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APPENDIX 1C
RANCHO SECO PROJECT ENGINEERING STAFF

1.0 INTRODUCTION

The technical qualifications of the applicant to construct and operate the nuclear power plant have been presented in Section 1.6 and Section 12 of the Preliminary Safety Analysis Report (PSAR). The required plant operating staff, and the training of these personnel, has been discussed in detail in Section 12. This appendix will provide a detailed discussion of the non-operating or support engineering staff; including their acquisition, training and duties. The primary function of this staff during the design and construction phases of this plant will be quality assurance and quality control. After the plant is in operation, this staff will provide engineering support to the operating staff. Members of this staff will also serve on the Nuclear Operations Safety Review Committee. The acquisition and training program for this staff is designed to provide the required personnel to fulfill these objectives.

2.0 ACQUISITION OF PERSONNEL

Figure 1C-1 provides the acquisition and training schedule for the project engineering staff. Nine of the members shown are in the employ of the District at the present time. The remaining personnel will be employed at the approximate dates shown. This staff can be divided into two groups based on functions. The top four men shown on Figure 1C-1 are primarily concerned with licensing and administrative functions. Their background includes over eighty years of design, construction and operating experience in the electrical, nuclear and related fields. This group has also taken nuclear courses ranging from short seminars to regular college courses in reactor engineering and nuclear physics. The remaining fifteen engineers will be involved in design review, component testing, and construction follow.

This group can be subdivided into three sub-groups based on level of competence. The most competent or senior level engineers will include the plant supervisory staff, the plant analyst and the controls engineer scheduled for employment in mid 1968. The intermediate level engineers will include the four engineers on the District's staff at the present time, plus the project engineering staff engineers scheduled to be employed in 1968. The three engineers scheduled for employment during 1967 will be junior level and possess whatever training or background that might be required to compliment the existing staff at that time.

Senior level technical personnel will be employed first to provide immediate capability in the design review and construction follow-up areas. These personnel will also assist in the on-the-job training of the intermediate and junior level engineers. SMUD's personnel recruitment program is active and current indications are that required personnel will be available when they are needed. There are also approximately fifteen engineers in SMUD's existing Engineering, Construction,

and Operating Departments that will support this project, but will not be permanently reassigned. Consultant contracts will also be maintained throughout the design and construction period to provide expertise in those areas not adequately covered by the District personnel.

3.0 TRAINING OF ENGINEERING PERSONNEL

The training program can be divided into two categories; special courses and on-the-job training. The on-the-job training will be obtained by working with consultants, vendor engineers, Bechtel engineers and senior SMUD engineers and supervisors. Office facilities have been established at the Bechtel engineering office for SMUD engineering personnel.

The special courses that will be provided are shown on Figure 1C-1. The nuclear engineering course at Sacramento State College is a three-credit-per-semester course based on Glasstone and Sesonske's text, "Nuclear Reactor Engineering". The short courses listed are typical summer courses offered by the various universities. Course B consists of several short courses including one on containment design offered at the University of California in March 1968. The location for course C has not been determined at this time. The District will also send several engineers to the Massachusetts Institute of Technology short course on reactor safety either in 1968 or 1969. The 100-hour course on the Rancho Seco Reactor will be an engineering level course covering all phases of the plant design. This course will be similar to those courses conducted at Duke and Florida Power Corporation, but will be expanded to include more design information on the secondary system and environmental considerations. The steam plant experience, Course E, will be obtained at one of Pacific Gas & Electric's power plants. The detailed arrangements for this training have not been confirmed; however, the present program includes both fossil fired and nuclear power plant experience. The nuclear steam supply system (NSSS) course is the same course that will be offered our operating personnel and emphasizes component and plant operating characteristics. The instrumentation course referred to in G has not been completely defined at this time; however, it will be presented by Bailey Meter Company and will cover the primary plant instrumentation. Other courses covering the turbine-generator controls and other secondary systems will also be attended by one or more of the controls engineers.

The health-physics and fuel management courses will be obtained at one of the colleges or national laboratories. Two or more of these courses are usually offered each year. The time and location will be determined when the needs of the particular employees are known.

4.0 FUNCTIONS OF ENGINEERING PERSONNEL

As stated earlier, the primary function of this staff during the design and construction phases of this plant will be in the quality assurance and quality control areas. This staff will review design specifications and drawings, inspect equipment during fabrication and inspect equipment and field work during construction. Assistance and/or instructions will be

obtained from specialists in the various fields as required. The plant will be divided into four main areas with a group of engineers assigned to each area.

The nuclear systems will initially be assigned to the plant superintendent, who has a master degree in nuclear engineering and over ten years of experience in the design, construction and operation of nuclear facilities. Two more nuclear engineers will be added to the engineering staff in 1968 and 1969 for assistance in this area. The first one, scheduled for employment in late 1968, will have experience in the core physics and reactor safeguards areas. The second nuclear engineer will either have the required background or be trained in those areas not covered adequately by the existing staff. Both men will work closely with the plant superintendent, Bechtel nuclear engineers, and Babcock & Wilcox engineers in the performance of their duties and in the continuance of their education.

The balance of plant or non-nuclear systems will be assigned to the plant technical supervisor. He will have a strong background in this area with a minimum of ten years experience in conventional steam plants and/or nuclear facilities. The first balance of plant engineer employed for the engineering staff will have five to seven years steam plant experience. He will compliment the background of the plant technical supervisor and assist in this area as soon as he is employed. Two more balance-of-plant engineers will be employed and trained in 1969 to adequately cover this area. The experience requirements for these engineers will be determined at that time. These engineers will also work closely with Bechtel and vendor technical personnel.

The instrumentation and controls area will be handled by a group headed by the controls engineer scheduled for employment in mid 1968. This engineer will have from five to ten years experience in the nuclear instrumentation and controls field. He will be assisted by two systems and controls engineers that are currently in the District's Engineering Department and are receiving additional training in the nuclear field. The plant analyst and operations supervisor will also contribute in this area. These men will both be senior personnel with a minimum of ten years experience in the steam plant and nuclear fields. They will provide a significant contribution in the equipment-operator interface design area and also assist in the training of the junior engineers. All personnel in the group will work with Bechtel and vendor engineers.

The civil-structural area of the plant will be the prime responsibility of an existing structural engineer in the District's Construction Department. He has over five years of design and construction experience and is currently taking several nuclear and structural design courses. He will be assisted by a second structural engineer scheduled for employment during 1968. The second engineer will have approximately five years experience in the structural-civil field. Both of these engineers are scheduled for additional courses and will work closely with Bechtel engineers and consultants during the design and construction of this plant.

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5.0 SUMMARY

This recruitment and training program will provide the District with a strong nuclear engineering staff both during construction and when the plant becomes operational. This staff will assure the District that an effective quality assurance and quality control program exists during design and construction, and that the plant will be operated safely and efficiently throughout its operating life.

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ENGINEERING STAFF

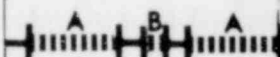
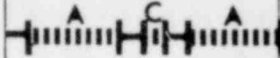
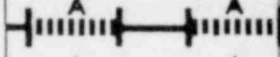
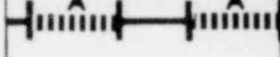
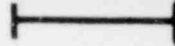


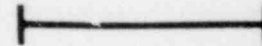
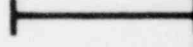
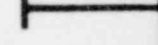
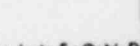
- PROJECT MANAGER
- PROJECT ENGINEER
- SYSTEMS PLANNING ENGINEER
- ASSISTANT MANAGER OF OPERATIONS
- STRUCTURAL ENGINEER (CIVIL)
- CONTROLS ENGINEER (ELECTRICAL)
- SYSTEMS ENGINEER (ELECTRICAL)
- TRANSMISSION ENGINEER (ELECTRICAL)
- CONTROLS ENGINEER (ELECTRICAL)
- BALANCE OF PLANT ENGINEER (MECHANICAL)
- NUCLEAR SYSTEMS ENGINEER (NUCLEAR)
- STRUCTURAL ENGINEER (CIVIL)
- BALANCE OF PLANT ENGINEER (MECHANICAL)
- NUCLEAR SYSTEMS ENGINEER (NUCLEAR)
- BALANCE OF PLANT ENGINEER (CHEMICAL)

PLANT OPERATING STAFF

- PLANT SUPERINTENDENT
- TECHNICAL SUPERVISOR
- PLANT ANALYST
- OPERATIONS SUPERVISOR

LEGEND

- A - NUCLEAR ENGR. COURSE AT SACRAMENTO STATE COLLEGE
- B - SHORT COURSE ON SEISMIC DESIGN AT COLLEGE
- C - SHORT COURSE ON CONTRCLS THEORY AT COLLEGE
- D - 100 HR. COURSE ON RANCHO SECO NUCLEAR POWER PLANT AT SMUD (BY BECHTEL & B & W)
- E - STEAM PLANT OBSERVATION
- F - 100 HR. COURSE ON RANCHO SECO NUCLEAR POWER PLANT AT SMUD (BY SMUD)
- G - COURSE ON NSSS BY B & W AT LYNCHBURG (INCLUDES INTRODUCTION TO SIMULATOR) PLUS INSTRUMENTATION COURSE
- H - COURSE ON NSSS BY B & W AT LYNCHBURG (INCLUDES INTRODUCTION TO SIMULATOR)
- I - HEALTH-PHYSICS COURSE
- J - FUEL MANAGEMENT

PRESENT STATUS	1968
	J F M A M J J J A S O N D
SMUD ENG DEPT	_____
↕	_____
SMUD ENG DEPT	_____
SMUD OPER DEPT	_____
SMUD ENG DEPT	
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SMUD ENG DEPT	
TO BE HIRED AS NOTED	
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TO BE HIRED AS NOTED	
SMUD OPERATING DEPT	
TO BE HIRED AS NOTED	
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TO BE HIRED AS NOTED	
	1968
	J F M A M J J J A S O N D

