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UniStar
NUCLEAR ENERGY

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November 20, 2009

UN#09-479

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Response to Request for Additional Information for the
Calvert Cliffs Nuclear Power Plant, Unit 3,
RAI No. 162, Initial Plant Test Program

References:
1) Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL RAI No. 162 CQVP 3412," email dated September 29, 2009

2) UniStar Nuclear Energy Letter UN#09-416, from Greg Gibson to Document Control Desk, U.S. NRC, Submittal of Response to RAI No. 162, Initial Plant Test Program, dated October 29, 2009

The purpose of this letter is to respond to the request for additional information (RAI) identified in the NRC e-mail correspondence to UniStar Nuclear Energy, dated September 29, 2009 (Reference 1). The RAI addresses the Initial Plant Test Program, as discussed in Section 14.2 of the Final Safety Analysis Report (FSAR), as submitted in Part 2 of the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Combined License Application (COLA), Revision 6.

Reference 2 stated that a response would be provided by November 20, 2009. The enclosure provides our responses to RAI No. 162, Questions 14.02-43 through 14.02-49, and includes

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revised COLA content. A Licensing Basis Document Change Request has been initiated to incorporate these changes into a future revision of the COLA.

Our responses do not include any new regulatory commitments. This letter does not contain any sensitive or proprietary information.

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Michael J. Yox at (410) 495-2436.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on November 20, 2009

Greg Gibson

Enclosure: Response to NRC Request for Additional Information, RAI No. 162, Initial Plant Test Program, Questions 14.02-43 through 14.02-49, Calvert Cliffs Nuclear Power Plant Unit 3

cc: Surinder Arora, NRC Project Manager, U.S. EPR Projects Branch
Laura Quinn, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2
U.S. NRC Region I Office

GTG/TD/mdf

UN#09-479

Enclosure

Response to NRC Request for Additional Information
RAI No. 162, Initial Plant Test Program, Questions 14.02-43 through 14.02-49
Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No 162

Question 14.02-43

In RAI 14.02-24, dated November 3, 2008 (ML083080607), the staff requested that the applicant revise the test abstracts under Section 14.2.14 to identify in which phase each test will be performed. In its response to the staff's RAI, dated December 22, 2008 (ML083650127), the applicant proposed to revise the tests described in Section 14.2.14 to indicate the applicable phase(s) in which testing will occur. In Revision 5 of the CCNPP3 COL FSAR, the applicant revised all of the test abstracts in Section 14.2.14 except for the following tests: 14.2.14.11 Portable Personnel Monitors and Radiation Survey Instruments, and 14.2.14.12 UHS Makeup Water Intake Structure and UHS Electrical Building Communication Systems. Therefore, the NRC staff requests that UniStar revise sections 14.2.14.11 and 14.2.14.12 of the CCNPP3 COL FSAR to identify in which phase each test will be performed.

Response

The tests associated with Portable Personnel Monitors and Radiation Survey Instruments and the UHS Makeup Water Intake Structure and UHS Electrical Building Communication Systems are to be completed during the preoperational testing phase. A schedule statement will be added to the applicable prerequisite sections. A test abstract on Plant Laboratory Equipment was added as FSAR Section 14.2.14.11 in Revision 6 of the COLA for CCNPP Unit 3. Consequently, FSAR Section 14.2.14.11 and 14.2.14.12 were renumbered as 14.2.14.12 and 14.2.14.13, respectively. The phase in which the test will be performed was not included in the new section. FSAR Section 14.2.14.11, Plant Laboratory Equipment will also be revised to include the phase in which the test will be performed.

COLA Impact

FSAR Sections 14.2.14.11, 14.2.14.12, and 14.2.14.13 will be updated as follows in a future COLA revision.

14.2.14.11 Plant Laboratory Equipment

1. OBJECTIVE

a. To demonstrate proper operation of laboratory equipment used to analyze or measure radiation levels.

b. To ensure proper operation of laboratory equipment used to analyze or measure isotopic concentrations (such as a mass spectrometer) of radioactive samples.

2. PREREQUISITES

Plant Laboratory Equipment testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

a. Construction activities on laboratory equipment support systems used to analyze or measure radiation levels are complete.

b. Construction activities on laboratory equipment support systems used to analyze or measure isotopic concentrations of radioactive samples are complete.

c. Construction activities related to the installation of vendor supplied laboratory equipment used to analyze or measure radiation levels are complete. The laboratory equipment has been installed per manufacture's recommendations.

d. Construction activities related to the installation of vendor supplied laboratory equipment used to analyze or measure isotopic concentrations of radioactive samples are complete. The laboratory equipment has been installed per manufacture's recommendations.

e. The laboratory equipment area radiological controls (such as postings, shielding, radioactive work permits) have been implemented or are capable of being implemented.

14.2.14.12 Portable Personnel Monitors and Radiation Survey Instruments

1. OBJECTIVES

   a. To demonstrate the ability of the Portable Personnel Monitors and Radiation Survey Instruments to monitor radiation levels.

   b. Provide local and remote indications, if applicable, to alert personnel of potential releases.

2. PREREQUISITES

Portable Personnel Monitors and Radiation Survey Instrument testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

   a. Construction activities on the Portable Personnel Monitors and Radiation Survey Instruments have been completed.

   b. Area ventilation systems in the area where the Portable Personnel Monitors and Radiation Survey Instruments are installed are functional.

   c. Plant ventilation systems in the areas where plant personnel are working are complete and functional.

   d. The plant access control has been established (doors and access points installed and wall, ceiling, and floor penetrations in their design condition). This prerequisite ensures that personnel exit routes that do not pass through the Portable Personnel Monitors and Radiation Survey Instruments have been eliminated.

   e. Test instrumentation available and calibrated.

   f. Support systems (120 volt AC, purge gas, etc.) are available.

14.2.14.13 UHS Makeup Water Intake Structure and UHS Electrical Building Communications System

1. OBJECTIVES

   a. To demonstrate the adequacy of the UHS Makeup Water Intake Structure and UHS Electrical Building intra-plant communications system to provide communications between vital plant areas.

2. PREREQUISITES

UHS Makeup Water Intake Structure and UHS Electrical Building Communications System testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

   a. Construction activities on the intraplant communications system have been completed.
   b. Support systems required for operation of the intraplant communications system are complete and functional.
   c. Plant equipment that contributes to the ambient noise level in the UHS Makeup Water Intake Structure and UHS Electrical Building shall be in operation.

RAI No 162

Question 14.02-44

In response to RAI 14.02-38, the applicant significantly revised Section 14.2.2, "Organization and Staffing," of the Calvert Cliffs Unit 3 COL FSAR. This revision included new organizational descriptions and titles for the staff participating in the initial test program. Specifically, the positions of Startup Manager, Startup Engineering Support Supervisor, Startup Engineer, and Preoperational Engineer were removed from Section 14.2.2 in the proposed revision. However, these positions are still referred to throughout Section 14.2, "Initial Test Program." Therefore, the NRC staff requests that UniStar revise the remainder of Section 14.2 to reflect the new organizational structure described in the proposed revision to Section 14.2.2 in response to RAI 14.02-38.

Response

The remainder of FSAR Section 14.2 will be revised to reflect the new organization structure.

COLA Impact

FSAR Sections 14.2.1, 14.2.3, 14.2.3.1, 14.2.3.5, 14.2.3.6, 14.2.5.1, 14.2.5.2, and 14.2.5.3 will be updated as follows in a future COLA revision:

14.2.1 SUMMARY OF TEST PROGRAM AND OBJECTIVES

No departures or supplements.

14.2.1.1.4 Phase III - Initial Criticality and Low Power Physics Testing

This section of the U.S. EPR FSAR is incorporated by reference with the following supplement.

For Item 6, following "The initial criticality and low-power physics tests (LPPT) as a minimum consist of the following:"

Verification that the Technical Specification SR 3.1.2.1 requirement of 1000 pcm is met. At this point the ~~Test Coordinator (or equivalent)~~ Site Commissioning Integration Supervisor or designee should verify that initial criticality activities have been completed and transition to those activities supporting low power physics testing.

14.2.1.1.5 Phase IV - Power Ascension Testing

No departures or supplements.}

14.2.3 TEST PROCEDURES

{This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

The U.S. EPR FSAR Section 14.2.3 text identified above is modified as follows for CCNPP Unit 3 FSAR Section 14.2.3:

In general, pump shutoff head values are obtained by verifying two or more developed head versus flow points on the vendor supplied pump curve and extrapolating the shutoff head. One of the points should be just greater than the recommended minimum flow point. The ~~Startup Manager (or equivalent)~~ Mechanical Commissioning Supervisor or designee shall approve the collection of any actual shutoff head test point.}

The U.S. EPR FSAR includes the following COL Item in Section 14.2.3:

> A COL applicant that references the U.S. EPR design certification will provide site-specific information for review and approval of test procedures.

This COL Item is addressed as follows:

Site-specific information regarding review and approval of test procedures is provided in the following subsections.

Sections 14.2.3.1 through 14.2.3.6 are added as a supplement to the U.S. EPR FSAR.

14.2.3.1 Test Procedure Preparation and Execution

Draft procedures, for Phases I through IV tests, are typically provided by ~~AREVA~~ {the Project Delivery Consortium}. These procedures ensure that the design bases attributes are verified by field measurements. Each test procedure is prepared using references provided by the appropriate design and vendor organizations, the U.S. EPR FSAR, the FSAR, the Technical Specifications, and the applicable Regulatory Guides.

The site approval process is as follows:

- Each draft test procedure is reviewed by the TRT to ensure that procedural requirements are met and any required changes are incorporated.

- The {~~Startup Manager~~ Site Commissioning Manager – Startup, Testing, and Commissioning or designee} approves test procedures and ensures that tests are properly scheduled and performed as scheduled.

The control of procedures as it relates to distribution, version control, modifications, and revisions will meet the administrative control requirements as described In Section 13.5.

14.2.3.5 Procedure Adherence Policy

The startup organization shall employ a verbatim procedure adherence program and document violations to the program in the Corrective Action Program. When a procedural step is discovered that cannot be performed as written the plant

shall be placed in a safe condition in accordance with the restoration guidance in the procedure or as determined by ~~the~~ {a Senior Reactor Operator, responsible Commissioning Supervisor, or designee} and all related testing activities placed on hold by the {~~Startup/Preoperational Test Engineer~~ responsible Commissioning Supervisor or designee} until the procedure is revised.

The decision to interrupt the performance of a test is the responsibility of the {~~Startup/Preoperational Test Engineer~~ responsible Commissioning Supervisor or designee, or a ~~/~~Senior Reactor Operator} but in cases of personnel or equipment safety issues, any of the personnel involved with the test can interrupt a test in progress. When a test has been interrupted, the {~~Startup/Preoperational Test Engineer~~ responsible Commissioning Supervisor or designee} ~~and {Senior Operator~~ will determine if the test can be safely resumed at the point it was interrupted or whether the test must be restarted at the beginning of the test.

14.2.3.6 Maintenance/Modification Procedures

Work authorization documents, controlled in accordance with procedures, are used to initiate maintenance and implement modifications on systems turned over by the construction organization. The work authorization document assigns an organization responsibility for the completion of the activity and specifies retest requirements. Upon completion of an activity, a copy of the executed form is returned to the responsible testing organization to ensure retest requirements are met. Results of retests due to maintenance shall be reviewed by the responsible {~~Startup/Preoperational Test Engineer~~ Commissioning Supervisor or designee} to ensure compliance with required acceptance criteria, including compliance with ITAAC commitments. Results of retests due to maintenance activities or modifications will be reviewed and approved in the same manner as those from the original tests.

Systems declared operational will be maintained and tested per operational procedures unless returned to startup organization control.

14.2.5.1 Procedure Review and Evaluation

The responsible {~~Startup/Preoperational Test~~ test engineer} presents to the responsible reviewer a completed test procedure and test report with remarks and recommendations. During this review, the {~~Startup/Preoperational Test Engineer~~ test engineer} and/or the reviewer initiates action items in a tracking system to document failure to meet Test (Review) or Acceptance Criteria.

Individual test results are reviewed and approved by the startup organization supervision as described in the site-specific administrative procedures prior to presenting the results to the TRT. Specific acceptance criteria for determining the success or failure of a test are included as part of its procedure and are used during review to determine adequacy. If a system does not meet its acceptance criteria in its as-built configuration, an engineering evaluation is performed.

Following this review, the completed procedure and test report is submitted to the TRT for final review, evaluation and approval recommendation. The TRT review

package also includes any completed engineering evaluations, if they were performed.

14.2.5.2 Test Review Team

The TRT shall advise on the technical adequacy of the testing program. The TRT functions include coordinating organizational responsibility for test procedures and for review, evaluation, and approval recommendation of test results. The TRT chairman is appointed by the {~~Startup Manager~~ Site Commissioning Manager – Startup, Testing, and Commissioning} and the team's minimum membership is:

- {TRT Chairman
- ~~AREVA Project Representative~~
- ~~Architect Engineer Project Representative~~ Project Delivery Consortium Representative
- Engineering Department Representative
- Operating Department Representative}

The TRT members are chosen to provide subject-matter expertise in specific testing phases. Composition of the TRT may be augmented from time to time to obtain necessary additional expertise.

The TRT performs the following startup functions:

- Evaluates adequacy of startup tests prior to test performance.
- Reviews completed startup test results and verifies that field revisions did not compromise the intent of the procedure.
- Assures that plant testing documents that the design objectives are met.
- Verify that the test results that do not meet acceptance criteria are entered into the corrective action program and the affected and responsible organizations are notified and have assumed responsibility for resolving the acceptance criteria deficiency.
- Implementation of corrective actions and retests are performed as required prior to proceeding to the next phase.
- Reviews and approves carryover of prerequisites and Phase I tests to Phases II through IV. Ensures that the justification for test deferral requests include a schedule for their performance.

- Reviews, evaluates, and provides approval recommendations for completed procedures, test reports, and engineering evaluations.

- Maintains records of ITAAC reviews and ensures that work is performed prior to proceeding to the next testing Phase.

- Issues a formal recommendation to proceed to the next testing Phase.

14.2.5.3 Test Expectations

Test results for each phase of the test program are reviewed and verified as complete (as required) and satisfactory before the next phase of testing is started. Phase I testing on a system is normally not started until all applicable prerequisite tests have been completed, reviewed and approved. Prior to initial fuel loading and commencement of initial criticality, a comprehensive review of required completed Phase I tests is conducted by the TRT. This review provides assurance that required plant systems and structures are capable of supporting initial fuel loading and subsequent startup testing.

Phase I testing is completed prior to commencing initial fuel loading. If prerequisite or Phase I tests or portions of such tests cannot be completed prior to commencement of fuel loading, provisions for carryover testing is planned and approved in accordance with the site-specific administrative procedures.

When carryover testing is required, the {~~Startup Manager~~ Site Commissioning Manager-Startup, Testing, and Commissioning or designee} approves each test and identifies the portions of each test that are delayed until after fuel loading. Technical justifications for delays are documented together with a schedule (power level) for completing each carryover test. Carryover testing is approved by the TRT as described in Section 14.2.5. Documentation for carryover testing is available for NRC review, as required, prior to commencing fuel loading.

Startup testing phases (Phases II, III, and IV) of the test program are subdivided into the following categories:

- Initial fuel load.

- Precritical tests.

- Initial criticality.

- Low power physics testing.

- Power ascension testing. This testing phase ends with the completion of testing at 100% power.

Each subdivision is a prerequisite which must be completed, reviewed, and approved before tests in the next category are started. The TRT membership is increased prior to beginning the low power physics testing phase by adding the {Plant General Manager, Engineering Manager, Operations Manager, and

Maintenance Manager} to the TRT. Power ascension tests are scheduled and conducted at pre-determined power levels. The power ascension plateaus areas follows:

RAI No 162

Question 14.02-45

In response to RAI 14.02-38, the applicant significantly revised Section 14.2.2, "Organization and Staffing," of the Calvert Cliffs Unit 3 COL FSAR. Specifically, the applicant proposed a new startup organization for the initial test program whose roles and responsibilities differ from the previously described organization in revision 5 of the Calvert Cliffs Unit 3 COL FSAR.

SRP Section 14.2.II. "COL/OL Applicants" 3.E.ii states, in part, that the applicant should use the NSSS vendor, architect-engineer, and other major contractors, as appropriate, to provide the test objectives and acceptance criteria used in developing detailed test procedures.

The staff requests that UniStar revise Section 14.2.2 to reinstate the provision that the NSSS vendor, architect-engineer, and other major contractors, as appropriate, should provide the test objectives and acceptance criteria used in developing detailed test procedures.

Response

The following bulleted item will be added to the responsibilities of the Project Delivery Consortium in FSAR Section 14.2.2. The Project Delivery Consortium consists of the NSSS vendor and architect-engineer who will provide objectives and acceptance criteria for developing detailed test procedures.

"Providing the objectives and acceptance criteria used in developing detailed test procedures"

COLA Impact

FSAR Section 14.2.2 (under "Project Delivery Consortium") will be modified as discussed above in a future COLA revision. See the COLA Impact section associated with Question 14.02-46.

RAI No 162

Question 14.02-46

Subsection 14.2 of Revision 5 of the CCNPP3 FSAR described the roles and responsibilities of the Startup Manager, Startup Engineering Support Supervisors, System Engineers, Startup and Preoperational Engineers, the Architect Engineering Personnel, and the Areva Site Startup Organization. Specifically, these positions had, in part, the following responsibilities:

- Approving startup administrative procedures
- Approving startup technical procedures
- Approving startup test schedule
- Approving work and procedures that are prerequisites for ITP
- Developing and implementing administrative controls to address system and equipment configuration control
- Managing the development and approval of procedures to support the ITP
- Responsibility for specific systems/subsystems for the ITP
- Providing technical guidance and assistance in testing and the preparation of test procedures
- Recommending changes in plant design and/or construction to facilitate testing, operation, and maintenance
- Assuring that assigned test procedures are written and testing is conducted in accordance with the site specific administrative procedures
- Supervising testing and reporting current status of ITP
- Coordinating activities among involved groups
- Providing the objectives and acceptance criteria used in developing detailed test procedures.
- Providing a designated member of the test review team.
- Evaluating test results
- Providing technical support and liaison with the startup organization to coordinate problem resolution.
- Provide the objectives and acceptance criteria used in developing detailed test procedures.
- Provide initial procedure drafts of startup test procedures and review proposed changes.
- Provide technical advice and consultation to the plant staff during the conduct of the test program.

These functions are not described in the proposed revision the Subsection 14.2 of the CCNPP3 COL FSAR provided in response to RAIs 14.02-37 and 14.02-38. Please identify which positions in the revised startup organization will perform each of these tasks and revise Subsection 14.2 accordingly.

Response

Table 1 identifies the position/group responsibilities listed in the question. The table also shows the position/group responsibilities in the new organization.

Table 1, Calvert Cliffs Nuclear Power Plant Unit 3 Responsibilities

Responsibilities	**New Organization Person or Group**
Approving startup administrative procedures	Site Commissioning Manager – Startup, Testing, and Commissioning
Approving startup technical procedures	Site Commissioning Manager – Startup, Testing, and Commissioning
Approving startup test schedule	Site Commissioning Manager – Startup, Testing, and Commissioning
Approving work and procedures that are prerequisites for ITP	Site Commissioning Manager – Startup, Testing, and Commissioning
Developing and implementing administrative controls to address system and equipment configuration control	Project Delivery Consortium
Managing the development and approval of procedures to support the ITP	Manager Commissioning Program Development
Responsibility for specific systems/subsystems for the ITP	System Engineers
Providing technical guidance and assistance in testing and the preparation of test procedures	System Engineers
Recommending changes in plant design and/or construction to facilitate testing, operation, and maintenance	System Engineers
Assuring that assigned test procedures are written and testing is conducted in accordance with the site specific administrative procedures	Project Delivery Consortium
Supervising testing and reporting current status of ITP	Project Delivery Consortium
Coordinating activities among involved groups	Project Delivery Consortium
Providing the objectives and acceptance criteria used in developing detailed test procedures	Project Delivery Consortium
Providing a designated member of the test review team	Project Delivery Consortium
Evaluating test results	Project Delivery Consortium
Providing technical support and liaison with the startup organization to coordinate problem resolution	Project Delivery Consortium
Provide the objectives and acceptance criteria used in developing detailed test procedures	Project Delivery Consortium
Provide initial procedure drafts of startup test procedures and review proposed changes	Project Delivery Consortium
Provide technical advice and consultation to the plant staff during the conduct of the test program	Project Delivery Consortium

FSAR Section 14.2.2 will be updated to reflect these responsibilities.

COLA Impact

FSAR Sections 14.2.2 will be updated as follows in a future COLA revision. The changes below represent the changes as a result of Questions 14.02-45, 14.02-46, 14.02-47, 14.02-48, and 14.02-49.

Startup Organization

{The organizational units with roles in the CCNPP Unit 3 startup organization include the UniStar Nuclear Energy (UNE) startup organization, the Project Delivery Consortium (see Section 13.1.1.1.6 and Figure 13.1-2), and UniStar Nuclear Operating Services, LLC.

~~UniStar Nuclear Energy (~~UNE~~)~~ will have both a corporate startup organization and a site-specific organization at CCNPP Unit 3. The corporate startup organization is led by the Vice

President - Startup, Testing, and Commissioning. Figure 13.1-3 includes the corporate structure. The CCNPP Unit 3 site organization is led by the Site Commissioning Manager who reports to the corporate Manager of Commissioning Integration. The Manager of Commissioning Integration reports to the Vice President - Startup, Testing, and Commissioning. The CCNPP Unit 3 site organization is represented in Figure 13.1-4. The UNE Startup, Testing, and Commissioning organization has an oversight role for the initial startup test program.

The Project Delivery Consortium has the responsibility to develop, manage, and execute the initial startup test program.

UniStar Nuclear Operating Services, LLC organization is described in Chapter 13. The corporate and site organization are also represented in Figures 13.1-3 and 13.1-4, respectively. UniStar Nuclear Operating Services, LLC participates as a member of the Test Review Team (Section 14.2.5.2) and in the operation of plant equipment.

~~The UNE Startup, Testing, and Commissioning group provides oversight and confirmation of system, structure, and component testing. This group ensures system turnover and testing procedures and boundaries are complete, accurate, and sufficiently clear to allow for the safe and efficient turnover of systems to UniStar Nuclear Operating Services, LLC. This group also provides direct support to UniStar Nuclear Operating Services, LLC for system turnover and plant testing to ensure requirements are met.~~

~~System completion, turnover of systems, and turnover of facility areas will be conducted according to fleetwide processes under development by UNE. This will occur on a schedule that coordinates with EPC Agreement requirements and is in line with NRC requirements and those of other regulatory agencies governing the CCNPP Unit 3 project. Commissioning and startup include some portions of the overall inspections, tests, analyses, and acceptance criteria (ITAAC). The commissioning and startup program include construction inspections and tests to verify that structures, systems and components have been installed in conformance with design specifications, drawings and other design documents. This group ensures system turnover and testing procedures and boundaries are complete, accurate, and sufficiently clear to allow for the safe and efficient turnover of systems to UniStar Nuclear Operating Services, LLC. This group also provides direct support to UniStar Nuclear Operating Services, LLC for system turnover and plant testing to ensure requirements are met.~~

The description below provides the principal positions of the UNE organization, followed by a description of UniStar Nuclear Operating Services, LLC and the Project Delivery Consortium.

Vice President - Startup, Testing, and Commissioning

The Vice President - Startup, Testing, and Commissioning reports to the Senior Vice President - Services and is the executive level manager responsible for the development (in conjunction with the Consortium) and management of the CCNPP Unit 3 ~~startup, testing, and commissioning program~~ initial startup test program. Three groups of functional level managers and staff report to the Vice President - Startup, Testing, and Commissioning.

The Manager of Commissioning Program Development reports to the Vice President - Startup, Testing, and Commissioning and works directly with the Project Delivery Consortium staff to manage the development of administrative and technical procedures to support the startup test program. The administrative procedures ~~Working closely with the Project Delivery Consortium~~

~~(See Section 13.1.1.1.6) personnel responsible for testing and system turnover, commissioning program development personnel develop procedures~~ describe~~ing~~ organizational responsibilities and interfaces between the Project Delivery Consortium, UNE testing personnel, and the UniStar Nuclear Operating Services, LLC ~~operational staff who will be accepting system turnover, maintaining configuration control, manipulating controls during testing, and reviewing test results~~.

Planning and scheduling personnel ensure testing schedules are aligned with construction and turnover schedules and that the proper organizational resources are available when needed. Detailed monitoring of testing performance is conducted to ensure problems are quickly identified and corrected and to ensure that proper and timely notification of ITAAC performance is made to required parties, including the NRC.

Oversight of coordination of ~~actual startup, testing, and commissioning~~ initial startup test program activities is performed by Startup, Testing, and Commissioning personnel located at the site. The Site Commissioning Manager - Startup, Testing, and Commissioning will lead the site work for UNE and report to the corporate Manager Commissioning Integration.

Site Commissioning Manager - Startup, Testing, and Commissioning

The Site Commissioning Manager reports to the Manager - Commissioning Integration (corporate) and ~~functionally~~ also has a matrix report~~s~~ to the Site Vice President of UniStar Nuclear Operating Services, LLC. Site Commissioning Manager is responsible for oversight and proper implementation of the preoperational and startup test program, including providing technical advice to people conducting the tests, briefing personnel responsible for operation of the plant during the tests, ensuring that the tests are performed in accordance with the applicable procedures, and reviewing test results and analyses.

The Site Commissioning Manager - Startup, Testing, and Commissioning will also have the following responsibilities during the initial startup test program:

- Approving startup administrative procedures;
- Approving startup technical procedures;
- Approving startup test schedule; and
- Approving work and procedures that are prerequisites for startup test program.

The Site Commissioning Manager executes these responsibilities through supervisors and technical personnel for mechanical, electrical, and I&C commissioning as well as overall integration of commissioning testing and test analysis and documentation. The supervisors in these areas ~~functionally~~ also have a matrix report to the Operations Manager to ensure efficient integration of commissioning staff with the plant operational staff for the testing and commissioning phase.

There are five supervisors that report the Site Commissioning Manager which include:

- Site Commissioning Integration Supervisor;
- Test Analysis & Documentation Supervisor;
- Mechanical Commissioning Supervisor;

- Electrical Commissioning Supervisor; and
- I&C Commissioning Supervisor.

~~During startup and commissioning, the Site Commissioning Integration, Test Analysis & Documentation, Mechanical Commissioning, Electrical Commissioning, and I&C Commissioning Supervisors (who report to the UNE Site Commissioning Manager) also report to and coordinate with the Operations Manager to ensure startup and commissioning activities are conducted safely and in accordance with station expectations and procedures.~~

Site Commissioning Integration Supervisor

Site Commissioning Integration Supervisor reports to the Site Commissioning Manager – Startup, Testing, and Commissioning. The Site Commissioning Integration Supervisor supports the Site Commissioning Manager to ensure proper oversight in implementing the initial startup test program, including providing technical advice to people conducting the tests, briefing personnel responsible for operation of the plant during the tests, and ensuring that the tests are performed in accordance with the applicable procedures. Provides oversight for non-system specific testing such as physics and chemistry testing and also supports the Test Analysis & Documentation Supervisor in the review of test results and documentation of startup test results and analyses.

Test Analysis & Documentation Supervisor

Test Analysis & Documentation Supervisor reports to the Site Commissioning Manager – Startup, Testing, and Commissioning. The Test Analysis & Documentation Supervisor supports the Site Commissioning Manager to ensure proper oversight in the review of test results and documentation of initial startup test results and analyses.

Mechanical Commissioning Supervisor

Mechanical Commissioning Supervisor is responsible for oversight and proper implementation of the initial startup test program, including providing technical advice to people conducting the tests, briefing personnel responsible for operation of the plant during the tests, and ensuring that the tests are performed in accordance with the applicable procedures. The Mechanical Commissioning Supervisor is responsible in the area of mechanical performance and also supports the Test Analysis & Documentation Supervisor in the review of test results and documentation of initial startup test results and analyses.

Electrical Commissioning Supervisor

Electrical Commissioning Supervisor is responsible for oversight and proper implementation of the startup test program, including providing technical advice to people conducting the tests, briefing personnel responsible for operation of the plant during the tests, ensuring that the tests are performed in accordance with the applicable procedures, and reviewing test results and analyses. The Electrical Commissioning Supervisor is responsible in the area of electrical performance and also supports the Test Analysis & Documentation Supervisor in the review of test results and documentation of initial startup test results and analyses.

I&C Commissioning Supervisor

I&C Commissioning Supervisor reports to Site Commissioning Manager – Startup , Testing, and Commissioning and is responsible for oversight and proper implementation of the initial startup test program, including providing technical advice to people conducting the tests, briefing personnel responsible for operation of the plant during the tests, and ensuring that the tests are performed in accordance with the applicable procedures. The I&C Commissioning Supervisor is responsible in the area of I&C performance and also supports the Test Analysis & Documentation Supervisor in the review of test results and documentation of initial startup test results and analyses.

UniStar Nuclear Operating Services, LLC

The UniStar Nuclear Operating Services, LLC plant operating, maintenance, and engineering personnel are utilized to the extent practicable during the Startup Test Program. ~~T~~After system turnover, the plant staff operates permanently installed and powered equipment ~~for Phases I through IV and subsequent system tests~~. Plant personnel such as instrument, chemistry, computer, radiation protection, and maintenance personnel are used to assist in the performance of tests and inspections in the areas in which they will primarily work during plant operation. Using plant staff, during startup in their respective operational areas, will maximize the transfer and retention of experience and knowledge gained during the startup program to the subsequent commercial operation. The Site Commissioning Manager will coordinate the use of the staff with the Site Vice President and the Project Delivery Organization. As indicated in Section 14.2.5.2, UniStar Nuclear Operating Services, LLC participates as a member of the Test Review Team.

The UniStar Nuclear Operating Service, LLC System Engineers have the following responsibilities during the initial startup test program:

- Responsibility for specific systems/subsystems;
- Providing technical guidance and assistance in testing and the preparation of test procedures; and
- Recommending changes in plant design and/or construction to facilitate testing, operation, and maintenance.

Project Delivery Consortium

The Project Delivery Consortium is discussed in Section 13.1.1.1.16. The Project Delivery Consortium consists of AREVA, Bechtel, and Alstom. The Project Delivery Consortium is responsible for developing the initial plant test program, procedures, and directing the tests at the CCNPP Unit 3. Personnel formulating and conducting test activities are not the same personnel who designed or are responsible for satisfactory performance of the system(s) or design features(s) being tested.

The Project Delivery Consortium will coordinate the construction schedules with startup test program requirements and provide manpower support as needed to meet the schedule, to correct deficiencies, or to make repairs. The organization provides technical advice and

consultation on matters relating to the design, construction, operation, and testing of systems and equipment.

The Project Delivery Consortium directs and controls startup program technical and functional test activities, including prerequisite work and testing Phases I through IV. The Project Delivery Consortium is responsible for:

- Developing the startup program;
- Providing the objectives and acceptance criteria used in developing detailed test procedures;
- Developing administrative and technical startup procedures;
- Ensure the procedures are reviewed and approved as required;
- Planning, organizing, scheduling, directing, and controlling Startup activities (subject to UNE oversight);
- Managing Startup Program contracts to ensure accurate and timely compliance;
- Developing the Startup Test Schedule;
- Maintaining liaison with UNE to keep them informed of status, emerging problems in their respective areas, and support requirements,
- Directing the startup tests (subject to UNE oversight) in accordance with site specific administrative procedures;
- Reporting the status of the startup tests;
- Developing and implementing administrative controls to address system and equipment configuration control;
- Providing representatives to site administrative groups or committees as requested by the Site Commissioning Manager;
- Reviewing test procedures;
- Evaluating test results; ~~and~~
- Providing technical support and liaison with the Site Commissioning Manager to coordinate problem resolution.;
- Coordinating activities among involved groups;
- Providing a designated member of the test review team; and

- Provide technical advice and consultation to the plant staff during the conduct of the test program.

RAI No 162

Question 14.02-47

In response to RAIs 14.02-37 and 14.02-38, UniStar provided a proposed revision to Subsections 13.1 and 14.2 of the CCNPP3 COL FSAR. In the proposed revision to Subsection 14.2, the applicant states, in part, that there are five supervisors that report to the Site Commissioning Manager which include the Site Commissioning Integration Supervisor, the Test Analysis & Documentation Supervisor, the Mechanical Commissioning Supervisor, the Electrical Commissioning Supervisor, and the I&C Commissioning Supervisor. In the proposed revision to Subsection 13.1, the applicant states that these positions have the equivalent training, education, and qualification requirements as the functional positions of preoperational and startup engineers, as described in ANS-3.1-1993.

The NRC staff requests that UniStar clarify whether these five supervisors will be performing the tests in the initial test program in the role of preoperational and startup engineers or whether they will be supervising staff performing these functions. In addition, the NRC staff requests that the applicant revise Subsection 14.2 to clearly reflect the role of these supervisors in the conduct of the initial test program.

Response

The five supervisors that report to the Site Commissioning Manager will not be performing any test during the initial test program. This is described in FSAR Section 14.2.2. The role of the Site Commissioning Manager is for oversight and proper implementation of the preoperational and startup test program.

FSAR Section 14.2.2, under the "Site Commissioning Manager – Startup, Testing, and Commissioning" states,

"Site Commissioning Manager is responsible for oversight and proper implementation of the preoperational and startup test program, including providing technical advice to people conducting the tests, briefing personnel responsible for operation of the plant during the tests, ensuring that the tests are performed in accordance with the applicable procedures, and reviewing test results and analyses. The Site Commissioning Manager executes these responsibilities through supervisors and technical personnel for mechanical, electrical, and I&C commissioning as well as overall integration of commissioning testing and test analysis and documentation."

FSAR Section 14.2.2 (under Project Delivery Consortium) states that the Project Delivery Consortium is responsible for developing the initial plant test program, procedures, and directing the tests at the CNPP Unit 3.

The responsibilities of the supervisors will be added to Chapter 14.

COLA Impact

FSAR Section 14.2.2 will be updated as discussed above in a future COLA revision. The modifications are represented in the COLA Impact Section for Question 14.02-46.

RAI No 162

Question 14.02-48

In response to RAIs 14.02-37 and 14.02-38, UniStar proposed a revision to Organization and Staffing Section of Subsection 14.2.2 of the CCNPP3 COL FSAR. The revision to Subsection 14.2.2 states, in part, that the commissioning and startup program include construction inspections and tests to verify that structures, systems and components have been installed in conformance with design specifications, drawings and other design documents. This group ensures system turnover and testing procedures and boundaries are complete, accurate, and sufficiently clear to allow for the safe and efficient turnover of systems to UniStar Nuclear Operating Services, LLC. This group also provides direct support to UniStar Nuclear Operating Services, LLC for system turnover and plant testing to ensure requirements are met.

The above description appears to describe construction acceptance testing and the turnover process. The NRC staff requests that the applicant clarify how the above description relates to the initial test program and revise Subsection 14.2.2 accordingly.

Response

Construction acceptance testing relation to the Startup Test Program

U.S. EPR FSAR Section 14.2.1.1 provides a summary of the Startup Test Program and states that there are four phases. The four phases are Phase I, preoperational testing program, Phase II, initial fuel loading and precritical testing, Phase III, initial criticality and low power physics testing, and Phase IV, power ascension testing. It also states that the startup test program includes testing activities that commence with the completion of construction and installation and end with the completion of the power ascension testing. U.S. EPR FSAR Section 14.2.1.1.1 discusses construction activities. Construction activities consist of tests and inspections required to confirm that construction is complete and that systems are ready for preoperational testing. Some of the construction activities are listed in U.S. EPR Section 14.2.1.1.1.

U.S. EPR FSAR Sections 14.2.1.1 and 14.2.1.1.1 have been incorporated by reference into the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 FSAR.

The abstracts of the startup tests within the scope of the CCNPP Unit 3 Startup Test Program are included in U.S. EPR FSAR Section 14.2.12 and those tests identified in COLA FSAR Section 14.2.14 (COL Applicant Site-Specific Tests).

The Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for CCNPP Unit 3 are specified in COLA Part 10. The ITAAC consist of the U.S. EPR FSAR Tier 1 ITAAC and site-specific ITAAC.

The ITAAC provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria are met, a facility will be operated in accordance with the design certification, the provisions of the Atomic Energy Act, and NRC regulations (10 CFR 52.47(b)(1)).

The Startup Test Program demonstrates that structures, systems, and components (SSC) will operate and comply with design requirements and meet the requirements of 10 CFR 50, Appendix B, Criterion XI. The startup test program results confirm that performance levels meet the functional safety requirements and verify the adequacy of SSC design and the functionality of systems over their operating ranges.

Procedures are required for each test within the scope of the Startup Test Program (FSAR Section 14.2.3). Some of the procedures developed for the preoperational phase of the Startup Test Program also satisfy some of the testing requirements defined within the scope of the ITAAC. COLA FSAR Section 14.2.11 requires the COL Holder to identify and cross reference each test (or portion thereof) required to be completed before initial fuel loading and that is designed to satisfy the requirements for completing ITAAC. This will be provided to the NRC at least 60 days prior to their scheduled performance date.

Most ITAAC will be closed during the construction phase but all of the ITAAC will be closed before initial fuel load (i.e., the end of Phase I, preoperational test phase and prior to the start of Phase II of the Startup Test Program). Due to the overlap between the ITAAC and the Startup Testing, FSAR Section 14.2.2 included a discussion of construction acceptance testing. However, the description under Startup Organization will be revised to limit the discussion to the organizational units associated with each phase of the Startup Test Program.

Turnover and the Startup Test Program

In the response to RAI No. 21 Question 14.02-7[1], UniStar Nuclear Energy has proposed changes to FSAR Section 14.2.1 to describe the content of site-specific administrative procedures which cover the turnover process from the construction organization to the startup organization. The changes were not included in Revision 6 of the CCNPP Unit 3. FSAR Section 14.2.1 will be updated as indicated below in the COLA Impact section in a future COLA revision.

The description in FSAR 14.2.2 will be revised to limit the discussion to responsibilities in managing, developing, or conducting the four phases of the startup test program.

COLA Impact

FSAR Sections 14.2.1 will be updated as follows in a future COLA revision:

14.2.1 SUMMARY OF TEST PROGRAM AND OBJECTIVES

No departures or supplements

14.2.1.1.1 Construction Activities

~~No departures or supplements~~The official turnover of systems or portions of systems from the construction organization to the startup organization is

[1] UniStar Nuclear Energy Letter UN#08-071, from Greg Gibson to Document Control Desk, U.S. NRC, Submittal of Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant Unit 3, RAI No. 21, Revision 0 Question 14.02.02-7, Initial Plant Test Program – Design Certification and New License Applicants, dated November 21, 2008

controlled by site-specific administrative procedures. The administrative procedures:

- Require components within the turnover boundary to be clearly designated;
- Require a review of construction activities to ensure that required construction activities within the turnover boundary are completed, or require identification of any incomplete construction activities;
- Require formal acceptance and turnover approval by the Site Commissioning Manager; and
- Establish controls to prevent unauthorized construction work activities within the turnover boundary to prevent potential safety issues.

FSAR Section 14.2.2 will be updated as discussed above in a future COLA revision. The modifications are represented in the COLA Impact Section for Question 14.02-46.

RAI No 162

Question 14.02-49

In RAI 14.02-16, the staff noted that Regulatory Guide (RG) 1.206, Section C.1.14.2.2, "Organization and Staffing," states that "the COL applicant should implement measures to ensure that personnel formulating and conducting test activities are not the same personnel who designed or are responsible for satisfactory performance of the system(s) or design features(s) being tested," and requested that the applicant revise its FSAR to include such provisions. In response to RAI 14.02-16, the applicant added the above language to Subsection 14.2.2.

In response to RAI 14.02-38, the applicant proposed a major revision to the organizational and staffing section of Subsection 14.2.2 and the above language was not included in the proposed revision. The NRC staff requests that the language included in response to RAI 14.02-16 be reinstated in Subsection 14.2.2 of the CCNPP3 COL FSAR.

Response

FSAR Section 14.2.2 will be modified to include the statement indicated in the question.

COLA Impact

FSAR Section 14.2.2 under "Project Delivery Consortium" will be modified as indicated in the COLA Impact Section for Question 14.02-46.