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NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM (NUQAP)  
TOPICAL REPORT

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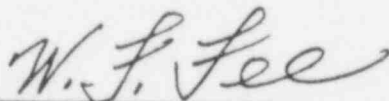
POLICY STATEMENT  
NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM  
TOPICAL REPORT

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 and operation of our nuclear facilities.

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

The program has been established to comply with the requirements of Title 10, Code of Federal Regulations, Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants." It is also responsive to selected NRC Regulatory Guides as well as ANSI N45.2.

The development and overall responsibility for this Quality Assurance Program lies with the NUSCO Executive Vice President - Engineering and Operations. Corporate authority is delegated to the NUSCO Manager, Quality Assurance for the preparation and administration of the Quality Assurance Program. Individual group Vice Presidents 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 NUSCO Manager, Quality Assurance. Any revisions or additions shall be approved by affected Departments prior to the incorporation of such changes into the program.



W. F. Fee  
Executive Vice President - Engineering and Operations  
Northeast Utilities

INTRODUCTION  
NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM  
TOPICAL REPORT

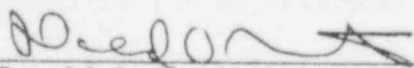
This Northeast Utilities Quality Assurance Program (NUQAP) Topical Report contains the quality assurance requirements which are relative to the safety of the nuclear power plant. The Topical Report consists of the following three parts:

1. Introduction, which delineates the purpose of the Topical Program, and summarizes its scope and applicability.
2. Quality Assurance Program (QAP), which summarizes the quality assurance approach, through eighteen criteria, to activities related to Category I material, parts, components, systems and services.
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 general public, from the conceptual phase through the operations phase of nuclear power plant life.

The NUQAP establishes controls which are applicable to systems, structures, components, material, parts and services identified as safety related and listed for each nuclear power plant and supplemented, if applicable, for plant betterment projects. 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 safety related 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 related procedures and revisions thereto are reviewed by and concurred with by the applicable NUSCO/NUPOC Quality Assurance Organization, 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 safety related systems, structures, components and services for nuclear power plants.

  
Donald O. Nordquist  
NUSCO Manager, Quality Assurance

## 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 sole owners of Millstone Units Number One and Two with 81% and 19% ownership respectively. They are the principal owners in Millstone Unit Number Three with 65% ownership and, by contract have the authority to make all of the decisions affecting the design, procurement, construction and operation of that unit. This decision making authority would be similar for any future units.

The NU Companies 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. This is also illustrated in Figure 1.1.

Northeast Nuclear Energy Company (NNECO) and CYAPCO are the operating companies established to operate their respective facilities. NNECO is delegated the responsibility for operating the Millstone Units by the owners. NNECO in turn has contracted for the services of NUSCO for the design and construction management of all of the units at Millstone and may solicit technical support during plant operations. 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, 1.4 and 1.5 provides services such as engineering, quality assurance, accounting, planning and procurement for the NU system operating companies where these services can be more efficiently and economically performed on a system-wide basis.

The NUPOC and NUSCO interrelationship shown in Figure 1.6, for quality related activities, indicates how conflicts are resolved. As indicated, the Senior Vice President-Nuclear Engineering and Operations - NUSCO is also the Senior Vice President-Nuclear Engineering and Operations - NUPOC. He resolves disputes arising from a difference of opinion between Quality Assurance personnel and other department personnel.

### 1.2 GENERAL (Refer to Figure 1.2)

- 1.2.1 The President and Chief Operating Officer of NU is also the President and Chief Operating Officer of NUSCO and directs specified nuclear related activities within NU. He has the ultimate responsibility for the establishment

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and execution of the NU Quality Assurance Program (NUQAP). Reporting to the President and Chief Operating Officer is the Executive Vice President-Engineering and Operations, the Senior Vice President-Administrative Services, and the Vice President - Information Resources Group. Authority for the establishment and execution of the NUQAP is delegated to the NUSCO Executive Vice President-Engineering and Operations (see Para. 1.2.3).

- 1.2.2 The NUSCO Senior Vice President-Administrative Services is responsible for procurement activities within NU. The System Director-Purchasing and Materials Management reports to the Senior Vice President-Administrative Services and is responsible to ensure that procurement requirements of the NUQAP are carried out within his division (see Para. 1.5.1).

The Vice President - Information Resources Group is responsible for all information storage, handling and delivery systems at NU. The following Director s/ Manager report to the Vice President-Information Resources Group:

- a. Director-Engineering Computer Systems and Technical Support (see paragraph 1.5.2.1).
- b. Director-Business Computer Applications and Data Center Operations (see paragraph 1.5.2.2).
- c. Director-Information Resources Administration (see paragraph 1.5.2.4).
- d. Manager-Information Resources Planning and Control (see paragraph 1.5.2.3).

- 1.2.3 The NUSCO Executive Vice President-Engineering and Operations is also the Executive Vice President-Engineering and Operations for NUPOC. He is responsible for engineering, construction, operation, maintenance, modification and quality assurance within NU. Specific nuclear related responsibilities rest with the following individuals who are responsible for ensuring that the requirements of the NUQAP are carried out within their respective groups.

- a. Senior Vice President-Nuclear Engineering and Operations (see Para. 1.2.4).
- b. Vice President - Transmission and Distribution Engineering and Operations (see Para. 1.5.3).

1.2.4 The NUSCO Senior Vice President-Nuclear Engineering and Operations is also the Senior Vice President-Nuclear Engineering and Operations for NUPOC. He is responsible for nuclear engineering, construction, operation, maintenance, modification and quality assurance.

1.2.4.1 The responsibilities of the Senior Vice President - Nuclear Engineering and Operations relating to the Quality Assurance Program are described in the Nuclear Engineering and Operations Policies and Procedures Manual. He has contact with quality assurance activities through the receipt of various documents such as: Weekly progress reports, Nuclear Review Board Meeting Notes and other reports, and audits related to NUPOC nuclear plant operations activities.

1.2.4.2 The Senior Vice President-Nuclear Engineering and Operations 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 Related Activities, Auditing, Management Responsibilities, and the NUQAP Topical Report.

1.2.4.3 The following division Vice Presidents report to the Senior Vice President-Nuclear Engineering and Operations:

- a. Vice President-Generation Engineering and Construction (see Para. 1.4.1)
- b. Vice President-Nuclear and Environmental Engineering (see Para. 1.4.2)

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- c. Vice President-Nuclear Operations (see Para. 1.4.3)

1.3 RESPONSIBILITIES (Refer to Figure 1.6)

- 1.3.1 Overall responsibility for the NUQAP is assigned to the NUSCO Manager-Quality Assurance who reports to the Vice President-Nuclear and Environmental Engineering through the Director-Nuclear Engineering and Operations Services. These responsibilities include: direction 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 Overall responsibility for the implementation of the NUQAP Topical Report at the NUPOC Nuclear Plant is assigned to a NUPOC Superintendent. Each NUPOC Quality Assurance Supervisor, reporting to the appropriate NUPOC Superintendent, is responsible for verifying implementation of the requirements of the NUQAP Topical Report.
- 1.3.3 The head of each NU department or organization performing quality related activities is responsible for:
- a. Administering those activities within his organization which are quality related as 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 his organization who perform quality related activities;
  - d. Planning, selecting and training personnel to meet the requirements of the NUQAP Topical Report;
  - e. Performing and coordinating quality matters within his department and interfacing with NUSCO/NUPOC Quality Assurance on quality related matters.
- 1.3.4 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.
- 1.3.5 The responsibility, authority, and organizational relationship for performing quality related activities within each organization is established and delineated in

the NU Organizational Charts, jurisdictional statements, and written job or functional descriptions.

#### 1.4 NU PARTICIPATING GROUPS - NUSCO NUCLEAR ENGINEERING AND OPERATIONS GROUP

The Senior Vice President-Nuclear Engineering and Operations Group is responsible for providing and directing projects and for providing technical and support personnel to meet responsibilities during engineering, construction, preoperational and startup testing, modification, and operation of nuclear power plants.

The Nuclear Engineering and Operations Group is divided into three divisions:

- a) Generation Engineering and Construction (Figure 1.3);
- b) Nuclear and Environmental Engineering (Figure 1.4); and
- c) Nuclear Operations (Figure 1.5).

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

1.4.1 The Vice President-Generation Engineering and Construction is responsible for engineering, design, and construction activities for new NU generating facilities and modification, backfit, and betterment projects for existing NU generating facilities. The following department heads report to him: (See Figure 1.3)

1.4.1.1 The Director-Generation Engineering and Design Department is responsible to provide technical and support personnel to new generation facility projects directed by the Generation Construction Department or the Project Manager - Millstone Unit 3 and to provide Project Engineers and support for betterment projects in existing generating facilities directed by the Generation Projects Department. Technical support is also provided for operations and maintenance activities of the existing generating facilities. The Generation Engineering and Design Department provides expertise for systems, specifications and procurement of equipment and material; it provides design expertise for the preparation and maintenance of design documents for generating facilities. These Generation Engineering and Design Department activities are performed by personnel within the following department branches:

- a. Mechanical Engineering;
- b. Electrical Engineering;
- c. Civil Engineering;
- d. Engineering Design.

1.4.1.2 The Director-Generation Construction Department is responsible for the following areas in new generation facility projects: 1) the direction and coordination of processes and assurance of necessary resources for construction; and 2) coordination of startup activities with NUPOC. For existing generation facility betterment projects; and when assigned, for new generation projects; the department is responsible for providing construction management and quality control services. The department consists of:

- a. New Site Construction to oversee the construction and quality related activities of Engineering Constructors for new generation facilities;
- b. Betterment Construction to oversee the construction and quality related activities of construction contractors for betterment work on existing generation facilities.
- c. NUSCO Construction Quality Control to perform quality control functions on items affecting quality, such as; inspection, receipt control coordination among applicable NU departments and outside organizations (see Figure 1.6).

1.4.1.3 The Director-Generation Projects Department is responsible to provide project management and coordination of projects involving existing generation facilities performed by NUSCO for the NU operating companies. This activity includes but is not limited to projects involving betterment and backfit modifications made to existing generation facilities. The coordinating function includes cost and schedule control of projects and outage planning and scheduling for the operating companies. Sections of this Department, which perform quality related activities, are:



- a. Generation Projects-Millstone Unit No. 1
- b. Generation Projects-Millstone Unit No. 2
- c. Generation Projects-Connecticut Yankee
- d. Cost and Schedule Control

1.4.1.4 The Project Manager-Millstone Unit 3 is responsible to direct and/or coordinate the processes and assure the necessary resources, construction management, cost and schedule control, and quality control for the licensing, engineering, construction, testing and startup of the new nuclear generating facility.

1.4.2 The Vice President-Nuclear and Environmental Engineering is responsible for Nuclear Engineering and Operations Services (including: Quality Assurance, Reliability Engineering, Generation Facilities Records, Nuclear Materials and Chemistry, and Nuclear Safety Engineering); Environmental Programs; Nuclear Engineering (including: Radiological Assessment, Reactor Engineering, Licensing, and Nuclear Fuel); and Nuclear Training for new and existing nuclear generation facilities. The following department Directors report to the Vice President-Nuclear and Environmental Engineering (see Figure 1.4):

1.4.2.1 The Director-Nuclear Engineering and Operations Services is responsible to direct and coordinate the support services as required for new nuclear and betterment projects and for NUSCO/NUPOC Departments during the design, construction and operation of nuclear power plants. He has reporting to him the following managers/supervisors:

- a. The NUSCO Manager, Quality Assurance is responsible for the preparation and issuance of the NUQAP Topical Report, and verification of the implementation of its requirements by applicable NUSCO/NUPOC Departments. Verification is performed by a planned program of audits inspections and surveillances by the quality assurance sections of design & operations, procurement, and construction. 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 assure all necessary quality affecting activities are performed and is 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 provide solutions, and to verify their implementation. He maintains an overview of NUPOC quality assurance activities through a planned and systematic program of audits and surveillances.

The following supervisors and their staffs report to the NUSCO Manager, Quality Assurance (see Figure 1.6):

1. Supervisor, Design and Operations Quality Assurance.
2. Supervisor, Construction Quality Assurance.
3. Supervisor, Procurement Quality Assurance.

The Supervisor, Design and Operations Quality Assurance assures that Quality Assurance responsibilities; as they relate to the design, operational phases, and betterment projects of nuclear power plants; are being implemented.

The Supervisor, Construction Quality Assurance assures that Quality Assurance responsibilities; as they relate to onsite Construction and the preoperational phase of new Nuclear power plants; are being implemented.

The Supervisor, Procurement Quality Assurance assures that Quality Assurance responsibilities, as they relate to procurement activities for the nuclear power plants, are being implemented.

These supervisors have positions which are free from non-Quality Assurance duties and

can give full attention to assure that the Quality Assurance Program is being effectively implemented and have appropriate organizational responsibilities and authority to exercise proper control over the Quality Assurance Program. They have the responsibility and authority to identify quality problems, to provide solutions, and to verify their implementation. Stop work orders initiated by NUSCO Quality Assurance personnel are delineated in writing with the concurrence of a NUSCO Supervisor, Quality Assurance and approved by the NUSCO Manager, Quality Assurance.

The responsibilities and duties of all NUSCO Quality Assurance personnel are described in NUSCO implementing procedures and job descriptions.

- b. Manager, Generation Facilities Records is responsible to provide guidance by the establishment of a corporate Nuclear Plant Records Program and Manual for the effective operation of all Northeast Utilities Nuclear Plant Records Facilities to meet corporate nuclear records objectives.
- c. Manager, Reliability Engineering is responsible to assure that proper reliability levels are included in the design, construction and operation of nuclear generating facilities.
- d. Manager, Nuclear Materials and Chemistry is responsible to provide evaluations of nuclear plant coolant chemistry and materials and to implement controls in accordance with the Nuclear Plant Water Chemistry Program.
- e. Manager, Nuclear Safety Engineering is responsible to provide nuclear safety engineering evaluations of operational experience at NU and Industry Nuclear Power Plants.

1.4.2.2 The Director-Environmental Programs is responsible for the planning, design, coordination and supervision of all scientific engineering

studies of problems related to environmental impacts of NU activities affecting proposed and operating generation facilities. He has, reporting to him, the following Managers/Supervisors:

- a. Manager, Earth Sciences is responsible for the preparation of atmospheric dispersion calculations required to estimate dose to the public from both routine releases and postulated accidents. He provides criteria and studies to assure that such calculations reflect state-of-the-art techniques and adequately support the corporate program for Nuclear Emergency Preparedness.
- b. Supervisor, Ecological Assessments provides statistical support to the NU Environmental Lab to ensure state-of-the-art statistical methods and techniques in all areas of the ecological monitoring programs.
- c. Manager, NU Environmental Laboratory directs ecological impact assessment studies for the operating generation facilities.

1.4.2.3 The Director-Nuclear Engineering is responsible to direct and coordinate the activities of Radiological Assessment, Generation Facilities Licensing, Reactor Engineering and Nuclear Fuel. The following managers report to Director-Nuclear Engineering:

- a. The Manager-Radiological Assessment is responsible to provide technical services in radiological matters relating to nuclear plant design and operation in new nuclear and betterment projects. It includes the studies of radiation exposure to plant personnel and the general public, liaison with regulatory agencies, and responsibility for the corporate program for Nuclear Emergency Preparedness.
- b. The Manager-Generation Facilities Licensing is responsible for corporate liaison with the Nuclear Regulatory Commission and coordination of responses to regulatory requirements for new nuclear projects and changes to operating facilities. This

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includes the preparation and coordination of documents for submittal to various regulatory agencies.

- c. The System Manager-Reactor Engineering is responsible to provide reactor engineering, NSSS safety analysis, probabilistic risk assessments, fuel design, and reactor core analysis and performance evaluation services for new nuclear projects, betterment projects, and operations of nuclear generation facilities. This includes services during reload of nuclear reactor cores, direction for optimal operations of reactor cores, evaluation of design and analysis of reactors, and NSSS transient evaluations.
- d. The Manager-Nuclear Fuel is responsible for the planning, scheduling and coordination of the nuclear fuel supply requirements for proposed and operating nuclear generation facilities. This includes contract engineering for technical administration of fuel contracts and technical support for the procurement of all elements of the nuclear fuel cycle, the handling of fuel removed from operating facilities, and determination of nuclear fuel costs.

1.4.2.4 The Director-Nuclear Training is responsible for all Nuclear Training and Training Evaluation activities. The Department consists of the Connecticut Yankee, Millstone, and the Berlin Nuclear Training Organizations.

1.4.3 The Vice President-Nuclear Operations is responsible for plant modifications, refueling, maintenance and operation of operating nuclear generation facilities; and for controlling and directing the preoperational and startup test program for new nuclear projects. The division consists of a Nuclear Operations Engineering staff and the NUPOC organizations (see Figure 1.5).

1.4.3.1 The Supervisor - Nuclear Operations is responsible for the coordination of activities between the NUSCO Engineering personnel and the NUPOC personnel. An engineer is assigned to each NUPOC operating nuclear generating facility to perform the coordination of the activities.



1.4.3.2 NUPOC Station Superintendents (Millstone and Connecticut Yankee) are responsible for the operation, maintenance, plant modifications, refueling and services of operating nuclear generation facilities and controlling and directing the preoperational and startup test programs for new nuclear projects. They provide operational input to the Project Engineers for the design of new nuclear and operating plant betterment projects.

- a. NUPOC Station Services Superintendents (Millstone and Connecticut Yankee) report to the individual Station Superintendents and are responsible for the service departments of each station such as Security, Health Physics, Chemistry, Stores, Nuclear Records and Quality Assurance (see Figure 1.6).
- b. At the Millstone Station only, the Quality Services Supervisor reports to the Station Services Superintendent and has responsibility for the areas of Stores, Records, and Quality Assurance (see Figure 1.6).
- c. The Millstone Quality Assurance Supervisor reports to the Quality Services Supervisor. The Connecticut Yankee Quality Assurance Supervisor reports to the CY Station Services Superintendent (see Figure 1.6). The Quality Assurance Supervisors are responsible for the verification of the implementation of the NUQAP requirements in the operating nuclear generation facilities and in new nuclear projects commencing at system turnover. They provide nuclear generation facility management and the NUSCO Manager, Quality Assurance with objective evidence of the implementation of the Quality Assurance Program within the facility. Their duties and organizational positions are described in NUPOC Procedures.

They have the authority, organizational freedom, and are sufficiently removed from undue cost and schedule influences to perform quality assurance functions effectively including responsibilities to:

- (1) Stop unsatisfactory work and control further processing, delivery or installation of nonconforming materials as delineated in writing;
- (2) Identify quality problems;
- (3) Initiate, recommend or provide solutions; and;
- (4) Verify implementation of solutions.

The Millstone and Connecticut Yankee Quality Assurance organizations routinely attend and participate in daily plant work schedules and status meetings to assure they are kept aware of day-to-day work assignments throughout the plant. This also assures that there is adequate Quality Assurance coverage relative to procedural and inspection control, acceptance criteria, and Quality Assurance staffing and qualification of personnel to carry out Quality Assurance assignments for safety related activities.

## 1.5 OTHER NU PARTICIPATING GROUPS

### 1.5.1 ADMINISTRATIVE SERVICES

The System Director-Purchasing and Materials Management is responsible to the Senior Vice President-Administrative Services for procurement activities within NU. Reporting to the System Director-Purchasing and Materials Management, are several Purchasing Directors and Managers responsible for:

- a. The procurement of materials and services from qualified suppliers in accordance with predetermined commercial, technical, and quality requirements;
- b. Issuing Purchase Orders/Contracts and changes thereto;
- c. Maintaining traceability of purchasing records from NUSCO/NUPOC;
- d. Processing of purchase requisitions through to preparation for payment for the purchased item.

The System Director-Purchasing and Materials Management controls quality related purchasing procedures.

1.5.2 INFORMATION RESOURCES GROUP (See Figure 1.7)

The Vice President - Information Resources Group is responsible for all information storage, handling and delivery systems at NU.

1.5.2.1 The Director - Engineering Computer Systems and Technical Support is responsible for:

- a. The design, coding and implementation of computer systems in support of engineering and scientific functions at NU.
- b. The initial supply, life-cycle support and replacement of NU process computer systems including the nuclear plant computers and various special purpose systems.
- c. Mainframe Computer System technical support, which includes all associated teleprocessing and distributed processing networks.

1.5.2.2 The Director - Business Computer Applications and Data Center Operations is responsible for:

- a. The design, coding and implementation of all computer systems in support of business related functions at NU.
- b. The operation of all NU Data Centers.

1.5.2.3 The Manager - Information Resources Planning and Control is responsible for:

- a. Evaluating new and emerging technologies to determine their applicability to NU and their impact on strategic directions.
- b. Coordinating all Information Resources Group Software Quality Engineering activities including:
  1. Development of software engineering standards detailing policies and procedures governing the development of computer software.
  2. Identifying minimum documentation levels for all software requirements specifications, design descriptions,

verification plans and verification reports.

3. Development of computer based systems for automated auditability and traceability, including source code libraries, object code libraries and executable load modules.
4. Application and review of software products which ensure traceability and auditability of quality-related computer programs.
5. Development of software system test plans.
6. Development of training and indoctrination programs in software engineering.
7. Monitoring compliance with all Information Resources Group Software Engineering standards.
8. Identifying deficiencies with existing Information Resources Group policies and standards relative to this NUQAP topical report.

1.5.2.4 The Director-Information Resources Administration is responsible for:

- a. Ensuring that data retention and ownership requirements are followed.
- b. Ensuring data integrity.
- c. Setting policy for data standardization.
- d. Overseeing the design, construction, tuning and recoverability process of physical data bases as part of application development.
- e. Administration of the Information Resources Disaster Recovery Programs.
- f. Administration of the Information Resources Information Asset Security Programs.

- g. Maintaining awareness and understanding of legislation and regulations pertaining to data security concerns.

### 1.5.3

#### SYSTEM TRANSMISSION AND DISTRIBUTION

The Vice President - Transmission and Distribution Engineering and Operations is responsible for quality related activities performed by groups within his organization. The System Superintendent-Transmission and Test reports to the Vice President-Transmission and Distribution Engineering and Operations and is also responsible for quality related activities. The Superintendent-Production Test reports to the System Superintendent-Transmission and Test and is responsible for quality related production test activities which include:

- a. Providing electrical testing services to the Nuclear Plant Operating Companies (NUPOC).
- b. Planning and coordinating periodic and corrective maintenance of electrical equipment.
- c. Conducting acceptance tests, calibrations, adjustments, functional checkout and commissioning of electrical systems.
- d. Overseeing electrical preoperational testing for new nuclear generation facilities projects and startup testing for backfit/betterment projects, as requested.



# NORTHEAST UTILITIES ORGANIZATION

Direct Control \_\_\_\_\_  
Operational Control - - - - -

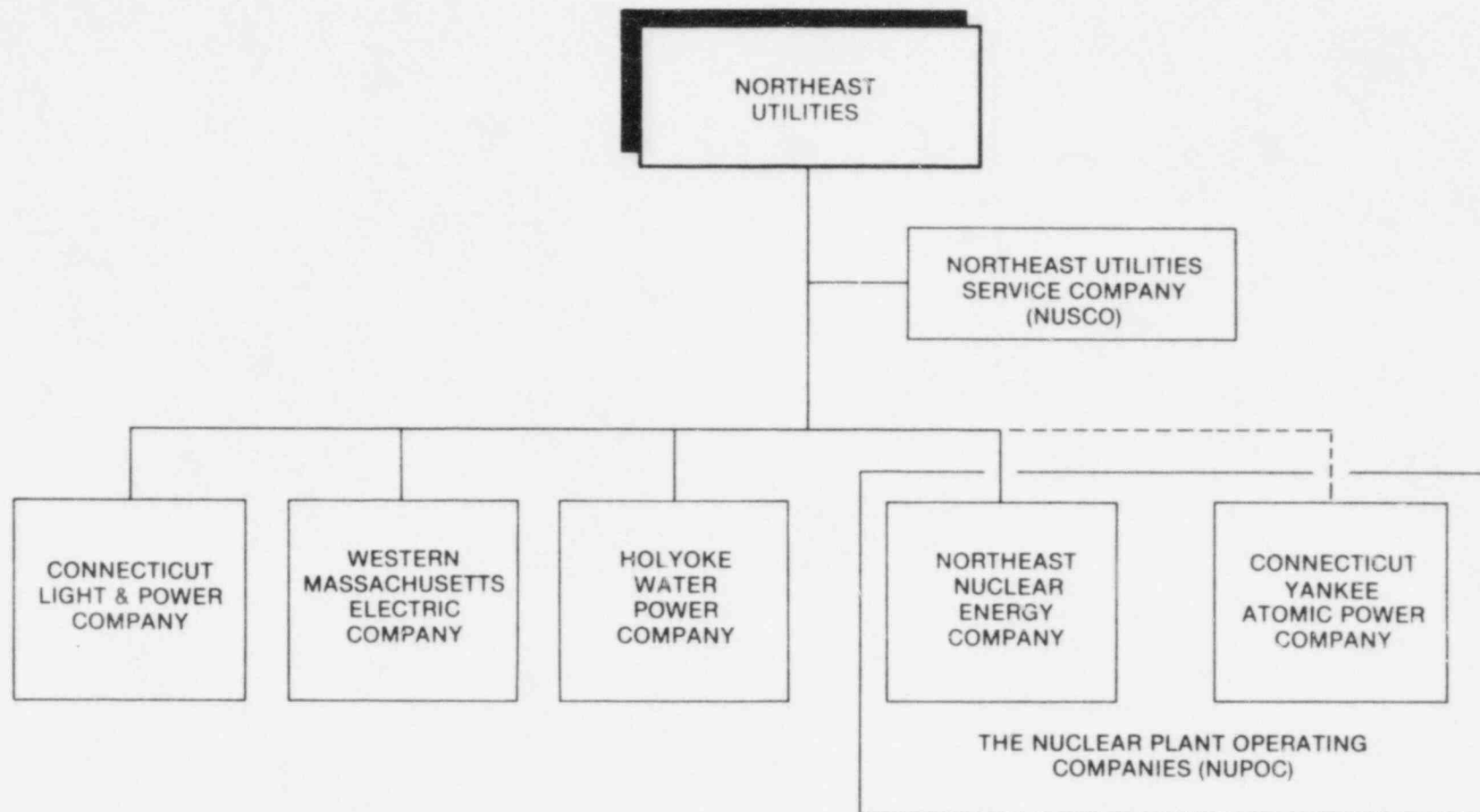


FIGURE 1.1

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# NORTHEAST UTILITIES

Organizational Relationships  
of Personnel having Quality  
Related Functions

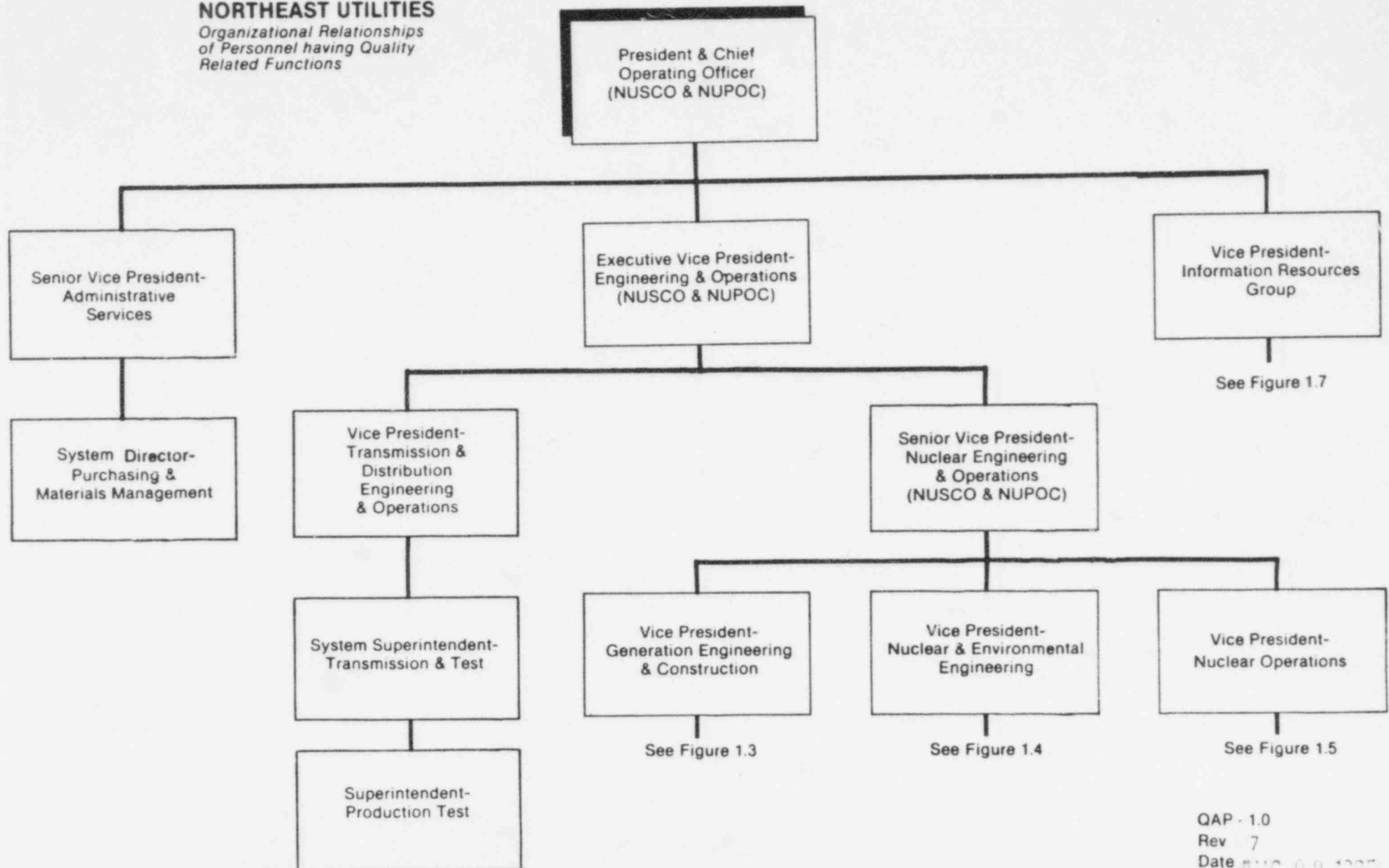


FIGURE 1.2

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## NORTHEAST UTILITIES

Organizational Relationships  
of Personnel having Quality  
Related Functions

From Figure 1.2

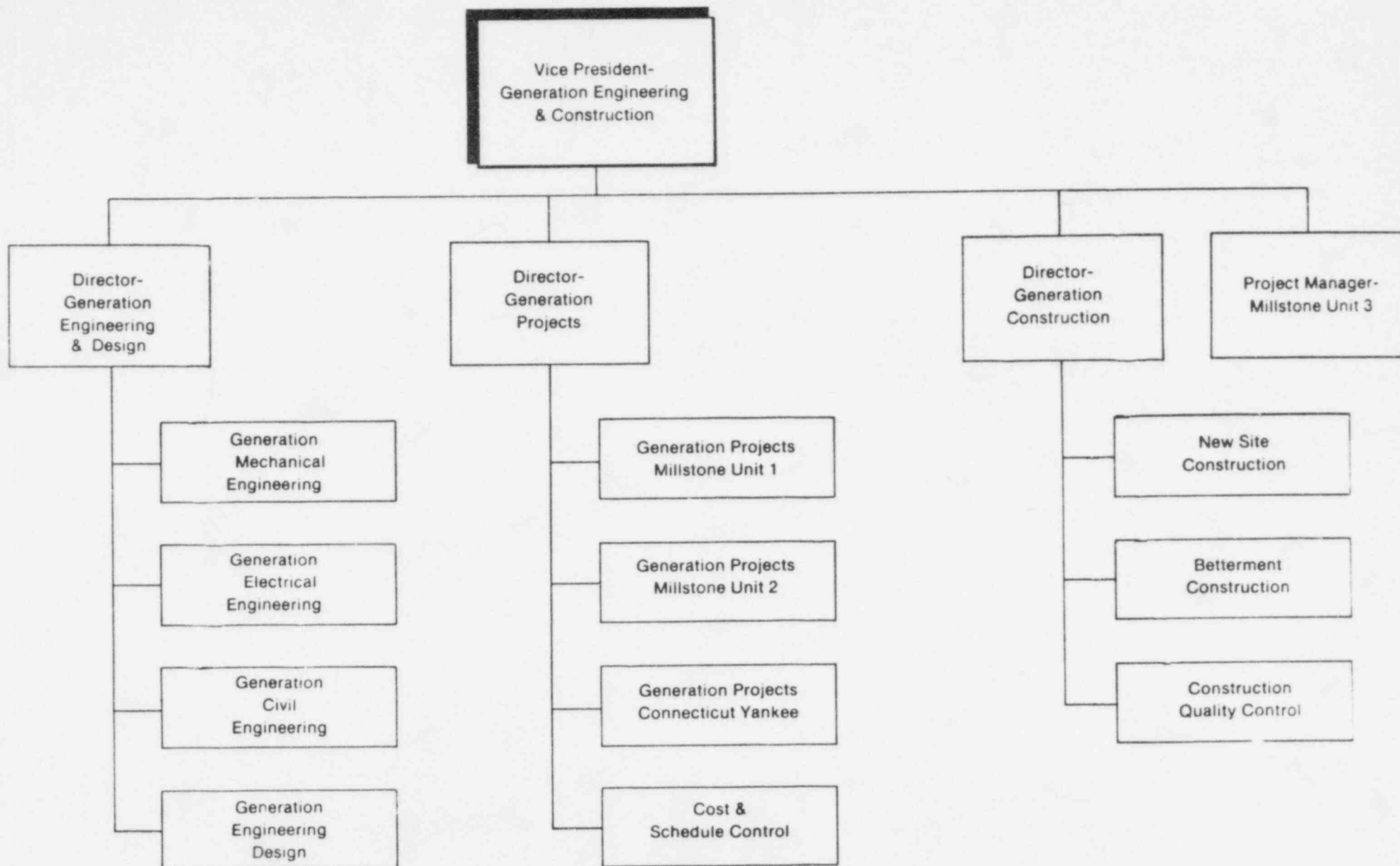


FIGURE 1.3

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From Figure 1.2

## NORTHEAST UTILITIES

*Organizational Relationships  
of Personnel having Quality  
Related Functions*

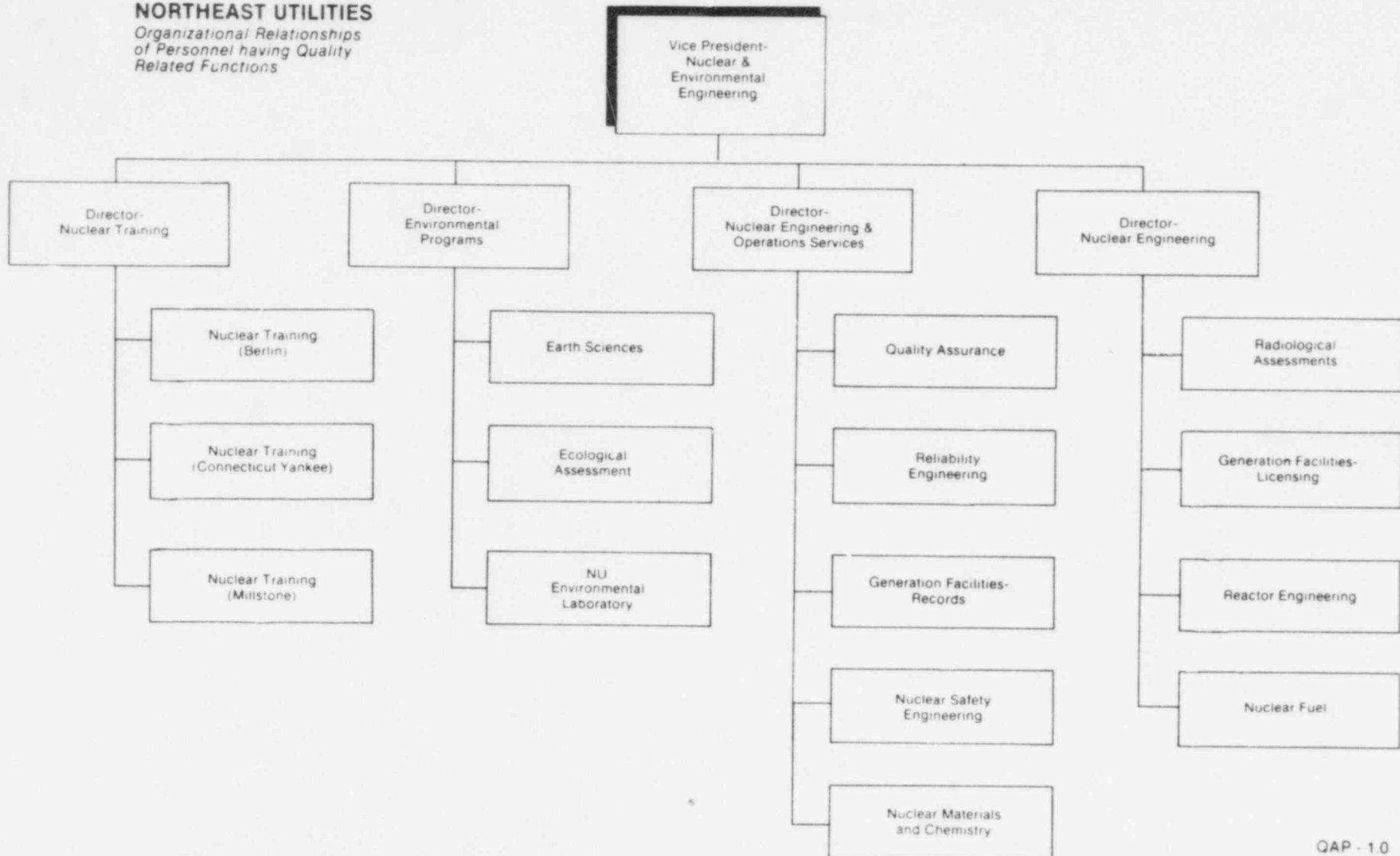


FIGURE 1.4

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# NORTHEAST UTILITIES

*Organizational Relationships  
of Personnel having Quality  
Related Functions*

From Figure 1.2

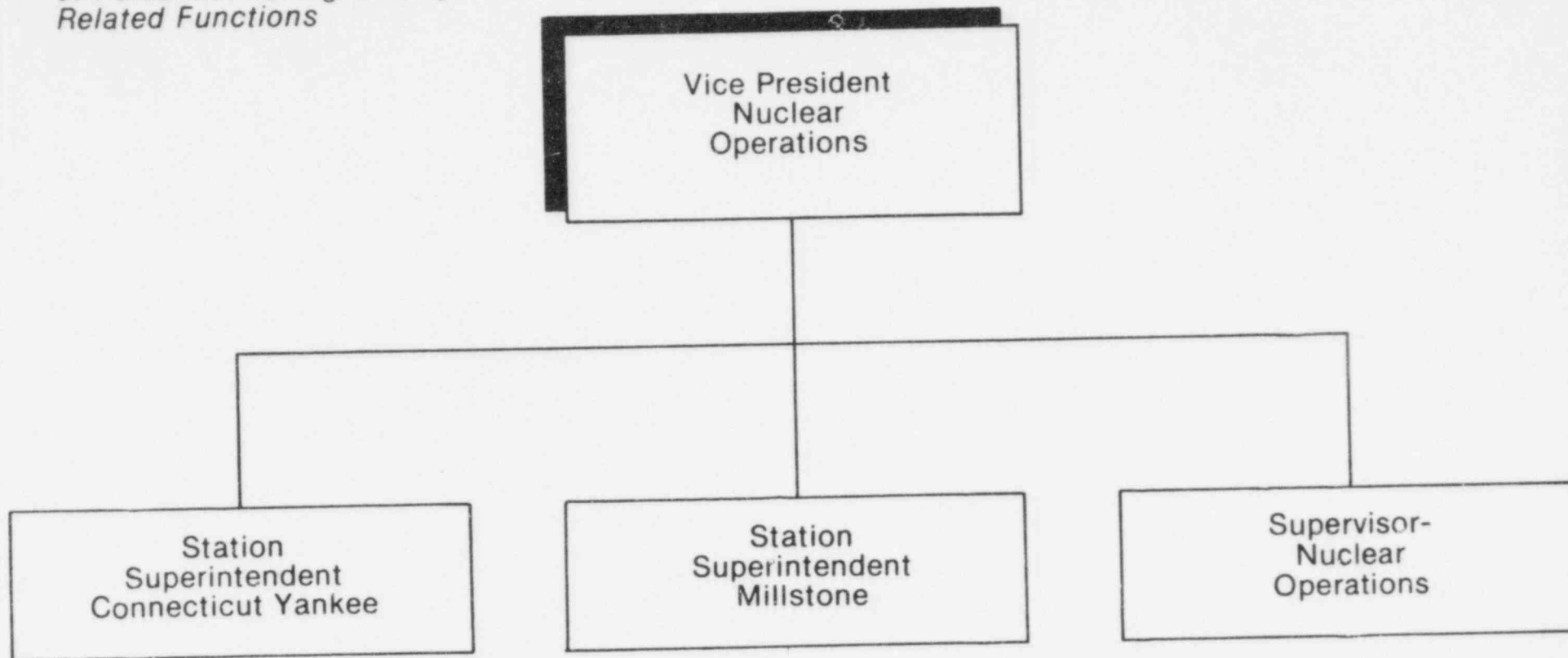


Figure 1.5

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### Organizational Relationship Between NUSCO & NUPOC Personnel Having Quality Related Functions

Line Reporting  
Communications

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FIGURE 16

## NORTHEAST UTILITIES

*Organizational Relationships  
of Personnel Having Quality  
Related Functions*

From Figure 1.2

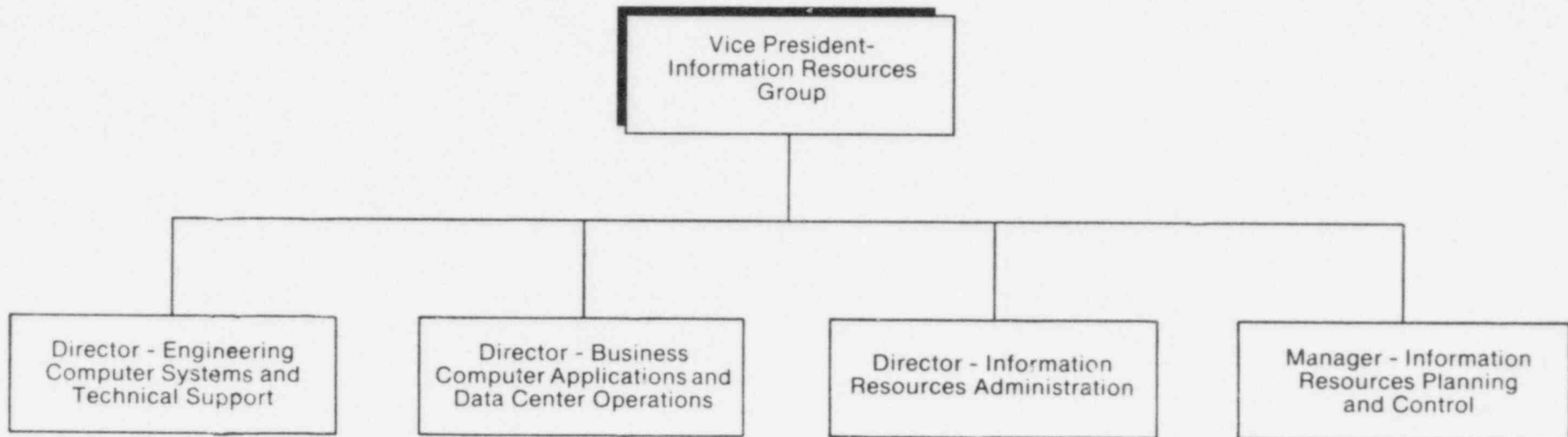


Figure 1.7

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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. This includes quality related activities initiated prior to submittal of the Preliminary Safety Analysis Report (PSAR), such as design and procurement, preparation of the PSAR, and safety related site preparation construction activities. It also includes quality related activities during the operation, maintenance 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, "Category I Systems, Structures and Components", and other items or services which are specifically identified in each FSAR/FDSA 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), the engineer-constructor, contractors, suppliers and engineering service organizations performing activities affecting the quality of safety related 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 NUSCO Quality Assurance audits, by Nuclear Review Board (NRB) Reviews, and by the independent audit team described herein and in QAP 1.0, Section 1.2.4.2. 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 nuclear safety related 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 of the safety related 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 related activities are performed by responsible personnel, through a system of audits of those organizations with quality related responsibilities;
- d. Appraise the Senior Vice President, Nuclear Engineering and Operations of quality related 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 Engineering and Operations 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 10CFR50.54(a)(3) and 10CFR50.55(f)(3).

Quality procedures are developed by the departments performing quality related 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 and are reviewed and concurred with by the applicable NUSCO/NUPOC Quality Assurance Organization 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 Superintendent 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 nuclear safety related systems, structures and components, as addressed in the Safety Analysis Reports (SAR). Safety related systems, structures and components are functionally identified in Appendix A of the NUQAP Topical Report and also as specifically identified in each FSAR/FDSA addressing Section 3.2.1 of NRC Regulatory Guide 1.70.

For systems, components, and structures; covered by the ASME Code, Section III; 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.

The degree of control over activities affecting the quality of safety related 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 for controls over special processes and skills necessary to attain the required quality, and the need for verification of quality by inspection and test.

NUSCO/NUPOC Quality Assurance organizations and applicable NUSCO/NUPOC technical organizations jointly determine and identify the extent Quality Assurance controls are to be applied to safety-related structures, systems, and components, designated as Category I in Appendix A and in implementing NUSCO/NUPOC Procedures. The Quality Assurance controls are in conformance with this NUQAP Topical Report, which complies with the 18 criteria set forth in Appendix B to 10CFR Part 50.

#### 2.2.4 Participating Organizations

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

NUSCO Quality Assurance is responsible for: a) the development, coordination, and control of the NUQAP including coordination of NUSCO Quality Assurance Branch 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 related procedures and revisions written by other departments. Procedure reviews will be performed in accordance with QAP 5.0.

NU shall require that their Engineer-Constructor, Nuclear Steam Supply System (NSSS), Suppliers, Engineering Service Organizations and contractors shall 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 related activities performed by these organizations are specified in the procurement documents. NUSCO Quality Assurance reviews and approves these organization's quality assurance programs prior to initiation of contracted activities, and audits subsequent activities for compliance to their procedures.

The object of the review is to verify that the engineer-constructor, contractors, suppliers and engineering service organizations have an adequate quality assurance program to meet the 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 NUSCO/NUPOC Quality Assurance to assure continued implementation of quality requirements.

After system construction by the engineer-constructor and system turnover to NUPOC, the program will fall under the requirements of the NUQAP. A formal test program is prepared to provide assurance that all systems and equipment function in accordance with design specifications.

The formal test program is described in a startup test manual which describes the administrative organization and procedure which will be followed, during the phaseout of design and construction, preoperational testing and plant turnover. It demonstrates control of quality related activities including management and technical interfaces among the engineer constructor, NSSS Supplier, NUSCO, and NUPOC.

During operation, 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 related 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 related procedures and instructions and that compliance to these documents is mandatory. The NUSCO Manager, Quality Assurance is responsible for the indoctrination of personnel within his department who perform quality related 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 NUSCO/NUPOC Quality Assurance) to be responsible for a training plan which assures that personnel performing quality related activities are trained in the principles and techniques of the activity being performed.

#### 2.2.6 Management Participation

NUSCO Department Heads/NUPOC Superintendents are responsible for implementing the NUQAP Topical Report within their Departments/Plants. The NUSCO Manager, Quality Assurance will assist in development, coordination and review of the Program.

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. The Management Review Committee is appointed by the NUSCO Senior Vice President - Nuclear Engineering and Operations. He ensures that deficiencies are tracked and resolved, and advises upper management of the results of the audits.

Actions considered by the Management Review Committee 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

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- c. Review of past audit results such as those conducted by previous Management Review Committees, the NRC, or other departments.

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

The quality assurance programs of the engineer-constructor, NUSCO contractors, suppliers and engineering service organizations that perform quality related activities are reviewed by NUSCO Quality Assurance 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

The NUSCO/NUPOC is responsible for controlling design work, administering design control activities (including design interface) and design modifications for nuclear safety related systems, structures and components defined in the "Category I Systems, Structures and Components List" (Appendix A).

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 safety related functions of the systems, structures and components. Changes to and deviations from specified requirements are identified, documented and controlled.

NUSCO has the ultimate responsibility for design control program implementation for plants presently under construction and for proposed plants. NUPOC has the responsibility for design control program implementation for operating plants unless they elect to appoint NUSCO to perform a modification. NUSCO and NUPOC may delegate to other organizations the work of establishing and executing the design control program or any part thereof, but retain the ultimate responsibility, for the program.

The interface controls, both internal and external, for organizations performing design work for safety related 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 safety related systems, structures and components in the 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

NUSCO/NUPOC is responsible for the design, design review, engineering approval of design changes, design evaluation and design control of nuclear power plants. 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 NUSCO/NUPOC. In all cases, final engineering decisions and ultimate design control of systems, structures and components related to nuclear power plants is the responsibility of NUSCO/NUPOC.

NUSCO/NUPOC Quality Assurance performs audits/surveillances/inspections to verify that the engineer-constructor, 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 tests. Measures established to control design documents are described in QAP 6.0.

Program procedures and instructions define the method for 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 safety related 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 reviews.

NUSCO 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. Drawings are reviewed for accuracy and completeness in accordance with NUSCO/NUPOC Procedures defining Document Control.

NUSCO/NUPOC Procedures describe the provisions to assure that design drawings and specifications are reviewed by NUSCO/NUPOC Quality Assurance to verify that the documents are prepared, reviewed, and approved in accordance with company procedures, and that the documents contain the necessary Quality Assurance requirements, such as inspection 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.

Prior to receipt of an operating license, an independent review and approval of design changes is performed by the organization that conducted the original design reviews, unless NUSCO/NUPOC designates another qualified organization to perform this function.

Subsequent to receipt of an operating license, proposed safety related 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 NUPOC Superintendents on matters relating to nuclear safety. Its composition, responsibilities, and authority are defined in Section 6 of each in-service unit Technical Specification. NUPOC QA personnel can be represented at the

PORC/SORC Committees if assigned by the appropriate NUPOC Unit Superintendent. If the change involves a Category I, 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 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/ERB are performed to assure that:

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

Errors and deficiencies in design, including the design process, that could adversely affect safety-related structures, systems, and components are documented and corrective action is taken to preclude repetition.

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 changes/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 Engineering and Operations 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 the Nuclear Steam Supply System (NSSS) supplier.



During the operations phase, procedures and instructions identify design interfaces which are controlled by the appropriate NUPOC Superintendent. 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 models/codes 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 NUSCO/NUPOC, 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 is 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, and 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 safety-related computer codes are certified for a specific use.

During the design and construction phases, the NUSCO Nuclear Project Engineer/Project Engineer maintains the ultimate responsibility for the design documents generated by the engineer-constructor, NSSS supplier and other NUSCO departments. The evaluation of selected documents by project engineers may be accomplished with assistance from other NUSCO departments concerned with the equipment/subject covered by the document being evaluated.

The NUSCO Nuclear Project Engineer/Project Engineer is responsible for the resolution of NUSCO comments on specifications and drawings issued by the engineer-constructor, NSSS supplier, and contractors.

## 4.0 PROCUREMENT DOCUMENT CONTROL

### 4.1 GENERAL REQUIREMENTS

The procurement of materials, equipment, parts and/or services required during the design, construction, operation and maintenance of Category I 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 Nuclear Project Manager and a Nuclear Project Engineer is selected and a Project Team is formed for each new nuclear power plant project (i.e., Millstone Unit 3). The NUSCO Nuclear Project Engineer by procedure coordinates the preparation, review and approval and control of NUSCO procurement documents for Category I material, equipment, parts or services. The review and approval cycle of procurement documents initiated by NUSCO includes: the appropriate NUSCO department for technical adequacy; NUSCO Quality Assurance for inclusion of quality assurance requirements, and the Nuclear Project Manager.

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

During the operations phase of nuclear power plants, NUSCO/NUPOC Purchase Requisitions are reviewed for technical adequacy and verification of the Category I designation. The appropriate NUSCO Project Engineer/NUPOC Superintendent reviews and approves Category I NUSCO/NUPOC Purchase Requisitions. NUSCO quality assurance personnel then review the purchase requisition, for the inclusion and adequacy of quality assurance requirements, prior to the issuance of the purchase order.

During design, construction, preoperational testing and operation of nuclear power plants, and modifications thereto, the engineer-constructor, contractors, suppliers

and engineering service organizations utilized by NUSCO/NUPOC are responsible to implement measures for control of procurement documents associated with Category I material, equipment, parts and services to ensure applicable requirements including quality assurance requirements are specified. NUSCO Quality Assurance performs on and off-site audits/surveillance/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 spare or replacement parts for safety related 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.

QA review of procurement documents determine that:

- a. The quality requirements are correctly stated, inspectable 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 documented prior to release and 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 provide for 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;
- 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.

#### 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 Category I procurement prior to issuing the purchase order for Category I material, equipment, parts and services. Supplier approval is not required for the procurement of nonengineered items which are:

- a. Relatively simple and standard in design, manufacture, and test (i.e., off the shelf item, the catalog number is in effect, a specification which controls the manufacture of the item) and;
- b. Adaptable to standard or automated inspections and/or tests of the end product to verify quality characteristics after delivery and;
- c. Of such a nature that product acceptance inspections/test performed upon receipt of items do not require operations which could adversely affect the integrity, function, or cleanness of the item.

Procurement documents may be issued to organizations with unapproved quality assurance programs. These procurement documents are approved by the NUPOC Superintendents, or the cognizant NUSCO Vice Presidents/Directors within the

Nuclear Engineering and Operations Group, and by the NUSCO/NUPOC Quality Assurance Departments who ensure procurement documents to unapproved organizations contain detailed supplementary quality assurance requirements to meet NUSCO requirements.

Procurement documents are reviewed by NUSCO/NUPOC Quality Assurance to ensure appropriate quality assurance requirements are specified. These requirements, included in the procurement document as necessary, include audits and inspections at the suppliers facilities with scheduled witness/hold points and acceptance criteria during the fabrication and process of the procurement 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 of Category I systems, structures and components during design, construction, preoperational testing and operation of nuclear power plants. These 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 related procedures provide direction for personnel performing safety related functions. The applicable NUSCO/NUPOC Quality Assurance Organization reviews and concurs with quality related procedures originated by other departments. Comments concerning compliance with the NUQAP Topical Report and regulatory requirements are resolved prior to issuance of the procedure. NUSCO Quality Assurance receives controlled copies of quality related procedures issued by other departments. During the design, construction and procurement phases, the engineer-constructor, contractors, suppliers, and engineering service organizations may be delegated responsibility for preparing maintaining, issuing and verifying the implementation of appropriate program documents which are selectively reviewed/approved by the appropriate NUPOC Superintendent, NUSCO System Superintendent Betterment Construction, NUSCO Superintendent New Construction, NUSCO Nuclear Project Engineer, or Project Engineer, as appropriate. In this case, NUSCO Quality Assurance 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 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.

During the design and construction phase, the NUSCO Superintendent New Construction, NUSCO System Superintendent Betterment Construction, NUSCO Nuclear Project Engineer,

or Project Engineer, ensures that contractors, suppliers and engineering service organizations 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 related, construction procedures and quality control inspection procedures are reviewed for concurrence by NUSCO Quality Assurance to assure compliance with the Program.

The NUPOC organization is responsible, during the pre-operational test and in-service phase, for the preparation, review and approval of plant quality related procedures. These procedures include preoperational and startup test procedures which are prepared, reviewed and approved in accordance with an approved Startup Manual, 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 safety related activities in accordance with individual license requirements. The applicable NUSCO/NUPOC Quality Assurance Organization reviews and concurs with inspection plans, tests, calibrations and special process procedures, drawings and specifications, and changes thereto.

#### 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 Nuclear Engineering and Operations Group, during design and construction phase, or the appropriate NUPOC Superintendent, during the preoperational test and in-service phase of the nuclear power plants, has the ultimate responsibility 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 ultimate 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, 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, preoperational testing, operation and major modification of nuclear power plant safety related systems, structures and components in accordance with NUSCO/NUPOC quality related 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 lists. 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 the quality of nuclear safety related systems, structures and components during design, construction, preoperational testing, operation and major 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. Preliminary Safety Analysis Report;
- h. Facility Description and Safety Analysis;
- i. Final Safety Analysis Report;
- j. Procurement documents;
- k. Design Change requests;
- l. Topical Report;
- m. Nonconformance Reports;
- n. Computer Codes.

NUSCO/NUPOC Procedures describe the measures taken by NUSCO/NUPOC Quality Assurance 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-related 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.

During the design and construction phase, the engineer- constructor, contractors, suppliers and engineering service organizations 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. NUSCO/NUPOC Quality Assurance performs periodic on-site and off-site audits/surveillances/ inspections of the engineer- constructor, contractors, suppliers and engineering services 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.

Holders of controlled copies of documents complete acknowledgement of receipt forms and return them to the distributor in order to assure that obsolete or superseded documents are removed from the work areas in a timely manner. NUSCO/NUPOC Quality Assurance perform periodic on-site and off-site Audits/Surveillances/Inspections to verify compliance with the requirements of procedures for document control.

#### 6.2.3 Drawing Control

During the preoperational test and the in-service phases of nuclear power plants, the NU Generation Facilities Records Organization is responsible to implement a program, as per approved procedures, for the retention and retrieval of drawings and records submitted by the cognizant NUSCO/NUPOC project personnel. The NU Generation Facilities Records 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 major 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.

NUSCO/NUPOC Quality Assurance performs on-site and off-site audits/surveillances/inspections of suppliers to verify they are effectively complying with their programs for document control of drawings.

If the engineer-constructor, contractor or supplier is not delegated the function of drawing control, the NUSCO Nuclear Project Engineer is responsible for the distribution of drawings to appropriate NUSCO/NUPOC personnel in accordance with controlled distribution lists.

#### 6.2.4 Instruction and Procedure Control

During the design and construction phase, the engineer-constructor, contractors, suppliers and engineering service organizations are responsible for control of quality related procedures and instructions issued by them. NUSCO/NUPOC Quality Assurance performs on-site and off-site audits/surveillances/ inspections of the engineer-constructor, contractors, suppliers and engineering service organizations quality assurance programs to ensure

they are effectively complying with their program for control of procedures and instructions.

During all phases of plant life, the originating department is responsible for establishing adequate control over quality related 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 PURPOSE

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, preoperational testing, operation, maintenance and major modification, to ensure conformance to procurement documents. These measures include provisions for source evaluation and selection, submission of objective evidence by the contractor or sub-contractor, inspection at the supplier source and examination of items upon delivery. Control of quality by contractors and sub-contractors 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 NUSCO Quality Assurance utilizes one or more of the following methods in evaluating the qualifications of a potential supplier:

- a. Coordinated review of a potential supplier utilizing one or more departments (i.e., Engineering, Construction, Operations and/or Purchasing);
- b. Engineer-constructor/other utility supplier evaluations;
- c. Coordinating Agency for Supplier Evaluation (CASE) evaluations.
- d. ASME MM or MS Quality System Certificates.

Evaluations ensure that NU suppliers employ a quality assurance program that conforms to applicable portions of the NUQAP Topical Report. NUSCO Quality Assurance 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, historical quality performance data, source surveys or audits and evaluations of the supplier's quality assurance program.

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

#### 7.2.2 Source Inspection

NUSCO Quality Assurance is responsible for the performance of source inspections at suppliers facilities to ensure that the requirements of a Purchase Order/Contract have been met.

Surveillances of suppliers are performed in accordance with written procedures which provide for:

- a. The method of surveillance and the extent of documentation required and those responsible for implementing those instructions;
- b. Surveillances of those items where verifications of procurement requirements cannot be determined upon receipt.

#### 7.2.3 Receipt Inspection

If the supplier is not delegated the function of receipt inspection for procured items, it is performed under the direction of NUSCO Construction Quality Control/NUPOC Quality Assurance in accordance with quality procedures which delineate requirements and responsibilities necessary to perform inspection functions. Contractual obligation fulfillment and quality assurance requirements are verified during receipt inspections.

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

- a. Measures for verifying that the shipment is complete, properly identified, undamaged and corresponds with the receiving 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 to inspection instructions;
- 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 available prior to release to construction/plant for installation.

#### 7.2.4 Supplier Furnished Records

Records required to be furnished by the supplier are specified in the procurement document. Certifications or documentation verifying conformance, provided by the supplier, identify 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) 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".

The responsible NUSCO/NUPOC QA/QC personnel shall review for acceptability these 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 nonengineered "off-the-shelf" items, where specific quality assurance controls for nuclear applications cannot be imposed in a practicable manner, special verification requirements are established and described.

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 applicable NUSCO/NUPOC Quality Assurance organizations.

## 8.0 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS

### 8.1 GENERAL REQUIREMENTS

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

The NUQAP provides measures for the identification and control of Category I material, parts and components, including partially fabricated assemblies, during design, construction, preoperational testing, operation, maintenance and major 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 verify that these items have been designed, fabricated, manufactured, tested, and inspected in accordance with specified requirements. The object of these controls is to prevent the use of incorrect or defective material, 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, preoperational testing, operation, maintenance or modifications to nuclear power plants, NUSCO/NUPOC

may delegate any portion of the implementation of the identification and control program to the engineer-constructor, contractors, suppliers and engineering service organizations, as appropriate. If delegated, contracts require that the contractor establish an identification and control program which meets the NUQAP Topical Report requirements. In this case NUSCO/NUPOC Quality Assurance performs on-site and off-site audits/surveillances/inspections of the engineer-constructor, contractors, suppliers, engineering service organizations quality assurance program to ensure they are effectively complying with their requirements for identification and control of material, equipment and components.

During the preoperational testing and the in-service phase of nuclear power plants, receipt inspections are performed to verify that material, equipment and components are properly identified in accordance with procurement requirements. NUPOC Quality Assurance/NUSCO Construction Quality Control 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 components are 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 Category I systems, structures and components by the use of qualified, approved procedures, equipment and personnel during design, construction, preoperational testing, operation, maintenance and major 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 and construction of nuclear power plants the NUSCO Nuclear Project Engineer is responsible for ensuring that special process data and documentation is reviewed, and that contractors and/or engineering service organization's special process procedures utilized at nuclear power plants are qualified and approved, and that personnel and equipment utilizing special processes are properly qualified.

NUPOC special process procedures utilized during preoperational 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.

During the design, construction, preoperational testing and operation phase of nuclear power plants the responsibility for control of special processes, when applicable, is delegated to the engineer-constructor, contractors, suppliers and engineering service organizations utilizing special process procedures which are approved. Personnel and equipment involved in special process procedures are qualified prior to the start of work. NUSCO/NUPOC Quality Assurance personnel perform on-site and off-site audits/surveillances/ inspections to ensure the engineer-constructor, contractors, suppliers, and engineering service organizations are effectively complying with their quality assurance program requirements for control of special processes.

#### 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 applicable specifications, 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 contract or procurement document requirements.

The NUSCO Manager, Quality Assurance 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.

During construction, the NUSCO Nuclear Project Engineer, NUSCO Superintendent New Construction/NUSCO System Superintendent Betterment Construction, and Manager-NUSCO Construction Quality Control are responsible for the review of records of qualified personnel, equipment and procedures associated with special processes. During preoperational testing and operation of nuclear power plants, the NUPOC Quality Assurance Supervisor is responsible for the review of these records.

### 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 instructions for final disposition of records.

During construction, the NUSCO Nuclear Project Engineer, NUSCO Superintendent New Construction/NUSCO System Superintendent Betterment Construction, and Manager-NUSCO Construction Quality Control are responsible for the review of documents for acceptance, and for assuring that documents for special processes utilized during construction are reviewed and accepted. During

preoperational testing and operation, the NUPOC Quality Assurance Supervisor is responsible for the review for completeness of data and documentation associated with the performance of special processes.

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 Plant Records Facility.



## 10.0 INSPECTION

### 10.1 GENERAL REQUIREMENTS

Inspection of activities to verify the quality of Category I 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 the construction phase, NUSCO/NUPOC Quality Assurance performs audits/surveillances/inspections to verify that the engineer-constructor, contractors, suppliers and engineering service organizations are effectively complying with their quality assurance program requirements for inspection. NUSCO/NUPOC Quality Assurance also observes the performance of selected inspections on-site and at contractors, suppliers and engineering service organizations facilities, associated with or specified as "hold" or "notification" points in procurement documents. In all cases audit/surveillance/ inspection activities are performed as specified in written quality assurance procedures.

During the preoperational testing and the operations phase, qualified NUSCO/NUPOC Quality Assurance personnel shall review procedures for maintenance, modification, and inspection in order to determine the need for:

- a. Inspections (e.g., receipt inspections, installation, system turnover, and product acceptance);
- b. Identification of inspection personnel;
- c. Documentation of inspection results.

The review also ensures that the necessary inspection requirements, methods, and acceptance criteria have been identified.

NUSCO/NUPOC Quality Assurance performs audits/surveillances/inspections to verify that contractors, suppliers, and engineering service organizations 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/inspection activities are performed under requirements specified in written quality assurance procedures.

#### 10.2.2 Inspection Plans and Schedules

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. Inspections are scheduled to assure that sufficient time and resources are available, and to assure inspections are not inadvertently omitted or bypassed.

During NUSCO-directed activities of in-service nuclear plants, 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 NUSCO Construction Quality Control. NUSCO Procedures also describe requirements for audits and surveillances performed by the NUSCO Construction Quality Assurance Section to assure the implementation of the inspection plans and schedules.

During the operations phase of in-service nuclear plants, inspection activities are performed in accordance with NUPOC Procedures. NUPOC Quality Assurance participates in inspection activities by the review of work procedures and the preparation and approval of inspection plans.

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 NUSCO/NUPOC Quality Assurance/Quality Control personnel or by qualified NUPOC plant personnel/contracted personnel, who are independent from undue pressure such as cost and schedule. When NUPOC plant personnel/contracted personnel perform inspections, their inspection plans/procedures and personnel qualification criteria are reviewed and found acceptable by the Quality Assurance organization 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 inspections, surveillance, or monitoring 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 inspection;
  - (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;
  - (6) A record of the results of the inspection;
  - (7) Record of inspector or data recorder.
- b. Written approved procedures specify surveillance or monitoring 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.

- d. During the preoperational testing and the operations phase, inspection procedures are reviewed by Quality Assurance personnel to determine the need for: 1) an independent inspection, 2) the degree and method of the inspection, if such an inspection is required, 3) the identification of inspection personnel, and 4) the documentation of inspection results (for procedure review requirements, see QAP 5.0).

#### 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 NUSCO/NUPOC Quality Assurance for adequacy of inspection, notification and/or mandatory hold controls.

#### 10.2.6 Inspection Result Evaluation

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

These 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.

NUSCO Quality Assurance performs audits 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 Category I 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 test prior to installation, construction tests, preoperational tests, surveillance tests, start-up tests and retest following repairs, replacement or modification.

### 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 repairs, 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 the construction, preoperational testing, maintenance, operation and modification of nuclear power plants.

During design, construction, preoperational testing, operation, maintenance and modification to nuclear power plants the engineer-constructor, contractors, suppliers and engineering service organizations, as appropriate, are responsible for implementing measures for the control of tests to ensure that Category I material, equipment and parts will perform satisfactorily. NUSCO/NUPOC Quality Assurance performs on-site and off-site audits/surveillances/

inspections of selected proof tests when "notification" points have been identified in Purchase Order/Contracts of the engineer-constructor, 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 NUSCO/NUPOC Quality Assurance.

During the preoperational testing phase of nuclear power plants, preoperational and startup testing is conducted by qualified personnel in accordance with procedures prepared, reviewed and approved in conformance to a NUPOC startup manual.

During the in-service phase of nuclear power plants proof tests, product acceptance tests, retest, 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

During NUSCO-directed activities of in-service nuclear plants, 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 an in-service 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. NUSCO Quality Assurance performs audits/surveillance/inspections to verify that these organizations are effectively complying with their quality assurance program requirements for test control.



## 12.0 CONTROL OF MEASURING AND TEST 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 Category I material, equipment 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 During the preoperational testing and the in-service phase of nuclear power plants, 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 Organization.

During NUSCO-directed activities of an in-service nuclear plant, the NUSCO calibration program is implemented in accordance with the requirements defined in NUSCO Procedures. NUSCO Betterment Construction Group is responsible for implementing these procedures which comply with the requirements contained in specifications and drawings. NUSCO Construction Quality Control 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 the operations 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 are responsible to ensure that M&TE equipment is calibrated, issued, and controlled in accordance with the requirements of the procedures. 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.

NUSCO/NUPOC Quality Assurance performs audits/inspections/surveillances to verify implementation of the calibration programs.

The engineer-constructor, contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC during the design, construction, operation, maintenance and modification of nuclear power plants, as appropriate, 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. NUSCO/NUPOC Quality Assurance performs on-site and off-site audits/surveillances/inspections of the quality assurance programs of the engineer-constructor, 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 System Superintendent Betterment Construction (for NUSCO-directed activities) or the SORC/PORC (for NUPOC-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 and authorized by the System Superintendent Betterment Construction or PORC/SORC.

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 Category I material, equipment and parts. These measures are imposed during the design, procurement, construction, preoperational testing and operation of nuclear power plants and major modifications thereto, in order to preclude damage, loss or deterioration of material, equipment 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 Category I material, equipment and parts, and required implementation of established design and specification requirements.

During design and construction the responsibilities associated with handling, storage, shipment, cleaning and preservation of Category I material, equipment and parts may be delegated to the engineer-constructor, contractors, suppliers and engineering service organizations. These organizations are monitored through audits/ surveillances/inspections by NUSCO/NUPOC Quality Assurance to verify compliance with their quality assurance program requirements for handling, shipping, cleaning and preservation.

Handling, storage, cleaning and preservation requirements of material, equipment and parts is conducted in accordance with written procedures and procurement documents during the preoperational testing and the in-service phase nuclear power plants. The Nuclear Plant Operating Companies may utilize contractors, suppliers, and engineering service organizations during the operation, maintenance and modification of the in-service nuclear power plant. These organizations are responsible for implementing measures for handling, storage, shipping, cleaning and preserving Category I material, equipment and parts to preclude damage, loss or deterioration. NUSCO/NUPOC Quality Assurance performs audits/surveillances/inspections to verify that NUPOC, contractors, suppliers and engineering service organizations are effectively implementing and complying with their approved procedures and

instructions for handling, storage, shipping, cleaning and preservation of Category I material, equipment 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 of the NRC Regulatory Guides and their endorsed ANSI Standards, listed in Appendix D of the NUQAP Topical Report, or specifications and/or suppliers technical manual, 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 Category I material, equipment and parts throughout design, construction, preoperational 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

The engineer-constructor, NUSCO/NUPOC contractors, suppliers and engineering service organizations utilized by NUSCO/NUPOC during design, construction, preoperational testing, operation, maintenance and modification of nuclear power plants, as appropriate, are responsible for implementing approved measures for the identification of inspection and test status of Category I materials, equipment and parts to preclude the bypassing of requirements. NUSCO/NUPOC Quality Assurance performs on-site and off-site audits/surveillances/inspections of the engineer-constructor, contractors, suppliers and engineering service organizations 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 inspecting by means of tagging, routing cards, stamping, manufacturing or test reports, labeling or other appropriate methods.

Where NUSCO/NUPOC performs receipt inspections at nuclear power plants, the NUSCO Nuclear Project Engineer (during plant construction) or the NUPOC Quality Assurance Supervisor/NUSCO Manager-Construction Quality Control (during preoperational testing phase and at in-service plants), ensures that traceability is maintained of

acceptable material, equipment and parts, to indicate conformance to Purchase Order/Contract requirements. Nonconforming material, equipment and parts are identified in accordance with QAP 15.0.

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 Category I 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 taken during Betterment Construction/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 safety related 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 material, parts, components, or services utilized in Category I systems, structures and components during design, construction, preoperational testing, operation and maintenance of nuclear power plants and major 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. In accordance with procedures, nonconforming material, parts, components, or services are reviewed and accepted, rejected, repaired or reworked.

### 15.2 Implementation

#### 15.2.1 Program

Approved procedures define the responsibilities and establish measures for identification, documentation, segregation, review and disposition of nonconforming materials, parts, components, or services, and notification to affected organizations. Each NU department is responsible for the identification, control and disposition of nonconformances within the scope of their departmental responsibilities.

NUSCO/NUPOC Quality Assurance performs on-site and off-site audits/surveillances/inspections of the engineer-constructor, contractors, suppliers and engineering service organizations to verify these organizations are effectively complying with their quality assurance program requirements for documentation and control of nonconforming material, parts, components, or services.

#### 15.2.2 Documenting and Controlling Nonconformances

Nonconformances of Category I systems, structures and components are documented and reported as requiring corrective action. Approved procedures delineate controls required for further processing and installation of nonconforming items. These controls include:

- a. Physical identification of the material, part, component, or services as nonconforming;

- b. Segregation of nonconforming items or services until properly dispositioned. Where physical separation is not practical, suitable tags, markings and documentation are used to assure control.

#### 15.2.3 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 is performed by NUSCO/NUPOC QA in accordance with approved procedures. The trend analysis results are periodically reported to the NUSCO Manager Quality Assurance and then to upper management, including the Senior Vice President, Nuclear Engineering and Operations, for review and assessment.

An engineering evaluation is performed, if necessary, prior to the resolution of nonconformances relating to Category I systems, structures and components.

#### 15.2.4 Evaluation and Disposition

Evaluations are performed to determine the disposition of nonconforming items and services. The evaluation determines whether an item or service is to be accepted 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 in which the item is installed or on which the service is performed. Applicable information is accumulated and records are maintained.

The engineer-constructor, contractors or NUSCO/NUPOC personnel are required to report to the NUSCO Project Engineer, NUSCO System Superintendent Betterment Construction, NUSCO Superintendent New Site Construction, NUSCO Nuclear Project Engineer or the appropriate NUPOC Superintendent, as applicable, to obtain release of nonconforming item or service prior to its installation or use. These release items are identified by a Nonconformance Tagging System which defines the description of the nonconformance and its nonconformance status.

Nonconformance reports dispositioned "accept as is" or "repair" are forwarded to the NUSCO Nuclear Project Engineer, NUSCO System Superintendent Betterment Construction, NUSCO Superintendent New Site Construction, NUSCO Project Engineer, or the appropriate NUPOC Superintendent, as applicable, and to NUSCO/NUPOC Quality Assurance for

review and approval, and then made part of the materials receipt inspection records. In addition, the status of all safety-related materials, parts, or components is maintained by a system of tags, which is administratively controlled by the cognizant QA/QC Department.

During NUSCO-directed activities of an in-service nuclear plant, NUSCO Generation Betterment Construction and NUSCO Construction Quality Control organizations are responsible for documenting the status of nonconforming, inoperative, or malfunctioning structures, systems, components, and services as described in NUSCO Procedures. During the operations activities of an in-service nuclear plant, the status of nonconforming, inoperative, or malfunctioning systems, structures components, and services is documented as necessary by NUPOC Quality Assurance/Quality Control and NUPOC Operations personnel as described in applicable NUPOC Procedures.

The need to release nonconforming material, 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 nonconformity 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 reworked or repaired in accordance with procedures are verified by reinspecting the item as originally inspected or by a documented method which is equivalent to the original inspection method.

## 16.0 CORRECTIVE ACTION

### 16.1 GENERAL REQUIREMENTS

The NUQAP provides documented measures for corrective action to ensure that nonconforming Category I systems, structures and components are identified and promptly corrected. These measures shall include, as appropriate, procedures for identification, documentation, segregation, disposition, notification to affected organizations and follow-up to prevent recurrence. Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with approved procedures. When conditions, adverse to quality, are identified through trend analysis, measures are taken to ensure corrective action and to prevent recurrence of the problem.

### 16.2 IMPLEMENTATION

#### 16.2.1 Corrective Action and Follow-Up

Evaluation of conditions adverse to quality such as, nonconformances, failures, malfunctions, deficiencies, deviations, and defective material and equipment is conducted to determine the need for corrective action in accordance with established procedures. NUSCO/NUPOC Procedures describe the measures taken to evaluate conditions adverse to quality, to determine the need for corrective action, to document the evaluation, and to assure Quality Assurance concurrence with the adequacy of the corrective action. NUSCO/NUPOC Procedures also describe the measures taken to assure what follow-up action is taken by NUSCO/NUPOC Quality Assurance to verify proper implementation and close out of corrective action in a timely manner.

Procedures describe the measures taken by NUSCO/NUPOC Quality Assurance to review and document concurrences with corrective action procedures established by applicable NUSCO/NUPOC departments.

During design, construction, preoperational testing and operation of nuclear power plants, the engineer-constructor, contractors, suppliers, engineering service organizations and their subtier contractors, (utilized by NUSCO/NUPOC), and NU personnel are responsible for informing the NUSCO Senior Vice President Nuclear Engineering and Operations, through their respective organizational chains of command, of significant conditions which are adverse to quality, the cause of the condition and the corrective action taken. NUSCO/NUPOC Quality Assurance or NUSCO Construction Quality Control, as appropriate, identifies deficiencies by audits/surveillances/inspections of the engineer-constructor's,

contractor's, supplier's and engineering service organization's quality assurance programs for corrective action. A reaudit/inspection/surveillance to verify implementation of corrective action and close-out of corrective action documentation shall be accomplished by the original auditing organization.

NUSCO Quality Assurance performs audits to identify deficiencies in departmental corrective action programs. The appropriate NUSCO Department Director/Branch Manager/Section supervisor or the appropriate NUPOC Superintendent, is responsible to implement timely corrective action. NUSCO Quality Assurance may reaudit the affected department to verify corrective action has been implemented and documented.

If corrective action is inadequate or not timely, the follow-up organization requests corrective action from management as delineated in procedures. The NUSCO Senior Vice President - Nuclear Engineering and Operations has the final authority in the event that agreement is not reached at lower levels.

Where corrective action is required of contractor personnel, NUSCO/NUPOC defines in procedures and contracts the corrective action interface between NUSCO/NUPOC and the contractor. NUSCO/NUPOC requires the engineer-constructor, contractor, suppliers and engineering service organizations, as appropriate, to have a documented corrective action program for safety related materials and services.

#### 16.2.2 Recurrence Control

The organization which is responsible for the condition adverse to quality, shall ensure that the corrective action will not only correct the immediate condition, but also prevent the adverse condition from recurring.

NUSCO/NUPOC procedures establish the responsibilities and measures taken to identify trends of conditions, adverse to quality, and to ensure that corrective action is taken for those conditions to prevent their recurrence. A trend analysis report; which identifies the conditions, adverse to quality; is issued to appropriate levels of NU management. The NUSCO Manager, Quality Assurance is responsible for follow-up of the trend analysis items and their corrective action.

Trends concerning specific contractor's performance shall be reported to the affected contractor for resolution and corrective action to prevent recurrence of the problem.

## 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, preoperational testing, operation, 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 equipment. 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 the quality of material, equipment, parts, processes or operations relating to Category I systems, structures and components which when founded on observations, measurements or tests can be fully verified, and documented by cognizant personnel.

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

During the preoperational testing and in-service phase of nuclear power plants NUSCO/NUPOC quality 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

NU Quality Assurance records are classified as life records or non-life records as delineated by Generation Facilities Records. Non-life records are those quality documents that are maintained for a specific period of time other than the life time of the in-service nuclear power plant or the particular component or part. Life records are 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:

- a. Demonstrating capability for safe operation;
- 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 NUSCO Nuclear Project Engineer, Project Engineer or other cognizant qualified personnel of NUSCO/NUPOC, engineer-constructor, etc., as appropriate, and are transmitted to the appropriate Nuclear Plant Records Facility. The responsibility of the appropriate Nuclear Plant Records Facility upon receipt of records, is to maintain and provide controlled retrievability of records affecting the quality of 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 measures be provided to implement an effective audit program. These measures are applied during the design, construction, preoperational testing and operation of nuclear power plants and major modifications thereto, through the performance of audits. Audits are conducted in accordance with preestablished procedures and written checklists by qualified personnel not having direct responsibilities in the areas being audited to ensure compliance with the NUQAP Topical Report. The results of audit findings are documented and then reviewed with management having responsibility in the area audited.

### 18.2 IMPLEMENTATION

#### 18.2.1 Program

The following audits relating to the NUQAP are performed:

- a. NUSCO Internal Audits; (audits of the 18 criteria of Appendix B to 10CFR, Part 50:
  - (1) are conducted annually for design and construction phase activities of new nuclear generating facilities, and
  - (2) are completed within a period of two (2) years for operational phase activities.
- b. NUSCO/NUPOC Engineer-Constructor, Contractor, Supplier, and Engineering Service Organization Audits; (as per procurement documents)
- c. NUSCO Construction Site Audits; (annually or as applicable by the procurement documents)
- d. Preoperational Testing Audits; (as per test schedule and administered under the direction of the NUSCO Audit Program)
- e. Plant Audits; (audits of the 18 criteria of Appendix B 10CFR Part 50 are completed within a period of two (2) years and are administered under the direction of the NUSCO Audit Program)

In addition, provisions are established to require that audits be performed of those activities where the requirements

of Appendix B to 10 CFR, Part 50, are being implemented, and associated with:

- a. The determination of site features which affect plant safety (e.g., core sampling, site and foundation preparation);
- b. The preparation, review, approval and control of early procurements;
- c. Indoctrination and training programs;
- d. Interface control among the licensee and the principal contractors.

Measures are provided to perform audits of those safety-related activities performed during the operational phase. Those areas are listed below:

- a. Operation, maintenance, and modifications;
- b. The preparation, review, approval and control of design documents, specifications, procurement documents and instructions, procedures and drawings;
- c. Receiving and plant inspections;
- d. Indoctrination and training programs;
- e. The implementation of operating and test procedures;
- f. Calibration of measuring and test equipment.

Audits are scheduled on the basis of the status and safety importance of the activities being performed. Schedules are originated and maintained by NUSCO Quality Assurance.

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

The engineer-constructor, contractors, suppliers and engineering service organizations utilized during the design, construction, preoperational testing and operation of nuclear power plants and major modifications thereto, are responsible for developing and implementing a system of planned and periodic audits to verify compliance with and the effectiveness of all aspects of their quality

assurance programs including reporting and resolution of deficiencies. NUSCO/NUPOC Quality Assurance personnel perform on-site and off-site audits/surveillances/inspections to ensure these organizations are effectively complying with their quality assurance requirements for audits.

Departments within the NUSCO/NUPOC organizations are responsible for implementing quality related functions in accordance with approved procedures and instructions. Internal audits are performed to verify implementation of the requirements prescribed in the NUQAP Topical Report and implementing departmental procedures.

18.2.2 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 correct the deficiencies revealed by the audit.

18.2.3 Reporting of Audit Results

Audit results are reviewed and approved by the Manager, Quality Assurance/Designee. He is responsible, based on the audit documentation, for issuing the audit reports to the appropriate management of the area audited and for ensuring that timely corrective action is taken to rectify deficiencies. In addition, audit data and reports are accumulated for the review and assessment of quality trends and the effectiveness of the Quality Assurance Program. This report is then submitted to the Senior Vice President, Nuclear Engineering and Operations.

18.2.4 Resolution of Audit Deficiencies

Appropriate action to resolve deficiencies identified during audits is to be taken by the cognizant engineer- constructor, contractor, supplier, engineering service organization or internal management before the scheduled resolution date. Follow-up audits are performed as necessary, to verify appropriate actions have been taken to resolve deficiencies. Items which exceed the scheduled resolution date and cannot be resolved by affected management are submitted for resolution to the NUSCO Senior Vice President Nuclear Engineering and Operations.

18.2.5 Records/Reports of Audits

Audit records, reports and associated documentation pertinent to audits are maintained in the appropriate NUSCO files with disposition to the appropriate Nuclear Plant Records 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 related activities affecting the safety related function of these systems, structures and components as listed below and to other items and services specifically identified by NU in each FSAR/FDSA 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 valve 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 reactor coolant system components important to safety, such as reactor coolant pumps.
- (i) Systems or portions of systems that are required to supply fuel for emergency equipment.
- (j) All electric and mechanical devices and circuitry between the process and the input terminals of the actuator systems involved in generating signals that initiate protective actuation of safeguard systems.
- (k) Systems or portions of systems that are required for (1) monitoring of systems important to safety and; (2) actuation of systems important to safety.
- (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 within 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.

- (t) Items and services associated with the preparation and classification of radioactive wastes for shipment to a land disposal facility or a licensed waste collector as required by 10CFR 20.311(d)(3) and encompassing 10CFR 61.55 and 10CFR 61.56.

#### 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



APPENDIX B

NORTHEAST UTILITIES QUALITY ASSURANCE PROGRAM TOPICAL REPORT

QUALIFICATION AND EXPERIENCE REQUIREMENTS  
NUSCO MANAGER, QUALITY ASSURANCE

The NUSCO Manager, Quality Assurance shall satisfy the following requirements:

Graduate of a four year accredited engineering or science college or university, plus twelve (12) or more years of industrial experience including three 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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# NUSCO QUALITY ASSURANCE

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# NUSCO QUALITY ASSURANCE

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# NUCLEAR ENGINEERING AND OPERATIONS

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# NUCLEAR ENGINEERING AND OPERATIONS

## POLICIES AND PROCEDURES MANUAL

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	NEO-5.08	Quality Assurance Requirements for Quality Related Software.
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IX. Control of Special Processes	<p>NEO-3.09 Certification of Non-Destructive Testing Personnel.</p> <p>NEO-3.11 Preparation, Qualification, Approval and Revision of Northeast Utilities Nondestructive Examina- tion Procedures.</p>
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XV. Nonconforming Materials, Parts, or Components	NEO-2.01 Implementation of the Requirements of Part 21 of Title 10, Code of Federal Regulations: Reporting of Defects and Noncompliance.
XVI. Corrective Action	NEO-2.09 Computer Tracking Program.
	NEO-2.18 Corrective Action.
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	NEO-2.12 Control of Nuclear Facilities Safeguards Information.
	NEO-2.13 Managment of Nuclear Power Plant Records.
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10CFR50 APP. B CRITERIA	GE&C - PROCEDURES
I. Organization	GE&C-1.01 Generation Engineering and Construction Division.
II. Quality Assurance Program	GE&C-1.02 Applicability and Use of Generation Engineering and Construction Procedures Manual.
	GE&C-1.03 Procedure for Review of Generation Engineering and Construction Division Procedures as Required by Revisions to NU QA Topical Report.
	GE&C-1.05 Generation Engineering and Construction Procedures Training Program.
III. Design Control	GE&C-2.01 Preparation, Review, Approval, Revision, and Control of NUSCO Generation Engineering and Construction Division Specifications.
	GE&C-4.02 Review of Engineering Service Organization, Supplier, and Engineer Constructor Design Documents.
	GE&C-4.06 Materials List.
IV. Procurement Document Control	GE&C-2.06 Purchase of Materials List Equipment.
V. Instructions, Procedures, & Drawings	GE&C-1.04 Preparation, Issuance and Control of Generation Engineering and Construction Division Procedures.
	GE&C-2.07 Preparation, Issuance and Control of Project Descriptions.
	GE&C-3.01 Design Information.
	GE&C-3.05 Preparation and Control of Design Drawings.

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- GE&C-3.06 Preparation, Review and Approval of Drawing Change Requests (DCR) and Drawing Submittal Requests (DSR) for In-Service Nuclear Plants.
- GE&C-3.07 Processing and Control of Drawing Change Requests and Drawing Submittal Requests by Generation Engineering Design.
- GE&C-5.01 Processing, Documenting, and Filing of Results of the Review of Contractor Procedures.
- GE&C-5.08 Preparation, Issuance, and Control of NUSCO Betterment Construction Work/Special and Administrative Work Procedures
- GE&C-5.09 Preparation, Issuance, and Control of NUSCO Betterment Construction Special Instructions/Requirement Sheets.
- VI. Document Control
- GE&C-3.04 Design Document Summary Log.
- GE&C-5.10 Preparation, Issuance and Control of NUSCO Betterment Construction Project Documents List.
- VII. Control of Purchased Material, Equipment, and Services
- GE&C-2.02 Review of Proposals Submitted by Engineering Service Organizations, Suppliers, Vendors, and Contractors.
- VIII. Identification and Control of Materials Parts & Components
- IX. Control of Special Processes
- GE&C-5.03 Control of Special Processes.
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XII. Control of Measuring  
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GE&C-5.04 Measuring and Test Equipment  
Control Program.

XIII. Handling, Storage,  
and Shipping

GE&C-5.02 Control, Inspection, Handling,  
Storage, Receiving of Purchased  
Material, Equipment, and Parts.

XIV. Inspection, Test,  
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XV. Nonconforming  
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GE&C-5.05 Issuance of a Stop Work Order.

GE&C-5.06 Installation of Nonconforming  
Material, Equipment, and Parts.

GE&C-5.07 Processing Nonconformance Reports.

XVI. Corrective Action

XVII. Quality Assurance  
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GE&C-2.05 Retention, Control and Final  
Disposition of Project Document  
Files for Betterment Projects.

XVIII. Audits

# MILLSTONE UNIT 3 PROJECT

## PROCEDURES MANUAL

10CFR50 APP. B CRITERIA	MP3 - PROCEDURES
I. Organization	MP3-1.01 Millstone Unit 3 Project.
II. Quality Assurance Program	MP3-1.02 Applicability and Use of Millstone Unit 3 Project Procedures Manual.
	MP3-1.03 Procedure for Review of Millstone Unit 3 Project Procedures as required by revisions to NUQAP Topical Report.
	MP3-1.05 Millstone Unit No. 3 Project Procedures Training Program.
III. Design Control	MP3-3.01 Preparation, Approval, Distribu- tion and Control of Category I System, Structure and Component List.
	MP3-4.12 Project Change Control.
	MP3-6.06 Basic Design Input Documents.
	MP3-6.08 Design Inputs and Design Verification.
IV. Procurement Document Control	MP3-6.02 Approval of Engineer-Constructor Purchase Orders for Non-Permanent Plant Materials, Equipment and Services.
V. Instructions, Pro- cedures, and Drawings	MP3-1.04 Preparation, Issuance and Control of Millstone Unit 3 Project Procedures.
VI. Document Control	MP3-4.01 Processing, Documenting and Filing of Results of Construction Procedure Review.



MILLSTONE UNIT 3 PROJECT

PROCEDURES MANUAL

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VII. Control of Purchased Material, Equipment, and Services	MP3-4.03 Control of Purchased Material, Equipment and Services - New Con- struction.
	MP3-4.13 Receipt Inspection of NUSCO Procured Material.
VIII. Identification and Control of Materials Parts and Components	
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X. Inspection	
XI. Test Control	
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XV. Nonconforming Materials, Parts & Components	MP3-4.08 Identification and Disposition of Deficiencies Identified During Construction and Installation.
	MP3-4.09 Documenting and Reporting Significant Deficiencies.
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MP3-2.03 Retention & Control of Quality  
Working Documents in the Project  
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NPRM - PROCEDURES

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| I. Organization                          | NPRM-1.01 Responsibility Guidelines for Nuclear Plant Records Facilities Located at Nuclear Power Stations. |
|  | NPRM-1.07 Nuclear Records Section and Responsibilities.   |
| II. Quality Assurance Program            | NPRM-6.01 Training Requirements.  |
| V. Instructions Procedures, and Drawings | NPRM-1.02 Issuing of the Nuclear Plant Records Manual.  |
|  | NPRM-1.04 Preparation of Nuclear Plant Records Manual.  |
| VI. Document Control                     | NPRM-1.03 Document Review and Acknowledgment.   |
|  | NPRM-2.02 Maintaining Nuclear Plant Records Vendor and Manufacturer File.                                   |
|  | NPRM-2.03 Maintenance of Nuclear Plant Records Backup Index.  |
|  | NPRM-2.04 Quality Checking of Record Indexing.  |
|  | NPRM-3.01 NUPOC/NUSCO Drawing Control System.   |
|  | NPRM-3.06 Request for Nuclear Plant Drawing or Aperture Card Copies.  |
|  | NPRM-3.09 Maintenance of Backup to the Drawing Status Files.  |
|  | NPRM-3.10 NUSCO NPRF's Function in Implementing the NUPOC/NUSCO Drawing Control System.                     |
| XVII. Quality Assurance Records          | NPRM-1.05 Establishing Submittal Schedules for Transfer of Nuclear Records Into Nuclear Records Facilities. |

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- NPRM-1.06 Nuclear Power Plant Quality Assurance Records Generated Collected and/or Transmitted by External Organizations.
- NPRM-1.08 Retention and Control of Quality Assurance Records Generated in Support of the Nuclear Plant Records System.
- NPRM-2.01 16MM Roll Film Microfilming Procedure.
- NPRM-2.05 Inspection of Permanent Storage Vaults for Temperature, Humidity, and General Condition.
- NPRM-2.06 Inspection of the Physical Condition of Nuclear Plant Documents of Record Stored Within Nuclear Records Vaults.
- NPRM-2.07 Storage of Radiographs and Photographic Materials Other Than Microfilm.
- NPRM-2.08 Use of Updateable Microfiche Systems.
- NPRM-3.08 35MM Aperature Card Microfilming Procedure Using the 3M 2000E Camera.
- NPRM-4.01 Housecleaning Guidelines for Records.
- NPRM-4.02 Transmittal/Receipt of Nuclear Records.
- NPRM-4.03 Access to Nuclear Plant Records Facilities and Records.
- NPRM-4.04 Disposition of Nuclear Plant Records.

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- NPRM-4.05 Checklist of Required Nuclear Power Plant Records Including Quality Assurance Records.
- NPRM-4.06 Descriptions of Nuclear Plant Records Storage Vaults.
- NPRM-4.07 Guide for Writing Implements and Paper Stock to be used for Documents Intended for Microfilming.
- NPRM-4.08 Proprietary/Confidential Record Control.
- NPRM-4.09 Assignment of Source Record Storage Locations to Nuclear Records NPR Computer File Entries.
- NPRM-5.01 Nuclear Records System Description.
- NRPM-5.02 NPR/DWG Computer Program Dictionary Maintenance.
- NPRM-5.03 NPR/DWG Computer File Integrity Verification.
- NPRM-5.04 Nuclear Records Indexing Guidelines & Minimum Index Entry Requirement.

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V. Instructions, Procedures and Drawings

ECSP-1.1 Preparation of Engineering Computer Services Department Procedures.

ECSP-1.2 Issuing of the Engineering Computer Services Department Procedure Manual.

VI. Document Control

ECSP-1.3 Document Review and Acknowledgment.

ECSP-2.1 ESD Program Development and Maintenance.

ECSP-3.1 Generation and Storage of Backup Files in Systems and Operations.

ECSP-4.1 PCE Program Development and Maintenance.

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I. Organization	NOD-1.01 Organization.
V. Instructions, Procedures and Drawings	NOD-1.02 Preparation, Issuance, and Control of Department Procedures.
	NOD-1.03 Distribution and Accountability of Department Procedures.
VI. Document Control	NOD-1.04 Distribution of Design Documents.
	NOD-3.02 Production Maintenance Management System (PMMS) Automated Work Order System.
XVII. Quality Assurance Records	NOD-1.05 Quality Assurance Records.



# MILLSTONE QA ADMINISTRATIVE CONTROL PROCEDURES (ACPS)

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## MILLSTONE QA (ACPS)

I. Organization	ACP-QA	1.01 Millstone Administration.
	ACP-QA	1.02 Organization & Responsibilities.
	ACP-QA	1.04 Plant Operations Review Committee.
	ACP-QA	1.05 Site Operations Review Committee.
II. Quality Assurance Program	ACP-QA	1.06 Quality Assurance/Quality Control Program.
	ACP-QA	1.10 Fire Protection Quality Assurance Program.
	ACP-QA	2.01 QA Program Boundary.
	ACP-QA	2.02C Work Orders.
	ACP-QA	2.05 Fire Protection Program.
	ACP-QA	2.14 Turnover of Systems, Components, and Structures (NEO 7.02).
	ACP-QA	8.01 Millstone Station Training.
	ACP-QA	8.07 QA Training Program.
	ACP-QA	8.08 Millstone Reactor Operator Training Program.
	ACP-QA	8.16 Training, Certification & Identification of Qualified Inspection and Testing Personnel.
III. Design Control	ACP-QA	8.21 Qualification of Audit Personnel.
	ACP-QA	2.13A Computer Software Implementation.
	ACP-QA	2.13B Maintenance and Control of Site Computer Systems.

# MILLSTONE QA ADMINISTRATIVE CONTROL PROCEDURES (ACPS)

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	ACP-QA	3.04A	Design Change Control - Design Phase.
	ACP-QA	3.04B	Design Change Control - Processing.
	ACP-QA	3.08	Safety Evaluations. (NEO 3.12)
	ACP-QA	3.09	Preparation Issuance and Control of Project Assignments.
	ACP-QA	3.10	Preparation, Review, and Disposition of Plant Design Change Request (PDCRs) (NEO 3.03).
	ACP-QA	3.11	Preparation, Review, Approval, Revision, and Control of Specifications (NEO 5.04).
	ACP-QA	3.12	Design Inputs and Design Verification (NEO 5.04).
	ACP-QA	3.13	Preparation, Review, and Approval of Design Analyses and Calculations (NEO 5.04).
	ACP-QA	3.14	Design Change Notices for Design Documents (NEO 5.04).
	ACP-QA	3.15	Performance of Fire Protection Systems (NEO 5.12).
IV. Procurement Document Control	ACP-QA	4.02	Procurement Control & Identification of Material.
	ACP-QA	4.06	Procurement and Evaluation of Shelf Life Material.
V. Instructions, Procedures, & Drawings	ACP-QA	3.05	Review & Approval of Vendor Procedures.
	ACP-QA	3.06	Preservice Unit Instructions.

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VI. Document Control	ACP-QA	3.01 ACP's & Station Forms.
	ACP-QA	3.02 Station Procedures & Forms.
	ACP-QA	3.03 Document Control.
	ACP-QA	3.19 Controlled Distribution of Design Documents (NEO 5.03).
VII. Control of Purchased Material, Equipment & Services	ACP-QA	4.05 Product Acceptance Inspection & Testing.
	ACP-QA	4.09 Transfer of Material Equipment and Parts (NEO 6.03).
	ACP-QA	5.02 Trend Analysis from Quality-Related Documents
VIII. Identification & Control of Materials, Parts & Components	ACP-QA	4.03 Classifying & Upgrading Spare Parts.
	ACP-QA	4.07 Control of Weld Material.
IX. Control of Special Processes	ACP-QA	2.07 Control of Special Processes.
X. Inspections	ACP-QA	2.02A Installation Inspections.
	ACP-QA	9.06 In-service Inspection Program.
	ACP-QA	9.07 Quality Assurance Surveillance Program.
XI. Test Control	ACP-QA	2.02B Retests.

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	ACP-QA	2.15 Preoperational Testing of Plant Modifications (NEO 7.03).	
	ACP-QA	9.02 Station Surveillance Program.	
	ACP-QA	9.02A Unit 1 Surveillance Master Control List.	
	ACP-QA	9.02B Unit 2 Surveillance Master Test Control List.	
	ACP-QA	9.03 Inservice Plant Testing.	
XII. Control of Measuring & Test Equipment	ACP-QA	9.04 Control & Calibration of Measuring and Test Equipment.	
XIII. Handling, Storage Shipping	ACP-QA	4.01 Plant Housekeeping.	
	ACP-QA	4.04 Instructions for Packaging, Shipping, Receiving, Storage & Handling.	
	ACP-QA	6.04 Radioactive Material Shipping Requirements.	
XIV. Inspection, Test & Operating Status	ACP-QA	2.06A Station Tagging.	
	ACP-QA	2.06B Station Bypass/Jumper Control (NEO 8.01).	
	ACP-QA	2.06C Station Bypass/Jumper Control for Trouble Shooting, Red Lining, and Calibration.	
	ACP-QA	2.12 System Valve Alignment Control.	
XV. Nonconforming Materials, Parts or Components	ACP-QA	5.01 Nonconforming Materials & Parts.	
XVI. Corrective Action	ACP-QA	10.01 Plant Incident Report.	

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	ACP-QA	10.06 NRC Commitment Follow Program.
	ACP-QA	10.08 Station Services Event Report.
	ACP-QA	10.09 Licensee Event Report.
	ACP-QA	10.10 Corrective Action.
XVII. Quality Assurance Records	ACP-QA	10.04 Nuclear Power Plant Records.
XVIII. Audits	ACP-QA	9.01 Quality Assurance Audits.
	ACP-QA	9.05 Monitoring of QA Activities.

# CONNECTICUT YANKEE QA PROCEDURES

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## CONNECTICUT YANKEE QA PROCEDURES

I. Organization	ACP 1.0-3	The Connecticut Yankee Organization Responsibility and Authority.
II. Quality Assurance Program	ACP 1.2-2.3	Certification, and Identification of Qualified Inspection and Testing Personnel.
	ACP 1.2-2.1	Request for a Category Evaluation.
	QA 1.2-2.2	Quality Assurance Program Boundary.
	ACP 1.2-2.4	Housekeeping Requirements.
	ACP 1.2-2.5	Classifying and Upgrading Spare Parts.
III. Design Control	ACP 1.2-3.1	NEO 3.03 - Preparation, Review and Disposition of Plant Design Change Requests (PDCRs).
	ACP 1.2-3.3	Setpoint Change Request (SCR)
	ACP 1.2-3.4	NEO 5.04 - Preparation, Review Approval, Revision and Control of Specifications.
	ACP 1.2-6.9	NEO 3.12 Safety Evaluations
IV. Procurement Document Control	ACP 1.2-4.1	Procurement Document Review.
V. Instructions, Procedures & Drawings	ACP 1.2-5.1	PMMS Trouble Reporting System and Automated Work Order.
	ADM 1.1-53	Drawing Changes & New Submittals.
VI. Document Control	ACP 1.2-6.1	Document Distribution & Accountability.

# CONNECTICUT YANKEE QA PROCEDURES

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	ACP	1.2-6.2	Master Document Index.
	ACP	1.2-6.4	Temporary Procedure Change.
	ACP	1.2-6.5	Station Procedures.
	ACP	1.2-6.10	Maintenance of Station Implementing Procedures with NUSCO Governing Documents.
	ACP	1.2-11.6	Proposed Technical Specification Change Requests.
VII. Control of Purchased Material, Equipment & Services	QA	1.2-7.1	Receipt Inspection and Identification of Materials, Parts, and Components.
	QA	1.2-7.2	Fuel Assembly Receipt Inspection.
VIII. Identification & Control of Materials, Parts & Components	ACP	1.2-8.2	Material Issue.
	ACP	1.2-8.3	Weld Material Control.
IX. Control of Special Processes	ACP	1.2-9.1	Control of Special Processes.
	QA	1.2-9.2	Requirements for Cleaning of Fluid Systems & Associated Components.
	ACP	1.2-9.3	NEO 3.11 - Preparation, Qualification, Approval, and Revision of Northeast Utilities Nondestructive Examination Procedures.
X. Inspections	ACP	1.2-10.1	Installation Inspections.
	ADM	1.1-51	Inservice Inspection Program.
	QA	1.2-10.3	Authorized Nuclear Inspector (ANI)/Authorized Nuclear Inservice Inspector (ANII).

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XI. Test Control	ACP	1.2-11.1	Technical Specification Surveillance Tracking.
	ACP	1.2-11.2	Review of Test Data.
	ACP	1.2-11.3	Retests.
	ACP	1.2-11.4	Product Acceptance Tests.
	ACP	1.2-11.5	QA Activity Surveillance.
XII. Control of Measuring & Test Equipment	ACP	1.2-12.1	Control of Measuring and Test Equipment.
XIII. Handling, Storage & Shipping	ACP	1.2-13.1	Handling of Material & Equipment.
	QA	1.2-13.2	Storage of Material & Equipment.
	ACP	1.2-13.5	Entry and Exit from Station of Transporter for Nuclear By-Product Material (Radwaste).
	ACP	1.2-13.6	Packaging and Shipping Requirements for Material Parts and Components.
XIV. Inspection, Test & Operating Status	ACP	1.2-14.1	NEO 8.01 - Jumper, Lifted Lead and Bypass Control.
	QA	1.2-14.2	Equipment Control (Locking & Tagging).
XV. Nonconforming Materials, Parts, or Components	ACP	1.2-15.1	Nonconformance Control.
	ACP	1.0-14	Determination and Follow of Substantial Safety Hazards (SSH).

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XVI. Corrective Action	ACP 1.2-16.1	Plant Information Reports.
XVII. Quality Assurance Records	ACP 1.2-17.2	Nuclear Power Plant Records.
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QUALITY CONTROL MANUAL

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QC-G - PROCEDURES

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| II. Quality Assurance Program                            | QC-G-1.01 Manual Application, Control and Assignment of Responsibilities.                                 |
|  | QC-G-8.01 Selection, Orientation, Training, Qualification and Certification of Quality Control Personnel. |
| V. Instructions, Procedures and Drawings                 | QC-G-2.01 Quality Control Instructions.   |
| VII. Control of Purchased Material, Equipment & Services | QC-G-6.01 Receiving and Handling.   |
| X. Inspections   | QC-G-3.01 Inspection and Inspection Surveillance Reports.   |
| XII. Control of Measuring and Test Equipment             | QC-G-5.01 Control of Measuring and Test Equipment.  |
| XIII. Handling, Storage, and Shipping                    | QC-G-6.02 Storage of Materials, Equipment and Parts.  |
| XIV. Inspection, Test, and Operating Status              | QC-G-7.01 Inspection Status (Tagging).  |
| XV. Nonconforming Materials, Parts and Components        | QC-G-4.01 Control of Nonconformance and Disposition Reporting.  |

# NU WELDING MANUAL

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## WELDING MANUAL QA PROCEDURES

I. Organization	AP 700	Organization & Control of NUSCO Welding Manual.
IX. Control of Special Processes	AP 701	Preparation, Qualification, Approval & Revision of NUSCO Welding Procedures.
	AP 703	Preparation, Review & Approval of Detailed Welding Procedures.
	AP 702	Control of Welder & Brazer Qualifications.

NU PURCHASING BUSINESS PROCEDURES

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QA PROCEDURES

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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 RELIABILITY ENGINEERING

## PROCEDURES MANUAL

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I. Organization	QRE-1.01 Organization.
II. Quality Assurance Program	QRE-1.02 Applicability and Use of Reliability Engineering Section Procedures Manual.
	QRE-1.06 Training Program.
	QRE-1.09 Training of Inservice Inspection and Nondestructive Examination Personnel.
	QRE-1.10 NUSCO ISI Coordinator Responsibilities and Conduct of ISI Planning and On-Site Activities for Refueling Outages.
V. Instructions Procedures and Drawings	QRE-1.04 Preparation, Issuance and Control of Engineering Department Procedures.
IX. Control of Special Processes	QRE-1.16 Nondestructive Examination Procedures.
XVII. Quality Assurance Records	QRE-1.12 Control of Documents.

# REACTOR ENGINEERING BRANCH

## PROCEDURES

10CFR50 APP. B CRITERIA	REB - PROCEDURES
III. Design Control	<p>REB-3.01 Generation of INCORE Analytical Input From B&amp;W Data.</p> <p>REB-2.01 Project Follow, Review and Documentation for Initial Core and Reload Fuel Campaigns.</p> <p>REB-3.02 Generation of Millstone Unit 1 Bundle Exposure and Isotopic Data for the Nuclear Fuel Branch.</p> <p>REB-3.03Q Generation and Evaluation of Incore Code Results to Verify Technical Specification Compliance.</p> <p>REB-3.06 Computer Program Development and Control.</p>
V. Instructions, Procedures and Drawings	REB-1.01 Preparation, Issuance and Control of REB Procedures and Subtier Instructions.
XVII. Quality Assurance Records	REB-1.02 Reactor Engineering Branch Record Retention - Management of Nuclear Power Plant Records.



# GENERATION FACILITIES LICENSING BRANCH

## PROCEDURES

10CFR50 APP. B CRITERIA	GFL - PROCEDURES
II. Quality Assurance Program	GFL-2.01Q Training in NEO Group Nuclear Policies, Procedures, and Programs.
V. Instructions, Procedures and Drawings	GFL-1.01Q Preparation, Issuance and Control of Generation Facilities Licensing Branch Procedures and Instructions.
VI. Document Control	GFL-3.01Q Regulatory Agency Correspondence.
	GFL-3.03Q U.S. Nuclear Regulatory Commission NUREG's.
	GFL-3.04Q U.S. Nuclear Regulatory Commission Federal Register Notices.
	GFL-3.05Q U.S. Nuclear Regulatory Commission Regulatory Guides.
	GFL-3.06Q Documentation of Telephone Conversations.
	GFL-3.07Q Forward Commitments.
	GFL-3.08Q Preparation and Submittal of Special Nuclear Material, Source Material, and Byproduct Material License Applications.
XVII. Quality Assurance Records	GFL-3.02Q Management of Nuclear Power Plant Records.

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

Regulatory Guide 1.8 - 1-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 Installations, 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.

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, November 1978 is utilized for Millstone 3.

Regulatory Guide 1.74 - Quality Assurance Terms and Definitions, Feb. 74 -Endorses ANSI N45.2.10 - 1973.

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 Plants - 4/76 -Endorses ANSI N45.2.5 - 1974.

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.

## 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; drawings, 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.

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.

Contractor - organizations that provide services that may include engineering, procurement, construction, and installation of material, equipment, and parts. The Nuclear Steam Supply System Supplier (NSSS Supplier) is included in this category.

Corrective Action - action taken to correct conditions adverse to quality in order to preclude recurrence of the conditions.

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 included in the NUPOC 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 which define the design of Category I systems, structures, and components of nuclear power plants.

Design Documents - design documents referred to herein are the drawings and specifications that define the design of Category I systems, structures, and components; the Facility Description and Safety Analysis (FDSA)/Final Safety Analysis Report (FSAR); the License Document; Technical Specifications; and Environmental Technical Specifications.

Drawing Change Request - a document used to request approval of revisions to existing NUSCO drawings.

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

Engineer-Constructor/Contractor Installation Inspection - an inspection of Category I systems, structures and components performed by the Engineer-Constructor/Contractor prior to system release/transfer to NUPOC for preoperational testing, as defined in the NUPOC Startup Manual.

Engineering Service Organization - organizations that provide services such as analysis, testing, and inspection.

Generation Facilities Records - the organization responsible for establishing the Corporate Nuclear Plant Records Program which is implemented at each Nuclear Plant Records Facility.

Handling - the transfer of an item from one location to another within a contractor's, supplier's or engineering service organization's facility or at the nuclear power plant.

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.

Inspection - a phase of quality control which, by means of examination, observation, or measurement determines the conformance of material, equipment, parts, and processes to predetermined 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.

Manager, QA/Designee - the designee is a NUSCO Quality Assurance employee, as well as the respective NUPOC QA/QC Supervisor or NUPOC QA/QC employee as depicted by Figure 1.6 of QAP 1.0.

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 measuring and test parameters comply with appropriate requirements in specifications and drawings.

Nonconforming Material, Equipment, and Parts - any material, equipment, or parts which do not conform to specified requirements.

Nonengineered Items - Material, equipment and parts which are:

- (1) Relatively simple and standard in design, manufacture and test.
- (2) Adaptable to standard or automated inspections and/or tests of the end product to verify quality characteristics after delivery.
- (3) Of such a nature that product acceptance inspections/tests performed upon receipt of the items do not require operations which could adversely affect the integrity, function, or cleanness of the item.

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 thru 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) - consists of the NUQAP Topical Report, Quality Assurance Branch Procedures and other Northeast Utilities Group/Divisional/Departmental/Branch/Section quality related procedures.

Nuclear Plant Operating Companies (NUPOC) - which as a subsidiary of Northeast Utilities performs preoperational testing of Category I systems, structures and components of nuclear power plants and major modifications thereto subsequent to completion of their design and construction and is also responsible for the operation of in-service nuclear power plants. The companies which comprise NUPOC are The Connecticut Yankee Atomic Power Company and The Northeast Nuclear Energy Company.

Nuclear Plant Records Facilities - three separate facilities; located at Millstone Station, Connecticut Yankee, and Berlin; responsible for indexing, retention, retrieval, and protection of Nuclear Plant Records.

NUSCO Internal Audits - audits performed by NUSCO Quality Assurance of NUSCO quality related activities at the corporate office.

NUSCO Nuclear Project Engineer - the engineer designated to act as project engineer during design, construction and preoperational testing of a new nuclear power plant. He may or may not be titled engineer.

NUSCO Nuclear Project Manager - NUSCO employee assigned the responsibility to coordinate all activities addressed in the NUQAP relating to a new Nuclear Power Plant Project (i.e., Project Manager - Millstone Unit 3).

NUSCO/NUPOC Engineer-Constructor Contractor, Supplier, and Engineering Service Organization Audits - audits performed by NUSCO/NUPOC Quality Assurance of the Engineer Constructor, contractors, suppliers, and engineering service organizations quality related activities.

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.



NUSCO Quality Records Center - the location at NUSCO of the NUSCO Quality Assurance records files under the cognizance of the NUSCO Quality Assurance Branch.

"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.

Plant Audits - Audits performed at the in-service nuclear power plant by NUSCO/NUPOC Quality Assurance of NUPOC quality related activities.

Preoperational Testing - tests performed by NUPOC to ensure Category I systems, structures, and components will perform satisfactorily during operation of the in-service nuclear power plant.

Preoperational Testing Audits - Audits performed by NUSCO/NUPOC Quality Assurance during preoperational testing to verify implementation of the requirements of the Northeast Utilities Quality Assurance Program.

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 which provide contractual basis for services such as engineering and procurement; supply of material, equipment, and parts; construction; installation; inspection; and testing. They define the requirements which items and services must meet, in order to be considered acceptable by the purchaser.

Product Acceptance Inspection/Test - Inspection/test performed as part of receipt inspection at the nuclear power plant to verify the quality characteristics of nonengineered items. Operations utilized during product acceptance inspections/tests are such that they do not adversely affect the integrity, function or cleanness of the item.

Proof Test - a test conducted prior to installation of Category I systems, structures and components to verify specification requirements have been met.

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

Project Manager - A NUSCO employee assigned the responsibility to coordinate all activities addressed in NUQAP relating to their assigned Projects.

Purchased Material, Equipment, and Parts - items procured for use in Category I systems, structures, and components.

Purchased Service - services procured to assist in operation, maintenance, modification, and refueling of in-service nuclear power plants.

Quality Assurance Records - any record pertaining to the quality of material, equipment, parts, processes, or operations relating to Category I 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 Related Procedures - an administrative document issued by a NUPOC Station Superintendent or NUSCO department head to implement the requirements of the NUQAP Topical Report.

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, modification, and refueling to verify that Category I 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.

Salvage - a disposition applied to nonconforming material, equipment, and parts that are unsuitable for their intended purpose and not feasible for rework or repair but which contain material, equipment, or parts which are reclaimable for future use.

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.

Storage - Maintenance of an item in the environment specified in appropriate documents.

Supplier - organizations that provide material, equipment, and parts.

Surveillance - A documented record of the observation of work operations performed at the construction or vendors site. Surveillances are not performed to a preplanned checklist. However, the results are formally documented and reviewed and follow-up action, if necessary, is provided.

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 records storage vault door and hardware at NNECO has a two-hour rating and the record storage 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..."

The use of Alternates was eliminated from the Northeast Utilities Nuclear Review Board (NRB) Charter due to the difficulties of keeping the Alternates up to date. The elimination of Alternates forced the creation of a larger NRB membership (seven to eleven members) for greater diversity, resources, and availability.

A quorum of the Nuclear Review Board shall consist of the Chairman or Vice Chairman and at least four NRB members. No more than a minority of the quorum shall be from the Nuclear Operations Department.

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 Plant Records Facility:

"A record is considered a working document until it is transmitted to the appropriate Nuclear Plant Records Facility (NPRF) at which time it is designated as a Quality Assurance Records. 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 NPRF within 90 days of completion of a new construction project or turnover of a betterment project to plant operations.
- 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."