



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

September 2, 1988

DUCKET: 50-445 and 50-446
APPLICANT: Texas Utilities Electric Company
FACILITY: Comanche Peak Steam Electric Station
SUBJECT: MEETING SUMMARY - AUGUST 30, 1988
OPERATOR TRAINING AND EXAM RESULTS

On August 30, 1988, the NRC staff met with representatives of Texas Utilities Electric Company (TU Electric) at the CPSES site to discuss the operator training program and license examination results. The meeting attendees and slides are enclosed.

The purpose of the meeting was to discuss TU Electric's response to the concerns raised in Examination Report 50-445/OL88-01 dated July 27, 1988. In particular, TU Electric described preliminary results of their assessment of the adequacy of the operator training program and the significance of the relatively high failure rate observed in the operator exam results administered by the NRC. A. B. Scott indicated that TU Electric has identified weaknesses in the operator training program caused, in large part, by the transition from traditional training to performance-based training and inactivity resulting from construction delays. In addition, TU Electric needs to prepare their training program for INPO accreditation.

With respect to the operator exam results, TU Electric has identified the need for improved screening criteria for candidate selection and diagnostic evaluation for both reactor operators (RO) and senior reactor operators (SRO). In addition, an improved auxiliary operator (AO) training program will enhance the development of qualified candidates for the RO training program.

TU Electric's corrective action efforts consist principally of the following items:

1. Establish a training board.
2. Thoroughly review the training program, develop a plan to prepare the program for accreditation, and establish adequate screening criteria.
3. Strengthen management and operations staff involvement in the evaluation and monitoring of training activities.
4. Implement an effective applicant selection process.
5. Strengthen the AO training program.

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Despite these weaknesses in the training program and a relatively high failure rate in requalification exams, TU Electric believes that there is an adequate number of above-average personnel assigned to shift crews to support plant operation. Nevertheless, TU Electric will similarly review the requalification training program, implement performance-based examinations, and establish screening criteria to identify marginal performance.

TU Electric indicated that training and exam improvements would be completed in preparation for an INPO "quick-look" training evaluation near the end of the year and the INPO full licensing readiness review in the spring of 1989. In addition, five training programs are scheduled to be submitted for accreditation in June 1989.

The staff indicated that it plans to conduct requalification exams scheduled in April 1989 and, if necessary, repeat exams in November-December 1988. The requalification exams will be conducted for about 20% of the operators. The staff further indicated that a follow-up meeting will be scheduled after the INPO "quick-look" to discuss the progress on training improvements.

Christopher J. Grimes, Director
Comanche Peak Project Division
Office of Special Projects

Enclosures:

1. List of Attendees
2. Slides

cc w/enclosures:
See next page

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OFC	:D:CPPD:OSP	:	:	:	:
NAME	:CIGrimes:cm/cb:	:	:	:	:
DATE	:9/2/88	:	:	:	:

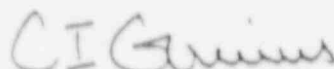
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LIST OF ATTENDEES
NRC/CPSES OPERATOR TRAINING PROGRAM MEETING
AUGUST 30, 1988

TU Electric

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W. D. Cahill, Jr.
W. G. Counsil
J. Donahue
A. F. Husain
J. Kelley
W. Melton
S. Palmer
J. Rawley
J. Redding
A. Scott
C. L. Turner
R. D. Walker

NRC

C. I. Grimes
J. L. Milhoan
J. L. Montgomery
J. G. Partlow
J. L. Pellet
R. F. Warnick
J. F. Whittemore
J. S. Wiebe

CASE

E. Ottney
Newman & Holtzinger
M. Axelrad
Self Employed
J. L. French
Sentco, Inc.
D. Poole

CPSSES

OPERATOR TRAINING PROGRAM

August 30, 1988

Austin B. Scott, Jr.
Vice President
Nuclear Operations

AGENDA

INTRODUCTION AND STATEMENT OF PURPOSE

TRAINING PROGRAM OBJECTIVES

- Learning Objectives and Lesson Plans
- Training Scope
- Training Philosophy

EVALUATION OF LOW EXAM PASSING RATE

- Root Causes
- Corrective Actions

REQUALIFICATION EXAMS

- Evaluation of Low Exam Passing Rate
- Operator Readiness for Plant Operation

SUMMARY

PURPOSE

RESPOND TO NRC LETTER OF 27 JULY

- Inadequate Candidate Screening
- High Failure Rate
- Exam Question Validity Criteria

DESCRIBE COURSE OF CORRECTIVE ACTION

- Analyze Exam Results
- Review Past Practices
 - License Training
 - Candidate Selection
 - Curriculum
 - Candidate Preparation
 - Screening
 - Grooming
 - Exam Preparation
- Determine Root Causes
- Verify Conclusions
- Make Required Changes

TRAINING PROGRAM OBJECTIVES

LONG TERM

PRODUCE SUFFICIENT NUMBERS OF LICENSED REACTOR OPERATORS TO SAFELY AND EFFICIENTLY OPERATE CPSES THROUGH A TRAINING PROGRAM WHICH MEETS REGULATORY AND COMPANY REQUIREMENTS.

SPECIFIC

- Create and Install a Performance-based Training Program
- Achieve Accreditation
- Maintain Operator Proficiency
 - Requalification Syllabus
 - Written and Oral Exams
 - Simulator
- Train Replacement Operators

CPSES TRAINING PROGRAM

HISTORICAL DEVELOPMENT

- Bought the Generic Training Package Offered by Westinghouse - Modified to Make It Plant Specific

- Lesson Notes
- Drawings, Diagrams, Plans
- Procedures
- Off-Site Practical Training
 - Startups and Shutdowns
 - Simulator Practice
- Walk-through Exams

- Began Modification to Accommodate Performance-based Criteria

- Hired Training Consultant (Harless Performance Guild)
- Began Job-Task Analysis Process
- Began Curriculum Development

- Current Systems

- Hybrid System
 - Systems Training
 - RO/SRO Licensing Syllabus

LEARNING OBJECTIVES AND LESSON PLANS

LEARNING OBJECTIVES

- Initially
 - *Assumed
 - *Not Prominent Part of Lesson Plan
- Transition to Performance Basis
 - *Attempted to Backfit Without Extensive Lesson Plan Revision
 - *Put Into Requalification Program First
 - *Gradually Inserted Into Systems Syllabus
 - *Did Not Pursue For RO Licensing
 - New Syllabus Coming
 - No More Cold License Classes Planned
 - Heavy Resource Commitment to Job-Task Analysis
- Currently
 - *Still In Transition

LESSON PLANS

- Still Using Those Initially Developed
- Audited Against NUREG-1122
- Will Be Replaced by Accredited RO Modules

TRAINING SCOPE - OPERATOR

INITIAL LICENSE CLASS

- **Pre-selection**
 - General Physics
 - Interviews
- **Pre-training (Math/Physics Review)**
 - General Physics
 - TU Training Group
- **Westinghouse Nuclear Training Center-Zion**
 - Theory
 - Systems Training
 - Integrated Plant Operations - Simulator
- **Plant-specific Training On Site**
- **Pre-exam**
- **License Exam**

SUBSEQUENT CLASSES

- **Second and Third**
 - No Pre-screen Test (Mostly USN Input)
 - Pre-Training On Site (3-6 Weeks)
 - Zion
 - Second: Entire Syllabus
 - Third: NTR and Simulator Only
- **Follow-on Classes**
 - No Pre-screen Test
 - Pre-training On Site
 - Theory and Systems On Site
 - NTR Training Off Site

ON-SITE SYLLABUS

- Theory - 9 Weeks
- Systems - 27 Weeks
- Walkdown - 20 Weeks
- Simulator - 12 Week
- Pre-exam

TRAINING PHILOSOPHY

**BEST JOB PERFORMANCE COMES FROM THE RIGHT
COMBINATION OF PERSONNEL SELECTION, MOTIVATION,
ENVIRONMENT, AND TRAINING.**

**THE PERFORMANCE-BASED TRAINING PROCESS
SPONSORED BY NUMARC AND INPO IS RIGHT FOR TU
ELECTRIC.**

**PERFORMANCE-BASED TRAINING REQUIRES
PERFORMANCE-BASED EVALUATION.**

GENESIS OF "THE PAPER"

- Issue of License Exams Raised at RIV Senior Nuclear Executives Periodic Meeting Late Spring 1986
- Led to RIV NRC License Exam Workshop June 24, 1986, at Arlington
- Paper Entitled "Licensing Examinations and Performance Training" Circulated by C. L. Turner, Training Manager, TU CPSES
- Thrust Was to Connect Performance-based Examining to Performance-based Training
- Paper Was Discussed But Failed to Catch Much Notice
- TU Invited to Prepare a Sample Exam
- RIV Not Impressed
- TU Included Comment on Question Basis With 9/86, 7/87, 12/87 and 6/88 Exams
 - Matrix Evaluating Each Question
 - Paper Supplied as Abbreviation Key
- RIV Not Impressed
- Will Not Be Circulated Again
 - Philosophy Is Not Fully Developed
 - Style Tends to Be Abrasive

EVALUATION OF LOW OPERATOR EXAM PASSING RATE

ANALYSIS OF CAUSAL FACTORS PRELIMINARY INDICATIONS

- Inappropriate Perseverance
Eight Individuals Account for Sixteen Failures
- Questionable Initial Selection
Seniority Criterion (Union Issue)
No Pre-screen Exam
No Critical Appraisal of Ability
- No Rigorous AO Training Program (RO Only)
- Poor On-the-job Training (Aggravated by Inactivity)
- Inadequate Operations Management Involvement
- Improper use of Diagnostic Exam Results
 - * Reluctance to Make Close Call Against Candidate
 - * Failure to Prescribe Sufficient Remedial Course
 - * Allowing Situational Override
- Inadequate Exam Preparation Materials Furnished
- Oral and Simulator Eval and Prep Better

CORRECTIVE ACTION

- **DEFER FURTHER INITIAL APPLICATIONS
PENDING**

 - Thorough Review of Training Program
Decision on Course of Action:

 - Overhaul Existing Program, or
Bring Forward Accreditation Syllabus
Development of a Pre-screening
Program

- **ESTABLISH A TRAINING BOARD**

- **CONTINUE TO STRENGTHEN OPERATIONS
STAFF INVOLVEMENT**

- **BETTER DEFINE APPLICANT SELECTION
PROCESS (AND STICK TO IT)**

- **STRENGTHEN AO TRAINING PROGRAM (IN
PROCESS)**

REQUALIFICATION EXAMINATIONS

EVALUATION OF LOW PASSING RATE

Analysis of Causal Factors

- Misdirected Requal Program
 - Soft On Academics
 - Two-year Syllabus
 - Unrigorous Written Exams
 - Overemphasis On Current Event
- Failure to Weed Out Consistent Poor Performers
- Plant Inactivity

CORRECTIVE ACTION

- Thoroughly Re-evaluate Program
- Strengthen Requal Review Board
- Get Tough With Marginal Performers
- Install Special Training Syllabus
- Develop Performance-based Re-exam for NRC Review
- Develop Performance-based Practice Exams

REQUALIFICATION FAILURE ANALYSIS

SRO LICENSES

	<u>TOTAL</u>	<u>NO. OF FAILURES</u>				
		0	1	2	3	4
	37					
Staff	20	15	3	2		
Shift	17	12	3	2		

RO LICENSES

	<u>TOTAL</u>	<u>NO. OF FAILURES</u>				
		0	1	2	3	4
	29					
Staff	0					
Shift	29	17	8	0	2	2

OPERATOR READINESS FOR PLANT OPERATIONS

- **SUFFICIENT DEPTH EXISTS TO STAFF SIX SHIFTS WITH ABOVE-AVERAGE PERFORMERS**
- **INCREASED TEST PROGRAM INVOLVEMENT FOR OPERATORS**
ALLOWS FOR CRITICAL EVALUATION
REMEDIAL ACTION WHERE NECESSARY
- **UPGRADED TRAINING PROGRAM IN PLACE**
BEYOND NORMAL REQUAL SYLLABUS
PREPARATION FOR PERFORMANCE-BASED EXAMS
- **INCREASED MANAGEMENT INVOLVEMENT**
SCHEDULED TRAINING OBSERVATION
- **SIGNIFICANT PROCEDURAL UPGRADE UNDERWAY**
- **EXTENDED HOT PARTICIPATION EXPERIENCE**
- **INPO EVALUATION AND ASSIST VISITS**
- **NRC REQUALIFICATION EXAM**

SUMMARY

- RECENT RECORD HAD BEEN REASONABLE
10/15 SRO
12/14 RO
- OPERATING MANAGEMENT DISCONTINUITY
- INACTIVITY
- POOR SELECTION AND TRAINING PRACTICES
CREPT IN
- NEED FOR THOROUGH RE-EVALUATION
INDICATED
- NO PHILOSOPHY DISCONNECT

sensitivity of this detector to gamma radiation means that the neutron flux provides most of the signal current ($i_y = i_n/100$).

The other type of detector with a solid boron lining is the compensated ionization chamber (CIC) which is a UIC with an additional inner chamber which has no Boron-10 lining. The inner chamber therefore only detects gammas and by subtracting the currents from each chamber we can get the "neutron only" current contributions as follows:

Outer chamber current = $i_n + i_y$

Inner chamber current = i_y

Net signal = outer chamber current - inner chamber current

$i_{net} = (i_n + i_y) - i_y$

$i_{net} = i_n$ or neutron only current

(Refer to Figures EXC 7 & 8)

To provide equal response to the gamma flux in each chamber physical design of the chambers and correct electrical "compensation" are required for operation of the inner chamber in the recombination region. Compensation requirements change depending upon environmental conditions or amount of residual gammas. Proper compensation yields the most correct response. By under compensating a higher than actual count level is maintained and thus underestimates the rate of change of ionization; overcompensating yields lower levels and overestimates the rate of change. Each presents operational problems under certain conditions.

4.0 INSTRUMENTATION AND CONTROL

4.1 Source Range Instruments (N-31, N-32)

(Refer to Figure EXC 9)

The Source Range Circuitry is specifically designed to provide independent monitoring of leakage neutron flux during shutdown and the initial phase of reactor startup/final phase of reactor shutdown.

TABLE C

CURRENT INDIVIDUALS' SHIFT ASSIGNMENT AND EXPERIENCE

NET PARTICIPATION EXPERIENCE

NO. OF WEEKS
ON M/T

STARTUP (S/U)
ON M/T

STARTUP (S/U)
ON M/T

NO. OF WEEKS
ON M/T

NAME	POSITION	TYPE LICENSE	NO. OF WEEKS ON M/T	STARTUP (S/U) ON M/T	NET PARTICIPATION EXPERIENCE	NO. OF WEEKS ON M/T	NO. OF WEEKS ON M/T
SHIFT CREW 11							
T.L. Marsh	Shift Supr.	SO	11 weeks	complete	complete	M/A	No Note 1
M.T. Miller	Unit Supr.	SO	31 weeks	1 S/D only	1 S/D only	31 weeks	Yes
S.P. Burnett	Unit Supr.	SO	complete	complete	complete	complete	Yes Note 2
C.M. Davis	Reactor Op.	SO					
D.B. Lollar	Reactor Op.	SO					
E.T. Fulton	Reactor Op.	SO					
P.A. Walton	Reactor Op.	SO					
Note 1: Needs: 2 weeks at > 50% power							
Note 2: Previously licensed at Melf Creek							
SHIFT CREW 12							
M.B. Smith	Shift Supr.	SO	10 weeks	complete	complete	M/A	Yes
E.B. Davis	Unit Supr.	SO	8 weeks	complete	complete	M/A	Yes
G.C. Bryan	Unit Supr.	SO	25 weeks	complete	complete	25 weeks	Yes
D.B. Essinger	Reactor Op.	SO					
M.E. Brown	Reactor Op.	SO					
M.G. Kerts	Reactor Op.	SO					
M.A. Walker	Reactor Op.	SO					
SHIFT CREW 13							
T.B. Bain	Shift Supr.	SO	7 weeks	S/B only	S/B only	M/A	No Note 3
T.M. Broughton	Unit Supr.	SO	27 weeks	complete	complete	27 weeks	Yes
E. Martines	Unit Supr.	SO	3 weeks	S/U only	S/U only	M/A	No Note 4
C.L. Alexander	Reactor Op.	SO					
J.B. Green	Reactor Op.	SO					
G.A. Taylor	Reactor Op.	SO					
B.B. Wheeler	Reactor Op.	SO					

Note 3: Needs: S/U

Note 4: Needs: S/B

OPERATIONS DEPARTMENT MANAGER'S ASSESSMENT
PERSONNEL

Aug 28, 1988

PLANT OBSERVATION EXPERIENCE - SHIFT SUPERVISORS

TABLE D

<u>NAME</u>	<u>DATE</u>	<u>PLANT VISITED</u>	<u>DAYS</u>	<u>TOTAL/GOAL</u>	<u>SU/SD</u>
BAIN T.E. (13)	11/82	PRAIRIE ISLAND	4	4/30	
	4/84	TROJAN	12	16/30	
	3/85	SALEM	10	26/30	
	10/87	SALEM	5	31/30	SD(1)
	6/88	WOLF CREEK	4	35/30	
BEAUDIN, T.J. (15)	11/82	PRAIRIE ISLAND	4	4/30	
	4/84	TROJAN	12	16/30	
	3/85	SALEM	10	26/30	
	3/86	DIABLO CANYON	9	35/30	
	5/87	CATAWBA	13	48/30	
	10/87	SALEM	5	53/30	SD(1)
	7/88	RANCHO SECO	10	63/30	
DASKAH, T.J.* (16)	1/83	D.C. COOK	4	4/130	
	3/85	SALEM	16	20/130	SU(1)**
	5/85	DIABLO CANYON	8	28/130	
	2/86	DIABLO CANYON	8	36/130	SU(1)
	6/86	DIABLO CANYON	73	110/130	SU(2)
	8/87	DIABLO CANYON	1	120/130	
	7/88	RANCHO SECO	10	130/130	
DEEN, M.D. (WCC)	1/83	D.C. COOK	3	3/130	
	3/84	TROJAN	14	17/130	
	3/85	NORTH ANNA	15	32/130	
	8/85	PRAIRIE ISLAND	4	36/130	
	5/86	PRAIRIE ISLAND	78	114/130	SU(1)
	4/87	PRAIRIE ISLAND	5	119/130	SD(1)
LYTLE, G.D. (14)	11/82	PRAIRIE ISLAND	4	4/30	
	3/85	McGUIRE	14	18/30	
	11/86	DIABLO CANYON	12	30/30	
SMITH, M.R. (12)	11/82	PRAIRIE ISLAND	4	4/30	
	6/84	BEAVER VALLEY	9	13/30	SU(2)
	3/85	McGUIRE	14	27/30	
	4/86	DIABLO CANYON	9	36/30	
	4/87	McGUIRE	4	40/30	SD(2)
	2/88	ST. LUCIE	10	50/30	FEB 88
9/88	PALO VERDE	11	61/30		

* INDICATES SUPERVISORS GAINING 6 MONTHS (26 WEEKS) HOT