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SOUTHERN CALIFORNIA EDISON COMPANY

NUCLEAR TRAINING DIVISION

SUMMARY REVIEW

PRESENTED TO NRC

FEBRUARY 25, 1981

STATEMENT OF OVERALL TRAINING OBJECTIVE

TO ENHANCE NUCLEAR POWER PLANT SAFETY, RELIABILITY AND AVAILABILITY  
THROUGH A PROGRAM OF COMPREHENSIVE AND EFFECTIVE TRAINING FOR ALL  
PERSONNEL ASSOCIATED WITH THE OPERATION, MAINTENANCE, MODIFICATION  
AND MANAGEMENT OF THE SAN ONOFRE NUCLEAR GENERATING STATION.

## OVERVIEW OF TRAINING REQUIREMENTS

### TRAINING REQUIREMENT

### REFERENCE

- |   |  |
|---|--|
| 1. NON-LICENSED OPERATOR                                  | ANS 3.1  |
| 2. LICENSED OPERATOR UNIT 1<br>UNITS 2 & 3                | ANS 3.1, 10 CFR 55, NUREG 0660 (0737)<br>DENTON LETTER OCT. 30, 1979 |
| 3. SENIOR LICENSED OPERATOR UNIT 1<br>UNITS 2 & 3         | ANS 3.1, 10 CFR 55, NUREG 0660 (0737)<br>DENTON LETTER OCT. 30, 1979 |
| 4. LICENSED OPERATOR RETRAINING UNIT 1<br><br>UNITS 2 & 3 | ANS 3.1, 10 CFR 55 APP. A NUREG 0660<br>(0737)                       |
| 5. SHIFT TECHNICAL ADVISOR                                | ANS 3.1, NUREG 0660 (0737)<br>DENTON LETTER OCT. 30, 1979            |
| 6. INSTRUCTOR QUALIFICATION AND RETRAINING                | ANS 3.1, NUREG 0660 (0737)   |
| 7. COLD LICENSE OPERATOR UNITS 2 & 3                      | ANS 3.1, 10 CFR 55, NUREG 0660 (0737)                                |
| 8. I & C TECHNICIAN                                       | ANS 3.1  |
| 9. RADIATION PROTECTION PROGRAM                           | ANS 3.1, 10 CFR 19, 10 CFR 20,<br>REG. GUIDE 8.8                     |
| 10. HEALTH PHYSICS TECHNICIAN APPRENTICE                  | SCE LETTER TO NRC  |
| 11. HEALTH PHYSICS TECHNICIAN RETRAINING                  | ANS 3.1  |

## OVERVIEW OF TRAINING REQUIREMENTS (CONT'D)

<u>TRAINING REQUIREMENT</u>	<u>REFERENCE</u>
12. CHEMISTRY TECHNICIAN APPRENTICE	SCE LETTER TO NRC
13. CHEMISTRY TECHNICIAN RETRAINING	ANS 3.1
14. QA/QC	ANS 3.2
15. GENERAL EMPLOYEE INDOCTRINATION	ANS 3.1
16. NUCLEAR ENGINEER DEVELOPMENT	SCE REQUIREMENT
17. SUPERVISORY STAFF INDOCTRINATION	SCE REQUIREMENT ANS 3.1
18. FIRE BRIGADE	10 CFR 50 APP. R
19. SECURITY	10 CFR 50, ANSI N18.17, REG. GUIDE 1.17
20. LEADERSHIP/MANAGEMENT	ANS 3.1
21. CORE DAMAGE MITIGATION	DENTON LETTER OCT. 30, 1979
22. SIMULATOR	ANS 3.1, NUREG 0660 (0737)
23. MAINTENANCE APPRENTICE ELECTRICIAN, MECHANIC, MACHINIST, WELDER AND I & C TECHNICIAN	ANS 3.1, SCE

## OVERVIEW OF TRAINING REQUIREMENTS (CONT'D)

<u>TRAINING REQUIREMENT</u>	<u>REFERENCE</u>
24. DIVISION MAINTENANCE PERSONNEL	SCE
25. RAD. WASTE PACKAGING AND SHIPMENT	ANSI/ASME N45.2.2
26. SRO COLLEGE CREDIT (60 HRS) PROGRAM	ANS 3.1, REG. GUIDE 1.8
27. SHIFT SUPERVISOR BS DEGREE PROGRAM	ANS 3.1, REG. GUIDE 1.8
28. ADMINISTRATIVE, CLERICAL, WAREHOUSE PERSONNEL	SCE
29. SITE EMERGENCY PLAN	10 CFR 50 APP. E, REG. GUIDE 1.101
30. DESIGN CHANGE INITIATION AND VERIFICATION PROCEDURES	ANS N45-2-11
31. LOW POWER TEST PROGRAM UNITS 2 & 3	NRC LETTER NOV. 14, 1980
32. IN PLANT DRILLS UNIT 1 UNITS 2 & 3	
33. QA PERSONNEL INDOCTRINATION	
34. RESPIRATORY DEVICE TRAINING	NUREG 0041, ANSI Z88.2
35. EMERGENCY PLAN DRILL	
36. SIMULATOR EXAM FOR LICENSING	
37. CRANE OPERATOR TRAINING & QUALIFICATION	NUREG 0612, ANSI B30.2, 1976

NOTE: ABOVE CONSISTS OF 48 SEPARATE PROGRAMS IDENTIFIED TO DATE.

## TRAINING CONCEPTS

### OPERATOR TRAINING

- ENTRY LEVEL CANDIDATE
  - H.S. GRAD., NO EXPERIENCE
  - ACADEMIC TRAINING REQUIRED
    - + NUCLEAR PHYSICS
    - + THERMODYNAMICS
    - + MATH
- TRAINING STAFF TO PROVIDE ACADEMIC\* AND TECHNICAL TRAINING
- TRAINEE ASSIGNED EXCLUSIVELY TO TRAINING DURING
  - INITIAL TRAINING
  - PERIODIC ADVANCED QUALIFICATION/LICENSING REVIEW TRAINING

(\* SOME ACADEMIC TRAINING MAY BE PROVIDED THROUGH COMMUNITY COLLEGES)

## TRAINING CONCEPTS (CONT'D)

### OPERATOR TRAINING (CONT'D)

#### ● TYPICAL TRAINING CYCLE (ESTIMATED)

- |   |               |
|---|---------------|
| - NON-LICENSED OPERATOR TRAINING  | ~52 WEEKS     |
| - ON SHIFT, QUALIFY AS NPEO   | 1 - 3 YEARS*  |
| - LICENSE REVIEW TRAINING   | 20-30 WEEKS   |
| - ON SHIFT AS LICENSED OPERATOR COMPLETE 60 SEMESTER HOURS** OF ENGINEERING RELATED SUBJECTS. | 1 YR. MINIMUM |
| - SRO LICENSE REVIEW TRAINING   | 10-12 WEEKS   |
| - ON SHIFT SRO, COMPLETE REQUIREMENTS FOR BS DEGREE** IF NOT PREVIOUSLY HELD.                 | AS REQUIRED   |
| - SUPERVISOR REVIEW TRAINING  | 4-6 WEEKS     |
| - QUALIFY WATCH ENGINEER (SHIFT SUPERVISOR)   |               |

(\* - ANS 3.1 - MAY 80 - PROPOSES EXPERIENCE LEVEL FOR LICENSE AS 3 YRS. POWER PLANT, 1 YR. NUCLEAR)

(\*\* - PER REVISION 2 TO REG. GUIDE 1.8)

## TRAINING CONCEPTS (CONT'D)

### MAINTENANCE AND TECHNICIAN TRAINING

- APPRENTICE TRAINING PROGRAMS WILL BE ESTABLISHED AT SAN ONOFRE FOR
  - B & C MECHANICS
  - ELECTRICIANS
  - I & C TECHNICIANS
  - WELDERS \*
  - MACHINISTS \*
  - COMPUTER TECHNICIANS
  - TEST TECHNICIANS \*
  - CHEMISTRY TECHNICIANS (REQUIRED BY 5/31/81)
  - RADIATION PROTECTION TECHNICIANS (REQUIRED BY 5/31/81)
- APPROPRIATE LABORATORY SPACE AND EQUIPMENT WILL BE PROVIDED IN THE TRAINING FACILITY
- CANDIDATES WILL BE H.S. GRADUATES WITH NO PREVIOUS EXPERIENCE
- TRAINING WILL BE CONDUCTED BY PERMANENT TRAINING STAFF

(\* MAY DESIRE TO ESTABLISH AT OTHER FACILITY. STEAM GENERATION ALSO ESTABLISHING APPRENTICE PROGRAMS WHICH SHOULD BE COORDINATED)

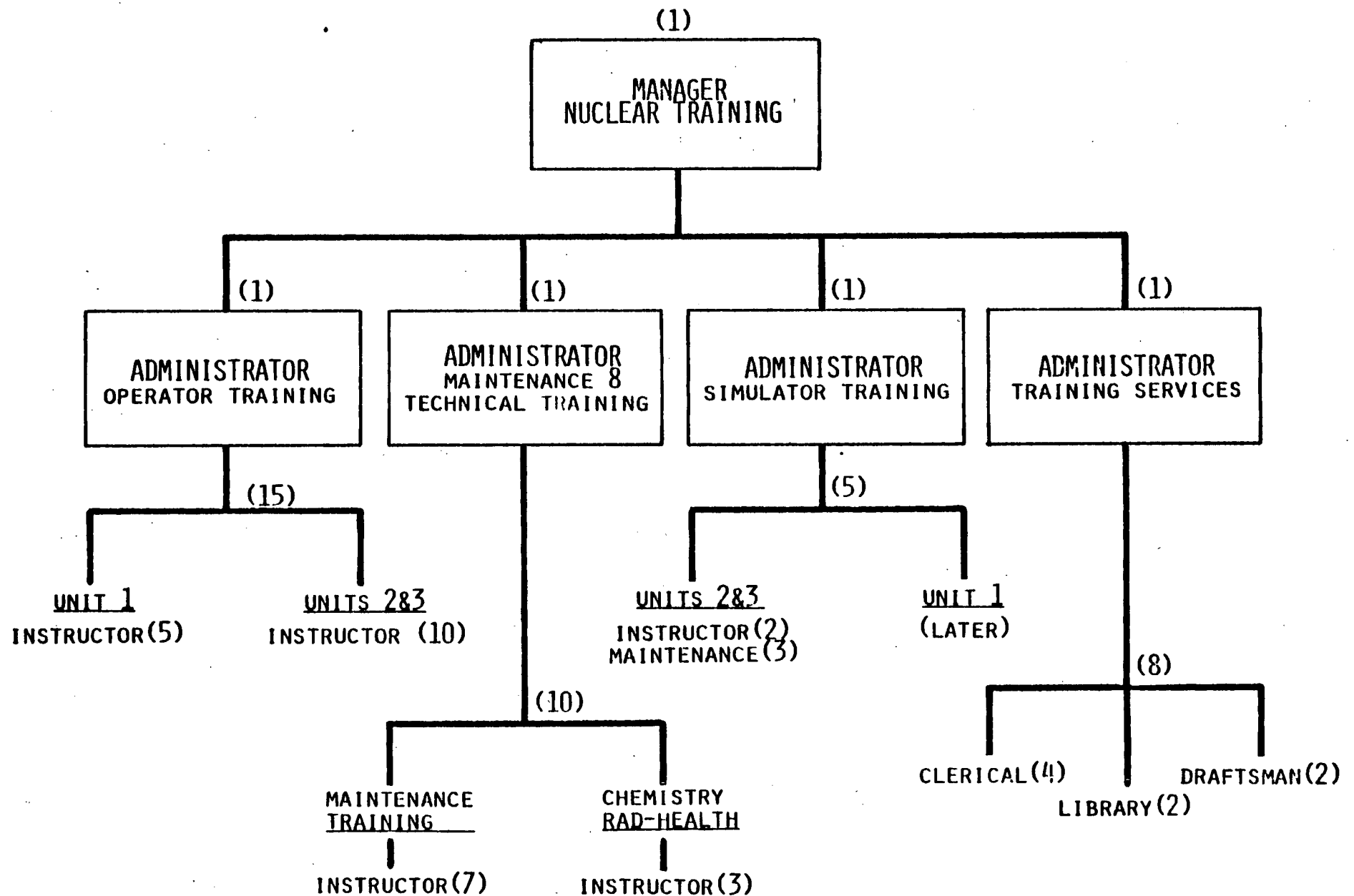


## TRAINING CONCEPTS (CONT'D)

### GENERAL TRAINING ASSUMPTIONS

- ALL NE&O TRAINING CONDUCTED/COORDINATED BY NUCLEAR TRAINING FACILITY
- NRC LEVIED TRAINING REQUIREMENTS WILL CONTINUE TO INCREASE
- NRC PARTICIPATION IN TRAINING AND CERTIFICATION WILL EXPAND
  - SIMULATOR EXAMS
  - ANNUAL REQUALIFICATION EXAMS
- NRC OR INPO ACCREDITATION OF TRAINING PROGRAMS WILL BE REQUIRED
- PLANT DRILLS WILL BE REQUIRED IN ADDITION TO SIMULATOR EXERCISES

## PROPOSED TRAINING DIVISION ORGANIZATION



# TRAINING DIVISION STAFF REQUIREMENTS (PRELIMINARY)

BILLET	AUTHORIZED	REQUIRED	REMARKS
MANAGER, NUCLEAR TRAINING	1	1	
TRAINING ADMINISTRATOR	3	5	
OPERATOR TRAINING INSTRUCTOR	9	15	<p>BASED ON 50 PERCENT PODIUM TIME FOR EACH INSTRUCTOR AND PROJECTED 2 YEAR SCHEDULE A TOTAL OF 20 INSTRUCTORS WILL BE REQUIRED UNTIL COMPLETION OF COLD LICENSING TRAINING FOR UNITS 2 &amp; 3 AND INCREASED MANNING REQUIREMENTS PROGRAM FOR UNIT 1. FIVE INSTRUCTORS WILL ULTIMATELY BE ASSIGNED TO THE SIMULATOR STAFF (ADMINISTRATOR, 2 INSTRUCTORS, 3 MAINTENANCE). FOURTEEN OPERATOR TRAINING INSTRUCTORS WILL BE REQUIRED FOR LONG TERM OPERATOR RETRAINING/ LICENSING TRAINING.</p>
MAINTENANCE TRAINING INSTRUCTORS	0	7	MECHANICAL - 3, ELECTRICAL/1 & C - 4
CHEMISTRY/RAD. HEALTH INSTRUCTOR	0	3	
RECORDS CLERK/TYPIST	2	4	<p>AN IMMEDIATE NEED EXISTS DUE TO A VERY LARGE BACKLOG OF TRAINING MATERIALS (LESSON PLANS, ETC.) TYPING. LONG TERM REQUIREMENTS INCLUDE:</p> <ol style="list-style-type: none"> <li>1 - GENERAL CORRESPONDENCE CLERK - TYPE LETTERS, MAINTAIN CORRESPONDENCE FILES, HANDLE PERSONNEL RECORDS (E.G. TIME CARDS ETC.)</li> <li>2 - TRAINING MATERIALS MAINTENANCE CLERKS - UPDATE AND MAINTAIN LESSON PLANS, STUDY GUIDES, EXAMS ETC.</li> <li>1 - TRAINING RECORDS CLERK - MAINTAIN RECORDS OF ALL PERSONNEL TRAINING.</li> </ol>

# TRAINING DIVISION STAFFING REQUIREMENTS (PRELIMINARY)

BILLET	AUTHORIZED	REQUIRED	REMARKS
LIBRARIAN	0	2	MAINTAIN TECHNICAL LIBRARY
DRAFTSMAN/PHOTOGRAPHER	0	2	DEVELOP TRAINING AIDS INCLUDING SYSTEM DIAGRAMS, COMPONENT DRAWINGS, SLIDES, TRANSPARENCIES, VIDEO TAPES, ETC.
SIMULATOR OPERATORS	0	5	2 - INSTRUCTORS 3 - MAINTENANCE/PROGRAMMING
<u>TOTALS</u>	<u>15</u>	<u>44</u>	

**NUCLEAR TRAINING DIVISION  
CURRENT STAFFING**

TRAINING MANAGER	- 1
TRAINING ADMINISTRATORS	- 4
INSTRUCTORS	- 9
TYPISTS CLERKS	- 3
CONTRACT PERSONNEL	- 5
TOTAL	22

**OUTSTANDING REQUISITIONS - 8**

# NUCLEAR TRAINING DIVISION

## STAFF SUMMARY

### INSTRUCTORS (9)

FORMER NAVY NUCLEAR TRAINING & EXPERIENCE	- 9	(86 MAN YRS)	
COLLEGE LEVEL ACADEMICS	- ASSOCIATES DEGREE GREATER THAN 50 CREDITS		- 2 - 3
SRO QUALIFICATION	- 2		
POWER PLANT EXPERIENCE	- 2 - 5 YRS - 5 5 - 10 YRS - 2		
TRAINING EXPERIENCE	- 2 - 5 YRS - 6 5 - 10 YRS - 3		

### TRAINING ADMINISTRATORS (4)

FORMER NAVY NUCLEAR TRAINING & EXPERIENCE	- 4	(29 MAN YRS)	
COLLEGE LEVEL ACADEMICS	- BS - 1 MS - 1 BA - 1		
SRO QUALIFICATION	- 2		
POWER PLANT EXPERIENCE	- 5 - 10 YRS - 4		
TRAINING EXPERIENCE	- 5 - 10 YRS - 4		

### TRAINING MANAGER (1)

FORMER NAVY NUCLEAR TRAINING AND EXPERIENCE	- 21 YEARS
EDUCATION	- BS DEGREE
POWER PLANT EXPERIENCE	- 24 YEARS
TRAINING EXPERIENCE	- 11 + YEARS

## TRAINING FACILITIES SUMMARY

### o CURRENT FACILITIES

- 10 WIDE TRAILER (7 CLASSROOMS)
- TRIPLE WIDE TRAILER, UNITS 2 & 3 STARTUP (2 CLASSROOMS)
- MAINTENANCE TRAINING CLASSROOM (1 CLASSROOM)
- DOUBLE WIDE TRAILER, RESERVOIR MESA (2 CLASSROOMS)

### o ADDITIONAL FACILITIES AUTHORIZED

- TRIPLE WIDE TRAILER UNITS 2 & 3 STARTUP (2 CLASSROOMS)

### o ADDITIONAL FACILITIES PLANNED

- TRAINING CENTER (APPROX. 60,000 FT<sup>2</sup>) CONTAINING:
  - EOF
  - SIMULATOR
  - LABORATORIES FOR MAINTENANCE AND TECHNICAL TRAINING
  - CLASSROOMS

CURRENT  
COLD LICENSE  
TRAINING PROGRAM

o	REACTOR THEORY	(14 wks)	(c)
o	C.E. NSSS LECTURE SERIES	( 5 wks)	(c)
o	PRIMARY/SECONDARY PLANT SYSTEM	(20 wks)	(c)
o	TEST REACTOR (SOME)	( 1 wk)	(c)
o	C.E. COLD LICENSE SIMULATOR TRAINING	(2-5 wks)	(c)
o	C.E. HEAT TRANSFER, FLUID FLOW	( 2 wks)	(c)
o	C.E. CORE DAMAGE MITIGATION	( 1 wk)	(c)
o	COLD LICENSE INTENSIVE REVIEW		
	- REACTOR THEORY, OPERATING CHARACTERISTICS	( 3 wks)	(c)
	- EMERGENCY PROCEDURES	( 2 wks)	
	- FACILITY DESIGN	( 2 wks)	
	- INSTRUMENTS & CONTROLS	( 2 wks)	
	- SAFETY AND EMERGENCY SYSTEMS	( 2 wks)	
	- FUEL HANDLING & CORE PARAMETERS	( 1 wk)	
	- RADIATION CONTROL & SAFETY	( 1 wk)	
	- ADMINISTRATION	( 1 wk)	
o	FIRE BRIGADE	( 1 wk)	(p)
o	SUPERVISORY SKILLS	( 2 wks)	(p)



UNITS 2 & 3 COLD LICENSE GROUP  
EXPERIENCE SUMMARY  
(31 PERSONNEL)

PREVIOUSLY LICENSED - SRO - 7  
RO - 1

POWER PLANT EXPERIENCE - 2- 5 YRS 22  
5-10 YRS 2  
10-20 YRS 6  
GREATER THAN 20 YRS 1

FORMER NAVY NUCLEAR  
TRAINING & EXPERIENCE - 20

COLLEGE LEVEL ACADEMIC - 30- 60 CREDITS - 8  
60- 90 CREDITS - 2  
90-120 CREDITS - 3  
DEGREE - 2

## SUMMARY OF PERSONNEL CURRENTLY IN TRAINING

### o NPEO

- UNIT 1 - 14
- UNITS 2 & 3 - 59

### o COLD LICENSE REVIEW - 31

### o STA

- UNIT 1 - 5
- UNITS 2 & 3 - 6

### o RADIATION HEALTH - 100/WEEK

### o MAINTENANCE - 20/WEEK (MINIMUM)

### o OPERATOR RETRAINING - 30 (UNIT 1)

### o MISCELLANEOUS - 10/WEEK

# MAN HOURS OF TRAINING ACCOMPLISHED

AT            SAN            ONOFRE

JUL 80 -	4520
AUG 80 -	6120
SEP 80 -	5960
OCT 80 -	6760
NOV 80 -	15478
DEC 80 -	7709
JAN 81 -	7656
FEB 81 -	9760

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TOTAL	63963
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APPROXIMATELY 12,000 MAN HOURS PER MONTH  
IS PREDICTED THROUGH JUNE, 1981.

Ref. to I A. 1.1

**Southern California Edison Company**

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ROSEMEAD, CALIFORNIA 91770

J. G. HAYNES  
MANAGER OF NUCLEAR OPERATIONS

December 30, 1980

TELEPHONE  
(213) 572-1742

D. G. Eisenhower, Director  
Division of Licensing  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D. C. 20555

**TMI ACTION PLAN REQUIREMENT  
SHIFT TECHNICAL ADVISOR**

Dear Sir:

Your letter of clarification dated October 31, 1980 provided confirmation that Shift Technical Advisors (STA's) were required to complete all training in accordance with the October 30, 1979 correspondence by January 1, 1981. The letter also requested additional information as specified in the following:

**REQUIREMENT**

Provide a description of the STA Training Program and plans for requalification training.

**RESPONSE**

The San Onofre Nuclear Generating Station "Shift Technical Advisor Training and Requalification Program" dated December 1980 is attached which describes the program.

**REQUIREMENT**

Describe the level of training which STA's have attained by January 1, 1981 and demonstrate conformance with the qualification and training criteria in the October 30, 1979 letter.

**RESPONSE**

Five Shift Technical Advisor candidates were assigned to the San Onofre STA Training Program in May, 1980 and have been fully committed to this endeavor since that time.

Dugger  
8101060513  
~~8101060513~~

RESPONSE (Continued)

Each candidate possesses a Bachelor of Science Degree in either Engineering or Physics and have past nuclear experience varying from one to four years.

Since entering the STA Training Program, the candidates technical education has been enhanced by general and specific training in Heat Transfer, Fluid Flow, Thermodynamics, Core Damage Mitigation, Nuclear Power Plant Chemistry (including Radio-Chemistry) and Reactor Physics.

Reactor Operations training has been provided which included details of Nuclear Steam Supply Systems, Balance of Plant Systems and Instrument Systems. Administrative and Regulatory Controls and Plant Procedures have similarly been topics of the program.

A comprehensive Nuclear Plant Simulator course was attended at the TVA Power Operations Training Center and Transient and Accident Operations have been analyzed.

All students participated in the Nuclear Power Reactor Safety Program at the Massachusetts Institute of Technology.

The qualifications of the incumbent STA's meet the intent of the October 30, 1979 correspondence and para- graphs A.1, 2 and 3 of Enclosure 2 to the September 13, 1979 letter in that:

1. All STA's possess a college level education in engineering or science subjects and have received training in reactor operations both normal and off normal.
2. The accident assessment function and the operating experience function will both be served by the STA, therefore, cognizance of evaluations of operating experience will be satisfied.
3. The technical education of the STA's include basic college subjects of Mathematics, Reactor Physics, Chemistry, Materials, Reactor Thermodynamics, Fluid Mechanics, Heat Transfer and Electrical Engineering. These subjects were also reviewed during STA training sessions emphasizing plant specific technology.

RESPONSE (Continued)

4. The STA's have received training in the details of the design, function, arrangement and operation of plant systems.
5. The STA's have received transient and accident response training that included simulated transients of moderate frequency and infrequent or limiting faults. Plant specific review of transients and accident scenarios has also been conducted.

San Onofre Unit 1 is presently at cold shutdown and is expected to remain in this condition until early 1981. It is, therefore, the intent to continue training of the present STA's through the first quarter of 1981.

REQUIREMENT

Provide a description of the long-term STA Program. Include qualification, selection criteria, training plans and plans, if any, for the eventual phase-out of the STA Program. Include a comparison of the San Onofre Program with the INPO document entitled "Nuclear Power Plant Shift Technical Advisor - Recommendations for Position Description, Qualifications, Education and Training" dated April 30, 1980.

RESPONSE

Long term plans for Shift Technical Advisor utilization at San Onofre have not been finalized. However, in concept, we expect the STA function to remain in effect for the foreseeable future.

This being the case, our selection process will require that a STA candidate possess a bachelors degree in a science or engineering discipline.

It is our plan, that whenever possible, the STA category will be the entry level position into the Plant Engineering group. Then, after approximately nine months of training and two years in the STA assignment, the incumbent would rotate into duties customarily performed by engineers and a new STA would be started on tour.

D. G. Eisenhut  
December 30, 1980  
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RESPONSE (Continued)

While performing duties as a STA, (i.e. during tours of duty on shift) the STA would report to the Supervising Engineer, bypassing the normal operations chain of command.

Training of STA's will be in accordance with the "Shift Technical Advisor Training and Requalification Program" (attached) or as amended.

A comparison of the San Onofre STA training and requalification program with the INPD document described above indicates that the San Onofre program generally meets or exceeds INPD guidelines relative to training. The San Onofre selection process will also result in meeting or exceeding the education requirements of the INPD Document.

We believe the San Onofre Program as described meets or exceeds the INPD recommendation for education and experience.

J. G. HAYNES

Attachment

V. Essner  
given to R. Dietch 12-8-80

December 8, 1980

Manager of Nuclear Operation  
Plant Manager, San Onofre Nuclear Generating Station  
Superintendent, San Onofre Unit 1  
Supervisor of Plant Operations, San Onofre Unit 1  
Operating Shift Personnel, San Onofre Unit 1

Shift Supervisor Responsibilities  
San Onofre Nuclear Generating Station  
Unit 1

This directive is intended to define the primary management responsibility of the Shift Supervisor at San Onofre Unit 1 and establish his command duties. It is prepared specifically to meet the requirements of position 2.2.1.a of the NRC's Short Term Lessons Learned Task Force.

Division Order D-N-7 defines the authority and responsibilities of NRC licensed personnel, including the Watch Engineer. The primary management responsibility of the Watch Engineer is to assure the safe operation of the plant under all conditions on his shift. He shall direct the activities of licensed operators and shall assure that the unit is operated within the requirements of the license (including the Technical Specifications), NRC orders and Station Procedures.

It is the on-duty Watch Engineer's responsibility to determine the circumstances, analyze the cause and determine that operations can proceed safely before the reactor is returned to power after a trip or an unscheduled or unexplained power reduction. He has the authority to stop or defer any plant modification, test or maintenance activity which, in his own opinion, could jeopardize continued safe plant operation or the ability to shutdown and cool-down the plant.

The Watch Engineer's authority, responsibilities and duties are further defined in Operating Instruction S-0-4. This instruction has been reviewed to assure that no administrative functions that would detract from or that are subordinate to the responsibility for assuring safe plant operation are assigned to the on shift Watch Engineer.

The duties and responsibilities of the Shift Supervisor shall be reviewed on an annual basis and a similar directive issued.

  
Robert Dietch

JRT/sf

cc: NRC Region V