
Guidelines for Utility Management Structure and Technical Resources

Draft Report for Interim Use and Comment

Office of
Nuclear Reactor Regulation

U.S. Nuclear Regulatory
Commission



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ABSTRACT

Guidelines are presented for the staffing levels and technical expertise that are considered to be essential within a utility to properly support nuclear power plant operation under both routine and accident conditions. Acceptable structures for both the utility corporate organization and the plant staff are described. Desired qualifications of plant staff and utility support personnel are indicated. The need for a subjective evaluation is acknowledged.

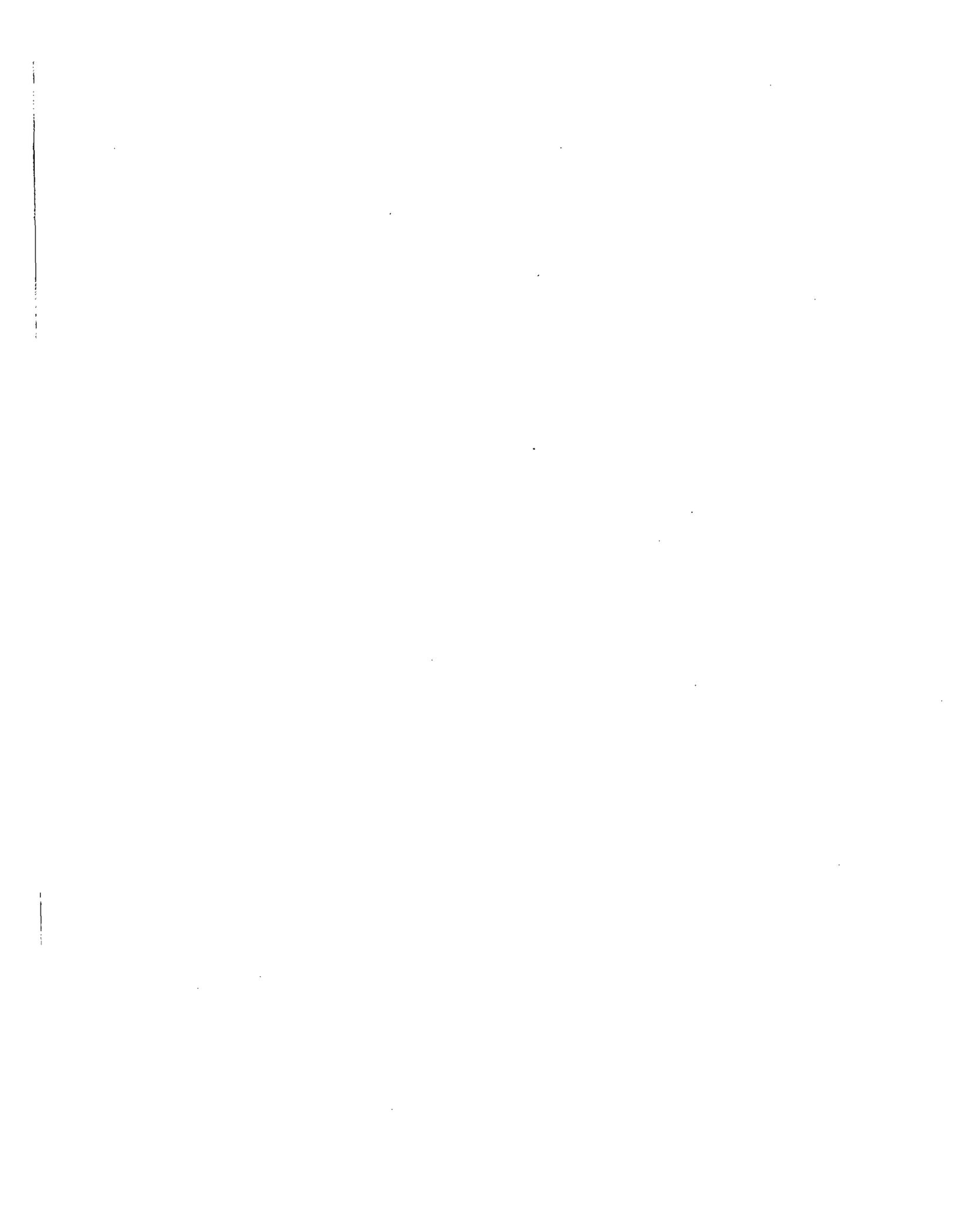


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I. INTRODUCTION

In the aftermath of the Three Mile Island nuclear plant accident, a number of studies and investigations conducted by the industry, the NRC and others have recommended changes in the numbers, qualifications and organization of personnel operating and providing support for nuclear power plants. The principal studies have been the President's Commission on Three Mile Island, the NRC Special Inquiry Group, the NRC staff's Lessons Learned Task Force, and the Atomic Industrial Forum. Collectively, these studies have called for an upgrading of utility capabilities for handling routine plant operations and especially for coping with accident conditions. As might be expected, the recommendations of these diverse groups are not completely compatible; what is clear, however, is that all of these studies have called for upgrading, at least in certain areas of management oversight and technical competence. The purpose of this document is to promulgate guidelines for nuclear plant staffing which are generally in accordance with the various recommendations and which describe an acceptable organizational structure and competence level for nuclear power plant operations.

These guidelines address both the onsite and offsite resources that must be available for plant operation under both routine and accident conditions. As noted in the later discussion, minimum shift staffing and competence is determined by the capabilities considered essential for short term accident response, since we must assume that a postulated accident occurs during a period when only the minimum operating staff is present at the facility.

This document describes the minimum qualifications considered to be essential for operating and support personnel. It does not address the specifics of how these personnel are to be trained. The document also refers in general terms to the procedures that will be required, but no attempt is made to itemize these procedures. Finally, the document mentions the communication facilities that are deemed necessary, but it does not attempt to describe these facilities in detail. In the final analysis, the capability of a utility to operate a plant safely under both routine and accident conditions will depend upon having a solid, workable, safety-conscious organization; with the requisite numbers of operating and support personnel properly trained and retrained to attain and maintain their skills; with adequate, understandable procedures in place to guide their actions; and with the ability to quickly communicate their needs, recommendations and instructions.

In February 1980, the staff issued for interim use and comment, NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." NUREG-0654 was designed to provide a common reference and interim guidance for State and local governments and nuclear facility operators in the development of emergency response plans and preparedness in support of nuclear power plants, as well as to provide guidance to Federal agency personnel. In effect, the thrust of NUREG-0654 is to assure adequate preparedness planning for protection of the population

around nuclear power plants. As a part of this emergency preparedness planning, however, NUREG-0654 necessarily addresses the emergency response capability of the nuclear plant operators. In particular, Section II.B of NUREG-0654 sets forth proposed criteria for the onsite emergency organization of the nuclear plant considered to be necessary to adequately support the plans for offsite response in the event of an accident at the plant.

Section III of this document also addresses the organization and resources deemed necessary to adequately respond to an accident at a nuclear plant. However, the concern of this document is with those minimum actions and activities considered necessary for accident mitigation and recovery of the plant. In simplified terms, this document is concerned with activities inside the nuclear plant fence, while NUREG-0654 is concerned with activities outside the plant fence. Our goal is that the documents be fully compatible and our later consideration of comments on the two documents will attempt to assure that this is the case. In the interim, should conflicts between the two documents be noted, the provisions of NUREG-0654 should govern.

Earlier draft versions of this document were made available to and have been discussed with a number of utilities and industry groups. The guidelines of the earlier draft versions were used by the staff in the review of the management and technical resources available to several utilities who had applications pending for operating licenses for nuclear power plants. We have attempted to factor into this document the comments and recommendations received as a result of the informal consideration of the earlier draft version by certain utilities and industry groups. In addition, this document incorporates the results of experience gained through trial use of the earlier draft versions, in the review of the management organizations and technical resources available to those several utilities with applications pending for near-term operating licenses.

An additional point is deserving of special mention. Evaluation of the organizational structure and the technical resources available to a utility will have to be made on a largely subjective basis. Variations in size, operating philosophy and basic organizational structure of the various utilities preclude a staff-imposed "best" solution to a perceived problem. We have attempted in this document to indicate the goals we deem to be important. Evaluations will be performed on a case basis to assure that each utility has met these goals. Further, it is not expected that each utility will be able to meet each of the goals described herein on an instantaneous basis. A reasonable period of time, probably on the order of two years, must be allowed for utilities to make necessary staffing changes and other arrangements.

This document is being issued for interim use and comment. We invite comment from interested members of the public as well as from utilities, industry groups and others who may be concerned.

Two other documents relating to this same general area have previously been issued for public comment. One, NUREG/CR-1280, "Power Plant Staffing," was issued in April 1980. The other, NUREG/CR-1656, "Utility Management and Technical Resources," was issued in September 1980. Our

intent is to consider both the substance of and the comments received on NUREG/CR-1280 and NUREG/CR-1656 in conjunction with the comments received on this document. We will then re-issue this document, revised as may be necessary, by about the end of December 1980, for an additional comment period. Guidance will be promulgated in final form during the Spring of 1981, after the second round of comments has been received.

II. GUIDELINES FOR ROUTINE OPERATIONS

A. Onsite (Plant Staff)

Each licensee of a nuclear power plant shall establish an onsite plant staff to operate the plant for routine operational activities (includes normal operation, routine maintenance, and short-term response to abnormal conditions). The plant staff consists of those persons who report functionally to the plant manager.

1. Plant Staff Organization

Each licensee shall establish an organization to provide for the overall management of personnel and activities associated with the day-to-day operation and maintenance of the facility. The responsibilities, authorities, and provisions described in Sections 3.4, 4.4, and 5.2 of ANSI/ANS 3.2* provide functional and organizational criteria to be met. Described below are those characteristics that we consider important in the development of a plant staff organization. However, the organizational arrangements can vary considerably so long as they include these characteristics, particularly for multi-unit sites and for utilities with nuclear power reactors at more than one site. The characteristics that form the basis for the plant staff organization are as follows:

- . The inclusion of one or more individuals knowledgeable in the fields described in Section 3.4 of ANSI/ANS 3.2 (June 1980 draft).
- . The reporting of the functional areas of radiation protection, quality assurance, and training should assure independence from operating pressures. In utilities with large commitments to nuclear power plants, overall management and technical direction in these areas may well be concentrated at the home office.
- . Clear lines of authority to the Plant Manager.
- . Responsibility for all activities important to the safe operation of the facility are clearly defined.

*Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, Draft 4, June 1980.

- . Distinct functional areas are separately supervised and/or managed.
- . Sufficient managerial depth to provide qualified backup in the event of the absence of the incumbent.

Plant staffs can be organized in many ways to include the above characteristics. Figure 1 is a representative type organization which may be satisfactorily used. This simplified type of organization may be more representative of a single nuclear power plant site. Multi-unit sites generally require a greater depth of supervision and management to manage the greater number of personnel. In addition, utilities with large commitments to nuclear power may centralize overall management for areas such as training and radiation protection with an offsite organization and reduce the onsite function to that of coordinator or program implementation supervisor.

2. Plant Staff Personnel Resources

a. Management Resources

- (1) The plant staff organization shall provide in-depth experience at the manager level, i.e., the level at which broad responsibilities are assigned for activities conducted at a nuclear power facility. Functional areas of sufficient importance to normally warrant the assignment of managers are overall plant management, operations management, training management, technical management, maintenance management and radiation protection management.
- (2) Qualification requirements for the functional levels of management positions are as endorsed by Regulatory Guide 1.8.*

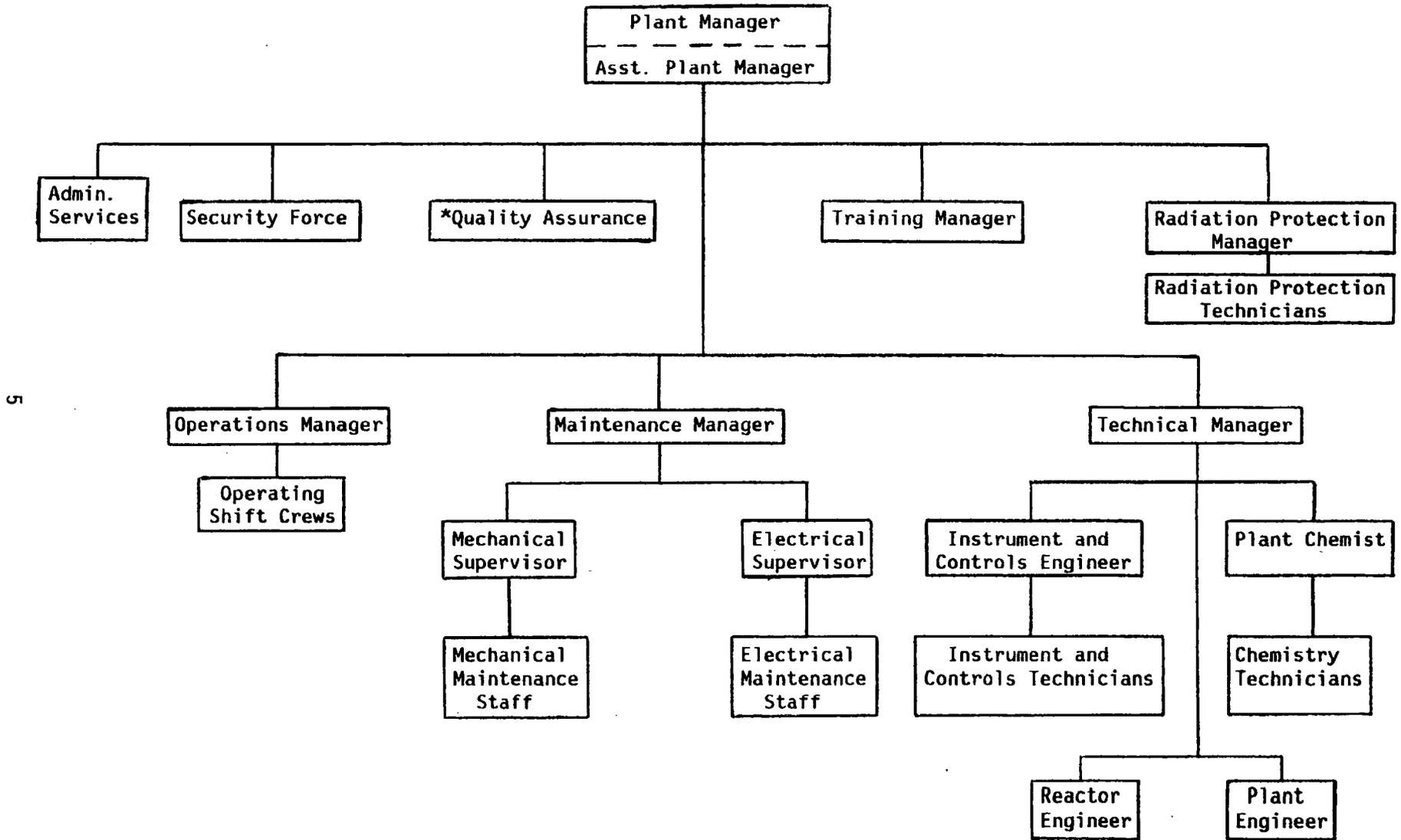
b. Professional-Technical Resources

- (1) Staffing levels shall provide support to the plant staff in each of the following areas:
 - 1) Nuclear Operations
 - 2) Chemistry and Radiochemistry
 - 3) Radiation Protection
 - 4) Instrumentation and Control
 - 5) Quality Assurance

*Personnel Selection and Training, draft Proposed Revision 2, dated June 19, 1980.

REPRESENTATIVE PLANT ORGANIZATION

Figure 1



*Reports offsite to the Director of Operational Quality Assurance

6) General Engineering Support

7) Reactor Engineering

Note: Sufficient personnel shall be provided to insure competent support in each of these areas.

(2) Qualification requirements for the functional level of professional-technical categories are as endorsed by Regulatory Guide 1.8*.

c. Shift Technical Advisor

A Shift Technical Advisor (STA) shall be available onsite to each operating shift. There shall be at least one STA assigned full time at each site from which one or more reactors is operating; the STA shall be available to report to the control room to act in an advisory capacity to the shift supervisor in a matter of minutes. The STA shall be qualified to provide technical support to the shift supervisor in the areas of thermal hydraulics, reactor engineering, and plant analysis. The long-term need for a shift technical advisor to provide advice to the control room supervisor may be eliminated when upgraded qualifications for the control room supervisor and improved control rooms have been attained. Minimum qualification requirements for the STA are as described in Section 4 of ANSI/ANS 3.1.**

d. Shift Crew

Each shift crew shall consist of senior licensed operators, licensed operators, and auxiliary operators as specified in (1) below. In addition, each shift should collectively possess the minimum qualifications as specified in (2) below. The intent is to assure adequate shift staffing for the plant during all operating modes and the capability of immediate, short term response to accident situations.

(1) Shift Staffing (Interim Criteria)

At any time a licensed nuclear unit is being operated (Modes 1-4 for a PWR or Modes 1-3 for a BWR)***, the minimum shift crew shall include two licensed senior

*Personnel Selection and Training, draft Proposed Revision 2, dated June 19, 1980.

**Standard for Qualification and Training of Personnel for Nuclear Power Plants, December 1979 Draft.

***The definition modes is given in Table 1.1 or 1.2, "Operational Conditions" in the Standard Technical Specifications for PWRs and BRWs.

reactor operators (SRO), one of whom shall be designated as the shift supervisor, two licensed reactor operators (RO) and two unlicensed auxiliary operators (AO). For a multi-unit station, depending upon the station configuration, shift staffing may be adjusted to allow credit for licensed senior reactor operators (SRO) and licensed reactor operators (RO) to serve as relief operators on more than one unit; however, these individuals must be properly licensed on each such unit. At all other times, for a unit loaded with fuel, the minimum shift crew shall include one shift supervisor who shall be a licensed senior reactor operator (SRO), one licensed reactor operator (RO) and one unlicensed auxiliary operator.

These requirements are further stated below and are summarized in the accompanying Table 1.

- (a) A shift supervisor with a senior reactor operator's license, who is also a member of the station supervisory staff, shall be onsite at all times when at least one unit is loaded with fuel.
- (b) In addition to a shift supervisor, a second licensed senior reactor operator (SRO) shall, at all times, be in the control room from which a reactor is being operated. The shift supervisor may from time-to-time act as relief operator for the licensed senior reactor operator assigned to the control room.
- (c) For any station with more than one reactor containing fuel, the number of licensed senior reactor operators onsite shall, at all times, be at least one more than the number of control rooms from which the reactors are being operated.
- (d) In addition to the licensed senior reactor operators specified in a., b., and c. above, for each reactor containing fuel, a licensed reactor operator (RO) shall be in the control room at all times.
- (e) In addition to the operators specified in a., b., c., and d. above, for each control room from which a reactor is being operated, an additional licensed reactor operator (RO) shall be onsite at all times and available to serve as relief operator for that control room. As noted above, this individual may serve as relief operator for each unit being operated from that control room, provided he holds a current license for each such unit.

INTERIM REQUIRED SHIFT STAFFING

Table 1

	One Unit One Control Room	Two Units One Control Room	Two Units Two Control Rooms	Three Units Two Control Rooms
One Unit Operating*	1 SS (SRO) 1 SRO 2 RO 2 AO	1 SS (SRO) 1 SRO 3 RO 3 AO	1 SS (SRO) 1 SRO 3 RO 3 AO	1 SS (SRO) 1 SRO 4 RO 4 AO
Two Units Operating*	NA	1 SS (SRO) 1 SRO 3 RO 3 AO	1 SS (SRO) 2 SRO 4 RO 4 AO	1 SS (SRO) 2 SRO (Only one SRO required if both units are operated from one control room) 4 RO 5 AO
All Units Operating*	NA	Same	Same	1 SS (SRO) 2 SRO 5 RO 5 AO
All Units Shutdown	1 SS (SRO) 1 RO 1 AO	1 SS (SRO) 2 RO 3 AO	1 SS (SRO) 2 RO 3 AO	1 SS (SRO) 3 RO 5 AO

SS - Shift Supervisor
 SRO - Licensed Senior Reactor Operator
 RO - Licensed Reactor Operator
 AO - Auxiliary Operator

NOTE: In order to operate or supervise the operation of more than one unit, an operator (SRO or RO) must hold an appropriate, current license for each such unit.

*Modes 1 through 4 for PWRs.
 *Modes 1 through 3 for BWRs.

- (f) Auxiliary (non-licensed) operators shall be properly qualified to support the unit to which assigned.
- (g) In addition to the staffing requirements stated above, shift crew assignments during periods of core alterations shall include a licensed senior reactor operator (SRO) to directly supervise the core alterations. This licensed senior reactor operator may have fuel handling duties but shall not have other concurrent operational duties.
- (h) In addition to (a) through (g) above, there shall be a radiation protection technician onsite at all times when there is fuel in one or more reactors.
- (i) Administrative procedures shall be in effect which substantially relieve the Shift Supervisor of routine administrative duties. Administrative functions that detract from or are subordinate to the Shift Supervisor's management responsibility for the safe operation of the plant are to be delegated to other personnel.
- (j) The administrative procedures shall also set forth a policy concerning overtime work for the licensed shift personnel. These procedures shall stipulate that overtime shall not be routinely scheduled to compensate for an inadequate number of personnel to meet the shift crew staffing requirements stated above. In the event that overtime must be used, due to unanticipated or unavoidable circumstances, the following overtime restrictions shall be followed:
 - 1 An individual should not be permitted to work more than 12 hours straight (not including shift turnover time).
 - 2 There should be at least a 12-hour break between all work periods (shift turnover time is included in this 12-hour break).
 - 3 An individual should not work more than 72 hours in any 7-day period.
 - 4 An individual should not be required to work more than 14 consecutive days without having two consecutive days off.

However, for those circumstances which arise requiring deviation from the above, such deviation may be authorized by the plant manager or high levels of management in accordance with

established procedures and with appropriate documentation of the cause.

(2) On-Shift Technical Requirements

Each shift crew for an operating nuclear reactor shall collectively include persons with experience in the areas described below. The objective is to assure that each shift crew has the level of expertise needed to respond to unanticipated reactor conditions.

Expertise shall be provided in the following areas:

- (a) Reactor Physics and Control
- (b) Nuclear Fuel
- (c) Thermal Hydraulics
- (d) Transient Analysis
- (e) Instrumentation and Control
- (f) Radiation Control and Health Physics
- (g) Electric Power
- (h) Chemistry and Radiochemistry
- (i) Plant Operation and Maintenance

While one individual may be qualified in more than one of the described areas, no one person could be expected to be qualified in all the areas, nor is a separate individual expected to cover each individual area. The required training for licensed operators, senior operators and Shift Technical Advisors would normally cover all the areas listed above except for (f) and (h). Expertise in the area of radiation control and health physics shall be provided by the assignment of a radiation protection technician on site at all times when there is fuel in the reactor.

Expertise in the areas of chemistry and radiochemistry should be provided by an additional qualified person available to each shift. For coverage of these areas an additional individual may need to be assigned to back shifts and weekends. Each utility should assure that the plant is staffed with the necessary expertise, such that when individuals need to be replaced for unanticipated absences, the overall crew capability will not be reduced.

Note also the requirements of Table B-1 of NUREG-0654 which specify an individual, in addition to those required by the above, to provide shift coverage in the area of Notification/Communication during an emergency. This individual could be used to relieve the Shift Supervisor of routine administrative duties during periods of normal plant operation.

e. Technician-Maintenance Resources

(1) Management shall assign technicians, repairmen, and inspectors to each plant to perform activities relative to:

- (a) Mechanical, electric, and instrumentation and controls maintenance and repairs;
- (b) Chemistry and radiochemistry sampling and analysis;
- (c) Radiation protection measurements, controls, and functions;
- (d) Inspection, review and audit required by the quality assurance program; and
- (e) Radwaste operations.

3. Training

Each member of the plant staff shall be trained and retrained in general plant procedures and activities such as radiation protection, fire protection, and security procedures to meet the training program described in Section 5 of ANSI/ANS 3.1.*

4. Qualifications of Plant Staff Personnel

Regulatory Guide 1.8, "Personnel Selection and Training,** sets forth the staff position on plant personnel qualifications.

B. Offsite

Corporate management of the licensee of a nuclear power plant shall be sufficiently involved in plant operations, including plant modifications, to assure a continual understanding of plant conditions and safety considerations. Corporate management shall assure that an adequate safety standard for the operation and maintenance of the nuclear power plant is established. To these ends each licensee shall

*Standard for Qualification and Training of Personnel for Nuclear Power Plants, December 1979 Draft.

**Draft of Proposed Revision 2, dated June 19, 1980.

establish an organization, parts of which shall be located onsite, to: perform independent reviews and surveillance of plant activities; provide technical support to the plant staff for maintenance, modifications, operational problems, and operational analysis; and to aid in the establishment of programs at the plant such as the quality assurance program, security program, fire protection program, radiation protection program, personnel training programs, and emergency planning.

1. Organization

The licensee shall establish an integrated organizational structure to provide for the overall management and technical support of nuclear power plant operations. The objective is to clearly establish the assignment of responsibility for the safe operation of the nuclear power plant and to provide the attendant resources needed to implement this responsibility. This organization shall provide for unambiguous management control and effective lines of authority and communication between and among the organizational units involved in the management, technical support, and operation of the nuclear unit. Figure 2 is a representative type of organization that could be used to accomplish this objective. The groupings in Figure 2 do not imply a best organizational structure, but are intended to: (1) indicate the types of activities that relate to nuclear power plant activities, and (2) suggest a division of responsibilities that would minimize any conflict with the application of resources applied to other non-nuclear plants and functions of the utility. This figure is considered to be representative of a utility with a medium sized commitment to nuclear power, since a utility with a single nuclear power plant would probably not have the resources to establish separate organizational units for all the areas shown in the figure. Some of these requirements could be supplied from other organizations within the company who normally perform those functions so long as the technical competence and availability to support the nuclear station can be demonstrated.

The key characteristics of this typical organization arrangement are:

- . Integration of all necessary functional responsibilities under a single responsible head.
- . The assignment of responsibility for the safe operation of the nuclear power plant(s) to an upper level executive position.

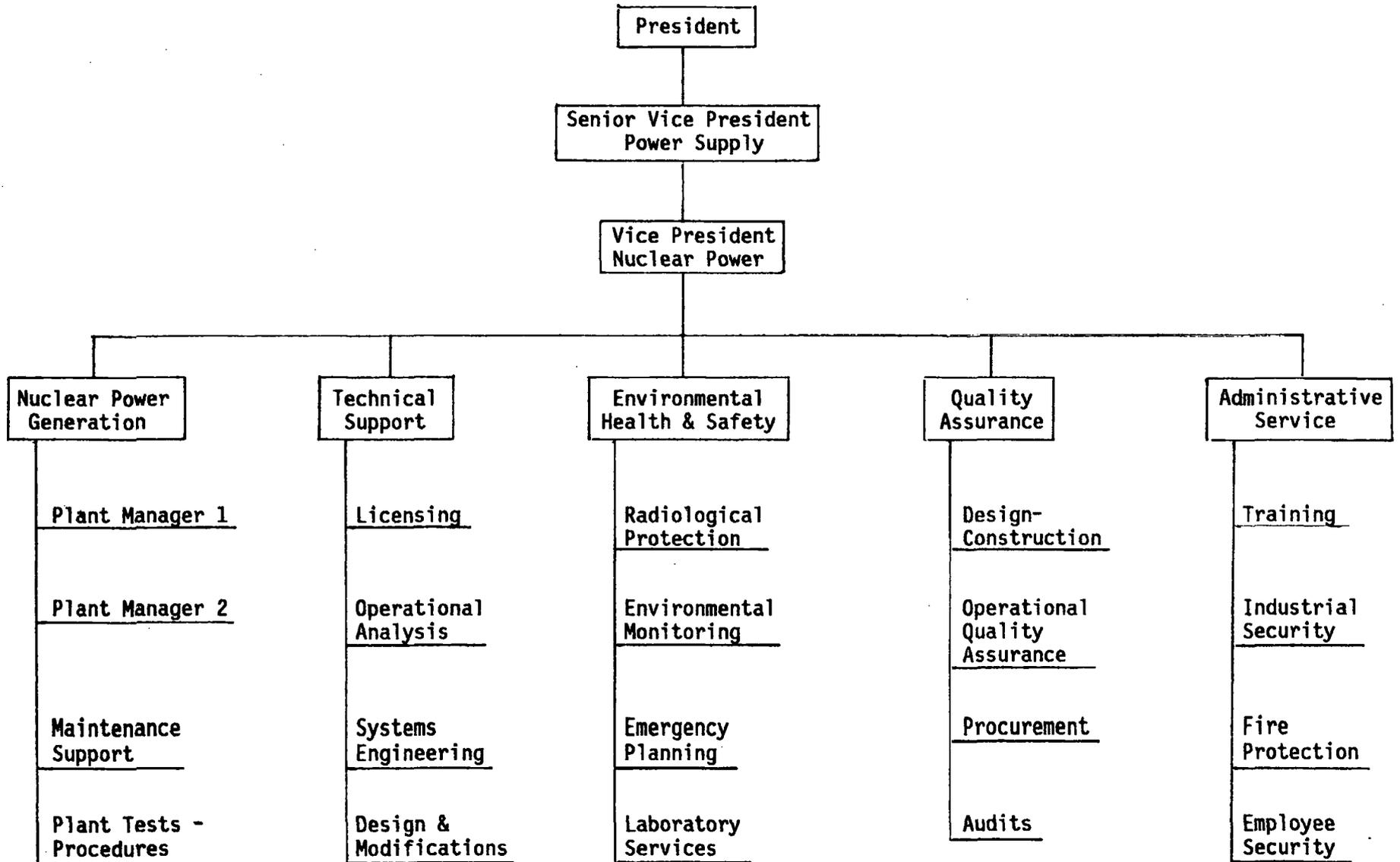
2. Resources

a. Management Resources

As a minimum, the management official in overall charge of nuclear power shall have a bachelors degree in science or

Figure 2

REPRESENTATIVE UTILITY ORGANIZATION



an engineering degree in a field associated with power production and ten years of experience associated with power plant design and operation, at least five years of which shall be nuclear power plant experience. Persons with management capability shall be provided in the areas that are important for the support of the nuclear power plant. The principal areas are operational management and engineering management.

The manager of each specific functional area shall have, as a minimum, a bachelors degree generally associated with that of his function and eight years of responsible experience, of which three years shall be specifically related to the type of function he will perform. Suitable depth should be provided to assure adequate support to the plant staff in the event of an emergency, such as at the plant Technical Support Center or the near-site Emergency Operations Facility (see Part III - Criteria For Accident Conditions).

The management official in overall charge of nuclear power (e.g., Vice President Nuclear Power) shall provide management direction for the following activities:

- . The establishment and approval of the qualification requirements for all plant staff positions.
- . The establishment and approval of qualification requirements for all offsite staff management positions that support safety related activities at the plant.
- . The establishment and supervision of functional unit(s) providing review of operational activities that is (are) independent of the plant staff.
- . The requirements established for the nuclear plant industrial security plan, quality assurance plan, fire protection program and plant staff training program.
- . Periodic assessment of plant staff training and quality assurance programs.
- . Review of NRC nuclear power plant inspection reports.
- . Review of deficiencies and violations of plant procedures and Technical Specifications requirements, and concurrence with corrective action taken to preclude recurrence.
- . The management of safety review groups that perform independent reviews of important matters affecting safety, except as noted in b. below.

In addition, this management official shall assure that an appropriate level corporate management official signs certification for operators and senior operators completed pursuant to Sections 55.10(a)(6) and 55.33(a)(4) and (5) of 10 CFR Part 55; and the certification of plant personnel in the category of managers.

b. Safety Review Resources

Each utility operator of a nuclear power plant shall establish provisions for the review of safety-related activities associated with the operation of the facility. Sections 4.3 and 4.4 of ANSI/ANS 3.2 (draft version of June 1980) describe a review program acceptable to the staff. In conjunction with the review program as described in this version of ANSI/ANS 3.2, each utility shall also establish an Independent Safety Engineering Group for each site. The Independent Safety Engineering Group is an additional independent group of five dedicated, full-time, site-based engineers, who report offsite to a technically oriented high level corporate official not responsible for power production.

The review functions of the Independent Safety Engineering Group will, as a minimum, include the following:

- . Evaluation for technical adequacy and clarity of all procedures important to the safe operation of the facility.
- . Evaluation of plant operations from a safety perspective
- . Evaluation of the effectiveness of the quality assurance program
- . Comparison of the operating experience of the plant and plants of similar design
- . Assessment of the plant performance regarding conformance to requirements related to safety
- . Any other matter involving safe operation of the nuclear power plant that an independent review deems appropriate for consideration
- . Assessment of plant safety programs

The group performing this function should be composed of individuals with varied backgrounds and disciplines related to nuclear power plants, such as those described in Sections 4.2 and 4.5 of ANSI/ANS 3.1 (December 1979 draft). Qualification requirements for these individuals

should be at a level generally comparable to that described in Section 4.2 of ANSI/ANS 3.1 (December 1979 draft), i.e., a bachelors degree in engineering with two to four years experience in their field, or equivalent as described in Section 4.1 of ANSI/ANS 3.1.

c. Offsite Technical Staff Resources

In addition to the technical and administrative support available as part of the plant staff, each licensee shall have the capability of providing additional support from resources located offsite. The objective is to assure that each licensee has the resources to discharge its responsibility for the safe operation of the facility and to provide, as a minimum, a nucleus of persons to provide timely technical support to the plant staff in the event of an emergency. Provisions for this offsite technical support, as a minimum, shall be as follows:

- (1) Support to the plant staff shall be provided to assist them in the following functions:
 - . Review of operating abnormalities;
 - . Review of plant system problems and performance;
 - . Review and correction of equipment malfunction;
 - . Perform plant design changes and modifications, or oversee such activities in detail in the event outside contractors are utilized;
 - . Support major maintenance efforts;
 - . Evaluate and provide response to NRC bulletins and orders;
 - . Establish and monitor contracted work;
 - . Establish training, security and emergency plans.
- (2) Technical capability shall be provided in the areas of:
 - . Nuclear, mechanical, structural, electrical, thermal-hydraulic and fluid systems;
 - . Metallurgy and materials, and instrumentation and controls engineering;
 - . Plant chemistry;

- . Health physics;
 - . Fueling and refueling operations support;
 - . Maintenance support;
 - . Technical and engineering management;
 - . Operations management;
 - . Quality assurance;
 - . Fire protection.
- (3) Staffing levels shall be such that the technical capabilities noted in (2) above are included in the offsite technical support staff. Personnel should be kept up-to-date on plant systems equipment and problems so they can promptly assist the plant staff in the event they are needed.

Note also the requirements of Part III.B.4 below.

- (4) Qualifications of persons in the technical areas described above shall include a bachelors degree in Engineering or the Physical Sciences or the equivalent and professional experience in the field for which they are providing technical support. Those individuals in a "lead" category and those who provide primary support to the plant in the event of an emergency shall have three years experience in their field.
- (5) Qualifications of persons filling management positions in technical support positions shall include an appropriate bachelors degree and six years of experience in power plant operation and/or design.

d. Training

Training shall be provided to those personnel not reporting to the plant manager but who provide technical support to the plant staff. This training should be aimed to aid these people in keeping current on:

- . Their functions within an emergency response organization; and
- . Health physics procedures in the event they need to function at the plant site.

Each licensee shall develop procedures to assure that these persons, when performing functions related to a nuclear power facility, have current familiarity with matters relevant to that facility such as:

- . Information on LERs applicable to the facility;
- . Current knowledge of federal regulations and changes thereto applicable to the facility;
- . Current status of plant design changes and modifications;
- . Information on applicable codes and standards.

e. Outside Contractual Assistance

The licensee shall, as a minimum, provide from inhouse resources the personnel necessary to satisfy the requirements for routine operations. However, to meet the resource requirements for accident conditions, as described in Part III below, some licensees may find it necessary to obtain additional support from resources outside the company. For these cases the licensee shall:

- . Identify the company with which the contract has been signed or with which an agreement has been arranged;
- . Describe the support to be provided;
- . Identify the duration of the contract or agreement; and
- . Specify the means by which all or a portion of the contract or agreement will be activated (phone call, other).

III. GUIDELINES FOR ACCIDENT CONDITIONS

This section addresses the management and technical resources required for accident mitigation and recovery efforts. The period of accident mitigation extends from the time an emergency condition is perceived to exist until the plant is brought under control. It is anticipated that, in most cases, accident mitigation efforts would extend over periods measured in hours. If consequences are such that long term effort will be required to return the plant to normal conditions, accident mitigation would gradually change over to accident recovery. Accident mitigation is subdivided into three time periods: short term, from accident initiation until approximately one hour after declaration of an emergency; near term from approximately one hour after declaration of an emergency until approximately 16 hours; and long term, from approximately 16 hours until plant conditions no longer pose a significant threat to public health and safety.

Emergency action levels are defined in NUREG-0610, "Draft Emergency Action Guidelines for Nuclear Power Plants." NUREG-0610 was issued for interim use and comment in September 1979, and is incorporated as Appendix 1 to NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," issued for interim use and comment in February 1980.

The shift supervisor, who is on duty at all times, is the individual who is in the immediate onsite position of authority who has responsibility for safe plant operation. The shift supervisor is responsible for the initial evaluation of any abnormal or emergency conditions and for initiating appropriate response efforts. If he determines that an emergency condition exists, the shift supervisor will assume the responsibilities assigned to the Emergency Director until such time as he is properly relieved. He will initiate appropriate emergency actions, implement emergency procedures as necessary, and notify appropriate authorities of the plant status. Emergency procedures shall be prepared that detail the actions to be taken by the shift supervisor. In the event the shift supervisor becomes incapacitated or is otherwise unavailable, the next senior operator shall assume his duties.

A. Onsite Resources and Activities

The utility operator shall provide for an onsite post-accident organization to cope with an emergency situation. This post-accident organization should use the existing onsite organizational structure to the greatest extent practical to take advantage of established lines of communication and responsibility. The organization shall provide management personnel assigned responsibility for specific functions. The post-accident onsite organization, under the control of the Emergency Director, shall direct all site operations necessary to establish safe plant conditions. Although the plant staff organization can reflect variations in company policy and procedures as established in Section II.A of these guidelines, a representative organization is shown in Figure 3; there are other organizations that are equally acceptable.

The onsite organization shall include the following resources in the areas indicated:

1. Control Room Resources

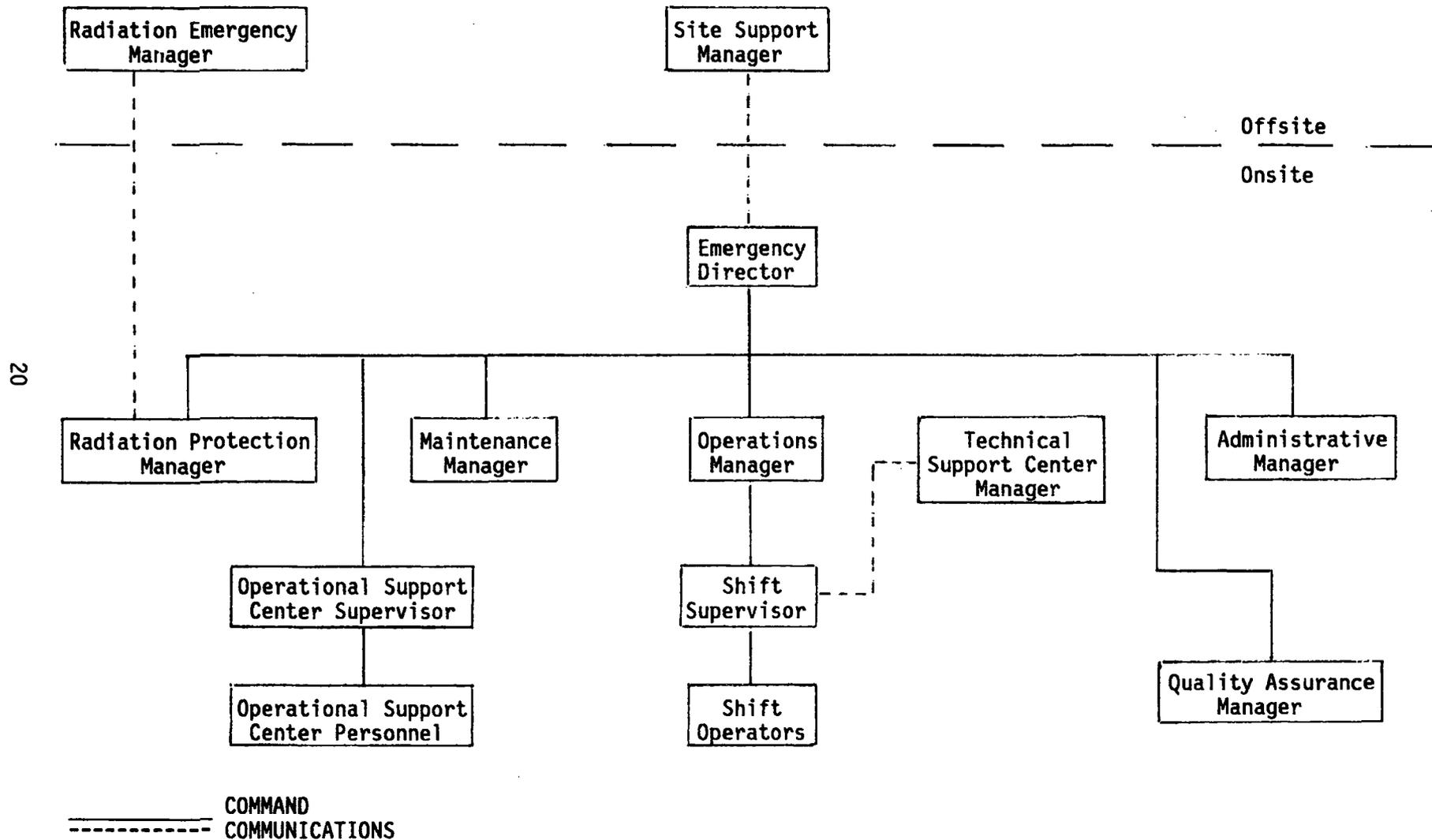
- a. Short Term - During this period, it is assumed that only the minimum required shift personnel will be available. Therefore, the shift supervisor will normally be in charge of all initial accident mitigation efforts. The shift staff consists of the personnel identified in Section II.A.2.d of these criteria.
- b. Near and Long Term - Provisions shall be made to assure that shift staffing can be maintained without exceeding applicable criteria on limitations of working hours.

2. Emergency Director

The position of Emergency Director may be initially filled by duty roster from among the key management and supervisory personnel at the station. However, it is expected that the Plant Manager (see Figure 1) would be the individual to whom most utilities would look to serve as the Emergency Director. The

REPRESENTATIVE POST-ACCIDENT ONSITE ORGANIZATION

Figure 3



Emergency Director is in charge of all accident mitigation efforts at the site.

Each utility operator shall develop plans to assure that the emergency organization can be staffed within the time frame indicated below. These personnel may be from the plant or site staffs, from the utility offsite organization, or through contract or other arrangements with outside organizations. These personnel or their alternates shall be onsite or on call continuously for the duration of the emergency condition, as determined by the Emergency Director.

- a. Short Term - No requirements.
- b. Near Term - Sufficient personnel shall be available to assure that the emergency organization can be manned in less than two hours following the determination that an accident condition exists. This shall consist, as a minimum, of persons with capability to function as managers in the areas of Operations Management, Technical Support Management, and Radiation Protection Management, and as coordinator for the Operational Support Center. In addition, management personnel in the areas of maintenance, quality assurance and administration shall be on call to respond as determined by the Emergency Director. These individuals shall have qualifications equal or comparable to those described in the draft revision to ANS 3.1, dated 12/6/79. Within eight hours, at least one full complement of personnel as designated above shall be available to relieve the management personnel initially staffing the emergency organization.
- c. Long Term - There shall be sufficient personnel planned for and available to assure that the emergency organization can be staffed on a 24-hour-a-day basis for an extended period of time, if such is needed.

3. Technical Support Center (TSC)

An onsite Technical Support Center (TSC) shall be established under the supervision of the Technical Support Center Manager to provide technical support and recommendations regarding emergency actions (see Section 2.2.2.b of NUREG-0578).

- a. Short Term - No requirements.
- b. Near Term - Plans should be completed to staff the TSC, if needed, within two hours of notification, with personnel having collective qualifications in the areas of: reactor engineering, thermal hydraulics, mechanical engineering, instrument and control engineering (including process computer), chemistry and radiochemistry, overall plant design and engineering, and electrical systems. Qualifications of these personnel should be equal or comparable to those

described in Section 4.4 of the draft revision to ANS 3.1, dated 12/6/79, in their respective areas. Within eight hours, at least one full complement of personnel as designated above shall be available to relieve those personnel initially staffing the TSC.

- c. Long Term - There shall be sufficient personnel planned for and available to assure that the TSC can be staffed on a 24-hour-a-day basis for an extended period of time, if such is needed.

4. Radiation Protection Manager

The Radiation Protection Manager is responsible for directing the activities of the radiological monitoring teams. He coordinates radiological assessment activities, reviews results and reports findings and makes recommendations to the Emergency Director. He shall also maintain communication with and coordinate his activities with the offsite Radiation Emergency Manager.

- a. Short Term - No requirements.
- b. Near Term - The Radiation Protection Manager or his designated alternate shall report to the plant site within two hours after notification that an emergency condition exists.
- c. Long Term - Plans shall be made to assure that the position of Radiation Protection Manager can be staffed on a 24-hour-a-day basis for an extended period of time.

5. Operational Support Center (OSC)

An onsite Operational Support Center (OSC) shall be established (see Section 2.2.2.c. of NUREG-0578). Each utility shall develop plans to assure that the OSC can be staffed, if needed, within the time frames indicated below. These personnel may be from the plant or site staffs, the utility offsite organization, or through contract or other arrangements with other organizations.

- a. Short Term - No requirements.
- b. Near Term - The following personnel shall be available to the Operational Support Center within one hour of the determination that an accident condition exists.
 - (1) Operational Support Center Coordinator - The function of the OSC Coordinator is to coordinate the availability and assignment of personnel supporting activities for the Emergency Director and the emergency organization managers. He shall report directly to the Emergency Director.

- (2) Technicians - At least one person in each of the following areas of expertise: instrumentation and control, plant chemistry, electrical systems, and mechanical systems. Qualifications of these personnel shall be as described in Section 4 of the draft revision to ANS 3.1, dated 12/6/79.
 - (3) Health Physics - At least three two-man monitoring teams.
 - (4) Operating Personnel - Plans shall be established to assure the availability of at least one full shift complement of licensed and unlicensed operators. The need to call these persons in will be determined by designated plant management, e.g., Emergency Director.
- c. Long Term - Each licensee shall establish plans to assure that the OSC can be staffed as needed on a 24-hour-a-day basis for an extended period of time.

B. Offsite Resources and Activities

The owner organization shall establish plans to assure the necessary management and technical resources to support the onsite staff in event of an accident. These resources may be provided from the utility-owner's staff or through contractual or other arrangements with other organizations.

1. Emergency Operations Facility (Near-Site)

The utility-owner shall establish an Emergency Operations Facility at a convenient location near the nuclear plant site. (See Appendix 5 to NUREG-0610.)

2. Organization

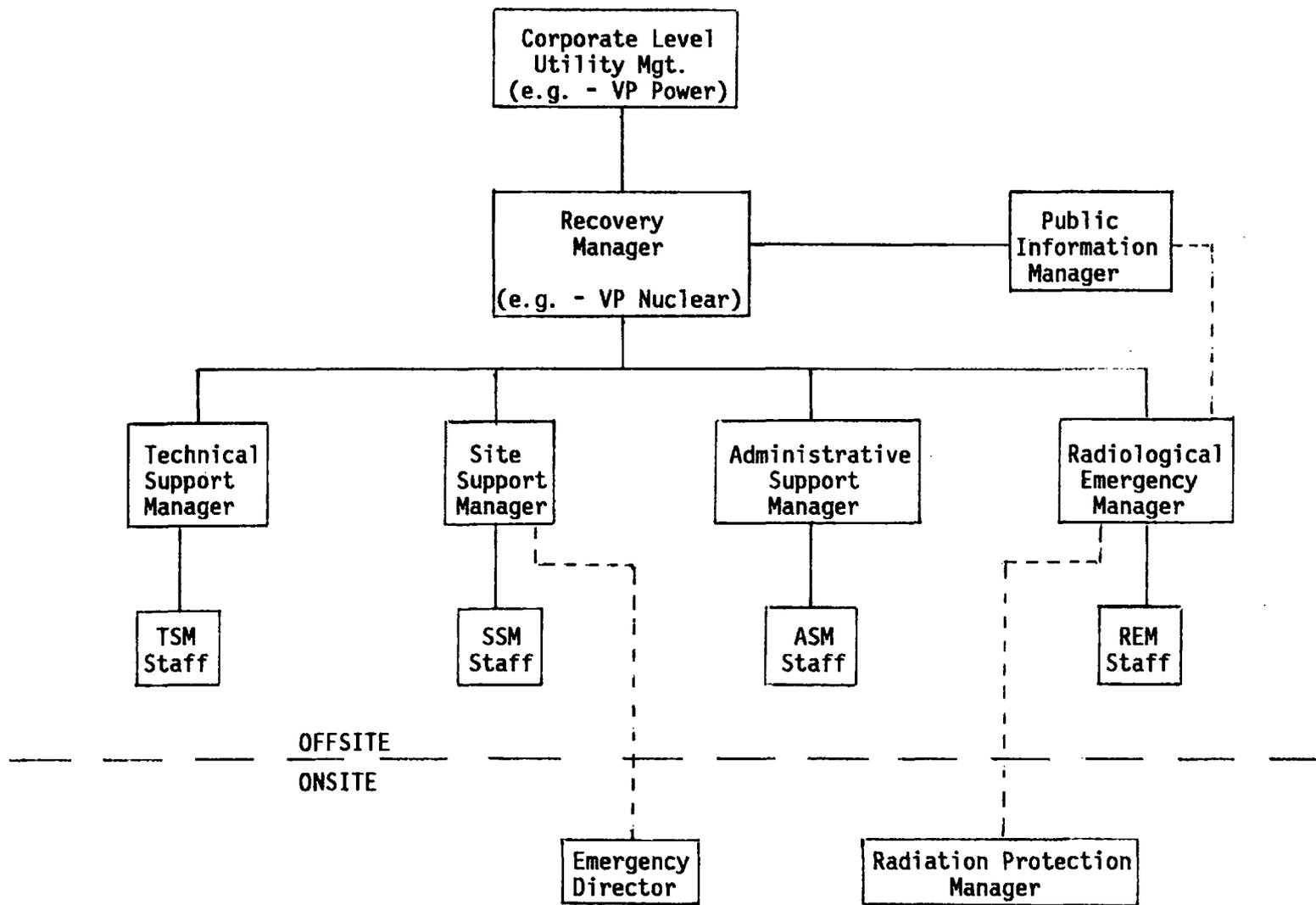
The utility operator shall describe its organization for accident mitigation and recovery. The key characteristics of an acceptable recovery organizational arrangement for the offsite recovery staff are shown in Figure 4, a representative type organization. Another representative type organization is shown in the AIF Nuclear Power Plant Emergency Response Plan, October 1979.

3. Management Resources

The utility operator shall provide personnel to manage the recovery organization in the areas of overall recovery management, technical management, site support management, administrative support management, radiological support management, and public information management. These managers shall be available to report to and activate the recovery organization within two hours from the time of notification that accident conditions exist. Qualifications of these managers shall be as follows:

REPRESENTATIVE OFFSITE RECOVERY ORGANIZATION

Figure 4



24

————— COMMAND
- - - - - COMMUNICATION

- a. Recovery Manager - The Recovery Manager is the corporate official, designated in advance, in overall charge of activities related to plant recovery following an accident. He should be a management official with full authority to make commitments for the corporation. The qualifications of the Recovery Manager should be equivalent to those described in Section II.B.2.a.
- b. Technical Manager - The Technical Manager shall have, as a minimum, a bachelor's degree in engineering or the physical sciences and ten years of experience, including at least four years of management experience and three years of nuclear experience.
- c. Site Support Manager - The Site Support Manager shall have, as a minimum, a bachelor's degree in engineering or the physical sciences and ten years of experience, including at least four years of management experience and five years of nuclear experience.
- d. Radiological Emergency Manager - The Radiological Emergency Manager shall, as a minimum, meet the requirements described in Section 4.4 of ANSI/ANS 3.1, draft revision dated December 6, 1979.
- e. Administrative Support Manager - The Administrative Support Manager shall have, as a minimum, experience in procurement, a familiarity with the utility's procurement practices and suppliers, at least two years of supervisory experience, and appropriate training in the duties that might be expected when in an accident recovery mode.
- f. Public Information Manager - The Public Information Manager shall have, as a minimum, at least two years experience in public/press relations. In addition, he shall be knowledgeable, by experience or training, in nuclear plant systems and radiation technology.

4. Offsite Recovery Staff Resources

Sufficient numbers of appropriately qualified personnel shall be available to support the offsite recovery operations. The requirements for each manager's staff are discussed below. Each manager's staff should be capable of functioning within four hours after the accident and should, as necessary, be established on a shift basis within 16 hours until the Recovery Manager determines that this level of support is no longer needed. The utility-owner shall state where the offsite recovery staff will be located in the event of an accident.

- a. Technical Staff - The Technical Manager shall have available on call, within the time frame indicated above, a staff with the expertise and general qualifications described in Table 2. Table 2 should be used as an indication of the

caliber of individual that should be available in each area of expertise listed. In addition, this staff shall include representatives from the NSS supplier and, when appropriate, from the architect/engineer and the constructor of the plant. The owner organization shall establish plans to provide, if needed, 24-hour-a-day coverage by at least one individual meeting the criteria in each area of expertise of Table 2. These individuals may be from the owner organization or by pre-planned arrangements with other utilities or by contract. Typical functions of this staff are writing emergency and contingency procedures, providing design and analysis information to the onsite Technical Support Center, and coordinating tasks with other organizations. Personnel from this staff may also be assigned to the onsite Technical Support Center as necessary.

- b. Site Support Staff - The Site Support Manager shall have available on call, within the time frame indicated above, a staff with the expertise and general qualifications described in Table 3. Table 3 should be used as an indication of the caliber of individual that should be available in each area of expertise listed. The function of this staff is to support plant recovery operation by providing liaison between the site Technical Support Center and the remainder of the offsite recovery team. This important function is intended to limit the number of organizations and individuals communicating with the site directly, thereby allowing site personnel to devote maximum effort to cope with the accident. It may be necessary for the Site Support Manager to provide personnel from his staff to work onsite in their areas of expertise. Staffing plans shall demonstrate that at least one individual meeting the general guidelines for each area of expertise in Table 3 is available for this staff on a shift basis.
- c. Administrative Support Staff - The Administrative Support Manager shall have available a staff of sufficient size to accomplish the following functions: establish necessary communications for the offsite recovery staff; notify offsite recovery staff members to assemble; provide housing, food, office equipment, etc., for the offsite recovery staff; make necessary contractual arrangements for the recovery effort; procure equipment, supplies, and additional personnel needed to support the recovery effort (both onsite and offsite); and provide additional manpower for scheduling activities deemed appropriate by the Recovery Manager. The staff members shall be trained in the use of the procedures to be used to accomplish these functions. The staff shall begin to accomplish the functions listed above, as necessary, within two hours after notification of the Administrative Support Manager that accident conditions exist.

Table 2
 OFFSITE TECHNICAL RESOURCES - TECHNICAL STAFF
 (Qualification Guidelines)

<u>Area of Expertise</u>	<u>Training</u>	<u>Experience</u>	
		<u>Total</u>	<u>Nuclear Power Plant</u>
Transient Analysis and System Interactions	B.S. in Engineering or related Sciences, Simulator training	10 years	5 years
Nuclear Engineering and Fuel Management	B.S. in Nuclear Engineering	10 years	5 years
Core Physics, Design and Control Theory	B.S. in Engineering or related Sciences	10 years including at least 3 years design	5 years
Electrical Power System	B.S. in E.E.	5 years, design and operation	3 years
Process Computers	B.S. in Computer Sciences	5 years operation	3 years
Instrumentation and Control Systems	B.S. in E.E.	6 years, including at least 2 years design	4 years
Refueling Operations	B.S. in Engineering. SRO or SRO limited to fuel handling	5 years	5 years
Engineering Mechanics of Power Plant Systems and Components	B.S. in M.E.	6 years, including at least 2 years design	3 years
Thermal-Hydraulics	B.S. in M.E.	5 years	2 years
Plant Structural and Containment Design	B.S. in M.E. or C.E.	5 years	4 years
Metallurgy (Materials) Q.A.	B.S. in Materials or B.S. in Engineering	5 years	2 years

Table 3
 OFFSITE TECHNICAL RESOURCES - SITE SUPPORT STAFF
 (QUALIFICATION GUIDELINES)

<u>Area of Expertise</u>	<u>Training</u>	<u>Experience</u>	
		<u>Total</u>	<u>Nuclear Power Plant</u>
Fire Protection	1 year specific training in Fire Fighting Sciences	5 years	2 years
Chemical Engineering	B.S. in C.E.	5 years	2 years
Radiochemistry	B.S. in Chemistry plus 1 year of Radiochemistry	5 years	3 years
Radioactive Waste Management	B.S. in C.E., 1 year of specialized training	5 years	4 years
Decontamination of Equipment	1 year specialized training	10 years*	2 years
Radiation Control and Health Physics	B.S. in appropriate Sciences, 1 year of specialized training	4 years	4 years
Plant Operations	Holds or has held SRO on plant by same vendor	7 years	5 years
Plant Maintenance	B.S. in Engineering	10 years	5 years

*Up to 8 years experience may be in nuclear facilities other than power plants.

- d. Radiological Emergency Staff - The Radiological Emergency Manager shall have available, if needed, at least 20 individuals per shift (including individuals from the plant staff who will be assigned to assist with environmental monitoring). The members of this staff shall be assigned duties as deemed necessary by the Radiological Emergency Manager. The individuals leading monitoring teams and similar work shall meet the qualification requirements for health physics technicians specified in ANSI/ANS 3.1, Section 4.5.2, draft revision of December 1979.
- e. Public Information Staff - The Public Information Manager shall have available several individuals to assist him in preparing and disseminating public information. Included in this staff shall be a technically trained individual who can assist the Public Information Manager in interpreting plant status information for dissemination to news media and other agencies. A report, "Emergency Public Information Procedures for Nuclear Plants," prepared by the Committee for Energy Awareness, provides excellent information on the needs of a public information program to be in place following an accident. Copies of the report may be obtained from Mr. Bill Perkins, Director, Committee for Energy Awareness, 1111 19th Street, N.W., Washington, D.C. 20036.

5. Outside Assistance

It may be necessary for the utility-owner to arrange for augmentation of the in-house personnel resources with personnel from outside the utility in order to assure that minimum staffing needs can be met for the offsite recovery organization. In such instances, the utility owner shall identify the source of these augmentation personnel, describe the arrangements that have been made to obtain their services when needed, and indicate how they will be integrated into the offsite recovery organization.

6. Training and Requalification

A training program shall be prepared to train the offsite recovery staff managers to perform their roles in the event of an accident. This training shall include other members of the offsite recovery team who are employees of the utility-owner and the contacts for other organizations that will furnish personnel in support of the recovery effort.



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