

17. EARLY SITE PERMIT QUALITY ASSURANCE MEASURES

17.0 Introduction

Dominion Nuclear North Anna, LLC (Dominion or the applicant), supplied information on quality assurance (QA) measures applied to early site permit (ESP) activities the applicant and its principal contractors conducted. The staff of the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection of the applicant's QA measures on November 17–21, 2003. Subsequently, the staff performed an in-office technical review to evaluate whether the applicant and its principal contractors had applied adequate QA measures. Specifically, the staff conducted a review to determine whether the applicant adequately applied the guidance in Section 17.1.1, "Early Site Permit Quality Assurance Controls," of Review Standard (RS)-002, "Processing Applications for Early Site Permits," to demonstrate the integrity and reliability of data that were obtained during ESP activities.

Under Title 10, Section 52.18, of the *Code of Federal Regulations* (10 CFR 52.18), "Standard for Review of Applications," the staff evaluates ESP applications in accordance with the applicable regulations of 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and its appendices, as well as 10 CFR Part 100, "Reactor Site Criteria," as they apply to construction permits. The current regulations do not require ESP holders or applicants to implement a QA program compliant with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50. However, the applicant is expected to implement QA measures equivalent in substance to the measures described in Appendix B to 10 CFR Part 50 to provide reasonable assurance that the information derived from ESP activities that could be used in the design and/or construction of systems, structures, and components (SSCs) important to safety would support satisfactory performance of such SSCs once in service. Therefore, the staff evaluated quality measures for activities associated with the applicant's generation of site-related information that could be an input to the design of future SSCs to ensure that these measures could provide reasonable assurance of the integrity and reliability of the information, assuming these measures were equivalent in substance to the criteria of Appendix B to 10 CFR Part 50.

In accordance with 10 CFR 52.79(a)(1), if an application for a combined license (COL) references an ESP, it must contain information sufficient to demonstrate that the design of the facility falls within the site parameters specified in the ESP. Therefore, the ESP applicant must provide reasonable assurance of the reliability and integrity of data contained in or supporting the ESP application, which in turn supports any future COL or construction permit (CP) application.

Conformance with the QA measures described in RS-002, Section 17.1.1, provides reasonable assurance that the applicant used adequate QA measures to support its ESP application. The staff focused its review on whether the applicant's QA measures adequately addressed the guidance in Section 17.1.1 of RS-002 for each applicable area, as determined by the applicant (e.g., organization and QA program). The staff performed much of its evaluation in an inspection conducted in November 2003 and documented in Inspection Report 05200008/2003001 (ADAMS Accession No. ML040150170). For any area the applicant determined was not applicable, the staff verified that the ESP activities did not rely on QA measures associated with that area. The review focused on the applicant and its primary

contractor, Bechtel. Inspection Report 05200008/2003001 includes details on the subcontractors involved in the Dominion ESP activities. Section 17.7 of this report discusses the adequacy of the QA measures applied by these subcontractors.

In Chapter 17, "Quality Assurance," of the site safety analysis report (SSAR), the applicant submitted the description of the QA measures it applied to ESP activities. Chapter 17 of the SSAR includes the ESP Application Development Quality Assurance Manual, Revision 2 (hereafter referred to as the QA Manual). The QA Manual delineates the QA plan for the development of an ESP application. The applicant developed this manual using guidance from the American Society of Mechanical Engineers (ASME) NQA-1-2000, "Quality Assurance Requirements for Nuclear Facility Applications," published in 2000. As discussed in Inspection Report 05200008/2003001, the applicant used elements of the operating QA program for the existing North Anna Units 1 and 2, which are located adjacent to the ESP site, to simplify the QA process for ESP application development. Use of detailed implementing procedures from the operating plant QA program for ESP activities obviated the need to develop new guidance for applicable ESP activities. The applicant's QA Manual provides details about the QA process for developing an ESP application and specifies the use of the processes in place that meet the requirements of Dominion's current QA program.

17.1 Organization

17.1.1 Technical Information in the Application (Organization)

The applicant supplied information on the ESP organization in SSAR Section 17.1, which includes the QA Manual. The QA Manual describes the organization, programs, and procedural requirements of the Dominion Quality Assurance Program and states that they are intended to ensure compliance with the criteria of Appendix B to 10 CFR Part 50.

The QA Manual states that a QA program will outline the organization, programs, and procedural requirements necessary to ensure that the application is developed in a quality manner and, as appropriate, in accordance with the requirements of Appendix B to 10 CFR Part 50. In this manual, the applicant described an ESP organization consisting of five groups, including the Early Site Permit Project, Nuclear Operations, Nuclear Engineering, Nuclear Support Services, and Nuclear Oversight. An organization chart outlines the overall structure and lines of authority. The manual sets forth each group's role and responsibilities, as well as the roles and responsibilities of first-line supervisors, management, and QA organization. Inspection Report 05200008/2003001 provides additional information on the staff's review of the applicant's QA organization.

17.1.2 Regulatory Evaluation (Organization)

While the NRC does not require an ESP applicant to develop an organization compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's organization. In Section 2 of its QA Manual, the applicant stated that its design controls would ensure that the application is developed in a quality manner and, as appropriate, in accordance with the requirements of Appendix B to 10 CFR Part 50.

Paragraph 17.1.1.1 in Section 17.1.1 of RS-002 outlines the QA measures that constitute an acceptable organization, including (1) an organization 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 those of its principal contractors, (2) the relative location of the QA organization, degree of independence from the organization performing the ESP activities, and authority of the individuals assigned the responsibility for performing QA functions, and (3) the organizational provisions that exist for ensuring the proper implementation of QA controls.

17.1.3 Technical Evaluation (Organization)

17.1.3.1 Dominion

The staff reviewed the Dominion QA Manual. In Section 2, the QA Manual describes the organizational responsibilities for ESP activities and those QA measures Dominion implemented. Section 2 states that the Nuclear Oversight Group is responsible for independently planning and performing activities to verify the development and effective implementation of nuclear management QA programs for activities associated with ESP development. As discussed in Inspection Report 05200008/2003001, the staff reviewed the training records of all involved management personnel. These management personnel all appear to have received appropriate training. Section 2 of the QA Manual also states that the Vice President of Nuclear Support Services has the overall responsibility for implementing the QA program for the ESP organization. The QA Manual provides specific guidance on resolving issues through the levels of management and details the roles and responsibilities of the QA organization.

As discussed in Inspection Report 05200008/2003001, the staff conducted interviews with key applicant personnel involved in ESP activities. From the interviews, the staff determined that these personnel were knowledgeable about their roles and responsibilities. Nuclear oversight personnel report through a management chain completely separate from ESP application development and product management. The staff found the guidance for organizational roles and responsibilities adequate for conducting ESP activities.

As described in Inspection Report 05200008/2003001, the applicant developed procedures specific to ESP activities not covered by the current QA program procedures for the existing operating units.

17.1.3.2 Bechtel

Dominion selected Bechtel as the primary contractor for ESP application activities. Bechtel designed its Nuclear Quality Assurance Manual (NQAM) to meet the requirements of Appendix B to 10 CFR Part 50. Bechtel used the NQAM to develop the quality assurance program plan (QAPP) specific to the Dominion ESP application effort. The NQAM contains detailed organization charts and personnel responsibilities. Bechtel's project quality assurance manager (PQAM) directed and controlled the project QA program. The PQAM was tasked with assuring that the QA actions Bechtel performed throughout the project organization were accomplished in accordance with the quality program criteria. The PQAM has organizational independence, reporting directly to the President of Bechtel's Nuclear Global Business Unit

(GBU). The GBU President has overall responsibility for the adequacy and implementation of the Bechtel nuclear QA program. The staff found Bechtel's guidance for organizational roles and responsibilities adequate for conducting ESP activities.

17.1.4 Conclusion (Organization)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that the applicant has implemented an acceptable organization. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 helps to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.2 Quality Assurance Program

17.2.1 Technical Information in the Application (QA Program)

The applicant supplied information on the QA program in SSAR Section 17.1, which includes the QA Manual. The QA Manual states that the objective of the Dominion Quality Assurance Program for the ESP application is to comply with the criteria in Appendix B to 10 CFR Part 50, as amended, and with the QA program requirements in Dominion's implementing procedures, which Inspection Report 05200008/2003001 discusses in greater detail.

The QA Manual states that the Dominion Quality Assurance Program applies to those ESP activities that can affect, either directly or indirectly, the safety-related site characteristics or analysis of those characteristics. In addition, this program applies to engineering activities used to characterize the site or analyze that characterization. The program defines the quality-related activities associated with developing the ESP application. Specifically, the QA Manual states that the Dominion Quality Assurance Program provides written policies, standards, procedures, and instructions covering engineering, design, procurement, periodic surveillance, and supporting tests for the development of the application.

The QA Manual states that nuclear oversight personnel report through a line of management completely separate from ESP application development, production management, and influences. The Nuclear Oversight Group must conduct audits in accordance with the Dominion Quality Assurance Program and perform other duties as directed by the Director of Nuclear Oversight. The QA Manual specifies the qualification criteria for nuclear oversight personnel.

17.2.2 Regulatory Evaluation (QA Program)

While the NRC does not require an ESP applicant to have a QA program compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's QA program. RS-002, paragraph 17.1.1.2, outlines the QA measures that constitute an acceptable level of control for ESP activities. The QA program should include (1) a scope of QA measures adequate to ensure that appropriate quality controls are applied to all site characterization data related to the design and analysis of SSCs important to safety that might be constructed on the proposed site, (2) provisions to

ensure proper definition of QA measures, and (3) provisions to ensure the adequacy of personnel qualifications.

17.2.3 Technical Evaluation (QA Program)

In this section of the safety evaluation report (SER), the staff documents its evaluation of the applicant and primary contractor's overall QA program description. The staff provides a detailed review and evaluation of each applicable portion of the program in the following sections of this SER.

17.2.3.1 Dominion

The staff reviewed the QA Manual, which delineates the Dominion Quality Assurance Program for the development of an ESP application and outlines the organization, programs, and procedural requirements for the applicant's QA program. The applicant developed the manual using guidance from ASME NQA-1-2000.

To simplify the QA process, the applicant invoked portions of the current QA program for Dominion's existing operating units. However, the operating Dominion Quality Assurance Program specifically excludes construction activities. The QA Manual provides details for construction-related QA processes that can be interchanged with appropriate sections of the operating QA program. The staff found the applicant's methodology for a QA program, which is based on the implementation of ASME NQA-1-2000 and applicable operating QA guidance, to be adequate for conducting ESP activities.

The applicant developed procedures specific to the ESP project to control ESP activities not adequately addressed in the operational program procedures. As discussed in Inspection Report 05200008/2003001, the staff found the procedures adequate for conducting ESP activities.

Inspection Report 05200008/2003001 also discusses the staff's review of the training and qualification program documents for all involved QA personnel; this review found no deficiencies.

17.2.3.2 Bechtel

The Bechtel NQAM identifies Bechtel's requirements for the development of quality program projects, such as the Dominion ESP application. Bechtel stated that it designed the QA policies contained in the NQAM to meet the requirements of Appendix B to 10 CFR Part 50. To this end, the NQAM incorporates QA policies corresponding to each criterion in Appendix B to 10 CFR Part 50. Bechtel used the NQAM to develop a QAPP specific to the Dominion ESP application QA effort.

The stated purpose of the QAPP is to establish the quality program interface between the Bechtel NQAM and Dominion's specific requirements relevant to the ESP application development activities. The QAPP specifically identifies the QA policies applicable to the Dominion ESP project, as well as the requirements contained in the Dominion QA Manual. Bechtel developed the NQAM for the full scope of its services, while the QAPP specifically

identifies QA policies applicable to Bechtel's scope of work on the Dominion ESP project. Bechtel applied the requirements of the QA program established in the QAPP in a graded manner, commensurate with the importance to safety of the activities being performed.

The staff reviewed the QAPP and QAPM and found that the documents cover all aspects of an adequate QA program, establish a clear link between the Dominion and Bechtel QA programs, and explain how the relationship worked. Modifications to the QA policies, as appropriate, reflected unique project or applicant requirements. The documents also stipulate that the reporting of defects or noncompliance to the NRC must be in accordance with 10 CFR Part 21, "Reporting of Defects and Noncompliance." The staff therefore finds the Bechtel Quality Assurance Program to be adequate for conducting ESP activities.

As discussed in Inspection Report 05200008/2003001, the staff also reviewed the training and qualification program documents for all involved QA personnel and found no deficiencies.

17.2.4 Conclusion (QA Program)

As set forth above, the staff reviewed the QA measures implemented by the applicant and its primary contractor and concludes that these measures form an acceptable QA program. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 helps to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.3 Design Control

17.3.1 Technical Information in the Application (Design Control)

The applicant supplied information on design control in SSAR Section 17.1, which includes the QA Manual. The manual states that the Nuclear Design Control Program (NDCP) delineates procedures, responsibilities, processes, and standards related to design control. The applicant based its procedures for design controls, analysis, and reviews on the applicable documents referenced in the Nuclear Design Control Manual (NDCM) and included in American National Standards Institute (ANSI) N45.2.11-1974, "Quality Assurance Requirements for Nuclear Power Plants," published in 1974, as modified in the Dominion QA procedures (see Inspection Report 05200008/2003001).

The QA Manual states that the NDCP provides for verifying or checking the adequacy of design through the performance of design review or suitable testing. The NDCP establishes measures for review of the selection and suitability of the application of materials, parts, equipment, and processes essential to safety-related or safety-significant functions. These measures require the use of valid and applicable industry standards and specifications.

The QA Manual states that quality measures are assured through all levels of the design control program by the design control organization, station, and corporate support organization. The applicant's procedures (discussed in Inspection Report 05200008/2003001) require that the applicant document and correct any nonconforming condition it identifies, in accordance with the corrective action process.

The QA Manual states that the NDCP delineates procedures to assure that the design basis, regulatory requirements, codes, and standards are correctly translated into specifications, drawings, procedures, or instructions for those items classified as safety related. Further, design changes, including field changes, are subject to design control measures commensurate with those applied to the original design and the applicable, specified design requirements.

As discussed in Inspection Report 05200008/2003001, Dominion's engineering standard establishes the interface between the company and its contractors for design activities. The standard requires that the preparation, review, and approval of design documents follow the licensee's program requirements.

In Request for Additional Information (RAI) 17.1-1, the staff asked the applicant to describe the QA measures it used to authenticate and verify any data important to safety that it retrieved from Internet Web sites that support information in the SSAR that could affect the design, construction, or operation of SSCs important to safety. In its response, the applicant provided a table identifying all the Internet Web sites it used as a source of information for the SSAR. A column in the table identifies whether the applicant used the information from an Internet Web site to support information in the SSAR that could affect the design, construction, or operation of SSCs important to safety. Another column describes the measures used to authenticate and verify data retrieved from Internet Web sites that support information in the SSAR that could affect the design, construction, or operation of SSCs important to safety.

17.3.2 Regulatory Evaluation (Design Control)

While the NRC does not require an ESP applicant to implement design controls compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's design controls. RS-002, paragraph 17.1.1.3, describes the QA measures that constitute an acceptable level of design control. Acceptable design controls should include (1) the scope of activities that could affect design and construction activities for SSCs important to safety that might be constructed on the site, (2) a definition of the organizational structure, activity, and responsibility of the positions or groups responsible for design activities important to safety (if any), (3) provisions to carry out design activities important to safety in a planned, controlled, and orderly manner, (4) provisions for interface control between functional units of the applicant's organization, (5) provisions to verify the technical adequacy of design documents applicable to ESP activities that could affect SSCs important to safety, and (6) provisions to control design changes applicable to ESP activities that could affect SSCs important to safety (if any).

17.3.3 Technical Evaluation (Design Control)

17.3.3.1 Dominion

The staff reviewed the Dominion procedures describing design control measures for design verification, computer software control, engineering drawings, design calculations, personnel training, design deviations, internal and external design control communications, design documentation, organizational responsibilities, field changes, and revisions.

The QA Manual delineates the QA plan for developing an ESP application and describes personnel roles and responsibilities for those involved in the project. The manual states that the NDCP delineates procedures to assure that design bases, regulatory requirements, codes, and standards are correctly translated into specifications, drawings, procedures, or instructions. The Dominion nuclear and engineering standards (discussed in Inspection Report 05200008/2003001) further describe the design control program. As stated in the QA Manual, the procedures for design controls, analysis, and review included, as part of their basis, ANSI N45.2.11-1974, as modified in the Dominion QA procedures (discussed in Inspection Report 05200008/2003001). Based on the training and procedural guidance, the staff found the guidance for design control to be adequate for conducting ESP activities. The staff verified the adequacy of Dominion's design control process by reviewing applicable procedures as discussed in Inspection Report 05200008/2003001.

Dominion's QA procedures (discussed in Inspection Report 05200008/2003001) describe the NDCP and the overall design control attributes, qualification of nuclear oversight personnel, and measures established to assure that regulatory requirements are met. The NDCP constitutes a detailed program for preparing, reviewing, maintaining, and approving procedures and standards to ensure compliance and consistency with Criterion V, "Instructions, Procedures, and Drawings," of Appendix B to 10 CFR Part 50. The NDCP also provides for verification and/or independent review of the adequacy of design through design reviews, use of alternate calculational methods, or testing. Additionally, the staff found that the NDCP adequately addresses control of design changes and organizational interfaces. For these reasons, the staff found the guidance of the NDCP to be consistent with Section 17.1.1 of RS-002.

The staff evaluated the applicant's response to the RAI concerning the QA measures the applicant used to authenticate and verify data retrieved from Internet Web sites that support information in the SSAR affecting the design, construction, or operation of SSCs important to safety. In its response to the RAI, the applicant listed all Internet Web sites referenced in the SSAR, identified whether the referenced data supported information in the SSAR that could affect the design, construction, or operation of SSCs important to safety, and described the method used to authenticate or verify the data. In all cases, the applicant requested that the respective Internet Web site organization authenticate or verify a hard copy of the data. The staff found this method of authenticating Internet Web site data to be acceptable. The staff stated that it would verify the completion of the applicant's requests for authentication as part of its inspection program before developing the final safety evaluation report. The staff identified this item as Confirmatory Item 17.3-1.

The staff conducted a followup inspection of Confirmatory Item 17.3-1 on February 8, 2005, at the primary contractor's office in Frederick, Maryland. The staff determined, through review of supporting documentation, that the applicant had provided adequate quality assurance measures to authenticate and verify data retrieved from Internet Web sites that support information in the SSAR that could affect the design, construction, or operation of SSCs important to safety. Specifically, Bechtel either (1) obtained letters certifying the authenticity of the data from the organizations posting the data on the Internet, or (2) performed an engineering review of the data to verify their reasonableness. Qualified individuals performed these engineering reviews based on their experience with similar data and compared the data to similar data obtained from other sources. Based on this inspection, the staff concludes that Confirmatory Item 17.3-1 is resolved.

17.3.3.2 Bechtel

Dominion established the ESP workscope and quality requirements for Bechtel in a Dominion purchase order (PO), as discussed in Inspection Report 05200008/2003001. The PO included a detailed description of Bechtel's workscope, including identification of specific sections of the ESP application for which Bechtel was responsible for performing design control activities supporting analyses, evaluations, and procurement. The PO also described Bechtel's responsibilities for ensuring that personnel involved with the project were trained and knowledgeable about the QA design control requirements.

Dominion specified that materials and services supplied by Bechtel were related to nuclear safety and that Bechtel should implement a quality control and assurance program that complied with the requirements of Appendix B to 10 CFR Part 50 and ANSI N45.2.11-1974. Bechtel implemented the ESP project quality requirements specified in the project-specific QAPP. The Bechtel QAPP invoked the quality policies contained in the Bechtel QA manual applicable to the ESP project.

As discussed in Inspection Report 05200008/2003001, the staff reviewed Bechtel procedures describing design control measures in the areas of design verification, computer software control, engineering drawings, design calculations, personnel training, design deviations, internal and external design control communications, design documentation, organizational responsibilities, and field changes and revisions. The staff found that the Bechtel procedures clearly stated the requirements for the preparation, review, approval, and control of design criteria, in accordance with ANSI N45.2.11-1974 and/or ASME NQA-1-2000. Additionally, Bechtel procedures regarding engineering control define the requirements for the preparation and control of ESP project and task design criteria, including the standards, codes, regulations, and design bases used for the project. The staff verified that the procedures provided the means to coordinate and communicate design criteria changes (including revision control) throughout any affected project discipline group. The procedures also specified internal document management requirements, including record retention.

As discussed in Inspection Report 05200008/2003001, the staff reviewed Section 3.2 of the QAPP and Bechtel's implementing procedures to verify that controls exist for design control interfaces among Bechtel personnel both internally and externally (i.e., with other contractors). The procedures define responsibilities for personnel internal and external to the organization, including communication, documentation, and distribution of design control criteria. This includes control of design input and development, special analysis, and approvals. Bechtel also defined responsibilities regarding actions to verify traceability and the appropriateness of information before it is used in any design document.

Section 3.3 of the QAPP and the Bechtel implementing procedures describe responsibilities and requirements for verifying the design work performed internally, including nongeneric computer software verification requirements. The staff confirmed that Bechtel had defined requirements for the performance and documentation of design verification on SSCs important to safety for the ESP. The staff verified that procedural controls and descriptions existed for design verification, either by interdisciplinary design review, independent off-project design review by technical staff, or individual critical design review. Once selected, the procedures specify that Bechtel document the verification method and justify and document design deviations.

Section 3.4 of the QAPP describes design change controls. The staff verified that the procedures specify requirements to control changes to the design of SSCs important to safety, after the initial design is complete, and include requirements for the review and independent verification of such changes. As discussed in Inspection Report 05200008/2003001, additional controls in Bechtel's implementing procedures specify engineering responsibilities and requirements for initial, as well as revised or changed, documents and drawings affecting the ESP project. For these reasons, the staff finds the design controls Bechtel described in the QAPP to be adequate for the conduct of ESP activities.

17.3.4 Conclusion (Design Control)

As set forth above, the staff reviewed the QA control measures employed by the applicant and its primary contractor and concludes that they have implemented acceptable design controls. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 help to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.4 Procurement Document Control

17.4.1 Technical Information in the Application (Procurement Document Control)

The applicant supplied information on procurement document control in SSAR Section 17.1, which includes the QA Manual. The manual stated that the applicant based its procedures for design controls, analysis, and reviews on the applicable documents referenced in the NDCM, including ANSI N45.2.11-1974, as modified by Dominion's QA procedures.

The QA Manual states that administrative procedures describe the program for completing procurement documents, including review, approval, document control, and change control. Dominion's procedures require that the applicant establish administrative procedures to ensure that procurement documents reference all actions required by a supplier, in accordance with the applicable codes, specifications, and drawings. The applicant must prepare, review, and approve procurement documents, as delineated in the procedures.

The QA Manual requires that procurement documents incorporate the design-basis, technical, and quality requirements, including the applicable regulatory requirements, specifications, codes and standards, test and inspection requirements, and instructions for special processes.

For development of the ESP application, the manual states that activities subject to this criterion were limited to the procurement of vendor services.

17.4.2 Regulatory Evaluation (Procurement Document Control)

While the NRC does not require an ESP applicant to implement procurement document controls compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's procurement document controls. RS-002, paragraph 17.1.1.4, outlines the QA measures that constitute an acceptable level of procurement document controls. These controls should include (1) provisions to ensure

that applicable technical requirements and QA controls are included or referenced in procurement documents related to ESP activities that could affect SSCs important to safety, and (2) provisions for the review and approval of procurement documents for ESP activities that could affect SSCs important to safety.

17.4.3 Technical Evaluation (Procurement Document Control)

17.4.3.1 Dominion

The QA Manual delineates the QA plan for procurement document control. The manual states that administrative procedures describe the program for completing procurement documents, including review, approval, document control, and change control. The applicant also established administrative procedures to ensure that procurement documents reference all actions required by a supplier, in accordance with applicable codes, specifications, and drawings. The procedures also ensure that procurement documents incorporate design-basis, technical, and quality requirements, including applicable regulatory requirements. As discussed in Inspection Report 05200008/2003001, the applicant based the procedures implementing this section on Dominion's QA procedures, which contain relevant standards, requirements, or guides. In addition, the staff verified that the applicant had adequate implementation procedures for control of procurement documents, as discussed in Inspection Report 05200008/2003001.

17.4.3.2 Bechtel

Bechtel procured engineering services and support from four subcontractors, including Tetra Tech NUS, Inc., MACTEC Engineering and Consulting, Inc., Risk Engineering, Inc., and William Lettis & Associates, Inc. The staff reviewed the procurement documents for these subcontractors to ensure adequate implementation of procurement document control. Section 17.7 of this SER discusses the specific details of the procurement controls Bechtel applied to each of these suppliers.

As discussed in Inspection Report 05200008/2003001, the applicant established workscope and quality requirements for Bechtel. The PO for Bechtel's services implemented the ESP project quality requirements given in the project-specific QAPP. The Bechtel QAPP invoked the quality policies contained in the Bechtel QA manual that applied to the ESP project. In accordance with specifications contained in the PO, Dominion approved the QAPP. For procurement document control, the QAPP states that Bechtel should use the NQAM. Policy No. Q-4.1, "Preparation of Procurement Documents," of the NQAM provides guidance for the preparation, review, approval, and control of procurement documents.

As discussed in Inspection Report 05200008/2003001, the Dominion PO contained a detailed description of Bechtel's workscope, including identification of specific sections of the ESP application for which Bechtel was to perform supporting analyses, evaluations, and investigations. Dominion specified that materials and services supplied by Bechtel were nuclear safety related and required that Bechtel implement a quality control and assurance program that complied with the requirements of Appendix B to 10 CFR Part 50 and ANSI N45.2.11-1974. Additionally, Dominion specified that the requirements of 10 CFR Part 21 be applied to the Bechtel PO. As discussed in Inspection Report 05200008/2003001, the staff

reviewed the Dominion safety-related vendor list and verified that Bechtel was listed as an active safety-related vendor, qualified to supply design and engineering services for major projects, including the ESP project. The staff did not note any deficiencies in this area.

17.4.4 Conclusion (Procurement Document Control)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they have implemented an acceptable level of procurement document control which meets the guidance of Section 17.1.1 of RS-002 and helps to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.5 Instructions, Procedures, and Drawings

17.5.1 Technical Information in the Application (Instructions, Procedures, and Drawings)

The applicant supplied information on instructions, procedures, and drawings in SSAR Section 17.1.1, which includes the QA Manual. As discussed in Inspection Report 05200008/2003001, the Dominion QA procedures list the standards, requirements, or guides which serve as the basis for the procedures, drawings, and instructions the applicant used to implement this section of the QA Manual.

The QA Manual states that the applicant established, approved, implemented, and maintained detailed written procedures to control development of the ESP application. Administrative procedures describe the requirements for developing, reviewing, approving, and controlling procedures, instructions, and drawings used for testing, as well as for design development, administrative, and other activities performed in support of application development. These requirements include references, prerequisites, precautions, limitations, manufacturers' specifications, check-off lists, and acceptance criteria.

The QA Manual states that changes to procedures or instructions require that the specific procedure or instruction be revised before the applicant implements the change. The revision process must have the same level of review as the original procedure or instruction. The QA Manual also states that the design control process governs drawing changes.

17.5.2 Regulatory Evaluation (Instructions, Procedures, and Drawings)

While the NRC does not require an ESP applicant to have instructions, procedures, and drawings compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's instructions, procedures, and drawings. RS-002, paragraph 17.1.1.5, details the QA measures that constitute an acceptable level of control for instructions, procedures, and drawings. Such controls should include provisions for (1) ensuring that ESP activities that could affect SSCs important to safety are prescribed by and accomplished in accordance with instructions, procedures, or drawings, and (2) including quantitative and qualitative acceptance criteria in instructions, procedures, and drawings related to ESP activities that could affect SSCs important to safety.

17.5.3 Technical Evaluation (Instructions, Procedures, and Drawings)

17.5.3.1 Dominion

Section 7, "Document Control," of the QA Manual describes the measures that the applicant established for control of procedures, instructions, and drawings to provide for the review, approval, issues, and changes thereto. The QA Manual requires that changes be approved by the same organization that performed the initial review and approval, though that approval may be delegated. Section 7 also requires that the applicant process, distribute, and control all procedures; dispose of obsolete copies; and maintain records of all procedure holders. Further, Section 7 requires that the applicant maintain an index of procedures, as well as the latest version of each. Section 7 also states that the station administrative procedures should address the measures for procedure control; Inspection Report 05200008/2003001 discusses the Dominion QA procedures that contain requirements, standards, and guides that serve as the basis for its implementing procedures. These procedures state that Dominion complied with Regulatory Guide (RG) 1.33, Revision 2, "Quality Assurance Program Requirements (Operation)," with exceptions and clarifications noted. The staff reviewed the administrative procedures and found the guidance adequate for the control of instructions, procedures, and drawings.

The method to control ESP project procedures, set forth in ESP-002, "Procedure Control," in the QA Manual, includes responsibilities. The document states that the manager for the ESP project identifies the necessary procedures and guidelines. This method requires that all ESP procedures be subject to an independent review and provides the approval authority. It also states that procedures must be maintained consistent with ESP-002, as well as with NDCP procedures and engineering standards, which contain provisions for including quantitative and qualitative acceptance criteria.

As discussed in Inspection Report 05200008/2003001, Dominion's procedure for implementing the NDCM details the NDCP and addresses the review and revision of procedures and standards, including methods of and reasons for changes to these procedures.

In addition, Dominion's QA procedures set forth expectations for procedure use and state that all procedure users in the Nuclear Business Unit (NBU) are responsible for verifying that only the latest approved documents are used to perform work activities, as discussed in Inspection Report 0500008/2003001. Procedures also provide instructions for distribution to ensure that users have the latest approved version of a procedure available at the job site.

The procedures also address compliance, requiring that NBU employees strictly adhere to procedures, that users ensure that procedures are approved and appropriate for the specific tasks or evolutions to be performed, and that users verify a procedure before its use to ensure that it is the current and approved revision. There are also requirements that, if an activity requires a written procedure, the procedure must be used to perform that activity.

The procedures also contain requirements for developing and revising procedures and for removing superseded procedures from use. The procedures describe intent versus nonintent changes and explain the approval authority for each. They also describe how changes are implemented, including consideration of work in progress when a change becomes effective. In

addition, they describe how hard-copy procedures, if maintained, are distributed, and they address the Electronic Procedure Distribution System (EPDS), a computer program used for the electronic distribution of procedures. Applicant staff stated that Dominion maintained and distributed all ESP procedures electronically. The NRC staff found that the applicant's measures for instructions, procedures, and drawings meet the guidance in Section 17.1.1 of RS-002. Additionally, in the course of reviewing the instructions, procedures, and drawings related to ESP activities, the staff verified that they were adequate for the task being performed and were properly controlled.

As discussed in Inspection Report 05200008/2003001, the NRC staff reviewed a sample of the original ESP procedures at the Innsbrook Records Management Center. The staff found that these procedures had approval signatures consistent with Dominion's requirements.

17.5.3.2 Bechtel

As discussed in Inspection Report 05200008/2003001, the Bechtel procedures provide requirements for the preparation, application, control, maintenance, and compilation of data in the controlled document database. The procedures state that all engineering department procedures (EDPs) must be prepared under the direction of the Engineering Committee and issued for review and comment by the cognizant Manager of Engineering, as well as by other managers, to allow a cross-functional review. The Bechtel Corporate Manager of Engineering has the approval authority. The Manager of Quality Assurance/Quality Services must review the EDPs.

As discussed in Inspection Report 05200008/2003001, the staff reviewed engineering department instructions (EDPIs), which Bechtel uses to modify EDPs for specific projects or to develop a project-specific procedure when no EDP exists. Applicable Bechtel procedures (1) require approval of procedure revisions in the same manner as specified for new procedures, (2) contain requirements for control and distribution of procedures, and (3) specify that procedure users must ensure that copies downloaded or printed from the corporate database are the latest revision. The procedures also state that the Bechtel Document Management Center maintains the original procedures, and that project engineers are responsible for identifying applicable EDPs and EDPIs. The staff found Bechtel's measures for instructions, procedures, and drawings adequate for the conduct of ESP activities.

17.5.4 Conclusion (Instructions, Procedures, and Drawings)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented an acceptable level of control for instructions, procedures, and drawings. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 helps to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.6 Document Control

17.6.1 Technical Information in the Application (Document Control)

The applicant supplied information on document control in SSAR Section 17.1, which includes the QA Manual. The QA Manual states that the applicant established and documented administrative measures describing controls for review, approval, and issuance of documents such as procedures, instructions, and drawings. These requirements also address changes to documents before their release. The manual requires that changes be approved by the same organization that performed the original review and approval. However, this responsibility may be delegated to other qualified, responsible organizations. The manual also requires that the applicant incorporate approved changes into procedures and drawings and other appropriate documents associated with the change. This method helps to ensure that procedures, drawings, and instructions, as well as changes to them, are processed, distributed, and controlled and that obsolete copies are discarded.

17.6.2 Regulatory Evaluation (Document Control)

While the NRC does not require an ESP applicant to implement document control procedures compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's document controls. RS-002, paragraph 17.1.1.6, describes the QA measures that constitute an acceptable level of document control. Acceptable document controls should include provisions to ensure that documents related to ESP activities that could affect SSCs important to safety, including changes, are reviewed for adequacy, approved for release by authorized personnel, and distributed and used at the location where the prescribed activity will be performed.

17.6.3 Technical Evaluation (Document Control)

Each section of this SER describes (or references relevant discussion in Inspection Report 05200008/2003001) the specific documents the staff reviewed and discusses their adequacy. The staff considered the scope of the documents to be adequate for the ESP activities that the applicant conducted. The staff reviewed documents that the applicant had reviewed and approved for issuance to ensure that the process was followed. Based on these considerations and reviews, the staff concludes that the applicant and its primary contractor had adequate controls in place to ensure the proper revision of a document.

17.6.4 Conclusion (Document Control)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented acceptable document controls. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 help to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.7 Control of Purchased Material, Equipment, and Services

17.7.1 Technical Information in the Application (Control of Purchased Material, Equipment, and Services)

The applicant supplied information on the control of purchased material, equipment, and services in SSAR Section 17.1, which includes the QA Manual. The manual stated that Dominion QA procedures contain standards, requirements, or guides that provide the basis for the procedures implementing this section.

The QA Manual stated that the applicant's administrative procedures describe the requirements for controlling purchased material, equipment, and services, including commercial-grade items, for use in safety-related applications. It also states that the applicant evaluates suppliers before contract award, except in specified emergency conditions. Surveillance of suppliers during fabrication, inspection, testing, and shipment of materials, equipment, and components must be planned and performed in accordance with written procedures to ensure conformance with applicable PO requirements. Administrative procedures describe the requirements for controlling purchased material, equipment, and services. The applicant must identify, document, and correct any nonconforming conditions consistent with its corrective action process.

17.7.2 Regulatory Evaluation (Control of Purchased Material, Equipment, and Services)

While the NRC does not require an ESP applicant to implement control of purchased material, equipment, and services compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's control of purchased material, equipment, and services. RS-002, paragraph 17.1.1.7, provides the QA measures that constitute an acceptable level of control of purchased material, equipment, and services. Such controls should include (1) provisions for the control of purchased material, equipment, and services related to ESP activities that could affect SSCs important to safety which apply to selecting suppliers and assessing the adequacy of quality, and (2) provisions to ensure the onsite availability of documented evidence of the conformance to procurement specifications of material and equipment related to ESP activities that could affect SSCs important to safety before their installation or use.

17.7.3 Technical Evaluation (Control of Purchased Material, Equipment, and Services)

Section 17.4.3.2 of this SER provides a detailed discussion of the controls of purchased material, equipment, and services that Dominion applied to its primary contractor. This section of the SER focuses on the additional subcontractors that were engaged in the North Anna site ESP activities. The following sections discuss the scope of activities and the QA measures applied to those activities.

17.7.3.1 Risk Engineering, Inc.

Bechtel subcontracted to Risk Engineering, Inc. (REI), to support Bechtel's ESP efforts in performing probabilistic seismic hazard and/or sensitivity analyses for the North Anna site. As discussed in Inspection Report 05200008/2003001, Bechtel's service requisition for REI's work

specified that REI provide its QA manual for Bechtel approval. Additionally, the service requisition specified that all work be performed under a QA program, in accordance with the criteria of Appendix B to 10 CFR Part 50 and in compliance with the requirements of 10 CFR Part 21. The staff found that REI maintained a QA manual and software quality assurance plan (SQAP), both of which REI submitted to Bechtel. Further, the staff found that Bechtel project management and QA personnel reviewed and accepted the REI QA manual and SQAP. Additionally, the staff noted that Bechtel performed supplier audits of REI in November 2002 and June 2003. Based on a review of its QA program and supplier audits, Bechtel added REI to its list of evaluated suppliers and identified REI as a supplier with a QA program consistent with the specifications of ANSI N45.2.11-1974.

As discussed in Inspection Report 05200008/2003001, the staff reviewed the QA measures employed by REI to determine whether they were acceptable and met the guidance of Section 17.1.1 of RS-002. Additionally, the staff held discussions with REI management to ensure that REI implemented QA measures properly. Based on its review of associated documents, the staff concludes that the QA measures were acceptable and appropriately implemented for use in the control of activities performed by REI related to Dominion's ESP application.

17.7.3.2 William Lettis & Associates, Inc.

As discussed in Inspection Report 05200008/2003001, the staff reviewed Bechtel's service requisition for work to be performed by William Lettis & Associates, Inc. (Lettis). The requisition outlined Bechtel's request for technical services from Lettis for the collection and evaluation of data that formed the basis of SSAR Sections 2.5.1 through 2.5.3.

Bechtel requested technical services in the form of field and office studies designed to meet the guidance of Appendix D to RG 1.165, "Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake Ground Motion," for identifying and characterizing seismic source zones in the region around the North Anna site. The studies also address investigation of the potential for active tectonic deformation (permanent ground displacement) at and in the vicinity of the site, in accordance with Appendix D to RG 1.165. The service requisition also outlines the applicable codes and standards. In addition, Bechtel's service requisition required the subcontractor to perform work in accordance with all the latest relevant and applicable regulatory guides and NRC guidance.

The staff noted that Bechtel's service requisition required Lettis to (1) integrate Bechtel's Quality Assurance Program requirements into its work processes and, before starting work, submit a summary workplan and schedule confirming an understanding of the work, (2) ensure that all Lettis personnel performing ESP work undergo QA training by Bechtel, (3) check for proper implementation of the QA requirements as work progressed, (4) allow Bechtel or Dominion access to its facilities and records for QA inspection and audit purposes, (5) identify and document all deviations from the requirements of the service requisition, and (6) identify 10 CFR Part 21 requirements.

The staff reviewed the QA measures employed by Lettis to determine whether they constituted an acceptable program and met the guidance of Section 17.1.1 of RS-002. Based on its review, as discussed above, the staff concludes that the QA measures were acceptable for use in the control of activities performed by Lettis related to Dominion's ESP application.

17.7.3.3 Tetra Tech NUS, Inc.

As discussed in Inspection Report 05200008/2003001, Bechtel's service requisition for work to be performed by Tetra Tech NUS, Inc. (Tetra Tech), limited the scope of work performed by Tetra Tech to the preparation of certain portions of the ESP environmental report. Because Bechtel identified this work as non-safety related, the quality requirements specified in the service requisition mandated only that Tetra Tech have a QA program compatible with the provisions and requirements of International Organization for Standardization (ISO) 9001. The staff reviewed the Tetra Tech scope of work and concluded that because the workscope was limited to developing the environmental report, it did not require QA controls equivalent in substance to the criteria of Appendix B to 10 CFR Part 50. The staff did not perform an additional review of Tetra Tech's QA measures.

17.7.3.4 MACTEC Engineering and Consulting, Inc.

Bechtel subcontracted to MACTEC Engineering and Consulting, Inc. (MACTEC), to obtain geological testing support. As discussed in Inspection Report 05200008/2003001, Bechtel's technical specification for work to be performed by MACTEC mandated that the MACTEC Quality Assurance Program meet the requirements of Appendix B to 10 CFR Part 50 and comply with the criteria of 10 CFR Part 21.

As discussed in Inspection Report 05200008/2003001, the staff found that, consistent with the requirements of the Bechtel technical specification, MACTEC developed a project-specific workplan to identify the scope of work activities and quality requirements and applied the MACTEC quality assurance program description (QAPD).

The staff noted that the MACTEC QA organization was independent of the organization performing field or lab work and reported directly to the senior project principal engineer and project manager. The staff found that the MACTEC QAPD and workplan provided adequate measures for the control of MACTEC work activities to ensure the integrity and reliability of site geological test data.

MACTEC used the services of five additional suppliers to complete the scope of work outlined in the Bechtel technical specification. These suppliers performed work activities associated with surveying, drilling, geologic testing, and laboratory analyses. The MACTEC project principal engineer, the project manager, and a representative from the QA organization reviewed the work instructions MACTEC provided to these subcontractors. Additionally, in discussions with the staff, the MACTEC project principal engineer stated that all subcontractors performing site work were trained on the MACTEC QA program and the requirements of 10 CFR Part 21.

In general, field and laboratory testing activities must be conducted in accordance with recognized testing methods from the American Society for Testing and Materials (ASTM) or the U.S. Environmental Protection Agency (EPA). The applicant described deviations from these testing methods in Appendix B, "Geotechnical Tests," to Section 2.5.4 of the ESP application.

The staff reviewed the QA measures employed by MACTEC to determine whether they were acceptable and met the guidance in Section 17.1.1 of RS-002. Based on its review, as

discussed above, the staff concluded that the QA measures were acceptable for use in the control of activities performed by MACTEC related to the Dominion ESP application.

As described below, the staff reviewed the workscope and QA measures applicable to each of the five MACTEC subcontractors.

17.7.3.4.1 Applied Research Associates

Applied Research Associates (ARA) provided geological testing support for the performance of cone penetrometer and seismic characterization testing. As discussed in Inspection Report 05200008/2003001, the staff found that the MACTEC project workplan stated that cone penetrometer testing and seismic downhole testing must be performed in general accordance with ASTM D-5778-95, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils," and ASTM D-4428/D-4428M-00, "Standard Test Methods for Crosshole Seismic Testing." In addition to these ASTM standard tests, the staff noted that ARA also developed an operating procedure that included guidance for equipment field verification procedures, testing instructions, and requirements for test records.

The staff noted that MACTEC work instructions applicable to ARA activities stated that work was to be performed in accordance with ASME NQA-1-2000. The MACTEC principal project engineer stated to the staff that MACTEC had previously reviewed ARA for compliance with ASME NQA-1-2000 to support cone penetrometer work at the Savannah River Site. Additionally, MACTEC stated that it had reviewed the ARA technical capability and personnel qualifications during the vendor procurement process.

Based on a review of the MACTEC work instructions governing ARA work activities, discussions with MACTEC personnel, and the basis for qualification of ARA as a supplier of ESP-related services, the staff found that MACTEC implemented adequate measures to provide reasonable assurance that the data collected by ARA were accurate and reliable.

17.7.3.4.2 Grumman Geophysics

Grumman Geophysics (Grumman), located in Columbus, Ohio, conducted crosshole and downhole seismic testing at the North Anna site as a subcontractor to MACTEC. As noted in Inspection Report 05200008/2003001, the MACTEC workplan specified that crosshole testing be performed in accordance with ASTM D-4428/D-4428M-00. In Appendix B to Section 2.5.4 of the SSAR, MACTEC identified specific deviations from the ASTM D-4428/D-4428M-00 test methods.

Grumman performed downhole seismic testing in accordance with the Grumman Standard Operating Guideline A.0, "Downhole Seismic Testing." As discussed in Inspection Report 05200008/2003001, the staff reviewed Grumman's standard operating guideline for this work and determined that it provided adequate instructions for the performance of downhole seismic testing.

The MACTEC work instructions for the Grumman workscope stated that the work was to be done under a QA program compliant with ASME NQA-1-2000. MACTEC personnel stated to the staff that Grumman was qualified as a supplier for the ESP project based on a previous contract with MACTEC under the vendor procurement process, as well as a review of past

work, personnel qualifications, and equipment information. The MACTEC senior principal project engineer also stated that MACTEC provided continuous oversight of the Grumman field activities.

Based on a review of MACTEC work instructions governing Grumman activities and MACTEC's oversight of Grumman field activities, the staff found that MACTEC implemented adequate measures to provide reasonable assurance that the data collected by Grumman were accurate and reliable.

17.7.3.4.3 Stantec Consulting

MACTEC subcontracted to Stantec Consulting (Stantec), located in Richmond, Virginia, to perform topographical surveys to locate geologic boreholes and exploration points. As discussed in Inspection Report 05200008/2003001, MACTEC personnel stated that Stantec was qualified as a supplier based, in part, on a review of Stantec's QA program, technical procedures, equipment, calibration methods, and personnel qualifications. The staff reviewed a sampling of survey results and verified that survey data were certified by a Stantec land surveyor licensed by the Commonwealth of Virginia.

Based on a review of MACTEC work instructions governing Stantec activities and the use of survey personnel licensed by the Commonwealth of Virginia, the staff found that MACTEC implemented adequate measures to provide reasonable assurance that the survey data collected by Stantec were accurate and reliable.

17.7.3.4.4 Bedford Well Drilling

MACTEC subcontracted to Bedford Well Drilling (Bedford), located in Bedford, Virginia, to drill boreholes and install casings for crosshole seismic work. Although Bedford was a licensed contractor in the Commonwealth of Virginia, it did not maintain a QA program that complied with the criteria of Appendix B to 10 CFR Part 50 or ASME NQA-1-2000. However, the MACTEC principal project engineer stated that MACTEC provided continuous surveillance of the site activities conducted by Bedford.

The staff reviewed the work conducted by Bedford and found that, given the limited nature of the work activities and the oversight provided by MACTEC, the activities performed by Bedford were adequately controlled for the purposes of the ESP site characterization studies.

17.7.3.4.5 Severn Trent Laboratory

MACTEC subcontracted to Severn Trent Laboratory (Severn Trent) for soil chemistry testing services. MACTEC specified that laboratory testing be accomplished in accordance with the requirements of EPA Testing Standard SW-846, Revision 1, "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods" (see Inspection Report 05200008/20030010). As discussed in Inspection Report 05200008/2003001, MACTEC qualified Severn Trent as a supplier for ESP services based, in part, on the performance of a MACTEC procurement process QA audit conducted in April 2002. Although the audit was associated with work at the Savannah River Site, the MACTEC senior principal project engineer stated to the staff that the North Anna ESP workscope was similar to the work performed at the Savannah River site.

Based on a review of the scope of laboratory testing activities and the results of the MACTEC vendor audit, the staff found that activities performed by Severn Trent were adequately controlled for the purposes of the ESP site characterization studies. These controls offered reasonable assurance of the accuracy and reliability of the ESP data provided by Severn Trent.

17.7.4 Conclusion (Control of Purchased Material, Equipment, and Services)

As set forth above, the staff reviewed the QA measures employed by the applicant and its contractors and concludes that they have implemented acceptable controls for purchased material, equipment, and services. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 help to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.8 Identification and Control of Materials, Parts, and Components

17.8.1 Technical Information in the Application (Identification and Control of Materials, Parts, and Components)

The applicant supplied information on the identification and control of materials, parts, and components in SSAR Section 17.1, which includes the QA Manual. The manual stated that the applicant would not procure or use any safety-related materials, parts, or components. For this reason, the applicant stated that this criterion did not apply to the development of an ESP application.

In RAI 17.1-2, the staff asked the applicant to explain why the identification and control of materials, parts, and components criterion does not apply to the development of the ESP application. Alternatively, if this QA measure were to apply to the ESP application, the staff asked the applicant to describe the QA measures it and its primary contractor would use. In its response, the applicant stated that, under Dominion's overall direction, several companies were involved in the preparation of the ESP application. The quality requirements imposed on the various companies differed depending on their scope of work. The applicant determined that the identification and control of materials, parts, and components was not applicable to the ESP project because no safety-related materials, parts, or components would be procured within the project scope. The applicant stated the same reason for not invoking this requirement for Bechtel's work. The staff noted that Bechtel invoked the complete requirements of Appendix B to 10 CFR Part 50 on all of the subcontractors it used on the ESP project for work important to safety.

17.8.2 Regulatory Evaluation (Identification and Control of Materials, Parts, and Components)

While the NRC does not require an ESP applicant to implement an identification and control of materials, parts, and components program compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's identification and control of materials, parts, and components. RS-002, paragraph 17.1.1.8, provides the QA measures that constitute an acceptable level of

identification and control of materials, parts, and components. Such controls should include provisions to (1) identify and control materials, parts, and components related to ESP activities that could affect SSCs important to safety, and (2) ensure that incorrect or defective items are not used in ESP activities that could affect SSCs important to safety.

17.8.3 Technical Evaluation (Identification and Control of Materials, Parts, and Components)

Neither the applicant nor its primary contractor invoked QA measures for the identification and control of materials, parts, and components. The staff concluded, based on its review of the applicant's response to RAI 17.1-2 and observations during the inspection, that the applicant and Bechtel did not conduct activities important to safety requiring the identification and control of materials, parts, and components.

17.8.4 Conclusion (Identification and Control of Materials, Parts, and Components)

As set forth above, the staff reviewed the applicant and its contractor's need for these QA measures and concludes that, based on the scope of work for the ESP project, the identification and control of materials, parts, and components is not required.

17.9 Control of Special Processes

17.9.1 Technical Information in the Application (Control of Special Processes)

The applicant supplied information on the control of special processes in SSAR Section 17.1, which includes the QA Manual. The manual states that the safety-related scope of the development of the ESP application would not involve the use of special processes. For this reason, the applicant stated that this criterion does not apply to the development of an ESP application.

In RAI 17.1-2, the staff asked the applicant to explain why the control of special processes does not apply to the development of the ESP application. Alternatively, if this QA measure does apply to the ESP application, the staff asked the applicant to describe the QA measures it and its primary contractor used. In its response, the applicant stated that, under Dominion's overall direction, several companies were involved in the preparation of the ESP application. The quality requirements imposed on the various companies differed depending on their scope of work. Dominion determined that control of special processes was not applicable because the project scope did not include any safety-related construction activities. The applicant stated the same reason for not invoking this requirement for Bechtel's work. The staff noted that Bechtel invoked the complete requirements of Appendix B to 10 CFR Part 50 on all subcontractors it used on the ESP project for safety-related work.

17.9.2 Regulatory Evaluation (Control of Special Processes)

While the NRC does not require an ESP applicant to implement control of special processes compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's control of special processes. RS-002, paragraph 17.1.1.9, provides the QA measures that constitute an acceptable level of

control of special processes. Acceptable control of special processes should include provisions to (1) ensure the acceptability of special processes used for ESP activities that could affect SSCs important to safety, and (2) ensure that qualified personnel using qualified procedures and equipment perform special processes related to ESP activities that could affect SSCs important to safety.

17.9.3 Technical Evaluation (Control of Special Processes)

Neither the applicant nor its primary contractor invoked QA measures for control of special processes. The staff concluded, based on its review of the applicant's response to RAI 17.1-2 and observations during the inspection, that the applicant and Bechtel did not conduct activities important to safety requiring control of special processes.

17.9.4 Conclusion (Control of Special Processes)

As set forth above, the staff reviewed the need for QA measures by the applicant and its contractors and concludes that, based on the scope of work for the ESP project, control of special processes is not required.

17.10 Inspection

17.10.1 Technical Information in the Application (Inspection)

The applicant supplied information on controls for inspection in SSAR Section 17.1, which includes the QA Manual. As discussed in Inspection Report 05200008/2003001, the manual states that the Dominion QA procedures contain the standards, requirements, or guides which form the basis for the procedures implementing this section.

The QA Manual states that administrative procedures describe the requirements for the inspection of relevant ESP activities. The manual notes that inspection procedures for those activities affecting quality must be established, as appropriate, before work commences. Written procedures must be developed as needed to include inspection hold points.

The QA Manual identifies procedures for examinations, measurements, or tests that require witnessing at inspection holdpoints. The inspection performed at a holdpoint must be specific in nature. It must include quality characteristics and acceptance/rejection criteria, or it must specify qualitative criteria, such as operability checks, compliance with procedural steps, or cleanliness instructions. The inspection must be documented by signature or initials on the written procedure form.

The QA Manual states that the inspection program requires that appropriate inspectors be assigned for the activity being inspected. An inspector may be a member of the organization performing the activity. However, the inspector must be qualified and must not be the person performing the activity or the supervisor directly responsible for the activity.

17.10.2 Regulatory Evaluation (Inspection)

While the NRC does not require an ESP applicant to implement inspection controls compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's controls for inspection. RS-002, paragraph 17.1.1.10, provides the QA measures that constitute an acceptable level of inspection control. Acceptable inspection controls should include (1) provisions for the inspection of activities affecting the quality of ESP activities that could affect SSCs important to safety, including the items and activities to be covered, (2) organizational responsibilities and qualifications for individuals or groups performing inspection of ESP activities that could affect SSCs important to safety, and (3) provisions for inspection personnel to be independent of the performance of the activity being inspected.

17.10.3 Technical Evaluation (Inspection)

17.10.3.1 Dominion

Section 11, "Inspection," of the QA Manual describes the measures that the applicant established for inspection of activities affecting quality. As discussed in Inspection Report 05200008/2003001, Section 11 of the QA Manual invokes the requirements of Dominion's existing QA procedures for the current operating units. The staff found that the Dominion Quality Assurance Program conformed to the criteria of Appendix B to 10 CFR Part 50 and complied with the regulatory positions of the RGs listed in the Dominion QA procedures. The staff found that nuclear oversight personnel, independent of the ESP activities performed, conducted the inspection activities. The personnel appeared to be adequately trained and qualified. Based on staff discussions with the nuclear oversight personnel who conducted the inspections, the staff concluded that the activities inspected appeared to have been adequately observed and documented.

17.10.3.2 Bechtel

The Bechtel QAPP invokes the requirements of the NQAM. Policy No. Q-10.1, "Plant Site Inspections," of the NQAM identifies the requirements and responsibilities for plant site inspection activities performed to verify quality. The policy applies to inspections performed at the ESP site by the Bechtel Quality Control Group for work in which Bechtel is responsible for quality verification inspection. Policy No. Q-7.6, "Subcontractor Control," of the NQAM describes Bechtel's surveillance of subcontractors who perform their own quality verification inspection. Bechtel stated that it designed the NQAM policies to meet the requirements of Appendix B to 10 CFR Part 50. Based on staff discussions with Bechtel personnel who had conducted inspections, the staff concluded that these personnel were knowledgeable of inspection requirements and appeared to be adequately trained and qualified. In addition, the staff found that Bechtel inspection personnel were independent of the ESP activities they inspected. The staff found no deficiencies in Bechtel's oversight and inspection of subcontractor activities.

17.10.3.2.1 MACTEC

In accordance with the project workplan, MACTEC provided oversight and surveillance for site activities. As discussed in Inspection Report 05200008/2003001, the staff reviewed QA checklists documenting the MACTEC QA surveillances performed to assure that MACTEC field activities complied with applicable procedures, codes, and standards. The QA surveillance checklists pertained to observations of MACTEC field activities conducted November 21–22, 2002, and December 11–12, 2002.

The staff determined that MACTEC completed the checklists for each section of MACTEC Work Plan No. 1, issued on November 22, 2002. The checklists addressed the salient aspects of each section of the plan. For example, the workplan addressed field requirements associated with planning and permitting. The surveillance checklist required verification of weather conditions and preparation of required permits before the start of field activities. The staff noted that the checklist associated with QA program documentation required verification that 10 CFR Part 21 requirements are available to project personnel. The staff also noted that MACTEC did not identify any deficiencies during the surveillance activities.

The staff also found that the MACTEC QA organization was independent of the organizations performing laboratory or field work.

17.10.4 Conclusion (Inspection)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented an acceptable level of control for inspection. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 helps to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.11 Test Control

17.11.1 Technical Information in the Application (Test Control)

The applicant supplied information on test controls in SSAR Section 17.1, which includes the QA Manual. As discussed in Inspection Report 05200008/2003001, the manual states that the Dominion QA procedures contain the standards, requirements, or guides on which the procedures implementing this section are based.

The QA Manual states that administrative procedures describe the requirements for test control in safety-related applications. Written test procedures must control testing done in support of the ESP application development. The manual states that these test procedures will include or reference (1) the requirements and acceptance limits contained in applicable design and procurement documents, (2) test prerequisites, such as the availability of adequate and appropriate equipment and calibrated instrumentation; trained, qualified, and licensed or certified personnel; the completeness of the item to be tested; suitable and controlled environmental conditions; and provisions for data collection and storage, (3) instructions for

performing the test, (4) inspection points, as appropriate, and (5) acceptance and rejection criteria.

17.11.2 Regulatory Evaluation (Test Control)

While the NRC does not require an ESP applicant to implement test controls compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's test controls. RS-002, paragraph 17.1.1.11, provides the QA measures that constitute an acceptable level of test control. Acceptable test controls should include provisions to ensure (1) that tests performed related to ESP activities that could affect SSCs important to safety are appropriately controlled to provide confidence that these SSCs will perform adequately in service, and (2) that prerequisites are provided in written test procedures and that test results are documented and evaluated for ESP activities that could affect SSCs important to safety.

17.11.3 Technical Evaluation (Test Control)

The staff found that the Bechtel QAPP established the quality control interface between the Dominion QA program and the Bechtel NQAM. Dominion also established policies for test control in the QA Manual and used the guidance contained in ASME NQA-1-2000. The Bechtel NQAM further delineates these policies. The staff reviewed reports of testing accomplished by subcontractors and found that they appear to have performed the testing in accordance with the policies established in the Bechtel NQAM. As discussed below, the applicant's test controls, and those of its primary contractor and subcontractors, meet the guidance in Section 17.1.1 of RS-002.

17.11.3.1 Dominion

Section 12, "Test Control," of the QA Manual states that written test procedures control testing in support of the ESP application development. The section also states that the test procedures include test prerequisites, requirements, and acceptance limits contained in applicable design and procurement documents; instructions for performing the test; appropriate inspection points; acceptance and rejection criteria; prerequisites regarding the use of trained and qualified personnel to perform the test; provisions for data collection and storage; and methods for documenting or recording test results. Instrumentation used for testing must be in a calibration program, further described in Section 17.12 of this SER. During the inspection, the staff reviewed test procedures for content, acceptance and rejection criteria, and test results. The staff did not note any deficiencies.

17.11.3.2 Bechtel

Policy No. Q-11.1, "Testing Requirements," of the Bechtel NQAM applies to the ESP project, as stated in the Bechtel QAPP. The policy identifies the requirements and responsibilities for the control of tests and safety-related items and systems. Bechtel stated that the test control policies contained in the NQAM were intended to meet the requirements of Appendix B to 10 CFR Part 50 and ASME NQA-1-2000. ASME NQA-1-2000 requires test prerequisites for applicable procedures. The Bechtel policy states that tests must be performed consistent with written procedures that incorporate or reference test requirements, acceptance limits, and the

measuring and test equipment to be used. The policy further mandates that components, systems, and equipment be tested in accordance with applicable design documents, test procedures, codes, standards, or other specified supplier requirements. Additionally, the policy provides requirements for personnel qualification, test methods, and review and documentation of test results and deviations. The staff did not note any deficiencies.

The staff reviewed a sample of the documentation for testing performed in support of the ESP project by Bechtel and its subcontractors. The sample included a review of geotechnical field investigations and laboratory reports, seismic source characterization models, cone penetrometer tests, soil and rock sample laboratory tests, and probabilistic seismic hazard assessments. The staff did not note any deficiencies.

17.11.4 Conclusion (Test Control)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented acceptable test controls. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 help to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.12 Control of Measuring and Test Equipment

17.12.1 Technical Information in the Application (Control of Measuring and Test Equipment)

The applicant supplied information on the control of measuring and test equipment (M&TE) in SSAR Section 17.1, which includes the QA Manual. As discussed in Inspection Report 05200008/2003001, the manual states that the Dominion QA procedures contain the standards, requirements, or guides which form the basis for the procedures implementing this section.

The QA Manual states that administrative procedures describe the requirements for the control of M&TE used in the measurement, inspection, maintenance, and monitoring of safety-related applications. The QA Manual notes that a program, established and documented in the administrative procedures, describes the calibration technique and frequency, maintenance, and control of all M&TE that are used in the measurement, inspection, maintenance, and monitoring of safety-related SSCs. The manual states that it does not intend to imply a need for special calibration and control measures of rulers, tape measures, levels, and other basic tools, if normal commercial practices provide adequate accuracy. Controls for M&TE include the transportation, storage, and protection of the equipment; the handling of associated documents giving the status of all items under the calibration system, such as maintenance history, calibration test data, and individual log sheets assigned to each device; and the permanent marking of each device by a unique number.

The QA Manual states that M&TE used on safety-related systems or equipment are calibrated using reference standards for which calibration has a known, valid relationship to nationally recognized standards or accepted values of natural physical constants. Stickers must be

affixed on a conspicuous surface identifying, at a minimum, the date of the last calibration and next calibration due date.

In addition, the QA Manual states that, when M&TE used in activities affecting quality is found to be out of calibration, the applicant will evaluate and document the validity of previous tests and the acceptability of devices previously tested. All previous tests and measurements performed during the current or preceding calibration cycle must be redone if the evaluation so indicates.

17.12.2 Regulatory Evaluation (Control of M&TE)

While the NRC does not require an ESP applicant to implement controls of M&TE compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's control of M&TE. RS-002, paragraph 17.1.1.12, details the QA measures that constitute an acceptable level of control of M&TE. Acceptable control of M&TE should include provisions to ensure that tools, gauges, instruments, and other measuring and testing devices are properly identified and controlled and are calibrated and adjusted at specified intervals.

17.12.3 Technical Evaluation (Control of M&TE)

17.12.3.1 Dominion

Section 17.2.12 of the Bechtel QAPP and Section 13 of the QA Manual state that the applicant established administrative procedures that describe its control of M&TE. As discussed in Inspection Report 05200008/2003001, Dominion's administrative procedures further describe requirements and programmatic controls for M&TE. The QAPP and QA Manual note that controls were established for M&TE transportation, storage, and protection of equipment. Dominion established additional controls for documentation of maintenance history, calibration test data, and log sheets assigned to each device. Section 13 of the QA Manual further states that M&TE is to be used on safety-related equipment, or systems will be calibrated using reference standards for which calibration has a known relationship to nationally recognized standards, such as the National Institute of Standards and Technology. The staff found the guidance for control of M&TE adequate for the conduct of ESP activities. Based on a review of the applicant's administrative controls for M&TE, the staff determined that the applicant implemented adequate measures to provide reasonable assurance that it would properly control M&TE.

17.12.3.2 Bechtel

Policy No. Q-12.1, "Control of Measuring and Test Equipment," of the Bechtel NQAM applies to the ESP project, as stated in the Bechtel QAPP, and defines the responsibilities for the maintenance and control of M&TE. The policy applies to the calibration and control of M&TE used by Bechtel personnel, suppliers, and subcontractors to conduct tests, make measurements, and record inspection and test results. The policy states that control of M&TE must conform to the requirements of ANSI N45.2, Section 12, or ASME NQA-1-2000, Supplement 12S-1. The policy requires that the calibration procedures define the calibration method, means of identification, recalibration frequency of the M&TE, and issuance of tools,

gauges, and test equipment used. Additionally, the policy discusses the evaluation of M&TE found to be outside calibration limits, calibration against certified equipment having known relationships to nationally recognized standards, and documentation of M&TE usage in test records.

As discussed in Inspection Report 05200008/2003001, the staff reviewed the policies, requirements, and controls established in the procedures noted above as they apply to M&TE. The staff also reviewed a sample of calibration records related to the performance of geologic tests, seismic test activities, and laboratory testing completed in support of the ESP project. Based on the review of Bechtel's administrative controls and sample of calibration records, the staff determined that Bechtel implemented adequate measures to provide reasonable assurance that it properly controlled M&TE.

17.12.4 Conclusion (Control of M&TE)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented acceptable control of M&TE. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 helps to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.13 Handling, Storage, and Shipping

17.13.1 Technical Information in the Application (Handling, Storage, and Shipping)

The applicant supplied information on the controls for handling, storage, and shipping in SSAR Section 17.1, which includes the QA Manual. As discussed in Inspection Report 05200008/2003001, the manual states that the Dominion QA procedures contain the standards, requirements, or guides that form the basis for the procedures implementing this section. The manual states that administrative procedures describe the requirements for control of handling, storage, and shipping of equipment for safety-related applications.

The QA Manual also states that Dominion has established measures in its administrative procedures to provide adequate methods for use by qualified personnel for the classification, packaging, cleaning, preservation, shipping, storage, and handling of material and equipment. These measures, prepared in accordance with design and specification requirements, define responsibilities, levels of cleanliness, tagging, and storage levels for categorized items. The procedures must also control cleaning, handling, storage, packaging, shipping, and preservation of materials, components, and systems to preclude damage, loss, or deterioration by environmental conditions, such as temperature or humidity. Materials verification and vendor surveillance inspectors verify implementation of these measures.

The QA Manual notes that the operational QA program includes some activities described in this section that may not be needed for ESP application development. However, the manual adds that handling, storage, and potential shipping of soil samples taken during site geotechnical investigations are examples of safety-related activities for the ESP program that are subject to this criterion.

17.13.2 Regulatory Evaluation (Handling, Storage, and Shipping)

While the NRC does not require that an ESP applicant implement controls for handling, storage, and shipping compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's controls for handling, storage, and shipping. RS-002, paragraph 17.1.1.13, provides the QA measures that constitute an acceptable level of handling, storage, and shipping control. Such controls should include provisions to control the handling, storage, shipping, cleaning, and preservation of items related to ESP activities that could affect SSCs important to safety, in accordance with work and inspection instructions, to prevent damage, loss, and deterioration by environmental conditions, such as temperature or humidity.

17.13.3 Technical Evaluation (Handling, Storage, and Shipping)

Dominion identified soil core samples as the sole type of sample material within the scope of this criterion. MACTEC, one of Bechtel's subcontractors, retrieved the soil core samples, which were stored and maintained onsite. The following sections detail the QA measures these organizations applied for the handling and storage of the soil core samples.

17.13.3.1 Dominion

Section 14 of the QA Manual, "Handling, Storage, and Shipping," states that Dominion established measures in its administrative processes for classifying, packaging, cleaning, preserving, shipping, storing, and handling materials and equipment. The section further states that these procedures define responsibilities, levels of cleanliness, tagging, and storage levels. They also provide for measures to preclude damage, loss, or deterioration by environmental conditions. As discussed in Inspection Report 05200008/2003001, the section also notes that the Dominion QA procedures contain standards, requirements, or guides that form the basis for implementing the procedures.

The staff found that these procedures note the establishment of such measures and that inspectors verify their implementation. The procedures state that Dominion complied with RG 1.38, Revision 2, "Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants," with specified clarifications and exceptions.

As discussed in Inspection Report 05200008/2003001, Dominion's applicable lower-tier administrative procedures specify responsibilities for materials handling, provide specific requirements and guidelines for packaging and for storage areas, and provide storage environments in terms of Levels A through D. Dominion stored the ESP materials at the most stringent level (A), in accordance with the procedures. This storage level maintains materials that are exceptionally sensitive to environmental conditions and therefore require special protection against temperature and humidity changes, physical damage, and airborne contamination. Such storage must be in a fire-resistant, weathertight, well-ventilated building or enclosure, which is (1) not subject to flooding, (2) temperature and humidity controlled, and (3) ventilated via filters.

The staff inspected the storage facilities for the soil samples at the North Anna site. These materials were kept in a dedicated Level A facility (i.e., a locked cage). The temperature, airflow, and humidity appeared to be consistent with a facility subjected to stringent climate control. The applicant stored the soil samples in sturdy wooden crates or in sealed glass jars kept in compartmented boxes. The staff did not note any deficiencies in the applicant's storage arrangements.

17.13.3.2 MACTEC

As discussed in Inspection Report 05200008/2003001, the MACTEC workplan contains instructions for handling core materials and samples before storage or testing. It requires that (1) disturbed soil sampling be performed in accordance with ASTM D1586-99, "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils," (2) undisturbed sampling be performed in accordance with ASTM D1587-00, "Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes," and (3) sample handling follow ASTM D4220-95, "Standard Practices for Preserving and Transporting Soil Samples." The workplan also provides additional instructions on specific measures for sample handling.

The staff reviewed the core and soil sample inventory log and found samples to be uniquely identified. During a check of several log entries against stored samples, the staff found no inconsistencies. The staff noted that several of the inventory sheets indicated that samples were prepared and checked by the same person, while others were apparently not checked. While this practice increases the chance of an error, the staff did not note any performance issues caused by this practice.

Based on observation of the storage area, a visual check of the samples, and review of the inventory sheets, the staff concluded that the applicant had properly stored and inventoried the samples and met the guidance in Section 17.1.1 of RS-002.

17.13.4 Conclusion (Handling, Storage, and Shipping)

As set forth above, the staff reviewed the QA measures employed by the applicant and its subcontractors and concludes that they implemented acceptable controls for handling, storage, and shipping. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 help to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.14 Inspection, Test, and Operating Status

17.14.1 Technical Information in the Application (Inspection, Test, and Operating Status)

The applicant supplied information on controls for inspection, test, and operating status in SSAR Section 17.1, which includes the QA Manual. The manual states that the applicant's administrative procedures and station operating procedures describe the requirements for inspection, test, and operating status of items and/or equipment for safety-related applications.

The QA Manual states that the administrative and station operating procedures establish measures for identifying and documenting the inspection and test status for items to prevent missing specified inspections and tests. These measures also define the three general categories of inspection and test status for items—accept, reject, or hold. They provide for status identification by stickers, tags, record cards, test records, checklists, or logs. Station procedures must control the application and removal of the various status tags, stickers, and other indicators. Specific test procedures control testing that supports the ESP project.

17.14.2 Regulatory Evaluation (Inspection, Test, and Operating Status)

While the NRC does not require an ESP applicant to implement controls for inspection, test, and operating status compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's controls for inspection, test, and operating status. RS-002, paragraph 17.1.1.14, provides the QA measures that constitute an acceptable level of controls for inspection, test, and operating status. Such controls should include provisions to indicate the inspection, test, and operating status of items related to ESP activities that could affect SSCs important to safety to prevent inadvertent use or bypassing of inspection and tests.

17.14.3 Technical Evaluation (Inspection, Test, and Operating Status)

17.14.3.1 Dominion

Section 15, "Inspection, Test, and Operating Status," of the QA Manual states that the applicant established measures in administrative and station operating procedures regarding the identification and documentation of inspection and test status items to prevent inadvertent bypassing of specified instructions and tests. The manual defines measures in three general categories and provides for status identification by stickers, tags, record cards, test records, checklists, or logs. Additionally, the manual states that the applicant identifies the operating status of items and/or equipment through records, checklists, or operational tagging systems maintained to indicate the status and authority to operate the item and/or equipment. Testing to support the ESP project is controlled by specific contractor test procedures. Section 17.11 of this SER also discusses test control. Based on its review of ESP administrative procedures and station operating procedures, the staff found the applicant's controls for inspection, test, and operating status to be adequate.

17.14.3.2 Bechtel

Policy No. Q-10.1 (discussed in Section 17.10 of this SER) of the Bechtel NQAM applies to the ESP project, as stated in the Bechtel QAPP. The policy defines the requirements and responsibilities for site quality verification. The policy states that procedures or instructions shall provide for the identification of personnel responsibilities, recordkeeping, inspection results, frequency of test documentation, and special process controls. Policy No. Q-11.1 (discussed in Section 17.11 of this SER) and Policy No. Q-15.1, "Control of Nonconformances," which describes the requirements for identifying nonconforming items, detail the additional QA controls in this area. Section 17.15 of this SER provides more details regarding QA controls for nonconforming materials, parts, or components.

As discussed in Inspection Report 05200008/2003001, the staff reviewed the policies noted above, as well as applicable administrative procedures, to verify that Bechtel established adequate QA controls in this area. Based on a review of applicable policies and procedures, the staff found the Bechtel guidance for inspection, test, and operating status adequate for the conduct of ESP activities.

17.14.4 Conclusion (Inspection, Test, and Operating Status)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented acceptable controls for inspection, test, and operating status. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 help to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.15 Nonconforming Materials, Parts, or Components

17.15.1 Technical Information in the Application (Nonconforming Materials, Parts, or Components)

The applicant supplied information on controls for nonconforming materials, parts, or components in SSAR Section 17.1, which includes the QA Manual. The QA Manual states that the applicant's administrative procedures describe the requirements for control of nonconforming materials, parts, or components for safety-related applications. Because of the scope of ESP activities, the applicant did not expect to receive any parts, materials, or components from offsite sources. However, the controls govern soil and site characterization samples and their storage and shipment, if necessary. Specifically, the administrative procedures require that the individual who discovers a nonconformance must identify, describe, and document it on a deviation report or a discrepant shipment report.

The QA Manual states that when a nonconforming item is identified, it is placed in the hold area established in the storeroom or other segregated location, if practical, and identified with a hold tag to prevent its inadvertent use. If material is classified as "reject," the hold tag must remain attached to the material/component until loaded for departure from the site and can only be removed by authorized personnel in accordance with approved procedures.

The QA Manual states that audits and inspections ensure the implementation and verification of the procedures for the control of nonconformances.

17.15.2 Regulatory Evaluation (Nonconforming Materials, Parts, or Components)

While the NRC does not require that an ESP applicant implement controls of nonconforming materials, parts, or components compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's control of nonconforming materials, parts, or components. RS-002, paragraph 17.1.1.15, provides the QA measures that constitute acceptable provisions for addressing nonconforming materials, parts, or components control. Such controls should

include provisions to control the use or disposition of nonconforming materials, parts, or components related to ESP activities that could affect SSCs important to safety.

17.15.3 Technical Evaluation (Nonconforming Materials, Parts, or Components)

17.15.3.1 Dominion

The applicant established a process for nonconforming materials, parts, or components, outlined in the QA Manual. As discussed in Inspection Report 05200008/2003001, a Dominion implementing QA procedure details the process for controlling nonconformances observed during receipt, inspection, storage, fabrication, erection, installation, initial and/or acceptance testing, or initial operation. The procedure provides for the preparation and issuance of deviation reports and discrepant shipment reports, in accordance with prescribed procedures. The procedure states that, when the applicant identifies a nonconforming item, it is placed in a hold area with a hold tag to prevent its inadvertent use. The procedure also provides guidance for the disposition of rejected material or material placed on hold. The staff found the guidance for nonconforming materials, parts, or components to be adequate for the scope of ESP activities.

17.15.3.2 Bechtel

In developing the QAPP, Bechtel determined that certain quality policies contained in the Bechtel NQAM do not apply to the ESP project, including the control of supplier and subcontractor nonconformances; identification and control of materials, parts, and components; control of special processes; control of status items; control of nonconformances; significant reportable deficiencies; and construction/site services QA records.

Bechtel personnel stated that its nonconformance quality policies address hardware procurement nonconforming conditions. Bechtel personnel noted that it would address deviations in ESP project engineering services from procurement specifications under the other processes that apply to the ESP project, such as the supplier deviation disposition process, the engineering error report process, or the corrective action request process. The staff reviewed these other deviation reporting processes and found that Bechtel had implemented sufficient measures to provide reasonable assurance that it could identify and correct nonconformances in procured engineering services.

As discussed in Inspection Report 05200008/2003001, the staff reviewed the scope of the QAPP, including quality-related activities determined not to apply to the ESP project, and found that the QAPP was consistent with the Dominion QA Manual. The quality elements covered by the Bechtel QAPP were also consistent with the scope of work outlined in Dominion's PO for Bechtel. Additionally, the staff found that the QAPP controls were reasonable and consistent with the guidelines contained in Section 17.1.1 of RS-002. Therefore, the staff determined that the procurement of engineering services from Bechtel complied with the Dominion QA Manual requirements and was consistent with the procurement controls specified in the Dominion NDCM procedures.

17.15.4 Conclusion (Nonconforming Materials, Parts, or Components)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented an acceptable level of control for nonconforming materials, parts, or components. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 helps to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.16 Corrective Action

17.16.1 Technical Information in the Application (Corrective Action)

The applicant supplied information on its Corrective Action Program in SSAR Section 17.1, which includes the QA Manual. The manual states that the applicant would control the Corrective Action Program in accordance with Dominion QA procedures.

The QA Manual states that Dominion establishes corrective action measures as an integral part of the processing and resolution of nonconformances and failures in service. These measures assure that significant adverse quality conditions are identified, documented, their cause determined, and the necessary corrective actions taken to preclude repetition of the adverse quality conditions. It further states that the monitoring effort of the staff and the audits conducted by the Nuclear Oversight Group ensure the verification of the proper implementation of corrective action measures and closeout of corrective action documentation. The applicant uses deviation reports and audit findings to report adverse conditions significant to quality, the cause of the conditions, and the initiation of corrective action to the appropriate levels of both offsite and onsite management. If further corrective action is required, the applicant relies on the appropriate management program for performing, tracking, and closing the issue.

The QA Manual states that the Nuclear Engineering Group maintains a program to evaluate complex design concerns that may lead to adverse quality conditions. The potential problem reporting (PPR) system allows for detailed, multidisciplinary reviews of complex design concerns that may yield deviation reports. Many design concerns cannot be determined to be adverse to quality until a detailed design review is performed. The PPR process controls this activity as part of the NDCP.

The QA Manual states that nuclear oversight and inspection personnel have the authority, and the responsibility, to stop work in progress when it is not being done in accordance with approved procedures or when it may jeopardize safety or equipment integrity.

17.16.2 Regulatory Evaluation (Corrective Action)

While the NRC does not require an ESP applicant to implement a corrective action program compliant with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's corrective action program. RS-002, paragraph 17.1.1.16, provides the QA measures that constitute an acceptable corrective action program. This program should include provisions to ensure that conditions

adverse to quality are promptly identified and corrected. For significant conditions adverse to quality, those provisions should preclude recurrence.

17.16.3 Technical Evaluation (Corrective Action)

17.16.3.1 Dominion

The applicant established a corrective action program. As discussed in Inspection Report 05200008/2003001, the QA Manual outlines the process, which is controlled in the Dominion QA procedures. These procedures detail the requirements for identifying, screening, documenting, resolving, and tracking discrepancies associated with the development of the ESP application. They also detail the process for identifying and determining the operability and reportability of conditions potentially adverse to quality and operability.

The staff noted that the Dominion engineering staff maintains a program to evaluate design concerns that could lead to adverse quality conditions. The PPR system, which is described in the NDCM procedures, allows for detailed, multidisciplinary reviews of complex design concerns that may yield a deviation report. The PPR system is not a corrective action or commitment tracking system. Instead, it provides a means to analyze and review complex technical concerns that may be significant and may become issues. As outlined in the procedure, other processes handle corrective actions and commitment tracking. The NRC staff found that the applicant's procedures governing corrective actions met the guidance in Section 17.1.1 of RS-002. Inspection Report 0520008/2003001 details specific examples of identified problems and the resultant corrective actions for ESP activities. The staff found that the applicant followed the guidance in the governing procedures and documents and adequately implemented corrective actions.

17.16.3.2 Bechtel

Bechtel's ESP-specific QAPP states that the NQAM would guide its Corrective Action Program. The manual states that corrective action applies to significant conditions adverse to quality, as described in Criterion XVI of Appendix B to 10 CFR Part 50; ANSI N45.2, Section 17; and ASME NQA-1-2000. In addition, the QAPP states that, if Bechtel personnel performing work identify a condition adverse to quality in existing Dominion procedures or documentation, they must document such a condition on a deviation report form, in accordance with Dominion procedures, and report it to Dominion for further evaluation and disposition. The staff concluded that Bechtel personnel implemented the corrective action program outlined in the QAPP.

17.16.4 Conclusion (Corrective Action)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented an acceptable corrective action program. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 helps to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.17 Quality Assurance Records

17.17.1 Technical Information in the Application (Quality Assurance Records)

The applicant supplied information on QA record controls in SSAR Section 17.1, which includes the QA Manual. The manual states that the Dominion QA procedures contain the requirements for the retention and storage of QA records. The administrative procedures establish and document the requirements and responsibilities for QA record transmittal, retention, and maintenance subsequent to the completion of work at the power station.

The QA Manual states that elements of the operating QA program must be used to ensure quality in the ESP project. Section 18 of the QA Manual, which addresses QA records, states that the administrative procedures document the requirements and responsibilities for record transmittal, retention, and maintenance. Dominion primarily used the existing administrative procedures for its current operating units, although the applicant did implement several administrative procedures specific to the ESP as part of its ESP project manual. As discussed in Inspection Report 0520008/2003001, the QA Manual also refers to the Dominion QA procedures as the source of requirements and commitments for retention and storage of QA records.

These procedures contain the requirements and responsibilities for QA records transmittal, retention, and maintenance. They list examples of QA records applicable to the operating nuclear power plants and state that records were maintained in accordance with NRC regulations, commitments to ANSI N45.2.9-1974, "Requirements for Collection, Storage and Maintenance of Quality Assurance Records for Nuclear Power Plants," and administrative requirements. These procedures contain statements of commitment to standards, requirements, or guides, and they refer to RG 1.88, "Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records." This RG (which the NRC has withdrawn because the ANSI standards endorsed by the RG have been incorporated into ASME NQA-1-1983, "Quality Assurance Program Requirements for Nuclear Facilities," and subsequently endorsed by RG 1.28, Revision 3, "Quality Assurance Program Requirements (Design and Construction)") endorsed the requirements and guidelines for records collection, storage, and maintenance in ANSI N45.2.9-1974, subject to certain clarifications and exceptions. Dominion's procedures also describe record retention measures, including maintaining proper indices, establishing a filing system, and constructing and securing records facilities to prevent destruction of records by fire, flooding, theft, and deterioration through environmental conditions, such as temperature and humidity.

17.17.2 Regulatory Evaluation (Quality Assurance Records)

While the NRC does not require an ESP applicant to control QA records compliant with the criteria of Appendix B, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's QA records. RS-002, paragraph 17.1.1.17, provides the QA measures that constitute an acceptable level of QA record control. Acceptable control of QA records should include provisions for the identification, retention, retrieval, and maintenance of quality records.

17.17.3 Technical Evaluation (Quality Assurance Records)

17.17.3.1 Dominion

During the inspection, a records management supervisor stated that permanent records submitted as "QA" were kept until and unless the Records Management Group was instructed to discard them. The staff observed the records to be retrievable through reference to a file number and vault location.

As discussed in Inspection Report 0520008/2003001, Dominion procedures include a lower-tier operating procedure for records management. This procedure establishes methods, responsibilities, and requirements for creation, collection, storage, maintenance, and disposition of records generated during operations, maintenance, and support of Virginia Power's nuclear power plants. It also describes personnel responsibilities for records management. The procedure contains requirements for (1) quality and legibility of records, (2) storage and maintenance of records, including the transmittal of completed records to Records Management within 30 days, (3) correction of records, (4) preparation of records for archival storage in a controlled environment, and (5) periodic media inspections to allow detection of unexpected degradation of records.

Applicable Dominion procedures refer to the nuclear-required records lists (NRRLs) for retention requirements. The staff reviewed a sample of these lists. For each record type, the NRRL lists the controlling Dominion procedure, the retention period, the retaining organization, and applicable regulations or other external documents (e.g., ANSI N45.2.9-1974).

Dominion procedures also contain requirements for records storage vaults and invoke ANSI N45.2.9-1974, with exceptions as specified in the procedures. They contain specific requirements for vaults and their contents. The staff conducted an inspection of the Innsbrook Technical Center Vital Records Vault, and found it to have limited access, and to be climate controlled and well ventilated. The vault appeared to be clean, and the staff noted no obvious evidence of environmental problems. Based on a review of the document control process, procedures, and storage vault, the staff found that the applicant's control of QA records meets the guidance of Section 17.1.1 of RS-002.

17.17.3.2 Bechtel

The staff reviewed records retention requirements for the applicant's primary ESP contractor, Bechtel. Bechtel's NQAM Policy No. Q-17.1 provides requirements for design and procurement records retention and turnover. This document states that Bechtel will turn QA records over to Dominion progressively as it completes tasks. The policy commits to ANSI N45.2.9-1974 and ASME NQA-1-1983, Supplement 17S-1, for maintenance and control of records. Once Bechtel turns the records over to its client, the policy states that Bechtel is not required to keep the copies it retains under controlled conditions, consistent with ANSI standards.

As discussed in Inspection Report 0520008/2003001, Policy No. Q-17.2 provides requirements for supplier and subcontractor records. It states that procurement documents will specify access for Bechtel and client staff to the end of the retention period, which is specified in the

Bechtel records retention requirements as the end of the contract plus 6 years. Requirements include document types to be turned over, either at job completion or at the time of issue.

As is also discussed in Inspection Report 0520008/2003001, Bechtel's administrative procedures set forth requirements for processing, controlling, distributing, and maintaining supplier documents. They require that supplier documents received by Bechtel be controlled through Bechtel's InfoWorks database. The staff found Bechtel's control of QA records adequate for the scope of ESP activities conducted.

17.17.4 Conclusion (Quality Assurance Records)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented an acceptable level of control for quality assurance records. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 helps to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.18 Audits

17.18.1 Technical Information in the Application (Audits)

The applicant supplied information on audits in SSAR Section 17.1, which includes the QA Manual. As discussed in Inspection Report 0520008/2003001, the manual states that the Dominion QA procedures contain the standards, requirements, or guides which form the basis of the procedures implementing this section.

The QA Manual states that administrative procedures describe the requirements for audits, which are performed on a formal, preplanned audit schedule. Under these procedures, the applicant periodically reviews and revises the audit system as necessary to ensure coverage commensurate with current and planned activities. The applicant may perform additional audits as deemed necessary by management. The quality status and safety importance of the activities being performed determines the scope of the audit. Trained personnel who do not have direct responsibilities in the area being audited conduct the investigation in accordance with preplanned and approved audit plans or checklists.

The Nuclear Oversight Group conducts periodic internal and external audits. It conducts internal audits to determine the adequacy of programs and procedures and whether they are meaningful and in compliance with the overall QA program. External audits determine the adequacy of vendor and contractor Appendix B programs. Audits must be performed in those areas where the requirements of Appendix B are being implemented.

The QA Manual states that the applicant's management responds to all audits and initiates corrective action when indicated. The applicant documents followup of applicable areas through inspections, review, reaudits, or other appropriate means to verify implementation of assigned corrective action.

17.18.2 Regulatory Evaluation (Audits)

While the NRC does not require an ESP applicant to control audits in accordance with the criteria of Appendix B to 10 CFR Part 50, Section 17.1.1 of RS-002 contains guidance for the staff to use in evaluating an ESP applicant's control of audits. RS-002, paragraph 17.1.1.18, provides the QA measures that constitute an acceptable level of audit control. Acceptable audits should include (1) provisions for audits to verify compliance with all aspects of QA measures and to determine the effectiveness of these measures, and (2) responsibilities and procedures for conducting, documenting, and reviewing the results of audits (including designating management levels to review and assess audit results).

17.18.3 Technical Evaluation (Audits)

The staff reviewed all audits and the requisite audit reports that cover Dominion's ESP activities. Inspection Report 0520008/2003001 contains details of this review.

17.18.3.1 Dominion

The QA Manual delineates the QA plan for the development and conduct of audits for ESP activities. The applicant performed internal audits of selected aspects of the ESP activities with a frequency commensurate with safety significance. Nuclear oversight personnel conducted periodic internal and external audits on a formal, preplanned audit schedule.

Nuclear oversight personnel conducted internal audits to determine the adequacy of programs and procedures to ensure compliance with the overall QA program. Audits were scheduled and conducted using existing operational procedures. As discussed in Inspection Report 0520008/2003001, the staff reviewed the Dominion internal auditing procedures and found them to be adequate.

Dominion's Nuclear Oversight Group also conducted external audits to determine the adequacy of the contractors' QA programs. Areas reviewed included, but were not limited to, activities associated with the preparation, review, approval, and control of design and design changes; procurement documents; instructions, procedures, and drawings; and indoctrination and training programs. Nuclear oversight personnel reported the results of each audit in writing to the Project Manager, the Vice President for Nuclear Support Services, the Senior Vice President for Nuclear Operations, and the Chief Nuclear Officer. Where corrective action measures were indicated, the Nuclear Oversight Group conducted documented followup to verify implementation of the assigned corrective action.

As discussed in Inspection Report 0520008/2003001, the staff interviewed Dominion QA personnel who conducted audits of ESP activities and reviewed personnel training and qualification records. In addition to routine individual and continuous training, personnel performing ESP specific activities received training. The staff reviewed the compliance of Dominion personnel with applicable procedural guidance and requirements for training and qualification, and verified the adequacy of the procedure. In addition, the staff reviewed training records and personnel qualifications. The staff did not note any deficiencies.

17.18.3.2 Bechtel

The applicant listed Bechtel on the Dominion safety-related vendor list as a supplier qualified to provide design and engineering services for major projects, including the ESP project. As discussed in Inspection Report 0520008/2003001, the applicant based its designation of Bechtel as a qualified supplier, in part, on two supplier audits that it had conducted within the year preceding submission of the ESP application. Specifically, the joint Nuclear Utility Procurement Issues Committee (NUPIC) conducted an audit during November 2002, and Dominion conducted a vendor programs audit during July 2003. The NUPIC audit verified continued satisfactory implementation of the Bechtel Nuclear Quality Program in meeting the intent of Appendix B to 10 CFR Parts 50 and 21.

As is also discussed in Inspection Report 0520008/2003001, the staff reviewed Bechtel's audit planning. The staff found that documents specifying audit plans were sufficient in detail to meet Bechtel's procedure requirements and that Bechtel performed audits as scheduled.

The staff reviewed Bechtel procedures for audits and found that Bechtel met procedural requirements for auditing design and construction phase project activities at least annually or once within the life of the project, whichever is shorter. Applicable procedures included requirements for auditor qualifications, audit implementation guidance, audit report documentation, and audit followup and closeout guidance. The staff found that these procedures had been met.

The staff reviewed Bechtel procedures for qualification of auditors and found that the auditor qualification requirements are equivalent in substance to the criteria of Appendix B to 10 CFR Part 50 and consensus standards. The procedures detail topics such as training audit participation, examination, and maintenance of auditor qualifications.

Based on a review of the NUPIC, Dominion, and primary contractor audits, the staff found that ESP audit activities were of sufficient scope and depth to provide reasonable assurance of the applicant and contractors' qualifications to perform safety-related work. In particular, the staff noted that audit activities included a review of significant quality attributes, such as design and software control, procurement activities, training, record retention, and corrective action. The staff determined that deficiencies identified during these audit activities were adequately resolved.

17.18.4 Conclusion (Audits)

As set forth above, the staff reviewed the QA measures employed by the applicant and its primary contractor and concludes that they implemented acceptable audit controls. The staff considered the regulatory guidance of Section 17.1.1 of RS-002 in their review of this portion of the application. The guidance in RS-002 help to provide reasonable assurance that information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety would support satisfactory performance of such SSCs once in service.

17.19 Conclusions

Based on its review and evaluation of the QA measures contained or referenced in the SSAR, as set forth above, the staff concludes the following:

- The organizations and persons performing QA functions have the independence and authority necessary to effectively carry out QA measures without undue influence from those directly responsible for costs and schedules.
- The QA procedures and measures, when properly implemented, are equivalent in substance to the criteria of Appendix B to 10 CFR Part 50 and conform to the guidance in RS-002, Section 17.1.1.
- The applicant applied QA measures to all ESP activities that established information regarding (1) the design and construction of SSCs important to safety which might be constructed on the proposed site, or (2) the establishment of site characteristics for comparison to the values of site parameters postulated in a certified design or to serve as design inputs for a custom design. The measures provide adequate confidence that information provided in the ESP application and accepted by the NRC is reliable and, when used as input for the design or construction of SSCs important to safety, would not adversely impact their ability to perform satisfactorily in service. Therefore, the staff concludes that the applicant implement acceptable QA measures fore the ESP activities.