

ABSTRACT
NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM (NUQAP)
TOPICAL REPORT

Northeast Utilities (NU) has developed and is implementing a comprehensive Quality Assurance Program to assure conformance with established regulatory requirements, set forth by the Nuclear Regulatory Commission (NRC), and accepted industry standards. The participants in the NU Quality Assurance Program assure that the design, procurement, construction, testing, operation, maintenance, repair and modification of nuclear power plants are performed in a safe and effective manner.

The NU Quality Assurance Program (NUQAP) Topical Report complies with the requirements set forth in Appendix B, of 10 CFR Part 50, along with applicable sections of the Safety Analysis Report (SAR) for each licensed application, and is responsive to the United States NRC Regulatory Guide 1.70, which describes the information required to be presented in the Quality Assurance Section of the SAR's for nuclear power plants.

The NUQAP is also established, maintained and executed with regard to Radioactive Material Transport Packages as allowed by 10 CFR 71.101(f). Quality Assurance Provisions for Fire Protection activities are detailed in the Northeast Utilities Fire Protection Program.

This NUQAP is applicable in its entirety to Category I systems, structures, components, materials, equipment, parts, and services. Appendix A defines Category I systems, structures, and components. The NUQAP is also applicable to other quality programs including Anticipated Transient Without Scram (ATWS) and Environmental Equipment Qualification (EEQ) as defined by NU commitments. Portions of the NUQAP are also applicable to Fire Protection Quality Assurance (FPQA), *Station Blackout Quality Assurance (SBOQA)* and Radwaste Quality Assurance (RWQA) which are delineated in established procedures. Quality Assurance provisions for primary chemistry laboratory activities are detailed in the Northeast Utilities Nuclear Chemistry Laboratory Quality Assurance Manual.

The NUQAP is committed to utilize the guidance obtained from the Regulatory documents and their endorsed Standards as referenced in Appendix D of the Topical Report.

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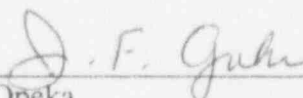
POLICY STATEMENT
NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM
TOPICAL REPORT

The policies, requirements and tasks contained in this Northeast Utilities Quality Assurance Program description have been developed to achieve a recognized need for quality assurance during the design, procurement, construction, testing, operation, maintenance, repair, and modification of our nuclear facilities.

Northeast Utilities procedures which implement this program are described in various manuals which are referenced herein.

This NUQAP is applicable in its entirety to Category I systems, structures, components, materials, equipments, parts, and services. Appendix A defines Category I systems, structures, and components. Portions of the NUQAP are also applicable to Fire Protection Quality Assurance (FPQA), *Station Blackout Quality Assurance (SBOQA)*, and Radwaste Quality Assurance (RWQA) which are delineated in established procedures, and Anticipated Transient Without Scram Quality Assurance (ATWS Quality Assurance is applicable to MP-1, 2 only; MP-3 commits to Generic Letter 85-06), and Equipment Environmental Qualification as defined by NU commitments. Quality Assurance provisions for primary chemistry laboratory activities are detailed in the Northeast Utilities Nuclear Chemistry Laboratory Quality Assurance Manual.

The development and overall responsibility for this Quality Assurance Program lies with the Executive Vice President - Nuclear as delegated by the *Executive Vice President and Chief Financial Officer of Northeast Utilities (NU) who also is the President-Energy Resources Group of Northeast Utilities Service Company (NUSCO). He is the President and Chief Financial Officer of the Northeast Nuclear Energy Company (NNECO) and the Executive Vice President and Chief Financial Officer of Connecticut Yankee Atomic Power Company (CYAPCO)*. Corporate authority is delegated to the Director, Quality and Assessment Services for the preparation and administration of the Quality Assurance Program. Individual Vice Presidents and Directors are responsible for the implementation of their portion of the Northeast Utilities Quality Assurance Program. Revisions, additions to, and audits of this program are the responsibility of the Director, Quality and Assessment Services. Any revisions or additions shall be approved by affected Departments prior to the incorporation of such changes into the program. Final approval of revisions or additions to this policy statement rests with the Executive Vice President - Nuclear.



J. F. Opeka
Executive Vice President - Nuclear
Northeast Utilities

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INTRODUCTION
NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM
TOPICAL REPORT


This Northeast Utilities Quality Assurance Program (NUQAP) Topical Report contains the quality assurance requirements which are relevant to the safety of the nuclear power plant. The Topical Report consists of the following three parts:

1. Introduction, which delineates the purpose of the Topical Program, and summarizes its scope and applicability.
2. The NUQAP, which is applicable in its entirety to Category I systems, structures, components, materials, equipments, parts, and services. Appendix A defines Category I systems, structures, and components. Portions of the NUQAP are also applicable to Fire Protection Quality Assurance (FPQA), *Station Blackout Quality Assurance (SBOQA)*, and Radwaste Quality Assurance (RWQA) programs, and Anticipated Transient Without Scram Quality Assurance (ATWS Quality Assurance is applicable to MF-1, 2 only; MP-3 commits to Generic Letter 85-06), and Equipment Environmental Qualification as defined by NU commitments.
3. Appendices, which provide supporting statements and tabulations.

This NUQAP Topical Report has been prepared to document that a meaningful quality assurance program has been established and implemented to ensure that adequate quality requirements are being complied with to safeguard NU employees, contracted personnel and the public, from the conceptual phase through the operations phase of nuclear power plant life. In addition, there are other programs to safeguard NU employees, contracted personnel, and the public.

The controls which implement the actions identified in the NUQAP Topical Report are departmental procedures and instructions which delineate actions and steps necessary to accomplish quality requirements. Procedures and instructions are written by company groups, divisions, departments, branches, or sections, which have the responsibility for implementing actions assigned to them as delineated by the NUQAP. Quality procedures and revisions thereto are reviewed by and concurred with by the Quality and Assessment Services Department in accordance with QAP 2.0 and QAP 5.0.

The NUQAP is responsive to applicable codes, Nuclear Regulatory Commission regulatory requirements, accepted industrial standards and revisions thereto. Provisions are established to update the NUQAP Topical Report in accordance with revisions to codes, standards and regulatory requirements, and to inform cognizant personnel to implement appropriate action to assure the highest standard of quality is achieved for systems, structures, components and services for nuclear power plants.



Joseph M. Solymossy
Director, Quality and Assessment Services

1.0 ORGANIZATION

1.1 INTRODUCTION

Northeast Utilities (NU) is a holding company which owns all of the common stock in several companies as illustrated by Figure 1.1.

The Connecticut Light and Power Company (CL&P) and Western Massachusetts Electric Company (WMECO) are the principal owners of Millstone Unit Nos. 1, 2, and 3, with the percent ownership as follows:

	<u>Millstone 1</u>	<u>Millstone 2</u>	<u>Millstone 3</u>
CL&P	81	81	52.93
WMECO	19	19	12.24

By contract they have the authority to make all of the decisions affecting the design, procurement, modifications, maintenance, and operation of these units.

CL&P and WMECO jointly own 44% of the Connecticut Yankee Atomic Power Company (CYAPCO). By contract, NU and Northeast Utilities Service Company (NUSCO) have been delegated operational control of CYAPCO. NUSCO provides technical support for the operation of that plant.

Northeast Nuclear Energy Company (NNECO) and CYAPCO are the operating companies established to operate their respective nuclear plants. NNECO is delegated the responsibility for operating the Millstone Units by the owners. NNECO and CYAPCO comprise the Nuclear Plant Operating Companies (NUPOC) as illustrated in Figure 1.1.

NUSCO, parts of which are organized as shown in Figures 1.2, 1.3, and 1.4, provides services such as engineering, quality assurance, training, licensing, planning, and procurement for the NU system operating companies where these services can be efficiently and economically performed on a systemwide basis.

This NUQAP Topical Report is not applicable to Public Service of New Hampshire (PSNH) or North Atlantic Energy Services Company (NAESCO).

1.2 GENERAL (refer to Figure 1.2)

1.2.1 *The Executive Vice President and Chief Financial Officer of Northeast Utilities (NU) is the President-Energy Resources Group of Northeast Utilities Service Company (NUSCO). He is the President and Chief Financial*

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Officer of the Northeast Nuclear Energy Company (NNECO) and the Executive Vice President and Chief Financial Officer of Connecticut Yankee Atomic Power Company (CYAPCO). Reporting to the Executive Vice President and Chief Financial Officer of NU is the Executive Vice President-Nuclear and the Vice President-Information Resources.

1.2.2 The Executive Vice President-Nuclear for NUSCO is also the Executive Vice President-Nuclear for NUPOC. *He directs specified nuclear-related activities within NU and has the ultimate responsibility for the establishment and execution of the NU Quality Assurance Program (NUQAP).* He is responsible for engineering, construction, operation, maintenance, modification, and quality assurance.

1.2.2.1 The responsibilities of the Executive Vice President-Nuclear relating to the Quality Assurance Program are described in the Nuclear Engineering and Operations Policies and Procedures Manual. He has contact with the quality assurance activities *through meetings with the Director, Quality and Assessment Services and* through the receipt of various documents such as:

Periodic progress reports, Nuclear Review Board Meeting Notes, other reports, and audits related to nuclear program implementation and nuclear plant operations activities.

1.2.2.2 The Executive Vice President-Nuclear is responsible to assess the scope, status, implementation, and effectiveness of the NUQAP. To meet this responsibility, he appoints a qualified team of individuals to perform an annual Management Quality Assurance Review.

This Management Quality Assurance Review is:

- a. A systematic evaluation;
- b. Preplanned toward the objective of determining the adequacy of the NUQAP and its compliance with Appendix B to 10 CFR Part 50 and other regulatory requirements;
- c. Capable of identifying, communicating, and tracking any required corrective action.

The team is made up of individuals knowledgeable in quality assurance, quality activities, auditing, management responsibilities, and the NUQAP Topical Report.

1.2.2.3 The following Vice Presidents and Nuclear Station Vice Presidents report to the Executive Vice President-Nuclear.

- a. Vice President-Nuclear, Engineering Services (see para. 1.4.1).
- b. Vice President-Nuclear, Operations Services (see para. 1.4.2).
- c. Nuclear Station Vice Presidents, (*Senior Vice President at Millstone Station and Vice President at Connecticut Yankee*). (see para. 1.4.3)

1.2.3 The Vice President-Information Resources Group reports to the Executive Vice President and Chief Financial Officer and operates and maintains corporate mainframe computer systems and provides support for quality activities as requested by Nuclear Group personnel (see para. 1.5.2).

1.3 RESPONSIBILITIES (Refer to Figure 1.5)

1.3.1 Overall responsibility for the NUQAP is assigned to the Director-Quality and Assessment Services, who reports to the Executive Vice President-Nuclear. These responsibilities include: directions of the Quality Assurance Program; implementation of policies, plans, requirements, procedures, and audits; verification to assure compliance with 10 CFR 50 Appendix B and other regulatory requirements; and verification of the implementation of the NUQAP Topical Report Requirements.

1.3.2 The head of each NUSCO/NUPOC department or organization performing quality activities is responsible for:

- a. Administering those activities within their organization which are defined by the NUQAP Topical Report;
- b. Ensuring implementation of the Quality Assurance Program;
- c. Establishing and clearly defining the duties and responsibilities of personnel within their organization who perform quality activities;

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- d. Planning, selecting, and training personnel to meet the requirements of the NUQAP Topical Report;
 - e. Performing and coordinating quality activities within their department and interfacing with Quality and Assessment Services.
- 1.3.3 Each individual, performing or verifying activities affecting quality, is responsible to conduct those activities in accordance with the requirements of the NUQAP and implementing procedures.
- 1.3.4 The responsibility, authority, and organizational relationship for performing quality activities within each organization is established and delineated in the NU Organizational Charts, *policy statements*, and written job or functional descriptions.

1.4 NU PARTICIPATING GROUPS - NUCLEAR GROUP

The Executive Vice President-Nuclear is responsible for providing and directing projects and for providing technical and support personnel to meet responsibilities during engineering, construction, maintenance, testing, licensing, modification, and operation of nuclear power plants.

The Nuclear Group is divided into two services divisions and two nuclear stations:

- a. Nuclear, Engineering Services (Figure 1.3);
- b. Nuclear, Operations Services (Figure 1.4);
- c. Connecticut Yankee (Figure 1.5A);
- d. Millstone Station (Figure 1.5B)

In addition to these, there are *three* other group responsibilities reporting directly to the Executive Vice President-Nuclear: the Nuclear Safety Concerns Program, *the Nuclear Planning, Licensing and Budgeting Department*, and *the Quality and Assessment Services Department*.

The functions of the personnel, who perform quality activities within these divisions and groups, are as follows:

1.4.1 *The Vice President-Nuclear, Engineering Services is responsible for Technical and Design Engineering support to existing NU nuclear plants. The following department heads report to him: (See Figure 1.3)*

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1.4.1.1

The Directors, Unit Nuclear Engineering Departments, MP1 (Millstone Unit 1), MP2, MP3, and CY are responsible to provide Technical and Design Engineering support to their assigned Nuclear Unit. Technical Support includes Reactor Engineering, Engineering Programs, Electrical System Engineers and Mechanical System Engineers. Design Engineering Support includes System Engineering, Mechanical Engineering, Electrical Engineering, Mechanical Design and Electrical Design. The Department is responsible for Core Performance Monitoring, Review and Input to Operating Plant Procedures, Balance of Plant Monitoring, Special Nuclear Materials Programs, Fire Protection, Section XI, In Service Inspections/In Service Testing, System Expertise, System Performance Trending, Investigations and Trouble Shooting. The Department also serves as the Design Authority for its assigned Unit providing Civil, Structural, Stress, Electrical, I&C Engineering and Design and Drafting Support to Design Change Activity, as well as overall Project Management for such activities. The Department is also responsible for Configuration Management Maintenance, Compliance with Appendix R, EQ, HELB, OPAL Database, SBO, Setpoint Changes and MEPL (Material, Equipment, and Parts List) programs.

1.4.1.2

The Director, Nuclear Engineering Services is responsible for Engineering and Technical support to the Nuclear Group in the areas of Nuclear Fuel Engineering, Radiological Assessment, Safety Analysis and Engineering Support. The Department is responsible for the commercial and technical aspects of nuclear fuel and core components, including fuel design, procurement and management, nuclear analysis, special nuclear accounting, spent fuel strategies, control rods and fuel channels. The Department is also responsible for LOCA and non-LOCA accident analysis, containment analysis, Integrated Safety Evaluations, Safety Functional requirements and PRA. In the radiological area, the Department is responsible for Standard Practices, ALARA support, Radiological Engineering, Dosimetry Laboratory and Low Level Waste. The Department is also responsible to provide technical focus on strategic issues, development and oversight of engineering programs, promotion of commonality of engineering practices, technical oversight and technical support for highly technical issues in support of NU's nuclear units. It provides expertise for systems, specifications and

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equipment, material and chemistry, and corrosion issues. It develops and sets electrical, mechanical, and civil engineering standards and practices and associated engineering programs for NU's nuclear units. The Department is also responsible for the development of the Configuration Management Program.

1.4.2 The Vice President-Nuclear, Operations Services is responsible for Nuclear Production Materials, Nuclear Emergency Preparedness, Nuclear Maintenance, *Nuclear Operation Support Services*, Programs, and Nuclear Training. The following department Directors report to the Vice President-Nuclear, Operations Services (see Figure 1.4):

1.4.2.1 The Director-Nuclear Production Materials is responsible for parts, materials, and records support services, and procurement *engineering services* for equipment and material as required for NUSCO/NUPOC Departments during the design, modification, maintenance, construction, and operation of nuclear power plants.

1.4.2.2 The Director-Nuclear Emergency Preparedness is responsible for the on-site Emergency Preparedness Program, the off-site Emergency Preparedness Program, *and the Emergency Preparedness Technical Programs.*

1.4.2.3 The Director-Nuclear Maintenance is responsible *to develop and coordinate programmatic maintenance* activities required to support NUSCO/NUPOC Departments during the maintenance, test, and operation of nuclear power plants.

1.4.2.4 The Director-Nuclear Training is responsible for Nuclear Training and evaluation of training activities.

1.4.3 Nuclear Station Vice Presidents (Millstone and Connecticut Yankee) are responsible for the operation, maintenance, testing, modifications, and refueling activities for the nuclear power plants.

a. Services Directors (Millstone and Connecticut Yankee) report to the individual Nuclear Station Vice Presidents and are responsible for the following functions. (See Figures 1.5A and B.)

These functions include:

- Administration

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- *Maintenance Services*
- Chemistry
- Computer Services (Millstone only)
- Health Facility
- Health Physics
- Radioactive Materials Handling
- Security
- *Cost and Budgeting*

b. Nuclear Unit Directors (Millstone and Connecticut Yankee) report to the individual Nuclear Station Vice Presidents and are responsible for the operation, maintenance, testing, modifications, and refueling of their respective nuclear plants. The following functions report to each Nuclear Unit Director: (See Figures 1.5A and 1.5B.)

- Operations
- Instrumentation and Controls
- Maintenance
- *Outage Management*
- *Work Planning and Control*

1.4.4 The Director-Nuclear Safety Concerns Program (see Figure 1.2), is responsible administratively to the Executive Vice President-Nuclear and functionally to the *Chairman of the Board of NU* for the development and administration of NU's program implemented to ensure that nuclear safety concerns receive appropriate management attention and that all such concerns are addressed in a timely manner.

1.4.5 The Director-*Nuclear Planning, Licensing and Budgeting* (see Figure 1.2) is responsible for maintaining licenses for each of the NU nuclear generating facilities, *and providing overall strategic planning support to integrate strategic planning with the Nuclear Business Plan. His responsibilities include:*

- a) assuring NU's licensing position are reasonable, consistent, cost-effective, and directed toward protection of public health and safety and in compliance with regulatory requirements,
- b) coordinating communications between NU and the Nuclear Regulatory Commission,
- c) coordinating the Integrated Safety Assessment Program (ISAP),
- d) maintaining the Final Safety Analysis Reports for each of the units,

- e) *providing integration and validation for performance enhancement program action plans,*
- f) *supporting the Critical Business Activity Teams project,*
- g) *reviewing the Nuclear Group's practices to develop best methods, and*
- h) *supporting the Nuclear Group strategic planning process.*

1.4.6 The Director-Quality and Assessment Services is responsible for the preparation and issuance of the NUQAP Topical Report, and verification of the implementation of its requirements by the applicable NUSCO/NUPOC Departments. Verification is performed by a planned program of audits, surveillances, and inspections by Quality and Assessment Services Sections. He provides management with objective evidence of the performance of activities affecting quality, independent of the individual or group directly responsible for performing the specific activity.

He has the authority and organizational freedom to verify all activities affecting quality. This is performed independent of undue influences and responsibilities for schedules and costs. He has the responsibility and authority, delineated in writing, to stop unsatisfactory work and control further processing, delivery, or installation of nonconforming materials. He also has the responsibility and authority to identify quality problems, to recommend or provide solutions, and to verify their implementation.

The responsibilities and duties of all Quality and Assessment Services personnel are described in NUSCO/NUPOC implementing procedures.

1.5 OTHER NU PARTICIPATING GROUPS

The Nuclear Group may request the services of these NU Participating Groups as necessary to support quality activities under Nuclear Group jurisdiction.

1.5.1 PURCHASING AND MATERIALS MANAGEMENT

The Vice President-Purchasing and General Services (see Figure 1.2) reports to the *Senior Vice President-Human Resources and Administrative Services* and is responsible for procurement activities. Reporting to the Vice President-Purchasing and General Services, is a *Purchasing Director*, responsible for the following:

- a. The procurement of materials and services from qualified suppliers in accordance with predetermined commercial, technical, and quality requirements;
- b. Processing of approved purchase requisitions.
- c. Issuance of Purchase Orders/Contracts and changes thereto;
- d. Maintaining traceability of purchasing records from NUSCO/NUPOC;

The Vice President Purchasing and General Services controls purchasing procedures.

1.5.2 INFORMATION RESOURCES GROUP (See Figure 1.6)

The Vice President-Information Resources Group operates and maintains corporate mainframe computer systems and provides support for quality activities as requested by Nuclear Group personnel. Reporting to the Vice President-Information Resources Group are:

- a. *The Director-Development Services*
- b. *The Director-Data Center Services*
- c. *The Director-Client Services*
- d. *The Director-Communications Services*
- e. *The Manager-Planning & Architecture*

NORTHEAST UTILITIES ORGANIZATION

Direct Control _____

Operational Control - - - - -

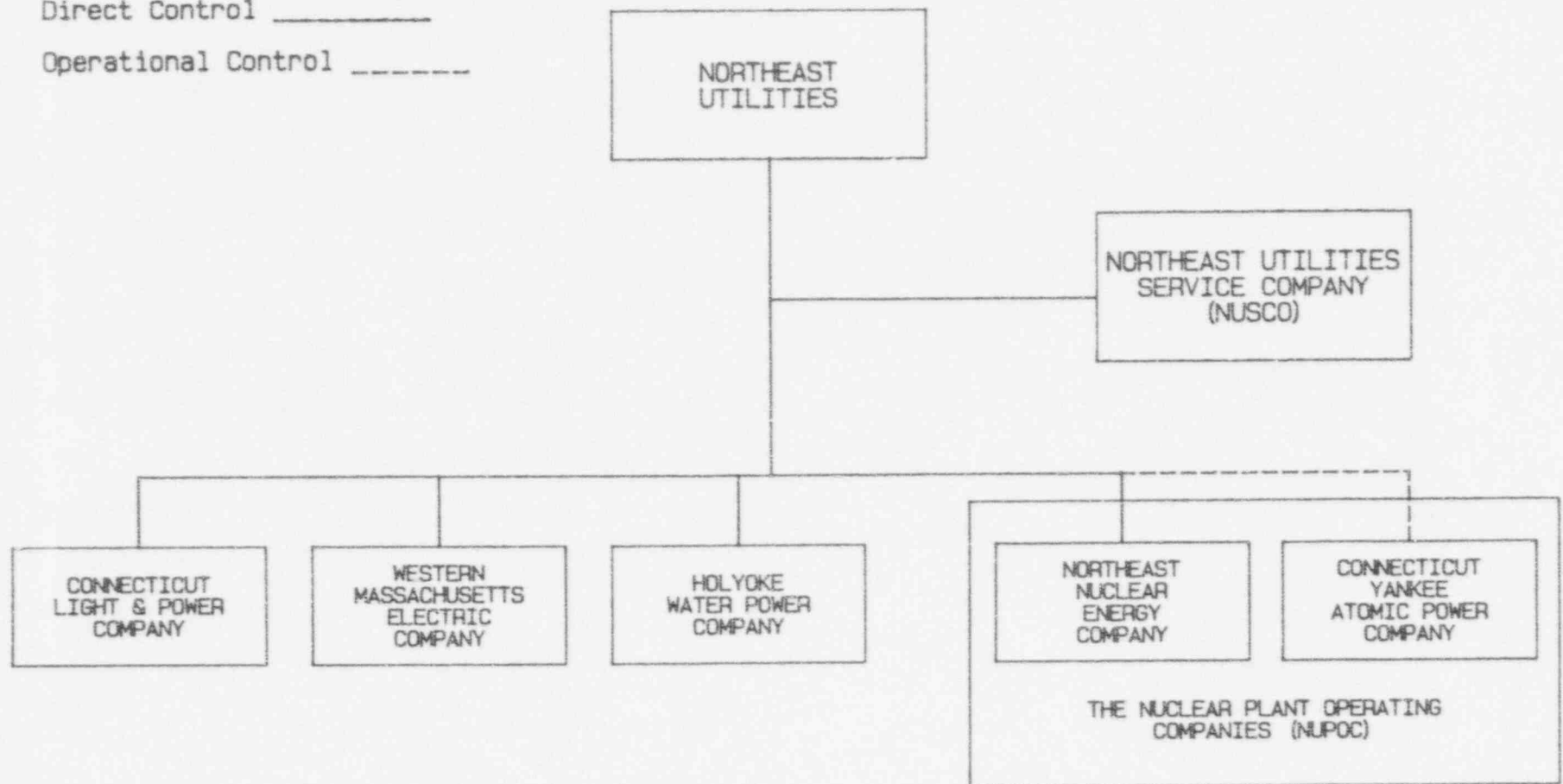
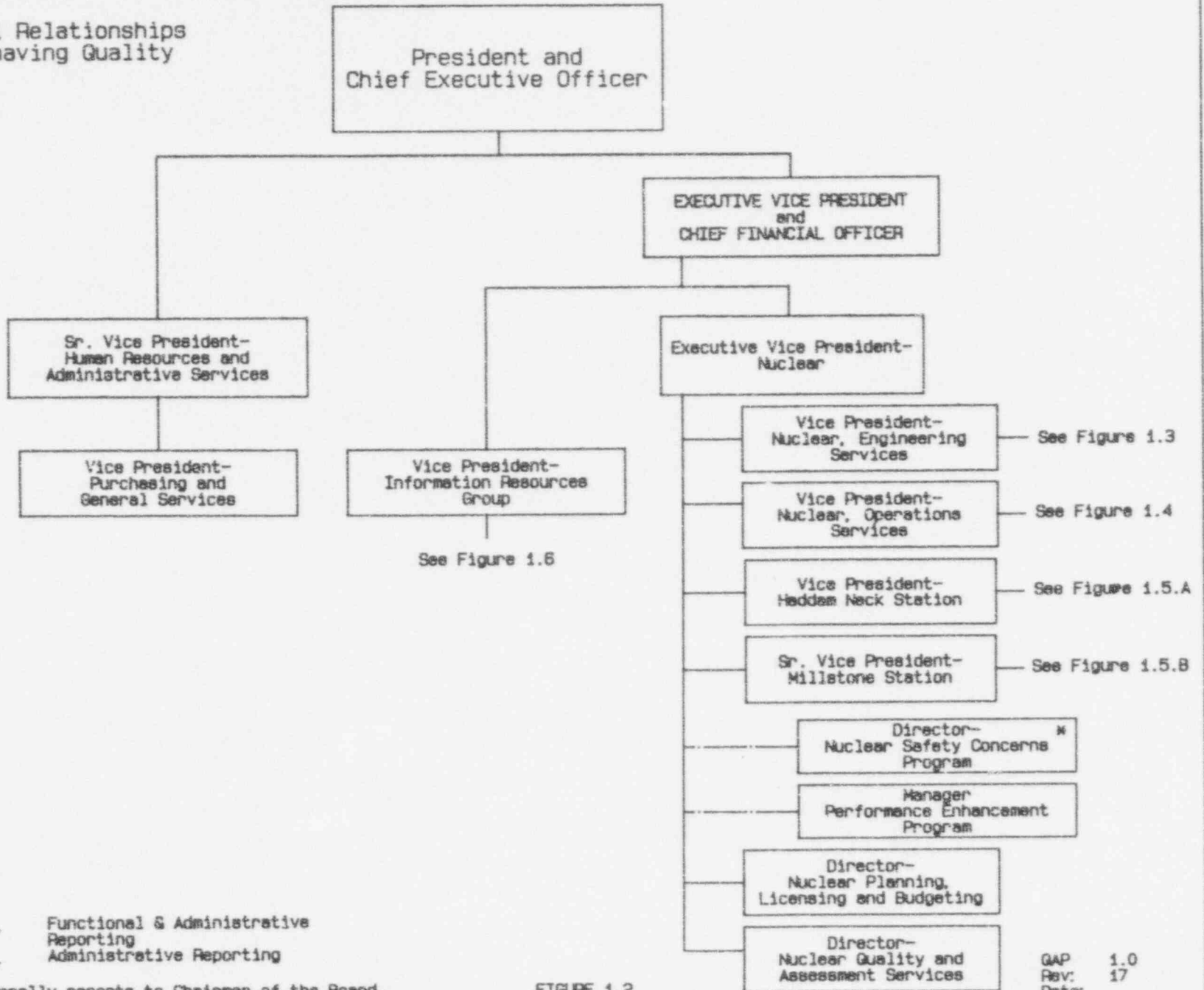


FIGURE 1.1

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Organizational Relationships
of Personnel having Quality
Functions



———— Functional & Administrative Reporting
 - - - - - Administrative Reporting

* Functionally reports to Chairman of the Board.

FIGURE 1.2

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From Figure 1.2

Organizational Relationships
of Personnel having Quality
Functions in MUSCO, NNECO
and CYAPCO

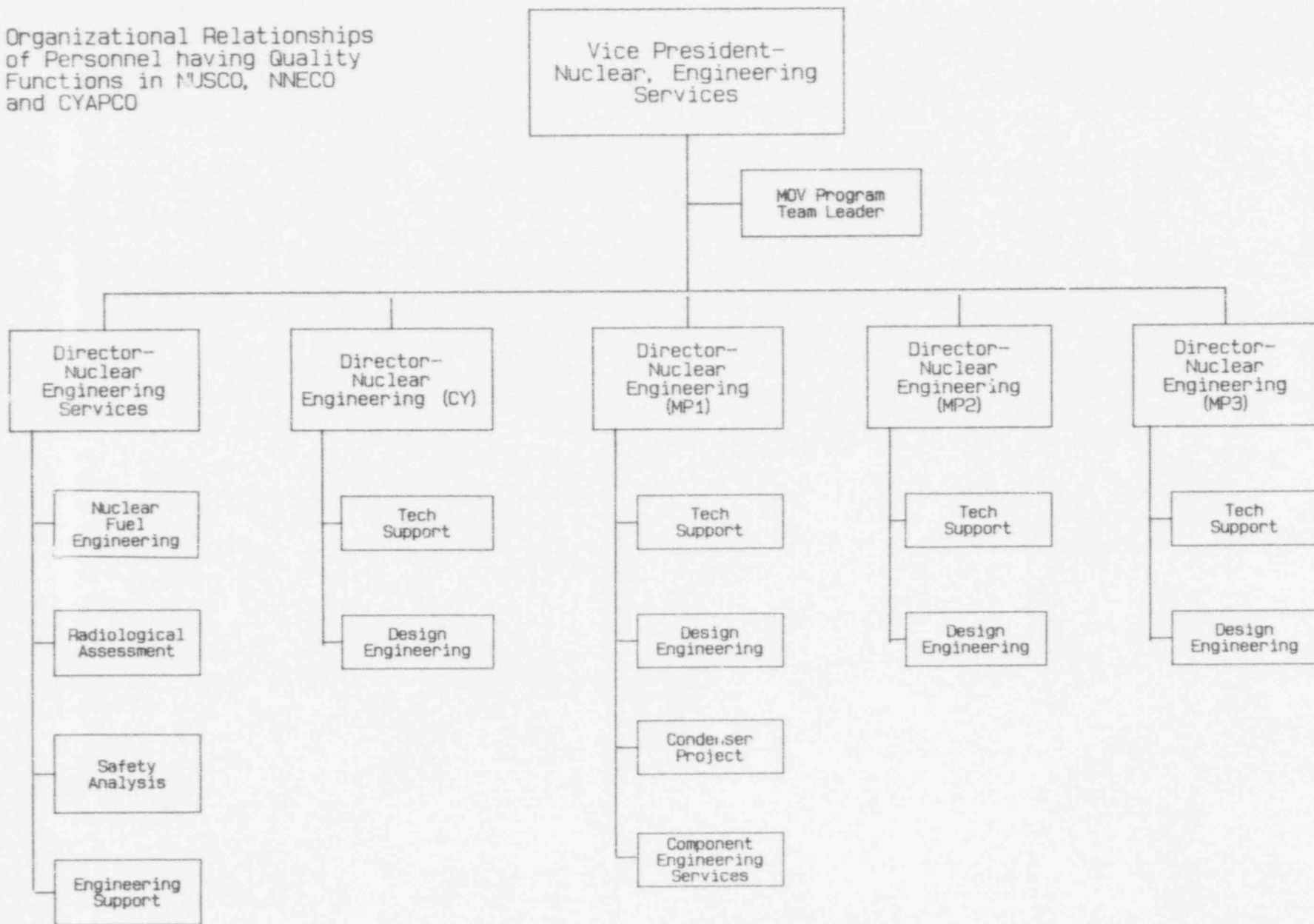


FIGURE 1.3

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Organizational Relationships
of Personnel having Quality
Functions in NUSCO

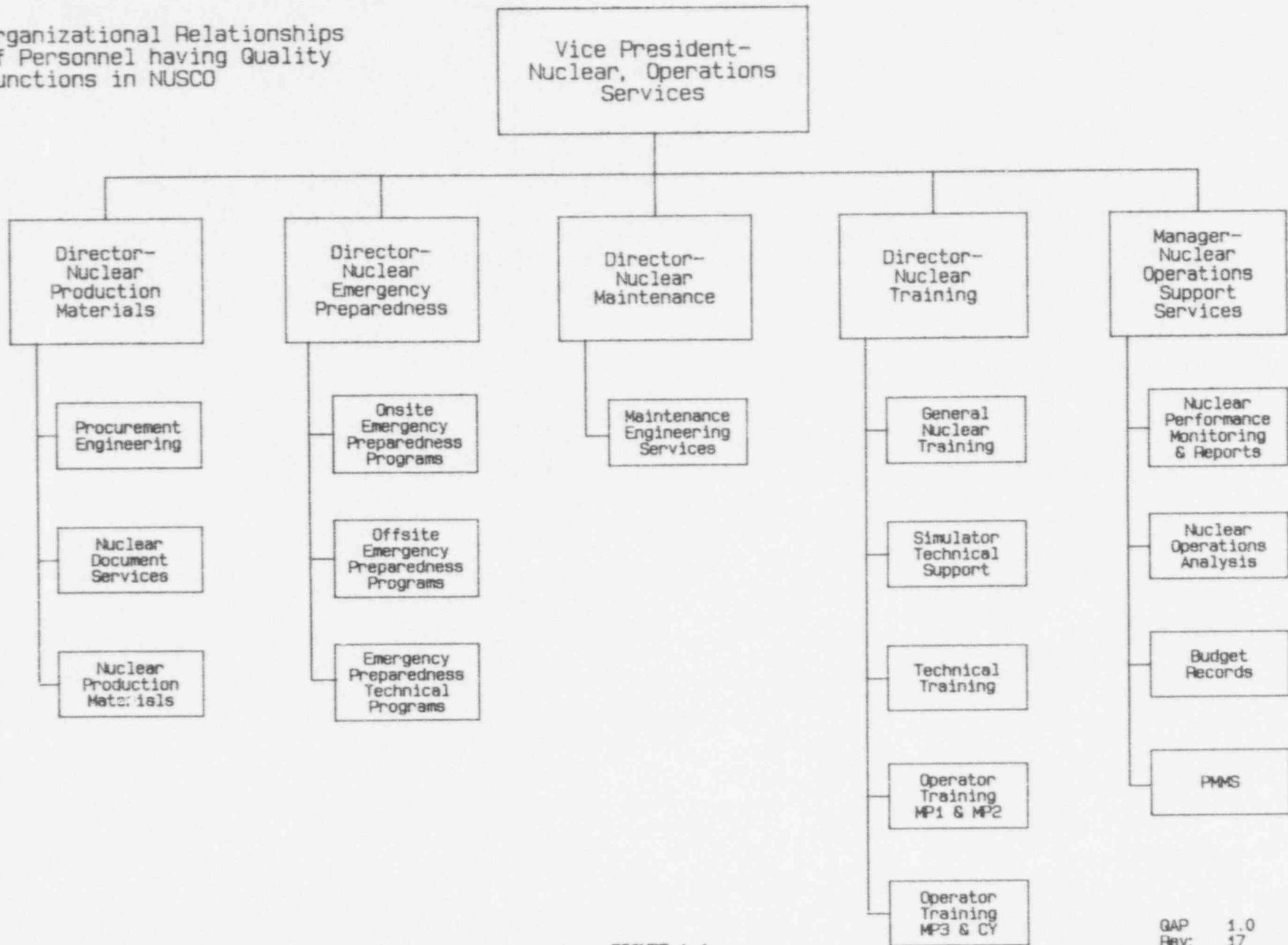
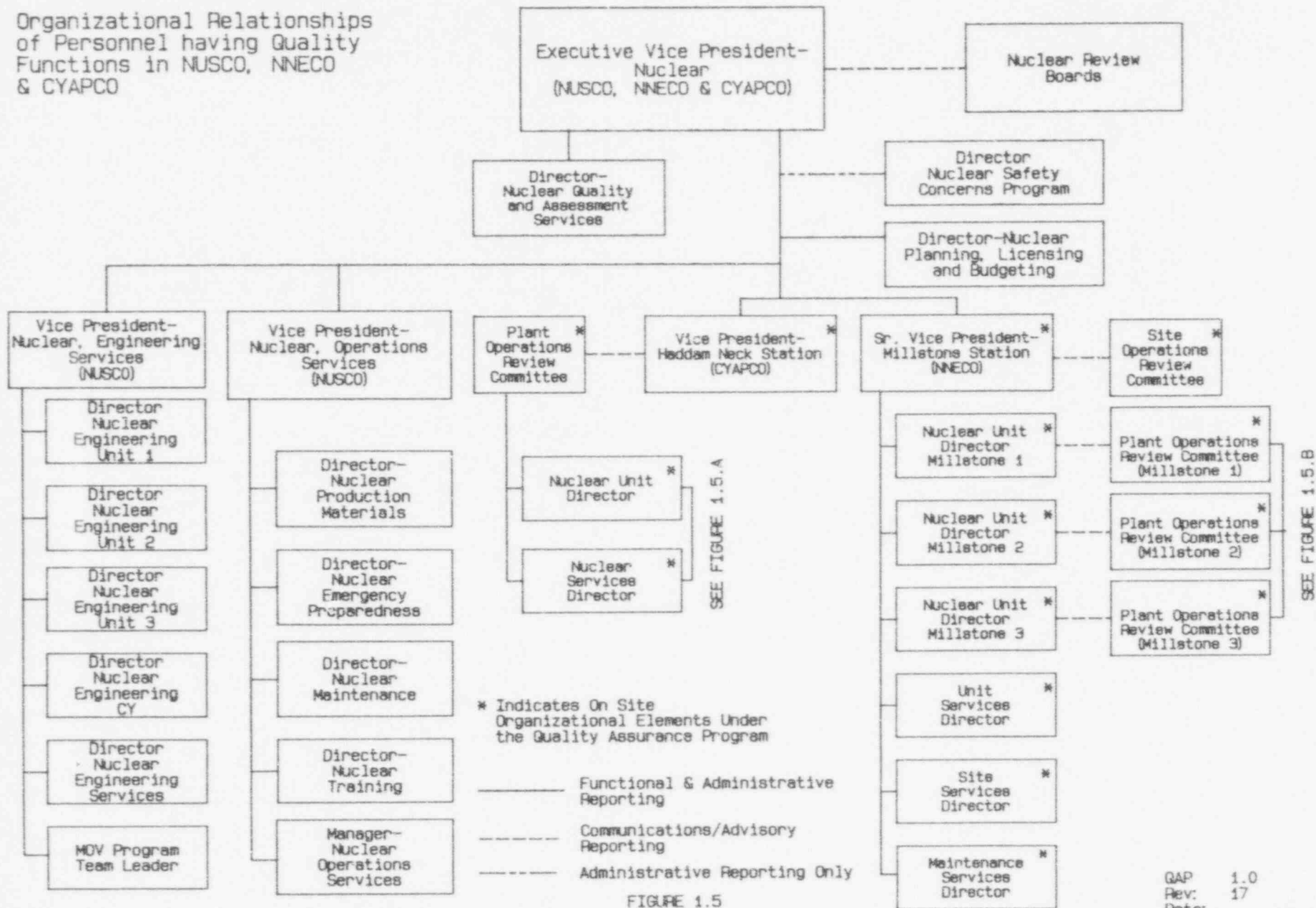


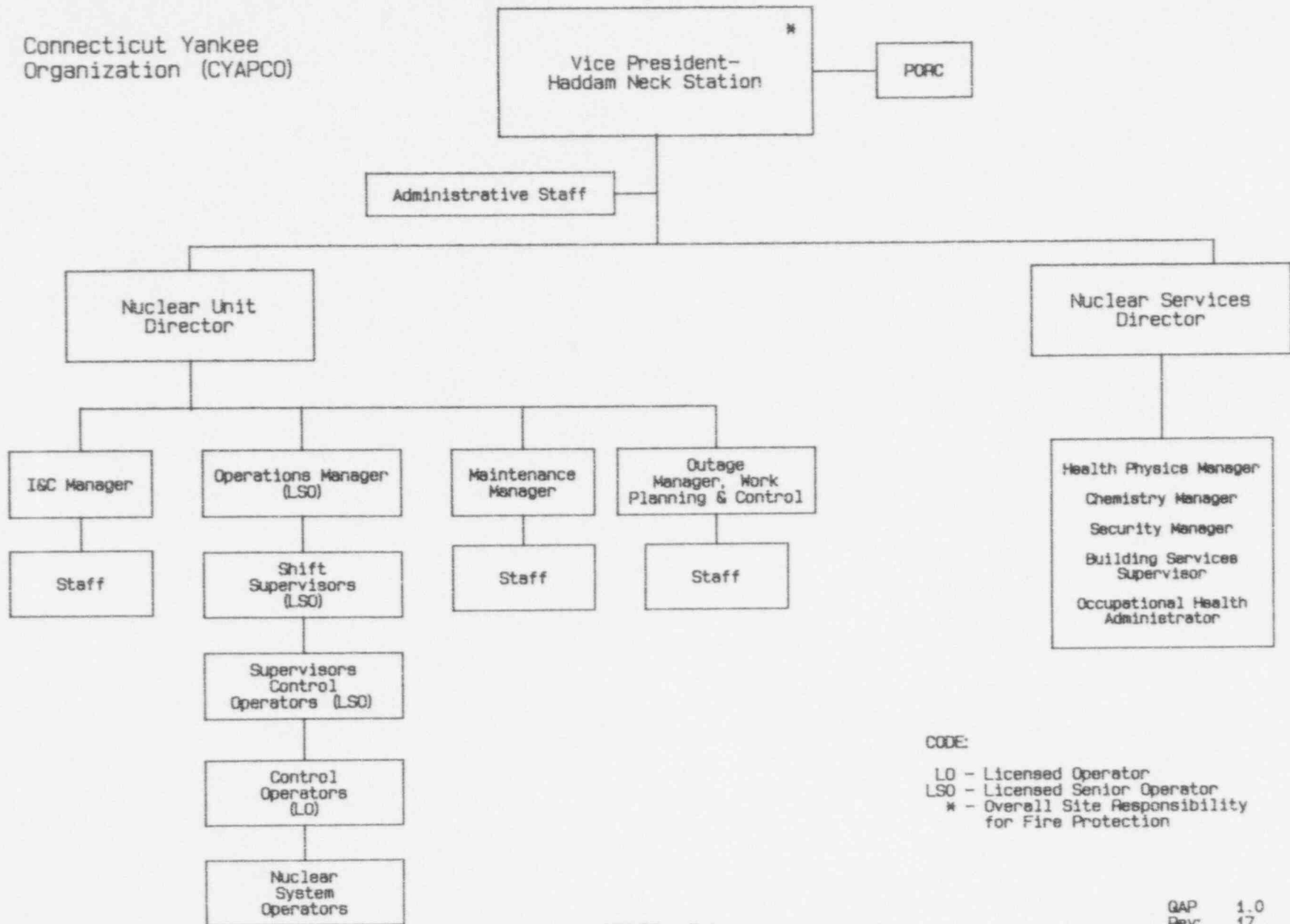
FIGURE 1.4

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Organizational Relationships
of Personnel having Quality
Functions in NUSCO, NNECO
& CYAPCO



Connecticut Yankee
Organization (CYAPCO)

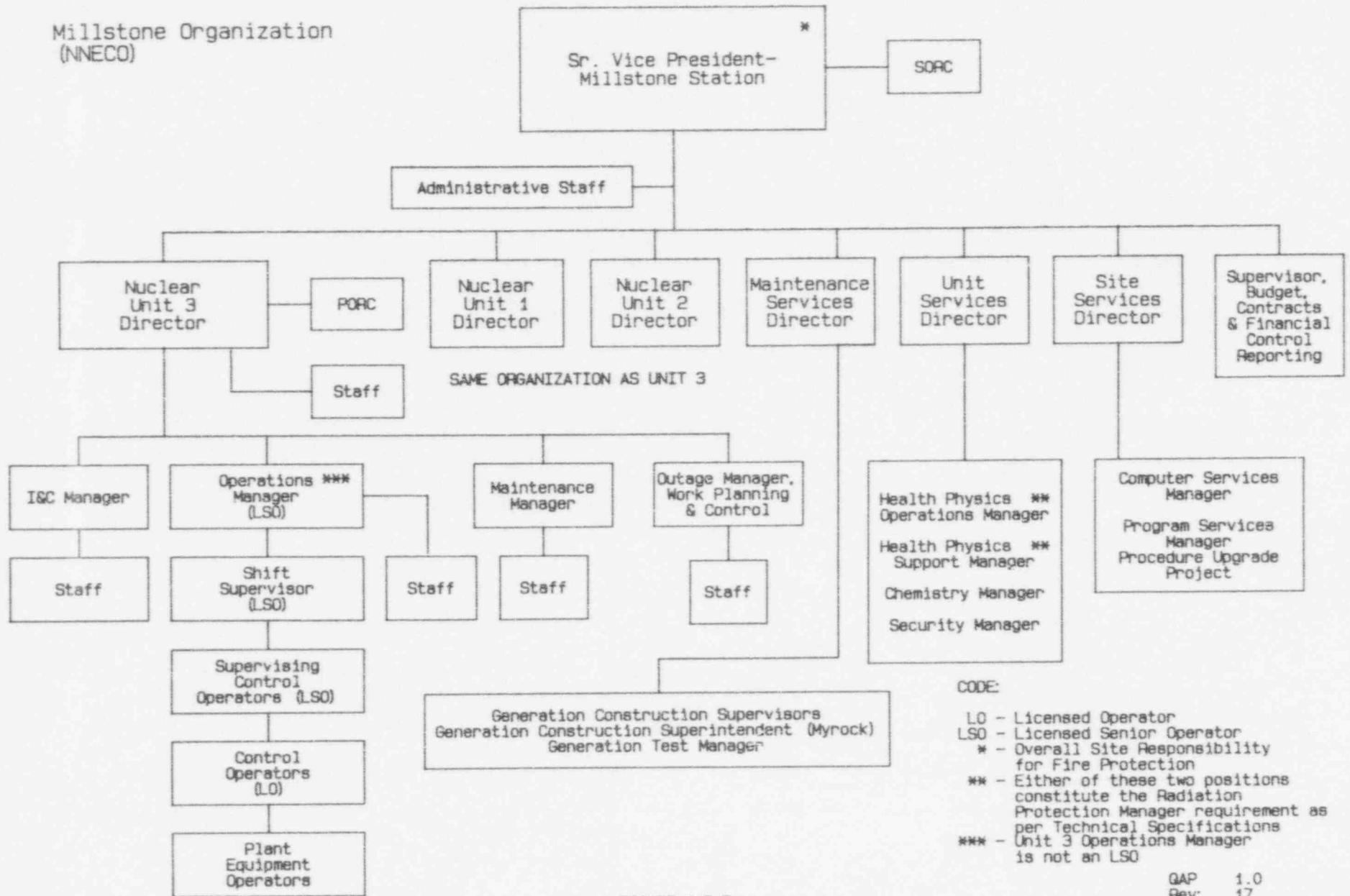


CODE:
 LO - Licensed Operator
 LSO - Licensed Senior Operator
 * - Overall Site Responsibility
 for Fire Protection

FIGURE 1.5.A

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Millstone Organization
(NNECO)



CODE:

- LO - Licensed Operator
- LSO - Licensed Senior Operator
- * - Overall Site Responsibility for Fire Protection
- ** - Either of these two positions constitute the Radiation Protection Manager requirement as per Technical Specifications
- *** - Unit 3 Operations Manager is not an LSO

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FIGURE 1.5.B

Organizational Relationships
of Personnel having Quality
Functions

From Figure 1.2

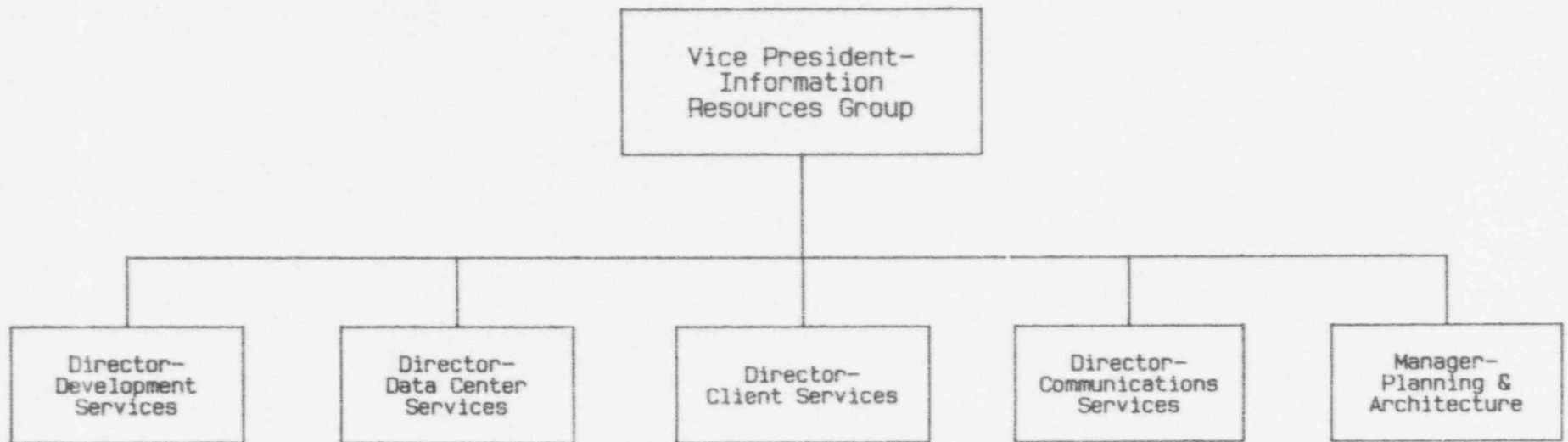


FIGURE 1.6

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2.0 QUALITY ASSURANCE PROGRAM

2.1 GENERAL REQUIREMENTS

Northeast Utilities (NU) has established a Quality Assurance Program (NUQAP) which complies with the criteria of 10 CFR 50, Appendix B, and follows the guidance referred to in Appendix D of this report. The quality assurance requirements set forth herein and the attached Policy Statement, supplemented by the Quality Assurance Procedures, provide the primary basis of the Program and the NU Policy with regard to quality assurance. This program is established for each plant site in a manner intended to accomplish the required level of quality and is carried out throughout the life of nuclear power plants. It includes quality activities during the operation, maintenance, testing, and modification of the in-service nuclear power plants.

The requirements of the NUQAP apply, as a minimum, to nuclear safety-related systems, structures and components as functionally identified in Appendix A, "Systems, Structures and Components" and other items or services which are specifically identified in each FSAR addressing Section 3.2.1 of NRC Regulatory Guide 1.70.

The requirements of the Program are implemented by Northeast Utilities Service Company (NUSCO), Nuclear Plant Operating Companies (NUPOC), engineer-constructors, contractors, suppliers, and engineering service organizations performing activities affecting quality systems, structures, and components of nuclear power plants.

Procedures define the required indoctrination and training of personnel performing activities affecting quality, as necessary, to assure that suitable proficiency is achieved and maintained.

Training sessions are documented, the content described, who attended, when they attended, and the results of the training sessions.

A periodic program review of the status and adequacy of the NUQAP is accomplished by Quality and Assessment Services audits, surveillances, and inspections by Nuclear Review Board (NRB) Reviews, and by the independent audit team described herein and in QAP 1.0, Section 1.2.2.2. Organizations outside NU are required to review the status and adequacy of that part of the Quality Assurance Program for which they have designated responsibility.

2.2 IMPLEMENTATION

2.2.1 GOALS AND OBJECTIVES

As stated in the Policy Statement of NU, the goals of the NUQAP are to maintain quality levels in an effective and efficient manner and to assure a high degree of functional integrity and reliability of quality systems, structures and components. To meet this goal, the following objectives of the NUQAP have been defined:

- a. Define through documented procedures, the quality activities that apply to the design, fabrication, procurement, construction, testing, operation, refueling, maintenance, repair, and modification of nuclear power plants;
- b. Establish, assign, and document the responsibilities for the conduct of those activities affecting quality systems, structures and components;
- c. Establish confidence that (a) the design, fabrication, construction, and operation of nuclear power generation facilities are performed in a manner consistent with NU Policies and (b) quality activities are performed by responsible personnel, and are verified through a system of audits, surveillances, and inspections of those organizations with quality responsibilities;
- d. Appraise the Executive Vice President-Nuclear of unresolved problems and trends which could have a significant effect on nuclear power plant safety and;
- e. Prevent schedule delays and high cost due to poor quality.

2.2.2 PROGRAM DOCUMENTATION

This NUQAP Topical Report defines the NU nuclear policies, goals, and objectives, and is used as guidance for the development of the various implementing divisional, departmental, branch, or section procedures. Revisions to the NUQAP Topical Report will be made as needed to reflect current requirements and descriptions of activities prior to implementation. These revisions will be made in accordance with a Nuclear Group Procedure.

Revisions to the NUQAP Topical Report, which reduce commitments previously accepted by the NRC, are submitted to the NRC for review and approval prior to implementation.

Revisions which do not reduce previously accepted commitments are periodically submitted to the NRC as required by 10 CFR 50.54 (a)(3) and 10 CFR 50.55 (f)(3).

Quality procedures are developed by the departments performing quality activities. These procedures are reviewed by the departments which are responsible for portions of these procedures. These procedures are approved by the departments which initiate these procedures. The Quality and Assessment Services Department reviews and concurs with Quality Procedures such as those listed in Appendix C for compliance with the NUQAP Topical Report. Changes to procedures are subjected to the same degree of control as that utilized in the preparation of the original document.

Each NUSCO Department Head/NUPOC Nuclear Station Services, and Unit Director is responsible for implementation of the NUQAP, which includes individual departmental procedure requirements applicable only to his respective activities. In addition, he is responsible for the preparation, approval, and distribution of those instructions, operating procedures, testing procedures, or other instructions where further guidance is necessary.

2.2.3 SYSTEMS, STRUCTURES, AND COMPONENTS

The requirements of the NUQAP Topical Report shall apply, as a minimum, to all activities affecting the safety functions of the systems, structures, and components, as addressed in the Safety Analysis Reports (SARs). Safety systems, structures and components are functionally identified in Appendix A of the NUQAP Topical Report and also as specifically identified in each FSAR addressing Section 3.2.1 of NRC Regulatory Guide 1.70.

For systems, components, and structures covered by the ASME Code, NUSCO/NUPOC Procedures describe the measures taken to assure that the quality assurance requirements contained in the code are supplemented by the specific guidance of the applicable regulatory guides listed in Appendix D of this Topical Report.

For systems, components, and structures, Regulatory Commitments and NUSCO/NUPOC procedures describe the measures taken to assure that the quality assurance requirements are met.

The degree of control over activities affecting quality systems, structures, and components is consistent with their importance to safety. Such controls include use of appropriate equipment, establishment of suitable environmental conditions, and assurance that all prerequisites for a given activity have been satisfied. This NUQAP Topical Report provides controls over special processes and skills necessary to attain the required quality, and the need for verification of quality by inspection and test.

Quality and Assessment Services Department and applicable NUSCO/NUPOC technical organizations jointly determine and identify the extent quality assurance controls are to be applied to quality structures, systems, and components. The quality assurance controls are in conformance with this NUQAP Topical Report, which complies with the 18 criteria set forth in Appendix B, to 10 CFR Part 50.

2.2.4 PARTICIPATING ORGANIZATIONS

The NU organizations with responsibilities for activities affecting quality systems, structures, and components are identified in QAP 1.0, which also briefly describes their assigned responsibilities.

Quality and Assessment Services Department is responsible for: a) the development, coordination, and control of the NUQAP including coordination of Quality and Assessment Services Department Procedure review and approval; b) control and issuance of the NUQAP Topical Report as a controlled document (as described in QAP 6.0) and; c) review and concurrence with quality assurance procedures and revisions written by other departments. Procedure reviews will be performed in accordance with QAP 5.0.

NU requires that their engineer-constructors, contractors, suppliers, engineering service organizations invoke upon their subcontractors, via procurement documents, requirements for a quality assurance program to meet the applicable criteria of Appendix B to 10 CFR, Part 50, including the applicable elements of the Regulatory Guides and their endorsed Standards identified in Appendix D of the Topical Report. However, NU retains overall responsibility for the QA Program. The specific quality activities performed by these organizations are specified in the procurement documents. Quality and Assessment Services reviews and approves these organizations quality

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assurance programs prior to initiation of contracted activities, and performs audits, surveillances, and inspections on subsequent activities for compliance to their procedures.

The object of the review is to verify that the engineering-constructors, contractors, suppliers, and engineering service organizations have an adequate quality assurance program to meet applicable requirements of Appendix B, to 10 CFR, Part 50.

In addition to the initial review, the engineer-constructor, contractors, suppliers, and engineering service organizations' quality assurance programs shall be periodically audited by Quality and Assessment Services to assure continued implementation of quality requirements.

Contractors may be delegated the execution of quality assurance functions by contract. These contracts are reviewed and approved in accordance with NUQAP requirements.

2.2.5 INDOCTRINATION AND TRAINING

A program is established and maintained for quality assurance indoctrination and training which provides confidence that the required level of personnel competence and skill is achieved and maintained in the performance of quality activities. Quality procedures delineate the requirements for an indoctrination program to assure that personnel responsible for performing quality activities are instructed in the purpose, scope, and implementation of quality procedures and instructions and that compliance to these documents is mandatory. The Director-Quality and Assessment Services is responsible for the indoctrination of personnel within his department who perform quality activities.

Nuclear training programs shall be developed and implemented to provide training for all individuals attached to or associated with NU nuclear facilities. Additional guidance is established in NUSCO/NUPOC Procedures.

Implementing NUSCO/NUPOC Procedures describe the nuclear training program requirements which assure that:

- a. Documentation of formal training and qualification programs includes the objective, content of the program, attendees, and date of attendance;

- b. Proficiency of personnel performing and verifying activities affecting quality is established and maintained. Personnel proficiency is established and maintained by training, examination/testing, and/or certification based upon the requirements of the activity. Acceptance criteria are developed to determine if individuals are properly trained and qualified;
- c. Certificates or other documentation of qualification clearly delineate the specific functions personnel are qualified to perform and the criteria used to qualify personnel in each function.

This program also requires the head of each department (including Quality and Assessment Services) to be responsible for a training plan which assures that personnel performing quality activities are trained in the principles and techniques of the activity being performed.

2.2.6 MANAGEMENT PARTICIPATION

NUSCO Department Heads and Nuclear Station, Services, and Unit Directors are responsible for implementing the NUQAP Topical Report within their Departments/Plants. The Director-Quality and Assessment Services will assist in development, coordination, and review of the Program.

The Executive Vice President-Nuclear ensures that a management review of the program is conducted on an annual basis, by an independent audit group, to assess the scope, status, implementation, effectiveness, and to assure compliance to NRC licensing commitments.

Actions considered by the Management Review may include, but are not limited to, the following:

- a. Review of selected procedures and documents,
- b. Verification of the implementation of selected procedural requirements,
- c. Review of past audit results such as those conducted by previous Management Reviews, the NRC or other departments.

The Management Review's findings of deficiencies and recommendations for program improvement are forwarded to the Executive Vice President-Nuclear, who will ensure appropriate corrective action is taken.

The quality assurance programs of the engineer-constructor, contractors, suppliers, and engineering service organizations that perform quality activities are reviewed by Quality and Assessment Services to assure that their management regularly reviews the status and adequacy of their part of the NUQAP.

3.0 DESIGN CONTROL

3.1 GENERAL REQUIREMENTS

Nuclear Engineering Services is responsible for controlling design work, administering design control activities (including design interface) and design modifications for quality systems, structures and components.

The NUQAP for design is established to assure that the applicable design requirements, such as design bases, regulatory requirements, codes, technical standards and quality standards are identified in design documents which are reviewed, approved and controlled in accordance with established procedures. Such controls include review for suitability of application of materials, equipment, parts and processes that are essential to the functions of the systems, structures and components. Changes to, and deviations from specified requirements are identified, documented and controlled.

The responsibility for design control program implementation rests with *Nuclear Engineering Services* for all NU nuclear generating facilities. The division of responsibilities and jurisdictional boundaries are set forth in the Nuclear Group Procedures (NGP). Although other organizations may be delegated the task of establishing and executing the design control program or any part thereof, *Nuclear Engineering Services* will retain the ultimate responsibility for the program. The applicable requirements of the NUQAP will be imposed on other organizations delegated the task of establishing or executing the program in accordance with QAP 4.0 and QAP 7.0.

The interface controls, both internal and external, for organizations performing design work for quality systems, structures and components are identified and implemented in accordance with documented procedures. This identification includes those organizations providing criteria, designs, specifications and technical direction.

Measures are applied to verify the adequacy of design. The extent of design verification is specified and documented by the responsible organization. The individuals performing design verification should not (1) have immediate supervisory responsibility for the individual performing the design, (2) have specified a singular design approach, (3) have ruled out certain design considerations, or (4) have established the design inputs for the particular design aspect being verified. The independent design verification should not dilute or replace the responsibility of the supervisors for the quality of work performed under their supervision. Where changes to previously verified designs have been made, design verifications are required for the change, including evaluation of the effects of those changes on the overall design. Design verification may be accomplished by testing. Tests to

demonstrate adequacy under adverse design conditions shall comply with the requirements of QAP 11.0, "TEST CONTROL." Design errors and deficiencies which adversely affect quality systems, structures and components in design process are documented, and appropriate corrective action is taken. These design errors and deficiencies are documented in accordance with design change procedures or as defined in QAP 15.0.

3.2 IMPLEMENTATION

Nuclear Engineering Services is responsible for the design, design review, engineering approval of design changes, design evaluation and design control of nuclear power plants, *except that Nuclear Fuel Engineering performs design/design changes in support of the reactor core reload.* The function may be delegated to other organizations to perform the design activity, or any part thereof, but the responsibility for overall design remains with *Nuclear Engineering Services.* In all cases, final engineering decisions and ultimate design control of systems, structures and components related to nuclear power plants is the responsibility of *Nuclear Engineering Services.*

Quality and Assessment Services performs audits, surveillances, and inspections, to verify that the engineering constructors, contractors, suppliers, engineering service organizations and NU departments are effectively complying with the NUQAP and procedural requirements for design control.

3.2.1 DESIGN PROCESS

Design control measures are applied to design analyses, such as, reactor physics, stress, thermal, hydraulic, nuclear radiation, accident and seismic analyses; compatibility of materials; accessibility for in-service inspection, maintenance, and repair; and delineation of acceptance criteria for inspections and test. Measures established to control design documents are described in QAP 6.0.

Program procedures and instructions define the method of implementing design control measures. These measures require that applicable design requirements, such as, design bases, regulatory requirements, codes and standards, are translated into specifications, drawings, procedures or instructions. Instructions further require that appropriate quality standards are specified and included in design documents. All materials, equipment, parts and processes, including standard "off the shelf" commercial or previously approved items essential to the quality functions, are selected and reviewed for suitability of application. The basis for selection may include industry standards, material and prototype hardware testing programs, and design

review.

NUSCO/NUPOC Procedures assure that a documented check is performed to verify the accuracy and completeness of design drawings and specifications before release to construction. Design drawings receive a documented check to verify dimensional accuracy.

Design drawings and specifications, issued for plant design changes during the operations phase of an in-service nuclear plant, are reviewed for completeness and accuracy before release to operations, in accordance with NUSCO/NUPOC Procedures defining Design Control.

NUSCO/NUPOC Procedures describe the provisions to assure that design drawings and specifications are prepared, reviewed and approved in accordance with company procedures, and that the documents contain the necessary quality assurance requirements, such as inspections and test requirements, acceptance requirements, and the extent of documenting inspection and test results.

3.2.2 DESIGN CHANGE CONTROL

Procedures and instructions governing design change control during construction, modifications to operating plants, control of discrepant or deficient design conditions, and reported unsatisfactory performance, provide for the identification of the need for design changes and a documented method to control these changes. Design and specification changes are subject to design control measures commensurate with those applied during the original design.

An independent review and approval of design changes is performed by the organization that conducted the original design reviews, unless NUSCO designates another qualified organization to perform this function.

Proposed design change modifications are submitted to the in-service units management for processing and review. This review includes the Plant Operations Review Committee (PORC)/Site Operations Review Committee (SORC). PORC/SORC is advisory to the appropriate Nuclear Station Vice Presidents and Unit Directors on matters relating to nuclear safety. Its composition, responsibilities, and authority are defined in Section 6 of each in-service unit Technical Specification. If the change involves a quality system structure or component, the change will be reviewed by qualified engineering personnel for technical adequacy. Reviews of the design change requests are performed by the Nuclear Review Board/Environmental Review

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Board on safety evaluations/environmental questions. The sequence of the NRB review depends upon the determination of whether an unreviewed safety question is involved (i.e., in accordance with ANSI N18.7, if a proposed change in the facility involves an unreviewed safety question then the NRB review is conducted prior to implementation).

The combination of these independent reviews by the PORC/SORC and NRB/SNRB are performed to assure that:

- a. the adequacy of the proposed change is substantiated;
- b. unreviewed safety questions are properly identified and handled per 10 CFR 50.59;
- c. nuclear safety/environmental requirements have been addressed.

Errors and deficiencies in design, including the design process, that could adversely affect quality structures, systems, and components are documented and corrective action is taken in accordance with QAP 15.0 and QAP 16.0.

During the operations phase, notification of plant design changes are transmitted to responsible plant personnel as part of the design package close out. NUSCO/NUPOC Procedures describe this notification which assures that personnel are made aware of design change modifications which may affect the performance of their duties.

3.2.3 DESIGN INTERFACE CONTROL

During design, construction or modifications of nuclear power plants, the Nuclear Group is responsible for review, coordination and documentation of design interfaces. Procedures provide the method for identification of design interfaces, design interface changes, and modifications affecting drawings and design documents.

During plant design and construction phases, control of interfaces may be delegated to the engineer-constructor and/or Nuclear Steam Supply System (NSSS) supplier.

During the operations phase, procedures and instructions identify design interfaces which are controlled by the appropriate Nuclear Station Vice President and Unit Director. Resolution of design interface questions are documented.

3.2.4 INDEPENDENT DESIGN VERIFICATION

Original designs and design modifications are reviewed for adequacy and the sign-off performed by a person other than the originator of the design. Design verification is documented in accordance with procedures or instructions. Simplified calculations or computer programs may be utilized as alternate means of design verification. When design verification is performed by testing, the tests are performed using approved procedures, which specify the authority and responsibility of design verification personnel. Ultimate responsibility for design adequacy and evaluation is retained by *Nuclear Engineering Services* as appropriate.

Design verification (if other than by qualification testing) is normally completed prior to release for procurement, manufacturing, and construction, or to another organization for use in other design activities. For those cases where design verification cannot be completed prior to release for procurement, manufacturing, and construction, procedures ensure that design verification is completed prior to the point when the installation is declared operational.

NUSCO/NUPOC procedures describe the requirements which assure the following when testing is considered as an alternate method of design verification:

- a. Specifications or procedures provide criteria that specify when verification should be by test.
- b. Prototype, component or feature testing is performed as early as possible prior to installation of plant equipment, or prior to the point when the installation is declared operational.
- c. Verification by test performed under conditions that simulate the most adverse conditions as determined by analysis.

Particular emphasis is placed on assuring that designs are in conformance with applicable codes, and on selecting the proper design verification or checking method. Procedures and instructions provide the requirements and necessary controls for design verification. These controls include a review to assure that design characteristics can be controlled, verification that there is adequate accessibility for inspection or test, and that inspection and test acceptance criteria are incorporated. During the operations phase, documentation of reviews is provided.

NUSCO/NUPOC procedures include requirements which identify the responsibility of design verifiers, the areas and features to be verified, and the extent of the documentation.

NUSCO/NUPOC procedures assure that procedural control is established for design documents that reflect the commitments of the SAR. These procedural controls vary for design documents which receive formal design verification by several disciplines or organizations, and those which can be reviewed by a single individual. The specific design documents and specialized reviews are determined and used as required by the design changes and modifications.

NUSCO/NUPOC procedures are established to assure that verified computer programs are certified for a specific use.

NUSCO is responsible for assuring that the design documents generated by the engineer-constructor, contractors, suppliers and engineering service organizations are adequately generated, approved and maintained.

4.0 PROCUREMENT DOCUMENT CONTROL

4.1 GENERAL REQUIREMENTS

The procurement of materials, equipments, parts and/or services required during the design, construction, testing, operation and maintenance of quality systems, structures and components in nuclear power plants is performed in a controlled manner which assures compliance with applicable regulatory requirements, procedures, quality assurance standards and regulations affecting procurement documents. Changes to procurement documents are subject to the same degree of control as utilized in the preparation of the original documents.

4.2 IMPLEMENTATION

4.2.1 PROGRAM

A Project Engineer is selected for each modification to an in-service nuclear power plant. The project engineer coordinates the preparation, review and approval of procurement documents for quality material, equipment, parts or services, and ensures the technical adequacy and inclusion of quality assurance requirements.

NUSCO/NUPOC purchase requisitions are reviewed for technical adequacy and verification of the quality designation. The appropriate NUSCO Project Engineer/Nuclear Unit Director reviews and approves NUSCO/NUPOC Purchase Requisitions, when applicable. Quality and Assessment Services personnel then review the purchase requisition, for the inclusion and adequacy of quality assurance requirements, prior to the issuance of the purchase order.

Any engineer-constructors, contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance, and modifications to nuclear power plants are responsible to implement measures for control of procurement documents associated with quality material, equipment, parts and services to ensure applicable requirements including quality assurance requirements are specified. Quality and Assessment Services performs on-site and off-site audits, surveillances, and inspections to ensure organizations utilized by NUSCO/NUPOC are effectively complying with their requirements for the control of procurement documents.

Changes to procurement documents, whether initiated by NUSCO/NUPOC or their representative, are subjected to the same degree of control as that utilized in the preparation of the original document. The procurement of

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spare or replacement parts for quality systems, structures, or components is subject to the controls of the latest NU QA Program and NUSCO/NUPOC procedure requirements. The spare or replacement parts are subject to controls equivalent to original or subsequent codes and standards. The use of subsequent codes and standards are controlled in accordance with the Design Change Control Requirements in QAP 3.0.

Procurement documents are reviewed by Quality and Assessment Services personnel to determine that:

- a. The quality assurance requirements are correctly stated, auditable and controllable;
- b. There are adequate acceptance and rejection criteria.
- c. The procurement document has been prepared, reviewed, and approved in accordance with the NU QA program requirements.

4.2.2 PROCUREMENT DOCUMENT PROVISIONS

Procurement documents are prepared, reviewed and approved in accordance with approved procedures of the issuing organization or department and are available for verification. These procedures require that procurement documents consist of the following, as necessary:

- a. The scope of work to be performed;
- b. Technical requirements (specified or referenced) including the applicable components and materials identification requirements, drawings, specifications, procedures, instructions, codes and regulations, and the identification of applicable test, inspection and acceptance requirements, or special process instructions;
- c. Quality Assurance Program requirements to be imposed on contractors which include the applicable requirements of 10 CFR 50, Appendix B, and the NRC regulatory position contained in the Regulatory Guides and their endorsed ANSI Standards listed in Appendix D of this Topical Report;
- d. Right of access which provides, as appropriate, for access to contractor facilities and records for inspection or audit by NUSCO or its designated representative; and provides access for events such as those requiring notification of hold points;

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- e. The documentation required to be prepared, maintained, and / or submitted to NUSCO/NUPOC or its representative for review, approval or historical record. The time of submittal of this documentation and the retention and disposition of quality assurance records which are not submitted to NUSCO/NUPOC is prescribed, as applicable, for NUSCO/NUPOC-Nuclear Grade procurements.

4.2.3 SELECTION OF PROCUREMENT SOURCES

If the engineer-constructor, contractor, or supplier is not delegated the function of procurement source selection, the NUSCO Purchasing Department verifies that the procurement document has been reviewed and approved, and that the supplier has been approved for procurement prior to issuing the purchase order for the material, equipment, parts and services.

Procurement documents may be issued to organizations with unapproved quality assurance programs. These procurement documents to unapproved organizations contain detailed supplementary quality assurance requirements and/or witness/hold point to meet NUSCO requirements.

Procurement documents are reviewed by Quality and Assessment Services to ensure appropriate quality assurance requirements are specified. These requirements, included in the procurement document as necessary, include acceptance criteria, audits and/or inspections at the suppliers facilities with scheduled witness/hold points during the fabrication process and/or prior to shipment of the procured item. Acceptance inspections and tests determined by NU shall be performed after receipt at NU but prior to operation.

5.0 PROCEDURES, INSTRUCTIONS, AND DRAWINGS

5.1 GENERAL REQUIREMENTS

The NUQAP provides measures for the preparation, review, approval, control and distribution of procedures, instructions and drawings of activities affecting quality systems, structures and components during design, construction, testing, maintenance, modifications, and operation of nuclear power plants. The documents include appropriate quantitative and qualitative acceptance criteria which specify the activity to be performed, the methods of construction and testing to be employed, material, equipment or parts to be used, a sequence of operation and the required documentation.

5.2 IMPLEMENTATION

Quality Procedures provide direction for personnel performing quality functions. The Quality and Assessment Services Department reviews and concurs with Quality Procedures such as those listed in Appendix C. Comments concerning compliance with the NUQAP Topical Report and regulatory requirements are resolved prior to issuance of the procedure. Quality and Assessment Services receives controlled copies of Quality Procedures that are listed in Appendix C. Any engineer-constructors, contractors, suppliers, and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance and modifications to nuclear power plants may be delegated responsibility for preparing, maintaining, issuing and verifying the implementation of appropriate program documents which are selectively reviewed/approved by the appropriate Director or Project Engineer. In this case, Quality and Assessment Services performs on-site and off-site audits/surveillances/inspections of the quality assurance programs to ensure the engineer-constructor, contractor suppliers and engineering service organizations are effectively complying with their requirements for compliance with their requirements for procedures and instructions. Contractor programs are required to clearly delineate the actions to be accomplished in the preparation, review and control of procedures, instructions and drawings and the methods for complying with 10 CFR 50, Appendix B.

5.2.1 PROCEDURES AND INSTRUCTIONS

Procedures and instructions for activities affecting quality are prepared, reviewed, and approved in accordance with written procedures and instructions.

The Director Maintenance Services or Project Engineer ensures that any engineer-constructors, contractors, suppliers and engineering service

organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance and modifications to nuclear power plant, implement quality assurance programs which contain written instructions for preparation, review and approval of procedures and instructions affecting quality. In addition, Contractor's site quality procedures and quality control inspection procedures are reviewed for concurrence by Quality and Assessment Services to assure compliance with the contractor's QA Program.

The NUPOC organization is responsible for the preparation, review and approval of plant Quality Procedures. The procedures include test procedures and overall site administrative procedures which implement the requirements of the NUQAP Topical Report. Each NUPOC organization is also responsible for the preparation, review and approval of procedures covering quality activities in accordance with individual license requirements. The Quality and Assessment Services Department reviews and concurs with quality procedures, such as those listed in Appendix C and special process procedures.

5.2.2 DRAWINGS

The design control and verification measures described in QAP 3.0, are applicable for the review and approval of drawings. The Engineering Design Supervisor and the Engineering Supervisor have the responsibility, which can be delegated, for review and approval of new drawings or modifications to existing drawings. The originating organization may delegate to other organizations or departments the work of design and review activities, or any part thereof, but retains responsibility for this work.

The measures taken to assure the preparation of as-built drawings and related documentation in a timely manner to accurately reflect the actual plant are described in NUSCO/NUPOC Procedures. Drawings critical to operation are updated prior to system turnover to operation and are available to the operating personnel.

5.2.3 ACCEPTANCE CRITERIA

Cognizant Department Heads review and approve departmental procedures, instructions and drawings to ensure the inclusion of adequate quantitative and qualitative acceptance criteria, as appropriate, for determining satisfactory work performance and quality compliance. These criteria apply to activities such as design, operations, maintenance, test control, inspection and plant modifications.

6.0 DOCUMENT CONTROL

6.1 GENERAL REQUIREMENTS

The NUQAP provides measures to assure controlled distribution of documents pertinent to quality assurance for the design, construction, testing, maintenance, operation and modification of nuclear power plant quality systems, structures and components in accordance with NUSCO/NUPOC quality procedures and 10 CFR 50, Appendix B.

Documents such as procedures, instructions, drawings, specifications and reports are prepared, reviewed for appropriate qualitative and quantitative acceptance criteria, and approved by authorized personnel in the affected organization. Approved controlled documents are distributed to affected locations in accordance with controlled distribution list. Changes to controlled documents are reviewed and approved by the same organization which performed the original review and approval, unless otherwise specified in the implementing procedures. Measures are provided for controlling documents to preclude the possibility of the use of outdated documents.

6.2 IMPLEMENTATION

6.2.1 RESPONSIBILITY

NUSCO/NUPOC procedures and instructions delineate the measures for controlling documents including direction for the review for adequacy, approval by authorized personnel, distribution of controlled documents and verification that changes are promptly incorporated and implemented. These control measures apply to documents affecting quality systems, structures and components during design, construction, maintenance, testing, operation and modifications thereto such as:

- a. Design Specifications;
- b. Design, Manufacturing, Construction and Installation Drawings;
- c. As-Built Documents;
- d. Quality Assurance Program Manuals, Procedures and Instructions;
- e. Manufacturing, Inspection and Testing Instructions;
- f. Test Procedures;

- g. Final Safety Analysis Report;
- h. Procurement Documents;
- i. Design Change Requests;
- j. Topical Report;
- k. Nonconformance Report;
- l. Computer Codes.

NUSCO/NUPOC Procedures describe the measures taken by Quality and Assessment Services or individuals other than the person who generated the document but qualified in quality assurance, for the control of documents to assure review and concurrence, as necessary, for such documents listed above with regards to quality assurance aspects.

The requirements for control of procurement documents are contained in QAP 4.0. During all phases of plant life, it is the responsibility of each organization issuing controlled documents to employ document control procedures. The issuing organization is additionally responsible for distribution of the documents to appropriate locations. There shall be provisions to assure that approved changes are included in instructions, procedures, drawings and other documents prior to implementation of the changes.

Any engineer-constructors, contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance, and modifications to nuclear power plants are responsible for implementing measures for review, approval, control and distribution of controlled documents, to ensure they are effectively complying with the requirements for document control. Quality and Assessment Services performs periodic on-site and off-site audits, surveillances, and inspections of the engineer-constructors, contractors, suppliers and engineering service organizations to verify compliance with their approved quality assurance programs.

6.2.2 DISTRIBUTION OF CONTROLLED DOCUMENTS

NUSCO/NUPOC procedures, specify in what manner controlled documents and revisions thereof, are distributed to appropriate locations, prior to commencing the work.

6.2.3 DRAWING CONTROL

The NU Nuclear Document Services Organization is responsible to implement a program, as per approved procedures, for the retention and retrieval of drawings and records submitted by cognizant NUSCO/NUPOC project personnel. The NU Nuclear Document Services Organization maintains a drawing status file for in-service units which includes drawings newly issued or revised with latest revision and current status.

The engineer-constructor, contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC during the design, construction and modification to nuclear power plants may be delegated the function of drawing control and must furnish periodic status reports listing the revisions of applicable drawings which they issue.

The Quality and Assessment Services Department performs on-site and off-site audits, surveillances, and inspections of suppliers to verify they are effectively complying with their programs for document control of drawings.

6.2.4 INSTRUCTION AND PROCEDURE CONTROL

The Quality and Assessment Services Department performs audits, surveillances, and inspections of NU departments and any engineer-constructors, contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance, and modification to ensure they are effectively complying with their QA program for control of procedures and instructions.

The originating department is responsible for establishing adequate control over quality procedures and instructions issued by them. The responsible organization also issues status reports or revised indices listing the latest revision of applicable controlled documents issued by them.

7.0 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES

7.1 GENERAL REQUIREMENTS

Measures for the control of procured material, equipment, parts and services by or for NU related to the safety of nuclear power plants are established and imposed by the NUQAP during design, construction, testing, operation, maintenance and modification, to ensure conformance to procurement documents. These measures include provisions for source evaluation and selection, submission of objective evidence by the contractor or subcontractor, inspection at the supplier source and examination of items upon delivery. Control of quality by contractors and subcontractors is assessed for effectiveness at intervals consistent with the importance, complexity and quantity of the product or service.

7.2 IMPLEMENTATION

The word supplier is used in this section to designate what is otherwise described as the engineer-constructor, contractor, supplier or engineering service organization.

The evaluation and selection of suppliers is performed in accordance with procedures, which specify that procurement source evaluation and selection measures are performed to determine supplier capability and delineate responsibilities of qualified personnel involved in the evaluation and selection process.

7.2.1 Quality and Assessment Services utilizes one or more of the following methods in evaluating the qualifications of a potential supplier:

- a. Audits and/or coordinated review of a potential supplier utilizing one or more departments (i.e., Engineering, Construction, Operations and/or Purchasing);
- b. Other utility supplier audits and evaluations;
- c. Nuclear Procurement Issues Committee (NUPIC) audits.
- d. ASME N, NA, NPT, NV, or MM/ MS Certificate of Authorization.
- e. Commercial grade surveys and/or coordinated review of a potential supplier utilizing one or more departments, (i.e., Engineering, Construction, Operations and/or Purchasing).
- f. Source inspection/surveillance

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Evaluations ensure that NU suppliers employ a quality assurance program that conforms to applicable portions of the NUQAP Topical Report.

Quality and Assessment Services maintains documented evidence of the evaluation and acceptance of the supplier's quality assurance program. The determination of supplier approval is based on such factors as prior performance, quality performance data, audits, commercial grade surveys, surveillances and evaluations of the supplier's quality assurance program.

Suppliers' Certificates of Conformance are periodically evaluated by audits, commercial grade surveys, surveillances, independent inspections and tests, to assure they are valid. This verification of Certificates of Conformance is documented.

7.2.2 SOURCE INSPECTION

Quality and Assessment Services is responsible for the performance of source inspections at suppliers' facilities to ensure that the requirements of a Purchase Order Contract have been met.

Source inspections are performed in accordance with written procedures which provide for the method of inspection, the extent of documentation required and those responsible for implementing those instructions.

Inspection of items occurs either when verifications of procurement requirements cannot be determined upon receipt or the supplier's QA program has not been accepted by Quality and Assessment Services.

7.2.3 RECEIPT INSPECTION

Receipt inspection for procured items is performed under direction of the Quality and Assessment Services Department in accordance with quality procedures which delineate requirements and responsibilities necessary to perform inspection functions. Contractual obligation fulfillment and specified requirements are verified during receipt inspections.

Receiving inspection of supplier-furnished material and equipment is performed to assure that material, components, equipment and acceptance records are examined in accordance with predetermined inspection instructions prior to acceptance, installation and operation. Receipt inspections include, as appropriate:

- a. Measures for verifying that the shipment is complete, properly identified, undamaged and corresponds with the required documentation;
- b. Measures for inspection of the item and review of supporting documentation (e.g., mill test reports, NDE reports) as required by the purchase documents;
- c. Measures for inspection and acceptance of items in accordance with predetermined methods.
- d. Measures for identifying and controlling acceptable items including identification of inspection status prior to release from the receiving inspection area;
- e. Measures for identifying, segregating and handling nonconforming items;
- f. Measures to ascertain that inspection records or certificates of conformance are acceptable prior to release for installation.
- g. In cases involving procurement of services, the project/discipline engineer or department head shall designate the means by which services may be accepted, and is given the authority to accept services in accordance with methods defined in NUSCO/NUPOC procedures.

7.2.4 SUPPLIER FURNISHED RECORDS

Records required to be furnished by the supplier are specified in the procurement document. Certifications or documentation provided by the supplier which attests to conformance, identifies that all the specific procurement requirements have been met (either by reference to the purchase order or by delineation).

The supplier must furnish the following records as a minimum:

- a. Documentation that identifies the purchased material or equipment and the specific procurement requirements. (e.g., codes, standards and specifications) which have been met by the items;
- b. Documentation that identifies any procurement requirements which have not been met, together with a description of those nonconformances dispositioned "accept as is" or "repair"

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The responsible Quality and Assessment Services personnel shall review for acceptability those documents which pertain to the requirements in the procurement document, in accordance with the NUQAP Topical Report and its applicable procedures.

- 7.2.5 NUSCO/NUPOC Procedures address the measures taken to assure that for commercial grade items, where specific quality assurance controls for nuclear applications cannot be imposed in a practicable manner, that special dedication requirements are established and implemented.

These measures follow the guidance in Regulatory Guide 1.144, paragraph C.3.b (1) and Regulatory Guide 1.123 and applicable paragraphs of Section 10 of ANSI N45.2.13.

These measures include appropriate requirements for special categorization and identification within the procurement document, receiving inspection, and additional controls during the installation and testing process to be performed by the Quality and Assessment Services Department, NUPOC and/or other appropriate groups.

8.0 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS

8.1 GENERAL REQUIREMENTS

NUSCO/NUPOC organizations assure that the identification of inspections, tests, and operation status of structures, systems, and components is known by affected organizations.

The NUQAP provides measures for the identification and control of material, parts and components, including partially fabricated assemblies, during design, construction, testing, operation, maintenance and modifications thereto. To ensure that each item can be traced to associated documentation, the identification of the item is maintained by heat number, lot number, part number, serial number, or other appropriate methods, and is physically marked on the item and/or on records traceable to the item. Documentation associated with material, equipment, and components delineated that these items have been designed, fabricated, manufactured, tested and/or inspected in accordance with the specified requirements. The object of these controls is to prevent the use of incorrect or defective materials, parts and components, in accordance with 10 CFR 50, Appendix B.

8.2 IMPLEMENTATION

NUSCO/NUPOC procedures establish the responsibilities and requirements for the identification and control of materials, parts and components. The procedures assure that identification and control is maintained throughout fabrication, receipt, handling storage and installation of items. Provisions include:

- a. Requirements for traceability to appropriate documentation such as: procurement documents, manufacturing documents, drawings, specifications, certifications, inspection and test records, and nonconformance reports.
- b. Controls to assure that the correct identification of an item is verified and documented prior to release for fabrication, assembly, shipping or installation.
- c. Requirements which assure that the method or location of markings do not affect the function or quality of an item.
- d. Establishment of identification requirements in specifications, drawings, procurement documents, procedures or instructions.

During the design, construction, testing, operation, maintenance or modifications to nuclear power plants, NUSCO/NUPOC may delegate any portion of the

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implementation of the identification and control program to any engineer-constructors, contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance and modification to nuclear power plants, as appropriate. If delegated, contracts require that the contractor establish an identification and control program which meets the NUQAP Topical Report requirement. In this case Quality and Assessment Services performs on-site and off-site audits, surveillances, and inspections of the engineering-constructor, contractor, supplier, engineering service organization's quality assurance program to ensure they are effectively complying with these requirements for identification and control of material, equipment and components.

Receipt inspections are performed to verify that materials, equipment and components are properly identified in accordance with procurement requirements. Quality and Assessment Services is responsible for assigning and applying permanent identification to the items in accordance with approved procedures. If the application of a serial number is not practical, other means of identification are implemented to assure proper identification and traceability.

In the event that the equipment, material or component is nonconforming or the identification becomes lost or illegible, the items are considered nonconforming and are identified and controlled in accordance with QAP 15.0.

9.0 CONTROL OF SPECIAL PROCESSES

9.1 GENERAL REQUIREMENTS

The NUQAP provides measures to assure control of special processes associated with quality systems, structures and components by the use of qualified, approved procedures, equipment and personnel during design, construction, testing, operation, maintenance and modifications to nuclear power plants.

Special processes are performed under controlled conditions in accordance with special requirements and may include, but are not limited to: welding, cleaning, heat treating, and nondestructive examination and/or testing.

9.2 IMPLEMENTATION

During design, construction testing, operation, maintenance, and modification of nuclear power plants, the NUSCO/NUPOC Project/Plant Engineer is responsible for ensuring that special process data and documentation is reviewed, and that contractors, engineer-constructors, suppliers, and/or engineering service organizations special process procedures utilized at nuclear power plants are qualified and approved, and that personnel and equipment utilizing special processes are properly qualified prior to start of work. Quality and Assessment Services personnel perform on-site and off-site audits, surveillances, and inspections to ensure the engineering-constructors, contractors, suppliers, and engineering service organizations are effectively complying with their quality assurance program requirements for control of special processes.

NUSCO/NUPOC special process procedures utilized during testing, operation, maintenance, modification and refueling of the in-service nuclear power plant are prepared, reviewed and approved in accordance with procedures as specified in QAP 5.0.

9.2.1 PROCEDURE QUALIFICATION AND CONTROL

NUSCO/NUPOC procedures specify that written process control documents are utilized and qualified, as required, in accordance with the applicable specification, codes or standards.

9.2.2 PERSONNEL QUALIFICATION AND CERTIFICATION

Codes, standards and NUSCO/NUPOC procedures specify personnel qualification/certification requirements. Personnel responsible for the performance and verification of special processes are trained, tested, and

certified as required by applicable specifications, codes and standards. Requirements for the period of certification, retesting, and recertification of personnel are also specified. Contractors qualify personnel and maintain records of qualified personnel in accordance with applicable codes, standards, specifications, and contractor procurement document requirements. Quality and Assessment Services Department is responsible for the review of records of qualified personnel, equipment and procedures associated with special processes.

The Director, Quality and Assessment Services is responsible for the training, testing, and certification of all NUSCO/NUPOC NDE personnel in accordance with the requirements of Regulatory Guide 1.58 (Rev. 1, 9/80) and ASNT Recommended Practice No. SNT-TC-1A.

9.2.3 SPECIAL PROCESS RECORDS

Records provide objective evidence that special processes were performed in accordance with approved procedures, by qualified personnel, and that when required by procedures, specifications, and codes, such performance was verified. Results of nondestructive examinations are recorded in accordance with applicable specifications, codes and standards. These records are retained by the supplier or supplied to NUSCO/NUPOC as required by contract or purchase orders. If records are to be retained by the supplier, the contract or purchase order specifies the retention period and instruction for final disposition of records.

Special process documentation such as special process procedures, qualifying data, and personnel and equipment qualification records associated with the performance of special processes at nuclear power plants, are kept current and maintained in appropriate NUSCO/NUPOC files, with final disposition to the appropriate NU Nuclear Document Services Facility.

10.0 INSPECTION

10.1 GENERAL REQUIREMENTS

Inspection of activities to verify the quality of systems, structures and components, which are performed by or for Northeast Utilities (NU), are executed in accordance with the Quality Assurance Program (NUQAP) and appropriate procedures, instructions and drawings by qualified personnel independent from the individual or group performing the activity being inspected. If inspection is impossible or disadvantageous, indirect controls by monitoring processing methods, equipment and personnel are provided. Inspection notification and hold points are identified, as required, in the applicable documents.

10.2 IMPLEMENTATION

10.2.1 INSPECTION RESPONSIBILITIES

During construction, testing, maintenance, modification, and operation, procedures shall define the need for inspections (e.g., receipt inspections, installation, system turnover, and product acceptance).

Quality and Assessment Services personnel will ensure procedural requirements are met by means of audits and surveillances as defined in Quality and Assessment Services procedures.

When inspections are required, Quality and Assessment Services' involvement is as follows:

- a. Identification of inspection personnel;
- b. Review of work procedures and work documents;
- c. Preparation and approval of inspection plans ensuring that the necessary inspection requirements, methods, and acceptance criteria have been identified;
- d. Documentation of inspection results.

Quality and Assessment Services performs audits, surveillances, and inspections to verify that any engineer-constructors, contractors, suppliers, and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance, and modification to nuclear power plants are effectively

complying with their quality assurance program requirements for inspection and for performing/witnessing inspections at "hold" or "notification" points identified in NUSCO/NUPOC procurement documents. All audit, surveillance, and inspection activities are performed under requirements specified in written quality assurance procedures.

10.2.2 INSPECTION PLANS

Documented inspection plans may be either a separate document or an integral part of work instruction documents. The plans are based on design specifications, procurement documents, drawings, other specifications, or previous experience, as appropriate.

During NUSCO-directed activities on site, NUSCO procedures provide criteria for the determination of accuracy requirements of inspection equipment and when inspections are required. These procedures describe requirements for the preparation of inspection plans and schedules by the Quality and Assessment Services Department. NUSCO Procedures also describe requirements for audits and surveillances performed by the Quality and Assessment Services Department to assure the implementation of the inspection plans.

During the operations phase of nuclear plants, inspection activities are performed in accordance with NUPOC/NUSCO procedures.

The inspection criteria, including the use of inspection equipment and their accuracy requirements, are specified in the Job Packages/ Inspection Plans.

10.2.3 INSPECTION PERSONNEL AND INSPECTION DOCUMENT ACCESS

- a. Inspections are performed by individuals other than those who performed or directly supervised the activity being inspected. Inspection personnel are qualified and/or certified in accordance with appropriate codes, standards, and/or NU training programs;
- b. Inspections are performed by Quality and Assessment Services personnel, qualified contracted personnel, and NUPOC personnel who are independent from undue pressure such as cost and schedule. When contracted personnel perform inspections, their inspection plans/procedures and personnel

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qualification criteria are reviewed for acceptance by the Quality and Assessment Services Department prior to the initiation of the activity;

- c. Access to drawings, procedures, specifications or other documented criteria necessary for the performance of inspections is provided prior to performing the inspection activity.

10.2.4 INSPECTION PROCEDURES

- a. Required inspection or surveillance activities are performed and documented according to written, approved procedures and/or checklists. Inspection procedures, plans or checklists contain the following:
 - (1) Identification of characteristics to be inspected;
 - (2) Identification of the individual or groups responsible for performing the inspections;
 - (3) Requirements for the necessary measuring and test equipment and the required accuracy of this equipment;
 - (4) Acceptance criteria;
 - (5) A description of the method of inspection when other than direct visual examination using the unaided eye;
 - (6) A record of the results of the inspection;
 - (7) Record of inspector or data recorder.
- b. Written approved procedures specify surveillance of processing methods or testing and operation of equipment when inspection is impossible, inaccessible or not applicable.
- c. Modification, repair, replacement or rework items are inspected in accordance with original inspection requirements or approved alternatives.

10.2.5

MANDATORY HOLD AND NOTIFICATION POINTS

Mandatory hold points are utilized when an inspection/operation must be performed or witnessed and signed off by the responsible personnel before work can proceed. Notification points are used to identify the operations or completed processes that NUSCO/NUPOC or its representatives may elect to witness and/or inspect during the manufacturing, construction, installation process. Mandatory hold and notification points, as required, are identified in procurement documents and procedures. These documents are subject to the review and concurrence of Quality and Assessment Services for adequacy of inspection, notification and/or mandatory hold controls.

10.2.6

INSPECTION RESULTS EVALUATION

Inspection results are evaluated for acceptability in accordance with approved NUSCO/NUPOC Procedures which identify the responsible organization.

The evaluations are performed by the responsible NUSCO/NUPOC personnel who are qualified in accordance with the appropriate Regulatory Guide/ANSI Standard commitments listed in Appendix D.

Quality and Assessment Services performs audits, and surveillances to assure that inspections are performed per the requirements of applicable NUSCO/NUPOC Procedures.

11.0 TEST CONTROL

11.1 GENERAL REQUIREMENTS

A documented test control program is established by the NUQAP for systems, structures and components to ensure that they will perform satisfactorily in service and that test results are documented in accordance with 10 CFR 50, Appendix B and other pertinent regulatory and/or technical requirements.

The test control program identifies the systems, structures and components to be tested, method of conducting tests, evaluation of tests and documentation of tests by qualified personnel to assure requirements have been satisfied.

The test control program is systematic and includes proof tests prior to installation, construction tests, operational tests, surveillance tests, and retest following repairs, replacements, preventative maintenance or modifications.

11.2 IMPLEMENTATION

11.2.1 TEST PROGRAM

Test requirements to determine or to verify the capability of an item to meet specified requirements in accordance with engineering/design documents, Safety Analysis Reports (SAR), technical specifications, procedures or procurement documents, as appropriate, are accomplished by subjecting the item to a set of physical, chemical, environmental or operating conditions. Retest following repair, replacement or modification is performed in accordance with the original design requirements or acceptable alternatives and is performed when original test results are invalidated.

NUSCO/NUPOC procedures are written and approved to delineate the methods and responsibilities for controlling, accomplishing and documenting testing during construction, maintenance, operation and modification of nuclear power plants.

Any engineer-constructors, contractors, suppliers, and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance and modification to nuclear power plants are responsible for implementing measures for the control of tests to ensure that materials, equipments and parts will perform satisfactorily. Quality and Assessment Services performs on-site and off-site audits, surveillances, and inspections of selected proof

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tests when hold points have been identified in Purchase Order/ Contracts of the engineer-constructors, contractors, suppliers and engineering service organizations to verify they are complying with their quality assurance program requirements for test control. Documentation associated with these observations are maintained by Quality and Assessment Services.

Proof tests, product acceptance tests, retests, and periodic surveillance tests are conducted by qualified personnel in accordance with approved procedures. Personnel performing tests ensure that calibrated equipment and instrumentation utilized are within the calibration interval specified. Documentation including test procedures and approved data sheets are maintained in appropriate files.

11.2.2

TEST PROCEDURE PREPARATION AND TEST PERFORMANCE

Testing is accomplished in accordance with approved test procedures which incorporate or reference the requirements and acceptance criteria in the applicable design and procurement documents. The test procedure or test program documents include the following as a minimum:

- a. Instructions for the testing method used;
- b. Required test equipment and instrumentation;
- c. Test requirements, such as acceptance and rejection criteria;
- d. Hold, notification, inspection and data collection points;
- e. Test prerequisites such as: calibrated instrumentation; trained, qualified, and licensed or certified personnel; preparation, condition and completeness of item to be tested; suitable and controlled environmental conditions;
- f. Methods for documenting or recording test data and results;
- g. Provisions for data collection and storage.

11.2.3

TEST EQUIPMENT

NUSCO/NUPOC Procedures provide the criteria for determining when a test is required and the accuracy requirements of test equipment.

During the operations phase of a nuclear plant, the following steps are taken:

- a. To ensure accuracy, test instrumentation is checked and calibrated in accordance with NUSCO/NUPOC procedures.
- b. Plant instrumentation used in testing is calibrated. It is maintained in calibration at regular intervals in accordance with established surveillance and / or preventative maintenance procedures.
- c. Where special instrumentation is required for testing, the requirements are stated in the procedures. Instrument characteristics, including accuracy requirements, are equivalent to or better than those specified by the vendor.

11.2.4

EVALUATION OF TEST RESULTS

The documented test results are evaluated against the predetermined acceptance criteria by an individual or group having appropriate qualifications. The acceptance status of the test is documented. Deficiencies noted during the evaluation are documented and dispositioned in accordance with approved procedures.

The evaluation of test results may also be delegated to other organizations. The evaluating organization is required to assure the use of qualified personnel, evaluate the data against predetermined criteria and document the results of the evaluation and acceptance status of the test. Quality and Assessment Services performs audits, surveillances, and inspections to verify that these organizations are effectively complying with their quality assurance program requirements for test control.

12.0 CONTROL OF MEASURING AND TESTING EQUIPMENT

12.1 GENERAL REQUIREMENTS

The NUQAP provides measures for the control of measuring and testing equipment (M&TE) used as the basis for acceptance in activities affecting quality during inspection, testing and measurement of materials, equipments and parts. Periodic calibration and adjustment of measuring and test equipment is performed and controlled to assure accuracy is maintained within limits necessary to verify that design and operating condition requirements have been met. Documentation is retained such that all items of M&TE are traceable to their calibration records.

12.2 IMPLEMENTATION

12.2.1 Approved procedures delineate the methods and responsibilities for the control, maintenance and calibration of M&TE including portable and installed instruments, tools, gages, fixtures, reference and transfer standards, and nondestructive test equipment.

All documentation associated with M&TE is maintained in appropriate files, with eventual incorporation into the NU Nuclear Records Program.

During NUSCO-directed activities on a nuclear plant, with the exception of Maintenance Services' directed activities, the calibration program is implemented in accordance with the requirements defined in NUSCO Procedures. NUSCO functional groups are responsible for implementing these procedures which comply with the requirements contained in specifications and drawings. The Quality and Assessment Services Department is responsible for verifying that receipt of calibrated equipment is in conformance with the requirements of procurement documents, and to control calibrated M&TE used during their inspections.

During NUPOC/Maintenance Services/Generation Test-directed activities, the calibration program is implemented in accordance with the requirements defined in NUPOC Procedures. The Site / Plant Operations Review Committee (SORC/PORC) reviews and approves procedures related to the calibration program. Department heads/Job Supervisors are responsible to ensure that

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M&TE equipment is calibrated, issued, and controlled in accordance with the requirements of the procedures. During Maintenance Services' directed activities, the Job Supervisor shall ensure that the users of the M&TE are properly instructed in the use and control of the M&TE. Department Heads are responsible for calibrating M&TE within the required frequency and for reviewing calibration data associated with M&TE calibration by outside vendors in accordance with the procedures.

Quality and Assessment Services performs audits, surveillances, and inspections to verify implementation of the calibration program.

Any engineer-constructors, contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance and modification to nuclear power plants are responsible for implementing measures for the control of M&TE to ensure they are properly calibrated, adjusted and maintained at specified intervals in order to maintain accuracy within required limits. Quality and Assessment Services performs on-site and off-site audits, surveillances, and inspections of the quality assurance programs of the engineer-constructors, contractors, suppliers and engineering service organizations to verify they are effectively complying with their requirements for control of M&TE.

12.2.2

CALIBRATION STANDARDS

Measuring and test equipment is calibrated at specified intervals based on the required accuracy, purpose, degree of usage, stability characteristics, and other conditions affecting the measurement. Measuring and test equipment shall be labeled or tagged to indicate the date calibrated and next calibration date.

NUSCO/NUPOC Procedures describe the measures taken to assure that reference and transfer standards are traceable to nationally recognized standards and that, where national standards do not exist, provisions are established to document the basis for calibration.

Calibration of this equipment should be against standards that have an accuracy of at least four times the required accuracy of the equipment being calibrated. When this is not possible, the standards shall have an accuracy that assures the equipment being calibrated will be within required tolerance and the basis of acceptance is documented and authorized by the applicable manager of the functional group (for NUSCO-directed activities) or the SORC/PORC (for NUPOC/Maintenance Services directed activities). In addition, the calibrating standards shall have greater accuracy than secondary standards being calibrated. Calibrating standards with the same accuracy may be used if they can be shown to be adequate for the requirements and the basis of acceptance is documented.

Implementing procedures describe the measures utilized in order to maintain the proficiency of the measuring and test equipment.

12.2.3

"OUT OF TOLERANCE" CONTROL

M&TE and reference standards when found out of tolerance are so identified and removed from service. A review is conducted to determine the validity of previous inspection or test results gained through use of the instrument, and of the acceptability of items previously measured or tested.

13.0 HANDLING, STORAGE AND SHIPPING

13.1 GENERAL REQUIREMENTS

Measures are established by the NUQAP using approved procedures, instructions and procurement documents to ensure proper handling, storage, shipping, cleaning and preservation of material, equipment and parts. These measures are imposed during the design, procurement, construction, testing and operation of nuclear power plants and modifications thereto, in order to preclude damage, loss or deterioration of materials, equipments and parts.

13.2 IMPLEMENTATION

13.2.1 GENERAL

Procedures, instructions and procurement documents define the requirements and responsibilities for the handling, storage, shipment, cleaning and preservation of material, equipment, and parts required for implementation of established design and specification requirements.

Handling, storage, cleaning and preservation requirements of material, equipment and parts is conducted in accordance with written procedures and procurement documents. Any engineer-constructors, suppliers, and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance and modifications to nuclear power plants are responsible for implementing measures for handling, storage, shipping, cleaning and preserving materials equipment and parts to preclude damage, loss or deterioration. Quality and Assessment Services performs audits, surveillances, and inspections to verify that NUSCO/NUPOC, contractors, suppliers and engineering service organizations are effectively implementing and complying with the approved procedures and instructions for handling, storage, shipping, cleaning and preservation of materials, equipments and parts.

13.2.2 ESTABLISHMENT OF SPECIAL HANDLING, STORAGE, SHIPPING, CLEANING AND PRESERVATION REQUIREMENTS

Special or additional handling, storage, shipping, cleaning and preservation requirements are to be identified and implemented as specified in procurement documents and approved procedures. These established requirements are consistent with the regulatory positions

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of the NRC Regulatory Guides and their endorsed ANSI Standards listed in Appendix D of the NUQAP Topical Report, or specifications and/or supplier technical manuals, and will be consistent with accepted industry standards.

NUPOC Procedures describe the measures taken for the storage of chemicals, reagents (including control of shelf life), lubricants, and other consumable materials.

14.0 INSPECTION, TEST AND OPERATING STATUS

14.1 GENERAL REQUIREMENTS

The NUQAP provides measures for indication, by the use of marking such as stamps, tags, labels or other suitable means, the status of tests and inspections of material, equipment and parts throughout design, construction, testing, operation, maintenance and modification of nuclear power plants, to preclude the inadvertent bypassing of inspection and test requirements. These measures provide for the identification of items which have satisfactorily passed required inspections and tests. Measures are also established for indicating the operating status of systems, structures and components to prevent inadvertent operation.

14.2 IMPLEMENTATION

14.2.1 GENERAL

Any engineer-constructors, contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance and modification to nuclear power plants are responsible for implementing approved measures for the identification of inspection and test status of material, equipment and parts to preclude the bypassing of requirements. Quality and Assessment Services performs on-site and off-site audits, surveillances, and inspections of the engineer-constructors, contractors, suppliers and engineering service organizations, as appropriate, to verify that they are effectively complying with their requirements for identification of inspection and test status, in compliance with approved procedures and instructions. Elements of this system require that suppliers and contractors have a controlled manufacturing and test operation, in order to preclude the inadvertent bypassing of process inspections or tests, and to provide a positive identification of component status throughout all phases of manufacturing, testing, and inspection by means of tagging, routing cards, stamping, manufacturing or test reports, labeling or other appropriate methods.

When Receipt Inspections are performed at the NU Nuclear Generating Facilities, Quality and Assessment Services ensures that traceability is maintained for acceptable materials, equipments and parts, to indicate conformance to Purchase Order/Contract requirements. Nonconforming materials, equipment and parts are identified in accordance with QAP 15.0.

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During tests and inspections of operating nuclear power plants, a status tagging system is implemented, as per approved procedures and instructions, to prevent inadvertent operations of systems, structures and components.

NUSCO/NUPOC Procedures describe the measures taken to control the altering of the sequence of required tests, inspections and other operations. The review and approval for these actions is subject to the same control as taken during the original review and approval of tests, inspections and other operations.

14.2.2

STATUS IDENTIFICATION AND CONTROL

Procedures and instructions describe control of the application and removal of markings such as stamps, tags, labels, and other suitable means to indicate the status of systems, structures and components to prevent inadvertent operation, and to preclude omission of inspections, tests or other critical operations. These procedures and instructions delineate the requirements, methods and responsibilities for indicating the status of the affected items. The complete status of all items under the calibration system is recorded and maintained.

Records associated with status identification are maintained in accordance with approved procedures.

15.0 NONCONFORMING MATERIALS, PARTS, COMPONENTS, OR SERVICES

15.1 GENERAL REQUIREMENTS

The NUQAP requires that documentation and control of nonconforming materials, parts, components, or services utilized in systems, structures and components during design, construction, testing, operation and maintenance of nuclear power plants and modifications thereto, be performed in accordance with approved procedures in order to prevent inadvertent use or installation. These procedures include appropriate requirements for identification, documentation, segregation and disposition of nonconforming items, and notification to affected organizations.

15.2 IMPLEMENTATION

15.2.1 PROGRAM

Approved procedures define personnel responsibilities and establish various measures for identification, documentation, segregation, review and disposition of nonconforming item reports. Report mechanisms are available to all NU personnel and utilized based on the scope of their departmental responsibilities and procedural guidance.

15.2.2 DOCUMENTATION

Documentation of nonconforming items requires identification of the items, description of the nonconformance, disposition of the nonconformance, inspection requirements and signature approval of the disposition. A trend analysis of nonconformances documenting program/procedural problems is performed by NU in accordance with approved procedures. The trend analysis results are periodically reported to upper management, including the Executive Vice President, Nuclear and Director, Quality and Assessment Services Department, for review and assessment.

Tagging systems are utilized to physically identify nonconforming items prior to installation. The Quality and Assessment Services Department utilizes tags for received material, parts and components.

An engineering evaluation is performed, if necessary, prior to the resolution of nonconformances.

15.2.3 EVALUATION AND DISPOSITION

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Evaluations are performed to determine the disposition of nonconforming items and services. The evaluation determines whether an item or service is to be used as is, returned to supplier, repaired, reworked, scrapped or salvaged. These evaluations assure that the final condition does not adversely affect safety, operation or maintenance of the item or service, or of the component or system. Reports involving deviation from design bases such as "use as is" or "repair" are forwarded to the appropriate engineering organization for review, and disposition. Applicable information is accumulated and records are maintained.

The need to release/use nonconforming materials, parts or components shall be based on such considerations as:

- a. Impact on plant safety;
- b. Safety of personnel;
- c. Suitability of material or items in the "as is" condition, i.e., probability of eventual satisfactory resolution of the nonconforming without repair, rework or replacement.
- d. Accessibility of material or items after release;
- e. Cost of removal and repair or replacement should material or items eventually have to be removed, repaired, or replaced;
- f. Effect on the orderly progress of work.

Items repaired are verified by reinspecting the items as originally inspected or by a documented method which is equivalent to the original inspection method. Items reworked may require reinspection as defined in approved procedures.

Quality and Assessment Services performs audits, and surveillances to verify that dispositions for reports documenting nonconforming conditions are adequate.

16.0 CORRECTIVE ACTION

16.1 GENERAL REQUIREMENTS

The NUQAP requires that an effective corrective action program be established for NUSCO/NUPOC and their contractors/service organizations to ensure that conditions adverse to quality are promptly identified and corrected as soon as practicable and documented in accordance with approved procedures. These procedures include measures for determining the root cause and corrective action to preclude recurrence for conditions evaluated as significant conditions.

16.2 IMPLEMENTATION

16.2.1 PROGRAM

Approved procedures define personnel responsibilities and establish various measures for identification, documentation, review, engineering evaluation, and disposition of conditions adverse to quality. Report mechanisms are available to all NU personnel and utilized based on the scope of their departmental responsibilities and procedural guidance.

16.2.2 CORRECTIVE ACTION AND FOLLOW-UP

Procedures describe the measures taken to evaluate if conditions adverse to quality exist and to determine the need for immediate corrective action or disposition. The Quality and Assessment Services Department performs audits, and surveillances to verify that NUSCO/NUPOC and their contractors/service organizations working on site comply with the corrective action program and that corrective action is adequate and properly implemented in a timely manner. The Executive Vice President-Nuclear has the final authority in the event that agreement on the action to be taken is not reached at lower levels within NUSCO/NUPOC.

16.2.3 RECURRENCE CONTROL

Quality and Assessment Services is responsible for assigning an appropriate significance level based on the actual or potential consequences and complexity as defined in approved procedures. The significance level assigned determines the need for a root cause determination and the schedule for establishing the necessary action to prevent recurrence. In these cases, the immediate corrective action,

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the cause, and recurrence control actions must be documented. Procedures establish the responsibilities and measures taken to accomplish these actions.

Trend analysis reports which identify program/procedural problems are periodically reported to upper management, including the Executive Vice President-Nuclear and the Director-Quality and Assessment Services Department, by the organization responsible for controlling the problem reporting document. Trends concerning specific contractor's performance shall be reported to the affected contractor for resolution and recurrence control, if appropriate.

17.0 QUALITY ASSURANCE RECORDS

17.1 GENERAL REQUIREMENTS

The NUQAP provides for the maintenance, identification, retention and retrieval of records to furnish evidence of activities affecting quality during design, construction, testing, operations, maintenance and modification of nuclear power plants. The records include but are not limited to: operating logs and the results of reviews, inspections, tests, audits, monitoring of work performance and material analyses. The records also include closely related data such as qualifications of personnel, procedures and equipments. Inspection and test records contain as a minimum but are not limited to: identification of inspector or data recorder and the acceptability and the action taken in connection with any deficiencies and Reportable Occurrences noted. Approved procedures establish requirements concerning record retention such as duration, location and assigned responsibility.

17.2 IMPLEMENTATION

NUSCO/NUPOC Procedures and Instructions establish the responsibilities and requirements for the maintenance, identification, retention and retrievability of records pertaining to materials, equipments, parts, processes or operations relating to systems, structures and components which when founded on observations, measurements or tests can be fully verified, and documented by cognizant personnel.

Any engineer-constructors, contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance and modification to nuclear power plants are responsible to implement measures for identification, maintenance, retention, retrieval and turnover to the NUSCO/NUPOC personnel of documented and approved records which contain objective evidence of quality, as specified in Purchase Order/Contracts. Quality and Assessment Services performs on-site and off-site audits, surveillances, and inspections of the engineer-constructors, contractors, suppliers and engineering service organizations, as appropriate, to verify they are effectively complying with their program for quality assurance records.

NUSCO/NUPOC records are identified, controlled and maintained in appropriate files and are identifiable to specific systems, structures and components within the nuclear power plant. When identification to a specific system, structure or component is not practical, records are filed by category (e.g. specification, nonconformance reports, audits, etc).

17.3 RETENTION

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NU quality assurance records are classified as life records or nonlife records as delineated by Nuclear Document Services. Nonlife records are those documents that are maintained for a specific period of time other than the lifetime of the in-service nuclear power plant or the particular component or part. Life records are those documents that are maintained for the lifetime of the in-service nuclear power plant or for the life of the particular component or part. Life records are those which would be of significant value in meeting one or more of the following criteria:

- a. Demonstrating capability for safe operations;
- b. Maintaining, reworking, repairing, replacing or modifying the item;
- c. Determining the cause of an accident or malfunction of an item;
- d. Providing required base line data for in-service inspection.

Records are reviewed and approved by the cognizant qualified personnel of NUSCO/ NUPOC, engineer-constructor, etc., as appropriate, and are transmitted to the appropriate Nuclear Document Services Facility. The responsibility of the appropriate Nuclear Plant Records Facility upon receipt of records, is to maintain and provide controlled retrievability of records affecting nuclear power plants, in such a manner as to prevent destruction of records by fire, flood, theft, and environmental conditions, such as temperature or humidity, as delineated in procedures.

18.0 AUDITS

18.1 GENERAL REQUIREMENTS

The NUQAP requires that a comprehensive system of planned and periodic audits shall be carried out to verify compliance with the NUQAP Topical Report during the design, construction, modification, testing, maintenance, and operation of nuclear power plants.

Audits are conducted in accordance with written procedures and checklists by appropriately trained personnel not having direct responsibilities in the areas being audited.

Audit results are documented and reviewed by management having responsibility in the area audited and the responsible management takes the necessary action to address any audit findings revealed by the audit.

18.2 IMPLEMENTATION

18.2.1 PROGRAM

The Audit program requires audits of corporate and plant quality activities. Audits are performed on activities where the requirements of 10 CFR 50 and respective Technical Specifications are being implemented. In addition to those activities, audits are performed on areas associated with indoctrination and training programs, and interface control among the licensee and contractors. Audits are regularly scheduled on the basis of the status and safety importance of the activities being performed. Regularly scheduled audits are supplemented by audits for one or more of the following conditions:

- a. When significant changes are made in functional areas of the quality assurance program, such as significant reorganization or procedure revisions.
- b. When it is suspected that the quality of the item is in jeopardy due to deficiencies in the quality assurance program.
- c. When a systematic, independent assessment of program effectiveness is considered necessary.
- d. When necessary to verify implementation of required corrective action.

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Schedules are originated and maintained by the Quality and Assessment Services Department.

Audits are performed as specified in procedures by qualified personnel, using a preestablished written audit plan prepared by the auditing organization. Auditors evaluate the work areas, activities, processes, items, and review documents and records to determine the effectiveness of implementation and conformance to the NUQAP.

Approved contractors, suppliers, and engineering service organizations utilized by NUSCO/NUPOC in the design, construction, testing, operation, maintenance, and modification to nuclear power plants are responsible for developing and implementing a system of planned and periodic audits to verify compliance with the effectiveness of all aspects of their quality assurance programs. Quality and Assessment Services personnel perform audits to ensure these organizations are effectively complying with their quality assurance requirements.

In addition to the audits, other methods, such as surveillances, and inspections are used to ensure that quality activities are in compliance with the NUQAP Topical Report.

18.2.2 REPORTING OF AUDIT RESULTS

Audit results are reviewed and approved by the Quality and Assessment Services Department in accordance with approved procedures. The audit reports are issued to the appropriate management of the area audited to ensure appropriate and/or timely corrective action is taken to address any audit findings. In addition, audit data and reports are accumulated as part of the review for quality trends and assessed to ensure the effectiveness of the quality assurance program.

18.2.3 REVIEW OF AUDIT FINDINGS

Audit results are documented, reviewed, and analyzed with management having responsibility in the area audited. The responsible management is required to take the necessary action to address any findings identified by the audit.

18.2.4 RESOLUTION OF AUDIT FINDINGS

Appropriate action to resolve findings identified during audits is to be taken by the cognizant NUSCO/NUPOC organization before scheduled resolution dates. *Quality and Assessment Services identifies* the

findings, and assigns an appropriate significance level based on the actual or potential consequences and complexity as defined in approved procedures. The significance level assigned determines the need for a root cause determination and the schedule for establishing the necessary action to prevent recurrence. Audit findings are evaluated for reportability.

Follow-up to audit findings are performed as necessary to verify appropriate actions have been taken to resolve audit findings. Items which cannot be resolved by affected management are submitted for resolution to the Executive Vice President-Nuclear.

18.2.5

RECORDS/REPORTS OF AUDITS

Audit records, reports, and associated documentation pertinent to audits are dispositioned to the appropriate Nuclear Document Services Facility, as specified in procedures.

APPENDIX A

CATEGORY I SYSTEMS, STRUCTURES, AND COMPONENTS

The following systems, structures and components of a nuclear power plant, including their foundations and supports, are designated as Category I. The pertinent quality assurance requirements of Appendix B to 10 CFR Part 50, should be applied, as a minimum, to all quality activities affecting the safety function of these systems, structures, and components as listed below and to other items and services specifically identified by NU in each FSAR addressing Section 3.2.1 of NRC Regulatory Guide 1.70.

- (a) The reactor coolant pressure boundary.
- (b) The reactor core and reactor vessel internals.
- (c) Systems or portions of systems that are required for (1) emergency core cooling; (2) post-accident containment heat removal or; (3) post-accident containment atmosphere cleanup (e.g., hydrogen removal system).
- (d) Systems or portions of systems that are required for (1) reactor shutdown; (2) residual heat removal or; (3) cooling the spent fuel storage pool.
- (e) Those portions of the steam systems of boiling water reactors extending from the outermost containment isolation up to but not including the turbine stop valve, and connected piping of 2-1/2 inches or larger nominal pipe size up to and including the first valve that is either normally closed or capable of automatic closure during all modes of normal reactor operation.
- (f) Those portions of the steam and feedwater systems of pressurized water reactors extending from and including the secondary side of steam generators up to and including the outermost containment isolation valves, and connected piping of 2-1/2 inches or larger nominal pipe size up to and including the first valve (including a safety or relief valve) that is either normally closed or capable of automatic closure during all modes of normal reactor operation.
- (g) Cooling water, component cooling and auxiliary feedwater systems or portions of these systems including the intake structures, that are required for: (1) emergency core cooling; (2) post-accident containment heat removal; (3) post-accident containment atmosphere cleanup; (4) residual heat removal from the reactor or; (5) cooling the spent fuel storage pool.

- (h) Cooling water and seal water systems or portions of these systems that are required for functioning of safety related reactor coolant system components such as PWR reactor coolant pump seals.
- (i) Systems or portions of systems that are required to supply fuel for emergency equipment.
- (j) All electrical and mechanical devices and circuitry between the process and the actuated devices involved in generating or responding to signals that provide protective functions of safeguard systems.
- (k) Systems or portions of systems that are required for (1) monitoring of systems safety-related and; (2) actuation of systems safety-related.

"Required for monitoring," i.e. Those parameters that provide information that is essential to permit the control room operator to take specific manually controlled actions for the direct accomplishment of the specified safety function.

- (l) The spent fuel storage pool structure, including the fuel racks.
- (m) The reactivity control system (e.g., control rods, control rod drives, and boron injection system).
- (n) The control room, including its associated equipment and all equipment needed to maintain the control room with safe habitability limits for personnel and safe environmental limits for vital equipment.
- (o) Primary and secondary reactor containment.
- (p) Systems other than radioactive waste management systems not covered by items (a) through (o) above which contain or may contain radioactive materials and whose postulated failure would result in conservatively calculated potential offsite doses (using meteorology as prescribed by Regulatory Guides 1.3 and 1.4) which are more than 0.5 rem to the whole body or its equivalent to any part of the body.
- (q) The Class IE electric systems, including the auxiliary systems for the onsite electric power supplies, that provide the emergency electric power needed for functioning of plant features included in items (a) through (p) above.
- (r) Those portions of systems, structures or components whose continued function is not required but whose failure could reduce the functioning of any plant feature included in items (a) through (q) above to an unacceptable safety level or could result in incapacitating injury to occupants of the control room should be designed and constructed so that the SSE would not cause such failures.

- (s) Items and services associated with Radioactive Material Transport Packages as described in 10CFR71.

CONSUMABLES

The following specific consumables when utilized in safety related systems shall be included in those portions of the NUQAP, as applicable.

1. Emergency generator diesel fuels
2. Hydraulic snubber fluids
3. Reagents
4. Resins
5. Boric Acid
6. Lubricants
7. Gas Turbine Fuel

APPENDIX B

NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM TOPICAL REPORT

QUALIFICATION AND EXPERIENCE REQUIREMENTS

DIRECTOR, QUALITY AND ASSESSMENT SERVICES

The Director, Quality and Assessment Services shall satisfy the following requirements:

Graduate of a four-year accredited engineering or science college or university, plus fifteen (15) or more years of industrial experience including five years in positions of leadership, such as lead engineer, project engineer, audit team leader, etc. At least two years of this experience should be associated with nuclear Quality Assurance Activities, and at least one year of this experience is in a Quality Assurance Organization. A masters degree in engineering or business management is considered equivalent to two years of experience.

Note: The education and experience requirements should not be treated as absolute when similar training or an outstanding record will provide reasonable assurance that a person can perform the required tasks.

APPENDIX C

NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM TOPICAL REPORT

LIST OF TYPICAL QUALITY ASSURANCE RELATED PROCEDURES

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	QAS-2.06 Training and Certification of Lead Auditors in Training and Technical Specialists
	QAS-2.07 Selection, Training, Qualification and Certification of Nondestructive Examination Personnel
IV. Procurement Document Control	QAS-3.01 Procurement Document Review
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VII. Control of Purchased Material, Equipment, and Services	QAS-3.02 Supplier Evaluations
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CONNECTICUT YANKEE QA PROCEDURES

10 CFR 50, APP. B CRITERIA	CONNECTICUT YANKEE QA PROCEDURES	
XI. Test Control	WCM 2.3-8	Review of Test Data
	WCM 2.3-1	Retests/Functional Verification
	WCM 4.3-3	Product Acceptance Test
	WCM 2.3-4	Special Testing
XII. Control of Measuring and Test Equipment	WCM 2.3-6	Control of Measuring and Test Equipment
XIII. Handling, Storage and Shipping	ACP 1.2-13.1	Handling of Material, Equipment, and Parts (MEP)
	WCM 4.2-1	Storage of Material, Equipment and Parts
	WCM 4.2-2	Packaging and Shipping Re- quirements for Material, Parts and Components
XIV. Inspection, Test and Operating Status	WCM 2.2-2	Jumper, Lifted Lead and Bypass Control
	WCM 2.4-1	Equipment Tagging
XV. Nonconforming Materials, Parts, Components, or Services	ACP 1.2-15.1	Nonconformance Reports
XVI. Corrective Action	ACP 1.2-16.1	Plant Information Reports
	ACP 1.2-16.2	Corrective Action Requests NEO 2.18
XVII. Quality Assurance Records	ACP 1.2-17.2	Nuclear Plant Records

CONNECTICUT YANKEE QA PROCEDURES

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CONNECTICUT YANKEE
QA PROCEDURES

WCM 3.1-4 Identification of Radiographs

NORTHEAST UTILITIES WELDING PROCEDURES

10 CFR 50, APP. B CRITERIA	NORTHEAST UTILITIES WELDING PROCEDURES	
I. Organization	AP 700	Organization & Control of Northeast Utilities Welding and Brazing Manual
IX. Control of Special Processes	AP 701	Preparation, Qualification, Approval & Revision of Northeast Utilities Welding Procedures
	AP 702	Control of Welder and Brazer Qualifications
	AP 704	Preparation, Approval, and Revision of Northeast Utilities General Welding Standards
	AP 705	Preparation, Qualification, Approval, and Revision of Northeast Utilities Material Process Procedures
	AP 706	Preparation, Approval, and Revision of Northeast Utilities Technical Guidelines and Standards
	AP 707	Preparation, Approval and Revision of Northeast Utilities Miscellaneous Weld Documents and Information

NORTHEAST UTILITIES PURCHASING BUSINESS PROCEDURES

10 CFR 50, APP. B
CRITERIA

NORTHEAST UTILITIES
PURCHASING BUSINESS PROCEDURES

IV. Procurement Document
Control

BP-3.1 Requisition: Standard and
Repeating

BP-3.3 Purchase Orders

BP-3.4 Changes to Purchase Orders

BP-3.19 Blanket Purchase Orders

NUSCO COMPONENT ENGINEERING SERVICES PROCEDURES

10 CFR 50, APP. B
CRITERIA

NUSCO COMPONENT ENGINEERING
SERVICES PROCEDURES

II. Quality Assurance Program	QCTS-2.10 NTE Section Responsibilities and Conduct of ISI Planning and On-Site Activities for Refueling Outages
V. Procedures, Instructions and Drawings	QCTS-2.11 Reliability Engineering Procedures
IX. Control of Special Processes	QCTS-2.16 Nondestructive Examination Procedures

NUCLEAR FUEL ENGINEERING BRANCH

PROCEDURES

10 CFR 50, APP. B CRITERIA	NFE PROCEDURES	
I. Organization	NFE-1	Preparation, Revision, Issuance, Deletion, and Control of NFE Procedures
II. Design Control	NFE-2	Project Follow, Review, and Documentation for Initial Core and Reload Fuel Campaigns
	NFE-3	Generation and Evaluation of Incore Code Results for QA Category I Applications
	NFE-4	Transmittal of Design Input and/or Results of Design Analysis and Calculations by Memoranda and Reports
V. Procedures, Instructions and Drawings	NFE-1	Preparation, Revision, Issuance, Deletion, and Control of NFE Procedures

SAFETY ANALYSIS BRANCH

PROCEDURES

10 CFR 50, APP. B CRITERIA	SAB PROCEDURES
I. Procedures, Instructions, and Drawings	SAB-1.01 Preparation, Revision, Issuance, Deletion, and Control of SAB Pro- cedures
III. Document Control	SAB-3.01 Communication of PRA Findings to NU Management
	SAB-3.02 Initiation of Projects to Address PRA Findings
	SAB-3.03 Update and Maintenance of PC- Based Plant PRA Models
	SAB-3.04 Transmittal of Design Inputs and Results of Design Analysis and Calculations by Memoranda and Reports
	SAB-3.05 Reporting Requirements Concerning Changes to and Errors in ECCS Evaluation Models or Applications
	SAB-3.06 Initiation, Tracking, and Handling of Design Discrepancies Identified during the Design Basis Reconstruc- tion Effort

NUCLEAR LICENSING DEPARTMENT

PROCEDURES

10 CFR 50. APP. B CRITERIA	NL PROCEDURES	
V. Instruction, Procedures, Drawings	NL-1.01Q	Preparation, Issuance and Control of Nuclear Licensing Department Procedures
VI. Document Control	NL-3.01Q	Nuclear Regulatory Commission Correspondence
	NL-3.03Q	Disposition of NRC and NRC Relat- ed Publications
	NL-3.06Q	Documentation of NL Telephone Conversations
	NL-3.07Q	Regulatory Commitment Actions
	NL-3.08Q	Preparation and Submittal of Special Nuclear Source Material, and By- product Material License Applica- tion
XVII. Quality Assurance Records	NL-3.02Q	Management of Nuclear Power Plant Records
	NL-3.09Q	Integrated Safety Assessment Pro- gram

APPENDIX D

NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM TOPICAL REPORT

REGULATORY GUIDE AND ANSI STANDARD COMMITMENTS

NOTE: The NUQAP is committed to utilize the guidance obtained from the following regulatory documents and their endorsed standards. Exceptions to these positions are listed in Appendix F of this Topical Report.

Appendix B to 10 CFR, Part 50 - Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.

10 CFR 50, Section 50.54, Condition of Licenses.

10 CFR 50, Part 55 - Operator's Licenses and its Appendix A - Requalification Programs for Licensed Operators of Production and Utilization Facilities.

Regulatory Guide 1.8 - I-R - 5/77 - Personnel Selection and Training - Endorses ANSI N18.1 - 1971.

Regulatory Guide 1.28 - 2/79 - Quality Assurance Program Requirements (Design and Construction) Endorses ANSI N45.2-1977.

Regulatory Guide 1.30 - (Safety Guide 30), 8-11-72 - Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electrical Equipment - Endorses ANSI N45.2.4-1972.

Regulatory Guide 1.33 - 2/78 - Quality Assurance Program Requirements (Operation) - Endorses ANSI N18.7-1976/ANS3.2.

Regulatory Guide 1.37 - Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants, 3-16-73 - Endorses ANSI N45.2.1 1973.

Regulatory Guide 1.38 - Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage and Handling of Items for Water-Cooled Nuclear Power Plants, 5/77 - Endorses ANSI N45.2.2 - 1972.

Regulatory Guide 1.39 - Housekeeping Requirements for Water-Cooled Nuclear Power Plants, 9/77 - Endorses ANSI N45.2.3-1973.

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Regulatory Guide 1.58 - Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel, Rev. 1, 9/80 - Endorses ANSI N45.2.6-1978.

Regulatory Guide 1.64 - Quality Assurance Requirements for the Design of Nuclear Power Plants, 6/76 - Endorses ANSI N45.2.11-1974.

Regulatory Guide 1.70 - "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants - LWR Edition" Revision 2, September 1975 is utilized for Connecticut Yankee, Millstone 1, and Millstone 2. Revision 3 has been used in the update process for Connecticut Yankee and Millstone 1 for format and to the nearest extent practical for content. No new analyses have been performed which would be required by Revision 3. Revision 3, November 1978 is utilized for Millstone 3.

Regulatory Guide 1.88 - Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records - 10/76 Endorses ANSI N45.2.9-1974.

Regulatory Guide 1.94 - Quality Assurance Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plant - 4/76 - Endorses ANSI N45.2.5 - 1974 and Section 6.11 of ANSI N45.2.5-1978.

Regulatory Guide 1.116 - Quality Assurance Requirements for Installation, Inspection, and Testing Mechanical Equipment and Systems - 5/77 - Endorses ANSI N45.2.8-1975.

Regulatory Guide 1.123 - Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants - 7/77 - Endorses ANSI N45.2.13-1976.

Regulatory Guide 1.144 - Auditing of Quality Assurance Programs for Nuclear Power Plants - Rev. 1 - 9/80 Endorses ANSI N45.2.12 - 1977.

Regulatory Guide 1.146 - Qualification of Quality Assurance Program Audit Personnel For Nuclear Power Plants - 8/80 Endorses ANSI N45.2.23-1978.

Regulatory Guide 1.152 - "Criteria for Programmable Digital Computer System Software in Safety Related System of Nuclear Power Plants," November 1985 - Endorses ANSI/IEEE-ANS 7.4.3.2 - 1982.

APPENDIX E

NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM TOPICAL REPORT

GLOSSARY OF QUALITY ASSURANCE TERMS

Accept As Is - (also known as "Use-As-Is") A disposition which may be imposed for a nonconformance when it can be established that the discrepancy will result in no adverse conditions and that the item under consideration will continue to meet all engineering functional requirements including performance, maintainability, fit and safety.

As Built Documents - Documents which accurately describe the condition actually achieved in a system, structure, or component. These documents include: material certification and test data; reports of inspections, examinations, and test results; drawing, specifications, procedures, and instructions; and records of nonconformance and their resolution.

Audit - A formal, documented activity performed in accordance with written checklists or procedures to verify by evaluation of objective evidence that a quality assurance program has been developed, documented, and implemented in accordance with applicable requirements.

Augmented Quality - Nonsafety related items for which a design basis or regulatory commitment has been made. The augmented quality items are included within the scope of quality assurance. These items fall under Nuclear Indicators such as FPQA, RWQA, ATWS, and SBOQA.

Calibration - The process by which measuring and test equipment are checked against standards of known higher accuracy and adjusted as necessary to ensure their compliance with designated specifications.

Category I - Designation given to systems, structures, and components of a Northeast Utilities nuclear power plant that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public.

Category I Systems, Structures, and Components - Defined in Appendix A.

Cleaning - Those actions performed to maintain an item in accordance with cleanliness requirements.

Commercial Grade Item (CGI) - The Procurement Classification applied to an item/service/computer software intended for use in a Nuclear Safety Related Application that are:

1. not subject to design specifications, or requirements that are unique to facilities or activities licensed or regulated by the NRC.
2. used in applications other than facilities or activities licensed or regulated by the NRC.

3. ordered from a manufacturer/supplier on the basis of a published product/service description, catalog, product/service bulletin, etc.

Commercial Grade Survey - Activities conducted by the purchaser to ascertain and verify that a supplier, or manufacturer of commercial grade items, controls the technical and quality characteristics determined to be critical for satisfactory performance of specifically designated commercial grade items, as a method to accept those items for safety-related use.

Condition-Adverse to Quality - Failures, malfunctions, deficiencies, deviations, defective materials and equipment, and nonconformances.

Contractor - Any organization under contract for furnishing items or services. It includes the terms Vendor, Supplier, Subcontractor, Fabricator and subtier levels of these where appropriate. The Nuclear Steam Supply System Supplier (NSSS Supplier) is included in this category.

Corrective Action - Action taken to correct conditions adverse to quality.

Deficiencies - Departures from specified requirements.

Department - The use of the word department, throughout the NUQAP Topical Report, can refer to any portion of the NUSCO/NUPOC organization (i.e., Group, Division, Department, Branch, Section, or Unit, as applicable).

Departmental Measuring and Test Equipment List - A list of all departmental measuring and test equipment in the departmental calibration program.

Design - Technical and management processes which lead to and include the issuance of design output documents such as drawings, specifications, and other documents defining technical requirements of systems, structures, and components.

Design Changes - Changes in drawings and specifications that define the design of systems, structures, and components of nuclear power plants.

Design Documents - The drawing, calculation, specification, or other document(s) that define the Technical requirements of systems, structures, or components.

Design Phase/Construction Phase/Preoperational Phase - Refers to work phase prior to the issuance of operating license.

Drawing Change Request (DCR) - A document used to initiate and control requests for revisions to generating plant drawings which exist in the General Records Information Tracking System (GRITS) (i.e., having a previously assigned Northeast Utilities Service Company (NUSCO) drawing number).

Engineer-Constructor - The principal organization contracted by NUSCO that performs the overall engineering, procurement, construction, and installation of systems, structures, and components of a nuclear power plant.

Engineering Service Organization - Organizations that provide services such as analysis, testing, computer software, and inspection.

Handling - An act of physically moving an item by hand or by mechanical machinery, but not including transport modes.

Identification - A means by which material, equipment and parts can be traced to their associated documentation through the use of heat numbers, lot numbers, part numbers, serial numbers, or other appropriate means.

Item - Any level of unit assembly, including structures, systems, subsystems, subassembly, component, part or material.

Inspection - A phase of quality control which, by means of examination, observation, or measurement, determines the conformance of material, supplies, components, parts, appurtenances, systems, processes, structures, or services to predetermine quality requirements.

Inspection Status - Identification of material, equipment, and parts that have completed inspection, either acceptable or unacceptable.

Life Records - Those quality documents that are maintained for the lifetime of the in-service nuclear power plant or for the life of the particular component or part. Life records are those which would be of significant value in meeting one or more of the following criteria:

- (1) demonstrating capability for safe operation.
- (2) maintaining, reworking, repairing, replacing or modifying the item.
- (3) determining the cause of an accident or malfunction of an item.
- (4) providing required base line data for in-service inspection.

Measuring and Test Equipment - Those instruments, gages, tools, fixtures, reference and transfer standards, nondestructive test equipment, and measuring devices used during inspection and testing to determine that the measuring and test parameters comply with appropriate requirements in specifications and drawings.

Nonconformance - A deficiency in characteristic documentation or procedure which renders the quality of an item unacceptable or indeterminate.

Non-Life Records - Those quality documents that are maintained for a specific period of time other than the lifetime of the in-service nuclear power plant or the particular component or part.

Northeast Utilities (NU) - A public utility holding company which owns Northeast Utilities Service Company and The Northeast Nuclear Energy Company and through its operating subsidiaries has a controlling interest in The Connecticut Yankee Atomic Power Company.

Northeast Utilities Service Company (NUSCO) - A wholly owned subsidiary of Northeast Utilities that provides engineering, procurement, construction, and quality assurance services for Northeast Utilities relating to design, construction, and preoperational testing of nuclear power plants and major modifications thereto.

Northeast Utilities Quality Assurance Program (NUQAP) - Consist of the NUQAP Topical Report, Quality and Assessment Services Department Procedures and other Northeast Utilities Group / Division / Department / Branch / Section quality procedures.

Nuclear Document Services - The organization responsible for establishing the Corporate Nuclear Plant Records Program which is implemented at each Nuclear Document Services Facility.

Nuclear Grade - The procurement classification applied to all materials and services intended for items listed as Cat. I in the MEPL. These may require validating documentation such as CMTR, Certificate of Conformance, Certificate of Compliance, Personnel Qualifications, etc., as specified by codes or standards, and have been designed/qualified for a nuclear application. Nuclear Grade items are manufactured/qualified under a 10CFR50, Appendix B program, with the supplier responsible for 10CFR, Part 21. The supplier should be approved and listed in the ASL.

Nuclear Plant Operating Companies (NUPOC) - Northeast Utilities Companies which perform preoperational testing of systems, structures and components of nuclear power plants, performs major modifications during the design and construction phases and operates the nuclear power plants. The companies which comprise NUPOC are the Connecticut Yankee Atomic Power Company and the Northeast Nuclear Energy Company.

Nuclear Document Services Facilities (NDSF) - A facility which has been established for the purpose of handling Nuclear Power Plant records in accordance with the Nuclear Records Program.

NUSCO Quality Assurance Contractor, Supplier, and Engineering Service Organization List - A list identifying the approval status of the quality assurance programs of contractors, suppliers, and engineering service organizations.

"Objective Evidence" - Any statement of fact, information, or record, either quantitative or qualitative, pertaining to the quality of an item or service based on observation, measurements, or tests which can be verified.

Operational Phase - Refers to work phase after plant has received its operating license.

Preservation - Those actions performed to maintain an item in its original and usable condition.

Procedures and Instructions - Documents that specify how an activity is to be performed. They may include methods to be employed; material, equipment, or parts to be used; and a sequence of operations.

Procurement Documents - Letters of intent, contracts, purchase requisitions, and purchase orders, including drawings, specifications, and instructions which provide contractual basis for services,

supply of equipment and parts, and installation, inspection, and testing. They define the requirements which items and services must meet in order to be acceptable to the purchaser.

Product Acceptance Test - Activities conducted as part of the receiving or source inspection process to verify acceptability of one or more critical characteristics of the item being inspected.

Project/Plant Engineer - A NUSCO / NUPOC employee assigned the responsibility to coordinate the engineering activities addressed in NUQAP.

Purchased Material, Equipment, and Parts (MEP) - Items procured for installation in nuclear power generating facilities systems, structures, and components, and items procured as construction and Power Generating Facility (PGF) spare MEP for potential installation of those systems, structures, and components.

Purchased Service - Services provided by a contractor or consultant on a QA requisition when activities are performed under a quality assurance program other than the NUQAP.

Quality Assurance Records - Any record pertaining to the quality of material, equipment, parts, processes, or operations relating to systems, structures and components which are founded on observations, measurements, or tests which can be fully checked or verified. Such statements may be recorded on a written or preprinted document or tag. The statements are authorized with a signature or stamp identifiable to the person making the statement of fact.

Quality Activities - Activities involving parts, components, structures, design documents, and services for Category I, Radwaste QA (including Radwaste Packaging and Shipping), ATWS, FPQA, EEQ, and other regulated programs in accordance with the requirements mandated by those regulations. Appendix A, of the NUQAP Topical, defines Category I program controls.

Quality Procedures - Those procedures which implement the requirements of the NUQAP Topical Report. Appendix C lists typical Quality Related Procedures that are reviewed and approved by the Quality and Assessment Services Department.

Repair - A disposition applied to nonconforming material, equipment, and parts that are unsuitable for their intended purpose which are modified by the use of additional operations and / or processes so that they are suitable for their intended purpose but may not meet all specified requirements.

Retest - A test conducted prior to operation following installation inspections of work associated with maintenance and refueling to verify that systems, structures, and components will function satisfactorily when in operation. A retest may also be performed when original test results are invalidated.

Return to Supplier - A disposition applied to nonconforming material, equipment, and parts that are unsuitable for their intended purpose but which are feasible to repair or rework at a supplier's facility.

Rework - A disposition applied to nonconforming material, equipment, and parts that are unsuitable for their intended purpose due to incomplete operations or variations from original engineering

requirements but which are modified through the use of additional operations or processes to meet all specified requirements.

Safety Related Systems and Components - Systems and components required to shut down the reactor, mitigate the consequences of postulated accidents, or maintain the reactor in a safe shutdown condition.

Significant Condition - A condition adverse to quality involving actual or potential consequences that have a serious impact on public or personnel health and safety or plant operations, and requiring a root cause evaluation to determine corrective action to prevent recurrence.

Special Processes - An operation performed under controlled conditions in accordance with special requirements utilizing qualified procedures, equipment, and personnel. These special processes may include, but are not limited to welding, brazing, soldering, cleaning, heat treating, and nondestructive testing.

Station Blackout - *The complete loss of alternating current electric power to the essential and non-essential switchgear buses in a nuclear power plant. It involves the loss of offsite power concurrent with turbine trip and failure of the onsite emergency ac power system, but not the loss of available ac power to buses fed by station batteries through inverters or the loss of power from alternate ac sources.*

Storage - The act of holding items at the construction site or in an area other than its permanent location in the plant.

Supplier - Organizations that provide material, equipment, parts, and services, or computer software.

Surveillance - A documented record of the observation of work operations performed at NUSCO / NUPOC or vendor's site to assure compliance with applicable codes, standards, specifications, procedures, drawings, and procurement documents. Surveillances are not performed to a preplanned checklist.

Test and Operating Status - Identification of material, equipment, and parts that are ready for test or operation, or an existing stage of a test operation.

Testing - The determination or verification of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating conditions.

APPENDIX F

NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM TOPICAL REPORT

Program Exceptions

1. ANSI N45.2.9, states in part, "structure, doors, frames, and hardware should be Class A fire-related with a recommended four-hour minimum rating." *The two record storage vaults at NNECO have a two-hour rating and the record vault door and hardware at CYAPCO has a three hour rating.*

Both NNECO and CYAPCO's vaults are used for storage of documentation that is unsuitable for filming or awaiting filming.

A records organization exists along with written procedures addressing the control of quality assurance records.

2. ANSI N18.7-1976, paragraph 4.3.2.3 "Quorum" states in part: "A quorum for formal meetings of the (Independent Review) Committee held under the provisions of 4.3.2.2 shall consist of not less than a majority of the principals, or duly appointed alternates..."

A quorum of the Nuclear Review Board shall consist of the Chairman or Vice Chairman and at least enough members to constitute a majority of the assigned members. No more than a minority of the quorum *shall have line responsibility for operation of one of Northeast Utilities' nuclear units. No more than two alternates shall be appointed voting status at any meeting in fulfillment of the quorum requirements.*

3. ANSI N45.2.9-1974, paragraph 1.4, definition of "Quality Assurance Records" states in part: "For the purposes of this standard, a document is considered a quality assurance record when the document has been completed."

Northeast Utilities has developed the following alternative definition to provide guidance during the interim period from the time a document is completed until it is transmitted to the Nuclear Document Services Facility:

"A record is considered a working document until it is transmitted to the appropriate Nuclear Document Services Facility (NDSF) at which time it is designated as a Quality Assurance Record. The following maximum time limits are established for the transmittal of working documents to the NPRF:

Operations Documents - Documentation generated during Plant Operations may be maintained, as needed, by operating plant departments, for up to one year.

New Construction or Betterment Documents - Documents which evolve during new construction or betterment projects shall be transmitted to NDSF within 90 days of

completion of a new construction project or turnover of a betterment project or plant operations.

Procurement Documents - Inspection/Surveillance/Audit Reports generated during vendor oversight activities which are used to maintain vendor status for current and future procurements may be maintained, as needed, by the Quality and Assessment Services Department, for up to three years.

All Other Working Documents - All other working documents shall be transmitted to NPRF within 6 months of their receipt or completion."

The requirements of ANSI N45.2.9-1974 do not apply to these "working documents" based on paragraph 1.1 of the ANSI standard which states:

"It (ANSI N45.2.9) is not intended to cover the preparation of the records nor to include working documents not yet designated as Quality Assurance Records."

4. Regulatory Guide 1.64 - 6/76, the Regulatory position states, in part, "It should not be construed that such verification constitutes the required independent design verification." Northeast Utilities has developed the following alternative to allow for adequate independent design verification:

This review may be performed by the originator's Supervisor, only if the Supervisor:

Did not specify a singular design approach;

Did not establish the design inputs or did not rule out certain design considerations;

Is the only individual in the organization competent to perform the review.

Where the Supervisor performs the design review, the next level of management shall fulfill the Supervisor's responsibilities.

5. ANSI N45.2.13 - 1976, paragraph 10.3.4, states in part, "Post-Installation Test requirements and acceptance documentation (should) shall be mutually established by the purchaser and supplier." Involvement by the supplier in establishing Post-Installation Test requirements and acceptance documentation is requested only when it is deemed necessary and proper by the responsible engineering organization.

Northeast Utilities no longer has any nuclear plants under construction. As a result, most procurements are made for spare parts from suppliers who are not the original equipment manufacturer. In these cases, the supplier may have little or no understanding or knowledge of either the operation of the system the component is to be installed in, or applicable Post-Installation Test requirements and acceptance documentation. As such, Northeast Utilities assumes responsibility for establishing Post Installation Test requirements and acceptance documentation.

6. ANSI N45.2.2-1972, paragraph 1.2, states in part that, "The requirements of this standard apply to the work of any individual or organization that participates in the packaging, shipping, receiving, storage, and handling of items to be incorporated into nuclear power plants."

Since a portion of Northeast Utilities procurement activities involve commercial suppliers which do not fully comply with the requirements of ANSI N45.2.2, Northeast Utilities Quality and Assessment Services organization verifies through source inspections, receipt inspection, and/or survey activities that the quality of the materials, items, components or equipment is preserved by those suppliers to the extent that packaging, shipping, storage and handling methods are employed which are commensurate with the nature of the product.

7. ANSI N45.2.12-1977, paragraph 4.5.1, states in part "The audited organization shall provide a follow up report stating the corrective action taken and the date corrective action was completed."

Currently at Northeast Utilities the Quality and Assessment Services Department (QAS) does the follow up of corrective action by the audited organization. QAS is required by procedure to follow up on each item to completion. This includes verifying corrective action, and documenting their completion date.

Since QAS performs this function it would be redundant for the audited organization to provide the follow up report stating the corrective action taken and the date it was completed.

8. *ANSI N18.1-1971, paragraph 4.2.2, states in part "The Operations Manager shall hold a Senior Reactor Operator's license.*

NU has developed an alternative to this requirement for the Millstone Unit No.3 license which allows the Operations Assistant to hold the SRO license if the Operations Manager has been certified in accordance with Section 4.2.2 of ANSI/ANS 3.1-1987.