

November 5, 2007

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SUBJECT: DRAFT SAFETY EVALUATION FOR BECHTEL TOPICAL REPORT (TR),
BQ-TOP-1, 2007 EDITION, REVISION 1, "QUALITY ASSURANCE PROGRAM
FOR NUCLEAR POWER PLANTS" (TAC NO. MD5365)

Dear Mr. Sarma:

By letter dated October 4, 2007, Bechtel submitted for U.S. Nuclear Regulatory Commission (NRC) staff review TR BQ-TOP-1, 2007 Edition, Revision 1, "Quality Assurance Program for Nuclear Power Plants." Enclosed for Bechtel review and comment is a copy of the NRC staff's draft safety evaluation (SE) for the TR.

Twenty working days are provided to you to comment on any factual errors or clarity concerns contained in the SE. The final SE will be issued after making any necessary changes and will be made publicly available. The NRC staff's disposition of your comments on the draft SE will be discussed in the final SE.

To facilitate the NRC staff's review of your comments, please provide a marked-up copy of the draft SE showing proposed changes and provide a summary table of the proposed changes.

If you have any questions, please contact Vanice Perin at 301-415-8143.

Sincerely,

/RA By David J. Nelson for/

Stacey L. Rosenberg, Chief
Special Projects Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project No. 1365

Enclosure: Draft SE

cc w/encl: See next page

Bechtel

Project No. 1365

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DATE	10/25/07	10/25/07	10/26/07	11/05/07

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DRAFT SAFETY EVALUATION BY THE
OFFICE OF NUCLEAR REACTOR REGULATION
TOPICAL REPORT BQ-TOP-1, REVISION 1
BECHTEL QUALITY ASSURANCE PROGRAM
FOR NUCLEAR POWER PLANTS
PROJECT NO. 1365

1 1.0 INTRODUCTION
2

3 By letter dated April 23, 2007 (Reference 1), Bechtel Power Corporation (Bechtel) submitted the
4 updated Bechtel Quality Assurance (QA) Program for Nuclear Power Plants Topical Report
5 BQ-TOP-1, 2007 Edition, (hereafter referred to as the Quality Assurance Topical Report
6 (QATR)) for NRC staff review and acceptance in accordance with the provisions of Title 10 of
7 the *Code of Federal Regulations* (10 CFR) Section 50.4(b)(7)(ii). Bechtel proposed that the
8 updated QATR would replace the current QA program description for Bechtel that had been
9 accepted by the NRC as documented in letter dated February 3, 1988 (Reference 2). The
10 QATR was subsequently revised by Bechtel to reflect Bechtel's response dated August 23,
11 2007 (Reference 3), to an NRC request for additional information (RAI) dated June 15, 2007
12 (Reference 4), necessary to make a determination regarding acceptability of the proposed
13 Bechtel QATR, 2007 Edition.
14

15 2.0 REGULATORY EVALUATION
16

17 The Commission's regulatory requirements related to QA programs for nonlicensees are set
18 forth in 10 CFR 50.4(b)(7)(ii).
19

20 Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing
21 Plants," to 10 CFR Part 50 establishes QA requirements for the design, construction, and
22 operation of structures, systems, and components (SSCs) of the facility. The pertinent
23 requirements of Appendix B to 10 CFR Part 50 apply to all activities affecting the safety-related
24 functions of those SSCs and include designing, purchasing, fabricating, handling, shipping,
25 storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing,
26 refueling, and modifying.
27

28 10 CFR 50.4(b)(7)(ii) requires that a change to an NRC-accepted QATR from nonlicensees (i.e.,
29 architect/engineers, nuclear steam system supplier suppliers, fuel suppliers, constructors, etc.)
30 must be submitted to the NRC. When requested, the NRC will review the proposed QATR for
31 acceptability to ensure the applicable requirements of Appendix B to 10 CFR Part 50 will be
32 satisfied.

ENCLOSURE

1 3.0 TECHNICAL EVALUATION

2
3 3.1 Background

4
5 The proposed QATR is similar in many respects to previous submittals approved for licensees
6 for the purpose of updating the QA program to extend applicability to early site permit
7 (ESP)/combined operating license application (COLA) activities and gain efficiencies from NRC-
8 approved QA program alternatives.
9

10 The proposed QATR represents a change from a QA program description based largely on
11 commitments to Appendix B to 10 CFR Part 50, Regulatory Guide (RG) 1.28, "Quality
12 Assurance Program Requirements (Design and Construction)," Revision 3, and RG 1.33,
13 "Quality Assurance Program Requirements (Operation)," Revision 2; to a program based on the
14 American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA) Standard
15 NQA-1-1994, "Quality Assurance Requirements for Nuclear Applications." Bechtel considers
16 the collective requirements of the QATR and NQA-1-1994 equivalent to the NRC staff's
17 guidance in NUREG-0800, "Standard Review Plan," (SRP) Section 17.5 (SRP 17.5). SRP 17.5
18 outlines the review of a standardized QA program and is based on ASME standard NQA-1,
19 1994 Edition; RG 1.8, "Qualification and Training of Personnel for Nuclear Power Plants"
20 Revision 3; RG 1.28; RG1.33; and NRC Review Standard 002, "Processing Applications for
21 Early Site Permits." The review approach of SRP 17.5 has previously been used by the NRC
22 staff as an acceptable approach to evaluating NQA-1-1994 as the basis for a QA program by a
23 licensee (References 5 and 6).
24

25 Part I of the NQA-1-1994 standard sets forth programmatic requirements for the establishment
26 and execution of QA programs for the siting, design, construction, operation, and
27 decommissioning of nuclear facilities. Part II of the standard sets forth non-programmatic QA
28 requirements for the planning and execution of identified tasks during the fabrication,
29 construction, modification, repair, maintenance, and testing of systems, components and
30 structures for nuclear facilities. NQA-1-1994 provides guidance that is similar to that provided
31 by the American National Standards Institute (ANSI) N45.2 series of standards, which were
32 developed in the 1970s and early 1980s. The proposed QATR is based on NQA-1-1994 in lieu
33 of current commitments to ANSI N45.2 and supplemental "daughter" standards.
34

35 The significant changes to the QA program for Bechtel in the QATR are: 1) a commitment to
36 NQA-1-1994 as the basis for the QA program; 2) clarification of applicability of the QA program
37 for ESP/COLA activities support; and 3) incorporation of alternatives to NQA-1-1994 that have
38 previously been approved by NRC safety evaluations (SEs).
39

40 3.2 Evaluation

41
42 This section evaluates the adequacy of the QATR in describing how the requirements of
43 Appendix B to 10 CFR Part 50 will be satisfied. The format and content of the QATR are
44 evaluated in accordance with the guidance of SRP 17.5, which provides a basis for NRC staff
45 review of QA programs based on NQA-1-1994. The acceptability of the level of detail provided
46 by the QATR is determined, in part, by its adequacy in addressing the acceptance criteria of
47 SRP 17.5. The NRC staff also reviewed alternatives from NQA-1-1994, considered not to be
48 reductions in QA program commitments, for conformance with the provisions established in
49 Bechtel's previously accepted QATR dated February 1988 (Reference 7).

1 3.2.1 Format and Content of the QATR

2
3 The format used for the following evaluation follows the sequence of the 18 criteria of
4 Appendix B and corresponding provisions of NQA-1-1994. It also includes an added provision
5 for safety significant nonsafety-related equipment.
6

7 3.2.1.1 Organization

8
9 The QATR is the top-level policy document that establishes the manner in which quality is to be
10 achieved and presents Bechtel's overall methodology regarding achievement and assurance of
11 quality. Implementing documents provide more detailed responsibilities and requirements, and
12 defines the organizational interfaces involved in conducting activities within the scope of the
13 QATR. Compliance with the QATR and implementing documents is mandatory for personnel
14 directly or indirectly associated with implementation of the Bechtel QA program.
15

16 The QATR describes the organizational structure, functional responsibilities, and levels of
17 authority and interfaces for establishing, executing, and verifying QA program implementation.
18 The organizational structure includes corporate functions and project, construction,
19 maintenance, or modification-specific functions. Implementing documents assign more specific
20 responsibilities and duties, and define the organizational interfaces involved in conducting
21 activities and duties within the scope of the QATR.
22

23 In establishing its organizational structure, Bechtel commits to compliance with NQA-1-1994,
24 Basic Requirement 1 and Supplement 1S-1.
25

26 3.2.1.2 Quality Assurance Program

27
28 Bechtel has established the necessary measures and governing procedures to implement the
29 QA program described in the QATR. Bechtel commits to meeting the QA program in all aspects
30 of work that affect SSCs (items) whose satisfactory performance is required to prevent
31 accidents that may cause undue risk to the health and safety of the public or to mitigate the
32 consequences of such accidents if they were to occur. These items would be defined as safety-
33 related and would be identified in the safety analysis report for the project. Senior management
34 is regularly apprised of audit results evaluating the adequacy of implementation of the QA
35 program.
36

37 Personnel working directly or indirectly for Bechtel are responsible for the achievement of
38 acceptable quality in the work covered by the QATR. Bechtel personnel performing verification
39 activities are responsible for verifying the achievement of acceptable quality. Activities
40 governed by the QA program are performed as directed by documented instructions,
41 procedures, and drawings that are of a detail appropriate for the activity's complexity and effect
42 on safety. The President of the Nuclear Business Unit is responsible for the overall quality
43 policy. The Project QA manager is responsible for verification that processes and procedures
44 comply with the QATR and other applicable requirements, and that such processes or
45 procedures are implemented for project quality-related activities.
46

47 Personnel assigned to implement elements of the QA program shall be capable of performing
48 their assigned tasks. To this end, Bechtel establishes and maintains formal indoctrination and

1 training programs for personnel performing, verifying, or managing activities within the scope of
2 the QA program to assure that suitable proficiency is achieved and maintained.

3
4 In establishing qualification and training programs, Bechtel commits to compliance with
5 NQA-1-1994, Basic Requirement 2 and Supplements 2S-1, 2S-2, 2S-3 and 2S-4, with
6 clarifications and exceptions to 2S-2 and 2S-3, which are addressed in Section 3.2.2 of this SE.

7 8 3.2.1.3 Design Control

9
10 Bechtel has established and implemented a process to control the design, design changes, and
11 temporary modifications of items that are subject to the provisions of the QATR. The design
12 process includes provisions to control design inputs, outputs, changes, interfaces, records, and
13 organizational interfaces. Changes to design requirements or in completed designs produced
14 by Project Engineering that may be proposed by suppliers, subcontractors, or Bechtel
15 Construction must be reviewed and accepted by Project Engineering. The design control
16 program includes interface controls necessary to control the development, verification, approval,
17 release, status, distribution and revision of design inputs and outputs. Design changes and
18 disposition of nonconforming items as “use-as-is” or “repair” are reviewed and approved by
19 Project Engineering. Also, Field Engineering has the authority to approve changes to design
20 details in cases where the original design details were prepared with the consent of Project
21 Engineering.

22
23 In establishing its program for design control and verification, Bechtel commits to compliance
24 with NQA-1-1994, Basic Requirement 3, and Supplement 3S-1, with clarifications and
25 exceptions to 3S-1 that are addressed in Section 3.2.2 of this SE. Bechtel commits to
26 Subpart 2.20 for subsurface investigation requirements and to Subpart 2.7 for computer
27 software controls.

28 29 3.2.1.4 Procurement Document Control

30
31 Bechtel has established the necessary measures and governing procedures to assure that
32 purchased items and services are subject to quality and technical requirements at least
33 equivalent to those specified for original equipment or specified by properly reviewed and
34 approved revisions to the original requirements to assure the items are suitable for the intended
35 service, and are of acceptable quality, consistent with their effect on safety. Procurement
36 documents are subject to the same degree of control as utilized in the preparation of the original
37 documents.

38
39 In establishing controls for procurement, Bechtel commits to compliance with NQA-1-1994,
40 Basic Requirement 4 and Supplement 4S-1, with clarifications and exceptions to 4S-1, which
41 are addressed in Section 3.2.2 of this SE.

42 43 3.2.1.5 Instructions, Procedures, and Drawings

44
45 Bechtel has established the necessary measures and governing procedures to ensure that
46 activities affecting quality are prescribed by and performed in accordance with instructions,
47 procedures or drawings of a type appropriate to the circumstances, and include quantitative or
48 qualitative acceptance criteria to implement the QA program as described in the QATR. Bechtel
49 requires suppliers and subcontractors to submit drawings and procedures to Bechtel for

1 acceptance prior to starting fabrication or construction. Provisions are included for reviewing,
2 updating, and canceling such procedures.
3

4 In establishing procedural controls, Bechtel commits to compliance with NQA-1-1994 and Basic
5 Requirement 5.
6

7 3.2.1.6 Document Control

8

9 Bechtel has established the necessary measures and governing procedures to control the
10 preparation of, issuance of, and changes to documents that specify quality requirements or
11 prescribe how activities affecting quality are controlled to assure that correct documents are
12 being employed. Such documents, including changes thereto, shall be reviewed for adequacy
13 and approved for release by authorized personnel.
14

15 In establishing provisions for document control, Bechtel commits to compliance with NQA-1-
16 1994, Basic Requirement 6 and Supplement 6S-1.
17

18 3.2.1.7 Control of Purchased Material, Equipment, and Services

19

20 Bechtel has established the necessary measures and governing procedures to control the
21 procurement of items and services to assure conformance with specified requirements. Such
22 control shall provide for the following as appropriate; source evaluation and selection, evaluation
23 of objective evidence of quality furnished by the supplier, source inspection, audit, and
24 examination of items or services upon delivery.
25

26 In establishing procurement verification controls, Bechtel commits to compliance with
27 NQA-1-1994, Basic Requirement 7 and Supplement 7S-1, with clarifications and exceptions to
28 7S-1, that are is addressed in Section 3.2.2 of this SE.
29

30 3.2.1.8 Identification and Control of Materials, Parts, and Components

31

32 Bechtel has established the necessary measures and governing procedures to identify and
33 control items to prevent the use of incorrect or defective items. This includes controls for
34 consumable materials and items with limited shelf life. The identification of items maintained
35 through fabrication, erection, installation and use so that the item can be traced to its
36 documentation, consistent with the item's effect on safety. Identification locations and methods
37 are selected so as not to affect the function or quality of the item.
38

39 In establishing provisions for identification and control of items, Bechtel commits to compliance
40 with NQA-1-1994, Basic Requirement 8 and Supplement 8S-1.
41

42 3.2.1.9 Control of Special Processes

43

44 Bechtel has established the necessary measures and governing procedures to assure that
45 special processes requiring interim process controls to assure quality, such as welding, heat
46 treating, and nondestructive examination are controlled. These provisions include assuring that
47 special processes are accomplished by qualified personnel using qualified procedures and
48 equipment. Special processes are performed in accordance with applicable codes, standards,
49 specifications, criteria or other specially established requirements. Special processes are those

1 where the results are highly dependent on the control of the process or the skill of the
2 personnel, or both, and for which the specified quality cannot be fully and readily determined by
3 inspection or test of the final product.

4
5 In establishing measures for the control of special processes, Bechtel commits to compliance
6 with NQA-1-1994, Basic Requirement 9 and Supplement 9S-1.

7 8 3.2.1.10 Inspection

9
10 Bechtel has established the necessary measures and governing procedures to implement
11 inspections that assure items, services and activities affecting safety meet established
12 requirements and conform to applicable documented specifications, instructions, procedures,
13 and design documents. Inspection may also be applied to address onsite receiving,
14 maintenance, installation, testing and subcontracted work activities performed during the
15 construction phase. Types of inspections may include those verifications related to
16 procurement, such as source, in-process, final, and receipt inspection, as well as maintenance
17 and modification activities. Inspections are carried out by properly qualified persons
18 independent of those who performed or directly supervised the work. Inspection results shall be
19 documented.

20
21 In establishing inspection requirements, Bechtel commits to compliance with NQA-1-1994,
22 Basic Requirement 10, Supplement 10S-1, and Subpart 2.4. Bechtel commits to Subparts 2.5
23 and 2.8 for establishing inspection requirements.

24 25 3.2.1.11 Test Control

26
27 Bechtel has established the necessary measures and governing procedures to demonstrate that
28 items subject to the provisions of the QATR will be tested for qualifying, demonstrating, or
29 assuring the quality of procured items. These programs include criteria for determining when
30 testing is required, such as proof tests before installation, pre-operational tests,
31 post-maintenance tests, post-modification tests and construction tests to demonstrate that
32 performance of plant systems is in accordance with design. Tests are performed according to
33 applicable procedures that include, consistent with the effect on safety, 1) instructions and
34 prerequisites to perform the test, 2) use of proper test equipment, 3) acceptance criteria, and
35 4) mandatory verification points as necessary to confirm satisfactory test completion. Test
36 results are documented and evaluated by the organization performing the test and reviewed by
37 a responsible authority to assure that the test requirements have been satisfied. If acceptance
38 criteria are not met, retesting is performed as needed to confirm acceptability following
39 correction of the system or equipment deficiencies that caused the failure.

40
41 In establishing provisions for testing, Bechtel commits to compliance with NQA-1-1994, Basic
42 Requirement 11 and Supplement 11S-1.

43
44 Additionally, Bechtel establishes and implements provisions to assure that computer software
45 used in applications affecting safety is prepared, documented, verified, tested, and used such
46 that the expected output is obtained and configuration control maintained.

47
48 Therefore, Bechtel commits to compliance with the requirements of NQA-1-1994, Basic
49 Requirement 11, Supplement 11S-2, and Subpart 2.7.

1 3.2.1.12 Control of Measuring and Test Equipment

2
3 For construction, Bechtel has established and implements procedures for the calibration and
4 adjustment of instrument and control devices. Provisions for contractor's control of measuring
5 and test equipment are provided in procurement documents specifying ASME NQA-1, Basic
6 Requirement 12 and Supplement 12S-1. Appropriate documentation is maintained for these
7 devices to indicate the control status, when the next calibration is due, and identify any
8 limitations on the use of the equipment.
9

10 In establishing provisions for control of measuring and test equipment, Bechtel commits to
11 compliance with NQA-1-1994, Basic Requirement 12, and Supplement 12S-1, with clarifications
12 and exceptions to 12S-1 that are addressed in Section 3.2.2 of the SE.
13

14 3.2.1.13 Handling, Storage, and Shipping

15
16 Bechtel has established the necessary measures and governing procedures to control the
17 handling, storage, packaging, shipping, clearing, and preservation of items to prevent
18 inadvertent damage or loss, and to minimize deterioration. These provisions include specific
19 procedures, when required to maintain acceptable quality for the items important to safety.
20 Items are appropriately marked and labeled during packaging, shipping, handling and storage to
21 identify, maintain, and preserve the item's integrity and indicate the need for special controls.
22 Special controls (such as containers, shock absorbers, accelerometers, inert gas atmospheres,
23 specific moisture content levels and temperature levels) are provided when required to maintain
24 acceptable quality.
25

26 In establishing provisions for handling, storage and shipping, Bechtel commits to compliance
27 with NQA-1-1994, Basic Requirement 13, and Supplement 13S-1. Bechtel also commits to
28 compliance with the requirements of NQA-1-1994, Subparts 2.1, 2.2 and 2.3, with clarifications
29 and exceptions to 2.1, 2.2 and 2.3 that are addressed in Section 3.2.2 of this SE.
30

31 3.2.1.14 Inspection, Test, and Operating Status

32
33 Bechtel has established the necessary measures and governing procedures to identify the
34 inspection, test, and in-process work of items and components subject to the provisions of the
35 QATR in order to maintain personnel and in-process work safety and avoid unauthorized
36 operation of equipment. Where necessary to preclude inadvertent bypassing of inspections or
37 tests, or to preclude inadvertent operation, these measures require the inspection, test or
38 in-process work status be verified before release, fabrication, receipt, installation, test or use.
39 These measures also establish the necessary authorities and controls for the application and
40 removal of status indicators or labels.
41

42 Temporary modifications, such as temporary bypass lines, electrical jumpers, lifted electrical
43 leads, and temporary trip setpoints are controlled by approved procedures.
44

45 In establishing measures for control of inspection, test and operating status, Bechtel commits to
46 compliance with NQA-1-1994 and Basic Requirement 14.

1 3.2.1.15 Nonconforming Materials, Parts, or Components

2
3 Bechtel has established the necessary measures and governing procedures to control items,
4 including services, which do not conform to specified requirements to prevent inadvertent
5 installation or use. Controls provide for identification, documentation, evaluation, segregation
6 when practical, disposition of nonconforming items, and notification to affected organizations.
7 These controls require suppliers and subcontractors to advise Bechtel of all nonconformances
8 from procurement documents or Bechtel-approved designs for which the recommended
9 disposition is repair or use-as-is. Nonconformances are evaluated for impact on operability of
10 quality SSCs to assure that the final condition does not adversely affect the item or service.
11 Nonconformances to design requirements dispositioned as repair or use-as-is, are reviewed by
12 Project Engineering and shall be subject to design control measures commensurate with those
13 applied to the original design. Dispositions on nonconformances to procurement requirements
14 at a supplier's facility must be approved by Project Engineering.
15

16 Bechtel procedures provide necessary measures for implementing a reporting program, which
17 conforms to the requirements of 10 CFR 50.55(e), "Conditions of Construction Permits," and
18 10 CFR Part 21, "Reporting of Defects and Noncompliance."
19

20 In establishing measures for nonconforming materials, parts, or components, Bechtel commits
21 to compliance with NQA-1-1994, Basic Requirement 15, and Supplement 15S-1.
22

23 3.2.1.16 Corrective Action

24
25 Bechtel has established the necessary measures and governing procedures to promptly
26 identify, control, document, classify, and correct conditions adverse to quality. Bechtel
27 procedures require personnel whose activities affect quality, to identify known condition adverse
28 to quality and assure that corrective actions are documented and initiated in accordance with
29 regulatory guidance and applicable quality standards. When complex issues arise where it
30 cannot be readily determined if a condition adverse to quality exists, Bechtel documents
31 establish the requirements for documentation and timely evaluation of the issue. Results of
32 evaluations of conditions adverse to quality are analyzed to identify trends. Significant
33 conditions adverse to quality and significant adverse trends are documented and reported to
34 responsible management.
35

36 In establishing provisions for corrective action, Bechtel commits to compliance with
37 NQA-1-1994, Basic Requirement 16.
38

39 3.2.1.17 Quality Assurance Records

40
41 Bechtel has established the necessary measures and governing procedures to ensure that
42 sufficient records of items and activities affecting quality are developed, reviewed, approved,
43 issued, used, and revised to reflect completed work. The provisions of such procedures
44 establish the scope for the records retention program and include requirements for records
45 administration, including receipt, preservation, retention, storage, safekeeping, retrieval, and
46 final disposition.

1 In establishing provisions for records, Bechtel commits to compliance with NQA-1-1994, Basic
2 Requirement 17 and Supplement 17S-1, with clarifications and exceptions to 17S-1 that are
3 addressed in Section 3.2.2 of this SE.
4

5 3.2.1.18 Audits

6

7 Bechtel has established the necessary measures and governing procedures to implement
8 audits to verify that activities covered by the QATR are performed in conformance with
9 established requirements. The audit programs will be reviewed for effectiveness as a part of the
10 overall audit process. Bechtel commits to perform periodic audits of the following internal
11 activities: 1) project engineering and procurement activities; 2) construction activities, post-
12 operational modifications and maintenance; 3) engineering activities that are performed by
13 personnel not assigned to Project Engineering teams; and 4) supplier quality activities. Periodic
14 summaries of these activities are documented and reported to appropriate management of the
15 audited group and to Quality Services.
16

17 Bechtel's external audit program includes audits of suppliers' and subcontractors' (contractors of
18 construction management) and design consultants' activities.
19

20 In establishing the independent audit program, Bechtel commits to compliance with NQA-1-994,
21 Basic Requirement 18 and Supplement 18S-1.
22

23 3.2.1.19 Nonsafety-Related SSC Quality Control

24

25 Bechtel has established the necessary measures and governing procedures to address certain
26 nonsafety-related SSCs for which Appendix B to 10 CFR Part 50 is not applicable, but are
27 considered significant contributors to plant safety. Program controls are applied to items in a
28 selective manner to target characteristics or critical attributes that render the SSC a significant
29 contributor to plant safety. The measures are applicable to fire protection (10 CFR 50.48),
30 anticipated transients without scram (ATWS) (10 CFR 50.62), and station blackout (SBO)
31 (10 CFR 50.63) SSCs.
32

33 In establishing provisions for nonsafety-related SSC quality control, Bechtel commits to
34 compliance with the following: 1) Regulatory Position 1.7, "Quality Assurance," in RG 1.189,
35 "Fire Protection for Operating Nuclear Plants;" 2) Generic Letter 85-06, "Quality Assurance
36 Guidance for ATWS Equipment That Is Not Safety-Related;" and 3) Regulatory Position 3.5,
37 "Quality Assurance and Specific Guidance for SBO Equipment That Is Not Safety-Related," in
38 RG 1.155, "Station Blackout," Appendix A, "Quality Assurance Guidance for Nonsafety Systems
39 and Equipment."
40

41 3.2.2 Evaluation of Alternatives In Bechtel's QA Program

42

43 The QATR delineates the alternatives to NQA-1-1994. The NRC staff's evaluation of Bechtel's
44 proposed alternatives is given below:

1 *Quality Assurance Program (QAP)*
2

- 3 • Bechtel proposed that in lieu of Supplement 2S-2 for qualification of nondestructive
4 examination personnel, Bechtel will follow the applicable standard cited in the version(s)
5 of Section III and Section XI of the ASME Code approved by the NRC for use at project
6 sites.
7
- 8 • Supplement 2S-2 requires the use of American Society for Nondestructive Testing
9 Recommended Practice No. SNT-TC-1A, June 1980 Edition. Section III and Section XI
10 of the ASME Code requires the use of the applicable edition of SNT-TC-1A approved in
11 the specific edition of the ASME Code. Therefore, the NRC staff finds the alternative
12 equivalent to NQA-1-1994.
13
- 14 • Bechtel proposed that the requirement that prospective Lead Auditors have participated
15 in a minimum of five audits in the previous three years be replaced by the following: “The
16 prospective lead auditor shall demonstrate his/her ability to properly implement the audit
17 process, as implemented by Bechtel, to effectively lead an audit team, and to effectively
18 organize and report results, including participation in at least one nuclear audit within the
19 year preceding the date of qualification.” This was subsequently revised to add the
20 following: “All remaining criteria of SRP Section 17.5, Paragraph II.S.4.c., will be met.”
21

22 The NRC staff determined that the revised wording was equivalent to the guidance in
23 SRP 17.5, Paragraph II.S.4.c. Therefore, the NRC staff finds the alternative equivalent
24 to the staff’s guidance.
25

26 *Design Control*
27

- 28 • Bechtel proposed that Section 3.0 implies traceability back from final design to the
29 source of design input. In practice, a literal interpretation of this is not always possible.
30 For example, final design drawings do not identify the related calculations. Direct
31 traceability from the final design to the source of design input is not always possible;
32 however, it shall be possible to relate the criteria used and analyses performed to the
33 final design documents and that record files will permit location of analyses that support
34 specific design output documents. The NRC staff, in an RAI, asked for clarification on
35 the ability to trace back to the source of the design input, which would more clearly meet
36 the guidance of SRP 17.5, Paragraph II.C.1.g, which states in part that, design records,
37 maintained to provide evidence that the design was properly accomplished, include not
38 only the final design output and revision to the final output, but also the important design
39 steps. Bechtel subsequently revised the alternative adding that a clear and easily
40 traceable path to all supporting design information is provided through the Information
41 Management System and the Calculation Index. Additionally, it shall be possible to
42 relate the criteria used and analyses performed to the final design documents.
43

44 The NRC staff determined that the revised wording was equivalent to the guidance in
45 SRP 17.5, Paragraph II.C.1.g. The design input will be traceable to the design output.
46 Therefore, the NRC staff finds the alternative equivalent to the staff’s guidance.

- Bechtel proposed that for records and documentation in Section 7 of the QATR, in-process documentation relating to checking and coordination of drawings (e.g., check and coordination prints) or copies of marked-up specifications used to solicit comments shall be retained until the drawing or specification is approved and issued for use outside of Bechtel Engineering. Such in-process documents will be available for review/audit until the document is approved, but may be discarded once the document has been approved. In the first sentence of the second paragraph the phrase “final design documents” shall mean those documents which are the latest revision that has been issued for use.

The NRC staff found the proposed alternative acceptable based on guidance in SRP 17.5, Paragraphs II.C.1.g. and II.C.1.h. Paragraph II.C.1.g. states that, design records, maintained to provide evidence that the design was properly accomplished, include not only the final design output and revisions to the final output, but also the important design steps (e.g., calculations, analyses, and computer programs) and the sources of input that support the final output. Paragraph II.C.1.h. states in part that, design documents are sufficiently detailed as to purpose, method, assumptions, design input, references, and units such that a person technically qualified in the subject can review and understand the analyses and verify the adequacy of the results without recourse to the originator.

The NRC staff determined that the wording was essentially equivalent to the guidance in SRP 17.5, Paragraphs II.C.1.g. and h. Working or in-process documents were not intended to be permanent records. Therefore, the NRC staff finds the alternative equivalent to the staff’s guidance.

Procurement Document Control

- Section 2.3 of Supplement 4S-1 includes a requirement that procurement documents require suppliers to have a documented QA program that implements NQA-1-1994, Part 1. Bechtel proposed that in lieu of this requirement, it may require suppliers to have a documented supplier QA program that is determined to meet the applicable requirements of Appendix B to 10 CFR Part 50, as appropriate to the circumstances of the procurement. Paragraph II.D.2.d. of SRP 17.5 states in part that, the supplier’s documented QAP that is determined to meet the applicable requirements of Appendix B to 10 CFR Part 50, as appropriate to the circumstances of procurement.

The NRC staff determined that the wording was essentially equivalent to the guidance in Paragraph II.D.2.d. of SRP 17.5. Therefore, the NRC staff finds the alternative equivalent to the staff’s guidance.

- Bechtel proposed that with regard to service performed by a supplier, Bechtel procurement documents may allow the supplier to work under the Bechtel QAP, including implementing procedures, in lieu of the supplier having its own QAP. Paragraph II.D.2.d. of SRP 17.5, states in part that, the supplier may work under the applicant’s approved QAP.

1 The NRC staff determined that the wording was essentially equivalent to the guidance in
2 Paragraph II.D.2.d. of SRP 17.5. Therefore, the NRC staff finds the alternative
3 equivalent to the staff's guidance.
4

- 5 • Bechtel initially proposed that Section 3 of Supplement 4S-1 requires procurement
6 documents to be reviewed prior to bid or award of contract. The QA review of
7 procurement documents is satisfied through review of the applicable procurement
8 specification, including the technical and quality procurement requirements, prior to bid
9 or award of contract. Bechtel subsequently proposed that procurement document
10 changes (e.g., scope, technical or quality requirements) will receive a QA review by
11 subjecting such documents to the same degree of control as utilized in the preparation of
12 the original documents. The NRC staff's guidance of SRP 17.5, Paragraph II.D.4. states
13 that, procurement document changes are subject to the same degree of control as
14 utilized in the preparation of the original documents.
15

16 The NRC staff determined that the wording was essentially equivalent to the guidance in
17 Paragraph II.D.4. of SRP 17.5. Therefore, the NRC staff finds the alternative equivalent
18 to the staff's guidance.
19

- 20 • Bechtel proposed that procurement documents for commercial-grade items that will be
21 dedicated by Bechtel as safety-related items shall contain technical and quality
22 requirements such that the procured item can be appropriately dedicated.
23

24 Dedication is outside the scope of NRC staff guidance provided in SRP 17.5.
25 Supplement 7S-1 of NQA-1-1994 addresses commercial-grade items. This statement
26 does not contradict the requirements in NQA-1-1994 or any NRC staff guidance on
27 commercial-grade dedication. Therefore, the NRC staff finds the proposed alternative
28 equivalent to the staff's guidance.
29

30 *Control of Purchased Material, Equipment, and Services* 31

- 32 • Bechtel proposed that when a certificate of conformance is used, the person attesting to
33 a certificate shall be an authorized and responsible employee of the supplier and shall
34 be identified by the supplier. Paragraph II.G.16.d. of SRP 17.5, states that, the certificate
35 is signed or otherwise authenticated by a person who is responsible for this QA function
36 and whose function and position are described in the purchaser's or supplier's QAP.
37

38 The NRC staff determined that the wording as essentially equivalent to the guidance in
39 Paragraph II.G.16.d. of SRP 17.5. Therefore, the NRC staff finds the alternative
40 equivalent to the staff's guidance.
41

- 42 • Bechtel proposed that the verification of the validity of supplier certificates and the
43 effectiveness of the certification system are accomplished as an integral part of the total
44 supplier control and product acceptance program, and no separate Bechtel system
45 exists that addresses itself solely to such verification.

1 The NRC staff determined that neither NQA-1-1994 nor SRP 17.5 have requirements or
2 guidance, stating that a supplier certificate verification program be implemented.
3 Therefore, the NRC staff determined that Bechtel's proposal to review the verification of
4 certificates through their supplier controls and acceptance program would provide
5 adequate controls.

- 6
- 7 • Bechtel proposed that 10 CFR Part 50 licensees, Authorized Inspection Agencies
8 (AIAs), the National Institute of standards and Technology (NIST), or other State and
9 Federal agencies which may provide items or services to Bechtel projects are not
10 required to be evaluated or audited.

11

12 The NRC staff determined that neither NQA-1-1994 or SRP 17.5 have requirements or
13 guidance stating that licensees, an AIA agency, NIST, or other State and Federal
14 agencies providing items or services, be evaluated or audited. Therefore, the NRC staff
15 determined that Bechtel's proposal of not evaluating such entities is acceptable.

- 16
- 17 • Bechtel proposed that when purchasing commercial-grade calibration services from a
18 domestic calibration laboratory, procurement source evaluation and selection measures
19 need not be performed provided certain stated conditions are met.

20

21 The NRC staff determined that the wording was essentially equivalent to the guidance in
22 Paragraphs II.L.8.a.-i. of SRP 17.5. Therefore, the NRC staff finds the alternative
23 equivalent to the staff's guidance.

- 24
- 25 • Bechtel proposed that documents that may be stored in approved electronic media
26 under Bechtel control and not physically located on the plant site, but which are
27 accessible from the respective nuclear facility site as meeting the NQA-1-1994
28 requirement for documents to be available at the site.

29

30 The NRC staff determined that the wording was essentially equivalent to the guidance in
31 Paragraphs II.Q.4.and 7 of SRP 17.5. Therefore, the NRC staff finds the alternative
32 equivalent to the staff's guidance.

- 33
- 34 • Bechtel proposed that requirements for control of commercial-grade items and services
35 will be established in Bechtel documents using 10 CFR Part 21 and the guidance of
36 Electric Power Research Institute (EPRI) NP-5652 as discussed in Generic Letter 89-02
37 and Generic Letter 91-05.

38

39 Dedication is outside the scope of NRC staff guidance provided in SRP 17.5.
40 Supplement 7S-1 of NQA-1-1994 addresses commercial-grade items. This statement
41 does not contradict the requirements in NQA-1-1994 or any NRC staff guidance on
42 commercial-grade dedication. Therefore, the NRC staff finds the proposed alternative
43 equivalent to the staff's guidance.

- 1 • Bechtel proposed to use other appropriate approved regulatory means and controls to
2 support its commercial-grade dedication activities. Bechtel will assume 10 CFR Part 21
3 reporting responsibility for all items that it dedicates as safety-related.

4
5 Dedication is outside the scope of NRC staff guidance provided in SRP 17.5.
6 Supplement 7S-1 of NQA-1-1994 addresses commercial-grade items. This statement
7 does not contradict the requirements in NQA-1-1994 or any NRC staff guidance on
8 commercial-grade dedication. Therefore, the NRC staff finds the proposed alternative
9 equivalent to the staff's guidance.

10
11 *Control of Measuring and Test Equipment*

- 12
13 • Bechtel proposed that the out of calibration conditions described in Paragraph 3.2 of
14 Supplement 12S-1 will be interpreted as “when the measuring and test equipment is
15 found out of the required accuracy limits, (i.e., out of tolerance during calibration).”
16 Paragraph 3.2 states in part that, when measuring and test equipment is found to be out
17 of calibration, an evaluation shall be made and documented of the validity of previous
18 inspection or test results and of the acceptability of items previously inspected or tested.

19
20 The NRC staff determined that the wording was essentially equivalent to the guidance in
21 Paragraph II.L.5 of SRP 17.5. Therefore, the NRC staff finds the alternative equivalent
22 to the staff's guidance.

23
24 *Handling, Storage, and Shipping*

- 25
26 • Bechtel proposed an alternative to the QATR, Subpart 2.1, Section 2.1, “Planning.”
27 Bechtel proposes that the required planning is frequently performed on a generic basis
28 for application to many installations on one or more projects. This results in standard
29 procedures or plans for installation and inspection and testing, which meet the
30 requirements of the standard. Individual plans for each item or system are not normally
31 prepared unless the work operations are unique. However, standard procedures or
32 plans will be reviewed for applicability in each case. Installation plans or procedures are
33 also limited in scope to those actions or activities which are essential to maintain or
34 achieve required quality. However, final cleaning or flushing activities will be performed
35 in accordance with procedures specific to the system.

36
37 This alternative was previously approved by the NRC staff in QATR BQ-TOP-1, dated
38 February 1988. Therefore, the NRC staff finds the alternative acceptable.

- 39
40 • Bechtel proposed an alternative to the QATR, Subpart 2.1, Section 5, “Pre-Installation
41 Cleanliness.” Bechtel proposed that as an alternate to this requirement, items may be
42 delivered to the installation site sooner than absolutely necessary when determined to
43 be advantageous for other considerations (e.g., reduced handling or easier access,
44 thereby reducing susceptibility to handling damage). In all such cases, equipment
45 stored in place will be protected in accordance with Subpart 2.1 of Section 6.

1 This alternative was previously approved by the NRC staff in QATR BQ-TOP-1, dated
2 February 1988. Therefore, the NRC staff finds the alternative acceptable.

- 3
4 • Bechtel proposed an alternative to the QATR, Subpart 2.2, Section 2.2, "Classification of
5 Items." Bechtel proposed that the four-level classification system may not be used
6 explicitly. However, the specific requirements for each classification as specified in the
7 standard will be applied to the items suggested in each classification and for similar
8 items.

9
10 This alternative was previously approved by the NRC staff in QATR BQ-TOP-1, dated
11 February 1988. Therefore, the NRC staff finds the alternative acceptable.

- 12
13 • Bechtel proposed classification differing from Section 2.2 will be considered acceptable,
14 provided no degradation is assured. For example, electric motors designed for outside
15 service may be stored in a level C area rather than a level B.

16
17 This alternative was previously approved by the NRC staff in QATR BQ-TOP-1, dated
18 February 1988. Therefore, the NRC staff finds the alternative acceptable.

- 19
20 • Bechtel proposed an alternative to the QATR, Subpart 2.2, Section 3.2, "Levels of
21 Packaging," and Section 3.5, "Caps, Plugs, Tapes, and Adhesives." Bechtel proposed
22 that for items in storage the packaging requirements described under Section 3,
23 "Packaging," may include alternate methods of affording required protection, such as
24 maintaining a storage atmosphere free from harmful contaminants in concentrations that
25 could produce damage to the stored items, thereby utilizing storage practices that
26 obviate the need for capping all openings.

27
28 The NRC staff found that Bechtel's proposed alternative provided an acceptable method
29 to ensure proper protection was afforded to equipment. Therefore, the NRC staff finds
30 the alternative acceptable.

- 31
32 • Bechtel proposed an alternative to the QATR, Subpart 2.2, Section 3.4.2, "Inert Gas
33 Blankets." Bechtel proposes that there may be cases involving large or complex shapes
34 for which an inert or dry air purge flow is provided rather than a static gas blanket in
35 order to provide adequate protection due to difficulty of providing a leak-proof barrier. In
36 these cases a positive pressure purge flow may be utilized as an alternative to the leak -
37 proof barrier.

38
39 This alternative was previously approved by the NRC staff in QATR BQ-TOP-1, dated
40 February 1988. Therefore, the NRC staff finds the alternative acceptable.

- 41
42 • Bechtel proposed an alternative to the QATR, Subpart 2.2 Section 8, "Records." Bechtel
43 proposes that the control of documentation and records shall be in accordance with
44 Section 17 of the QATR.

45
46 This alternative was previously approved by the NRC staff in QATR BQ-TOP-1, dated
47 February 1988. Therefore, the NRC staff finds the alternative acceptable.

- 48
49 • Bechtel proposed that alternate equivalent zone designations and requirements may be
50 utilized to cover those situations not included in Subpart 2.3. For example, situations in

1 which shoe covers and/or coveralls are required, but material accountability is not. In
2 addition, zones might be combined into the next more restrictive category in order to
3 reduce the total number of zones.
4

5 This alternative was previously approved by the NRC staff in QATR BQ-TOP-1, dated
6 February 1988. Therefore, the NRC staff finds the alternative acceptable.
7

8 *Quality Assurance Records*

9

- 10 • Bechtel proposed that for hard-copy records maintained by it, the records are suitably
11 stored in steel file cabinets or on shelving in containers, except that methods other than
12 binders, folders or envelopes may be used to organize the records for storage.
13 Supplement 17S-1, Section 4.2(b), requires records to be firmly attached in binders or
14 placed in folders or envelopes for storage in steel file cabinets or on shelving in
15 containers. Other Supplement 17S-1 records requirements, such as storage,
16 preservation, safekeeping, fire ratings for cabinets and fire protection will continue to be
17 met.
18

19 The NRC staff guidance of SRP 17.5, Paragraph II.F., does not address a methodology
20 for storage. An approved alternative (ADAMS Accession No. ML050340298) removed
21 all guidance regarding hard-copy storage requirements. Therefore, the NRC staff finds
22 the alternative acceptable.
23

24 The NRC staff concluded that the cited alternatives are either in conformance with the
25 guidance of SRP 17.5, or were part of the previously approved Bechtel QATR and the
26 bases are applicable to Bechtel's QA program.
27

28 4.0 CONCLUSION

29

30 The NRC staff evaluated Bechtel's QATR (Reference 8) submittal and the supplemental
31 correspondence. The NRC staff concluded that Bechtel's QA program description, including
32 alternatives, adequately addresses the requirements of Appendix B to 10 CFR Part 50, and is
33 therefore, acceptable.
34

35 5.0 REFERENCES

36

- 37 1. Bechtel letter from E. James Reinsch to NRC, "Bechtel Quality Assurance Program for
38 Nuclear Power Plants Topical Report, BQ-TOP-1, 2007 Edition, Revision 0," dated
39 April 23, 2007 (ADAMS Accession No. ML071160379).
40
- 41 2. NRC letter from Seymour H. Weiss to S.A. Bernsen, "NRC Acceptance of Bechtel QA
42 Topical Report," dated February 3, 1988 (Accession No. 8802100361).
43
- 44 3. Bechtel letter from T.V. Sarma to NRC, "Bechtel Quality Assurance Program for Nuclear
45 Power Plants, NRC Project #1365, Responses to Request for Additional Information
46 Regarding Topical Report BQ-TOP-1, 2007 Edition, Revision 0," dated August 23, 2007
47 (ADAMS Accession No. ML072390208).
48
- 49 4. NRC letter from Vanice Perin to T.V. Sarma, "Request for Additional Information (RAI)
50 Regarding the Bechtel Topical Report (TR) BQ-TOP-1, 2007 Edition, Revision 0,

- 1 "Quality Assurance Program for Nuclear Power Plants," (TAC NO. MD5365) dated
2 June 15, 2007 (ADAMS Accession No. ML071580407).
3
- 4 5. Safety Evaluation by NRC Office of Nuclear Reactor Regulation (NRR) of proposed
5 change to the QA programs, "Approval of Proposed Revision 70 to Quality Assurance
6 Topical Report EGC-1A, Revision 70, in Accordance with 10 CFR 50.54(a)
7 Requirements for Exelon/Amergen Plants," dated December 24, 2002 (ADAMS
8 Accession No. ML023440300).
9
- 10 6. Safety Evaluation by NRC Office of NRR of proposed change to the QA programs,
11 "Approval of Dominion Nuclear Connecticut and Virginia Electric and Power Company
12 Quality Assurance Program Description Topical Report for Millstone Power Station, Unit
13 No.s 1 2 and 3, North Anna Power Station Unit No.s 1 and 2, and Surry Power Station,
14 Unit Nos. 1 and 2," dated September 9, 2005 (ADAMS Accession No. ML071490455).
15
- 16 7. Bechtel Quality Assurance Program for Nuclear Power Plants, BQ-TOP-1, Revision 4A,
17 dated February 1988 (Accession No. 8803110142).
18
- 19 8. Bechtel Quality Assurance Program for Nuclear Power Plants, BQ-TOP-1, 2007 Edition,
20 Revision 1, dated October 4, 2007 (ADAMS Accession No. ML072820600).