Chapter 13

CONDUCT OF OPERATIONS

CONTENTS

CONTENTS (Continued)

CONTENTS (Continued)

Chapter 13

TABLES

Chapter 13

FIGURES

Chapter 13

APPENDICES

Appendix	Title
13.1A	Deleted in Revision 17
13.1B	Deleted in Revision 12

Chapter 13

CONDUCT OF OPERATIONS

Pacific Gas and Electric Company (PG&E) became involved in the operation of nuclear power plants in 1957 after many years of successfully operating its fossil-fueled power plants. In the operation of Humboldt Bay Power Plant (HBPP), Unit 3, and Diablo Canyon Power Plant (DCPP), Unit 1 and Unit 2, and the Humboldt Bay and Diablo Canyon Independent Spent Fuel Storage Installations (ISFSIs), PG&E has demonstrated its dedication as a competent and safety-oriented operating organization. PG&E is also committed to continually developing and enhancing the organization responsible for the operation of DCPP to meet expanded technical and regulatory requirements. In keeping with this commitment, PG&E has made significant changes since commencement of operations in its nuclear organization and operating policies to strengthen PG&E's capability to operate DCPP safely and reliably for all operating conditions.

13.1 ORGANIZATIONAL STRUCTURE

The following regulatory requirements are applicable to the organizational structure presented in this section:

(1) 10 CFR 50.40 – Common Standards

10 CFR 50.40(b) requires applicants for an operating license to be technically qualified to engage in the proposed activities in accordance with the applicable regulations. The organizational structure established by PG&E to address this requirement is presented in Section 13.1.

(2) 10 CFR 50.54 – Conditions of Licenses

10 CFR 50.54(i), (j), (k), (l), (m), and (y) specify requirements for operating shift staffing. The organizational structure established by PG&E to address these requirements is presented in Section 13.1.2.2. Note 1 in the table at 10 CFR 50.54(m)(2)(i) is applicable to DCPP in accordance with DCPP Technical Specification 5.2.2.b.

(3) Regulatory Guide 1.8, Revision 2 (Proposed) – Personnel Selection and Training

Regulatory Guide 1.8, Revision 2 (Proposed), endorses ANSI/ANS 3.1-1978, with certain enhancements. Members of the plant staff are required to meet the minimum qualifications of ANSI/ANS 3.1-1978 for comparable positions, with exceptions as identified in DCPP Technical Specification 5.3.1 and in Table 17.1-1.

(4) Regulatory Guide 1.8, Revision 2 – Qualification and Training of Personnel for Nuclear Power Plants

The Manager, Radiation Protection, is required to meet the minimum qualifications of Regulatory Guide 1.8, Revision 2, for radiation protection manager in accordance with DCPP Technical Specification 5.3.1.a (refer to Section 13.1.2.1).

(5) Regulatory Guide 1.8, Revision 3 – Qualification and Training of Personnel for Nuclear Power Plants

In accordance with DCPP Technical Specification 5.3.1.c, the licensed Reactor Operators (ROs) and Senior Reactor Operators (SROs) are required to meet the minimum qualifications of ANSI/ANS 3.1-1993 as endorsed by Regulatory Guide 1.8, Revision 3, with the exceptions clarified in the current revision to the Operator Licensing Examination Standards for Power Reactors, NUREG-1021, ES-202.

(6) NUREG-0737 (Item I.A.1.1), November 1980 – Clarification of TMI Action Plan Requirements

Item I.A.1.1 – Shift Technical Advisor

Item I.A.1.1 requires each licensee to provide a fully trained on-shift Shift Technical Advisor (STA) to the shift foreman. The STA provides advisory technical support to the unit operations shift crew in the areas of thermal hydraulics, reactor engineering, and plant analysis with regard to the safe operation of the unit. This position is manned in Modes 1, 2, 3, and 4 unless an individual with a SRO license meets the qualifications specified by the Commission Policy Statement on Engineering Expertise on Shift. Refer to License Condition 2.C(6)a in the DCPP Unit 1 Operating License and Section 5.2.2.f in the DCPP Technical Specifications.

(7) Generic Letter 88-06, March 1988 – Removal of Organization Charts from Technical Specification Administrative Control Requirements

The DCPP Technical Specifications and Chapter 17 contain requirements that are derived from Generic Letter 88-06, March 1988 (refer to DCPP Technical Specification Sections 5.2.1.a through 5.2.1.d).

13.1.1 CORPORATE ORGANIZATION

PG&E's corporate organizational structure is depicted in Figure 17.1-1. The manner in which the various PG&E departments function in performing the design, operation, and quality assurance of DCPP is described in Section 17.1.1.

13.1.1.1 Corporate Functions, Responsibilities, and Authorities

PG&E is a public utility and the primary operating subsidiary of PG&E Corporation, a holding company. The Board of Directors of PG&E Corporation oversees the governance of PG&E.

Refer to Section 17.1.1 for discussion of corporate functions, responsibilities, and authorities.

13.1.1.2 Corporate Staffing and Organizational Relationships

Current operations of PG&E are organized under and responsible to the PG&E Corporation Board of Directors through the Chairman of the Board, Chief Executive Officer, and President, PG&E Corporation.

Reporting relationships are described in Figure 17.1-1.

13.1.1.3 Interrelationship With Contractors And Suppliers

The working interrelationships and organizational interfaces among PG&E, Westinghouse (the nuclear steam supply system manufacturer) and other suppliers and contractors are described in Chapter 1 (refer to Section 1.4).

13.1.1.4 Technical Staff

DCPP may call upon a variety of other PG&E departments, as well as outside consultants, to assist in the technical support of nuclear power plant operations as shown in Figure 17.1-1.

PG&E's overall technical capability is such that most technical support functions for DCPP are provided from within the PG&E organization. Outside consultants are available to provide technical support in all technical areas for plant operations and are used to assist on special problems as required. Consultant personnel interface with PG&E specialists in a variety of technical, engineering, and design areas.

13.1.2 OPERATING ORGANIZATION

The operating organization and reporting relationships are provided in the organization chart in Figure 17.1-2. The functions, responsibilities, and authorities of key management positions in the DCPP operating organization are described in Section 17.1.2. The Operations Services Organization including the shift crew composition is described in more detail below.

13.1.2.1 Operations Services Organization

The Operations Services organization is shown in Figure 13.1-5.

The Director, Operations Services reports to the Station Director and exercises direct supervision over operations activities. The following positions report to the Director, Operations Services, directly or through the Manager, Operations, as indicated:

- Manager, Operations

  The Manager, Operations, is the operations manager specified in Technical Specification 5.2.2.e. The Manager, Operations, is responsible for ensuring that appropriate operating procedures are available and that operating personnel are familiar with the procedures. In carrying out these responsibilities, this individual provides direct supervision to the shift operating crews (or to the Operations Superintendent if the Manager, Operations, does not hold an SRO license for DCPP).

  During high workload periods (such as outages), the Director, Operations Services may choose to appoint an additional operations manager in order to better fulfill the responsibilities listed above. In such cases, the division of responsibilities will be clearly identified, and establishment of that position will be communicated to all appropriate organizations.

- Operations Superintendent

  If the Manager, Operations, does not hold an SRO license for DCPP, the Operations Superintendent shall hold an SRO license for DCPP. The Operations Superintendent shall be responsible for providing operating instructions to the Shift Foremen and Shift Managers as indicated in Figure 13.1-5. The Operations Superintendent satisfies the operations middle manager position specified in Technical Specification 5.2.2.e and shall meet the requirements of ANSI 3.1-1993, Sections 4.2.2 and 4.3. This position is not intended to be filled using rotational personnel.

  If the Manager, Operations, holds an SRO license for DCPP, then the Operations Superintendent position is not required to be staffed as indicated in Figure 13.1-5.

- Shift Manager

  The Shift Manager reports to the Manager, Operations, and is responsible for overall supervision of the operation of the facility. The Shift Manager provides direct supervision to the Shift Foremen, and, in the absence of higher supervision, is in full charge of the plant. In the event of an operating emergency, the Shift Manager is authorized to take any actions deemed necessary to respond to the emergency.

- Shift Foreman

The Shift Foreman reports to the Shift Manager and is responsible for providing direct supervision of the plant operators and the work they perform, and for ensuring administrative support is available in this area. The Shift Foreman has command and control responsibility for the control room for the assigned unit.

The Shift Foreman may also be assisted by a work control shift foreman. The work control shift foreman is an optionally staffed position, whose function is described in the appropriate administrative procedure.

- Shift Technical Advisor

  The STA function will normally be assigned to one of the SRO licensed operators on crew. The STA function may be assigned to an STA qualified individual supplementing the crew.

  The STA provides technical and analytical support to the operating shift crew to ensure safe operation of the plant.

  During transient and emergency events, the STA qualified individual is responsible for applying knowledge and experience to the analysis of and response to the event and advising the rest of the crew, as applicable, on actions to terminate the event or mitigate its consequences.

- Manager, Operations Planning

  The Manager, Operations Planning, is responsible for Operations' role in outage and daily work control planning and clearance preparation.

- Manager, Chemistry and Environmental Operations

  The Manager, Chemistry and Environmental Operations, is responsible for administering, coordinating, planning, and scheduling all chemistry activities at the plant. This individual is also responsible for coordinating DCPP environmental activities and for developing and managing programs to achieve and maintain compliance with applicable environmental regulations and requirements.

13.1.2.2 Shift Crew Composition

With either or both units fueled and in Mode 1, 2, 3, or 4, the minimum shift crew composition is:

- One Shift Manager and one Shift Foreman, each with an SRO license pursuant to 10 CFR Part 55.

- Three licensed operators, each licensed under 10 CFR Part 55; at least

one assigned to each unit.

- Three non-licensed operators (Nuclear Operators), with at least one assigned to each unit. These positions satisfy Technical Specification 5.2.2.a.

- One STA, an individual who provides technical support to the unit operations shift crew in the areas of thermal hydraulics, reactor engineering, and plant analysis with regard to safe operation of the unit. This position will be manned unless there is a crew member with an SRO license who meets the qualifications specified by the Commission Policy Statement on Engineering Expertise on Shift. This position satisfies Technical Specification 5.2.2.f.

- One chemical and radiation protection technician. This position satisfies Technical Specification 5.2.2.c.

With both units defueled or both units in Mode 5 or 6, the minimum shift crew complement is:

- One Shift Foreman with an SRO license pursuant to 10 CFR Part 55.

- At least one individual holding an SRO license or an SRO license limited to fuel handling, and who has no other concurrent responsibilities, will be present during core alterations on either unit.

- Two licensed operators, each licensed under 10 CFR Part 55, with at least one assigned to each unit.

- Three non-licensed operators (Nuclear Operators), with at least one assigned to each reactor containing fuel. These positions satisfy Technical Specification 5.2.2.a.

- One chemical and radiation protection technician. This position satisfies Technical Specification 5.2.2.c.

The shift crew composition may be one less than the minimum requirements of 10 CFR 50.54(m)(2)(i) and Technical Specifications 5.2.2.a and 5.2.2.f for a period of time not to exceed two hours in order to accommodate unexpected absence of on duty shift crew members provided immediate action is taken to restore the shift crew composition to within the above minimum requirements. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crewman being late or absent.

The establishment of the shift organization is based on consideration of PG&E's power plant staffing philosophy, the evaluation of the operating practices of U.S. pressurized

water reactor (PWR) plants, PG&E's experience with HBPP and large (up to 750 MWe) fossil-fuel units, and the expanded technical and operational regulatory requirements of nuclear power operation.

This shift organization provides effective manpower to cover the operating contingencies that can reasonably be expected to occur during normal operation of the plant. An organization of this size is also effective to monitor operation of engineered safety systems in the event of any plant accidents. Refer to the Emergency Plan for additional staffing requirements.

The shift chemical and radiation protection technician performs the chemistry sampling and analysis radiation monitoring, and other chemistry and radiation protection functions normally encountered during both normal and nonroutine operations. In addition, all licensed operators are trained in chemistry and radiation protection as part of their operator license training.

13.1.3 QUALIFICATION REQUIREMENTS FOR NUCLEAR PLANT PERSONNEL

13.1.3.1 Minimum Qualification Requirements

PG&E is using proposed Revision 2 of Regulatory Guide 1.8 (ANSI/ANS 3.1-1978) as the basis for establishing minimum qualification requirements for comparable management, supervisory, and technical positions in the plant organization. One exception is that the Manager, Radiation Protection, shall meet or exceed the qualification requirements of Regulatory Guide 1.8, Revision 2, for the radiation protection manager. A second exception is that the operations manager shall meet or exceed the minimum qualifications as specified in Technical Specification 5.2.2.e. A third exception is that the licensed ROs and SROs shall meet or exceed the minimum qualifications of ANSI/ANS 3.1-1993 (Reference 6) as endorsed by Regulatory Guide 1.8, Revision 3, (Reference 7) with the exceptions clarified in the current revision to NUREG-1021 (Reference 8), Section ES-202. The above three exceptions are specified by Technical Specifications 5.3.1.a, 5.3.1.b, and 5.3.1.c, respectively. Other exceptions are summarized in Table 17.1-1.

The minimum qualification processes for physical force personnel (operators, instrument technicians, maintenance personnel, and chemical and radiation protection technicians) are defined by the Institute of Nuclear Power Operation (INPO) accreditation criteria (Reference 5). PG&E has received, and will maintain, INPO accreditation of the training and qualification programs for physical force personnel.

13.1.3.2 Qualifications of Plant Personnel

PG&E has addressed NUREG-0660, May 1980 (Reference 1), NUREG-0731, September 1980 (Reference 2), and Regulatory Guide 1.8, Proposed Revision 2 (Reference 3) (ANSI/ANS-3.1-1978, Selection and Training of Nuclear Power Plant Personnel) as the basis for establishing minimum educational background and

experience requirements for all management, supervisory, and professional personnel.

The key management, supervisory, and technical positions in the plant organization are filled by individuals who have been actively engaged in the nuclear power field. Qualification forms for personnel holding the key positions in the plant operating organization are maintained on file at the plant.

13.1.4 REFERENCES

1. NUREG-0660, NRC Action Plan Developed as a Result of the TMI-2 Accident, Task I.B.1

2. NUREG-0731, Guidelines for Utility Management Structure and Technical Resources

3. Regulatory Guide 1.8, Personnel Selection and Training, USNRC February 1979 (Proposed Revision 2)

4. Regulatory Guide 1.33, Quality Assurance Program Requirements (Operation), USNRC February 1978

5. ACAD 00-001, Revision 0, The Process for Accreditation of Training in the Nuclear Power Industry, INPO, January 2000

6. ANSI/ANS 3.1, American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plants, April 1993

7. Regulatory Guide 1.8, Qualification and Training of Personnel for Nuclear Power Plants, USNRC, Revision 3, May 2000

8. NUREG-1021, Operator Licensing Examination Standards for Power Reactors

13.2 TRAINING PROGRAM

The following regulatory requirements are applicable to the training programs described in this section:

(1) 10 CFR 50.120 – Training and Qualification of Nuclear Power Plant Personnel

DCPP is required to meet the requirements for the training and qualification of nuclear power plant personnel contained in 10 CFR 50.120.

(2) 10 CFR Part 55 – Operators' Licenses

The DCPP training program is required to meet the requirements for the preparation, approval, proctoring, grading, and security of written examinations and operating tests contained in 10 CFR Part 55, Subpart E, Written Examinations and Operating Tests. In addition, the DCPP training program is required to meet the requalification program requirements contained in 10 CFR 55.59.

On May 26, 1987, the U.S. Nuclear Regulatory Commission (NRC) revised 10 CFR Part 55 regarding training and qualifications of licensed operators. As a result of this issuance, DCPP revised its Continuing Training Program to meet the requirements of 10 CFR Part 55 utilizing a Systems Approach to Training methodology.

In accordance with Generic Letter 87-07, March 1987, PG&E submitted a response on April 28, 1988, to inform the NRC that the DCPP Continuing Training Program would be following a Systems Approach to Training methodology.

(3) NUREG-0737 (Items I.A.1.1, I.A.1.2, I.C.3, I.C.5, and II.B.4), November 1980 – Clarification of TMI Action Plan Requirements

Item I.A.1.1 – Shift Technical Advisor (STA)

This item requires the DCPP requalification training program for STAs to include review of the five elements described in DCPP's response for this item.

Item I.A.1.2 – Shift Supervisor Administrative Duties

This item requires the training program for shift foremen (i.e., the DCPP equivalent of the shift supervisor) to emphasize and reinforce (1) the responsibility for safe operation and (2) the management function the shift foreman provides for assuring safety.

Item I.C.3 – Shift Supervisor Responsibilities

This item is included with Section I.A.1.2 above.

Item I.C.5 – Procedures for Feedback of Operating Experience to Plant Staff

PG&E is required to implement procedures to assure that operating information pertinent to plant safety originating both within and outside the utility organization is continually incorporated into the training program.

Item II.B.4 – Training Program for Mitigating Core Damage

The DCPP training program is required to teach the use of installed equipment and systems to control or mitigate accidents in which the core is severely damaged. The training program is required to contain the following items, as a minimum:

(1) Incore Instrumentation
(2) Excore Instrumentation
(3) Regulatory Guide1.97, Revision 3, Instrumentation
(4) Primary Chemistry
(5) Radiation Monitoring
(6) Gas Generation

(4) Generic Letter 88-17, October 1988 – Loss of Decay Heat Removal

The DCPP training program is required to implement a commitment to include midloop operation in control room operator training, which was made in the station's response to Generic Letter 88-17, October 1988.

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED.

13.2.1 INITIAL PROGRAM DESCRIPTION

The experience obtained by PG&E since 1956 in training personnel for operation and maintenance of nuclear power plants has enabled it to clearly define the training requirements for each position in the plant organization and to evaluate the various means of obtaining this training. Based on this experience, PG&E chose to utilize a combination of formal classroom training and on-the-job experience with operating nuclear plants to achieve its training goals. A brief summary of each of the initial training activities is given in Table 13.2-1. The extent to which each individual participated in these activities was determined based on the person's position in the plant organization and his previous experience. A training summary for the initial operating organization is presented in Table 13.2-2.

Tables 13.2-1 and 13.2-2 summarize the initial plant training program and are historical in nature.

13.2.1.1 Program Content

The training programs described in Sections 13.2.1.1.1, 13.2.1.1.2, 13.2.1.2, 13.2.1.3, 13.2.1.4, 13.2.1.5, and 13.2.1.6 were for the initial plant personnel and are retained herein for historical value. Starting with Section 13.2.1.7, the present and ongoing plant training programs are described.

13.2.1.1.1 Training for Initial Plant Supervisorial Personnel

The training programs for the initial appointees to supervisory positions in the Diablo Canyon operating organization are summarized in Table 13.2-2.

The first formal involvement by a member of the plant staff in the Diablo Canyon project occurred in early 1968, when the Power Plant Engineer was assigned to PG&E's General Office for approximately 2 months to assist in the preparation of the preliminary safety analysis report (PSAR) for Unit 1. In the spring of 1969, both the Power Plant Engineer and the Supervisor of Operations were engaged in similar work on the Unit 2 PSAR for approximately 6 months, and they also assisted in the conceptual design of several plant systems. These two individuals were then assigned to the R. E. Ginna plant in the latter part of 1969 to participate in the startup testing program. Since that time, other key plant supervisory personnel have been sent to various PWR plants that were in operation or in the startup testing program. The majority of these assignments took place in the period from 1970 to 1972.

In July 1970, the second major step in the early supervisory training activities occurred with the organization of the Diablo Canyon Task Force at Humboldt Bay. This was the first time that the majority of the supervisory staff was assembled as a group. Initially, the Task Force consisted of 14 individuals on a full- or part-time basis. During the period that the group was at Humboldt Bay, work was begun on the various Task Force assignments, including preparation of training material, operating manuals, licensing material and technical specifications, and performing an operational review of the plant design.

In August 1971, the Task Force was transferred to the site, along with several supervisors who had not previously been on the Task Force, in order to obtain maximum participation of plant staff personnel in onsite activities, including observation of equipment installation and review and comment on the system and equipment preoperational and startup test procedures prepared by the General Construction Department.

The second basic phase of the training program began with the arrival onsite of selected plant operators about 5 years before the initial anticipated core loading. At that time, the formal nuclear training courses required to prepare individuals for the operator

license examinations began. These courses were conducted by members of the plant supervisory staff. Depending on a particular individual's experience and qualifications, supervisors were either instructors or participants as appropriate during different portions of this program. In most cases, the supervisors participating in these courses had completed similar training at the HBPP.

In addition to participation in the formal training programs, the supervisors were actively engaged in preoperational testing and checkout of systems and equipment, hot functional testing, initial loading and low level testing, and in the power escalation program leading to commercial operation, as those activities took place.

13.2.1.1.2 Training for Plant Physical Force Personnel

All physical force personnel were trained in radiation protection, quality assurance, and security procedures and practices to an extent commensurate with their duties. In addition, the chemical and radiation protection technicians and control technicians participated in the nuclear technology and plant design seminars. The chemical and radiation protection technicians were also trained in chemical and radiochemical techniques.

The first physical force personnel assigned to the site were the control technicians, three of whom arrived in late 1971. They were placed on loan to the General Construction instrument staff and participated in the installation and checkout of plant equipment. An apprentice control technician was transferred to the site in December 1972 and was also placed on loan to General Construction.

13.2.1.2 Coordination with Preoperational Tests and Fuel Loading

The schedule of formal nuclear training designed to prepare candidates for NRC Operator and Senior Operator License examinations is shown in Figure 13.2-1 in relation to the schedule for preoperational testing and initial fuel loading.

13.2.1.3 Practical Reactor Operation

The senior control operators and control operators for Unit 1 were assigned to the site about five years before the initial anticipated core loading and began formal training at that time. The remaining operators were assigned as the preoperational testing work load dictated. All operators received extensive on-the-job training in the operation of plant controls during the preoperational and startup testing programs.

Other physical force personnel were assigned to the site as dictated by the work load and in time to complete any training required prior to work assignment.

13.2.1.4 Reactor Simulator Training

The simulator training program for the "Cold" license candidates is described in Table 13.2-1, Section 16, Simulator Training.

13.2.1.5 Previous Nuclear Training

The majority of the initial supervisory personnel had several years of nuclear power plant experience at HBPP or at other nuclear facilities. Thus, the initial training for this group was largely concentrated in two major areas: (a) becoming familiar with the differences between the PWR and boiling water reactor concepts, and (b) study of the design and operation of the Diablo Canyon plant itself.

13.2.1.6 Other Scheduled Training

Plant personnel were required to participate in a program of lectures, demonstrations, written assignments, and drills designed to familiarize them with fire protection procedures, security procedures, medical and first aid techniques, radiation protection principles, their actions in the event of a plant emergency, and other topics. The extent of the training that a particular individual received was dependent on the responsibilities of his or her position on the plant staff.

13.2.1.7 Training Programs for Nonlicensed Personnel

Each individual on the plant staff receives training to some degree depending on the scope of their job duties and responsibilities. This training falls into three general categories: (a) standard PG&E training programs, (b) general employee training programs related to working at DCPP, and (c) training programs specific to job-related departmental duties.

All personnel receive general employee training as discussed in Section 13.2.1.8.

Each onsite DCPP department has defined a training program directed toward the technical skills needed for job-related duties. These training programs are described in the Plant Manual.

13.2.1.8 General Employee Training Program

Training programs involving industrial safety, first aid, fire protection, security, emergency planning, radiation protection, quality control, and other general topics are conducted for onsite personnel to supplement specific job-related technical training programs.

General training for all onsite personnel is given in the following areas:

(1) General description of plant and facilities
(2) General site rules
(3) Radiological health and safety program
(4) Site emergency plans

(5) Industrial safety program (including medical emergency response notification, and general fire protection)
(6) Security program
(7) Quality assurance/orientation
(8) Fitness for Duty
(9) Hazardous Materials

The extent of training in the above topics varies from one person to another commensurate with factors such as the duties and responsibilities of the person's job, areas of the plant to be accessed, whether the access is to be escorted or unescorted, duration of the access, and prior experience.

13.2.1.9 Responsible Individual

The CNO has overall responsibility for the entire training effort for plant personnel, including ensuring that necessary training programs are established, implemented, documented, and audited.

The Director, Learning Services reports to the VP Nuclear Generation, and is responsible within the DCPP organization for conducting the majority of plant training. The director is also responsible for training coordination so that resources are used effectively and the training program content reflects the actual needs of the various departments and workers and satisfies current NRC and industry standards.

Within Learning Services, there are functional groups reporting to the Director, Learning Services that conduct operator, technical, maintenance, engineering, and general employee training. There is also an ongoing training development and administration effort.

13.2.2 LICENSED OPERATOR CONTINUING (REQUALIFICATION) TRAINING PROGRAM

The Diablo Canyon Licensed Operator Continuing Training Program was accredited by INPO in March 1986. This program is maintained in accordance with the standards specified in the accreditation criteria and is evaluated for accreditation renewal every six years.

PG&E will comply with the functional requirements identified in ANSI/ANS 3.5-2009, “Nuclear Power Plant Simulators for Use in Operator Training and Examination.” Personnel qualifications will be in accordance with the requirements specified in Table 17.1-1.

13.2.3 NEW OPERATOR TRAINING

13.2.3.1 Licensed Operator and Senior Operator Training Program

The Diablo Canyon Licensed Operator and Senior Licensed Operator Training Program was accredited by INPO in March 1986. These programs are maintained in accordance with the standards specified in the accreditation criteria and are evaluated for accreditation renewal every six years.

13.2.3.2 Shift Technical Advisor Training Program

The Diablo Canyon STA Training Program was accredited by INPO in March 1986. This program is maintained in accordance with the standards specified in the accreditation criteria and is evaluated for accreditation renewal every six years.

13.2.3.3 Non-Licensed Operator Training Program

The Diablo Canyon Non-Licensed Operator Training Program was accredited by INPO in March 1986. This program is maintained in accordance with the standards specified in the accreditation criteria and is evaluated for accreditation renewal every six years.

13.2.4 RECORDS

Training record files are maintained for all personnel. The files are maintained in accordance with Plant Manual procedures that state that the files shall contain records of qualifications, experience, training, and retraining for each member of the plant organization. Audits of the various plant training programs and records are conducted by the quality verification (QV) organization.

13.3 EMERGENCY PLANNING

A comprehensive Emergency Plan has been developed for DCPP as required by 10 CFR 50.47(b) and 10 CFR Part 50, Appendix E. It serves several purposes including:

(1) Establishing the emergency duties and responsibilities of the various members of the plant staff at or near the site

(2) Informing all affected agencies (including members of the plant staff) of the interfaces that have been established between the plant staff and participating PG&E and non-PG&E support groups

(3) Providing a convenient means for gathering together, by way of appendices to the Emergency Plan, the plans of the various participating offsite agencies such that plant staff personnel are made aware of the basic responsibilities and capabilities of these agencies

(4) Providing an overview of the facilities, equipment, and procedures utilized by the plant staff in the emergency in order to inform and assist those offsite agencies who must coordinate their activities with those of the plant staff

(5) Providing training and exercising of emergency plans for both licensee employees and other support groups' personnel

(6) Fulfilling licensing requirements of the NRC

The DCPP Emergency Plan has been developed in accordance with the guidance of NUREG-0654/FEMA-REP-1 (Reference 1) and has been placed on the docket of each unit.

13.3.1 REFERENCES

1. NUREG-0654/FEMA-REP-1, Revision 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, November 1980.

13.4 REVIEW AND AUDIT

Refer to Sections 17.2.3 and 17.18 for additional information on review and audit functions.

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED.

13.4.1 REVIEW AND AUDIT - CONSTRUCTION PHASE

The independent review and audit of construction activities was incorporated into the Quality Assurance Program during design, construction, and preoperational testing as prescribed by the Quality Assurance program as described in Chapter 17 of the FSAR Update.

13.4.2 REVIEW AND AUDIT - OPERATION PHASE

Review and audit during the operation phase is accomplished by senior members of the plant staff, independent review and audit groups, and management oversight groups as discussed below. In addition, the QV organization independently audits operation phase activities in accordance with Chapter 17.

13.4.2.1 Plant Staff Review Committee

A plant staff review committee (PSRC) has been established at the plant site to advise the Station Director on all matters related to nuclear safety. The PSRC's functions and responsibilities are detailed in Section 17.2.4.

13.4.2.2 Independent Review and Audit Program

A program of independent review and audit of nuclear plant operations has been in effect since the initial operation of HBPP, Unit 3 in 1963. This program, which was applied to the preoperational testing, startup testing, and operation of DCPP, has been reviewed and appropriately modified so that it conforms to the requirements and recommendations of ANSI N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants.

This program satisfies the requirements of Sections 4.3 and 4.5 of ANSI 18.7-1976. The independent review and audit program functions and responsibilities are detailed in Sections 17.2.3 and 17.18.

13.4.2.3 Management Oversight Groups

As a means for corporate management to be involved in nuclear plant safety considerations and to ensure that these considerations are effectively applied to plant operation, management oversight groups have been established.

13.5 PLANT PROCEDURES AND PROGRAMS

Refer to Section 17.5 for more information on procedures.

13.5.1 PROCEDURES

Activities involving the design, operation, maintenance, and testing of PG&E Design Class I plant systems and equipment are carried out in accordance with written policies and detailed written procedures. These policies and procedures, as well as others involving plant activities not related to safety, are incorporated into a Diablo Canyon Plant Manual. Because of its physical size and diversity of topics, the manual has been divided into several volumes.

Except as noted in Table 17.1-1, these policies and procedures implement the requirements of the Regulatory Guide 1.33, Revision 2, Quality Assurance Program Requirements (Operations) (Reference 1) and the requirements and recommendations of ANSI N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants. Emergency operating procedures meet the requirements of Supplement 1 to NUREG-0737, December 1982, Clarification of TMI Action Plan Requirements: Requirements for Emergency Response Capability (Reference 2).

The review, change, and approval process for these procedures is described in Section 17.5.

13.5.2 PROGRAMS

Significant programs that are part of the DCPP licensing basis are described or referenced below. Some programs were transferred from the DCPP Technical Specifications by license amendment. Other programs that are also part of the licensing basis are included here for consistency.

In addition to the programs listed below, PG&E implements the programs described in the DCPP Technical Specifications (refer to Section 5.5).

13.5.2.1 Process Control Program

The Process Control Program (PCP) contains the current formulas, sampling, analyses, tests, and determinations to be made to ensure that processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to ensure compliance with 10 CFR Parts 20, 61, and 71 and Federal and State regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste.

Changes to the PCP are documented and records of review for changes made to the PCP are retained. The documentation contains:

- sufficient information to support the change together with the appropriate analyses or evaluations justifying the change(s), and

- a determination that the change will maintain the overall conformance of the solidified waste product to existing requirements of Federal, State, or other applicable regulations.

PCP changes become effective after review and approval by the Station Director.

13.5.2.2 Radiation Protection Program

Procedures for personnel radiation protection are prepared consistent with the requirements of 10 CFR Part 20 and are approved, maintained, and adhered to for all operations involving personnel radiation exposure.

13.5.2.3 In-Plant Radiation Monitoring

A program, which will ensure the capability to accurately determine the airborne iodine concentration in vital areas under accident conditions is established, implemented, and maintained. The program includes:

- Personnel training
- Procedures for monitoring
- Provisions for maintenance of sampling and analysis equipment

13.5.2.4 Backup Method for Determining Subcooling Margin

A program, which will ensure the capability to accurately monitor the reactor coolant system (RCS) subcooling margin is established, implemented, and maintained. The program includes the following:

- Personnel training
- Procedures for monitoring

13.5.2.5 Containment Polar and Turbine Building Cranes

A program is established, implemented, and maintained to ensure that: (1) the parked location of the containment polar cranes precludes jet impingement from a postulated pipe rupture, and (2) the operation of the turbine building cranes is consistent with the restrictions associated with the current Hosgri seismic analysis of the turbine building. This program includes the following:

- Personnel training
- Procedures for the containment polar and turbine building cranes operation

The procedures will control the operation of the containment polar cranes in jet impingement zones.

13.5.2.6 Motor-Operated Valve Testing and Surveillance Program

A program is established to comply with Generic Letter 89-10, June 1989, “Safety-Related Motor-Operated Valve Testing and Surveillance” and its supplements and Generic Letter 96-05, September 1996, “Periodic Verification of Motor-Operated Valves.”

13.5.2.7 Fire Protection Program

A fire protection program has been established and is maintained in conformance with Condition 2.C(5) of the DCPP Unit 1 operating license and Condition 2.C(4) of the DCPP Unit 2 operating license. Refer to Sections 3.1.2.3 and 9.5.1 and Table 17.1-1 for additional information.

The fire protection program is implemented through and controlled by plant procedures.

13.5.2.8 Control of Heavy Loads Program

A control of heavy loads program has been established consistent with commitments DCPP made in response to NUREG-0612, July 1980, and its associated generic letters. The program is designed to ensure safe handling of heavy loads and is described in Section 9.1.4.3.10.

The control of heavy loads program is implemented through and controlled by plant procedures.

13.5.2.9 Environmental Qualification Program

An environmental qualification (EQ) program has been established in accordance with 10 CFR 50.49, *Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants*. The program is designed to ensure that electric equipment relied on to remain functional during a design basis event would be able to withstand the harsh environment to which it would be exposed as a result of the event. The program is described in Section 3.11.

The EQ program is implemented through and controlled by plant procedures.

13.5.2.10 Seismically Induced Systems Interaction Program

A seismically induced system interaction (SISI) program has been established in response to NRC requirements promulgated after the accident at Three Mile Island Unit 2; refer to Task II.C.3, "Systems Interaction," in NUREG-0660, May 1980. The program

addresses the potential for seismically-induced physical interactions between PG&E Design Class II or III structures, systems, and components (SSCs) and PG&E Design Class I SSCs. Refer to Section 3.7.3.13 for additional information.

The SISI program is implemented through and controlled by plant procedures.

13.5.2.11 Long Term Seismic Program

A long term seismic program (LTSP) was established for the station in response to License Condition 2.C.(7) of the DCPP Unit 1 operating license (License No. DPR-80). Although a final report for the LTSP was submitted (Reference 6), along with a follow-up addendum (Reference 7), and the license condition was closed by the NRC (References 8 and 9), PG&E made certain commitments to continue the LTSP as an ongoing program at DCPP. The ongoing LTSP implements the following PG&E commitments:

- Continue to maintain a strong geosciences and engineering staff to keep abreast of new geological, seismic, and seismic engineering information and evaluate it with respect to its significance to DCPP (Reference 10 and Section 2.5.2.4 of Reference 8).

- Continue to operate the strong-motion accelerometer array and the coastal seismic network (Reference 10 and Section 2.5.2.4 of Reference 8).

- Evaluate new seismic information consistent with the evaluation process defined in Reference 11 (Reference 12, Commitment 2).

- Review future plant additions and modifications, determined as specified in Reference 13, against insights and knowledge gained from the LTSP to verify that the plant "high-confidence-of-low-probability-of-failure" values remain acceptable (Sections 1.4 and 3.8.1.8 of Reference 8, Reference 13, and Reference 14).

Refer to Sections 2.5.7 and 3.7.7.7 for additional information. The LTSP is implemented through and controlled by plant procedures.

13.5.2.12 Inservice Inspection Program

An inservice inspection (ISI) program is in place at the station to implement the requirements of 10 CFR 50.55a(g), *Inservice Inspection Requirements*. Refer to Section 5.2.3.15 for additional information.

The ISI program is implemented through and controlled by plant procedures.

13.5.2.13 Reactor Vessel Material Surveillance Program

A reactor vessel material surveillance program is in place at the station to implement the requirements of 10 CFR Part 50, Appendix H, *Reactor Vessel Material Surveillance Program Requirements*. Refer to Section 5.2.1.19 for additional information.

The reactor vessel material surveillance program is implemented through and controlled by plant procedures.

13.5.2.14 Instrument Drift Monitoring Program

An instrument drift monitoring program has been established at the station to support 24-month fuel cycle implementation. Refer to License Amendment Request 96-10 (Reference 15) for additional information.

The instrument drift monitoring program is implemented through and controlled by plant procedures.

13.5.2.15 Heat Exchanger Program (Includes Generic Letter 89-13, July 1989, Service Water Program)

A heat exchanger program has been established at the station in response to Generic Letter 89-13, July 1989, "Service Water System Problems Affecting Safety-Related Equipment," and other regulatory requirements.

The heat exchanger program is implemented through and controlled by plant procedures.

13.5.2.16 Snubbers Program

A snubbers program has been established at the station that comprises an augmented ISI program and a snubber service life program. Refer to Equipment Control Guideline (ECG) 99.1 for additional information. Note that ECG 99.1 is a relocated Technical Specification as described in Section 16.1 and listed in Table 16.1-1.

The snubbers program is implemented through and controlled by plant procedures.

13.5.2.17 Flow-Accelerated Corrosion Monitoring Program

A flow-accelerated corrosion monitoring program has been established at the station in response to Generic Letter 89-08, May 1989, "Erosion/Corrosion-Induced Pipe Wall Thinning." The program manages wall thinning due to flow-accelerated corrosion on the internal surfaces of carbon steel piping, elbows, reducers, expanders, and valve bodies, which contain high energy fluids (both single phase and two phases). Refer to Chapter 10.

The flow-accelerated corrosion monitoring program is implemented through and controlled by plant procedures.

13.5.2.18 Boric Acid Corrosion Control Program

A boric acid corrosion control program has been established at the station to address boric acid corrosion concerns associated with the reactor coolant pressure boundary and other systems containing boric acid. The program has been established in response to Generic Letter 88-05, March 1988, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and Bulletin 2002-01, March 2002, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity."

The boric acid corrosion control program is implemented through and controlled by plant procedures.

13.5.2.19 Maintenance Rule Program

A maintenance rule program has been established in accordance with 10 CFR 50.65, *Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*. The program uses guidance provided in NUMARC 93-01, Revision 4A, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Regulatory Guide 1.160, Revision 3, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," endorses NUMARC 93-01, Revision 4A, and provides additional provisions and clarifications.

The maintenance rule program is implemented through and controlled by plant procedures.

13.5.2.20 Preventive Maintenance Program

A preventive maintenance program is in place at the station to ensure that plant SSCs are maintained in a condition such that they will perform their intended functions.

The preventive maintenance program is implemented through and controlled by plant procedures.

13.5.2.21 Reactor Coolant System Materials Degradation Management Program

A RCS materials degradation management program has been established in accordance with NEI 03-08, May 2003, "Guideline for the Management of Materials Issues," and its subsequent revisions and addenda.

The RCS materials degradation management program is implemented through and controlled by plant procedures.

13.5.2.22 Buried and Underground Piping and Tanks Program

A buried piping and tanks program has been established in accordance with NEI's underground piping and tanks integrity initiative. NEI 09-14, "Guideline for the Management of Underground Piping and Tank Integrity," describes the policy and practices that the industry has committed to follow in managing underground piping and tanks. NEI's underground piping and tanks integrity initiative superseded and incorporated all the elements of the previous buried piping integrity initiative.

The buried piping and tanks program is implemented through and controlled by plant procedures.

13.5.2.23 Cable Aging Management Program

A cable aging management program has been established to maximize the reliable service life of electrical cable by identifying adverse trends and planning appropriate actions. Cable is an integral part of most plant systems. It has historically proven to be very reliable.

The cable aging management program is implemented through and controlled by plant procedures.

13.5.3 REFERENCES

1. Regulatory Guide 1.33, Revision 2, Quality Assurance Program Requirements (Operation), USNRC, February 1978.

2. NUREG-0737, Supplement 1, Clarification of TMI Action Plan Requirements: Requirements for Emergency Response Capability, December 1982.

3. NRC Letter to PG&E, dated May 28, 1999, granting License Amendment 135, Units 1 and 2.

4. PG&E Letter DCL-94-262, dated November 28, 1994, “Closure Response to NRC Generic Letter 89-10” and all supporting PG&E letters.

5. PG&E Letter DCL 99-031, dated March 25, 1999, “Response to Request for Additional Information Regarding NRC Generic Letter 96-05, Periodic Verification for Motor Operated Valves dated December 29, 1998” and all supporting PG&E letters.

6. PG&E Letter DCL-88-192 dated July 31, 1988, "Long Term Seismic Program Completion."

7. PG&E Letter DCL-91-027 dated February 13, 1991, "Addendum to Long Term Seismic Program Final Report."

8. NUREG-0675, "Safety Evaluation Report Related to the Operation of Diablo Canyon Nuclear Power Plant, Units 1 and 2," Supplement 34, June 1991.

9. NRC Letter to PG&E dated April 17, 1992, "Transmittal of Safety Evaluation Closing Out Diablo Canyon Long-Term Seismic Program (TAC Nos. M80670 and M80671)."

10. PG&E Letter DCL-91-091, dated April 17, 1991, "Benefits and Insights of the Long Term Seismic Program."

11. NRC Letter to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, dated March 12, 2012, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident."

12. PG&E Letter DCL-12-108 dated October 25, 2012, "Withdrawal of License Amendment Request 11-05, 'Evaluation Process for New Seismic Information and Clarifying the Diablo Canyon Power Plant Safe Shutdown Earthquake.'"

13. PG&E Letter DCL-91-178 dated July 16, 1991, "Long Term Seismic Program – Future Plant Modifications."

14. PG&E Letter DCL-91-143 dated May 29, 1991, "Long Term Seismic Program – Implementation of the Results of the Program."

15. PG&E Letter DCL-96-213 dated December 9, 1996, "License Amendment Request 96-10, Revision of Technical Specifications to Support Extended Fuel Cycles to 24 Months."

13.6 PLANT RECORDS

Plant records are maintained in accordance with established PG&E practices. The records management program is discussed in Chapter 17.

13.7 PHYSICAL SECURITY

The Security Plans for DCPP have been developed as required by 10 CFR Part 73, 10 CFR 37 and DPR-80 and DPR-82 License Condition E.

The Security Plans include the following:

(1) The Physical Security Plan (PSP), including the following appendices:

(a) Appendix A: Glossary of Terms and Acronyms

(b) Appendix B: Training and Qualification Plan (per 10 CFR Part 73, Appendix B)

(c) Appendix C: Safeguards Contingency Plan (per 10 CFR Part 73, Appendix C)

(d) Appendix D: Independent Spent Fuel Installation Security Program (per 10 CFR 73.51)

(2) The Cyber Security Plan (CSP).

(3) The Diablo Canyon Nuclear Power Plant Part 37 Security Plan for the Protection of Category 1 and Category 2 Quantities of Radioactive Material (RMSP).

The PSP establishes and maintains a physical protection system and security organization on site for the purpose of protecting against radiological sabotage and preventing the theft of special nuclear material. Portions of the information contained in the PSP are considered to be "Safeguards Information" as defined in 10 CFR 73.2 and must therefore be protected against public disclosure and disseminated on a "need-to-know" basis as required by 10 CFR 73.21.

The CSP is the program implemented to prevent damage to, prevent unauthorized access to, and allow restoration of computers, electronic communications systems, electronic communication services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authenticity, confidentiality, and non-repudiation. In control systems, this includes unauthorized access that could affect operation of plant SSCs. The CSP contains information that has been designated "Security-Related Information - Withhold under 10 CFR 2.390."

The RMSP provides reasonable assurance of the security of category 1 or category 2 quantities of radioactive material by protecting these materials from theft or diversion as described in 10 CFR 37.41 – 57 (Subpart C – Physical Protection Requirements During Use).

The PSP has been approved by the NRC and is implemented at the DCPP site.

The implementation of the CSP, including the key intermediate milestone dates and the full implementation date, will be in accordance with the implementation schedule submitted to the NRC in PG&E Letter DCL-11-040, dated April 4, 2011, and approved by the NRC Staff with License Amendments (LA) 210 (Unit 1) and LA 212 (Unit 2).

The RMSP is approved by the individual with overall responsibility of the security program at DCPP.

All changes to the Security Plans require evaluation per 10 CFR 50.54(p) to determine whether prior NRC review and approval via 10 CFR 50.90, the License Amendment process, is required.

TABLE 13.2-1

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED.

SUMMARY OF ACTIVITIES EMPLOYED IN TRAINING PROGRAMS FOR PERSONS IN THE INITIAL DIABLO CANYON OPERATING ORGANIZATION (HISTORICAL AS SUBMITTED IN NOVEMBER 1978)

---

1. Humboldt Bay Experience

Many of the key individuals in the initial plant organization were members of the Humboldt Bay staff before they transferred to Diablo Canyon Power Plant and have extensive nuclear experience in their areas of responsibility. Certain other individuals, who were not members of the Humboldt Bay staff, have been assigned there for appropriate periods to participate in operations involving their areas of responsibility.

2. PWR Experience

Key individuals were assigned to an operating PWR (or one in the process of preoperational and/or startup testing) to observe and/or participate in operations involving their areas of responsibility. The plants involved included R. E. Ginna, H. B. Robinson, Connecticut Yankee, Point Beach, and San Onofre. Assignments ranged from 3 weeks to 7 months, with most lasting approximately 1 month.

3. Participation in the Diablo Canyon Task Force

This group consists of selected technical and operating supervisory personnel and is responsible for the preparation of training material, operating manuals, licensing material and Technical Specifications, test procedures, and for performing an operational review of the plant design.

4. Design Lecture Series

This 4-week course was conducted in March 1971 at the Westinghouse Atomic Power Division in Pittsburgh, Pennsylvania. Fifteen supervisors on the plant staff and one member of the Department of Steam Generation attended this course. The trainees were given a series of lectures covering the function, design description, control and instrumentation, normal and abnormal operation, and maintenance of all principal components of the Diablo Canyon Units 1 and 2 nuclear steam supply systems. These lectures were given by Westinghouse design engineers who were closely associated with the design of the plant. The lectures were supplemented by study of written information on pressurized water reactor technology provided by Westinghouse and trips to Westinghouse manufacturing facilities where trainees were afforded an opportunity to witness actual fabrication of components.

5. Nuclear Technology Course

This course is taught by members of the plant staff and utilizes PG&E's Introduction To Nuclear Power training manual as a text. The purpose of this course is to provide a general background in the field of nuclear power plant technology. The major topics that are included in the course are:

a. Basic mathematics
b. Basic atomic and nuclear physics
c. Introduction to nuclear reactors and nuclear power plant cycles
d. Light water reactor physics
e. Heat transfer considerations in light water reactors
f. Operating characteristics of light water reactors
g. Nuclear instrumentation
h Chemical, radiochemical, and waste disposal considerations in light water reactor operation
i. Reactor safeguards.

These topics are treated in sufficient depth to prepare an individual for applicable portions of the Senior Operator License examination. The complete course, which is intended for license candidates, takes about 4 weeks and covers each of these topics in detail. Abbreviated versions of the course covering subjects directly related to their duties and responsibilities are given to other personnel as appropriate.

6. Radiation Protection Training Course

This course is taught by members of the plant staff and utilizes PG&E's Radiation Protection Training Manual, Radiation Control Standards And Procedures, and other appropriate material as texts. The standards are a compilation of technical statements of policy covering each aspect of a nuclear power plant's radiation protection program and are based on the requirements of 10 CFR 20 and other applicable regulations. The procedures provide practical information regarding the implementation of the standards and are based on adaptations to nuclear power plant requirements of procedures and practices widely used throughout the atomic energy industry.

The Training Manual is a general work that covers theory and other background material. The major topics covered in this course include:

a. Basic radiation physics and biology
b. Sources of radioactivity in nuclear power plants
c. Radiation protection instrumentation
d. Fundamentals of shielding
e. Personnel exposure limits

f. Protective clothing and equipment
g. Control and transfer of radioactive materials
h. Decontamination practices
i. Radiation monitoring techniques
j. Control of access
k. Records and reporting requirements.

The complete course for radiation and process monitors requires about 4 weeks. A similar course designed for NRC license examination candidates required about 1 week. Personnel in other classifications receive shorter courses covering those subjects directly related to their duties and responsibilities.

7. Plant Design and Operation Seminars

This seminar course is conducted by supervisory personnel on the plant staff and covers the design, description, and operation of each plant system plus related topics such as the Technical Specifications and the Site Emergency Plan. The course is primarily designed for operators and is expected to last about 8 weeks. As appropriate, personnel in other classifications will receive shorter courses covering systems and equipment related to their areas of responsibility.

8. NRC Operator and Senior Operator License Examination Seminars

These seminars are conducted by supervisory personnel on the plant staff for the benefit of license examination candidates. They consist of a review of appropriate items in activities 5, 6, and 7 above plus discussions of additional topics required to cover the items listed in 10 CFR 55.21-23. The length of this program will be determined following an evaluation of the needs of the individuals involved, but based on Humboldt Bay experience, it is expected to last about 4 weeks.

9. P-250 and P-2000 Computer Maintenance Courses

These courses, lasting a total of 16 weeks, were conducted in the fall of 1970 by Westinghouse Computer and Instrument Division personnel and were designed to provide comprehensive coverage of the construction, operation, repair, and maintenance of the P-250 and P-2000 computers. The course attended by Diablo Canyon personnel was held at PG&E's Pittsburg Power Plant where a P-250 computer was available for use by the students.

10. Instrument and Control Course

This is a 12-week course intended for instrument maintenance supervisors and technicians and is conducted by instructors from the Nuclear Instrumentation and Control

Department of Westinghouse at the department headquarters in Baltimore, Maryland. The general subjects covered include the design, maintenance, and testing of the solid-state rod control system, flux mapping system, nuclear instrumentation system, radiation monitoring system, and solid-state protection system. The course combines both formal classroom lectures on systems and modules and practical bench work with the equipment. Diablo Canyon personnel attended this course beginning in January 1972.

11. *Process Controls Course*

This 2-week course was conducted at the Portland General Electric Trojan site in June 1972 by Westinghouse Computer and Instrument Division personnel. The course material included lectures on both systems and modules for the various process control systems (feedwater control, steam dump, pressurizer level and pressure). In addition, the various modules were available for bench work by the students.

12. *Refresher Course in Radiological Engineering*

This 3-week course was conducted in 1972 by personnel from the health physics staff of the General Electric Company Vallecitos Nuclear Center. It was designed to provide graduate-level refresher training in radiological engineering topics such as internal and external radiation dosimetry, radiation biology, atmospheric diffusion modules, instrumentation, and environmental pathways. It consisted primarily of formal classroom lectures.

13. *Chemistry and Radiochemistry Seminars*

These seminars are conducted by supervisory personnel on the plant staff for training of radiation and process monitors, and will take about 4 months. The subject matter for these seminars will include such topics as basic chemistry, laboratory techniques, radiochemical methods, and theory and use of counting room equipment. A variety of texts will be employed, including PG&E procedures manuals, vendors' instruction manuals, and standard chemistry and radiochemistry texts. In addition, the classroom work will be supplemented by actual laboratory training as appropriate.

14. *Nondestructive Testing School*

This 3-week course is presented at the site by instructors from General Dynamics/Convair. The class consists of both formal lectures and practical demonstrations, and persons completing it and successfully passing the examinations are qualified as ASNT Level II inspectors for radiography, ultrasonic testing, magnetic particle testing, and liquid penetrant testing.

15. Operational Core Analysis Training

This 3-week course is presented in Pittsburgh, Pennsylvania, by Westinghouse and is intended for nuclear engineers. It discusses the theory and operation of the operational core analysis computer codes that will be used to monitor core thermal-hydraulic performance and fuel depletion.

16. Simulator Training

Candidates for "Cold" NRC licenses will attend a 14-day training program at the Westinghouse reactor simulator at Zion, Illinois.

The course has been established so that the typical day is divided approximately equally into classroom work and "hands-on" simulator time. Emphasis during the first week will be on taking the trainee through a simulated operational cycle from a cold shutdown through plant heatup/reactor startup/turbine-generator startup/power operation/plant shutdown/and plant cooldown. This first cycle will stress familiarization with control board and plant operation under normal operating conditions.

The second week's training will be a repeat of the training received the first week, but at an accelerated pace and will incorporate the maximum number of minor and major malfunction situations in the time allotted. The trainee will learn to identify specific malfunctions, analyze the hazards involved, and effect proper corrective actions. The second week will also incorporate simulation and evaluation of normal and abnormal plant transients and the required operator action to effect recovery from transient and accident situations.

A refresher simulator training course of seven days duration will be provided shortly before initial loading.

17. In-place Filter Testing Workshop

This 5-day workshop is conducted by the Harvard School of Public Health in Boston, Massachusetts. The subject matter deals with subjects of theory, design, and testing of HEPA and activated charcoal air filtration systems. About half of the time is devoted to classroom lectures and the other half consists of laboratory work using DOP generators and detection equipment and other filter testing devices. The Power Plant Engineer attended this course in September 1971.

TABLE 13.2-2

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED.

TRAINING SUMMARY FOR INDIVIDUALS IN THE INITIAL DIABLO CANYON OPERATING ORGANIZATION (HISTORICAL)

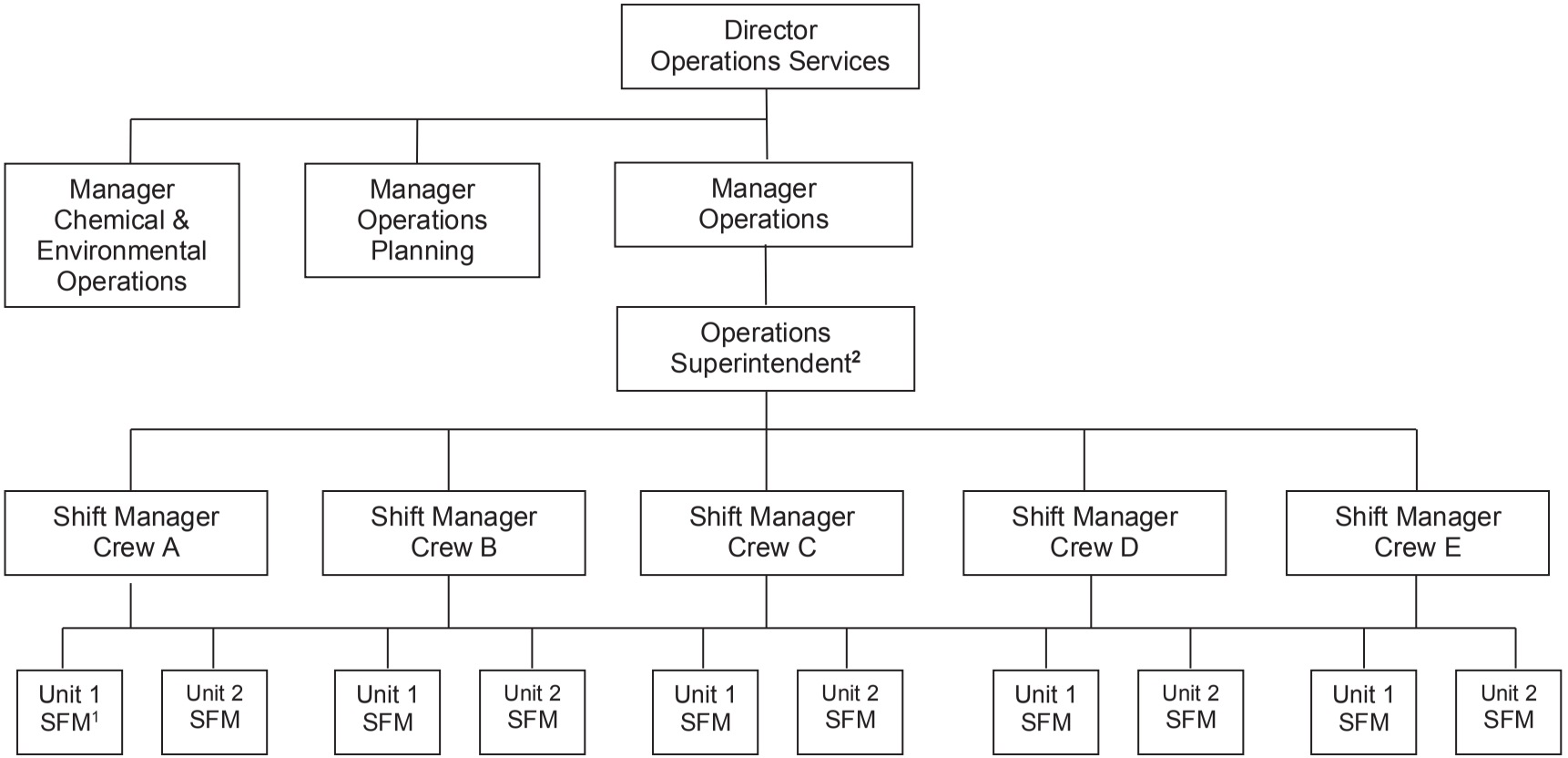
Position - Name	*AEC License*	*Humblt. Bay Exper.*	*PWR Exper.*	*Task Force*[a]	*Dsgn. Lect. Series*	*Nuclr. Tech.*	*Rad. Prot. Course*	*Plant Dsgn. Semr.*	*Oper. Lic. Revw.*	*Comp. Maint.*	*I & C Course*	*Proc. Ctrls. Course*	*Rad. Engr. Refr.*	*Chem. Semrs.*	*NDT Sch.*	*Core Code*	*Anal. Trng.*	*Simul. Trng.*
Plant Superint.	*Cold SOL,OP*	*3 y*	*2 m*	*July 1970*	*P*	*OP*	*OP*	*OP*	*OP*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
Supv. of Operations	*Cold SOL*	*3 y*	*6 m*	*July 1970*	*P*	*I*	*I*	*I*	*I*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
Power Plant Engr.	*Cold SOL,OP*	*8 y*	*7 m*	*July 1970*	*P*	*I*	*I*	*I*	*I*	*-*	*-*	*-*	*P*	*-*	*-*	*-*	*-*	*P*
Supv. of Maint.	*-*	*9 y*	*1 m*	*Aug. 1971*	*P*	*OP*	*OP*	*OP*	*-*	*-*	*-*	*-*	*-*	*-*	*P*	*-*	*-*	*-*
Relief Shift Supv.	*Cold SOL*	*8 y*	*1 m*	*July 1970*	*P*	*OP*	*OP*	*I*	*I*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
Shift Foreman	*Cold SOL*	*6 y*	*1 m*	*Oct. 1970*	*P*	*P*	*P*	*I,P*	*I,P*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
	Cold SOL	*9 y*	*1 m*	*July 1970*	*P*	*P*	*P*	*I,P*	*I,P*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
	Cold SOL	*9 y*	*1 m*	*Feb. 1972*	*-*	*P*	*P*	*I,P*	*I,P*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
	Cold SOL	*10 m*	*1 m*	*May 1972*	*-*	*P*	*P*	*I,P*	*I,P*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
	Cold SOL	*11 y*	*1 m*	*-*	*P*	*P*	*P*	*I,P*	*I,P*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
	Cold SOL	*1 y*	*1 m*	*Aug. 1971*	*P*	*P*	*P*	*I,P*	*I,P*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
	Hot SOL	*-*	*-*	*-*	*-*	*P*	*P*	*P*	*P*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
Nuclear Engineers	*Cold SOL,OP*	*2 y*	*3 m*[b]	*Aug. 1970*	*P*	*I,OP*	*I,OP*	*I,OP*	*OP*	*-*	*-*	*-*	*-*	*-*	*P*	*-*	*-*	*-*
	Cold SOL,OP	*1 m*	*1 m*[b]	*Jan. 1971*	*-*	*I,OP*	*I,OP*	*I,OP*	*OP*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*P*
	Hot SOL,OP	*1 y*	*1 m*	*Dec. 1970*	*P*	*I,OP*	*I,OP*	*I,OP*	*OP*	*-*	*-*	*-*	*-*	*-*	*-*	[c]	*-*	*-*
	Hot SOL,OP	*-*	*-*	*-*		*OP*	*P*	*OP*	*OP*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
	Hot SOL,OP	*-*	*-*	*-*		*OP*	*P*	*OP*	*OP*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
	Hot SOL,OP	*-*	*-*	*-*		*OP*	*P*	*OP*	*OP*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
Chem. & Rad. Prot. Engr.	*-*	*5 y*	*1 m*	*July 1970*	*-*	*OP*	*I*	*I,OP*	*I*	*-*	*-*	*-*	*P*	*I*	*-*	*-*	*-*	*-*
		3 y	*3 w*	*Nov. 1972*	*P*	*OP*	*I*	*I,OP*	*I*	*-*	*-*	*-*	*P*	*I*	*-*	*-*	*-*	*-*
Instrument Engr.	*-*	*8 y*	*2 m*	*July 1970*	*P*	*OP*	*OP*	*I,OP*	*-*	*-*	*P*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
Inst. & Contrls. Supv.	*-*	*1 m*	*-*	*July 1970*	*-*	*OP*	*OP*	*I*	*-*	*P*	*P*	*P*	*-*	*-*	*-*	*-*	*-*	*-*

TABLE 13.2-2

Position - Name	AEC License	Humblt. Bay Exper.	PWR Exper.	Task Force[a]	Dsgn. Lect. Series	Nuclr. Tech.	Rad. Prot. Course	Plant Dsgn. Semr.	Oper. Lic. Revw.	Comp. Maint.	I & C Course	Proc. Ctrls. Course	Rad. Engr. Refr.	Chem. Semrs.	NDT Sch.	Core Code	Anal. Trng.	Simul. Trng.
Q/A Coordinator	-	7 y	-	Aug. 1970	P	OP	I	I,P	I	-	-	-	-	-	-	-	-	-
Maintenance Engr.	-	-	-	-	-	OP	P	OP	-	-	-	-	-	-	-	-	-	-
Mechanical Foreman	-	-	-	-	-	OP	P	OP	-	-	-	-	-	-	-	-	-	-
Electrical Foreman	-	-	-	-	-	OP	P	OP	-	-	-	-	-	-	-	-	-	-
Operators	Hot L[h]	[d]	-	-	-	P	P	P	P	-	-	-	-	-	-	-	-	[i]
Control Technicians	-	[e]	-	-	-	OP	P	OP	-	[f]	[g]	-	-	-	-	-	-	-
Rad. & Proc. Monitrs.	-	OP	-	-	-	P	P	OP	-	-	-	-	-	P	-	-	-	-
Maint. Phys. Forces	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-
Clerical	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-

Key: y = years, m = months, w = weeks, P = participant, I = Instructor, OP = Optional Participation depends on work load and individual needs, SOL = Senior Operator License, L = Operator License

(a) Date given is date at which participation in Task Force project began. Task Force work largely complete by March 1973.
(b) Not including experience gained while not a PG&E employee.
(c) A second individual from the Steam Generation Department will also attend.
(d) It is expected that approximately 1/3 of the successful bidders will have had prior experience at Humboldt Bay. There are no plans to send others to Humboldt Bay.
(e) Two of the successful bidders have had several years of experience at Humboldt Bay. The other two have had approximately one month.
(f) Two only. A third individual has had computer experience in his previous assignment at a conventional plant. The fourth is receiving training as part of apprenticeship program.
(g) Three only. Fourth is in training as apprentice and will receive on-the-job experience prior to startup.
(h) For Assistant Control Operator and above.
(i) Three Senior Control Operators with prior Operator Licenses at Humboldt Bay.



NOTES:

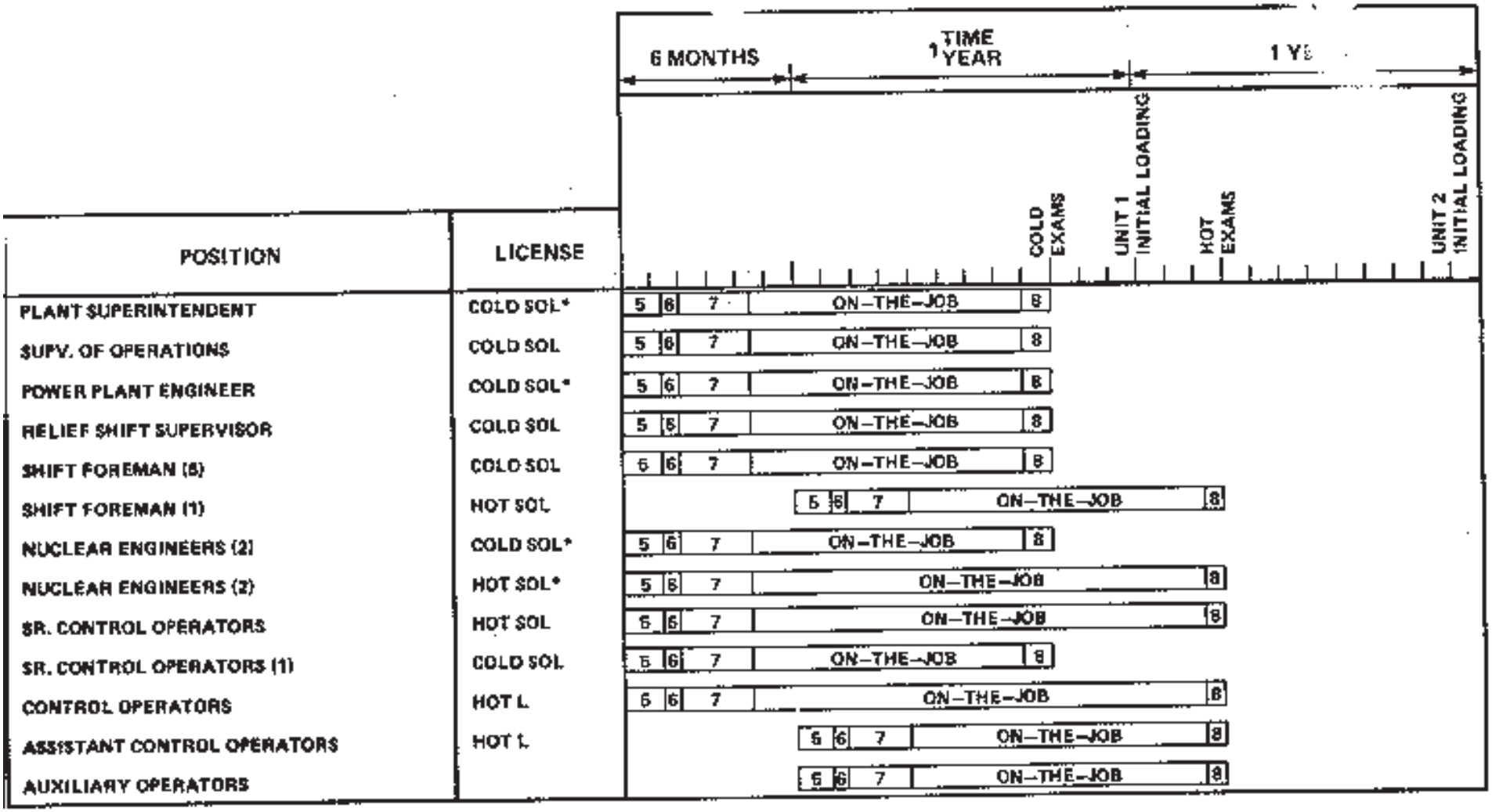
1. SFM = Shift Foreman
2. The Operations Superintendent is not required to be staffed if the Manager, Operations holds an SRO license for DCPP.

FSAR UPDATE

UNITS 1 AND 2
DIABLO CANYON SITE

FIGURE 13.1-5
OPERATIONS SERVICES ORGANIZATION

Revision 23 December 2016



NOTE: 5 – NUCLEAR TECHNOLOGY COURSE
6 – RADIATION PROTECTION COURSE
7 – PLANT DESIGN SEMINAR
8 – LICENSE REVIEW SEMINAR
* – OPTIONAL

FSAR UPDATE

UNITS 1 AND 2
DIABLO CANYON SITE

FIGURE 13.2-1
INITIAL SCHEDULE OF PLANNED NUCLEAR TRAINING (HISTORICAL)