PUBLIC SERVICE ELECTRIC AND GAS COMPANY

# AN OVERVIEW OF PSE&G TECHNICAL QUALIFICATIONS AND MANAGEMENT CAPABILITY IN SUPPORT OF THE OPERATION OF HOPE CREEK GENERATING STATION

JULY 1984

TABLE OF CONTENTS

## 1.0 INTRODUCTION

This document provides a detailed description of the nuclear organization of Public Service Electric and Gas Company (PSE&G) and its management philosophy, programs and practices that provide the management capability and technical qualifications to ensure the safe and reliable operation of the Hope Creek Generating Station.

Recognizing the critical importance of centralized management direction and control of the operations, maintenance and support functions of its nuclear facilities, PSE&G established the Nuclear Department at the site of its nuclear plants. A nuclear organization has been developed that assures management effectiveness and is compatible with the latest regulatory and industry guidance.

At the station level, management effectiveness is being attained through the establishment of clear lines of station management responsibility, accountability and authority and through the development, documentation and implementation of station programs and processes.

To assure that the Hope Creek Station Operations staff have appropriate experience and qualifications, a plan for staffing and qualifying operations and maintenance personnel has been developed which is consistent with NRC regulations, industry operating experience and good practices. PSE&G has committed to, and invested in, a comprehensive training program which is described in this report. The Program will not only train operating personnel to meet the technical qualifications which are required by the NRC and consistent with industry operating experience and good practices, but also will provide training for managers and supervisors to continually increase their effectiveness.

This report discusses PSE&G's design for management capability in the Nuclear Department in general and in the Hope Creek Operations Department in particular. It delineates staffing plans, training programs and specific existing experience that PSE&G will use to insure it has appropriate technical and managerial resources to safely and efficiently operate the Hope Creek Generating Station.

## 2.0 PSE&G NUCLEAR ORGANIZATION

PSE&G has developed an organizational structure which enhances management effectiveness and ensures the safe and efficient operations of the Hope Creek Generating Station.

In Section 2.1 the company's management philosophy is discussed with emphasis on how PSE&G's commitment to strong centralized management of its nuclear facilities has been demonstrated by Nuclear Department actions and policy directives. The objectives of the recent reorganization of the Nuclear Department's senior management structure are also explained.

Section 2.2 describes how the revised senior management structure will increase the Nuclear Department's capacity to provide day-to-day senior management direction, coordination and control of all nuclear operations and support activities, while Section 2.3 examines the compatability of the revised organizational structure with NRC and INPO guidelines for utility management structure.

In Section 2.4, the responsibilities and authorities of key management roles are described as these relate to providing technical support for operations. The qualifications criteria for assignment of personnel to these key management roles are outlined in Section 2.5.

## 2.1 MANAGEMENT PHILOSOPHY AND STRUCTURE

PSE&G has long recognized the critical importance of ensuring centralized management direction and control of the operations, maintenance and support of its nuclear facilities. In July, 1981, the Company established its Nuclear Department and became one of the first companies in the nuclear industry to locate its Vice President - Nuclear and the entire Nuclear Department at the site of its nuclear plants.

By taking this innovative step, the Company accomplished two important objectives. First, it consolidated all of the organizations which provide technical and administrative support to the nuclear facilities at the same site on which all of the company's nuclear stations are physically located. This consolidated position enhances the Nuclear Department's abililty to coordinate on a routine basis concerning "lessons learned" and to address operating problems from a shared experience data base for all three units. With operations and operations support work groups physically accessible to each other, there is greater understanding of both day-to-day operational needs and technical/administrative support concerns. Timely informal communications between these various organizations result in more effective coordination and responsiveness to ensure maximum plant safety and reliability.

Secondly, the Vice President - Nuclear, the Company's senior nuclear manager, is also physically accessible to operations and operations support managers and is closely attuned to day-to-day plant operations and support activities. He is able to make informed, on-the-spot decisions as the need arises; to provide senior management direction and control of Department-wide programs; and to ensure that effective lines of authority and communication are established and maintained between work groups responsible for the operations, servicing and technical/administrative support of the nuclear facilities.

In addition to demonstrating its commitment to effective centralized management by locating the Nuclear Department on site, PSE&G has also demonstrated its commitment to safe and reliable nuclear operations management by establishing strong policy directives in those areas which affect nuclear safety and power production, and by requiring that all Company managers and personnel comply with these policies. Examples of such directives include the following:

NUCLEAR SAFETY

Nuclear safety is of the highest priority and shall take precedence over matters concerning power production. The employee's and the public's health and safety shall be the prime consideration in the conduct and support of Public Service Electric and Gas Company's nuclear activities and shall not be compromised.

All decisions which could affect health and safety shall be made conservatively. If significant questions or disagreements concerning nuclear safety matters arise, the Vice President - Nuclear shall make or concur in the final decision.

POWER PRODUCTION

The production of economical electricity to benefit the stockholders and customers of Public Service Electric and Gas Company is a principal purpose of the Company. Power production at Company nuclear generating facilities makes an important contribution to this goal. It shall be made clear to all personnel, however, that safety concerns come before power production at all times.

MANPOWER STAFFING AND TRAINING

A staff of sufficient size and qualification to support the safe and reliable operation of the nuclear plants shall be established and maintained. Position qualifications shall be established that are equal to or exceed those established by NRC or the American National Standards Institute (ANSI).

Training shall be adequate to assure that all persons with operating responsibility are fully qualified. All training programs shall meet or exceed industry standards.

SECURITY

Public Service Electric and Gas Company is fully committed to maintaining a program which is capable of countering threats which could lead to sabotage or loss of special nuclear materials.

All employees shall comply with the requirements of the security program and directions of guardforce personnel.

RADIATION PROTECTION

Nuclear plant design changes and operating and maintenance practices, shall be evaluated to assure that radiation exposure is As-Low-As-Reasonably-Achievable (ALARA). PSE&G is committed to the ALARA concept throughout all operating, maintenance and design activities.

REGULATORY AND LICENSING

Public Service Electric and Gas Company shall comply explicity with all regulatory requirements and commitments that are part of the plant operating licenses, Final Safety Analysis Reports and Technical Specifications.

QUALITY ASSURANCE

A Quality Assurance Program is an essential part of the PSE&G commitment to safe and reliable nuclear power operation. Applicable program requirements shall be strictly adhered to in the performance of activities covered by the Quality Assurance Program.

ENVIRONMENTAL MATTERS

The nuclear stations shall be operated in compliance with the Nuclear Regulatory Commission (NRC) requirements, and in accordance with commitments to other federal, state and local government agency requirements.

It shall be the policy of PSE&G to minimize station operating effects on the environment.

RADIOACTIVE WASTE

A vigorous policy to minimize the amount of radioactive waste generated at each nuclear plant shall be enforced. All efforts shall be made to minimize the amount of radioactive waste stored on site, consistent with current industry practice and license requirements.

PUBLIC INFORMATION

Information released to the public through various forms of the news media shall be done in a timely manner and in accordance with the policies and procedures developed within the Information Services Department.

REPORTS

Reports that are necessary to keep senior management informed on items pertinent to the safe, reliable, and efficient operation of Public Service Electric and Gas Company nuclear units shall be submitted on a timely basis.

As the Nuclear Department has developed over the past three years, it has become evident to the Company that the role of the Vice President - Nuclear is a far more complex and demanding one than was first envisioned. In addition to serving as a Corporate Officer, the Vice President - Nuclear has also been required to dedicate increasing time to performing external relations functions, including various types of interface with regulatory agencies and oversight groups, meetings with local government and community representatives, and participation in professional industry activities. All of these functions are important to the effectiveness of nuclear operations.

At the same time, however, the Nuclear Department is an expanding organization and demands full-time senior management direction and control. Recognizing this problem, and the number of functions reporting directly to the Vice President - Nuclear, PSE&G committed itself in September, 1983 to performing an in-depth analysis of the role(s) of the Vice President - Nuclear and his direct reports. The purpose of the analysis was to establish the most effective organizational structure possible to accomplish the following objectives:

1. Ensure full-time senior management oversight of all Nuclear Department activities while still allowing the Vice President - Nuclear to devote sufficient time and attention to other critical role demands;

2. Provide increased senior management coordination and control over functionally interdependent organizations;

3. Establish reporting structures which encourage improved communication and support among functionally interdependent work groups;

4. Accommodate any future consolidations or expansions of functions and, at the same time, maintain a stable organizational structure;

5. Assist key Nuclear Department managers in developing a Department-wide perspective, as opposed to a functional perspective only, and thus be more fully prepared for senior management positions.

The revised organizational structure which resulted from this analysis is depicted in Figure 2-1. For comparison purposes, the former Nuclear Department organization chart is also included in Figure 2-2. It is the intent of PSE&G to implement this revised Nuclear Department organization structure during the Fall and Winter of 1984.

FIGURE 2-1

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
REVISED NUCLEAR DEPARTMENT ORGANIZATION

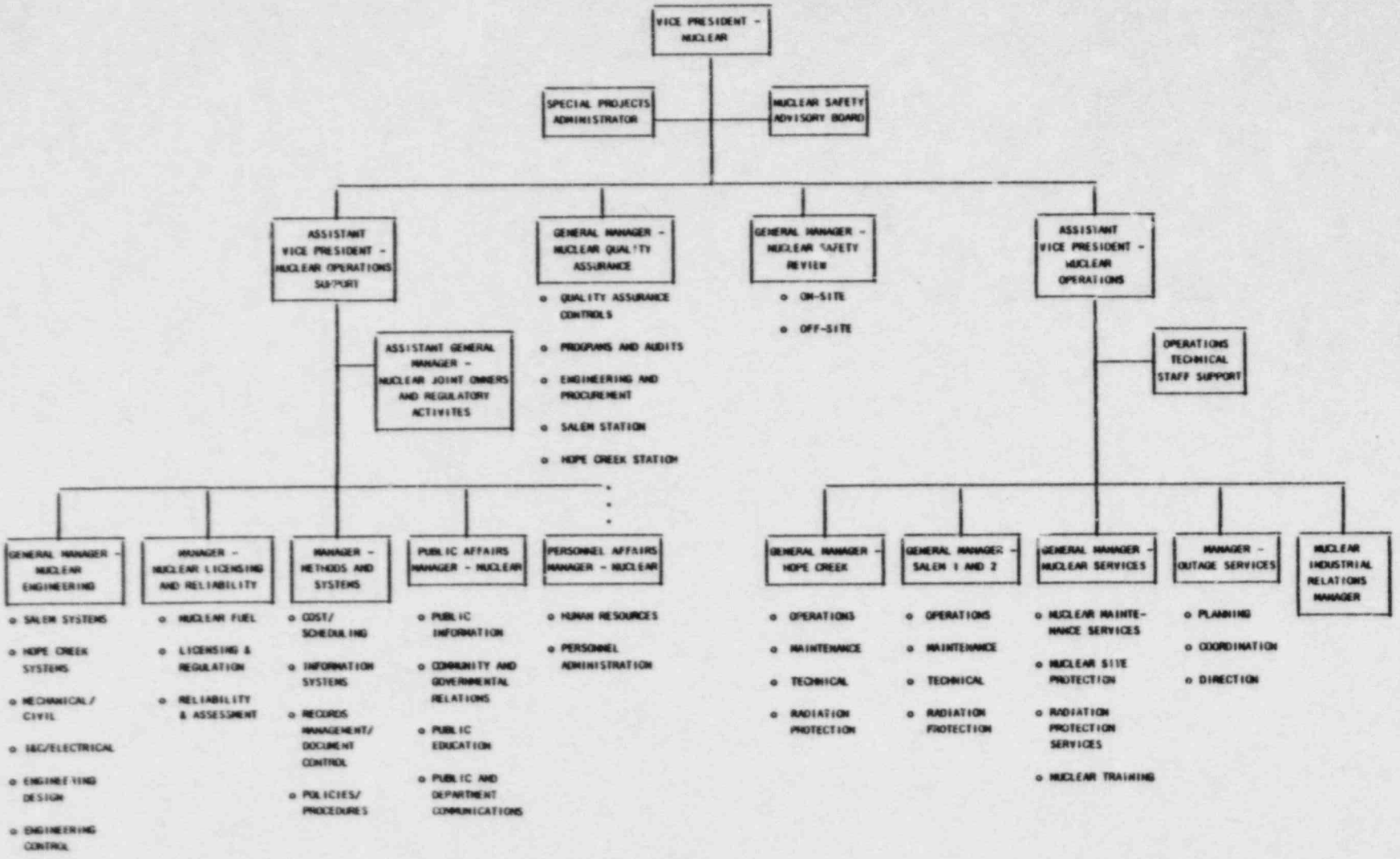
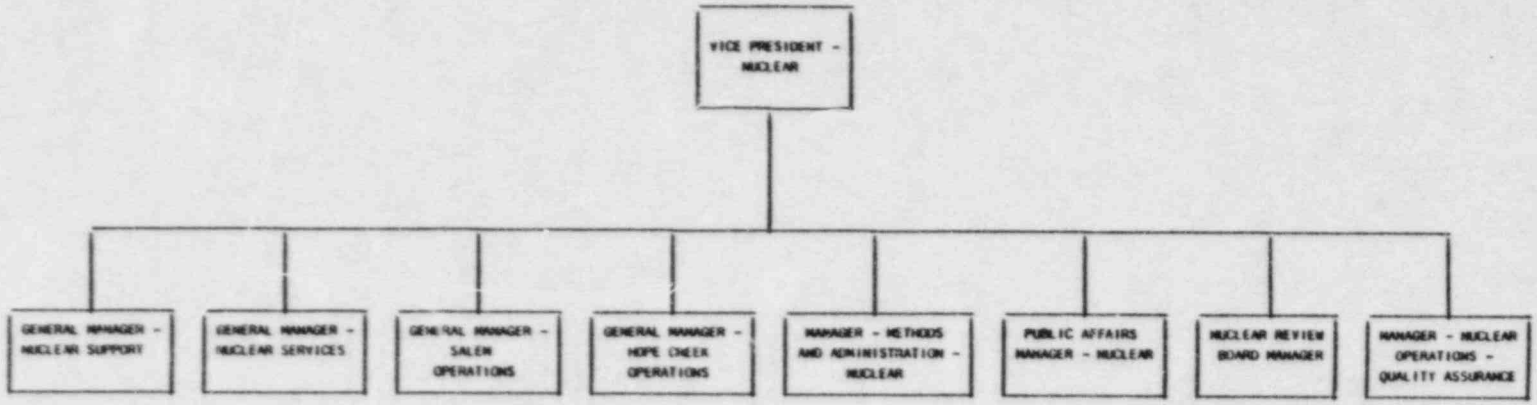


FIGURE 2-2

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
PRIOR NUCLEAR DEPARTMENT ORGANIZATION



## 2.2 NUCLEAR DEPARTMENT ORGANIZATION

By comparing the original and revised Nuclear Department organization charts it can be observed that the new Nuclear Department structure provides enhanced senior management direction and control by introducing a new level of day-to-day management authority at the Assistant Vice President level. Under the former organization, there were eight line managers reporting directly to the Vice President - Nuclear. Each of these direct reports was able to provide input for Nuclear Department planning, decision making and problem solving purposes, however, since many programs cut across functional boundaries it was difficult to focus complete attention to interface concerns. In the revised management structure, the Vice President - Nuclear has the assistance of two experienced senior managers to establish Nuclear Department plans, make decisions about program activities and address interface problems from a Nuclear Department-wide perspective.

In terms of the number and focus of the functions reporting to him, each Assistant Vice President has a more desirable span of control. All operations and maintenance functions are assigned to the Assistant Vice President - Nuclear Operations; all technical and administrative support functions are assigned to the Assistant Vice President - Operations Support. Each Assistant Vice President is responsible for ensuring effective functional management on the part of the line managers reporting to him, for ensuring timely coordination and responsiveness between operations and operations support work groups, and for resolving all interface concerns in support of effective Nuclear Department-wide programs.

The key functions of Quality Assurance and Nuclear Safety Review report directly to the Vice President - Nuclear. This structure allows independent authority in the execution of Nuclear Department-wide quality assurance and safety review activities and ensures ongoing senior management awareness and support of safety-related programs.

The innovative concept of a "senior management team" has been established. The Vice President, two Assistant Vice Presidents, and the General Managers of Quality Assurance and Nuclear Safety Review meet briefly at the beginning of each work day to review the operating status of the plants and to discuss any immediate interface or coordination concerns. A plan for addressing such concerns is developed and responsible senior managers then coordinate with their line managers to ensure timely and appropriate action. On a weekly basis, the senior management team meets to address more long-range program development and problem-solving concerns which require a Department-wide perspective.

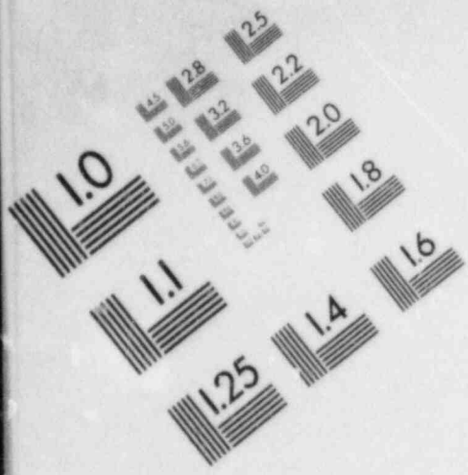
With the revised organizational structure and the introduction of the "senior management team" concept, PSE&G has ensured that the Company's philosophical commitment to strong centralized management of its nuclear facilities continues to be an operational reality.

## 2.3 COMPATABILITY WITH NRC/INPO ORGANIZATION GUIDANCE

The NRC NUREG-0731 "Guidelines for Utility Management Structure and Technical Resources" provides guidelines for staffing levels, technical expertise and personnel qualifications along with acceptable structures for both the utility corporate organization and the plant structure. All personnel, systems and organizations within the Nuclear Department conform to these guidelines.

To implement the basic guidelines set forth in NUREG-0731, the Institute of Nuclear Power Operations (INPO) has developed performance objectives and criteria for its use in evaluations and assistance visits related to corporate support of nuclear stations. The Nuclear Department and its generating stations are within the parameters of these guidelines.

Tables 2-1 and 2-2 outline point by point comparisons of the PSE&G Nuclear Department organization with the major NRC and INPO guidelines in the area of organization.

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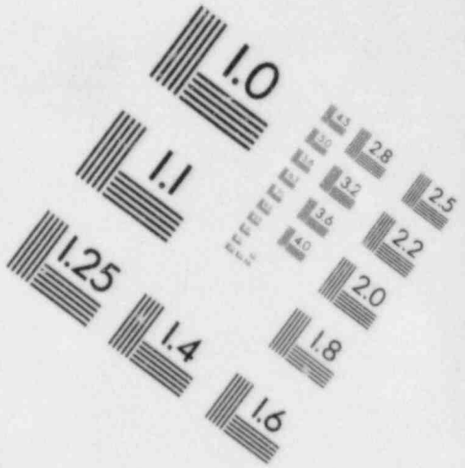


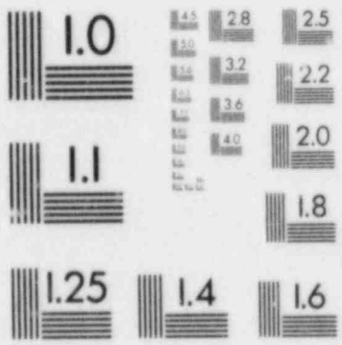


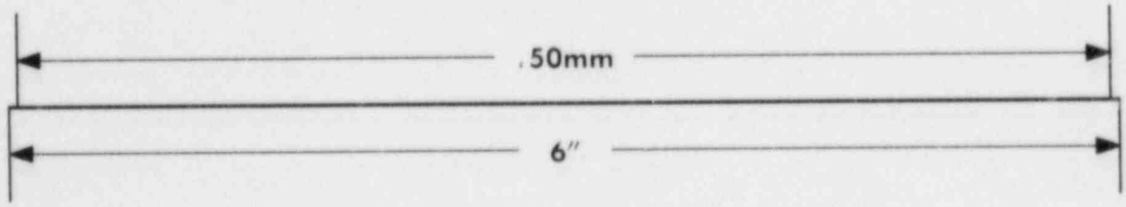


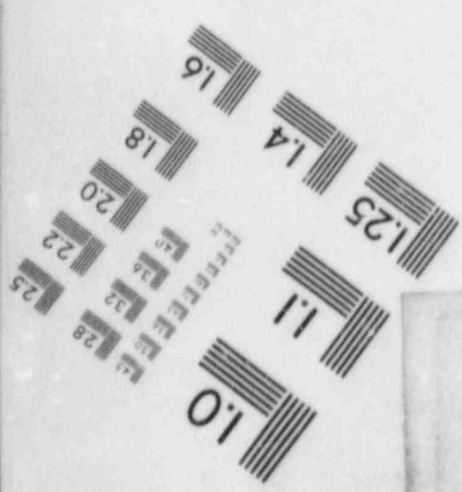


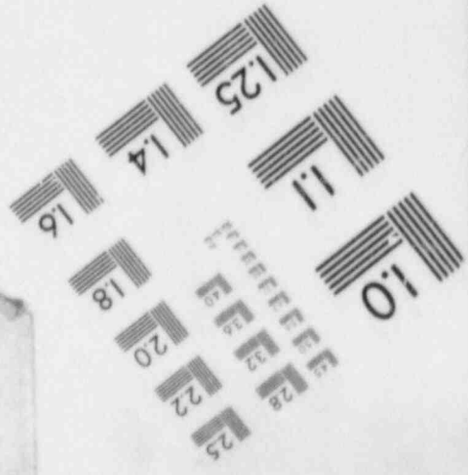

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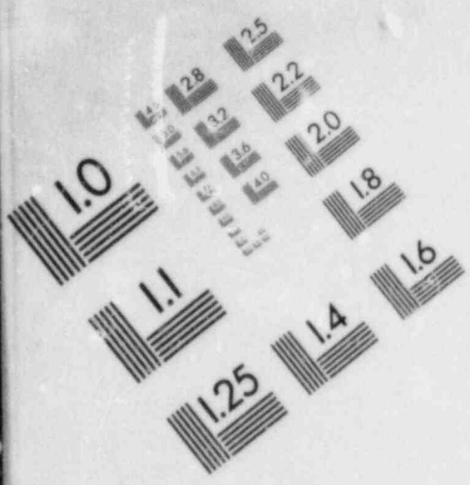
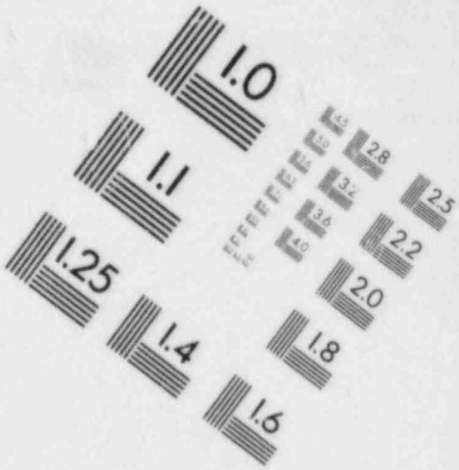
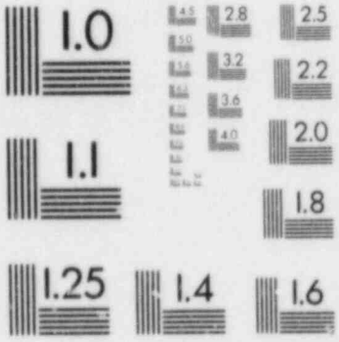
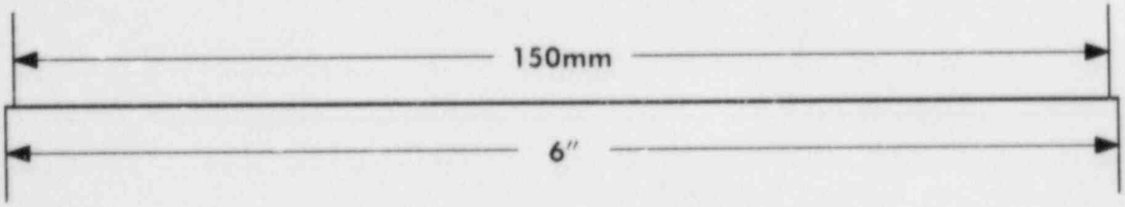
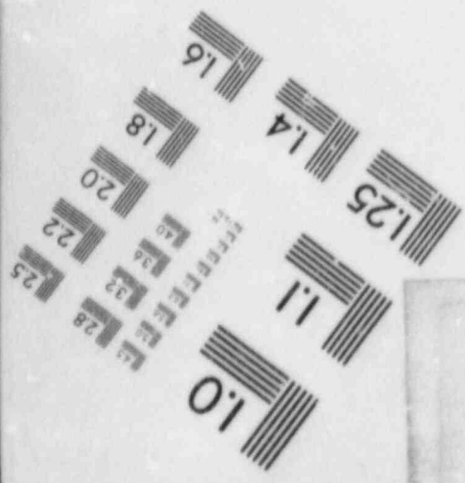


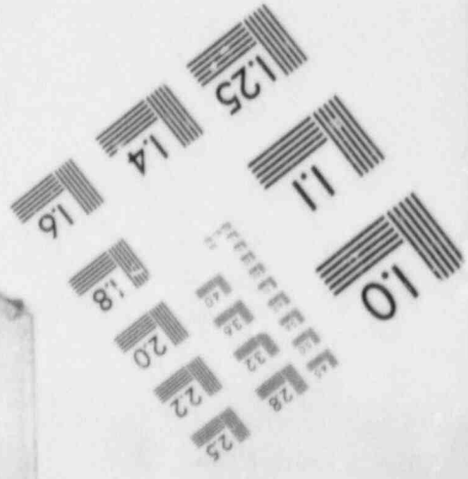



**TABLE 2-1**

**COMPARISON OF NUREG-0731 ORGANIZATIONAL GUIDELINES WITH THE PSE&G NUCLEAR DEPARTMENT ORGANIZATION**

| NUREG-0731 Guidelines for Organizational Structure | PSE&G Nuclear Department Organizational Features |
|---|---|
| Offsite Organization | |
| Key Characteristics | |
| .Integration of all necessary functional responsibilities under a single responsible head. | .The organization structure identified in Figure 2-1 shows that all significant functional responsibilities are under the Vice President-Nuclear. |
| .The assignment of responsibility for the safe generation of the nuclear power plant(s) to an upper level executive position | .The Vice President - Nuclear is a corporate officer |

**TABLE 2-2**

**COMPARISON OF INPO ORGANIZATIONAL GUIDELINES WITH THE PSE&G NUCLEAR DEPARTMENT ORGANIZATION**

| INPO Performance Objective and Criteria for Organizational Structure | PSE&G Nuclear Department Organizational Features |
|---|---|
| .The corporate organization is established in such a manner that functions, assignments and responsibilities of individuals are clearly defined and understood. | .The PSE&G Nuclear Department, through the organization structure, position descriptions, policies and procedures has established clearly defined functions, assignments and responsibilities. |
| .All major aspects of the Nuclear operation are covered with emphasis on management control of safety and reliability. | .VPN policy statement indicating emphasis on safety and reliability are outlined in previous pages of this document. |
| .Corporate level manager responsibilities are clearly defined for thirteen functional areas in support of nuclear station(s) activities. | .Managerial responsibilities have been defined for thirteen significant functional areas-see organizational chart. |
| .The Corporate manager assigned principal responsibility for the safe and reliable operation of the utilities nuclear station(s) has this as his primary responsibility and preferably is not assigned responsibilities other than nuclear plant operation and support. | .The Vice President - Nuclear as the Senior Nuclear Manager has no other significant responsibilities other than nuclear plant operations and support. |

**TABLE 2-2**
**(CONTINUED)**

| INPO Performance Objective and Criteria for Organizational Structure | PSE&G Nuclear Department Organizational Features |
|---|---|
| .The Senior Nuclear Manager has sufficient control over those areas assigned to managers who do not report to him to ensure safe and reliable operation of the station(s). | .The Vice President - Nuclear has all relevant functions either reporting to him directly or matrixed to him to operate and support Salem Station and Hope Creek Station. |
| .The Station Manager's relationship to the Senior Nuclear Manager is clearly understood and provides appropriate access and, when necessary, direct access to his position. | .There is only one managerial level between the Vice President - Nuclear and the two station managers. Direct access is available at any time. |
| .The Senior Nuclear Manager's relationship to higher corporate management, and ultimately to the CEO, is clearly understood and provides appropriate access and, when necessary, direct access to these positions. | .The Vice President - Nuclear has direct access to the CEO at any time the Vice President - Nuclear deems it necessary. |

## 2.4 TECHNICAL SUPPORT FOR OPERATIONS

The Vice President - Nuclear, as the company's senior nuclear manager, provides the overall management direction and control for all Nuclear Department programs and activities related to the operations, maintenance and technical and administrative support of the company's operating nuclear plants as shown in Figure 2-1 and as described below.

a. Assistant Vice President - Nuclear Operations. The Assistant Vice President - Nuclear Operations provides the day-to-day direction and control of the Nuclear Operations functions directly related to plant operations, maintenance, outage management and industrial relations.

b. Assistant Vice President - Nuclear Operations Support. The Assistant Vice President - Nuclear Operations Support provides the day-to-day direction and control of the support functions necessary for the safe and reliable operation of the plants including engineering, licensing and reliability, nuclear fuel technology, methods and systems, public affairs, and personnel affairs.

c. General Manager - Nuclear Quality Assurance. The General Manager - Nuclear Quality Assurance provides the day-to-day direction and control of functions which assess the safe operation of the nuclear stations, quality of work performed by support personnel and compliance of all departments with QA program requirements, regulatory commitments and other company and governmental policies and regulations.

d. General Manager - Nuclear Safety Review. The General Manager - Nuclear Safety Review provides management direction and control over on-site and off-site independent safety review functions, including technical staff work for the Nuclear Safety Advisory Board, an independent committee which provides an overview of Nuclear Department operations for the Vice President - Nuclear.

e. General Manager - Nuclear Engineering. The General Manager - Nuclear Engineering directs and controls engineering services for operating nuclear plants; provides engineering services for plant modifications and operations/maintenance activities; establishes criteria and specifications for systems and equipment performance; directs and oversees the performance of safety evaluations on all design changes and abnormal plant occurrences.

f. Manager - Nuclear Licensing and Reliability. The Manager - Nuclear Licensing and Reliability directs and controls all nuclear licensing, fuel design and reliability assessment activities to support operating nuclear plants; coordinates regulatory and environmental program activities and all company involvement with regulatory agencies.

g. General Manager - Hope Creek Operations. The General Manager - Hope Creek Operations is the senior manager located within the nuclear station and provides management direction and control for the safe and efficient operations of the station.

h. General Manager - Nuclear Services. The General Manager - Nuclear Services directs and controls all nuclear service functions which include maintenance services, training, site protection, radiation protection services, procurement and material control, and emergency preparedness.

i. Manager - Method and Systems. The Manager - Method and Systems directs and controls the development and implementation of effective Nuclear Department-wide services for information systems, cost and scheduling methods, records management systems and the promulgation of Nuclear Department policies and procedures.

j. Public Affairs Manager - Nuclear. The Public Affairs Manager - Nuclear is responsible for the management and direction of public affairs activities for the Nuclear Department and for the preparation, updating and sign-off of the public information section of the emergency plan. Presents the Company's position on relevant public policy or legislative issues.

k. Personnel Affairs Manager - Nuclear. The Personnel Affairs Manager - Nuclear directs and controls the human resources and administration functions for the Nuclear Department which include employee benefits, medical services, employment and placement, equal opportunity activities, employee compensation, management resource development, personnel development, personnel administration and administrative services.

l. Manager - Outage Services. The Manager - Outage Services is responsible to manage, direct and control the outage committee in all matters related to the planning, scheduling, conduct and control of outages. Responsible to minimize the outage duration with good management and safety practices and to assure that outage activites are in compliance with facility license, Company and governmental regulations.

m. Nuclear Industrial Relations Manager. The Nuclear Industrial Relations Manager is the chief interpreter and spokesman for the Nuclear Department on all matters pertaining to Company/Union agreements and management labor relations, and ensures consistent Nuclear Department-wide adherence to Company/Union agreements and good labor relations practices.

n. Assistant General Manager - Joint Owners and Regulatory Affairs. The Assistant General Manager - Joint Owners and Regulatory Affairs serves as the chief coordinator and spokesperson for the Nuclear Department on aspects of Nuclear Department activities involving Co-owners and State regulatory bodies; assists in the preparation for rate case proceedings; and testifies for the Nuclear Department before the New Jersey Board of Public Utilities and other similar regulatory agencies.

o. Special Projects Administrator. The Special Projects Administrator provides technical research, writing, liaison and special projects assignments for the Vice President - Nuclear; investigates and reviews nuclear industry and regulatory concerns and recommends appropriate Company responses to the Vice President.

p. Operations Technical Staff Support. The Operations Technical Staff Support provide the Assistant Vice President - Nuclear Operations with technical review of operations related concerns and handles special inquiries and projects regarding technical operation functions or interfaces.

q. Nuclear Safety Advisory Board. The Nuclear Safety Advisory Board is a senior level management oversite committee. It is charged with providing an overview of the company's nuclear safety program; reviewing the policies and processes to identify issues or trends requiring management attention; and advising the Vice President accordingly.

## 2.5 QUALIFICATIONS

For staffing the technical support organization PSE&G uses qualification requirements similar to those of other major engineering firms. These requirements consist primarily of appropriate academic training and substantive work experience in relevant areas, including college degrees or the equivalent training and, for management positions, experience in progressively responsible supervisory positions. In certain instances, exceptions to the standard qualification requirements are made for technicians who, by virtue of formal education, training programs, or experience have acquired special expertise in particular areas. In keeping with responsible management practices, the capabilities of individuals and the degree of supervision required are appropriately considered in making personnel assignments.

a. Vice President - Nuclear. The Vice President - Nuclear shall hold a bachelors degree in engineering or a related technical discipline generally associated with power production; have training in nuclear science, nuclear power plant operations and maintenance; and have a minimum of eighteen years of progressively more responsible power plant experience, of which at least eight years shall be experience in nuclear power generation and/or related nuclear fields. In addition, the Vice President - Nuclear shall be familiar with regulatory requirements and applicable codes and standards.

b. Assistant Vice President - Nuclear Operations. The Assistant Vice President - Nuclear Operations shall hold a bachelors degree in engineering, science or a related technical discipline generally associated with power production, and have at least sixteen years of experience in progressively more responsible positions in power plant engineering, construction or operation. A minimum of eight years of this experience shall consist of providing day-to-day direction and control of nuclear operation functions directly related to plant operation, maintenance, and/or outage management. In addition, the Assistant Vice President - Nuclear Operations shall be familiar with regulatory requirements, applicable codes and standards and good industrial relations practices.

c. Assistant Vice President - Nuclear Operations Support. The Assistant Vice President - Nuclear Operations Support shall hold a bachelors degree in engineering, science, or a related technical discipline generally associated with power production, and have a minimum of sixteen years of experience in progressively more responsible positions in power plant engineering,

construction or operation. A minimum of eight years of this experience shall consist of providing day-to-day direction and control of nuclear power plant construction, engineering, or plant operating functions. In addition, the Assistant Vice President - Nuclear Operations shall be familiar with regulatory requirements and applicable codes and standards.

d. General Manager - Nuclear Quality Assurance. The General Manager - Nuclear Quality Assurance shall hold a bachelors degree in engineering or science, and have at least fourteen years of experience in progressively more responsible positions in power plant engineering, construction, operation, or quality assurance. A minimum of seven years of this experience shall be in nuclear power plant construction, engineering, quality assurance or plant operation experience. Familiarity with regulation requirements and applicable codes and standards is required.

e. General Manager - Nuclear Safety Review. The General Manager - Nuclear Safety Review shall hold a bachelors degree in engineering, science, or a related technical discipline generally associated with power production and have at least fourteen years of experience in progressively more responsible positions in power plant engineering, construction, operation, or quality assurance. A minimum of seven years of this experience shall be in nuclear power plant construction, engineering, quality assurance or plant operating experience.

f. General Manager - Nuclear Engineering. The General Manager - Nuclear Engineering shall hold a bachelors degree in engineering or science, be a licensed Professional Engineer, and have at least fifteen years experience in progressively more responsible positions in power plant engineering, construction or operation. A minimum of seven years of this experience shall be in nuclear plant construction, engineering, or plant operating experience. In addition, the General Manager - Nuclear Engineering shall be familiar with regulatory requirements and applicable codes and standards.

g. Manager - Nuclear Licensing and Reliability. The Manager - Nuclear Licensing and Reliability shall hold a bachelors degree in engineering or science and have at least ten years of experience in power plant engineering, construction, quality assurance or operations. A minimum of five years of this experience shall be nuclear power plant construction, engineering, or plant operating experience. In addition, the Manager - Nuclear Licensing and Reliability shall be familiar with regulatory requirements, the regulatory process, overall plant operation, applicable codes and standards, and quality assurance functions.

h. General Manager - Salem Operations. The General Manager - Salem Operations or the Assistant General Manager - Salem Operations shall hold a bachelors degree in engineering or a related science, hold an NRC Senior Operator License,(or have held a license for a similar unit or been certified at the plant or at an appropriate simulator), and shall have at least fifteen years of experience in progressively more responsible positions in power plant engineering, construction, operation, or quality assurance. A minimum of three years of this experience shall be nuclear power plant operating experience.

i. General Manager - Hope Creek Operations. The General Manager - Hope Creek Operations or the Assistant General Manager - Hope Creek Operations shall hold a bachelors degree in engineering or a related science and hold an NRC Senior Operator License,(or have held a license or been certified at the plant or at an appropriate simulator) and shall have at least fifteen years of experience in progressively more responsible positions in power plant engineering, construction, operation, or quality assurance. A minimum of three years of this experience shall be nuclear power plant operating experience.

j. General Manager - Nuclear Services. The General Manager - Nuclear Services shall hold a bachelors degree in engineering or science and have at least fifteen years of experience in progressively more responsible positions in power plant engineering, construction or operation. A minimum of seven years of this experience shall be nuclear power plant construction, engineering, or plant operating experience. Familiarity with regulatory requirements and applicable codes and standards is required.

k. Manager - Methods and Systems. The Manager - Methods and Systems shall hold a bachelors degree in engineering, computer sciences, business administration or a related discipline and have a minimum of ten years of experience in the development and implementation of information systems, including a minimum of five years in responsible supervisory positions.

l. Public Affairs Manager - Nuclear. The Public Affairs Manager - Nuclear shall hold a bachelors degree in public relations, communication sciences, business, or engineering, and have a minimum of five years of experience in the public relations field. This experience shall be in progressively more responsible positions, including supervisory roles, and include at least three years of experience in the nuclear power industry.

m. Personnel Affairs Manager - Nuclear. The Personnel Affairs Manager - Nuclear shall hold a bachelors degree in personnel management business or engineering, and have at least five years of experience in the personnel management field. This experience shall be in progressively more responsible positions including supervisory roles and shall include at least three years of experience in the nuclear power industry.

n. Manager - Outage Services. The Manager - Outage Services shall hold a bachelors degree in engineering or a related physical science and have at least ten years of experience in progressively more responsible supervisory positions in power plant maintenance, operations or maintenance engineering support. A minimum of five years of this experience shall be in nuclear power plant operations or operations support.

o. Nuclear Industrial Relations Manager. The Nuclear Industrial Relations Manager shall hold a bachelors degree in industrial and labor relations or M.B.A. with a major in industrial relations, and shall have at least five years of experience in industrial relations with emphasis on grievance processing, arbitration preparation and presentation, and contract negotiation and labor law.

## 3.0 HOPE CREEK CONDUCT OF OPERATIONS

The safe and efficient operation of the Hope Creek Generating Station (HCGS) is a primary committment of PSE&G. To assure that this commitment is met, clear lines of station management accountability, responsibility and authority have been established and station processes and programs are being developed and documented.

Section 3.1 describes the scope of responsibility of the various Hope Creek Station departments. Management hierarchy and key management personnel responsibilities are delineated.

Descriptions of the types of plant procedures used by station personnel to formally conduct the operation of the HCGS are addressed in Section 3.2. Applicable industry operating experience and established regulatory guidance are used as the basis for procedural development. Sound operations management practices are used to implement the procedures.

## 3.1 STATION ORGANIZATION AND RESPONSIBILITIES

Station Organization

The station organization charts for Hope Creek Generating Station (HCGS), Figures 3-1 through 3-5, located at the end of this section, indicate the title of each departmental position and the number of personnel assigned to these positions.

The succession of authority and responsibility for the overall operation of the station is in the following order:

a. General Manager

b. Assistant General Manager

c. Technical Manager

d. Operations Manager

Overall Station Management

The General Manager - Hope Creek Operations reports directly to the Assistant Vice President-Nuclear Operations and is responsible for the overall management, direction, and control of station activities. In fulfilling these responsibilities he ensures the safe and efficient operation of the HCGS.

administration, liaison activities with regulatory and other agencies, approving and implementing programs and procedures, and acting on matters pertaining to Company policies and practices. He acts as the chairman of the Station Operations Review Committee (SORC). He is responsible for ensuring compliance with the requirements of the technical specifications, operating license, and all other applicable government regulations.

The General Manager - Hope Creek Operations also ensures the station's commitment to the PSE&G Operational Quality Assurance Program by maintaining close liaison with the Station Quality Assurance Engineer.

The Assistant General Manager - Hope Creek Operations reports directly to the General Manager. He assists the General Manager in all of his principal accountabilities and assumes responsibility for station management in the General Manager's absence.

The Assistant General Manager's functional management responsibilities include the direction and coordination of the Operations, Technical, Maintenance, and Radiation Protection Departments' daily activities. He serves as the Vice - Chairman of the SORC and maintains contact with the NRC Resident Inspector.

The Office Supervisor also reports directly to the General Manager and is responsible for clerical support; operation of the word processing center; control of plant costs and budgeting; and liaison with the Nuclear Service organizations for the control and procurement of plant materials, equipment and operating supplies.

Operations Department

The Operations Department (Figure 3-2) is responsible for the safe and efficient plant operation in accordance with the facility operating license, technical specifications, all applicable government regulations, and policies established by PSE&G.

The Operations Manager reports to the Assistant General Manager and is responsible for managing, directing, and controlling the Operations Department activities. He ensures that a properly trained, licensed and non-licensed staff is available to provide safe and efficient operation which in turn ensures plant availability and reliability. Administratively, the Operations Manager is responsible for the approval of all operating procedures and the review of incident reports, reportable events, and other correspondence.

The Operating Engineer assists the Operating Manager in the implementation of his responsibilities by directing and controlling the work of the department. The Operating Engineer assumes primary authority and responsibility for the department in the absense of the Operations Manager. The Operations staff and the Operations Shift Organization report to the Operating Engineer.

The Senior Operating Supervisor (SOS) reports to the Operating Engineer and functions as the Operating Engineer in the event of his unavailability. The SOS is responsible for supervising shift administrative duties. The SOS is qualified to relieve the Senior Nuclear Shift Supervisor when he is unavailable.

The Senior Nuclear Shift Supervisor (SNSS) reports to the Senior Operating Supervisor and is responsible for safe plant operation while on shift. The SNSS has the authority to take any action necessary, including plant shutdown, to protect personnel or equipment in accordance with approved procedures. During shift hours, he assumes responsibility for all plant functions in the absence of senior plant management. To ensure safe and efficient plant operation, the SNSS supervises the Nuclear Control Operators and the Shift Support Supervisor, and performs plant equipment inspections. He also reviews and approves completed checkoff lists, logs, and other data to detect abnormal trends or potential operating problems. He approves removal of equipment from service and proper safety tagging of such equipment in support of the plant surveillance and maintenance programs. In an emergency, the SNSS notifies management personnel and the appropriate agencies in accordance with the Emergency Plan and functions as the Emergency Duty Officer until properly relieved.

The Nuclear Shift Supervisor (NSS) assists the SNSS by directly supervising the activities of the Nuclear Control Operators, Equipment Operators, and Utility Operators. He is also responsible for performing various duties of the SNSS when so assigned.

The Shift Support Supervisor (SSS) assists the SNSS by providing direct supervision of radwaste facility activities and the radwaste Equipment Operator(s). The SSS reports to the Shift Operating Support Supervisor for administrative direction.

The Nuclear Shift Technical Advisor (STA), if licensed at the Senior Reactor Operator level, may function as a NSS. The STA provides an independent, objective assessment of the plant safety and provides technical assistance to shift supervision during normal and abnormal plant conditions. The STA reports to the Operating Engineer.

Nuclear Control Operators (NCO) report to the Senior Nuclear Shift Supervisor through the Nuclear Shift Supervisor and perform all shift operations associated with the nuclear steam supply system from the main control room. The NCO is responsible for manipulating controls for startup, changing electrical output and reactor power, and plant shutdown as required. These functions are performed in compliance with the facility operating license and technical specifications.

The Equipment Operator (EO) and Utility Operator (UO) perform routine duties outside of the main control room necessary for safe continuous operation of the plant as directed by the Nuclear Control Operator or Nuclear Shift Supervisor. Their duties also include completing checkoff lists and logs; initiating immediate actions necessary to maintain assigned equipment in a safe condition during normal, abnormal, and emergency operations; maintaining continuous surveillance of equipment assigned; and operating auxiliary equipment as assigned to support plant operations.

Radwaste Equipment Operators report directly to the Shift Support Supervisor and perform all shift radioactive waste operations required to support plant operations. The radwaste program receives administrative and scheduling direction from the Senior Operating Support Supervisor.

Responsibilities of the radwaste Equipment Operators include completing checkoff lists and logs; providing other shift data associated with radwaste operations to provide continuous surveillance of the equipment assigned; manipulating controls, valves, and equipment to support radwaste processing, storing, and shipping; and initiating immediate actions necessary to maintain radwaste equipment in a safe condition during normal, abnormal, and emergency operations.

The Senior Operating Technical Supervisor (SOTS) reports to the Operating Engineer and supervises the Operations Staff Engineers performing technical and administrative functions within the department. The SOTS is responsible for reviewing incident reports, reportable events, and other NRC correspondence. He is also responsible for preparing and maintaining Operations Department procedures.

The Operations Staff Engineers report to the SOTS. They are responsible for providing technical and administrative support to the Operations Department.

The Senior Operating Support Supervisor (SOSS) reports to the Operating Engineer and is responsible for radioactive waste management, control, and processing. The SOSS works closely with all departments, primarily the Radiation Protection Department, to ensure that ALARA program objectives are met and that radioactive waste production is minimized. He is also responsible for developing and maintaining radwaste procedures and providing administrative guidance to the SSS.

Shift electricians, instrumentation and control (I&C) technicians, chemical technicians and radiation protection technicians are assigned to the shift schedule and report to the Shift Supervisor. These personnel perform support functions associated with electrical, I&C, chemistry, and radiation monitoring disciplines. During normal operation, they are available to perform surveillance, preventive maintainence, and corrective maintenance activities. During periods of emergency or abnormal operating conditions, they are available as part of the station emergency preparedness program for emergency response and technical assistance.

Shift staffing is based on an 8-hour shift, 6-days-on/2-days-off schedule (4 shifts) with a fifth shift scheduled for training or requalification.

Shift staffing is in accordance with the requirements of NUREG-0737 and, in addition, the following adjunct requirements are incorporated in the administrative control of shift staffing:

a. A Nuclear Shift Supervisor (SRO-licensed) will be onsite at all times whenever there is fuel in the reactor.

b. A licensed senior reactor operator will be in the main control room area at all times when the unit is in Operational Conditions 1, 2, or 3.

c. A licensed reactor operator will be in the main control room at all times whenever there is fuel in the reactor.

d. The licensed senior reactor operator assigned to supervise core alterations in Operational Condition 5 will have no concurrent operational duties.

e. The qualified Shift Technical Advisor required in Operational Conditions 1, 2, and 3 will have a bachelor's degree in an engineering discipline and will have received training as specified in NUREG-0737.

f. In addition to the radiation protection technician required to be on shift whenever there is fuel in the reactor, all shift personnel will be trained in basic radiation protection.

g. Shift hours will be administratively controlled to ensure compliance with current NRC policy.

h. The site fire protection program will provide for a full-time site fire brigade consisting of fire protection operators and fire fighters trained in firefighting and first aid. Fire brigade training will conform to NRC guidelines.

Technical Department

The Technical Department (Figure 3-3) is responsible for performing functions in the areas of chemistry, instrumentation and control, reactor engineering, technical reports and procedures, thermal performance, equipment reliability monitoring, and document control.

The Technical Manager directs and controls the activities of the department through the Chemistry Engineer, Instrumentation and Control Engineer, and Technical Engineer. The Technical Engineer assumes authority and responsibility for the department in his absence. The Technical Manager reports to the Assistant General Manager and is responsible for directing and coordinating Technical Department activities.

The power ascension test program (Phase III) is conducted by the Nuclear Department, specificaly it is the reponsibility of Hope Creek Operations. Formal tests, denoted as startup tests, are conducted during this program. Startup tests confirm the plant design basis and demonstrate, to the extent practical, that plant systems operate and respond to anticipated transients and postulated events as designed. To perform these startup tests, the PSE&G Startup Group functions as a support organization under the direction of the Technical Department during Phase III.

The Principal Startup Engineer - Testing reports to the Startup Manager during preoperational testing and then reports to the Technical Manager during power ascension testing (Phase III). His responsibility during Phase III is the overall planning and implementation of the testing program, which includes core load, initial criticality, low power physics and power ascension testing. These activities include preparing and revising procedures, determining manpower support needs, scheduling tests, reviewing personnel qualifications, analyzing test results, and preparing test reports.

The Chemistry Engineer is responsible for the development and implementation of the chemistry, radiochemistry, and effluent monitoring programs. The Senior Chemistry Supervisor reports to the Chemistry Engineer and assumes authority and responsibility in his absence.

The I&C Engineer is responsible for developing and implementating the I & C maintenance and surveillance programs. Reporting to the I&C Engineer are the Senior I&C Supervisor and Senior Engineer I&C Staff. The Senior I&C Supervisor is supported by I&C Supervisors and the Computer Supervisor. The Senior Engineer I&C Staff is supported by I&C Staff Engineers. The Senior I&C Supervisor assumes authority and responsibility in the absence of the I&C Engineer.

The Technical Engineer is responsible for reactor engineering; technical reports and procedures; thermal performance; equipment reliability monitoring and testing; and document control. Reporting to the Technical Engineer are the Senior Reactor Supervisor, Senior Engineer-Technical, and the Technical Document Room Supervisor.

The Senior Reactor Supervisor is responsible for reactor engineering, thermal performance and equipment reliability monitoring. The Senior Reactor Supervisor assumes authority and responsibility in the absence of the Technical Engineer. Engineers are assigned to the Senior Reactor Supervisor to develop and implement the details of the programs. The reactor engineering group assists the Principal Startup Engineer in the development and implementation of initial criticality, low power physics and power ascension test programs; and provides technical direction to the operators for thermal and nuclear operation of the reactor, and initial core loading and refueling operations. The reactor engineering group also monitor, collect, trend, and analyze performance data for systems important to plant efficiency and reliability.

The Senior Technical Staff Supervisor is responsible for the administrative procedures, technical responses, and for reports leaving the station in support of the facility operating license and review of operating experiences.

The Technical Document Room Supervisor directs the operation of the technical document room, which includes centralized control of designated plant documents and records management.

Maintenance Department

The Maintenance Department (Figure 3-4) is responsible for the performance and monitoring of electrical and mechanical preventive and corrective maintenance work.

The Maintenance Manager reports directly to the Assistant General Manager and has the overall responsibility for managing, directing, and controlling all activities of the Maintenance Department in accordance with the facility operating license and federal regulations. He is responsible for the development and approval of departmental procedures and ensures that department personnel are trained and qualified. He is also responsible to ensure that his department is accomplishing its work safely and efficiently in support of plant availability and reliability.

The Maintenance Engineer assists the Maintenance Manager in the execution of his duties and is responsible to plan, conduct, and oversee daily maintenance functions. He is responsible to ensure identified maintenance activities are completed in a safe, timely, and efficient manner. He provides direct supervision to the Senior Nuclear Maintenance Supervisors and the Senior Maintenance Planning Supervisor. The Maintenance Engineer assumes the duties of the Maintenance Manager in his absence.

The Senior Nuclear Maintenance Supervisor is responsible for assisting the Maintenance Engineer in planning and executing maintenance repair and inspection activities. He is responsible for the effective use of materials and manpower while conducting maintenance repairs. He directs the activities of the Nuclear Maintenance Supervisors and assumes the authority and responsibilities of the Maintenance Engineer in his absence.

The Senior Maintenance Planning Supervisor reports to the Maintenance Engineer and assists the Maintenance Manager in the direction of the department's administrative and planning functions. He is responsible for the maintenance history records, repair and maintenance procedure system (RAMPS), maintenance procedure preparation, and maintenance planning.

Radiation Protection Department

The Radiation Protection Department (Figure 3-5), under the direction of the Radiation Protection Engineer, ensures implementation of the plant radiological safety program and the radiological material control programs in accordance with the facility operating license and government regulations. These programs require that personnel exposure to radiation and releases of radioactive material to the environment are as low as reasonably achievable (ALARA).

Reporting to the Radiation Protection Engineer are the Senior Radiation Protection Supervisor and a staff of supervisors and engineers which implement the radiation exposure control and measurement program. In addition, they prepare and review procedures for implementing the ALARA program; perform surveys of radiation, surface contamination, and airborne activity to identify locations, operations, and conditions that have the potential for significant personnel exposure; implement the radiation surveillance and personnel exposure tracking program; and are responsible for the emergency response and preparedness staffing, procedures and coordination.

## 3.2 PLANT PROCEDURES

Plant procedures are prepared by the station staff, support organizations, or contract organizations under the direction of the Assistant General Manager - Hope Creek Operations and implemented by the Operations Manager, Maintenance Manager, Technical Manager, and Radiation Protection Engineer.

Plant procedures are prepared for applicable safety-related activities delineated in Regulatory Guide 1.33 and provide the controls necessary to comply with applicable Regulatory Guides as listed in Section 1.8 of the HCGS FSAR.

Preparation of plant procedures necessary for fuel load has begun and is scheduled to be completed six months prior to fuel load. Review of procedures affecting nuclear safety and review of changes to these procedures are performed by the Station Operations Review Committee (SORC) and approved by the individual department managers for Hope Creek Operations.

Procedures are periodically reviewed and revised when changes are necessary or desirable. Similarly, procedures are reviewed and revised when necessary following the completion of system design changes or equipment modifications.

Administrative Procedures

Station administrative procedures are written to provide stationwide direction in areas that are common to all station departments.

These administrative procedures cover such subjects as station organization and responsibilities, Station Operations Review Committee, changes to station procedures, document control, procedure review, personnel qualification, personnel training, design changes, tests and experiments, control of maintenance and preventive maintenance program, technical specification surveillance responsibilities, radiation protection program, radioactive waste and material control program, inservice inspection program, security program, quality assurance program, incident reports and reporting requirements.

In addition to these station administrative procedures, operationally oriented administrative procedures provide guidelines for the operations Senior Nuclear Shift Supervisors and their shift crews. Operations administrative procedures meet the requirements of 10 CFR 50.54 (i), (j), (l), and (m).

Operating and Maintenance Procedures

The operating and maintenance procedures meet the applicable requirements of Regulatory Guides.

Operating instructions are provided for startup, normal, manual and automatic modes of operation of each system or subsystem related to plant safety. Detailed checkoff lists are included, where appropriate, within each procedure. These lists prescribe the proper valve lineups or switch positions for the specific mode of plant operation.

Overall plant operating procedures provide instructions for integrated plant operations. Checkoff lists are used for confirming completion of major steps in the proper sequence.

Instructions for abnormal conditions specify operator actions for restoring an operating variable to its normal controlled value in the event that it departs from its acceptable range.

Emergency instructions provide guidance for plant operations during emergencies while allowing sufficient flexibility to accommodate variations. These procedures specify actions, including manipulation of controls, to avoid further degradation of abnormal conditions or reduce the consequences of an emergency condition.

Alarm response instructions guide operators in their response to main control room alarm conditions. The alarm response instructions are available to the operators in the main control room and are compiled in a manner which is consistent with the alarm system layout.

Temporary procedures may be issued to direct operations during activities such as testing, refueling, maintenance, and modifications. They provide guidance in unusual situations not within the scope of existing procedures. Temporary procedures are only in effect for specified periods of time, and require the same review and approval process as other plant procedures.

Chemistry procedures include chemical and radiochemical analyses, sample collection, and equipment instructions. Chemistry procedures maintain reactor coolant quality and concentrations of harmful agents within prescribed limits.

The Emergency Plan, as described in Section 13.3 of the HCGS FSAR establishes the concepts, evaluation criteria, and actions necessary to mitigate the consequences of radiological incidents, abnormal operational events, natural hazards, and civil disturbances. The Emergency Plan Procedures define emergency response actions required to ensure public health and safety.

Radiation Protection Procedures govern the implementation of the Radiation Protection Program described in Section 12.5 of the Hope Creek Generating Station FSAR. These procedures describe various aspects of the radiation protection program including equipment operating instructions; control of area access and stay time; the ALARA program; radiation surveys; contamination surveys; airborne radioactive material surveys; and personnel monitoring and training.

Instrumentation and Control Procedures govern the required periodic calibration and testing of plant instrumentation, calibration of measuring and test equipment, and instrument maintenance. These procedures have provisions for taking instruments out of service; ensuring adequate accuracy to maintain safety parameters; recording the date, as-found condition, corrective actions, as-left condition, identity of personnel performing tests; and restorating instruments to normal operating status.

Maintenance Procedures provide instructions for maintaining mechanical and electrical equipment in satisfactory operating condition. This category also includes procedures for implementing the preventive maintenance program for mechanical and electrical equipment. In addition, they provide for calibration and testing of protective relays. These procedures have provisions for recording the date, as-found condition, corrective action, as-left condition, and identity of personnel performing the tests.

Material Control Procedures establish instructions for the proper procurement, documentation, and control of materials and components associated with safety-related structures or systems. These procedures are sufficiently detailed to ensure that materials and components are purchased and handled in a controlled manner in accordance with 10 CFR 50, Appendix B.

Radwaste Management Procedures include operating procedures for the solid, liquid, and gaseous radwaste systems, and provide administrative controls for the shipment of solid radwaste and release of liquid and gaseous radwaste. These controls adhere to 10 CFR 71, and establish provisions that allow for liquid and gaseous radwaste releases only when required data, analyses, and approvals are completed.

Reactor Engineering Procedures provide for the monitoring and evaluation of core thermal and hydraulic parameters. In addition, these procedures establish methods for evaluating fuel exposure, isotopic composition, core flux levels, and nuclear instrumentation setpoints as they relate to core power and flow.

Records Procedures provide for the identification, preparation and retention of plant records. These procedures also address storage requirements and retention periods.

Security Procedures describe and implement security requirements for the plant. These procedures include, but are not necessarily limited to, the subjects listed in Section 4.2 of ANSI N18.17-1973.

Surveillance Procedures are written to provide for operability verification of safety-related structures and components in accordance with the technical specifications. Surveillances are scheduled in accordance with frequencies established in the technical specifications.

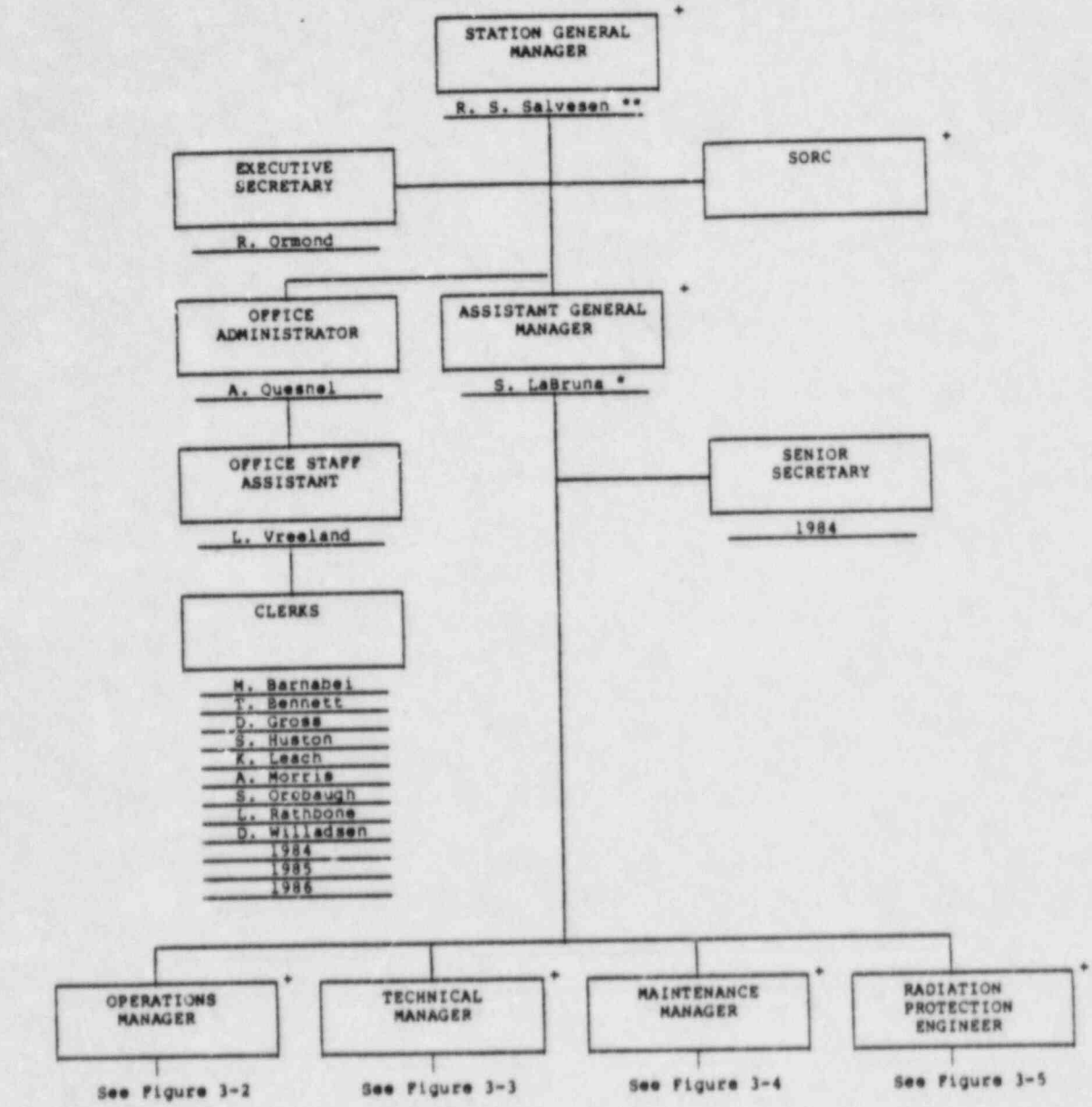
Training Procedures establish guidelines to ensure that fully qualified personnel are responsible for the operation, maintenance, and technical support of the plant. These procedures describe licensed operator training, licensed operator requalification, non-licensed personnel training, and general employee training.

Fire Protection Procedures cover various aspects of fire safety, such as control of combustibles, control of ignition sources, periodic inspections of fire protection equipment, fire brigade training, fire drills, and control of hazardous operations. These procedures also cover the fire fighting organization, activities during a fire emergency, and individual responsibilities during a fire emergency.

Figure 3-1

**HOPE CREEK GENERATING STATION**

**GENERAL MANAGER AND STAFF**




LEGEND

Meet ANSI/ANS 3.1 - 1981 Qualifications:
* As of 7/84
** As of fuel load

+ Position required to meet ANSI/ANS 3.1

7/84

FIGURE 3-2

HOPE CREEK GENERATING STATION

OPERATIONS DEPARTMENT

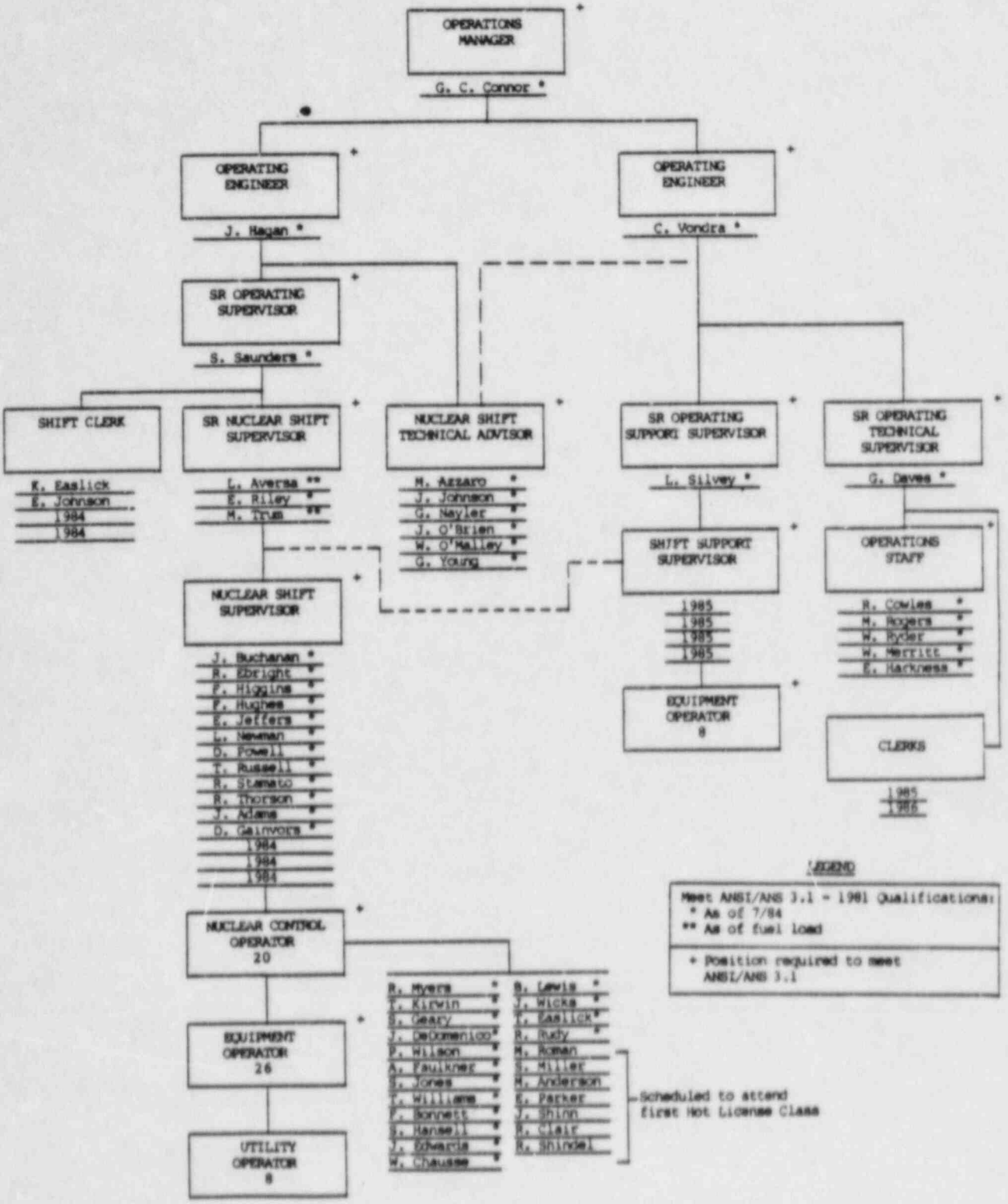
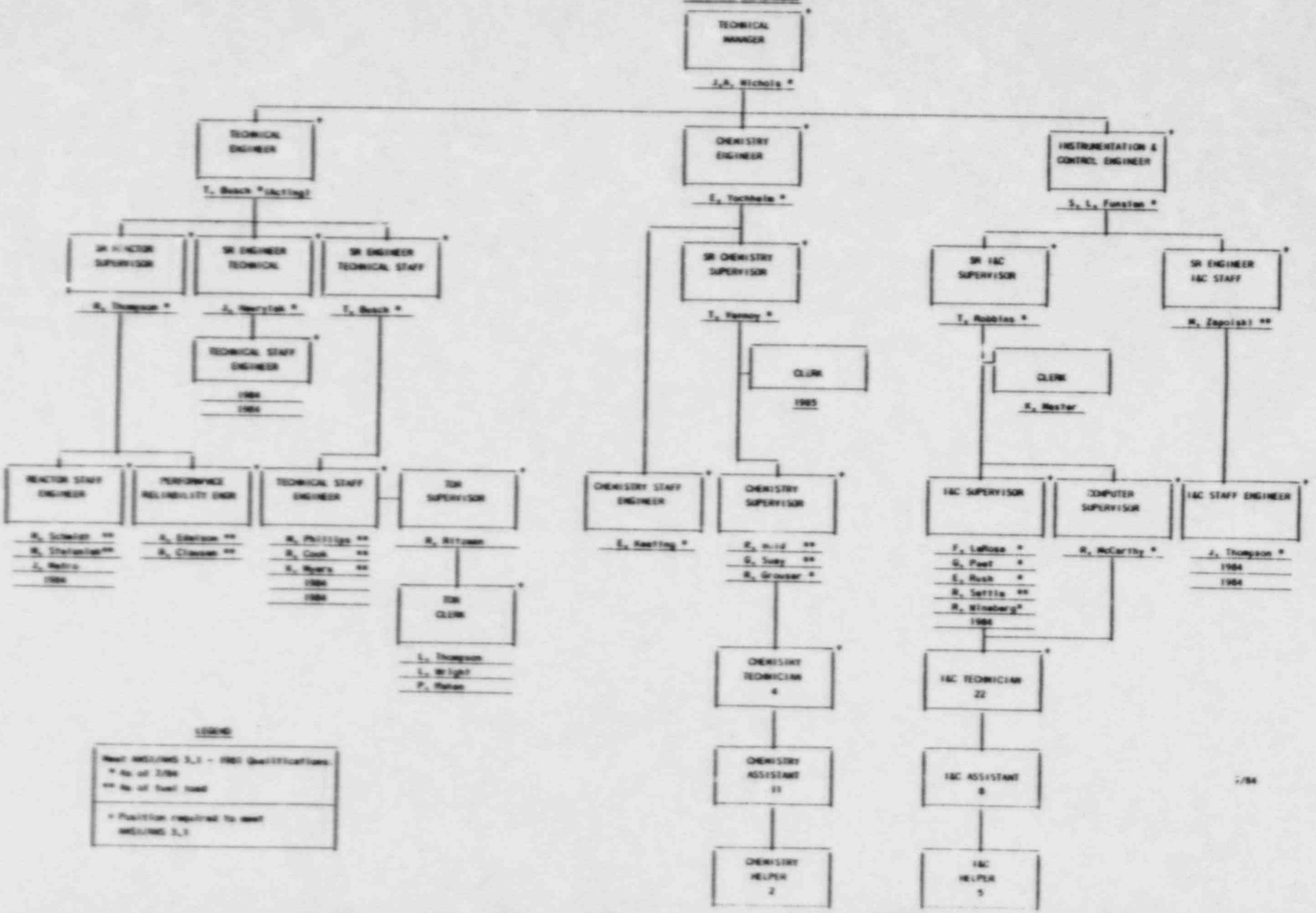


Figure 5-3

HOPE CREEK GENERATING STATION

TECHNICAL DEPARTMENT




LEGEND

Meet ANSI/ANS 3.1 - 1981 Qualifications.
* No. of 2/84
** No. of Fuel Load

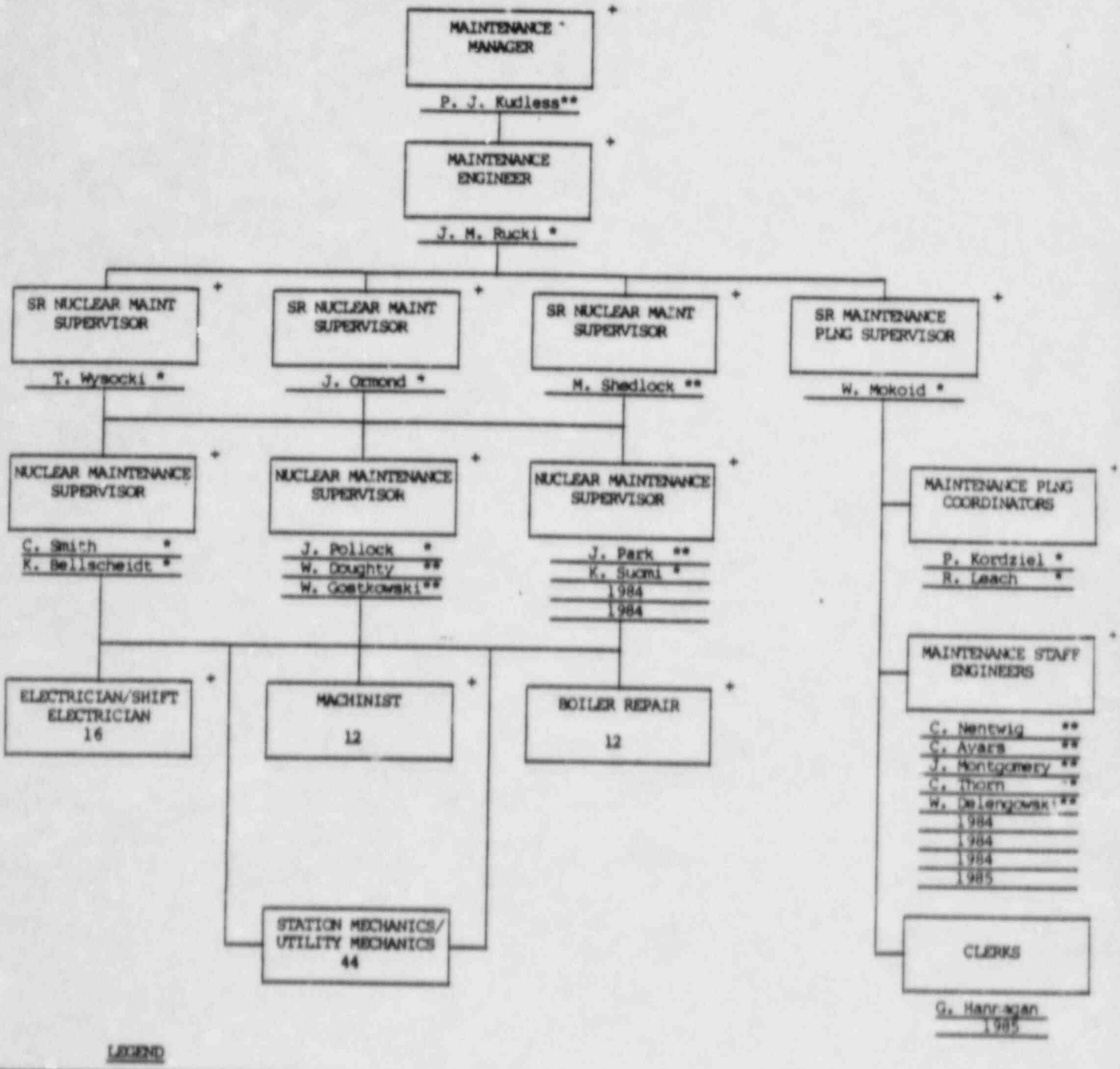
* Position required to meet ANSI/ANS 3.1

2/84

FIGURE 3-4

**HOPE CREEK GENERATING STATION**

**MAINTENANCE DEPARTMENT**




LEGEND

Meet ANSI/ANS 3.1 - 1981 Qualifications:
* As of 7/84
** As of fuel load

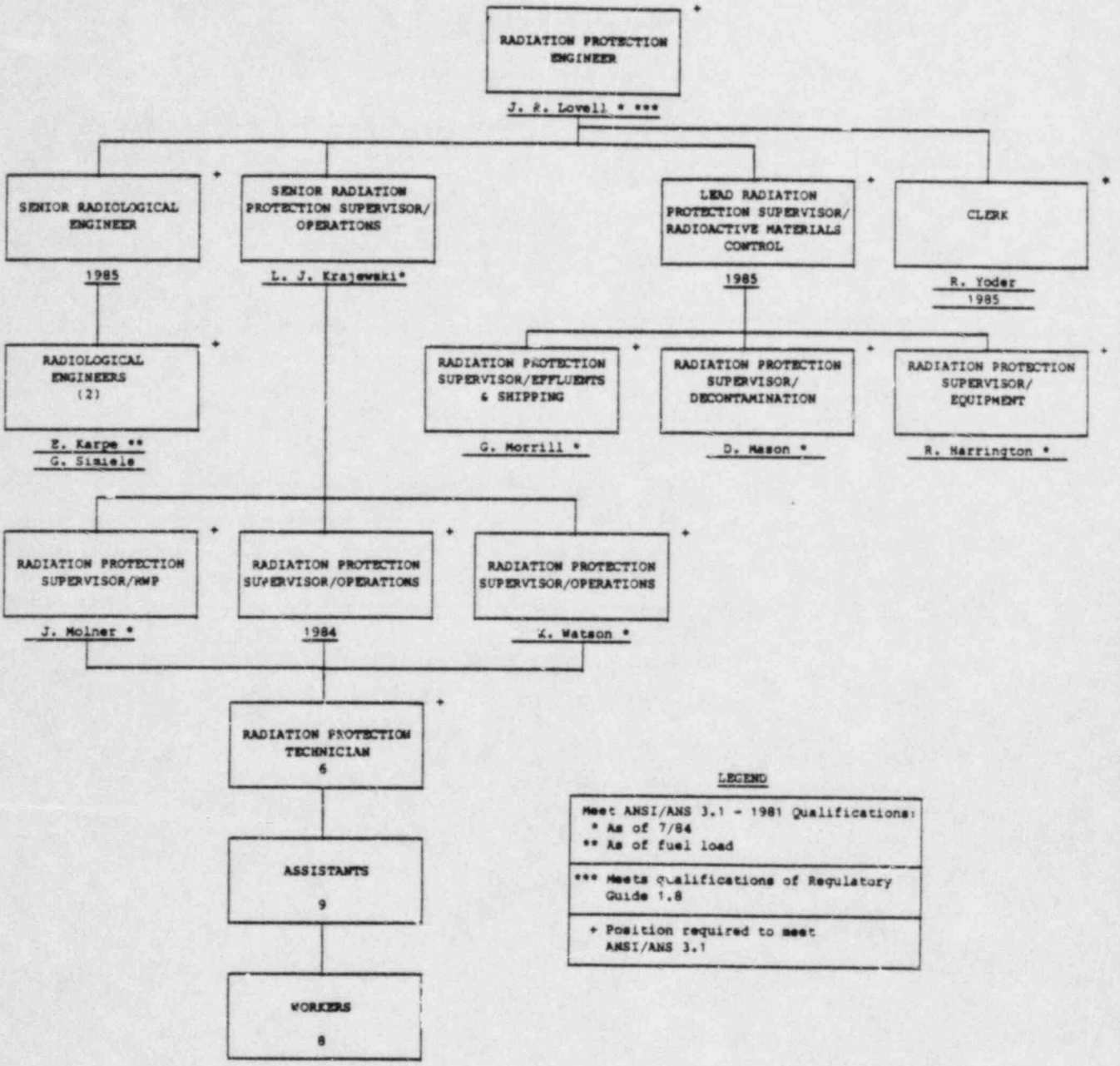
+ Position required to meet ANSI/ANS 3.1

7/84

Figure 3-5

**SHPT CREEK GENERATING STATION**

**RADIATION PROTECTION**




7/84

## 4.0 STAFFING AND QUALIFICATIONS OF HOPE CREEK GENERATING STATION (HCGS) OPERATING AND MAINTENANCE PERSONNEL

HCGS management has developed and is implementing a plan to staff the HCGS operating organization with qualified operations and maintenance personnel. This plan is consistent with NRC regulations, industry experience and good practices. The plan consists of augmenting the present organization by hiring personnel with BWR nuclear experience; and providing for personnel qualification through extensive formal training, and participation at similar operating plants. The recruitment of personnel provides a complementary level of experience and training throughout the organization.

PSE&G management is implementing the staffing plan in a time frame to allow station personnel to participate in preoperational startup activities.

This section reviews the specifics of the HCGS staffing plan and provides an overview of station personnel qualificatons and experience.

## 4.1 STANDARDS FOR QUALIFICATION REQUIREMENTS

The staffing plan addresses personnel qualification requirements and establishes appropriate levels based on these qualifications. The following documents were used during the formulation of the staffing plan to identify qualification requirements:

1) NUREG-0737, Clarification of TMI Action Plan Requirements

2) NUREG-0731, Guidelines of Utility Management Structure and Technical Resources

3) ANSI/ANS 3.1-1981, Selection, Qualification and Training of Personnel for Nuclear Power Plants

4) Regulatory Guide 1.8, Personnel Selection and Training

## 4.2 STAFFING AND ORGANIZATIONAL READINESS

The plan for staffing the station is reflected in Figures 3-1 thru 3-5 which provide the following information:

- number of personnel authorized to each functional area

- number of personnel presently assigned or having firm employment start dates

- number of personnel meeting ANSI/ANS 3.1 - 1981 presently and the number who will meet these requirements by core load.

The station personnel staffing level will be 370 by core load. Table 4-1 provides a breakdown of this number by department.

The primary function of the station organization before the time of core load is preparation for operational readiness. This preparation includes training and qualifying personnel; developing and implementing administrative programs and detailed procedures; and identifying and procuring equipment necessary for plant operation and maintenance. In addition, the station staff is actively supporting the preoperational startup program by providing the supervisors, operators, technicians and mechanics to test, operate and maintain systems released from construction. This direct involvement provides an opportunity to demonstrate program adequacy, and optimize station processes and procedures before core load. This "hands-on" involvement also reinforces plant specific training and provides an opportunity for the Station organization to develop as a cohesive team.

## 4.3 QUALIFICATIONS AND EXPERIENCE

Station personnel who have the responsibility for plant operation and maintenance will have a combination of education, training, experience, health and skills appropriate to their level of responsibility. To assure the station meets this objective, PSE&G has committed to comply with the requirements of ANSI/ANS-3.1 -1981, "Selection, Qualification and Training of Personnel for Nuclear Power Plants." These requirements are incorporated in the station administration procedure, Station Personnel Qualification and Training Program.

Table 4-3 provides a listing of experience and qualification for each Hope Creek Station management level emloyee. From a review of this table and Figures 3-1 thru 3-5, it can be seen that PSE&G has met its commitment to staff HCGS with qualified individuals.

From a qualification standpoint, experience is defined in terms of professional level, total power plant, nuclear power plant, navy nuclear, plant operations above 20% power, refueling and startup working time. Several members of the HCGS staff have also obtained valuable related nuclear plant experience by having been assigned to the Institute of Nuclear Power Operations (INPO) as nuclear power plant evaluators. Others obtained related experience through previous employment with a Nuclear Steam Supply System vendor or Architect/Engineering firms.

Recently, the Nuclear Regulatory Commission (NRC) has established additional experience requirements for the operating shift senior reactor operator. The present qualifications and planned hot participative experience of HCGS operating shift personnel will assure their meeting these latest NRC criteria.

In the station Radiation Protection Department, further specialized qualifications are required. The Radiation Protection Engineer must meet the qualifications for the Radiation Protection Manager as outlined in Regulatory Guide 1.8. The Radiation Protection Engineer assigned to Hope Creek meets these criteria and furthermore, has been certified by the American Board of Health Physicists.

Table 4-2 summarizes the experience of key management (general manager through senior supervisory positions), shift supervision, and licensed operator positions. From Table 4-2, it can be seen that the total applicable experience is 696 years or an average of 11 years per person. Of the total applicable experience, 539 years is nuclear experience of which 383 years is commercial nuclear experience. Additionally, of the total applicable years of experience, 384 years or 55% is in management positions providing an average of 15 years per person.

From a review of individual experience histories, Hope Creek Generating Station personnel have held 18 NRC licenses on commercial nuclear power plants, 10 on PWRs and 8 on BWRs. Also, 35 personnel have completed BWR cold license certification and 24 personnel have completed U.S. Navy certification.

In summary, PSE&G is staffing the Hope Creek Generating Station with qualified, experienced personnel.

TABLE 4-1

**HOPE CREEK GENERATING STATION STAFFING BY CORE LOAD**

| | | Department Total |
|---|---|---|
| General Manager | | |
| Management and Staff | 4 | |
| Administrative and Clerical | 12 | |
| | | 16 |
| Operations Manager | | |
| Management and Staff | 21 | |
| Nuclear Shift Supervisors | 19 | |
| Control Operators | 23 | |
| Equipment Operators | 39 | |
| | | 102 |
| Maintenance Manager | | |
| Management and Staff | 15 | |
| Supervision | 13 | |
| Electricians and Mechanics and Helpers | 84 | |
| | | 112 |
| Technical Manager | | |
| Technical Engineer | | |
| Management and Staff | 22 | |
| Instrument and Control | | |
| Management and Staff | 6 | |
| Supervision | 8 | |
| Technicians and Helpers | 36 | |
| Chemistry Engineer | | |
| Management and Staff | 4 | |
| Supervision | 4 | |
| Technicians | 19 | |
| | | 99 |
| Radiation Protection Engineer | | |
| Management and Staff | 5 | |
| Supervision | 8 | |
| Technicians | 28 | |
| | | 41 |
| | TOTAL | 370 |

Table 4-2

**HOPE CREEK APPLICABLE EXPERIENCE SUMMARY**

| | Nuclear Experience(Yrs.) | | | Other Power Plant Exp. | Related Exp. | Total |
|---|---|---|---|---|---|---|
| | PWR | BWR | NAVY | (Years) | (Years) | (Years) |
| Management (26) | 115 | 121 | 47 | 61 | 40 | 384 |
| Nucl. Shift Supervision (21) | 44 | 60 | 52 | 44 | 12 | 212 |
| Nucl. Control Rm. Operators (16) | 18 | 25 | 57 | 0 | 0 | 100 |
| Total (64) | 177 | 206 | 156 | 105 | 52 | 696 |

TABLE 4.3

HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Genl. Mgr.- Hope Creek Operations | R. S. Salvesen | GM - Hope Creek Operations | | 2½ | | | | SRO Certification (BWR) | BSME |
| | | Mgr. - Hope Creek | | 3 | | | | | |
| | | Mgr. - Nucl. Ops. | 7 | | | | | | |
| | | Chief Engineer - Salem Nucl. Sta. | 3 | | | | | RO Certification (PWR) | W RO Training Program |
| | | Various Dept. Head and Supv. Positions at Fossil Stations | | | | 12 | | | |
| Asst. Genl. Manager - Hope Creek Operations | S. LaBruna | Asst. GM - Operations | | 2½ | | | | | BSEE |
| | | Maint. Engr. Salem Nucl. | 4 | | | | | SRO License (PWR) | STA/SRO Training Course Hope Creek Generating Station BWR Cold License Training Program |
| | | Various Dept. Heads and Supv. Positions at Fossil Stations | | | | 13 | | | |

TABLE 4.3

HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Technical Manager | J. A. Nichols | Technical Manager - Hope Creek | | 2½ | | | | | BSEE |
| | | Nuclear Plant Engr.- INPO | | | | | 1 - INPO (Technical Area Evaluations) | | |
| | | Reactor Engineer- Salem Nucl. Station | 10 | | | | | SRO License (PWR) RO (Equivalency | W RO Training Program Hope Creek Generating BWR License)-SaxtonCold License Training Program |
| | | Various Supervisory Positions at Fossil | | | | 4 | | | |
| Operations Manager | G. C. Connor | Operations Manager- Hope Creek | | 2½ | | | | | BSE Hope Creek Generating Station BWR Cold License Training Program |
| | | Station Planning Engineer - Salem Nuclear Station | 5 | | | | | SRO License (PWR) | W Simulator Training |
| | | Various Supervisory Positions at Salem Nuclear Station | 7 | | | | | | |
| | | Engineering Watch Supv. - Naval Nucl. Programs | | | 7 | | | SRO (Navy Certification) | Various Navy Nuclear Training Programs |

**TABLE 4.3**

**HOPE CREEK MANAGEMENT PERSONNEL**

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Maintenance Manager | P. J. Kudless | Maintenance Manager-Hope Creek | | | | | | | |
| | | Project Construction Manager - Hope Creek | | 3½ | | | | Registered PE | BSCE |
| | | Principal Construction Engineer - Hope Creek | | 2½ | | | | | |
| | | Senior Construction Engineer - Hope Creek | | 2 | | | | | |
| Operations Engineer | J. J. Hagan | Operations Engineer-Hope Creek | | 1½ | | | | SRO Cert. (BWR) | BSEE<br>MSEM<br>Hope Creek Generating Station BWR Cold License Training Program |
| | | Maintenance Engineer-Salem Nucl. Station | 1 | | | | | | |
| | | Various Supervisory Positions at Salem Nuclear Station | 4 | | | | | | |
| | | Various Supervisory Positions at Fossil Stations | | | | 2 | | | |

TABLE 4.3

HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Operating Engineer | C. A. Vondra | Operating Engineer-Hope Creek | | ½ | | | | | BSME 90% Hope Creek Generating Station BWR Cold License Training Program |
| | | Operations Manager-Marble Hill | 5 | | | | 1 Year INPO (Operations Audit) | | |
| | | Shift Supervisor-Engr. Duane Arnold | | 7 | | | | SRO License (BWR) | |
| | | Reactor Operator-Naval Nuclear Program | | | 6 | | | SRO (Navy Cert.) | Various Nuclear Training Programs |
| Maintenance Engineer | J. M. Rucki | Maintenance Engineer-Hope Creek | | 1½ | | | | | BSEE |
| | | Consulting Engineer United Engineers 10CFR50, App. B | | | | | 1 (BWR Projects) | | |
| | | Lead Site Engineer Brunswick Nucl. Sta. Construction | | 9 | | | | | |
| | | Design Engineer-UE&C | | 2 | | | | | |

TABLE 4.3

HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Instrument and Control Engineer | S. L. Funsten | I&C Engineer - Hope Creek | | 1½ | | | | SRO Cert. (BWR) | BSEE<br>Hope Creek Generating Station BWR Cold License Training Program |
| | | Field Engineering Supervisor - GE Nuclear Instrum. Installations | | 9 | | | | | |
| | | Service Engg. GE Switchgear Div. | | | | | 4 | | |
| Chemistry Engineer | E. D. Yochheim | Chemistry Engineer - Hope Creek | | ½ | | | | | BSC |
| | | Chemical Consulting Engr. - Nuclear Plant Chemistry | | | | | 2 | | |
| | | TVA - Unit Leader Water Quality and Rad. Measurement | | | | | 1 | | |
| | | Senior Engineer Babcox & Wilcox On-Site - PWR Chemistry Startup Consultation | 6 | | | | | | |

## TABLE 4.3

## HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Radiation Protection Engineer | J. R. Lovell | Rad. Prot. Engr.- Hope Creek | | 1 | | | | | BA - Japanese<br>MS - Health Physics and Industrial Hygiene<br>Certified HP from Amer. Board of Health Physicists |
| | | Plant Health Physicist (Palisades Nucl. Station) | 1 | | | | | | |
| | | Senior Health Physicist Midland Energy Center | | 1 | | | | | |
| | | Radiological Engineer | | | | | 2 (Newport News Rx Serv.) | | |
| | | Health Physicist (Industrial) | | | | | 1 (Allied Chem. | | |

TABLE 4.3

HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Senior Operations Technical Supervisor | G. S. Daves, Jr. | Senior Operations Technical Supervisor - Hope Creek | | 1½ | | | | SRO Cert. (BWR) | BSEE<br>Hope Creek Generating Station BWR Cold License Training Program |
| | | I&C Lead Engineer Hope Creek | | 2 | | | | | |
| | | Eng/Lead Engineer Salem Nuclear Station | | 2½ Admin. Staff) | | | | | |
| | | Engineer, I&C Salem Nuclear Station | | 3½ | | | | | |
| | | Engineer - QA Salem Nuclear Station | | 1 | | | | | |
| | | Associate Engineer Hudson/Bergen | | 2 | | | | NJ Black Seal | |
| Lead Engineer - Operations Staff | M. E. Rogers | Lead Engineer, Ops. Staff - Hope Creek | 1½ | | | | | SRO Cert. (BWR) | Widener University (32 credits)<br>Hope Creek Generating Station BWR Cold License Training Program |
| | | Nuclear Training Supv./Specialist/ Staff Assistant - Salem Nuclear Station | 4½ | | | | | SRO License (PWR) | |
| | | Engineer Watch Supv. | 6½ | | | | | EWS/EOOW Cert. (Navy) | Various Navy Nuclear Programs |

7/84

TABLE 4.3

HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Senior Operations Support Supervisor | L. M. Silvey | Nuclear Shift Supv. Hope Creek Gen. Sta. | ½ | | | | | | High School Graduate |
| | | Quadrex Supv. Service Eng. | 1 | | | | | | |
| | | Shift Supervisor Peach Bottom Sta. | 6 | | | | | SRO License (BWR) | |
| | | Chief Operator Peach Bottom Sta. | 3 | | | | | RO License (BWR) | |
| | | Plant Operator Peach Bottom Sta. | 1 | | | | | RO Cert. (BWR) | |
| | | Asst. Cont. Rm. Oper. Peach Bottom Sta. | 3 | | | | | | |
| | | HP Technician Peach Bottom Sta. | 1 | | | | | | |
| | | Aux. Operator Peach Bottom HTGR | | | | | 3 | | |
| | | Aux. Operator Various Fossil | | | | 6 | | | |

## TABLE 4.3

## HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Technical Engineer | T. G. Busch | Technical Engineer Hope Creek | ½ | | | | | | BSNE - University Cincinnati |
| | | Superintendent Technical Support W. H. Zimmer Nuclear Station | 1 | | | | | SRO License (BWR) | |
| | | Technical Eng./Staff Eng. - W. H. Zimmer Nuclear Station | 4 | | | | | | |
| | | Reactor Engineer W. H. Zimmer Nuclear Station | 4 | | | | | | |
| Senior Maintenance Supervisor | M. Shedlock | Senior Maintenance Supervisor Hope Creek Nucl. Sta. | 1 | | | | | | BSEE |
| | | Resident Electrician Engineer Salem Nucl. Sta. | 4 | | | | | | |
| | | Construction Engr. Hope Creek Nucl. Sta. | ½ | | | | | | |
| | | Lead Constr. Engr. Salem Nucl. Sta. | 2 | | | | | | |

## TABLE 4.3

## HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Senior Technical Engineer (I&C) | M. Zapolski | Senior Technical Engineer (I&C) Hope Creek Nucl. Sta. | | 1 | | | | | BSE |
| | | Lead Engineer Operations Staff Hope Creek Nucl. Sta. | | 2 | | | | | |
| | | Assoc. Engr/Eng. Salem Nucl. Sta. | 5 | | | | | | |
| | | Staff Asst. Salem Nucl. Sta. | 1 | | | | | | |
| | | Navy Nuclear Program | | | 4 | | | EEOW | Various Navy Nuclear Schools |
| Senior Maintenance Supervisor | T. B. Wysocki | Senior Maintenance Supervisor Hope Creek Nucl. Sta. | | 3 | | | | | AACT |
| | | Maintenance Supervisor Salem Nucl. Sta. | 5 | | | | | | |
| | | Startup Engineer Salem Nucl. Sta. | 3 | | | | | | |
| | | Staff Assistant PSE&G | | | | 2 | | | |
| | | U. S. Navy Nuclear | | | 5 | | | | Various Navy Nuclear Schools |

TABLE 6.3

HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Senior I&C Supervisor | T. R. Robbins | Senior I&C Supervisor Hope Creek Nucl. Sta. | | 3 | | | | High School Graduate | |
| | | I&C Supervisor Salem Nucl. Sta. | 6 | | | | | | |
| | | I&C Technician Salem Nucl. Sta. | 3 | | | | | | |
| | | U. S. Navy Nuclear Program | | | 7 | | | EWS, RO | Various Navy Nuclear Schools |
| Senior Maintenance Planning Supv. | W. Mokoid | Senior Maintenance Planning Supv. Hope Creek Nucl. Sta. | | 2 | | | | PE New Jersey | BSEE |
| | | Maintenance Supv. Salem Nucl. Sta. | 2 | | | | | | |
| | | Engineer, E&C Hope Creek Nucl. Sta. | | ½ | | | | | |
| | | Maintenance Dept. Salem Nucl. Sta. | 2 | | | | | | |
| | | E&C, Newark PSE&G | | | | | 5 | | |

## TABLE 4.3

## HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Chemistry Supervisor | T. W. Vannoy | Chemistry Supverisor Hope Creek Nucl. Sta. | | 2 | | | | | AA |
| | | Chemistry Supervisor Salem Nucl. Sta. | 4 | | | | | | |
| | | Chemistry Technician Salem Nucl. Sta. | 5 | | | | | | |
| | | U. S. Navy Nuclear Program | | | 6 | | | ELT | Various Navy Nuclear Schools |
| Senior Maintenance Supervisor | J. T. Ormond | Senior Maintenance Supervisor Hope Creek Nucl. Sta. | | 1 | | | | | High School Graduate |
| | | Senior Maintenance Supervisor Salem Nucl. Sta. | 1 | | | | | | |
| | | Progresssive Maintenance Department Positions up to Senior Maintenance Supervisor - Bergen and Kearny Generating Sta. | | | | 24 | | | |

## TABLE 4.3

## HOPE CREEK MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Senior Reactor Supervisor | R. J. Thompson | Senior Reactor Supervisor Hope Creek Nucl. Sta. | | 1½ | | | | SRO Cert. (BWR) | BSNE |
| | | Nuclear Energy Services, Inc. | | | | | 2 | STA Cert. Susquehanna | |
| | | G.P.U. Nuclear Oyster Creek Reactor Engineer | | 5 | | | | | |
| Senior Engineer Computer Services | J. P. Hawrylak | Senior Engineer Computer Services Hope Creek Nucl. Sta. | | 1 | | | | SRO Cert. (BWR) | MSNE Hope Creek Generating Station BWR Cold License Training Program |
| | | Nuclear Engineer Shoreham Nucl. Sta. | | 5 | | | | | |
| | | Engineer Westinghouse | | | | | 5 | | |
| Senior Reactor Protection Supervisor | L. J. Krajewski | Senior Radiation Protection Supv. Hope Creek Nucl. Sta. | | 1½ | | | | | High School Graduate |
| | | Radiation Protection Supervisor Salem Nucl. Sta. | 1-3/4 | | | | | | |
| | | Radiation Protection Supervisor LaCrosse Nucl. Sta. | | 12 | | | | | |
| | | U.S. Navy Nuclear Program | | | 6 | | | ELT | Various Navy Nuclear Schools |

**TABLE 4.3**

**HOPE CREEK OPERATIONS DEPARTMENT MANAGEMENT PERSONNEL**

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Sr. Nuclear Shift Supervisor | L. A. Aversa | Sr. Nucl. Shift Supv. Hope Creek Gen. Sta. | | 2 | | | | | High School Graduate Memphis State Univ., 56 Credits<br><br>Hope Creek Generating Station BWR Cold License Training Program |
| | | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1½ | | | | BWR Cold Cert. (SRO) | |
| | | Nuclear Shift Supv. Salem Gen. Station | 1½ | | | | | | |
| | | Control Operator Fossil Station | | | | 1 | | | |
| | | Equipment Operator Fossil Station | | | | 5 | | | |
| | | Utility Operator Fossil Station | | | | 2 | | | |
| Sr. Nuclear Shift Supervisor | S. C. Saunders | Sr. Nucl. Shift Supv. Hope Creek Gen. Sta. | | 1 | | | | | High School Graduate Memphis State Univ., 6 Credits<br><br>Hope Creek Generating Station BWR Cold License Training Program |
| | | Nuclear Shift Supv. Salem Gen. Station | 1½ | | | | | SRO License (PWR) | W SRO Training |
| | | Nucl. Control Operator Salem Gen. Station | 7 | | | | | RO License (PWR) | W Reactor Operator Training |
| | | Equipment Operator/ Utility Operator at Fossil Station | | | | 4 | | | |

7/84

TABLE 4.3

HOPE CREEK OPERATIONS DEPARTMENT MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Sr. Nuclear Shift Supervisor | M. J. Trum | Sr. Nucl. Shift Supv. Hope Creek Gen. Sta. | | 2 | | | | | High School Graduate Memphis State Univ., 56 Credits |
| | | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1½ | | | | BWR Cold Cert. (SRO) | Hope Creek Generating Station BWR Cold License Training Program |
| | | Nuclear Shift Supv. Salem Gen. Station | 1½ | | | | | | |
| | | Shift Supervisor Fossil Station | | | | 2½ | | | |
| | | Control Operator Fossil Station | | | | 2 | | | |
| | | Equipment Operator Fossil Station | | | | 1 | | | |
| | | Utility Operator Fossil Station | | | | 1 | | | |
| Sr. Nuclear Shift Supervisor | E. J. Riley | Sr. Nucl. Shift Supv. Hope Creek Gen. Sta. | | ½ | | | | | BSNT 80% Hope Creek Generating Station BWR Cold License Training Program |
| | | Shift Supervisor J. Fitzpatrick Sta. | | 6½ | | | | SRO License (BWR) | |
| | | Nucl. Inst. Tech. Surry Gen. Sta. | | 1 | | | | | |
| | | Reactor Operator Navy Nuclear Program | | | 8½ | | | SRO Cert. | Various Nuclear Navy Programs |

7/84

TABLE 4.3

HOPE CREEK OPERATIONS DEPARTMENT MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Nuclear Shift Supv. | J. Buchanan | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1½ | | | | | High School Graduate Memphis State Univ., 44 Credits |
| | | Control Operator Fossil Station | | | | 1 | | | Hope Creek Generating Station BWR Cold License Training Program |
| | | Equipment Operator Fossil Station | | | | 5 | | | |
| | | Utility Operator Fossil Station | | | | 1 | | | |
| Nuclear Shift Supv. | R. F. Ebright | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 3/4 | | | | | High School Graduate Memphis State Univ., 6 Credits |
| | | Nuclear Equipment Operator | | 2 | | | | RO License (BWR) | RO Training Program |
| | | I&C Technician Combustion Engr. | 1 | | | | | | Hope Creek Generating Station BWR Cold License Training Program |
| | | Electronic Tech./ Reactor Operator (Nucl. Navy Program) | | | 4 | | | RO (Navy Cert.) | Various Nuclear Naval Training Programs |
| Nuclear Shift Supv. | F. P. Higgins | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1½ | | | | BWR Cold Cert. (SRO) | High School Graduate Memphis State Univ., 56 Credits |
| | | Instrument Engineer Bechtel, Inc. (BWR Field Instrumentation) | | | | | 3½ | | Hope Creek Generating Station BWR Cold License Training Program |
| | | Engr. Watch Supervisor | | | 6 | | | SRO (Navy Cert.) | Various Nuclear Naval Training Programs |

7/84

TABLE 4.3

HOPE CREEK OPERATIONS DEPARTMENT MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Nuclear Shift Supv. | F. J. Hughes | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1 | | | | | High School Graduate Memphis State Univ., 44 Credits |
| | | | | | | | | | Hope Creek Generating Station BWR Cold License Training Program |
| | | Shift Supervisor Indian Point 3 | 3/4 | | | | | SRO License (PWR) | SRO Training Program |
| | | Control Operator Indian Point 3 | 9-1/3 | | | | | RO License (PWR) | RO Training Program |
| | | Electronics Tech./ RO-Nuclear Navy | | | 6-1/3 | | | RO (Navy Cert.) | Various Nuclear Naval Training Programs |
| Nuclear Shift Supv. | E. M. Jeffers | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1½ | | | | | High School Graduate Memphis State Univ., 44 Credits |
| | | Shift Supervisor Fossil Station | | | | 2 | | | Hope Creek Generating Station BWR Cold License Training Program |
| | | Control Operator Fossil Station | | | | 2-1/4 | | | |
| | | Equipment Operator Fossil Station | | | | 5-3/4 | | | |
| | | Utility Operator Fossil Station | | | | 2-1/3 | | | |

TABLE 4.3

HOPE CREEK OPERATIONS DEPARTMENT MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Nuclear Shift Supv. | C. L. Newman | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1½ | | | | BWR Cold Cert. (SRO) | High School Graduate Memphis State Univ., 56 Credits<br>Hope Creek Generating Station BWR Cold License Training Program |
| | | Electrician/Engg. Watch Supervisor | | | 7-3/4 | | | SRO (Navy Cert.) | Various Nuclear Naval Training Programs |
| Nuclear Shift Supv. | D. M. Powell | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1 | | | | | High School Graduate Memphis State Univ., 27 Credits<br>Hope Creek Generating Station BWR Cold License Training Program |
| | | Control Operator Grand Gulf Nucl. Sta. | | 3 | | | | RO License (BWR) | RO Training Program |
| | | Electronics Tech./ Reactor Operator | | | 7 | | | RO (Navy Cert.) | Various Nuclear Naval Training Programs |
| Nuclear Shift Supv. | T. L. Russell | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1½ | | | | SRO Cert. (BWR) | Hope Creek Generating Station BWR Cold License Training Program |
| | | Control Operator Salem Gen. Station | 8-1/4 | | | | | RO License (PWR) | W RO Training Program |
| | | Equipment Operator Salem Gen. Station | 2 | | | | | | High School Graduate Memphis State Univ.,44 Credits |
| | | Equipment Operator/ Utility Operator at Fossil Station | | | | 3-1/2 | | | |

7/84

TABLE 4.3

HOPE CREEK OPERATIONS DEPARTMENT MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Nuclear Shift Supv. | R. Stamato | Nuclear Shift Supv. Hope Creek Gen. Sta. | | 1½ | | | SRO Cert. (BWR) | | Hope Creek Generating Station BWR Cold License Training Program |
| | | Control Operator Salem Gen. Station | 8-1/4 | | | | RO License (PWR) | | W RO Training Program |
| | | Equipment Operator Salem Gen. Station | 3/4 | | | | | | High School Graduate Memphis State Univ.,44 Credits |
| | | Equipment Operator/ Utility Operator at Fossil Station | | | | 3 | | | |
| Nuclear Shift Supv. | J. R. Adams | Nuclear Shift Supv. Hope Creek Gen. Sta. | | | | | | | Hope Creek Generating Station BWR Cold License Training Program ASNT 5CP6 |
| | | Reactor Operator Duane Arnold Sta. | | 3 | | | | RO License (BWR) | |
| | | Ops. Technician W - Hanford | | | | | 1½ | | |
| | | Engr. Watch Supv. Navy Nuclear Program | | | 6 | | | SRO Cert. (USN) | |
| uclear Shift Supv. | H. E. Collins | Nuclear Shift Supv. Hope Creek Gen. Sta. | | | | | | | Hope Creek Generating Station BWR Cold License Training Program MSNE |
| | | Asst. Shift Supv./STA Nine Mile Point-Unit 1 | | 3 | | | | SRO License (BWR) | BS Physics |
| | | Asst. Nuclear Eng. Niagara Mohawk | | 1½ | | | | | |

TABLE 4.3

HOPE CREEK OPERATIONS DEPARTMENT MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Nuclear Shift Supv. | D. C. Gairvors | Nuclear Shift Supv. Hope Creek Gen. Sta. | | | | | | | Hope Creek Generating Station BWR Cold License Training Program ASIT 5086 (Pending) |
| | | Sr. Cont. Rm. Oper. Brunswick Gen. Sta. | | 1 | | | | SRO License (BWR) | |
| | | Cont. Rm. Operator Brunswick Gen. Sta. | | 2 | | | | RO License (BWR) | |
| | | Aux. Operator Brunswick Gen. Sta. | | 2 | | | | | |
| | | Electrical Operator Navy Nuclear Program | | | 6 | | | RO Cert. (USN) | Various Nuclear Naval Training Programs |
| Nuclear Shift Technical Advisor | M. J. Azzaro | Nuclear STA Hope Creek Gen. Sta. | | 1½ | | | | BWR Cold Cert. (SRO) | BSNE - State Univ. of NY MSU STA, 48 Credits Nucl. Reactor Fund. Program |
| | | Engineer/Outage Engineering Gilbert Assoc. | 1 | | | | | | Hope Creek Generating Station BWR Cold License Training Program |
| | | RO State Univ. New York Facility | | | | | 1-3/4 | RO License | |
| Nuclear Shift Technical Advisor | W. J. Johnson | Nuclear STA Hope Creek Gen. Sta. | | 1-1/2 | | | | SRO Cert. (BWR) | BSME - Drexel Univ. MSU STA, 48 Credits Nucl. Reactor Fund. Program |
| | | Tech. Assistant/ Test Engineer - Conowingo Gen. Station | | | | | 1/2 | | Hope Creek Generating Station BWR Cold License Training Program |
| | | Tech. Assistant/ Test Engineer - Peach Bottom | | 1/2 | | | | | |

## TABLE 4.3

## HOPE CREEK OPERATIONS DEPARTMENT MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Nuclear Shift Technical Advisor | G. F. Nayler | Nuclear STA Hope Creek Gen. Sta. | | 1-1/2 | | | | BWR Cold Cert. (SRO) | BSME - Drexel Univ.<br>MSU STA, 48 Credits<br>Nucl. Reactor Fund. Program |
| | | Co-Op Student/ Engr. Aid-NISCO | | | | | 1-1/2 | | Hope Creek Generating Station BWR Cold License Training Program |
| | | Engineer Power Div.-Nuclear Div. UE&C | | | | | 1-1/4 | | |
| Nuclear Shift Technical Advisor | J. B. O'Brien | Nuclear STA Hope Creek Gen. Sta. | | 1-1/2 | | | | SRO Cert. (BWR) | BSNE - North Carolina St.<br>MSU STA, 48 Credits<br>Nucl. Reactor Fund. Program |
| | | Cooperative Engg. Aid/Spent Fuel - Savannah River Proj. | | | | | 1/3 | | Hope Creek Generating Station BWR Cold License Training Program |
| | | Student Engineer Light Water Breeder Project - Argonne National Lab | | | | | 1 | | |
| | | Summer Hire Engr./ Fuel Reload License | | | | | 1/4 | | |

TABLE 4.3

HOPE CREEK OPERATIONS DEPARTMENT MANAGEMENT PERSONNEL

| Title | Name | Position | Plant/Related Experience PWR | BWR | Navy | Fossil | Other | License | Education |
|---|---|---|---|---|---|---|---|---|---|
| Nuclear Shift Technical Advisor | W. P. O'Malley | Nuclear STA<br>Hope Creek Gen. Sta. | | 1-1/2 | | | | BWR Cold Cert. (SRO) | BSME - Drexel Univ.<br>MSU STA, 48 Credits<br>Nucl. Reactor Fund. Program |
| | | Co-Op Student/<br>Susquehanna Steam<br>Electric Station | | | | | 1/2 | | Hope Creek Generating Station<br>BWR Cold License Training<br>Program |
| Nuclear Shift Technical Advisor | G. Young | Nuclear STA<br>Hope Creek Gen. Sta. | | 1-1/2 | | | | | Hope Creek Generating Station<br>BWR Cold License Training<br>Program |
| | | Assoc. Engr-Opers.<br>Hudson Gen. Sta. | | | | 1-1/2 | | | BSEE - Youngstown State Univ.<br>MSU STA, 56 Credits<br>Nucl. Reactor Fund. Program |

## 5.0 PERSONNEL TRAINING

Public Service Electric and Gas Company has committed to and invested in a program to train Nuclear Department personnel to meet the technical qualifications required to safely operate the Hope Creek Generating Station and to train management and supervisory personnel to continually increase their effectiveness.

This section reviews the PSE&G nuclear training philosophy and commitment; and delineates the programs which address management training, plant operator training, general employee training, job specific training, and technical support staff training.

## 5.1 PHILOSOPHY AND COMMITMENT

Public Service Electric and Gas Company has adopted a philosophy of providing training based upon a systematic analysis of job requirements. The philosophy is consistent with Nuclear Regulatory Commission requirements and accreditation requirements of the Institute of Nuclear Power Operations, and is based on proven educational techniques.

It is the purpose of the Nuclear Training Center to support the PSE&G Nuclear Department by providing training services that are needed. The Nuclear Department is committed to providing quality training programs that address:

- Company and Nuclear Department needs.
- Industry standards.
- Regulatory requirements.
- Individual employee needs.
- Position requirements.

The Nuclear Training Center works with Nuclear Department personnel to determine training needs, and to establish programs and schedules that support plant operation. Training services are provided in the following major areas: technical supervision and management, maintenance, technical support, operations, and radiation protection.

The Nuclear Training Center staff, in consultation with the station staff, perform the following functions:

1. Delineates training requirements by evaluating the background and experience people bring to the job against the performance based job qualification requirements.

2. Considers NRC requirements, INPO accreditation requirements, industry standards, and experience in defining training.

3. Schedules training to meet department needs.

4. Develops training methods (classroom, simulator, on-the-job, etc.) based on efficient and effective learning.

5. Provides training with a staff that meets technical, supervisory, and instructional ability requirements.

6. Obtains feedback from the station staff and students to improve training effectiveness.

The commitment to training excellence is indicated by the investment PSE&G has made and continues to make toward facilities and people. PSE&G's investment includes:

1. technical and instructional capability qualification requirements for instructional staff;

2. the authorization of over 100 full-time personnel for training and training support functions;

3. a full scope, Hope Creek simulator;

4. extensive laboratories, shops, mock-ups, and audio/visual media to enhance training effectiveness; and

5. A 65,000 square foot training center that was opened in April 1983.

The Nuclear Training organization is charged with implementing PSE&G's Nuclear Training commitment. This is reflected in the mission statement for the Nuclear Training organization:

"Conduct and coordinate all training functions, including the operation of the Nuclear Training Center for all Nuclear Department and support personnel. Develop and present training programs in accordance with management objectives, nuclear regulatory requirements and the Company Union agreement. Provide comprehensive training programs for operations, technical, maintenance and radiation protection department personnel, and for employees in the nuclear support and services area. Develop, conduct and evaluate nuclear training programs and staff to meet Company and industry criteria, standards and practices. Cooperate and coordinate with all Company departments to assure effective and efficient use of resources."

## 5.2 MANAGEMENT TRAINING

The Nuclear Department supervisory and management personnel are selected based on technical experience, education, prior training and ability to effectively deal with employees (supervisors and workers). The technical knowledge and skills necessary to perform effectively in a supervisory and management role include:

- Familiarization with industry, corporate, department, and station organizations and functions;
- Development of an increased understanding of plant component systems;
- Understanding of policies, procedures, and specifications;
- Familiarization with federal, state, and local codes

A multi-level training program supplements prior experience and maintains a high caliber of management and supervisory personnel.

The purpose of management training is to prepare management personnel to accept increased responsibilities and to improve their decision processes, their communication skills and their approaches to personnel matters.

To accomplish this, each program has been tailored to the identified needs for that management level and is provided in the context of career growth. Training and experience form the basis for personnel progression from the lower management positions to the senior positions. Management personnel from first-line station supervisors and technical support management personnel up to, but not including, department heads, participate in Technical Supervisory Skills Program (TSSP). Department Heads, Managers, Assistant General Managers, General Managers, Assistant Vice Presidents and others (e.g., Radiation Protection Engineers, Maintenance Engineer, Instrument and Control Engineer) participate in the programs sponsored by the Company's Human Resources department. In addition, management personnel holding NRC licenses receive operator license training (see Section 5.3, Plant Operator Training). The following describes the content and objectives of the management training programs.

TECHNICAL SUPERVISORY SKILLS PROGRAM

The Technical Supervisory Skills Program (TSSP) is a four-level program designed to enhance the technical and supervisory skills of management personnel. This is being implemented for Hope Creek management personnel.

TSSP-1: This program is designed for first-line supervisors and other selected management personnel responsible for directing the work forces in the Hope Creek Station. The objective of this seven-week program is to provide training in leadership/management skills; plant systems and programs; procedures, codes, standards, and ethics within the nuclear industry.

Specific modules of this program include:

- BWR Indoctrinations
- Labor Relations
- Leadership
- Group Dynamics/Motivation Communications
- Performance Appraisal/Progressive Discipline

- Aberrant Behavior Identification
- Stress Management
- Planning/Problem Solving/Time Management
- Decision Making
- Nuclear Ethics
- Technical Administration
- QA Training
- Department Training

TSSP-2: The intent of TSSP-2 is to provide additional supervisory and technical training for senior supervisors. This five-week program is designed to enhance and further develop the individual's knowledge of plant systems, industry codes and standards, and management skills. Specific modules of this program include:

- BWR Indoctrinations
- Labor Relations
- Technical Administration
- QA Training
- Aberrant Behavior Identification
- Managing and Managers
- Nuclear Standards/Ethics
- Problem Working
- Planning
- Decision Making
- Managing Stress
- Leading

- Team Management
- Performance Appraisal/Progressive Discipline

TSSP-3: This fulfills the need for continuing training for management and supervisory personnel who have or will attend other TSSP programs. The intent is to make available training in management and technical skill areas on a continuing basis. The topics will be reflective of new, revised or timely information that will be of value to all management personnel. Specific modules of this program include, but are not limited to:

- Performance Appraisals/Counselling
- ALARA
- Classroom Management Communications
- Goal Setting
- Leadership
- On-the-Job Training

TSSP-4: The purpose of this program is to provide awareness level training for professional support personnel within the Nuclear Department. This program utilizes the flexibility of allowing personnel to be scheduled for training segments which best meet the needs of the position. Specific modules of this program include, but are not limited to the following:

- Industry Orientation
- Corporate/Nuclear Department Programs
- Quality Assurance Programs
- Planning and Scheduling
- Aberrant Behavior Identification

- o PWR Indoctrination
- o BWR Technology

PROGRAMS FOR MANAGERS

For Department Heads and above, the management development program combines corporate level training programs with specific nuclear related technical training. Specifically, the three corporate offerings are the Management Training Program, the Advanced Management Program, and the Executive Development Program. These programs are designed to increase the manager's awareness and understanding of the relationships between the management process, the interpersonal dimension of the manager's position, and the principles of management needed to effectively manage the organization.

The Management Training Program provides advanced training and development in both task and people management. Practical techniques are developed in the areas of communication, motivation, leadership, coaching and counselling.

The Advanced Management Program provides practical insights into Company operations, current management trends, productivity improvement and utility finance.

In the Executive Development Program, the manager develops a better understanding of the economic, political and social forces which impact management planning and decision making.

## 5.3 PLANT OPERATOR TRAINING

The Plant Operator Training program for Hope Creek Generating Station (HCGS) is designed to develop and maintain a licensed operations organization qualified to assume responsibility for preoperational testing, operation, surveillance, and technical considerations. Training programs are developed to meet the requirements of Title 10, Code of Federal Regulations part 50 (10CFR50) and part 55 and industry standard ANSI/ANS 3.1-1981. The General Manager - Hope Creek Operations approves the training procedures and the implementation schedule. The Manager - Nuclear Training is responsible for implementing the training programs and for using qualified instructional staff.

Screening for initial license operator candidates is provided by the Power Operator Service Selection (POSS) examination. All candidates, except prior licensed operators or personnel holding baccalaureate in engineering or related science, must achieve a satisfactory score prior to being assigned to the operator license programs. POSS predicts the ability of license candidates to successfully complete the operator training program.

The Hope Creek plant reference simulator is scheduled for delivery in the fall of 1984. This training tool will provide hands-on training equivalent to actual plant operation, enhance the operators' understanding of plant operation, and serve to strengthen overall operating ability.

NRC examinations are scheduled for July and September of 1985. The operator license candidates will be divided up into two groups of approximately 25 people each to accommodate training and the examination process.

An eight week pre-license review period will be conducted prior to each NRC examination period. This review will consist of intensive training in theory, Technical Specifications, procedures and systems operation. The pre-license review process will utilize the Hope Creek simulator to the maximum extent possible.

Prior to the pre-license review, the operator license candidates will participate in shift training as part of the normal shift rotation. This shift training reviews system design and operation and enables the operators to trace out each system in the plant to determine physical plant location. Shift training also covers the operation of components using local panels and controls and addresses equipment failure.

Training for newly hired personnel will be conducted commensurate with their previous experience and education, but will ensure that all established training requirements are met.

## TRAINING FOR THE INITIAL GROUP OF LICENSED OPERATORS

The initial operator license training program is designed for NRC licensed Reactor Operators (RO) and Senior Reactor Operators (SRO). Both ROs and SROs receive approximately 42 weeks of training in the following subjects:

- o Nuclear Reactor Fundamentals
- o Reactor Startup
- o Pre-Certification System Training
- o BWR Cold Certification Training
- o Hope Creek System Training

Shift Supervisor (SRO candidates) receive approximately 12 weeks of additional training in the following subjects:

- o BWR Chemistry
- o Nuclear Engineering
- o Corrosion - Materials
- o Radiological Emergencies
- o Abnormal Event Analysis
- o Degraded Core Damage
- o Materials Study
- o Human Behavior

Senior Shift supervisors also receive approximately 28 academic credit hours in the following subjects:

- o Differential Calculus
- o Integral Calculus
- o Thermodynamics I

- o Fluid Mechanics
- o Thermodynamics II
- o Heat Transfer
- o Advanced Reactor Physics
- o Materials Study Course
- o Human Behavior

Previously licensed SRO's will have attended a BWR operational review training program at an appropriate BWR simulator or the Hope Creek BWR simulator when it becomes operational. Following the Hope Creek systems training, the SRO candidates are assigned to a shift where they complete their control pre-operational testing and practical work assignment requirements, and on-the-job system and equipment qualification. As a minimum, the Senior Nuclear Shift Supervisor and the Nuclear Shift Supervisor candidates will have completed six weeks of participatory training at an operating BWR. In addition, one of the two shift supervisors will have six months of participatory training at an operating BWR. Additional courses in management and supervisor training are provided as outlined in Section 5.2 of this report.

A requalification program as required by 10CFR50.54 (i-1) is being developed to provide continuous training and upgrading of plant operations personnel and will meet the requirements of 10CFR55, Appendix A. The program will start after the initial NRC operator license examinations. Use will be made of the Hope Creek plant reference simulator. Upon formal acceptance of the simulator and establishment of operator shift rotation, the licensed operator requalification program will be implemented to ensure that all licensed operators maintain a high level of knowledge and operating ability. Procedures describing the content and conduct of the requalification program will be maintained in the Nuclear Department Training Procedure Manual.

Training for Other Operation Personnel

The initial group of Shift Technical Supervisors (STA) have received the training described below unless the candidates' prior education and experience could substitute. The program included plant specific thermodynamics, fluid flow, reactor physics, system engineering, transient and accident analysis, nuclear instrumentation, process computer, plant response and STA's duties and responsibilties.

The program consisted of approximately 42 weeks in the following subjects:

- Nuclear Reactor Fundamentals
- Reactor Startup Experience
- Pre-certification System Training
- BWR Cold Certification Training
- Hope Creek Systems Training

STA's received approximately 28 academic credit hours in:

- Differential Calculus
- Integral Calculus
- Thermodynamics I
- Fluid Mechanics
- Thermodynamics II
- Heat Transfer
- Advanced Reactor Physics
- Materials Study Course
- Human Behavior

Additionally all STA's will complete six weeks participatory experience at an operating BWR.

Previously licensed STA's will attend a BWR operational review training program at an appropriate BWR simulator or the HCGS specific simulator when it becomes available.

All STA candidates will be assigned to HCGS staff where they will participate in pre-operational testing and complete work assignments as specified by the Operations Manager - Hope Creek. All STA candidates will continue to attend training with the SRO candidates.

Plant Equipment Operators receive training in Hope Creek Generating Station systems, operations and procedures. These personnel perform their work under the direction of licensed plant operators. This work is generally performed outside of the control room and includes operation of such equipment as valves, pumps, ventilation equipment and heat exchangers that support overall plant operations. Personnel selected for this training usually have previous power plant experience or have had military power plant training in either steam propulsion or nuclear power.

Training includes both formal classroom training and on-the-job qualification, under the direction of a qualified instructor, on plant equipment and systems that the Equipment Operator will operate. The classroom training program of approximately 13 weeks includes the following materials:

- Mathematics
- Physics and Basic Heat Transfer and Fluid Flow
- Basic Power Plant Equipment (valves, pumps, etc.), Lubrication, and Job Duties
- Nuclear Steam Supply Systems
- Electrical Systems
- Auxiliary Systems
- Health Physics
- Firefighting

- o Heating Boiler
- o Procedures (as applicable)
- o Administrative Functions, Equipment Tagging, and Log Keeping
- o Technical Specifications (as applicable)

## 5.4 GENERAL STATION WORKER AND JOB SPECIFIC TRAINING

Training programs for nuclear power plant personnel are designed to provide an individual with the knowledge and skills necessary to perform the duties commensurate with his specific job classificaton. A performance-based, objective training program utilizing classroom instruction, laboratory procedures and equipment specific to the station, as well as process and equipment simulators, is conducted for each job classification. In addition, continuing training is conducted to ensure that department personnel maintain a high level of proficiency and meet industry and regulatory standards.

The Instructional System Development approach to training uses Review Groups comprised of Nuclear Training Center personnel and station personnel to identify training needs, requirements, and programs to support plant operations. The results of the Review Groups, INPO generic task lists, NRC requirements, industry experience and industry standards are used in defining programs.

All personnel requiring unescorted access to Hope Creek are required to attend General Employee Indoctrination/Radiation Worker Training. All workers must requalify annually in Radiation Worker review. All workers must be able to read individual radiation exposure reports, respond properly to radiological warning signs, minimize their own exposure to radiation, read and record personal dosimetry readings, and recognize worker rights and responsibilities under NRC Regulations. Training also covers procedures concerning the wearing and removing of protective clothing, minimizing radioactive waste, responding to station alarms, drills and accountability, following security procedures and policies, and the implementation of Quality Control procedures.

In General Employee Indoctrination/Radiation Worker Training and Radiation Worker Review, students are trained in the areas of radiation, biological effects of radiation, contamination, hazards protection, instrumentation, respiratory protection, protective clothing, and plant specific limits.

In addition to General Employee Indoctrination/Radiation Worker Training, entry level technicians and those in journeyman positions attend a Nuclear Indoctrination program. The first part of this program consists of a three week section common to all departments. This section covers math, physics, quality assurance, quality control, first aid, safety and nuclear power plant systems. Each department then conducts a one to two week section containing material which is specifically applicable to that department.

The duties for each department job classification and associated training programs are described on the following pages.

INSTRUMENTATION AND CONTROL JOB CLASSIFICATION

There are three Instrumentation and Control job clasifications: Worker, Assistant, and Technician.

The Worker is primarily responsible for housekeeping, equipment issue room, and routine maintenance of recording instruments and instrument gauges. Training is conducted as part of the Nuclear Indoctrination Program during a two week intensive training program. Instruction includes personal safety, basic electricity, fundamentals of instrumentation and control, and plant systems. The Worker returns to the station where on-the-job training emphasizes proper adherence to written procedures and observance of quality control requirements.

The Assistant performs work of an intermediate skill level in the general testing of equipment and maintenance of instrument and control apparatus. Responsibilities include inspection, adjustment, removal, repair and reinstallation of indicating and recording instruments, self-acting control equipment, thermocouples, and volumetric and mechanical pressure, temperature, flow, and level devices. Other requirements include calculations of daily and monthly performance data, performing volumetric and weight checks on trucks, barges and tanks. Before performing work in this classification, training is provided during a 26 week period at the Nuclear Training Center. Training is conducted in math and physics fundamentals, plant systems, basic electronics, process and control fundamentals, performance reports, maintenance and calibration of instrument and control equipment, station procedures, reports and record-keeping. After the 26 week program, the trainee returns to the station for a detailed on-the-job training program. The station supervisor is responsible for assessing the performance of Assistants and determining final qualification in each area of responsibility.

The Technician is required to maintain the instruments and automatic control apparatus associated with the power plant, and perform surveillance tests. Inspection, adjustment, repair, calibration and installation of all types of automatic control apparatus, radiation detection instrumentation, plant computers, seismic monitoring and turbine supervisory instrumentation are all part of this classification. Training for this classification follows a similar pattern to the Assistant program. The 46 week Technician training program addresses troubleshooting, recognition and correction of malfunctioning and/or out of specification conditions of equipment. Subjects covered include math and physics review, basic electronics review, advanced electronics, advanced instrumentation, nuclear systems, documentation and administration. Upon completion of this program, the trainee returns to the plant for on-the-job training and final qualification in designated areas of responsibility.

## RADIATION PROTECTION JOB CLASSIFICATION

There are three job classifications in the Radiation Protection Department: Worker, Assistant, and Technician.

The Worker performs simple, routine tasks associated with radiological surveys, radioactive waste shipments, processing of protective clothing, material disposal and area/equipment decontamination. As part of Nuclear Indoctrination, the Worker receives two weeks of intensive classroom training in basic mathematics, health physics fundamentals, regulations, radiological surveys, respiratory protection, radiation protection equipment and posting/control of radiological areas.

The Assistant's duties include inspection, adjustment and repair of radiation protection instruments and respiratory protection equipment; operation of fixed and portable equipment to collect, store, and analyze radiological data; and monitoring plant evaluations that involve radioactive material to ensure that work is performed in a radiological safe manner. Training is provided in a 26 week program covering math, physics, health physics fundamentals, fixed and portable instrumentation and application of radiation protection methods.

The Technician performs duties which include inspection, adjustment, repair and installation of all radiation protection equipment; establishing radiological controls based on radiological survey data and approved procedures; and analyzing and interpreting radiological data to identify radionuclides not normally associated with radiological monitoring. The Technician training program consists of 17 weeks of instruction covering radiation protection fundamentals, external and internal dose control, plant systems, environmental health physics and radiation protection equipment.

On-the-job training for all three classifications emphasizes application of knowledge and skills gained during classroom and laboratory sessions.

## MAINTENANCE (ELECTRICAL, MECHANICAL) JOB CLASSIFICATION

There are six job classifications within the Maintenance/Skills Group: Utility Mechanic, Station Mechanic, Electrician, Shift Electrician, Boiler Repair Mechanic, and Machinist.

The Utility Mechanic performs tasks associated with machine tool operation; equipment and materials handling; operation of heating units; cleaning and lubricating equipment; removal, repair, and installation of power plant equipment and structures. Training is conducted during a two week period as part of the Nuclear Indoctrination program.

The Station Mechanic performs duties which include set up and operation of machine tool equipment; assembling, disassembling, repairing and adjusting all types of electrical and mechanical equipment, tubing, piping, valves and fittings; analyzing, testing and repairing lighting, signaling and simple control circuits; and operating the turbine room crane. Training in this classification includes 26 weeks of instruction at the Nuclear Training Center covering electricity, machining, and boiler repair. This program is followed by two weeks of on-the-job training.

The Machinist, Electrician, Shift Electrician and Boiler Repair Mechanic perform duties involving inspection, repair, testing, adjustment, installation and removal of mechanical, electrical, piping and boiler plant equipment respectively. Training for these specialties varies from 36 to 45 weeks, some of which occurs at the Nuclear Training Center and some of which takes place as on-the-job training. Depending on the specialty, topics include machining skills, outage maintenance, electricity, boiler repair, electronics, plant maintenance and troubleshooting, advanced welding, codes, pipe fitting and valving, inspection and repair of auxiliary equipment and data applications.

## FIRE PROTECTION JOB CLASSIFICATIONS

There are two job classifications within the Fire Protection Group: Fire Fighter and Fire Operator.

The Fire Fighter performs duties in the operation, inspection and testing of all installed fire protection systems and operates and inspects the portable fire protection equipment. The initial training course is five weeks in length and includes instruction in the plant's fire fighting plan; identification, use and location of all installed fire fighting equipment; toxicity of smoke; self-contained breathing equipment; and the proper method of fighting fires in confined spaces.

The Fire Operator performs the duties of a higher skill in the operation, inspection and testing of all the installed fire protection systems and makes routine building inspections in order to generate an analysis of fire hazards. The Fire Operator is trained further in the fire protection systems, leadership and the relationship of the safety related systems to the safe shutdown of the plant.

EMERGENCY RESPONSE

Emergency Response Training is given to all personnel assigned to emergency duty positions. Training is aimed at providing an overview of the Emergency Plan and is generic in nature. Classroom instruction covers plan scope, plan definition, emergency organization, emergency procedures, emergency facilities and equipment. Team training ensures that members of specific teams function together smoothly. Drill and exercise training is aimed at ensuring that all teams interface properly during emergency conditions. Management level emergency duty positions must participate in at least one drill per year. In addition, all personnel assigned to emergency duty positions receive training as part of their job classification and must requalify annually by retaking Emergency Response Training.

CHEMISTRY JOB CLASSIFICATIONS

There are three job classifications within the Chemistry Group: Worker, Assistant, and Technician.

The Worker is primarily responsible for housekeeping; routine maintenace of recording instruments and instrument gauges; collection of samples; and routine analyses. Training for this position occurs as part o

the Nuclear Indoctrination Program over one week. This training includes instruction in proper lab, sampling and safety techniques and emphasizes following written procedures. The Worker returns to the station where on-the-job training emphasizes proper sampling and adherence to quality control procedures.

The Assistant performs duties in the operation of water treatment equipment; chemical additions; maintenance of the proper daily functioning of chemistry instruments and equipment; and the testing evaluation of chemistry and radiochemistry conditions. A 26 week program of training covers math, physics, electricity fundamentals, electronics fundamentals, chemistry fundamentals, analytical chemistry, radiochemistry, gamma spectroscopy, and chemical controls. The Assistant returns to the station for on-the-job training and final qualification by the station supervisor.

The Technician inspects, adjusts, repairs and installs instruments used by the department in the laboratories and water treatment facilities. Analysis and interpretation of radiochemical data to identify radioactive material not normally associated with plant effluent monitoring is also a duty of this classification. Training occurs at the Nuclear Training Center over a 51 week period. Training emphasizes troubleshooting techniques and the recognition and correction of malfunctioning and/or out of specification conditions. Subjects covered include math; physics; instrumentation; advanced electronics; Federal, State, and local codes; advanced chemistry fundamentals; radiochemical principles; and advanced instrument analysis. On-the-job training occurs during a three to six month period with final qualification by the station supervisor.

QUALITY ASSURANCE TRAINING

QA Training consists of a combination of Formal Classroom Instruction, on-the-job training and continuing training for maintenance of proficiency. Training is conducted on subjects such as Quality Sciences, document control, records management, blue print reading, BWR/PWR systems technology, inspection planning, NDE, M&TE, mechanical equipment, instrumentation and auditing.

Quality Assurance personnel who perform inspections, examinations, or tests are required to be qualified and certified to one of three levels of proficiency in accordance with Regulatory Guide 1.58: Level I, Level II, and Level III.

All Quality Assurance personnel who are certified are qualified through a combination of education, training and experience.

Level I personnel are qualified and certified to perform and document the results of inspections or tests that are required to be performed in accordance with documented procedures and acceptance standards.

Level II individuals have the capabilities of a Level I and in addition have demonstrated capabilities in planning inspections, examinations, and tests; evaluating the acceptability of results; and supervising lower level personnel.

Level III individuals have broad experience and training in the performance of inspections, examinations and tests and have the capability of evaluating the adequacy of training programs utilized to train inspection, examination and test personnel.

## 5.5 TECHNICAL SUPPORT STAFF TRAINING

Technical staff support personnel provide engineering expertise to support plant operations. Prior to core load, selected technical support staff personnel performing reactor engineering functions will attend vendor offered training courses.

Examples of courses provided are:

- Core Management Engineering - core behavior, thermal hydraulics, core fuel management principles, fuel cycles, core performance monitoring, safety and licensing, computer simulation of core loading and rod pattern development.

- o Abnormal Event Analysis - transient analysis; accident analysis; actions to mitigate accidents, identify and correctly react to transient and accidents.

- o Degraded Core - recognition and recovery from a degraded core condition.

- o Boiler Water Chemistry and Nuclear Materials - chemistry practices, industry problems associated with chemistry control, corrosion properties of BWR materials, effect of material microstructure.

## 5.6 INSTRUCTIONAL STAFF

PSE&G has a formal instructor qualification and certification program. The goal of this program is for each instructor to be technically competent to teach the highest level course within the instructor's area of expertise, and to have the instructional capability and supervisory skills to effectively train others in the knowledge and skills required to perform their jobs.

Technical competence is the result of the individual's having acquired the necessary subject matter expertise and related work experience to enable the person to be an effective instructor in a particular area of instructional content. Technical competence differs from instructional capability in that an individual can be competent technically but may require additional training to develop the ability to help others learn and evaluate successful performance. Individuals providing instruction to license operator candidates will have received all appropriate training and hold or have held an SRO license or certification.

Supervisory skills provide the potential for effectively supervising trainees. Supervisory skills are independent of instructional capability in that one may be effective in a supervisory capacity without being an effective instructor.

Instructional capability is the potential for being an effective instructor due to the presence of the necessary knowledge, skills, and abilities. Instructional capability, which enables the instructor to help people learn and professionally evaluate learner performance, is relatively independent of the particular subject matter being taught. The continuing training program develops the professional growth of the instructor.