnel, the names, affiliations, and educational and experiential qualifications for these individuals are as follows:

Individual: Mr. Stephen H. Cooley

Affiliation: Advanced Resource Development (ARD) Corporation

Education: M.A., Industrial/Organizational Psychology, University of Illinois at Chicago, Illinois, 1980.
B.A, Psychology with minors in Business-Administration and Statistics, George Washington University, Washington, D.C., 1976.

Experience: For the past 3 years Mr. Cooley, a Senior Human Factors Specialist for ARD, has worked in the nuclear power industry. He has provided support in a number of human factors areas that include: program plan development, control room design reviews, procedure writing and evaluation, training, and human error as a result of inadequate man/machine interfaces. Prior to that he has 3 years of experience in the design, conduct and evaluation of both applied and theoretical research in leadership emergency, personnel selection, personnel staffing patterns, stress management, group dynamics, market research, management assessment, and the psychological factors associated with addiction.

Individual: Mr. Andrew T. Bayer

Affiliation: Commonwealth Edison Company

Education: B.S., Human Factors Engineering, Wright State University, Dayton, Ohio, 1981.

Experience: For the past two years Mr. Bayer has supported projects under the auspices of CECO's human factors engineering program. Projects he has worked on include operator error analysis, program plan development, control panel design, SPDS design and evaluation, and control room design reviews.

Individual: Mr. Joseph B. Winter

Affiliation: Advanced Resource Development (ARD) Corporation

Education: M.S., Psychology, Virginia Commonwealth University,
Richmond, Virginia, 1979.
B.S., Psychology, Virginia Commonwealth University,
Richmond, Virginia, 1974.

Experience: Mr. Winter has over two years experience in the power industry conducting task analyses on nuclear jobs for training purposes. In addition to utility employment, he has three additional years of human factors experience utilizing a variety of analytic techniques in the areas of test validation, selection, classification, compensation, performance appraisal and multi-purpose job analysis. He is an accomplished SAS programmer and has used task analysis approaches to create computerized classification systems, tying them to human resource development projects which factor geographic differences in pay. He has experience developing job evaluation systems and has worked extensively as a job analyst.

Individual: Michael A. Boggi

Affiliation: Advanced Resource Development (ARD) Corporation

Education: M.S., Industrial Engineering, North Carolina State University, Raleigh N.C., expected completion: June 1984.

B.A., Psychology, LaSalle College, Philadelphia, PA, 1981.

Experience: In 1982 Mr. Boggi supervised a group of researchers conducting a noise control project for the regional headquarters of the Amoco Oil Company of Raleigh, N.C. In addition, Mr. Boggi worked on a team that evaluated aspects of safety, biomechanics, and the man/machine interface at specific work locations at the ITT plant in Raleigh, N.C. Besides his applied experience Mr. Boggi has conducted observational research in freight management and traffic control. Presently he is applying his training and experience to complex man/machine interface issues in the nuclear industry.

Individual:

Mr. Paul S. Rau

Affiliation:

Advanced Resource Development (ARD) Corporation

Education:

M.A., Applied Experimental Psychology, The Catholic University of America, Washington, D.C., 1983.

M.S.W., Social Works, University of Maryland, Baltimore, Maryland, 1981.

B.S., Physiological Psychology, Tusculum College, Greenville, Tennessee, 1977.

Experience:

For the past 2 years Mr. Rau has provided support to the nuclear power industry in the areas of control room design reviews and the design, implementation and evaluation of control room modifications to enhance operator/control panel interactions. In the year prior to that, he provided support in the evaluation of thermal printers for use in nuclear power facilities and in the review of human factors criteria for the testing of the arrangements and design of dynamic displays. Mr. Rau has designed and conducted research in the use of 3D viewing systems for use in teleoperated robotic systems.

Effective as of February 13, 1984 Mr. Paul Rau was replaced on the project by Mr. Christopher C. Plott an ARD employe. Mr. Plott's qualifications are as follows:

Education: M.S., Industrial Engineering, Texas Tech University, Lubbock, Texas, 1983.
B.S., Kinesiological Sciences, University of Maryland, College Park, Md., 1981.

Experience: For the past 2 1/2 years Mr. Plott has been involved in various applied research projects conducted at Texas Tech. These included work in the areas of work physiology, biomechanics, anthropometry, task analysis and work load measurement while under contract to the Bureau of Mines, the State of Texas, and the McDonnell Douglas Corp. His responsibilities included the design, conducting and analysis of various aspects of these projects. Mr. Plott has also done work in the area of human/computer interface and software development. He is currently applying his background to complex man/machine interface issues in the nuclear industry as well as helping to develop the computerized data base management system being used for a Detailed Control Room Design Review.

2.6 Other Review Team Members

2.6.1 The position of System Design Engineer is being filled by Michael S. Tucker of CECO. Mr. Tucker's qualifications are as follows:

Education: B.S., Electrical Engineering, Illinois Institute of Technology, 1977

Experience: For the past 3 years Mr. Tucker has been in the Station Nuclear Engineering Department providing support for modifications to Dresden and Quad Cities Stations including the control room. Prior to that time, he was in the Station Electrical Engineering Department providing support in the design of Bulk Power Switching Stations.

The Instrument and Control Engineer position is being filled by Robert E. Howard of CECo. Mr. Howard's qualifications are as follows:

Education: B.S., Electrical Engineering, University of Wisconsin, 1955

Experience: For the past six years Mr. Howard has served as a staff engineer in the control and instrument group of Station Electrical Engineering Department and for the past three and one half has participated in CECo control room design reviews. He has 40 years experience, of which 23 has been in the nuclear power area. Mr. Howard has held positions in operations, maintenance, construction and engineering at CECo over the past 23 years. From 1973 to 1979 he held an SRO license at the Zion Station.

DCRDR MODIFIED FORMS

The following forms contained in the Generic DCRDR Program Plan for Commonwealth Edison have been modified since the plan was submitted to the NRC in April of 1983.

1. Control Room Human Engineering Discrepancy Record
2. Questionnaire Item Summary Form
3. Control Room Review Task Development
4. Instrument/Control Form
5. System Review Summary Reference

The reason for the modifications are contained below and copies of the original forms and the modified forms are attached.

The Control Room Human Engineering Discrepancy Record was modified as a result of the HED numbering system which CECO is using. After developing the HED numbering system it was found that the original form was not adequate in this area. Therefore the top portion of the form was modified to facilitate the numbering of HED's.

The Questionnaire Item Summary Form was modified so that obtained responses could be tallied by job position for use in further analysis of the responses. A column was also added so that responses could be referred to items contained in the CECO Human Factors Checklist and used as supplemental information for HED's.

The Control Room Review Task Development Form was modified because it was initially used for training purposes and information contained on it is not relevant to the task analysis being performed as part of the DCRDR. Therefore this information has been removed from the form.

The Instrument/Control Form was modified to facilitate data collection and the transference of collected data to the Data Base Management System. The form was made into four forms, two for the task analysis effort and two for the control room inventory. In addition, information needed for each process was added to the appropriate form.

The System Review Summary Reference Form was modified to facilitate collection of system function information. In modifying the form it is now specific to emergency related functions to be more consistent with the DCRDR task analysis effort.

CONTROL ROOM HUMAN ENGINEERING DISCREPANCY RECORD

HFS:		Date:	No:	Plant:
				Unit: _____
				System: _____
Panel ID#	Equipment ID#	Equipment Name		
<u>Description of Discrepancy</u>				
Photo Log No.	Photography Instructions			
Photo Caption:			Guideline No. & Caption:	
C _____	1. Workspace	_____	6. Labels & Aids	
O _____	2. Communications	_____	7. Computer/CRT	
D _____	3. Annunciators	_____	8. Panel Layouts	
E _____	4. Controls	_____	9. C/D Integration	
S _____	5. Displays	_____	Other:	
Comments:				
Assessment Category/Level: I _____ II _____ III _____				

RECOMMENDATION(S) RECORD

REVIEWERS: _____

RECOMMENDATION(S): _____

ACCEPT RECOMMENDATION NO.: _____

REJECTION SIGNATURE

REJECT RECOMMENDATION NOS.: _____

REJECTION JUSTIFICATION: _____

IMPLEMENTATION AND SCHEDULING

TENTATIVE SCHEDULED COMPLETION DATE: _____

PROJECT ENGINEER APPROVAL: _____

STATION ASST. SUPT. OPS. APPROVAL: _____

DCRDR COORDINATOR: _____

HED COMPLETED: _____

CONTROL ROOM HUMAN ENGINEERING DISCREPANCY RECORD

HFS:	DATE	STATION	UNIT	INDEX NO.	AREA	AREA NO.	SYSTEM	
Panel ID#		Equipment ID#		Equipment Name				
<u>Description of Discrepancy</u>								
Photo Log No.				Photography Instructions				
Photo Caption:						Guideline No. & Caption:		
C	_____	1. Workspace	_____	6. Labels & Aids				
O	_____	2. Communications	_____	7. Computer/CRT				
D	_____	3. Annunciators	_____	8. Panel Layouts				
E	_____	4. Controls	_____	9. C/D Integration				
S	_____	5. Displays	_____	Other:				
Comments:								
Assessment Category/Level: I _____ II _____ III _____								

RECOMMENDATION(S) RECORD

REVIEWERS: _____	
RECOMMENDATION(S): _____	
ACCEPT RECOMMENDATION NO.: _____	REJECTION SIGNATURE
REJECT RECOMMENDATION NOS.: _____	_____
REJECT JUSTIFICATION: _____	
IMPLEMENTATION AND SCHEDULING	
TENTATIVE SCHEDULED COMPLETION DATE: _____	
PROJECT ENGINEER APPROVAL: _____	
STATION ASST. SUPT. OPS. APPROVAL: _____	
DCRDR COORDINATOR: _____	
HED COMPLETED: _____	

QUESTIONNAIRE ITEM SUMMARY FORM

1. HFS Analyst: _____
2. Content Area: _____
3. Question #: _____
4. Question: _____

FREQUENCY/%	TYPE OF RESPONSE/SPECIFIC EQUIP. REF.	INVESTIGATION
	● Omission - No Response Given	

QUESTIONNAIRE ITEM SUMMARY FORM

HFS ANALYST: _____

CONTENT AREA: _____

QUESTION # : _____ : CHECKLIST REFERENCE #'s: _____

QUESTION: _____

F/%	EQUIPMENT ATTENDANT	EQUIPMENT OPERATOR	NSO	SHIFT CR ENGINEER	SHIFT FOREMAN	TECH ENGINEER	TECH STAFF	TRAINING	ADMINISTRATIVE	SUMMARY RESPONSE/ SPECIFIC EQUIPMENT REFERENCE	CHECKLIST REFERENCE NUMBER(s)	INVESTIGATION
										● OMISSION - NO RESPONSE GIVEN		

**CONTROL ROOM REVIEW
TASK DEVELOPMENT**

JOB TITLE: _____ **TASK NO.** _____

PREPARED BY: _____ **STA. NO.** _____

TASK DESCRIPTION

ACTION: _____

ACTION STEPS: _____
(Sequence of what must be done to accomplish ACTIONS)

TASK CONDITIONS: _____
(Givens, Denials, Environment)

Frequency: Shift Day Wk. Mo. Bi. Quar. 6Mos. Year Cycle Other
Once A Mo.

Initiating Cues: (When Does the task start)

Performance Criteria: (What Does Job Incumbent Have to Accomplish)

Physical Difficulty:	LOW	MED	HIGH
Mental Difficulty:	LOW	MED	HIGH
Safety Related Sys. Importance:	LOW	MED	HIGH
Operational Importance:	LOW	MED	HIGH

CONTROL ROOM REVIEW
TASK DEVELOPMENT

JOB TITLE: _____

TASK NO. _____

PREPARED BY: _____

STA. NO. _____

TASK DESCRIPTION

ACTION:

ACTION STEPS: (Sequence of what must be done to accomplish ACTIONS)

TASK CONDITIONS: (Givens, Denials, Environment)

Frequency: Shift Day Wk. Mo. Bi. Quar. 6 Mos. Year Cycle Other
Once A Mo.

Initiating Cues: (When Does the task start)

Performance Criteria: (What Does Job Incumbant Have To Accomplish)

INSTRUMENT CONTROL FORM

SYSTEM TASK ____ COMPONENT TASK ____ INVENTORY ____

System Name _____ System Number _____ Page ____ of ____

Prepared By _____ Station Number _____ Date _____

Task Action Statement _____

		INSTRUMENT											MANUAL CONTROL									
SPECIFIC ACTION STEPS	E.P.N.	PANEL LOC.			PARAMETER MEASURED		TYPE OF INSTRUMENT					INSTRUMENT DATA		TYPE OF CONTROL SWITCH						NO. OF SW POSITIONS		
		I	H	V	WHAT MEASURED	UNITS	RM	EM	SP	MP	IP	RANGE	DIV	JS	SCS	TB	PB	K	RS	TS	2	3

A63

Original Form

**INSTRUMENT CONTROL FORM
(Continued)**

MANUAL CONTROL															AUTOMATIC CONTROL																		
TYPE OF CONTROL SWITCH							NO. OF SWITCH POSITIONS				TYPE OF ACTION		TYPE OF CONTROL					TYPE OF CONTROL		CONTROL DATA		COMPONENT CONTROLLED			PARAMETER CONTROLLED			INSTRUMENT DATA					
JS	SCS	TB	PB	K	RS	TS	2	3	5	?	SR	AS- IS	SO SC	SO TC	TO SC	TO TC	M	M/A	AT	A	RANGE	DIV	V	T	M	F	P	S	RANGE	DIV			

A-9b

INSTRUMENT/CONTROL INVENTORY FORM

System Name _____ System Number _____ Page _____ of _____
 Prepared By _____ Station Number _____ Date _____

CONTROL ROOM EQUIPMENT				DISPLAY									MANUAL CONTROL																										
EQUIPMENT NAME	E.P.N.	PANEL LOCATION			TYPE OF INSTRUMENT					PARAMETER MEASURED		INSTRUMENT DATA		INDICATOR	TYPE OF CONTROL SWITCH							NAMES OF SWITCH POSITIONS	TYPE OF ACTION		TYPE OF VALVE CONTROL														
		#	X COORD	Y COORD	RM	EM	SP	MP	#P	WHAT MEASURED	UNITS	RANGE	DIV.		JS	SCS	TB	PB	TW	K	RS		TS	SR	IS	SC	SO	TO	TC										
																														TYPE OF ACTION		TYPE OF VALVE CONTROL							

A-10

New Form

INSTRUMENT/CONTROL INVENTORY FORM FOR CONTROLLERS

System Name _____ System Number _____ Page _____ of _____

Prepared By _____ Station Number _____ Date _____

ACTION STEP	NAME	EPH	MATCH	COMMUN. WITH OTHERS	LOCATION			CONTROL REQUIREMENTS				DEMAND DISPLAY INFORMATION				RESPONSE DISPLAY INFORMATION			
					PANEL #	X COORD	Y COORD	CONTROL TRANSFER SWITCH	CONTROL	WHAT CONTROLLED	WHAT MEASURED	UNITS	RANGE	DIVISIONS	WHAT MEASURED	UNITS	RANGE	DIVISIONS	
																			TYPE OF CONTROLLER

A-11

TASK ANALYSIS INSTRUMENT/CONTROL REQUIREMENT FORM

System Name _____ System Number _____ Page _____ of _____

Prepared By _____ Station Number _____ Date _____

Task Number _____

Task Action Statement _____

ACTION STEP	NAME	EPN	MATCH	COMMUN. WITH OTHERS	LOCATION			DISPLAY REQUIREMENTS					MANUAL CONTROL REQUIREMENTS				
					TILE #	PANEL #	PLANE	WHAT MEASURED	UNITS	RANGE	DIV.	TYPE OF INSTR.	INDI-CATION	TYPE OF SWITCH	NAME(S) OF SWITCH POSI.	TYPE OF VALVE COH.	TYPE OF ACTN.

A-12

TASK ANALYSIS INSTRUMENT/CONTROL REQUIREMENT FORM FOR CONTROLLERS

System Name _____ System Number _____ Page _____ of _____

Prepared By _____ Station Number _____ Date _____

Task Action Statement _____

Task Number _____

ACTION STEP	NAME	EPH	MATCH	COMMON WITH OTHERS	LOCATION			CONTROL REQUIREMENTS				DEMAND DISPLAY REQUIREMENTS				RESPONSE DISPLAY REQUIREMENTS					
					TILE #	PANEL #	PLANE	CONTROL TRANSFER SWITCH	CONTROL	WHAT CONTROLLED	WHAT MEASURED	UNITS	RANGE	DIVISIONS	WHAT MEASURED	UNITS	RANGE	DIVISIONS			
																			TYPE OF CONTROLLER		

A-13

System Review Summary Reference

- 1) Station Number _____
- 2) System Name _____
- 3) System Designation Identifier _____
- 4) Piping and Instrumentation
Diagrams used _____

5) References

5.1 System Procedures Used: _____

5.2 System References Used: _____

5.3 System Characteristics
described: _____

5.4 System Function(s): _____

6) System Functions Verified: _____

Human Factors Specialist