UNITED STATES
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Regulatory Guide Distribution List (Division 1)

Enclosed for your information and use is a copy of Regulatory Guide 1.70.6, "Additional Information - Quality Assurance During Design and Construction."

A current Table of Contents for Division 1 and a list of Division 1 Regulatory Guides currently being developed are also enclosed.

Comments and suggestions to improve this and other guides are encouraged at any time. Comments on Regulatory Guide 1.70.6 will, however, be particularly useful in evaluating the need for an early revision if received by September 30, 1974.

Comments should be sent to the Secretary of the Commission, U. S. Atomic Energy Commission, Washington, D. C. 20545, Attention: Chief, Public Proceedings Staff.

Sincerely,

Lester Rogers

Lester Rogers
Director of Regulatory Standards

Enclosures:
1. Regulatory Guide 1.70.6
2. Table of Contents (Division 1)
3. Guides Under Development (Division 1)

U.S. ATOMIC ENERGY COMMISSION

July 1974

REGULATORY GUIDE

DIRECTORATE OF REGULATORY STANDARDS

REGULATORY GUIDE 1.70.6

ADDITIONAL INFORMATION QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

A. INTRODUCTION

In October 1972, the Commission issued Revision 1 of the "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants."* This document provides a standard format for the safety analysis reports required by the Commission's regulations and identifies the principal information needed by the Regulatory staff in order to conduct its safety evaluations.

In its review of recent applications for construction permits and operating licenses, the Regulatory staff has identified information that has often been missing from these safety analysis reports. To obtain the information needed to perform its evaluation, the staff has had to request this informatiion by directing written questions to each applicant. The Foreword of the Standard Format states: "Any revisions of the Commission's needs for information will be conveyed to the industry and the public in various ways such as (1) amendments to the Standard Format, (2) in the Information Guide series, (3) as part of future Safety Guides, or (4) in Public Announcements." This guide identifies information related to quality assurance during design and construction that is required at the construction permit stage of review of the safety analysis report. This guide can also be used by applicants and their major contractors such as nuclear steam system suppliers, architect-engineers, constructors, and major equipment manufacturers in preparing topical reports describing their Quality Assurance (QA) Programs.

The Commission plans to revise the Standard Format within the next year to include this modification. In the interim, the information requested here should be included in safety analysis reports submitted for AEC review.

*The "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" has been designated as Regulatory Guide 1.70.

B. ADDITIONAL INFORMATION

The additional information requested should be incorporated into sections of the Preliminary Safety Analysis Report (PSAR) as indicated below:

1. The entire Section 17.0, "Quality Assurance," of the Standard Format should be replaced with the following:

17.0 QUALITY ASSURANCE

In order to provide assurance that the design, construction, and operation of the proposed nuclear power plant are in conformance with applicable regulatory requirements and with the design bases specified in the license application, it is necessary that a Quality Assurance Program (QA Program) be established by the applicant. In this chapter of the SAR, the applicant should provide a description of the QA Program to be established and executed during the design and construction of the nuclear power plant. In addition, the FSAR should describe the QA Program to be established and executed during operation of the nuclear power plant. The QA Program must be established at the earliest practical time consistent with the schedule for accomplishing the activity. Where some portions of the QA Program have not yet been established at the time the SAR is prepared because the activity will be performed in the future, the description should also provide a schedule for implementation. The program must meet the requirements of Appendix B to 10 CFR Part 50. The inspection and survey systems required by §50.55a "Codes and Standards," of 10 CFR Part 50 may be used in partial fulfillment of these requirements to the extent that they are shown by the description of the QA

Program to satisfy the appli le requirements of Appendix B.

In order to facilitate the presentation of the information, the QA Program for each of the major organizations involved in executing the QA Program should include the information described (either separately for each organization or integrally for all organizations) in accordance with the outline presented below. It is not intended to dictate the format of any QA Program Manual; that is left to the discretion of the applicant. It is required, however, that the description in the SAR address, at a minimum, each of the criteria in Appendix B in sufficient detail to enable the reviewer to determine whether and how all the requirements of the Appendix will be satisfied in accordance with §50.34 of 10 CFR Part 50. Reference to appropriate portions of other sections of the SAR may suffice.

AEC Regulatory Guides and the documents entitled "Guidance on Quality Assurance Requirements During Design and Procurement Phase of Nuclear Power Plants," Revision 1 dated May 1974 (Gray Book - Revision 1), "Guidance on Quality Assurance Requirements During the Construction Phase of Nuclear Power Plants," Revision 0 dated May 1974 (Green Book - Revision 0), and "Guidance on Quality Assurance Requirements During the Operations Phase of Nuclear Power Plants," Revision 0 dated October 1973 (Orange Book - Revision 0) contain guidance on acceptable methods of implementing portions of the quality assurance program. The PSAR should specifically indicate whether this guidance will be followed. If such guidance will not be followed, the PSAR should describe specific alternative methods that will be used and the manner of implementing them and should identify the organizations responsible for their implementation.

Where a portion of the QA Program to be implemented will follow the guidance provided by a Regulatory Guide, the Gray Book - Revision 1, the Green Book - Revision 0, or the Orange Book - Revision 0, the Program description may consist of a statement that the guidance will be followed for that portion of the QA Program. When these documents are used in describing the QA Program, the applicant should indicate how the guidance documents will be applied to portions of the QA Program and should delineate the organizational element responsible for implementing various provisions of the respective guidance documents within each major organization in the project, including that of the applicant, the architect-engineer, the nuclear steam system supplier, the constructor, and construction manager (if other than the constructor).

2. The entire Section 17.1, "Quality Assurance During Design and Construction," of the Standard Format should be replaced with the following:

17.1 Quality Assurance During Design and Construction

17.1.1 Organization

17.1.1.1 - The PSAR should describe clearly the authority and duties of persons and organizations performing quality assurance (QA) functions of assuring that the QA Program is established and executed or of verifying that an activity has been correctly performed. The PSAR should provide organization charts and functional responsibility descriptions that denote the lines of responsibility and areas of authority within each of the major organizations in the project, including those of the applicant, the architect-engineer, the nuclear steam system supplier, the constructor, and construction manager (if other than the constructor). These charts and descriptions should present the structure of QA organizations involved as well as other functional organizations performing activities affecting quality in design, procurement, manufacturing, construction and installation, testing, inspection, and auditing with clear delineation of their responsibility, authority, and relationship to corporate management. In addition, a single overall project organization chart should be included showing how each of the major organizations or companies working directly for the applicant on the project interrelate with one another.

17.1.1.2 - The PSAR should describe those measures which assure that persons and organizations performing QA functions have sufficient authority and organizational freedom to (1) identify quality problems; (2) initiate, recommend, or provide solutions; and (3) verify implementation of solutions. The PSAR should describe the measures which assure that persons and organizations assigned the responsibility for checking, auditing, inspecting, or otherwise verifying that an activity has been correctly performed report to a management level such that this required authority and organizational freedom, including sufficient independence from the pressures of production, are provided. Irrespective of the organizational structure, the PSAR should describe how the individual or individuals with primary responsibility for assuring effective implementation of the QA Program at any location where activities subject to the control of the QA Program are being performed will have direct access to such levels of management as may be necessary to carry out this responsibility. The PSAR should indicate from whom the persons performing QA functions receive technical direction for performing QA tasks and administrative control (salary review, hire/fire, position assignment). The PSAR should identify those positions or organizations which have written delegated responsibility and authority to stop work or control further processing, delivery, installation, or use of nonconforming items until proper disposition of the deficiency has been approved.

The PSAR should describe how requirements will be imposed on contractors and subcontractors to assure that individuals or groups within their organizations performing QA functions have sufficient authority and

organizational freedom to effectively implement their respective QA Programs.

17.1.1.3 - The PSAR should describe the extent to which the applicant will delegate to other contractors the work of establishing and executing the QA Program or any part thereof. A clear delineation of those QA functions which are implemented within the applicant's QA organization(s) and those which are delegated to other organizations should be provided in the PSAR. The PSAR should describe the method by which the applicant will retain responsibility for and maintain control over those portions of the QA Program delegated to other organizations and identify the organization responsible for verifying that delegated QA functions are properly carried out. The PSAR should identify major work interfaces for activities affecting quality and describe how clear and effective lines of communication exist between the applicant and his principal contractors to assure necessary coordination and control of the QA Program.

17.1.2 Quality Assurance Program

17.1.2.1 - The QA Program in the PSAR should cover each of the criteria in Appendix B to 10 CFR Part 50 in sufficient detail to permit a determination as to whether and how all of the requirements of Appendix B will be satisfied. The PSAR should (1) describe the extent to which the QA Program will conform to various provisions of the Gray Book - Revision 1, the Green Book - Revision 0, and AEC Regulatory Guides which provide guidance on acceptable methods of implementing portions of the QA Program and (2) identify the organizational element responsible for implementing these provisions. If the applicant elects not to follow the above guidance, the PSAR should describe in detail equivalent to that furnished in the AEC guidance the alternative methods that will be used and the manner of implementing them and should indicate the organizations responsible for their implementation.

17.1.2.2 - The PSAR should identify the safety-related structures, systems, and components to be controlled by the QA program.

17.1.2.3 - The PSAR should describe the measures which assure that the QA Program is being established at the earliest practicable time consistent with the schedule for accomplishing activities affecting quality for the project. That is, the PSAR should describe how the QA Program is being established in advance of the activity to be controlled and how it will be implemented as the activity proceeds. Those activities affecting quality initiated prior to the submittal of the PSAR, such as establishing information required to be included in the PSAR, design and procurement, and safety-related site preparation activities should be identified in the PSAR. The PSAR should describe how these activities are controlled by a QA Program which complies with Appendix B to 10 CFR Part 50.

17.1.2.4 - The PSAR should describe how the QA Program is documented by written policies, procedures, or instructions and how it will be implemented in accordance with these policies, procedures, or instructions. The PSAR should include a listing of QA Program procedures or instructions which will be used to implement the QA Program for each major activity such as design, procurement, construction, etc. The procedure list should identify which criteria of Appendix B to 10 CFR Part 50 are implemented by each procedure. In the event certain required procedures are not yet established, a schedule for their preparation should be provided in the PSAR.

17.1.2.5 - The PSAR should describe the program which provides adequate indoctrination and training of personnel performing activities affecting quality to assure that suitable proficiency is achieved and maintained. The PSAR should describe how the indoctrination and training program will assure that:

(1) Personnel performing activities affecting quality are appropriately trained in the principles and techniques of the activity being performed;
(2) Personnel performing activities affecting quality are instructed as to purpose, scope, and implementation of governing manuals, policies, and procedures;
(3) Appropriate training procedures are established.

17.1.2.6 - The PSAR should describe the qualification requirements for the position or positions responsible for assuring effective implementation of the QA Program of the applicant and of his major contractors.

17.1.2.7 - The PSAR should describe the measures which assure that activities affecting quality will be accomplished under suitable controlled conditions, including (1) the use of appropriate equipment, (2) a suitable environment for accomplishing the activity, e.g., adequate cleanliness, and (3) compliance with necessary prerequisites for the given activity.

17.1.2.8 - The PSAR should describe the measures which assure that there is regular management review of the QA Program to assess the adequacy of its scope, implementation, and effectiveness. The PSAR should describe the provisions for reviews by management above or outside the QA organization to assure achieving an objective program assessment.

The PSAR should describe the measures which assure that the QA organization of the applicant will (1) review and document agreement with the QA Program of his principal contractors and (2) conduct or have conducted audits of the contractors' QA Program activities.

17.1.3 Design Control

17.1.3.1 - The PSAR should describe the design control measures which assure that (1) applicable regulatory requirements and design bases for safety-related structures, systems, and components are correctly translated into specifications, drawings, procedures, and instructions, (2) appropriate quality standards are specified in design documents, and (3) deviations from such standards are controlled.

17.1.3.2 - The PSAR should describe measures which assure that adequate review and selection for application suitability is conducted for materials, parts, equipment, and processes that are essential to safety-related functions of the structures, systems, and components. The PSAR should describe provisions which assure that standard commercial or so-called "off the shelf" materials, parts, and equipment also receive adequate application review and selection.

17.1.3.3 - The PSAR should describe the program for applying design control measures to such aspects of design as reactor physics; stress, thermal, hydraulic, and accident analysis; materials compatibility; and accessibility for maintenance, inservice inspection, and repair and should describe measures for delineation of acceptance criteria for inspections and tests.

17.1.3.4 - The PSAR should describe measures which assure verification or checking of design adequacy, such as design reviews, use of alternative calculational methods, or performance of a qualification testing program under the most adverse design conditions. The PSAR should identify the positions or organizations responsible for design verification or checking and should describe measures which assure that the verifying or checking process is performed by individuals or groups other than those who performed the original design, but who may be from the same organization.

17.1.3.5 - The PSAR should describe measures for identifying and controlling design interfaces, both internal and external, and for coordination between participating design organizations. The PSAR should describe measures in effect between participating design organizations for review, approval, release, distribution, collection, and storage of documents involving design interfaces and changes thereto. The PSAR should describe how these measures will assure that these design documents are controlled in a timely manner to prevent inadvertent use of superseded design information.

17.1.3.6 - The PSAR should describe the measures that will be employed to assure that design changes, including field changes, are subject to the same design controls that were applied to the original design and are reviewed and approved by the organization that performed the original design unless the originating organization designates another responsible organization.

17.1.4 Procurement Document Control

17.1.4.1 - The PSAR should describe measures which assure that documents, and changes thereto, for procurement of material, equipment, and services, whether purchased by the applicant or by his contractors or subcontractors, correctly include or reference the following as necessary to achieve required quality:

(1) Applicable regulatory, code, and design requirements;
(2) Quality assurance program requirements;
(3) Requirements for supplier documents such as instructions, procedures, drawings, specifications, inspection and test records, and supplier QA records to be prepared, submitted, or made available for purchaser review or approval;
(4) Requirements for the retention, control, and maintenance of supplier QA records;
(5) Provision for purchaser's right of access to suppliers' facilities and work documents for inspection and audit;
(6) Provision for supplier reporting and disposition of nonconformances from procurement requirements.

17.1.4.2 - The PSAR should describe (1) measures which clearly delineate the control responsibilities and action sequence to be taken in the preparation, review, approval, and issuance by competent personnel of procurement documents and (2) measures which assure that changes or revisions to procurement documents are subject to the same review and approval requirements as the original documents.

17.1.4.3 - The PSAR should describe measures which assure (1) that procurement documents require suppliers to have and implement a documented QA Program for purchased materials, equipment, and services to an extent consistent with their importance to safety; (2) that the purchaser has evaluated the supplier before the award of the procurement order or contract to assure that the supplier can meet the procurement requirements; and (3) that procurement documents for spare or replacement items will be subject to controls at least equivalent to those used for the original equipment.

17.1.5 Instructions, Procedures, and Drawings

17.1.5.1 - The PSAR should describe measures that assure that activities affecting quality such as design, procurement, manufacturing, construction and installation, testing, inspection, and auditing are prescribed by appropriately documented instructions, procedures, or drawings and that these activities will be conducted in accordance with the documented instructions and procedures.

17.1.5.2 - The PSAR should describe the system whereby the documented instructions and procedures will include appropriate quantitative (such as dimensions, tolerances, and operating limits) and qualitative

(such as workmanship samples and weld radiographic acceptance standards) acceptance criteria for determining that prescribed activities have been satisfactorily accomplished.

17.1.6 Document Control

17.1.6.1 - The PSAR should describe those measures established to control the issuance of documents such as instructions, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality. The description should cover control measures which assure that:

(1) Documents are reviewed for adequacy (i.e., information is clearly and accurately stated) and are approved by authorized personnel for issuance and use at locations where the prescribed activity will be performed before the activity is started;
(2) Means such as use of updated master document lists exist to assure that obsolete or superseded documents are replaced in a timely manner by updated applicable document revisions; and
(3) Document changes are reviewed and approved by the same organizations that performed the original review and approval unless delegated by the originating organization to another responsible organization.

17.1.6.2 - The PSAR should identify the types of documents to be controlled and the group responsible for review, approval, and issuance of documents and changes thereto.

17.1.7 Control of Purchased Material, Equipment, and Services

17.1.7.1 - The PSAR should describe those measures that assure that material, equipment, and services purchased directly by the applicant or by his contractors and subcontractors will conform to procurement document requirements. The PSAR should describe the measures that provide, as appropriate, for:

(1) Evaluation and selection of sources of supply;
(2) Surveillance at the supplier's facility by the purchaser or his representative in accordance with written procedures during design, manufacture, inspection, and test of the procured item or service to verify compliance with quality requirements;
(3) Source and/or receipt inspection in accordance with written procedures and acceptance criteria of procured items furnished by the supplier; and
(4) Documentary evidence to the site from the supplier that procured items meet procurement quality requirements such as codes, standards, or specifications. The PSAR should describe measures established by the applicant to (a) examine and indicate acceptance of this documented evidence during source or receipt inspection and (b) assure that this documented evidence is available at the nuclear power plant site prior to installation or use of the procured item and that the documentation will be retained at the plant site.

17.1.7.2 - The PSAR should describe measures whereby the applicant or its designated representative will audit and evaluate the effectiveness of the control of quality-related activities of contractors and subcontractors at a frequency or to an extent consistent with the importance to safety, complexity, and quantity of the item or service being furnished.

17.1.8 Identification and Control of Materials, Parts, and Components

The PSAR should describe measures established to identify and control items such as materials, parts, and components, including partially fabricated assemblies, to prevent use of incorrect or defective items. The PSAR should describe measures which assure (1) that identification of the item, (i.e., heat number, part number, serial number, or other appropriate marking) is maintained either on the item or on records traceable to the item and verified, as required, throughout fabrication, erection, installation, and use of the item and (2) that the method and location of the identification does not affect the function or quality of the item being identified.

17.1.9 Control of Special Processes

The PSAR should describe measures established to control special processes such as welding, heat treating, nondestructive testing, and electrochemical machining and to assure that they are accomplished by qualified personnel using written procedures qualified in accordance with applicable codes, standards, specifications, or other special requirements. The PSAR should describe those measures which assure that qualifications of special processes, personnel performing special processes, and equipment are kept current and that record files thereof are maintained.

17.1.10 Inspection

17.1.10.1 - The PSAR should describe the measures which assure that a program for inspection is established and implemented by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity. The PSAR should describe measures which assure that (1) inspection personnel are appropriately qualified and are independent of the individual or group performing the activity being inspected; (2) inspections or tests are performed for each work operation as necessary to verify quality; (3) indirect control by monitoring processing methods, equipment, and personnel is used if direct inspection of processed material or products is impossible or disadvantageous, and (4) both inspection and process monitoring are used when control is inadequate without both. The PSAR should describe

measures which assure that (1) inspection procedures and instructions are made available with necessary drawings and specifications for use prior to performing the inspections; (2) inspectors' qualifications or certifications are kept current; and (3) replaced or reworked items are inspected in accordance with original inspection requirements and modified or repaired items are inspected by methods which are equivalent to the original inspection method.

17.1.10.2 - The PSAR should describe the system whereby appropriate documents will identify any mandatory inspection hold points which require witnessing or inspecting by the applicant's designated representative and beyond which work may not proceed without the consent of its designated representative.

17.1.11 Test Control

17.1.11.1 - The PSAR should describe the measures that establish a test program which (1) identifies all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service, (2) is conducted by trained or appropriately qualified personnel in accordance with written test procedures which incorporate or reference the requirements and acceptance limits contained in applicable design documents, and (3) includes testing that will be performed under the construction permit.

17.1.11.2 - The PSAR should describe the measures which assure test procedures have provisions for assuring that:

(1) All prerequisites for the given test have been met;
(2) Adequate test instrumentation and equipment are available;
(3) The test is performed under suitable environmental conditions and with adequate test methods.

17.1.11.3 - The PSAR should describe the system whereby test results are documented and evaluated to assure that test requirements have been satisfied.

17.1.12 Control of Measuring and Test Equipment

The PSAR should describe the measures established to assure that tools, gages, instruments, and other measuring and testing devices used in activities affecting quality are properly identified, controlled, adjusted, and calibrated at specified periods to maintain accuracy within necessary limits. The PSAR should describe measures which assure (1) that these devices are adjusted and calibrated against certified equipment or reference or transfer standards having known valid relationships to nationally recognized standards or (2) that if no national standards exist, the basis for calibration is documented. The PSAR should describe the measures which assure that the error of calibration standards is less than the error of production measuring and test equipment. The PSAR should describe provisions that will apply if measuring and test equipment is found out of calibration (1) for evaluating the validity of previous inspection or test results and the acceptability of items inspected or tested since the last calibration check and (2) where necessary to establish acceptability of suspect items, for repeating original inspections or tests using calibrated equipment. The PSAR should describe measures which assure the maintenance of records which indicate the calibration status of all items under the calibration system and which indentify the measuring and test equipment.

17.1.13 Handling, Storage, and Shipping

The PSAR should describe the measures established to control the handling, storage, shipping, cleaning, and preservation of material and equipment in accordance with work and inspection instructions to prevent damage or deterioration. The PSAR should describe the measures for specifying and providing, when necessary for particular products, special protective environments such as inert gas atmosphere, specific moisture content levels, and temperature levels.

17.1.14 Inspection, Test and Operating Status

The PSAR should describe measures established to indicate by the use of markings such as stamps, tags, labels, routing cards, or other suitable means the status of inspections and tests performed on individual items of the nuclear power plant throughout fabrication, installation, and test. The PSAR should describe measures which provide for the identification of items which have satisfactorily passed required inspections and tests, where necessary to preclude inadvertent bypassing of such inspections and tests. The PSAR should describe the measures established for indicating the operating status of structures, systems, and components of the nuclear power plant such as tagging valves and switches to prevent inadvertent operation.

17.1.15 Nonconforming Materials, Parts, or Components

The PSAR should describe the measures established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation. The PSAR should describe measures which provide for, as appropriate, identification, documentation, segregation, disposition, and notification to affected organizations. The PSAR should describe measures which assure that nonconforming items are reviewed and accepted, rejected, repaired, or reworked in accordance with documented procedures. The PSAR should describe measures which control further processing, delivery, or installation pending proper disposition of the deficiency. The PSAR should describe measures established by the applicant (1) for contractors to report to him those nonconformances concerning departures from procurement requirements

that are dispositioned "use as is" or "repair" and (2) to make such nonconformance reports part of the documentation required at the nuclear plant site or to include a description of the nonconformance and its disposition on certificates of conformance that are provided to the site prior to installation or use of material or equipment at the site. The PSAR should state whether periodic analyses of nonconformance reports are performed to show quality trends and whether such analyses are forwarded to management.

17.1.16 Corrective Action

17.1.16.1 - The PSAR should describe the measures which assure that conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.

17.1.16.2 - The PSAR should describe how, in the case of significant conditions adverse to quality, the cause(s) of the condition is determined, corrective action is taken to preclude repetition, and the problem with its determined cause(s) and corrective action is documented and reported to appropriate levels of management.

17.1.17 Quality Assurance Records

17.1.17.1 - The PSAR should describe the measures which assure that sufficient records are maintained to furnish evidence of activities affecting quality. The PSAR should describe how the content of such records (1) includes at least the following: test logs; results of reviews, inspections, tests, audits, monitoring of work performance, and materials analyses; and such data as qualifications of personnel, procedures, and equipment; (2) identifies the type of operation, the inspector or data recorder, the results, the acceptability, and action taken in connection with any deficiencies noted; and (3) provides sufficient information to permit identification of the record with the item(s) or activity to which it applies.

17.1.17.2 - The PSAR should describe the measures which assure that records will be identifiable and retrievable.

17.1.17.3 - The PSAR should describe the measures which establish requirements, consistent with regulatory requirements and responsibilities concerning record submittal and retention, security, and storage facilities for protecting records from destruction by fire, flooding, tornadoes, insects, and rodents and from deterioration by extremes in temperature and humidity.

17.1.18 Audits

The PSAR should describe the program of the applicant and of his principal contractors for conducting comprehensive planned and periodic audits to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program

The PSAR should describe the program features which cover the functions listed below and should identify the positions or organizations which perform these functions.

(1) External audits to be performed by the applicant and his principal contractors on their respective suppliers.
(2) Internal audits to be performed by the applicant and his principal contractors within their respective organizations.
(3) The planning and scheduling of audits to assure that they are regularly scheduled on the basis of the status and safety importance of the activities being performed and are initiated early enough to assure effective quality assurance during design, procurement, manufacturing, construction and installation, inspection, and test.
(4) Conduct of audits in accordance with written procedures or check lists by appropriately trained and qualified personnel not having direct responsibility in the area being audited.
(5) Documentation of audit results with review by management responsible for the area audited and, where indicated, followup action taken, including re-audit of deficient areas.

DIVISION 1 REGULATORY GUIDES
POWER REACTORS

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1.80 Preoperational Testing of Instrument Air Systems (6/74)
1.81 Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants (6/74)
1.82 Sumps for Emergency Core Cooling and Containment Spray Systems (6/74)
1.83 Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes (6/74)
1.84 Code Case Acceptability–ASME Section III Design and Fabrication (6/74)
1.85 Code Case Acceptability–ASME Section III Materials (6/74)

1.86 Termination of Operating Licenses for Nuclear Reactors (6/74)
1.87 Construction Criteria For Class 1 Components in Elevated Temperature Reactors (Supplement to ASME Section III Code Cases 1592, 1593, 1594, 1595, and 1596) (6/74)

DIVISION 1 REGULATORY GUIDES UNDER DEVELOPMENT

POWER REACTORS

* Tornado Design Classification
* Availability of Electric Power Sources
* Requirements for Instrumentation to Assess Nuclear Power Plant Conditions During and Following an Accident for Water-Cooled Reactors
* Isolation of Low Pressure Systems Connected to the Reactor Coolant Pressure Boundary
* Requirements for Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records
* Requirements for Assessing Ability of Material Underneath Nuclear Power Plant Foundations to Withstand Safe Shutdown Earthquake
* Fire Protection Criteria for Nuclear Power Plants
* Protective Coatings for Light Water Nuclear Reactor Containment Facilities
* Inservice Surveillance of Grouted Prestressing Tendons
* Seismic Input Motion to Uncoupled Structural Model
* Primary Reactor Containment (Concrete) Design and Analysis
* Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems
* Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel
* Fracture Toughness Requirements for Vessels Under Overstress Conditions
* Material Limitations for Component Supports
* Protection Against Postulated Events and Accidents Outside of Containment
* Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants
* Assumptions Used for Evaluating the Potential Radiological Consequences of a Gas Holdup Tank Failure in a Boiling Water Reactor
* Quality Assurance Requirements for Procurement of Equipment, Materials, and Services
* Quality Assurance Requirements for Lifting Equipment
* Maintenance and Testing of Batteries
* Qualification of Class I Electric Equipment
* Type Tests for Class IE Cables, Connections, and Field Splices for Nuclear Power Plants
* Seismic Qualification of Class I Electric Equipment
* Fracture Toughness Requirements for Materials for Class 2 and 3 Components
* Maintenance of Water Purity in PWR Secondary Systems
* Main Steam Line Sealing System Design Guidelines for Boiling Water Reactors
* Criteria for Heatup and Cooldown Procedures
* Effects of Residual Elements on Predicted Radiation Damage
* Fuel Oil Supplies for Standby Diesel-Generators
* Assumptions Used for Evaluating the Potential Radiological Consequences of a Liquid Radioactive Waste System Accident
* Surveillance and Examination and Testing of Irradiated Fuel Rods
* Elevated Temperature Inservice Surveillance Tests for HTGR Plants
* Design Load Combinations for Component Supports
* Requirements for Containment Isolation
* Probable Maximum Storm Surge Flooding on Lakes and Sea Shores
* Requirements for Concrete Reactor Vessels and Containments (ASME Section III Division 2)
* Instrument Span and Trip Setting
* Failed Fuel Detection System for Nuclear Power Plants
* Code Case Acceptability—ASME Section III Nonmetallic Materials
* Design, Qualification Test, and Installation Requirements for Class 2 and 3 Safety-Related Pumps
* Seismic Response Combination of Modes and Spatial Components
* Analysis of Seismic Recorded Data
* Protection of Nuclear Power Plant Control Room Operators Against an Onsite Chlorine Release
* Functional Specification for Self-Operated and Power-Operated Safety-Related Valves
* Nuclear Power Plant Environmental Characteristics for Designated Sites
* Evaluation of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plant Sites