U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

17.1 QUALITY ASSURANCE DURING THE DESIGN AND CONSTRUCTION PHASES

REVIEW RESPONSIBILITIES

Primary - ~~Quality Assurance Branch (QAB)~~Quality Assurance and Maintenance Branch (HQMB)[1]

Secondary - Mechanical Engineering Branch (EMEB)[2]
~~Instrumentation & Control Systems Branch~~Instrumentation and Controls Branch (HICB)[3]
~~Power Systems Branch~~Electrical Engineering Branch (EELB)[4]
~~Accident Evaluation Branch~~
~~Radiological Assessment Branch~~Emergency Preparedness and Radiation Protection Branch (PERB)[5]
~~Hydrologic & Geotechnical Engineering Branch~~Civil Engineering and Geosciences Branch (ECGB)[6]
~~Containment Systems Branch~~Containment Systems and Severe Accident Branch (SCSB)[7]
Materials and Chemical Engineering Branch (EMCB)[8]

I. AREAS OF REVIEW

~~QAB~~HQMB[9] reviews and evaluates the description of the quality assurance (QA) program for the design and construction phases in each application for a construction permit (CP), a manufacturing license, or a standardized design approval in accordance with applicable portions of this section of the Standard Review Plan (SRP).[10] SRP Sections 17.1 and 17.2 provide guidelines for review of programs based upon ANSI N45.2 (Reference 41) and its daughter

USNRC STANDARD REVIEW PLAN

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555.

standards.[*11] SRP Section 17.3 provides guidelines for review of a QA Program developed following ASME standards NQA-1 and NQA-2 (References 43 and 44, respectively). Either approach is acceptable. The NRC Staff is developing new staff positions related to graded quality assurance and upon issuance of those positions, these sections will be considered for further revision.[12] ~~The secondary review branches review the listing of structures, systems, and components (QA list) covered by the QA program for their areas of review responsibility in accordance with all of this section of the Standard Review Plan and documents the acceptability of the listing including any items that should be added or clarified by memo to the QAB. The review by MEB in this regard also addresses the areas of review responsibility normally assigned to ASB, RSB, CEB, PSB (except electrical), and SEB.~~[13]

Pre-Docketing

Prior to docketing a CP application, the NRC performs a substantive review of the applicant's QA program description relative to ongoing design and procurement activities. This review and associated inspection are performed immediately after tendering of a CP application to determine that a satisfactory QA program has been established and is being implemented. The pre-docketing substantive review places particular emphasis on the areas of organization, QA program, design control, procurement document control, and audit. The application is not docketed unless the established and implemented program in these areas has no substantive deviation from NRC QA guidance applicable to activities conducted prior to docketing. Representatives from the ~~o~~Office of Nuclear Reactor Regulation (NRR) ~~and IE~~[14] may meet with the applicant's representatives 9–12 months prior to tendering of the application to provide a clear understanding of what is expected in the QA program description and the implemented program in order for the program to be accepted during the substantive review and associated inspection.

Where an NRC-accepted QA topical report is referenced in the application, the referenced QA program is not re-reviewed except for conformance to the applicable staff positions in this SRP section and the regulatory guides in effect at the time of docketing the application. ~~For the case of CP applications referencing a standard design that includes an approved QA program directly or by reference, the applicant need not conform to new or revised Regulatory Guides unless they contain regulatory positions determined to be significant to safety, as indicated in the implementation section of each guide.~~ For applications referencing a design certified under 10 CFR 52 that includes an approved QA program (either directly or by reference), the quality assurance commitments shall be those in the approved QA program for the referenced design. (The Commission may not impose new requirements on a certified design except through rulemaking, as specified in 10 CFR 52.63.)[15]

---

[*]NOTE: ANSI N45.2 was last endorsed by Regulatory Guide 1.28, Rev. 2. In conjunction with issuance of Regulatory Guide 1.28, Rev. 3, numerous Regulatory Guides endorsing ANSI N45.2 daughter standards were withdrawn. Reference to Regulatory Guide 1.28, Rev. 2 and to withdrawn Regulatory Guides, including 1.58, 1.64, 1.74, 1.88, 1.123, 1.144 and 1.146, have been retained in this revision of SRP 17.1 to support continued use of the N45.2 series as an acceptable method of compliance with 10 CFR 50 Appendix B.

Post-Docketing

The ~~QAB~~HQMB[16] review, after docketing, covers the QA controls to be applied by the applicant and principal contractors to activities that may affect the quality of structures, systems, and components important to safety. These activities include site testing and evaluation (starting with evaluation of exposed excavated surfaces, determination of site characteristics, and testing), designing, purchasing, fabricating, constructing, handling, shipping, storing, cleaning, erecting, installing, inspecting, and testing. This review extends to the determination of how the applicable requirements of the 18 criteria of Appendix B to 10 CFR Part 50 are satisfied by the proposed QA program.

The areas of review are as follows:

1. ORGANIZATION

   A. Organizational description and charts of the lines, interrelationships, and areas of responsibility and authority for all organizations performing quality-related activities, including the applicant's organization and principal contractors (architect engineer, nuclear steam supply system vendor, constructor, and construction manager when other than the constructor).

   B. Organizational location, degree of independence from the performing organization, and authority of the individuals assigned the responsibility for performing QA functions.

   C. Organizational provisions for ~~assuring~~ ensuring[17] the proper implementation of the QA program.

2. QUALITY ASSURANCE PROGRAM

   A. Scope of the QA program.

   B. Provisions to ~~assure~~ ensure proper definition of the QA program.

   C. Programmatic provisions to ~~assure~~ ensure proper implementation of the QA program.

   D. Provisions to ~~assure~~ ensure adequacy of personnel qualifications.

3. DESIGN CONTROL

   A. Scope of the QA program for design activities.

   B. The organizational structure, activity, and responsibility of the positions or groups responsible for design activities.

C. Provisions to carry out design activities in a planned, controlled, and orderly manner.

D. Provisions for interface control.

E. Provisions to verify or check the technical adequacy of design documents.

F. Provisions to control design changes.

4. PROCUREMENT DOCUMENT CONTROL

A. Provisions ~~which assure~~ to ensure that applicable regulatory requirements, technical requirements, and QA program requirements are included or referenced in procurement documents.

B. Provisions for review and approval of procurement documents.

5. INSTRUCTIONS, PROCEDURES, AND DRAWINGS

A. Provisions for ~~assuring~~ ensuring that activities affecting quality are prescribed by and accomplished in accordance with documented instructions, procedures, or drawings.

B. Provisions for including quantitative and qualitative acceptance criteria in instructions, procedures, and drawings.

6. DOCUMENT CONTROL

A. Provisions to ~~assure~~ ensure that documents, including changes, are reviewed for adequacy, approved for release by authorized personnel, and distributed and used at the location where the prescribed activity is performed.

B. Provisions to prevent the inadvertent use of obsolete or superseded documents.

7. CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES

A. Provisions for the control of purchased material, equipment, and services; for selection of suppliers; and for assessing the adequacy of quality.

B. Provisions to ~~assure~~ ensure that documented evidence of the conformance of material and equipment to procurement requirements is available at the plant site prior to installation or use.

8. IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

A. Provisions to identify and control materials, parts, and components.

B. Provisions to ~~assure~~ ensure that incorrect or defective items are not used.

9. CONTROL OF SPECIAL PROCESSES

A. Provisions to ~~assure~~ ensure the acceptability of special processes such as welding, heat treating, nondestructive testing, and chemical cleaning.

B. Provisions to ~~assure~~ ensure that special processes are performed by qualified personnel using qualified procedures and equipment.

10. INSPECTION

A. Provisions for the inspection of activities affecting quality, including the items and activities to be covered.

B. Organizational responsibilities and qualifications established for individuals or groups performing inspections.

C. Prerequisites to be provided in the written inspection procedures with provisions for documenting and evaluating inspection results.

11. TEST CONTROL

A. Provisions for tests ~~which assure~~ to ensure that structures, systems, and components will perform satisfactorily in service.

B. Prerequisites to be provided in written test procedures with provisions for documenting and evaluating test results.

C. Personnel qualification programs established for test personnel.

12. CONTROL OF MEASURING AND TEST EQUIPMENT

Provisions to ~~assure~~ ensure that tools, gages, instruments, and other measuring and testing devices are properly identified, controlled, calibrated, and adjusted at specified intervals.

13. HANDLING, STORAGE, AND SHIPPING

Provisions to control handling, storage, shipping, cleaning, and preservation of items in accordance with work and inspection instructions to prevent damage, loss, and deterioration by environmental conditions such as temperature or humidity.

14. INSPECTION, TEST, AND OPERATING STATUS

Provisions to indicate the inspection, test, and operating status of items to prevent inadvertent use or bypassing of inspection and tests.

15. NONCONFORMING MATERIALS, PARTS, OR COMPONENTS

Provisions to control the use or disposition of nonconforming materials, parts, or components.

16. CORRECTIVE ACTION

Provisions to ~~assure~~ ensure that conditions adverse to quality are promptly identified and corrected and that measures are taken to preclude repetition.

17. QUALITY ASSURANCE RECORDS

Provisions for the identification, retention, retrieval, and maintenance of records that furnish evidence of activities affecting quality.

18. AUDITS

A. Provisions for audits to verify compliance with all aspects of the QA program and to determine the effectiveness of the QA program.

B. Responsibilities and procedures for auditing, documenting and reviewing audit results, and designating management levels to review and assess audit results.

Review Interfaces[18]

The HQMB reviews reliability assurance programs under SRP Section 17.4 (proposed).[19]

The HQMB coordinates other branch evaluations that interface with the overall review, as follows:

1. The secondary review branches review the listing of structures, systems, and components (QA list) covered by the QA program for their areas of review responsibility in accordance with all of this section of the Standard Review Plan and documents the acceptability of the listing, including any items that should be added or clarified by memo to the HQMB. The review by EMEB in this regard under SRP Sections 3.2.1 and 3.2.2[20] also addresses the areas of review responsibility normally assigned to SPLB, SRXB, EMCB, HICB,[21] and ECGB.[22]

2. The EMCB performs the detailed review of the adequacy of programs for assuring the integrity of bolting and threaded fasteners as part of its primary review responsibility for SRP Section 3.13 (proposed).[23]

II. ACCEPTANCE CRITERIA

A.[24] 10 CFR Part 21 requires firms constructing, owning, operating or supplying components to have procedures for evaluating and reporting defects or noncompliances.[25]

B. 10 CFR Part 50, §50.55(e) requires holders of facility construction permits to have procedures for evaluating and reporting of defects or noncompliances.[26]

C. 10 CFR Part 50, §50.55a requires that structures, systems and components (SSC) be designed, fabricated, erected, constructed, tested and inspected to quality standards commensurate with the importance of the safety function to be performed.[27]

D. Appendix A of 10 CFR Part 50, General Design Criterion (GDC) 1, "Quality Standards and Records," requires that SSC important to safety be designed, fabricated, erected and tested to quality standards commensurate with the importance of the safety functions to be performed.[28]

E. Appendix B of 10 CFR Part 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," specifies 18 quality criteria which must be addressed in a QA program.[29]

The applicant (and its principal contractors such as the NSSS vendor, architect/engineer (A/E),[30] constructor, and construction manager) must establish a QA program for the design and construction phases in accordance with Appendix B to 10 CFR Part 50~~, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."~~[31] The applicant's QA program (including its principal contractors) must describe in the preliminary safety analysis report (PSAR) or final safety analysis report (FSAR)[32] how each criterion of Appendix B will be met. The ~~acceptance~~specific criteria[33] used by the ~~QAB~~HQMB[34] to evaluate this QA program are listed in the following 18 subsections. These ~~acceptance~~ criteria[35] include an expectation of an applicant's[36] commitment to comply with the regulations, regulatory positions presented in the appropriate issue of the regulatory guides, ~~and the~~ branch technical positions, and Generic Letters[37] ~~listed~~discussed in subsection ~~V~~II.2A1.[38] ~~Thus, the~~Such a[39] commitment constitutes an integral part of the QA program description and requirements. Exceptions and alternatives to these ~~acceptance~~specific[40] criteria may be adopted by applicants provided adequate justification is given; the ~~QAB~~HQMB[41] review allows for considerable flexibility in defining methods and controls while still satisfying pertinent regulations. When the QA program description meets the applicable ~~acceptance~~specific[42] criteria of this subsection or provides acceptable exceptions or alternatives, the program is considered to be in compliance with pertinent NRC regulations.[43]The review will ascertain that the commitments and the description of how the commitments are implemented, to the extent necessary, are objective and stated in inspectable terms.

The Organization (17.1.1) elements responsible for the QA program are acceptable if:

1A1.** The responsibility for the overall program is retained and exercised by the applicant.

1A2. The applicant has identified and described major delegation of work involved in establishing and implementing the QA program or any part thereof to other organizations.

1A3. When major portions of the applicant's program are delegated:

a. Applicant describes how responsibility is exercised for the overall program. The extent of management oversight should be addressed, including the location, qualifications, and criteria for determining the number of personnel performing these functions.

b. Applicant evaluates the performance (frequency and method stated — once per year although longer cycle acceptable with other evaluations of individual elements) of work by the delegated organization.

c. Qualified individual(s) or organizational element(s) are identified within the applicant's organization as responsible for the quality of the delegated work prior to initiation of activities.

1A4. Clear management controls and effective lines of communication exist for QA activities among the applicant and the principal contractors to ~~assure~~ ensure direction of the QA program.

1A5. Organization charts clearly identify all the "onsite" and "offsite" organizational elements which function under the cognizance of the QA program (such as design, engineering, procurement, manufacturing, construction, inspection, test, instrumentation and control, nuclear engineering, etc.), the lines of responsibility, and a description of the criteria for determining the size of the QA organization, including the inspection staff.

1A6. The applicant (and principal contractors) describes the QA responsibilities of each of the organizational elements noted on the organization charts.

1B1. The applicant (and principal contractors) identifies a management position that retains overall authority and responsibility for the QA program (normally, this position is the QA manager), and this position has the following characteristics:

a. Is at the same or higher organization level as the highest line manager directly responsible for performing activities affecting quality (such as engineering,

** The alphanumeric designation for each acceptance criterion in subsection II indicates its relationship to areas of review identified in subsection I.

procurement, construction, and operation) and is sufficiently independent from cost and schedule.

b. Has effective communication channels with other senior management positions.

c. Has responsibility for approval of QA manual(s).

d. Has no other duties or responsibilities unrelated to QA that would prevent his full attention to QA matters.

1B2. Verification of conformance to established requirements (except for designs, ~~ref.~~see[44] 3E2) is accomplished by individuals or groups within the QA organization who do not have direct responsibility for performing the work being verified or by individuals or groups trained and qualified in QA concepts and practices and independent of the organization responsible for performing the task.

1B3. Persons and organizations performing QA functions have direct access to management levels which will ~~assure~~ ensure the ability to:

a. Identify quality problems.

b. Initiate, recommend, or provide solutions through designated channels.

c. Verify implementation of solutions.

Those persons and organizations with the above authority are identified and a description of how those actions are carried out is provided.

1B4. a. Designated QA personnel, sufficiently free from direct pressures for cost/schedule, have the responsibility delineated in writing to stop unsatisfactory work and control further processing, delivery, or installation of nonconforming material.

b. The organizational positions with stop work authority are identified.

1B5. Provisions are established for the resolution of disputes ~~involving quality,~~ arising from a difference of opinion about quality between ~~QA~~ personnel representing quality assurance and those of other departments (engineering, procurement, manufacturing, etc.) ~~personnel~~.[45]

1B6. Designated QA individuals are involved in day-to-day plant activities important to safety (i.e., the QA organization routinely attends and participates in daily plant work schedule and status meetings to ~~assure~~ ensure they are kept abreast of day-to-day work assignments throughout the plant and that there is adequate QA coverage relative to procedural and inspection controls, acceptance criteria, and QA staffing and qualification of personnel to carry out QA assignments).

1C1. Policies regarding the implementation of the QA program are documented and made mandatory. These policies are established at the corporate president or vice president level.

1C2. Position description (see 1B1) ~~assures~~ ensures that the individual directly responsible for the definition, direction, and effectiveness of the overall QA program has sufficient authority to effectively implement responsibilities. This position is to be sufficiently free from cost and schedule responsibilities. Qualification requirements for this individual are established in a position description which includes the following prerequisites:

a. Management experience through assignments to responsible positions.

b. Knowledge of QA regulations, policies, practices, and standards.

c. Experience working in QA or related activity in reactor design, construction, or operation or in a similar high technological industry.

The qualifications of the QA manager should be at least equivalent to those described in Section 4.4.5 of ANSI/ANS-3.1-1978, "Selection and Training of Nuclear Power Plant Personnel," as endorsed by the regulatory positions in Regulatory Guide 1.8.[46]

1C3. The person at the construction site responsible for directing and managing the site QA program is identified by position and has appropriate organizational position, responsibilities, and authority to exercise proper control over the QA program. This individual is free from non-QA duties and can thus give full attention to ~~assuring~~ ensuring that the QA program at the plant site is being effectively implemented.

Activities related to Quality Assurance Program (17.1.2) are acceptable if:

2A1. The scope of the QA program includes:[***47]

a. A commitment that activities affecting structures, systems, and components important to safety will be subject to the applicable controls of the QA program. The structures, systems, components, and related consumables covered by the QA program are identified in the (QA list) in Section ~~3.2.1~~3.2.2[48] of the safety analysis report (SAR).[~~*****~~49]

[***]Guidance applicable to non-safety-related SSC may be by: 1) application of portions of the QAP required by 10 CFR 50, Appendix B; or 2) application of a separate program(s) specifically for non-safety-related SSC.

[~~*****~~]~~Rulemaking is currently underway to clarify the requirement that structures, systems, and components important to safety as derived from the General Design Criteria of Appendix A to 10 CFR Part 50 shall be subjected to the pertinent requirements of the quality assurance criteria of Appendix B to 10 CFR 50. Until this rulemaking process is completed, the staff reviewers should assure that the applicant's list of structures, systems, and components include all those~~

NUREG-0660 (Reference 34), TMI Action Plan item I.F.1 was established to address the expansion of the QA list required by 10 CFR 50, Appendix B. Item I.F.1 was resolved without additional requirements for expansion of the QA list. However, prior to resolution of I.F.1, 10 CFR 50 was revised to incorporate additional TMI-related requirements applicable to certain applicants for construction permits and manufacturing licenses. 10 CFR 50.34(f)(3)(ii) requires that the QA list include all structures, systems, and components (SSCs) important to safety. The requirement is also applicable to Design Certification applicants via 10 CFR 52.47(a)(I)(ii). Generic Letter 84-01 (Reference 36) is related to this issue and indicates that SSCs important to safety would be included in the QA list in specific situations.[50] Regulatory Guides 1.26 and 1.29 should be sufficient to identify those non-safety-related SSC considered important to safety. (Also note that 10 CFR 50.49 defines what electrical equipment is considered important to safety and Regulatory Guide 1.97 lists accident monitoring equipment considered important to safety.)[51]

b. A commitment that the preoperational test program will be conducted in accordance with the QA program and a description of how the QA program will be applied.

c. A commitment that the development, control, and use of computer code programs will be conducted in accordance with the QA program and a description of how the QA program will be applied.

d. The identification of fire protection in SRP Section 9.5.1 as a system covered by the QA program or identification of the QA controls for fire protection. These controls are reviewed and accepted using the guidelines contained in BTP ~~ASB~~SPLB[52] 9.5-1, including Generic Letter 82-21 (Reference 35),[53] and 10 CFR Part 50, Appendix B, as appropriate.

e. A commitment that special equipment, environmental conditions, skills, or processes will be provided as necessary.

f. A commitment to comply with the regulations, regulatory positions presented in the regulatory guides and the Branch Technical Positions listed in Subection VI.[54]

g. A commitment to address position C.3.5 of Regulatory Guide 1.155. Non-safety-related equipment not already covered by existing quality assurance requirements and relied upon to meet the requirements of 10 CFR 50.63 should be addressed by a program following the guidance of Regulatory Guide 1.155. Such a program should ensure that the quality assurance guidance provided in Appendix A to Regulatory Guide 1.155 will be applied for such equipment, and that the

~~items necessary to prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public as stated in the introduction to Appendix B. Guidance for identifying such items is provided in Regulatory Guide 1.29.~~

guidance provided in Appendix B to Regulatory Guide 1.155 will be appropriately reflected in specifications for such equipment.[55]

h. A commitment that the quality assurance for radwaste management systems will be managed according to the guidance of Regulatory Guide 1.143, Regulatory Position C.6.[56]

i. A commitment that the quality assurance for accident monitoring instrumentation will be consistent with the guidance contained in Regulatory Guide 1.97 (see Table 1, paragraph 5, "Quality Assurance").[57]

j. A commitment that quality assurance for nonsafety-related anticipated transient without scram (ATWS) equipment will be managed according to the guidance contained in Generic Letter 85-06 (Reference 37).[58]

2A2. A brief summary of the company's corporate QA policies is given.

2B1. a. Provisions are established to ~~assure~~ ensure that quality-affecting procedures required to implement the QA program are consistent with QA program commitments and corporate policies and are properly documented, controlled, and made mandatory through a policy statement or equivalent document signed by the responsible official.

b. The QA organization reviews and documents concurrence with these quality-related procedures.

c. The organizational group or individual having responsibility for the policy statement should be identified.

d. The quality affecting procedural controls of the principal contractors should be provided for the applicant's review with documented agreement of acceptance prior to initiation of activities affected by the program.

2B2. Provisions are included for notifying NRC of changes (a) for review and acceptance in the accepted description of the QA program as presented or referenced in the SAR or ~~SSAR~~ standard SAR prior to implementation, as specified in 10 CFR 50.55(f),[59] and (b) in organizational elements within 30 days after announcement. (Note: editorial changes or personnel reassignments of a nonsubstantive nature do not require NRC notification.)

2B3. The applicant (and the principal contractors) commits to comply with the regulatory position in the appropriate issue of the regulatory guides listed in subsection VI; to comply with 10 CFR ~~Part 50, §~~[60]50.55a, 10 CFR 50.34(a)(7),[61] 10 CFR 50.34(f)(3)(ii) (where applicable), and 10 CFR 50.34(f)(3)(iii) (where applicable);[62] to conduct activities under 10 CFR Part 21 and 10 CFR Part 50, 10 CFR 50.55(e)[63], in accordance with the QA program; and to comply with ~~10 CFR 50 Appendix A, General Design Criterion~~ GDC 1[64]. For systems, components, and structures covered by the ASME Code Section III (Classes 1, 2, and 3), the quality assurance code requirements should be

supplemented by the specific guidance addressed in the regulatory positions of the applicable regulatory guides. The commitment identifies the regulatory guides and ANSI standard by number, title, and revision or date. Any alternatives or exceptions are clearly identified and supporting information presented in the docket. QA regulatory guides should be addressed which have an implementation date prior to the submittal or docket date of the QA program description.

Although primary responsibility for Regulatory Guides 1.26 and 1.29 is assigned to ~~ASB~~EMEB[65] (SRP Sections 3.2.1 and 3.2.2), their use as acceptance criteria in this SRP section is necessary to ~~assure~~ ensure that adequate quality assurance requirements are specified for systems, components, and structures addressed by those guides.

The QA organization and the necessary technical organizations participate early in the QA program definition stage to determine and identify the extent QA controls are to be applied to specific structures, systems, and components. This effort involves applying a defined graded approach to certain structures, systems, and components in accordance with their importance to safety and affects such disciplines as design, procurement, document control, inspection tests, special processes, records, audits, and others described in 10 CFR Part 50, Appendix B.

2B4. Existing or proposed QA procedures are identified reflecting that regulatory guides listed in subsection VI; ~~General Design Criterion 1 of Appendix A to 10 CFR Part 50~~ GDC 1; 10 CFR Part 50, §§ 50.55a, 50.55(f);[66] and each criterion of 10 CFR Part 50, Appendix B, will be met by documented procedures. In addition, activities conducted under 10 CFR Part 21 and 10 CFR ~~Part 50, §~~50.55(e) shall conform to the requirements of the QA program.[67]

2B5. A description is provided that emphasizes how the docketed QA program description, particularly the 10 CFR Part 50 regulations and the regulatory guides listed in subsection VI, will be properly carried out.

2C1. A description is provided of how management (above or outside the QA organization) regularly assesses the scope, status, adequacy, and compliance of the QA program to 10 CFR Part 50, Appendix B. These measures should include:

a. Frequent contact with program status through reports, meetings, and/or audits.

b. Performance of an annual assessment preplanned and documented. Corrective action is identified and tracked.

2C2. Quality-related activities (such as design, procurement, and site investigation) initiated prior to formal NRC acceptance of the QA program are controlled under a QA program in accordance with this SRP section[68] and, accordingly, with the requirements of 10 CFR Part 50, Appendix B. Approved procedures and a sufficient number of trained personnel should be available to implement the applicable portion of the QA program prior to the initiation of the activity.

2C3. A summary description is provided on how responsibilities and control of quality-related activities are transferred from the principal contractors to the applicant during the phaseout of design and construction and during preoperational testing and plant turnover.

2D. Indoctrination, training, and qualification programs are established such that:

a. Personnel responsible for performing quality-affecting activities are instructed as to the purpose, scope, and implementation of the quality-related manuals, instructions, and procedures.

b. Personnel verifying activities affecting quality are trained and qualified in the principles, techniques, and requirements of the activity being performed.

c. For formal training and qualification programs, documentation includes the objective, content of the program, attendees, and date of attendance.

d. Proficiency tests are given to those personnel performing and verifying activities affecting quality, and acceptance criteria are developed to determine if individuals are properly trained and qualified.

e. Certificate of qualifications clearly delineates (1) the specific functions personnel are qualified to perform and (2) the criteria used to qualify personnel in each function.

f. Proficiency of personnel performing and verifying activities affecting quality is maintained by retraining, reexamining, and/or recertifying as determined by management or program commitment.

g. The description of the training program provisions listed above satisfies the regulatory position in Regulatory Guide 1.58.

Activities related to Design Control (17.1.3) are acceptable if:

3A. The scope of the design control program includes design activities associated with the preparation and review of design documents, including the correct translation of applicable regulatory requirements and design bases into design, procurement, and procedural documents. Included in the scope are such activities as field design engineering; physics, seismic, stress, thermal, hydraulic, radiation, and the SAR accident analyses; associated computer programs; compatibility of materials; accessibility for inservice inspection, maintenance, and repair; and quality standards.

3B. Organizational responsibilities are described for preparing, reviewing, approving, and verifying design documents such as system descriptions, design input and criteria, design drawings, design analyses, computer programs, specifications, and procedures.

3C1. Errors and deficiencies in approved design documents, including design methods (such as computer codes), that could adversely affect structures, systems, and components

important to safety are documented; and action is taken to ~~assure~~ ensure that all errors and deficiencies are corrected.

3C2. Deviations from specified quality standards are identified and procedures are established to ensure their control.

3D. Internal and external design interface controls, procedures, and lines of communication among participating design organizations and across technical disciplines are established and described for the review, approval, release, distribution, and revision of documents involving design interfaces to ~~assure~~ ensure structures, systems, and components are compatible geometrically, functionally, and with processes and environment.

3E1. Procedures are established and described requiring a documented check to verify the dimensional accuracy and completeness of design drawing and specifications.

3E2. Procedures are established and described requiring that design drawings and specifications be reviewed by the QA organization to ~~assure~~ ensure 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.

3E3. Guidelines or criteria are established and described for determining the method of design verification (design review, alternate calculations, or test).

3E4. Procedures are established and described for design verification activities which ~~assure~~ ensure the following:

a. The verifier is qualified and is not directly responsible for the design (i.e., neither the performer or ~~his~~the[69] immediate supervisor). In exceptional circumstances, the designer's immediate supervisor can perform the verification provided:

(1) The supervisor is the only technically qualified individual.

(2) The need is individually documented and approved in advance by the supervisor's management.

(3) QA audits cover frequency and effectiveness of use of supervisors as design verifiers to guard against abuse.

b. Design verification, if other than by qualification testing of a prototype or lead production unit, is completed prior to release for procurement, manufacturing, construction, or to another organization for use in other design activities. In those cases where this timing cannot be met, the design verification may be deferred, providing that the justification for this action is documented and the unverified portion of the design output document and all design output documents, based on the unverified data, are appropriately identified and controlled. Construction site

activities associated with a design or design change should not proceed without verification past the point where the installation would become irreversible (i.e., require extensive demolition and rework). In all cases, the design verification should be complete prior to fuel load for a plant under construction, or in the case of an operating plant, prior to relying upon the component, system, or structure to perform its function.

c. Procedural control is established for design documents that reflect the commitments of the SAR; this control differentiates between documents that receive formal design verification by interdisciplinary or multi-organizational teams and those which can be reviewed by a single individual (a signature and date is acceptable documentation for personnel certification). Design documents subject to procedural control include, but are not limited to, specifications; calculations; computer programs; system descriptions; SAR, when used as a design document; and drawings, including flow diagrams, piping and instrument diagrams, control logic diagrams, electrical single line diagrams structural systems for major facilities, site arrangements, and equipment locations. Specialized reviews should be used when uniqueness or special design considerations warrant.

d. The responsibilities of the verifier, the areas and features to be verified, the pertinent considerations to be verified, and the extent of documentation are identified in procedures.

3E~~3~~5.[70] The following provisions are included if the verification method is only by test:

a. 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 would become irreversible.

c. Verification by test is performed under conditions that simulate the most adverse design conditions as determined by analysis.

3E~~4~~6.[71] Procedures are established to ~~assure~~ ensure that verified computer codes are certified for use and that their use is specified. Each licensee or vendor intending to use a safety analysis computer code to support licensing actions should demonstrate an appropriate level of proficiency by performing and submitting code verifications. Such information should include comparisons of the code results with experimental data, plant operational data, or other benchmarked data.[72]

3F1. Design and specification changes, including fields changes, are subject to the same design controls that were applicable to the original design.

3F2. The description of the design control provisions satisfies the criteria of Regulatory Guide 1.64.

Activities related to Procurement Document Control (17.1.4) are acceptable if:

4A1. Procedures are established for the review of procurement documents to determine that quality requirements are correctly stated, inspectable, and controllable; there are adequate acceptance and rejection criteria; and procurement documents have been prepared, reviewed, and approved in accordance with QA program requirements. To the extent necessary, procurement documents should require contractors and subcontractors to provide an acceptable quality assurance program. The review and documented concurrence of the adequacy of quality requirements stated in procurement documents ~~is~~ are[73] performed by independent personnel trained and qualified in QA practices and concepts.

4A2. Procedures are established to ~~assure~~ ensure that procurement documents identify applicable regulatory, technical, administrative, and reporting requirements; drawings; specifications; codes and industrial standards; test and inspection requirements; and special process instructions that must be complied with by suppliers.

4B1. Organizational responsibilities are described for (a) procurement planning; (b) the preparation, review, approval, and control of procurement documents; (c) supplier selection; (d) bid evaluations; and (e) review and concurrence of supplier QA programs prior to initiation of activities affected by the program. The involvement of the QA organization is described.

4B2. The description of the procurement document control provisions listed above satisfies the regulatory position in Regulatory Guide 1.123.

Activities related to Instructions, Procedures, and Drawings (17.1.5) are acceptable if:

5A. Organizational responsibilities are described for ~~assuring~~ ensuring that activities affecting quality are (a) prescribed by documented instructions, procedures, and drawings and (b) accomplished through implementation of these documents.

5B. Procedures are established to ~~assure~~ ensure that instructions, procedures, and drawings include quantitative (such as dimensions, tolerances, and operating limits) and qualitative (such as workmanship samples) acceptance criteria for determining that important activities have been satisfactorily accomplished.

Activities related to Document Control (17.1.6) are acceptable if:

6A1. The scope of the document control program is described, and the types of controlled documents are identified. At a minimum, controlled documents include:

a. Design documents (e.g., calculations, drawings, specifications, analyses), including documents related to computer codes.

b. Procurement documents.

c. Instructions and procedures for such activities as fabrication, construction, modification, installation, test, and inspection.

d. As-built documents.

e. Quality assurance and quality control manuals and quality affecting procedures.

f. Topical reports.

g. SAR.

h. Nonconformance reports.

6A2. Procedures for the review, approval, and issuance of documents and changes thereto are established and described to ~~assure~~ ensure technical adequacy and inclusion of appropriate quality requirements prior to implementation. The QA organization, or an individual other than the person who generated the document but qualified in quality assurance, reviews and concurs with these documents with regards to QA-related aspects.

6A3. Procedures are established to ~~assure~~ ensure that changes to documents are reviewed and approved by the same organizations that performed the initial review and approval or by other qualified responsible organizations delegated by the applicant.

6A4. Procedures are established to ~~assure~~ ensure that documents are available at the location where the activity will be performed prior to commencing the work.

6B1. Procedures are established and described to ~~assure~~ ensure that obsolete or superseded documents are removed and replaced by applicable revisions in work areas in a timely manner.

6B2. A master list or equivalent document control system is established to identify the current revision of instructions, procedures, specifications, drawings, and procurement documents. When such a list is used, it should be updated and distributed to predetermined responsible personnel.

6C1. Procedures are established and described to provide for the preparation of as-built drawings and related documentation in a timely manner to accurately reflect the actual plant design.

Activities related to Control of Purchased Material, Equipment, and Services (17.1.7) are acceptable if:

7A1. Organizational responsibilities are described for the control of purchased material, equipment, and services, including interfaces between design, procurement, and QA organizations.

7A2. Verification of suppliers' activities during fabrication, inspection, testing, and shipment of materials, equipment, and components is planned and performed with QA organization participation in accordance with written procedures to ~~assure~~ ensure conformance to the purchase order requirements. These procedures, as applicable to the method of procurement, provide for:

a. Specifying the characteristics or processes to be witnessed, inspected or verified, and accepted; the method of surveillance and the extent of documentation required; and those responsible for implementing these procedures.

b. Audits, surveillance, or inspections ~~which assure~~ to ensure that the supplier complies with the quality requirements.

7A3. Selection of suppliers is documented and filed. If a licensee, contractor, and vendor inspection program (LCVIP)[74] letter of confirmation or the "CASE" Register is used to establish the qualifications of the supplier, the documentation should identify the "letter" or "audit" used.

7A4. Procurement of spare or replacement parts for structures, systems, and components important to safety is subject to present QA program controls, to codes and standards, and to technical requirements equal to or better than the original technical requirements, or as required to preclude repetition of defects.

7B1. Receiving inspection is performed to ~~assure~~ ensure:

a. The material, component, or equipment is properly identified and corresponds to the identification on the purchase document and the receiving documentation.

b. Material, components, equipment, and acceptance records satisfy the inspection instructions prior to installation or use.

c. Specified inspection, test, and other records (such as certificates of conformance attesting that the material, components, and equipment conform to specified requirements) are available at the nuclear power plant prior to installation or use.

7B2. Items accepted and released are identified as to their inspection status prior to forwarding them to a controlled storage area or releasing them for installation or further work.

7B3. The supplier furnishes the following records to the purchaser:

a. Documentation that identifies the purchased item and the specific procurement requirements (e.g., codes, standards, and specifications) met by the item.

b. Documentation identifying any procurement requirements that have not been met.

c. A description of those nonconformances from the procurement requirements dispositioned "accept as is" or "repair."

The review and acceptance of these documents should be described in the purchaser's QA program.

7B4. For commercial "off-the-shelf" items where specific quality assurance controls appropriate for nuclear applications cannot be imposed in a practicable manner, special quality verification requirements shall be established and described to provide the necessary assurance of an acceptable item by the purchaser. Guidance related to such special quality verification requirements is contained in Generic Letters 89-02 and 91-05 (References 39 and 40, respectively).[75]

7B5. Suppliers' certificates of conformance are periodically evaluated by audits, independent inspections, or tests to ~~assure~~ ensure they are valid and the results documented.

7B6. The description of the control of procurement provisions listed above satisfies the regulatory position in Regulatory Guide 1.38 and Regulatory Guide 1.123.

Activities related to Identification and Control of Materials, Parts, and Components (17.1.8) are acceptable if:

8A. Controls are established and described to identify and control materials (including consumables), parts, and components, including partially fabricated subassemblies. The description should include organizational responsibilities.

8B1. Procedures are established ~~which assure~~ to ensure that identification is maintained either on the item or on records traceable to the item to preclude use of incorrect or defective items.

8B2. Identification of materials and parts important to the function of structures, systems, and components important to safety can be traced to the appropriate documentation such as drawings, specifications, purchase orders, manufacturing and inspection documents, deviation reports, and physical and chemical mill test reports.

8B3. Correct identification of material, parts, and components is verified and documented prior to release for fabrication, assembling, shipping, and installation.

Activities related to Control of Special Processes (17.1.9) are acceptable if:

9A1. The criteria for determining those processes that are controlled as special processes are described. As complete a listing as possible of special processes, which are generally those processes where direct inspection is impossible or disadvantageous, should be provided. Some examples are welding, heat treating, nondestructive testing (NDT),[76] and chemical cleaning.

9A2. Organizational responsibilities, including those for the QA organization, are described for qualification of special processes, equipment, and personnel.

9B1. Procedures, equipment, and personnel associated with special processes are qualified and are in conformance with applicable codes, standards, QA procedures, and specifications. The QA organization is involved in the qualification activities to ~~assure~~ ensure they are satisfactorily performed.

9B2. Procedures are established for recording evidence of acceptable accomplishment of special processes using qualified procedures, equipment, and personnel.

9B3. Qualification records of procedures, equipment, and personnel associated with special processes are established, filed, and kept current.

Activities related to Inspection (17.1.10) are acceptable if:

10A. The scope of the inspection program ~~is~~ described ~~that~~ indicates that[77] an effective inspection program has been established. Program procedures provide criteria for determining the accuracy requirements of inspection equipment and criteria for determining when inspections are required or define how and when inspections are performed. The QA organization participates in the above functions.

10B1. Organizational responsibilities for inspection are described. Individuals performing inspections are other than those who performed or directly supervised the activity being inspected and do not report directly to the immediate supervisors who are responsible for the activity being inspected. If the individuals performing inspections are not part of the QA organization, the inspection procedures, personnel qualification criteria, and independence from undue pressure such as cost and schedule should be reviewed and found acceptable by the QA organization prior to the initiation of the activity.

10B2. A qualification program for inspectors (including NDT personnel) is established and documented, and the qualifications and certifications of inspectors are kept current.

10C1. Inspection procedures, instructions, or checklists provide for the following:

a. Identification of characteristics and activities to be inspected.

b. A description of the method of inspection.

c. Identification of the individuals or groups responsible for performing the inspection operation in accordance with the provisions of item 10B1.

d. Acceptance and rejection criteria.

e. Identification of required procedures, drawings, and specifications and revisions.

f. Recording inspector or data recorder and the results of the inspection operation.

g. Specifying necessary measuring and test equipment, including accuracy requirements.

10C2. Procedures are established and described to identify, in pertinent documents, mandatory inspection holdpoints beyond which work may not proceed until inspected by a designated inspector.

10C3. Inspection results are documented, evaluated, and their acceptability determined by a responsible individual or group.

Activities related to Test Control (17.1.11) are acceptable if:

11A1. The description of the scope of the test control program indicates an effective test program has been established for tests, including proof tests, prior to installation and preoperational tests. Program procedures provide criteria for determining the accuracy requirements of test equipment and criteria for determining when a test is required or how and when testing activities are performed.

11B1. Test procedures or instructions provide as required for the following:

a. The requirements and acceptance limits contained in applicable design and procurement documents.

b. Instructions for performing the test.

c. Test prerequisites such as calibrated instrumentation; adequate test equipment and instrumentation, including their accuracy requirements; completeness of item to be tested; suitable and controlled environmental conditions; and provisions for data collection and storage.

d. Mandatory inspection holdpoints for witness by owner, contractor, or inspector (as required).

e. Acceptance and rejection criteria.

f. Methods of documenting or recording test data and results.

g. Provisions for ~~assuring~~ ensuring test prerequisites have been met.

11C1. Test results are documented, evaluated, and their acceptability determined by a responsible individual or group.

Activities related to Control of Measuring and Test Equipment (17.1.12) are acceptable if:

12.1 The scope of the program for the control of measuring and test equipment is described and the types of equipment to be controlled are established. This information indicates an effective calibration program has been established.

12.2 QA and other organizations' responsibilities are described for establishing, implementing, and ~~assuring~~ ensuring effectiveness of the calibration program.

12.3 Procedures are established and described for calibration (technique and frequency), maintenance, and control of the measuring and test equipment (instruments, tools, gages, fixtures, reference and transfer standards, and nondestructive test equipment) ~~that is~~[78] used in the measurement, inspection, and monitoring of structures, systems, and components. The review and documented concurrence of these procedures is described and the organization responsible for these functions is identified.

12.4 Measuring and test equipment is identified and traceable to the calibration test data.

12.5 Measuring and test equipment is labeled or tagged or "otherwise controlled" to indicate due date of the next calibration. The method of "otherwise controlled" should be described.

12.6 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. 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 or, when this is not possible, have an accuracy that ~~assures~~ ensures the equipment being calibrated will be within required tolerance and that the basis of acceptance is documented and authorized by responsible management. The management authorized to perform this function is identified.

12.7 ~~Calibrating~~ Calibration standards have greater accuracy than standards being calibrated. ~~Calibrating~~ Calibration standards with the same accuracy may be used if ~~it~~ they can be shown to be adequate for the requirements and if[79] the basis of acceptance is documented and authorized by responsible management. The management authorized to perform this function is identified.

12.8 Reference and transfer standards are traceable to nationally recognized standards; where national standards do not exist, provisions are established to document the basis for calibration.

12.9 Measures are taken and documented to determine the validity of previous inspections performed and the acceptability of items inspected or tested since the last calibration when measuring and test equipment is found to be out of calibration. Inspections or tests are repeated on items determined to be suspect.

Activities related to Handling, Storage, and Shipping (17.1.13) are acceptable if:

13.1 Special handling, preservation, storage, cleaning, packaging, and shipping requirements are established and accomplished by suitably trained individuals in accordance with predetermined work and inspection instructions.

13.2 Procedures are established and described to control the cleaning, handling, storage, packaging, and shipping of materials, components, and systems in accordance with

design and procurement requirements to preclude damage, loss, or deterioration by environmental conditions such as temperature or humidity.

13.3 The description of the control of handling, storage, and shipping listed above satisfies the regulatory position in Regulatory Guide 1.38.

Activities related to Inspection, Test, and Operating Status (17.1.14) are acceptable if:

14.1 Procedures are established to indicate the inspection, test, and operating status of structures, systems, and components throughout fabrication, installation, and testing.

14.2 Procedures are established and described to control the application and removal of inspection and welding stamps and status indicators such as tags, markings, labels, and stamps.

14.3 Procedures are established and described to control altering the sequence of required tests, inspections, and other operations important to safety. Such actions should be subject to the same controls as the original review and approval.

14.4 The status of nonconforming, inoperative, or malfunctioning structures, systems, and components is documented and identified to prevent inadvertent use. The organization responsible for this function is identified.

Activities related to Nonconforming Materials, Parts, or Components (17.1.15) are acceptable if:

15.1 Procedures are established and described for identification, documentation, segregation, review, disposition, and notification to affected organizations of nonconforming materials, parts, components, and as applicable to services (including computer codes) if disposition is other than to scrap. The procedures provide identification of authorized individuals for independent review of nonconformances, including disposition and closeout.

15.2 QA and other organizational responsibilities are described for the definition and implementation of activities related to nonconformance control. This includes identifying those individuals or groups with authority for the disposition of nonconforming items.

15.3 Documentation identifies the nonconforming item; describes the nonconformance, the disposition of the nonconformance, and the inspection requirements; and includes signature approval of the disposition. Nonconformances are corrected or resolved prior to the initiation of the preoperational test program on the item.

15.4 Reworked, repaired, and replacement items are inspected and tested in accordance with the original inspection and test requirements or acceptable alternatives.

15.5 Nonconformance reports are periodically analyzed by the QA organization to show quality trends, and the significant results are reported to upper management for review and assessment.

Activities related to Corrective Action (17.1.16) are acceptable if:

16.1 Procedures are established and described indicating an effective corrective action program has been established. The QA organization reviews and documents concurrence with the procedures.

16.2 Corrective action is documented and initiated following the determination of a condition adverse to quality (such as a nonconformance, failure, malfunction, deficiency, deviation, and defective material and equipment) to preclude recurrence. The QA organization is involved in the documented concurrence of the adequacy of the corrective action.

16.3 Followup action is taken by the QA organization to verify proper implementation of corrective action and to close out the corrective action in a timely manner.

16.4 Significant conditions adverse to quality, the cause of the conditions, and the corrective action taken to preclude repetition are documented and reported to immediate management and upper levels of management for review and assessment.

Activities related to Quality Assurance Records (17.1.17) are acceptable if:

17.1 The scope of the records program is described. QA records include results of reviews, inspections, tests, audits, and material analyses; monitoring of work performance; qualification of personnel, procedures, and equipment; and other documentation such as drawings, specifications, procurement documents, calibration procedures and reports; nonconformance reports; and corrective action reports. Optical disk document imaging systems may be used for the storage and retrieval of control copies of quality assurance records when appropriate quality assurance controls are applied. Such controls are specified in Generic Letter 88-18 (Reference 38).[80]

17.2 QA and other organizations are identified and their responsibilities are described for the definition and implementation of activities related to QA records.

17.3 Inspection and test records contain the following, where applicable:

a. A description of the type of observation.

b. The date and results of the inspection or test.

c. Information related to conditions adverse to quality.

d. Inspector or data recorder identification.

e. Evidence as to the acceptability of the results.

f. Action taken to resolve any discrepancies noted.

17.4 Suitable facilities for the storage of records are described and satisfy the regulatory position given in Regulatory Guide 1.88 (endorses N45.2.9). Alternatives to the fire protection rated provisions are acceptable if records storage facilities conform to NFPA No. 232 (Reference 45)[81] Class 1 for permanent-type records and that the 2-hour fire rating requirement contained in the ~~proposed~~ N45.2.9 standard (Reference 42)[82] is met by applicants in any one of the following three ways. Specifically, (1) a 2-hour vault meeting NFPA No. 232; (2) 2-hour rated file containers meeting NFPA No. 232 (Class B); or (3) a 2-hour rated fire resistant file room meeting NFPA No. 232 if the following additional provisions are provided.

1. Early warning fire detection and automatic fire suppression should be provided, with electronic supervision at a constantly attended central station.

2. Records should be stored in fully enclosed metal cabinets. Records should not be permitted on open steel shelving. No storage of records should be permitted on the floor of the facility. Adequate access and aisle ways should be maintained at all times throughout the facility.

3. Work not directly associated with records storage or retrieval that should be prohibited within the records storage facility includes, but ~~are~~ is not limited to,[83] records reproduction, film developing, and fabrication of microfiche cards.

4. Smoking and eating/drinking should be prohibited throughout the records storage facility.

5. Ventilation, temperature, and humidity control equipment should be protected inside with standard fire-door dampers where they penetrate fire barriers bounding the storage facility.

17.5 The description of the control of records provisions listed above satisfies the regulatory position of Regulatory Guide 1.88.

Activities related to Audits (17.1.18) are acceptable if:

18A1. Audits to ~~assure~~ ensure that procedures and activities comply with the overall QA program are performed by:

a. The QA organization to provide a comprehensive independent verification and evaluation of quality-related procedures and activities.

b. The applicant (and principal contractors) to verify and evaluate the QA programs, procedures, and activities of suppliers.

18A2. An audit plan is prepared identifying audits to be performed, their frequencies, and schedules. Audits should be regularly scheduled based upon the status and safety

importance of the activities being performed and are initiated early enough to ~~assure~~ ensure effective QA during design, procurement, manufacturing, construction, installation, inspection, and testing.

18A3. Audits include an objective evaluation of quality-related practices, procedures, instructions, activities and items, and review of documents and records to ensure that the QA program is effective and properly implemented.

18A4. Provisions are established requiring that audits be performed in all areas where the requirements of Appendix B to 10 CFR Part 50 are applicable. Areas which are often neglected but should be included are activities associated with:

a. The determination of site features which affect plant safety (e.g., core sampling, site and foundation preparation, and methodology). (PSAR only)

b. The preparation, review, approval, and control of early procurements. (PSAR only)

c. Indoctrination and training programs.

d. Interface control among the applicant and the principal contractors.

e. Corrective action, calibration, and nonconformance control systems.

f. SAR and ~~SSAR~~ standard SAR[84] commitments.

g. Activities associated with computer codes.

18B1. Audit data are analyzed by the QA organization and the resulting reports indicating any quality problems and the effectiveness of the QA program, including the need for reaudit of deficient areas, are reported to management for review and assessment.

18B2. Audits are performed in accordance with pre-established written procedures or checklists and conducted by trained personnel having no direct responsibilities in the areas being audited.

18B3. The description of the conduct of audit provisions satisfies the regulatory position in Regulatory Guides 1.144 and 1.146.

Technical Rationale[85]

The technical rationale for application of these acceptance criteria to quality assurance during design and construction phases is discussed in the following paragraphs:

1. Compliance with 10 CFR 50.55a and GDC 1 requires that SSC important to safety be designed, fabricated, erected, tested and inspected to quality standards commensurate with the importance of the safety function to be performed.

GDC 1 and 10 CFR 50.55a are applicable to this section because they mandate application of requirements normally contained within a quality assurance program. SRP Section 17.1 describes the staff's position regarding the content and review of an applicant's required QA program.

Meeting the requirements of 10 CFR 50.55a and GDC 1 provides assurance that structures, systems, and components important to safety will be designed, fabricated, constructed, and tested in a manner that will facilitate their intended safety function.

2. Compliance with 10 CFR Part 50, Appendix B, pursuant to §50.34, requires that every applicant for a construction permit or an operating license include in its SAR a description of the QA program to be used for the design, fabrication, construction, testing and operation of the facility's structures, systems, and components.

10 CFR Part 50, Appendix B, is applicable to this section because it specifies the criteria for establishing a QA program for the design, construction and operation of a nuclear power plant. SRP Section 17.1 provides guidance related to staff review and approval of the required QA program. Regulatory Guide 1.28 describes a method acceptable to the NRC staff for establishing and implementing such a program.

Meeting the requirements of 10 CFR Part 5O, Appendix B, provides assurance that nuclear power plants will be designed, fabricated, constructed, tested and operated in a manner that would not cause undue risk to the health and safety of the public.

3. Compliance with 10 CFR Part 21 and 10 CFR 50.55(e) requires reporting of defects or failures to comply that are determined to be substantial safety hazards. Part 21 and 50.55(e) specify what constitutes substantial safety hazards and the format and schedule for such reporting.

10 CFR Part 21 and 10 CFR 50.55(e) are applicable to this section because reportable defects or noncompliances should be identified, evaluated and reported under the QA Program.

Meeting the requirements of 10 CFR Part 21 or 10 CFR 50.55(e) provides assurance that substantial safety hazards are: 1) evaluated; 2) subject to proper corrective action; and 3) identified to the Commission so they can evaluate the adequacy of corrective actions and consider any generic implications.

III. REVIEW PROCEDURES

Each element of the QA program description will be reviewed against the acceptance criteria described in subsection II, including the regulations, regulatory guides, and Branch Technical Position listed in subsection VI.[86] ~~QAB~~HQMB[87] will interface with the secondary review branches to ~~assure~~ ensure that they have documented to the ~~QAB~~HQMB[88] by memo the acceptability of the identification of structures, systems, and components covered by the QA program (Q-List). ~~QAB~~HQMB[89] will process the necessary requests for additional information to the applicant and coordinate the response with the appropriate branches for

acceptance. Changes to the QA program will be evaluated to ~~assure~~ ensure at a minimum that such changes have not degraded the previously approved program. Consideration should be given to the current regulatory position in the area of the change in determining acceptability of the change. The reviewer's judgment during the review is to be based on an assessment of the material presented, the similarity of the material to that recently reviewed on other plants, and whether items of special safety significance are involved. Any exceptions or alternatives to this SRP section, including the regulations and regulatory positions presented in the regulatory guides in subsection VI, will be carefully reviewed to ~~assure~~ ensure that they are clearly defined and that an adequate basis exists for acceptance.

The acceptability of the QA program is determined by the following review procedures:

1. The QA program description is reviewed in detail to determine if each of the criteria of 10 CFR Part 50, Appendix B~~, has been~~ and, if applicable, the requirements of 10 CFR 50.34(f)(3) items (ii) and (iii) have been[90] acceptably addressed and if there is an adequate commitment to comply with the regulations and regulatory positions in the appropriate issue of the regulatory guides in subsection VI,[91] as identified by number, title, revision, or date. The QA program description is also reviewed to ~~assure~~ ensure that the applicant's approach to meeting the QA criteria and commitments is acceptable.

2. The measures described to implement 10 CFR Part 50, Appendix B are evaluated for:

   a. Technical acceptability (i.e., Do they meet the regulations and regulatory guides?)

   b. Workability (i.e., Do they seem to fit into an overall plan of action that can be implemented?)

   c. Management support (i.e., Do QA program measures have adequate review, approval, and endorsement of management?)

   This evaluation is based primarily on the acceptance criteria contained in subsection II.

3. The duties, responsibility, and authority of personnel performing QA functions are reviewed to ~~assure~~ ensure they provide sufficient independence to effectively perform these functions.

4. Through review of information provided; through meetings with the applicant; by review of the acceptability of QA program and plant activities, including performance and capability of personnel; and by review of the ~~Office of Inspection and Enforcement~~ NRR[92] position statement and inspection reports, a judgment is made of the applicant's capability to carry out its QA responsibilities.

5. Satisfaction with program commitments and descriptions of how the commitments will be met, organizational arrangements, and capabilities to fulfill QA requirements should lead to the conclusion of acceptability, as described in subsection IV.

For standard design certification reviews under 10 CFR Part 52, the procedures above should be followed, as modified by the procedures in SRP Section 14.3 (proposed), to verify that the design set forth in the standard safety analysis report, including inspections, tests, analysis, and acceptance criteria (ITAAC), site interface requirements and combined license action items, meet the acceptance criteria given in subsection II. SRP Section 14.3 (proposed) contains procedures for the review of certified design material (CDM) for the standard design, including the site parameters, interface criteria, and ITAAC.[93]

IV. EVALUATION FINDINGS

The reviewer verifies that sufficient information has been provided and that ~~his~~ the[94] review is sufficiently complete and adequate to support conclusions of the following type to be included in the staff's safety evaluation report (SER):[95]

Based on our detailed review and evaluation of the QA program description contained in the (topical report or SAR) for (nuclear facility), we conclude that:

1. The organizations and persons performing QA functions have the required independence and authority to effectively carry out the QA program without undue influence from those directly responsible for costs and schedules.

2. The QA program describes requirements, procedures, and controls that, when properly implemented, comply with: the requirements of Appendix B to 10 CFR Part 50; with the requirements of 10 CFR Part 21; with the requirements of 10 CFR Part 50, §§ 50.55a, ~~and §~~50.55(e), 50.55(f), and 50.34(f)(3)(ii) and (iii) (discuss only if the applicant is subject to 10 CFR 50.34(f))[96]; with the criteria contained in SRP Section 17.1; and with the regulatory positions presented in the following regulatory guides:

   Reg. Guide/ANSI Std. Title Revision or Date
   (Reviewer fill in table of committed Regulatory Guides)[97]

   A brief description of the applicant's QA program is provided highlighting the more important aspects of the program.

3. The QA program covers activities affecting structures, systems, and components important to safety as identified in the PSAR.

Accordingly, the staff concludes that the applicant's description of the QA program is in compliance with applicable NRC regulations and industry standards and can be implemented for the (specify) phases of (specify application).

For design certification reviews, the findings will also summarize, to the extent that the review is not discussed in other safety evaluation report sections, the staff’s evaluation of inspections, tests, analyses, and acceptance criteria (ITAAC), including design acceptance criteria (DAC),

site interface requirements, and combined license action items that are relevant to this SRP section.[98]

V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plan for using this SRP section.

This SRP section will be used by the staff when performing safety evaluations of license applications submitted by applicants pursuant to 10 CFR 50 or 10 CFR 52.[99] Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed six months or more after the date of issuance of this SRP section.[100]

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced guides and NUREGs.

VI. REFERENCES[101]

1. 10 CFR Part 21, "Reporting of Defects and Noncompliance."[102]

~~4~~2. 10 CFR Part 50, §50.34~~(a.7)~~, "Contents of Applications; Technical Information~~"~~ ~~(preliminary safety analysis QA program description)~~."[103]

3. 10 CFR Part 50, §50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants."[104]

~~3~~4. 10 CFR Part 50, §50.55(e), "Conditions of Construction Permits" (reporting significant QA deficiencies).

5. 10 CFR Part 50, §50.55(f), "Conditions of Construction Permits" (implementation of and changes to the QA Program).[105]

~~2~~6. 10 CFR Part 50, §50.55a, "Codes and Standards."

7. 10 CFR Part 50, §50.63, "Loss of all Alternating Current Power."[106]

~~5~~8. 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants~~.~~," General Design Criterion 1, "Quality Standards and Records."[107]

~~1~~9. 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."

~~6~~10. Regulatory Guide 1.8, "~~Personnel Selection and Training~~Qualification and Training of Personnel for Nuclear Power Plants" (endorses ANSI/ANS 3.1 for selected positions and ANSI N18.1 for others).[108]

~~7~~11. Regulatory Guide 1.26, "Quality Group Classification, and Standards for Water, Steam, and Radioactive Waste Containing Components of Nuclear Power Plants."

~~8~~12. Regulatory Guide 1.28, "Quality Assurance Program Requirements (Design and Construction)" (Rev. 2 endorses N45.2 and Rev. 3 endorses ANSI/ASME NQA-1).[109]

~~9~~13. Regulatory Guide 1.29, "Seismic Design Classification."

1~~0~~4. Regulatory Guide 1.30, "Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment" (endorses N45.2.4).

15. Regulatory Guide 1.36, "Nonmetalic Thermal Insulation for Austenitic Stainless Steel."[110]

1~~1~~6. Regulatory Guide 1.37, "Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants" (endorses N45.2.1).

1~~2~~7. Regulatory Guide 1.38, "Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants" (endorses N45.2.2).

1~~3~~8. Regulatory Guide 1.39, "Housekeeping Requirements for Water-Cooled Nuclear Power Plants" (endorses N45.2.3).

19. Regulatory Guide 1.54, "Quality Assurance Requirements for Protective Coatings Applied to Water-Cooled Nuclear Power Plants."[111]

~~14~~20. Regulatory Guide 1.58, "Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel" (endorses N45.2.6).

~~15~~21. Regulatory Guide 1.64, "Quality Assurance Requirements for the Design of Nuclear Power Plants" (endorses N45.2.11).

~~16~~22. Regulatory Guide 1.74, "Quality Assurance Terms and Definitions" (endorses N45.2.10).

~~17~~23. Regulatory Guide 1.88, "Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records" (endorses N45.2.9).

~~18~~24. 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" (endorses N45.2.5).

25. Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Access Plant and Environs Conditions During and Following an Accident."[112]

~~19~~26. Regulatory Guide 1.116, "Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems" (endorses N45.2.8).

2~~0~~7. Regulatory Guide 1.123, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants" (endorses N45.2.13).

28. Regulatory Guide 1.143, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants."[113]

2~~1~~9. Regulatory Guide 1.144, "Auditing of Quality Assurance programs for Nuclear Power Plants" (endorses N45.2.12).

~~22~~30. Regulatory Guide 1.146, "Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants" (endorses N45.2.23).

31. Regulatory Guide 1.152, "Criteria for Programmable Digital Computer System Software in Safety-Related Systems of Nuclear Power Plants."[114]

32. Regulatory Guide 1.155, "Station Blackout."[115]

~~23~~33. Branch Technical Position (BTP) ~~ASB~~SPLB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants" (attached to SRP Section 9.5.1).[116]

34. NUREG-0660, "NRC Action Plan Developed as a Result of the TMI-2 Accident," May 1980.[117]

35. NRC Letter to All Licensees and Applicants of Nuclear Power Reactors, "Technical Specifications for Fire Protection Audits (Generic Letter 82-21)," October 6, 1982.[118]

36. NRC Letter to All Holders of Operating Licenses, Applicants for Operating Licenses and Holders of Construction Permits for Power Reactors, "NRC Use of the Terms, 'Important to Safety' and 'Safety Related' (Generic Letter 84-01)," January 5, 1984.[119]

37. NRC Letter to All Power Reactor Licensees and Applicants for Power Reactor Licenses, "Quality Assurance Guidance for ATWS Equipment that is not Safety-Related (Generic Letter No. 85-06)," April 16, 1985.[120]

38. NRC Letter to All Licensees of Operating Reactors and Holders of Construction Permits, "Plant Record Storage on Optical Disks (Generic Letter 88-18)," October 20, 1988.[121]

39. NRC Letter to All Holders of Operating Licenses and Construction Permits for Nuclear Power Reactors, "Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products (Generic Letter 89-02)", March 21, 1989.[122]

40. NRC Letter to All Holders of Operating Licenses and Construction Permits for Nuclear Power Reactors, "Licensee Commercial-Grade Procurement and Dedication Programs (Generic Letter 91-05)," April 9, 1991.[123]

41. ANSI N45.2-1977, "Quality Assurance Program Requirements for Nuclear Facilities."[124]

42. ANSI N45.2.9-1974, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants."[125]

43. ANSI/ASME Standard NQA-1, "Quality Assurance Program Requirements for Nuclear Facility Applications," 1983.[126]

44. ANSI/ASME Standard NQA-2, "Quality Assurance Requirements for Nuclear Facility Applications," 1986.[127]

45. NFPA 232-1980, "Standard for the Protection of Records."[128]

SRP Draft Section 17.1
Attachment A - Proposed Changes in Order of Occurrence

Item numbers in the following table correspond to superscript numbers in the redline/strikeout copy of the draft SRP section.

Item	Source	Description
1.	Current PRB name and abbreviation	Changed PRB to Quality Assurance and Maintenance Branch (HQMB).
2.	Current SRB abbreviation	Changed SRB to EMEB.
3.	Current SRB name and abbreviation	Changed SRB to Instrumentation and Controls Branch (HICB).
4.	Current SRB name and abbreviation	Changed SRB to Electrical Engineering Branch (EELB).
5.	Current SRB name and abbreviation	Changed SRBs to Emergency Preparedness and Radiation Protection Branch (PERB).
6.	Current SRB name and abbreviation	Changed SRB to Civil Engineering and Geosciences Branch (ECGB).
7.	Current SRB name and abbreviation	Changed SRB to Containment Systems and Severe Accident Branch (SCSB).
8.	Current SRB name and abbreviation	Changed SRB to Materials and Chemical Engineering Branch (EMCB).
9.	Current PRB name and abbreviation	Changed PRB to Quality Assurance and Maintenance Branch (HQMB).
10.	Editorial	Provided "SRP" as initialism for Standard Review Plan.
11.	Integrated Impacts 890, 891, 892, 893, 894, 896, 897 and 898	Added footnote to explain the continued use of withdrawn Regulatory Guides 1.58, 1.64, 1.74, 1.88, 1.123, 1.144 and 1.146.
12.	Editorial, PRB Comments	Added explanation of the difference between SRP Sections 17.1/17.2 and SRP Section 17.3. This reflects comments from HQMB that NQA-1/2 or ANSI N45.2 are acceptable approaches and that they still use 17.1 and 17.2 to review programs based upon N45.2. Also added discussion of ongoing efforts by the Staff to address graded QA.
13.	SRP-UDP format item	Relocated to "Review Interfaces."
14.	SRP-UDP format item	Inspection and Enforcement (IE) no longer exists. Defined NRR as Office of Nuclear Reactor Regulation.
15.	Integrated Impact No. 911	Modified the discussion of standardized design to reflect the requirements of 10 CFR 52.63.
16.	Current PRB abbreviation	Changed PRB to HQMB.
17.	Editorial	Changed "assure" to "ensure" (global change for this section).

Item	Source	Description
18.	SRP-UDP format item	Added "Review Interfaces" to AREAS OF REVIEW describing how HQMB reviews aspects of quality assurance during the design and construction phases under other SRP sections and how other branches support this review.
19.	Potential Impact 23066	Added a review interface reflecting review of reliability assurance programs.
20.	Editorial, PRB responsibilities	Identified the SRP sections under which EMEB conducts the review of classification of structures, systems and components.
21.	Branch names and abbreviations	Replaced "PSB (except electrical)" with HICB as the branch which now covers the non-electrical scope of the previous PSB.
22.	Editorial	Relocated text from first paragraph, incorporating revised designators for review branches.
23.	SRP-UDP Integration of Bolting Issues, Potential Impact 19831	Added a review interface reflecting reviews of bolting and threaded fastener programs under new SRP Section 3.13.
24.	Editorial	Separated general Acceptance Criteria into separate paragraphs and added alphabetical designation to facilitate referencing these criteria.
25.	Integrated Impact 1075	Added 10 CFR Part 21 as Acceptance Criteria.
26.	Editorial	Identified 10 CFR 50.55(e) as an acceptance criterion (previously identified only by general reference to the reference listing).
27.	Editorial	Identified 10 CFR 50.55a as an acceptance criterion (previously identified only by general reference to the reference listing). Also defined acronym SSC for structures, systems and components, consistent with usage in other SRP sections.
28.	Editorial	Listed GDC 1 as an Acceptance Criterion, previously only included in II.2B3.
29.	Editorial	Provided characterization of 10 CFR 50 Appendix B.
30.	Editorial	Defined "A/E" as "architect/engineer."
31.	Editorial	Struck title of Appendix B since it is listed above (and in References subsection).
32.	Editorial	Defined PSAR and FSAR as preliminary safety analysis report and final safety analysis report, respectively.

Item	Source	Description
33.	Editorial	Changed "acceptance criteria" to "specific criteria" to provide a distinction between requirements (e.g., regulations) and regulatory guidance.
34.	Current PRB abbreviation	Changed PRB to HQMB.
35.	Editorial	Changed "the acceptance criteria" to "these criteria" to make a distinction between acceptance criteria (requirements) and specific criteria (review or regulatory guidance).
36.	Editorial	Added text to clarify that the commitment is on the part of the applicant, not the SRP section.
37.	SRP-UDP format item	Added "and Generic Letters" to reflect the addition of GLs to the acceptance criteria commitments in subsection II and to subsection VI as references.
38.	Editorial	Revised the referenced location of additional regulatory guidance to allow expanded discussion of applicable documents. (Note: original reference to subsection V was in error and should have been subsection VI.)
39.	Editorial	Revised text for increased clarity.
40.	Editorial	Changed "acceptance criteria" to "specific criteria" to make a distinction between requirements and regulatory guidance.
41.	Current PRB abbreviation	Changed PRB to HQMB.
42.	Editorial	Changed "acceptance criteria" to "specific criteria" to make a distinction between requirements and regulatory guidance.
43.	Editorial	Removed paragraph break for consistency with corresponding text in SRP 17.2 and since the next sentence logically connects with the content of the previous paragraph.
44.	Editorial	Replaced "ref." with "see" for clarity (there is no 3E3 in the reference section).
45.	Editorial	Corrected a misplaced modifier and clarified sentence.
46.	No change.	Regulatory Position C.2 of RG 1.8, Rev. 2 would imply that qualifications of the QA Manager should meet ANSI N18.1-1971; however, that standard does not provide guidance directly applicable to the QA Manager. This reference to ANS 3.1-1978 was retained as is, despite the apparent conflict with RG 1.8.

Item	Source	Description
47.	PRB Comment	To address HQMB comments regarding application of SRP 17.3 to non-safety-related equipment, a footnote was added to explain that such equipment may be addressed under elements of an Appendix B program or other program.
48.	Editorial	Corrected QA list from section 3.2.1 to 3.2.2. The former is seismic classification.
49.	Integrated Impact No. 908; editorial	Original footnote deleted since the topic is addressed by the main text. Also defined "SAR" as "safety analysis report."
50.	Integrated Impact Nos. 908 and 1058	Added discussion of TMI Item I.F.1, related regulations, and Generic Letter 84-01 concerning QA program coverage beyond safety related equipment.
51.	PRB Comment; Integrated Impact No. 905	Added statement, based upon HQMB comment (related to draft SRP section 17.3) that RGs 1.26 and 1.29 serve as primary criteria and should be sufficient to address QA coverage of non-safety-related components. Also included note of definitions of equipment important to safety in RG 1.97 and in 10 CFR 50.49.
52.	SRP-UDP format item, Reference verification	Added identification of the BTP by its current designation.
53.	Integrated Impact No. 909	Added citation of GL 82-21 in SRP 17.1 as guidance for fire protection audits.
54.	Editorial	Added a paragraph to address commitment to the regulations, RGs and BTPs listed in the REFERENCES subsection to replace the original statement in the Acceptance Criteria introductory paragraph. (This invokes the RGs that are not otherwise discussed in the section.)
55.	Integrated Impact Item No. 903	Added guidance for QA of non-safety-related equipment relied upon to meet station blackout requirements.
56.	Integrated Impact No. 904	Added guidance for a commitment to QA of radwaste management systems.
57.	Integrated Impact No. 905	Added guidance for QA of accident monitoring instrumentation.
58.	Integrated Impact No. 907	Added guidance for QA of nonsafety-related ATWS equipment.
59.	Integrated Impact No. 912	Added 10 CFR 50.55(f) to Subsection II.2B2. Also defined "SSAR" as "standard SAR."
60.	Editorial	Provided correct citation format for the Code of Federal Regulations (global change for this section).

Item	Source	Description
61.	Editorial	Listed 10 CFR 50.34(a)(7) to accommodate revision of the subsection VI listing from 50.34 a.7 to a more general reference to 50.34.
62.	Integrated Impact Nos. 908, 1058 and 1083	Added 10 CFR 50.34(f)(3)(ii) and (iii) to list of regulations to which the applicant must commit.
63.	Integrated Impact No. 1075	Added 10 CFR Part 21 to the discussion of 50.55e.
64.	Editorial	Changed format of citation for GDC 1.
65.	Current SRB abbreviation	Changed SRB to EMEB.
66.	Integrated Impact No. 912	Added 10 CFR 50.55(f) to Subsection II.2B4.
67.	Integrated Impact No. 1075	Added discussion of 10 CFR 21 to that for 50.55(e).
68.	Editorial	Added "section" to correct an apparent typographical error.
69.	Editorial	Changed "his" to "the" to avoid the gender specific pronoun.
70.	Editorial	Revised subsection numbering from 3E3 to 3E5 to correct redundant numbering of previous version.
71.	Editorial	Revised subsection numbering from 3E4 to 3E6 to correct redundant numbering of previous version.
72.	Integrated Impact No. 910	Added GL 83-11 staff position concerning computer code verification.
73.	Editorial	Changed "is" to "are" to provide noun-verb agreement.
74.	Editorial	Defined LCVIP.
75.	Integrated Impact No. 906	Added GLs 89-02 and 91-05 as guidance related to QA for procurement of commercial grade equipment.
76.	Editorial	Defined "NDT" as "nondestructive testing."
77.	Editorial	Revised sentence to correct apparent typographical error.
78.	Editorial	Deleted unnecessary words.
79.	Editorial	Revised item 12.7 to improve clarity and correct apparent typographical errors.
80.	Integrated Impact No. 901	Added provision for optical disk document imaging system for imaging systems for the storage and retrieval of records.
81.	SRP-UDP Guidance, Reference Citations; Integrated Impact No. 1507	Added reference notation for listing of NFPA 232 in subsection VI where the applicable version is identified.

Item	Source	Description
82.	Integrated Impact No. 1506; SRP-UDP Guidance, Reference Citations	Struck "proposed" from citation of ANSI N45.2.9 based upon RG 1.88 endorsement of issued version 1974. Added reference notation to listing of the standard in subsection VI.
83.	Editorial	Revised sentence to correct noun-verb disagreement.
84.	Editorial	Defined "SSAR."
85.	SRP-UDP format item, develop technical rationale	Added "Technical Rationale" to ACCEPTANCE CRITERIA and formatted in numbered paragraphs describing the bases for referencing the General Design Criteria.
86.	Editorial	Corrected the subsection reference for References.
87.	Current PRB abbreviation	Changed PRB to HQMB.
88.	Current PRB abbreviation	Changed PRB to HQMB.
89.	Current PRB abbreviation	Changed PRB to HQMB.
90.	Integrated Impact Nos. 908, 1058 and 1083	Added discussion of 10 CFR 50.34(f) requirements related to the QA program.
91.	Editorial	Corrected the designation for References subsection (subsection V is implementation subsection).
92.	SRP-UDP format item	Changed to reflect the fact that Inspection and Enforcement has been integrated into NRR.
93.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard paragraph to address application of Review Procedures in design certification reviews.
94.	Editorial	Revised to elimination gender-specific reference.
95.	Editorial	Provided "SER" as Initialism for "safety evaluation report."
96.	Integrated Impact Nos. 908, 912, 1058, 1075 and 1083; Editorial	Added 10 CFR Part 21 and §§ 50.55(f) and 50.34(f)(3)(ii) and (iii) to reflect the same changes already made to the acceptance criteria. Also added punctuation to clarify the listing of regulations and requirements.
97.	Editorial	Added parenthetical note to prompt reviewer to fill in table of RGs.
98.	SRP-UDP Format Item, Implement 10 CFR 52 Related Changes	To address design certification reviews a new paragraph was added to the end of the Evaluation Findings. This paragraph addresses design certification specific items including ITAAC, DAC, site interface requirements, and combined license action items relevant to this SRP section.

Item	Source	Description
99.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard sentence to address application of the SRP section to reviews of applications filed under 10 CFR Part 52, as well as Part 50.
100.	SRP-UDP Guidance	Added standard paragraph to indicate applicability of this section to reviews of future applications.
101.	SRP-UDP Guidance	Reorganized and renumbered references following SRP-UDP guidance and to accommodate addition of new references.
102.	Integrated Impact No. 1075	Added listing of 10 CFR Part 21.
103.	Editorial; Integrated Impacts 908, 1058 and 1083	Revised reference to 10 CFR 50.34 to support citations of 50.34(a)(7) and 50.34(f)(3)(ii) and (iii).
104.	Editorial	Added listing of 10 CFR 50.49 to support addition of a note referring to that regulation.
105.	Integrated Impact No. 912	Added reference to 10 CFR 50.55(f), "Conditions of Construction Permits" (implementation of and changes to the QA Program) to parallel the same change in acceptance criterion and renumbered references.
106.	Integrated Impact No. 903	Added Reference to 10 CFR 50.63 for QA of station blackout.
107.	Editorial	Completed reference to GDCs by including designation and title for GDC 1.
108.	Integrated Impact No. 902; Editorial	Corrected the title of RG 1.8 to correspond with that for Rev. 2 of the guide and clarified the parenthetical notation of endorsed guides to reflect the endorsements of Rev. 2.
109.	Integrated Impact No. 897	Identified the endorsement of N45.2 by Rev. 2 of the RG and endorsement of ANSI/ASME NQA-1 by Rev. 3.
110.	Integrated Impact No. 1546	Added RG 1.36 as a reference applicable to QA program commitments.
111.	Integrated Impact No. 1546	Added RG 1.54 as a reference related to QA Program commitments.
112.	Integrated Impact No. 905	Added Reference to RG 1.97 for QA guidance for accident monitoring equipment.
113.	Integrated Impact No. 904	Added Reference to RG 1.143 to provide QA guidance for radwaste management systems.
114.	Integrated Impact No. 1546	Added RG 1.152 to references list.
115.	Integrated Impact No. 903	Added Reference to RG 1.155 for QA guidance for station blackout equipment.

Item	Source	Description
116.	Reference Verification; editorial	Replaced BTP "ASB 9.5-1" with BTP "SPLB 9.5-1" and added document title.
117.	Integrated Impact No. 1058	Added NUREG-0660 to list of references.
118.	Integrated Impact No. 909	Added Reference 30, GL 82-21, to subsection VI to provides staff positions on an acceptable audit program in the fire protection area.
119.	Integrated Impact No. 1058	Added GL 84-01 as a reference.
120.	Integrated Impact No. 907	Added Reference to GL 85-06 to provide QA guidance for nonsafety-related equipment encompassed by the ATWS rule.
121.	Integrated Impact No. 901	Added Reference to GL 88-18 for guidance regarding plant record storage on optical disks.
122.	Integrated Impact No. 906	Added Reference to GL 89-02 for dedication of commercial grade equipment.
123.	Integrated Impact No. 906	Added Reference to GL 91-05 to provide staff positions regarding certain aspects of licensee commercial grade procurement and dedication programs.
124.	Reference Verification	Specified N45.2-1977 based upon the version endorsed by RG 1.28, Rev. 2 which was in effect at the time of the last revision of SRP Sections 17.1 and 17.2.
125.	SRP-UDP Guidance, Reference citations; Integrated Impact No. 1506	Added listing of ANSI N45.2.9. Specified 1974 version based upon endorsement in RG 1.88.
126.	Reference Verification	Specified NQA-1-1983 based upon endorsement by RG 1.28, Rev. 3. The current version is NQA-1, 1992.
127.	Reference Verification	Specified NQA-2-1986 based upon review by SIAC documented in NUREG/CR-5152. NQA-2 was never formally endorsed by the NRC. It has since been incorporated into NQA-1. The latest version of NQA-1 is 1992.
128.	SRP-UDP Guidance, Reference Citations; Integrated Impact No. 1507	Added listing of referenced standard. Specified the 1980 version of NFPA 232 since it was the version in effect at the time of the last revision to SRP 17.1. The current version is NFPA 232-1991.

Integrated Impact No.	Issue	SRP Subsections Affected
889	Update SRP Section 17.1 to address the concerns of GL 86-10.	No changes to SRP 17.1 since GL 86-10 was incorporated in the Branch Technical Position attached to SRP 9.5.1.
890	Update SRP Section 17.1 by replacing RG 1.88, as a review criterion, with RG 1.28.	Areas of Review, I
891	Update SRP Section 17.1 by removing RG 1.64 as a review criterion.	Areas of Review, I
892	Update SRP Section 17.1 by removing RG 1.74 as a review criterion.	Areas of Review, I
893	Update SRP Section 17.1 by removing RG 1.146 as a review criterion.	Areas of Review, I
894	Update SRP Section 17.1 by removing RG 1.144 as a review criterion.	Areas of Review, I
896	Update SRP Section 17.1 by removing RG 1.123 as a review criterion.	Areas of Review, I
897	Consider revising SRP Section 17.1 to incorporate RG 1.28 directly into the main body of Section 17.1 as a review criterion.	Areas of Review, I References, VI.10
898	Update SRP Section 17.1 by removing RG 1.58 as a review criterion.	Areas of Review, I
901	Update SRP Section 17.1 to address the unique requirements of optical disk storage systems.	Acceptance Criteria, II.17.1 References, VI.38
902	Specify the current version of ANSI/ANS 3.1 in SRP 17.1 and revise acceptance criterion 1C2.	References, VI.10
903	Add acceptance criteria for quality assurance guidance for station blackout equipment.	Acceptance Criteria, II.2A1.f References, VI.7, & VI.32
904	Add acceptance criteria for quality assurance guidance for radwaste management systems.	Acceptance Criteria, II.2A1.g References, VI.28
905	Add acceptance criteria for quality assurance guidance for accident monitoring instrumentation.	Acceptance Criteria, II.2A1 and II.2A1..i References, VI.25
906	Augment acceptance criteria for the dedication of commercial grade equipment for use in safety-related applications.	Acceptance Criteria, II.7B4 References, VI.39, & VI.40

Integrated Impact No.	Issue	SRP Subsections Affected
907	Add acceptance criteria for quality assurance guidance for ATWS equipment, GL 85-06.	Acceptance Criteria, II.2A1.i References, VI.37
908	Add 10 CFR 50.34(f)(3)(ii) and (iii) as acceptance criteria. In addition, include Generic Letter 84-01 and discussion of the relationship between GDC 1 and SRP 17.1.	Acceptance Criteria, II.2A1.a & II.2B3 Review Procedures, III.1 Evaluation Findings, IV.2 References, VI.2
909	Add acceptance criteria related to fire protection audits.	Acceptance Criteria, II.2A1.d References, VI.35
910	Add acceptance criteria for code verification activities.	Acceptance Criteria, II.3E6
911	Add discussions to reflect 10 CFR 52.63 in AREAS OF REVIEW.	Areas of Review, I Pre-Docketing, second paragraph
912	Modify ACCEPTANCE CRITERIA to reflect the requirements to implement and report changes to the quality assurance program.	Acceptance Criteria, II.2B2 & II.2B4 Evaluation Findings, IV.2 References, VI.5
1058	Revise Acceptance Criteria to reflect the requirements of 50.34(f)(3)(ii) to include all structures, systems, and components important to safety.	Acceptance Criteria, II.2A1a & II.2B3 Review Procedures, III.1 Evaluation Findings, IV.2 References, VI.2, VI.34 & VI.36
1075	Perform additional analysis regarding amendments to 10 CFR 21 and 10 CFR 50.55(e) related to resolution of TMI Action Plan Item II.J.4.1.	Acceptance Criteria, II.A, II.2B3 & II.2B4 Evaluation Findings, IV.2 References, VI.1
1083	Modify Acceptance Criteria to include identification of the requirements of 50.34(f)(3)(iii).	Acceptance Criteria, II.2B3 Review Procedures, III.1 Evaluation Findings, IV.2 References, VI.2

SRP Draft Section 17.1
Attachment B - Cross Reference of Integrated Impacts

Integrated Impact No.	Issue	SRP Subsections Affected
1506	Update the citation of ANSI N45.2.9 to cite the 1974 version.	Acceptance Criteria, II.17.4 References, VI.42
1507	Consider updating the citation of NFPA 232 to cite the 1980 version.	Acceptance Criteria, II.17.4 References, VI.45
1546	Consider adding RGs 1.36, 1.54 and 1.152 as guidance in SRP Section 17.1, consistent with applicable guidance cited in SRP 17.3.	References, VI.15, VI.19, VI.31