FINAL SAFETY ANALYSIS REPORT

CHAPTER 14

VERIFICATION PROGRAMS

14.0 VERIFICATION PROGRAMS

This chapter of the U.S. EPR Final Safety Analysis Report (FSAR) is incorporated by reference with supplements as identified in the following sections.

14.1 SPECIFIC INFORMATION TO BE ADDRESSED FOR THE INITIAL PLANT TEST PROGRAM

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

14.2 INITIAL PLANT TEST PROGRAM

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

14.2.1 Summary of Test Program and Objectives

No departures or supplements.

14.2.1.1 {Summary of the Startup Test Program

No departures or supplements

14.2.1.1.1 Construction Activities

The official turnover of systems or portions of systems from the construction organization to the startup organization is 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 with 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.

14.2.1.1.2 Phase I - Preoperational Testing

No departures or supplements

14.2.1.1.3 Phase II - Initial Fuel Loading and Precritical Testing

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 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.}

14.2.2 Organization and Staffing

The U.S. EPR FSAR includes the following COL Item in Section 14.2.2:

A COL applicant that references the U.S. EPR certified design will provide site-specific information that describes the organizational units that manage, supervise, or execute any phase of the test program. This description should address the organizational authorities and responsibilities, the degree of participation of each identified organizational unit, and the principal participants. The COL applicant should also describe how, and to what extent, the plant's operating and technical staff participates in each major test phase. This description should include information pertaining to the experience and qualification of supervisory personnel and other principal participants who are responsible for managing, developing, or conducting each test phase. In addition, the COL applicant is responsible for developing a training program for each fundamental group in the organization.

This COL Item is addressed as follows:

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 13.1-3), and UniStar Nuclear Operating Services, LLC.

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 13.1-4 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 13.1-5. 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 13.1-4 and 13.1-5, 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 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 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 describe organizational responsibilities and interfaces between the Project Delivery Consortium, UNE testing personnel, and the UniStar Nuclear Operating Services, LLC.

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 initial startup test 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 also has a matrix report 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 and 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 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.

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, 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. After system turnover, the plant staff operates permanently installed and powered equipment. 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 feature(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;
- 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.

Qualification and Training

The education and qualification requirements for the Site Commissioning Integration Supervisor, Test Analysis & Documentation Supervisor, Mechanical Commissioning Supervisor, Electrical Commissioning Supervisor, and I&C Commissioning Supervisor are consistent with both the Preoperational Test Engineer and Startup Testing Engineer positions of ANSI/ANS-3.1-1993, specified in Table 13.1-1.

Education and qualification requirements for the Site Commissioning Manager position are analogous to the Technical Manager position of ANSI/ANS-3.1-1993, described in Table 13.1-1.

Training and qualification of other plant staff (i.e. instrument, chemistry, computer, radiation protection, and maintenance personnel) assigned to support the Startup Organization continue to be managed by their line organization. They perform duties in line with their normal training and qualification programs at the direction of the Site Commissioning Managers organization and in support of the startup test program.

The Project Delivery Consortium and other contract or vendor staff will meet the education and experience requirements consistent with ANSI/ANS-3.1-1993, Section 3.2, for Contractor and Temporary Positions.

Training of personnel responsible for the conduct of preoperational and startup tests, and for organizations that will develop the preoperational and startup tests is based on site specific training and qualification of engineering personnel. Specific topics that will be addressed include the following:

- Administrative controls for modifying procedures;
- Verbatim procedure compliance and independent verification requirements;
- Administrative controls for documenting condition reports;
- Test sequence and program administration;
- Documentation requirements, including acceptance criteria reviews;
- Policies regarding operations control of equipment manipulations (valves, breakers switches, etc.);
- Interface with Test Review Team;
- Requirements regarding identifying (tagging) components within the released for test boundary;
- Requirements for components within tag-out boundaries; and
- Component specific training by major vendors (turbine, reactor coolant pumps, etc.), as applicable.}

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 concerning pump shutoff head 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 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 {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 {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.

14.2.3.2 Special Test Procedures

During the Phases I through IV test program, special test procedures may become necessary for investigative purposes. The preparation, review and approval of these special procedures are governed by site-specific administrative control procedures. Special test procedures that deal with normal startup testing are processed under the same controls as those that affect nuclear safety.

14.2.3.3 Sign-Off Provisions

Test procedures contain sign-off provisions for prerequisites and for all procedural steps. The person conducting the test signs and dates each data form as the data is entered.

14.2.3.4 Acceptance Criteria

Data that is contained in startup test procedures can be categorized into three distinct categories, as described below:

Ancillary Data -	The lowest category of data recorded in startup procedures. This data may be useful to recreate the test conditions or for trending but is not used to determine component or system performance. Examples include oil temperature, weather conditions and general observations.
Test (Review) Criteria -	Test (Review) Criteria are based on differences between calculations and measurements and are not based on the Safety Analysis. Therefore, these criteria typically have two-sided tolerances. For example, the maximum safety analysis stroke time for a specific valve may be 15 seconds, but the valve vendor may have designed the valve to stroke in less than 10 seconds. In this example, the Review Criteria could be expressed as 8 to 12 seconds.
Acceptance Criteria -	Acceptance Criteria are those criteria that have a direct link to the Safety Analysis. These criteria are typically one-sided and are constructed from the safety analysis or related assumptions. It is necessary to define whether the Acceptance Criteria is a minimum or maximum limit. For example, the maximum safety analysis stroke time for a specific valve may be 15 seconds, but the valve vendor may have designed the valve to stroke in less than 10 seconds. In this example, the Acceptance Criteria could be expressed as less than 15 seconds.

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 {a Senior Reactor Operator, responsible Commissioning Supervisor, or designee} and all related testing activities placed on hold by the {responsible Commissioning Supervisor, or designee} until the procedure is revised.

The decision to interrupt the performance of a test is the responsibility of the {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 {responsible Commissioning Supervisor or designee} 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 {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.

14.2.4 Conduct of Test Program

The U.S. EPR FSAR includes the following COL Item in Section 14.2.4:

> A COL applicant that references the U.S. EPR design certification will plan, and subsequently conduct, the plant startup test program.

This COL Item is addressed as follows:

The initial test program will be planned and conducted by the startup test group and will be controlled by administrative procedures and requirements.

14.2.5 Review, Evaluation, and Approval of Test Results

The U.S. EPR FSAR includes the following COL Item in Section 14.2.5:

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

This COL Item is addressed as follows:

Sections 14.2.5.1 through 14.2.5.3 are added as a supplement to the U.S. EPR FSAR.

14.2.5.1 Procedure Review and Evaluation

The {responsible Commissioning Supervisor, or designee} presents to the responsible reviewer a completed test procedure and test report with remarks and recommendations. During this review, the {responsible Commissioning Supervisor, or designee} 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 {Site Commissioning Manager - Startup Testing and Commissioning} and the team's minimum membership is:

- {TRT Chairman
- 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 {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 are as follows:

- ♦ 5%
- ♦ 25%
- ♦ 50%
- ♦ 75%
- ♦ ≥98%

The TRT shall review the tests performed in the plateau and determine if it is acceptable to proceed to the next plateau. If core anomalies or plant stability issues are present the TRT shall assign a responsible organization to develop bases for proceeding to a higher power level that is reviewed, approved, and entered into the plant records by the TRT prior to increasing reactor power. Results of tests and individual parts of multiple tests conducted at a given plateau are evaluated prior to proceeding to the next level. In tests involving plant transients for which a realistic transient performance analysis has been performed, test results are compared to results of the realistic analysis rather than results of a similar analysis performed using accident analysis assumptions. For those tests which result in a plant transient for which a realistic plant transient performance analysis has been performed, the test results will be compared to the results of the realistic transient analysis to determine if the model should be revised.

The TRT compares measured plant parameters against predicted plant parameters at each plateau to determine if any limits could be exceeded prior to reaching the next plateau. If a review of plant parameters indicates that any regulatory or administrative limits could potentially be exceeded, then testing will be suspended before proceeding to the power level. Appropriate corrective actions will then be implemented and reviewed by the TRT before testing is allowed to continue. Examples of limits for which plant parameters will be monitored are as follows:

- Radiation Safety Limits (10 CFR Part 20 and Part 50.36a)
- Liquid and Gaseous Effluents (Part 50 Appendix I)
- Offsite Release Limits (thermal, chemical, etc.)
- Grid Stability (voltage, frequency, etc.)

Following completion of testing at 100% of rated power, final test results will be reviewed, evaluated and approved. This is accomplished prior to disbanding the startup organization and normal plant operation.

14.2.6 Test Records

No departures or supplements.

14.2.7 Conformance of Test Programs with Regulatory Guides

No departures or supplements.

14.2.8 Utilization of Reactor Operating and Testing Experience in Development of Initial Test Program

No departures or supplements.

14.2.9 Trial Use of Plant Operating and Emergency Procedures

The U.S. EPR FSAR includes the following COL Item in Section 14.2.9:

> A COL applicant that references the U.S. EPR design certification will identify the specific operator training to be conducted as part of the low-power testing program related to the resolution of TMI Action Plan Item I.G.1, as described in (1) NUREG-0660 - NRC Action Plans Developed as a Result of the TMI-2 Accident, Revision 1, August 1980, (2) NUREG-0694 - TMI-Related Requirements for New Operating Licenses, June 1980, and (3) NUREG-0737 - Clarification of TMI Action Plan Requirements.

This COL Item is addressed as follows:

Specific operator training and participation, as described in the U.S. EPR FSAR Section 14.2.9 will be conducted.

14.2.10 Initial Fuel Loading and Initial Criticality

No departures or supplements.

14.2.11 Test Program Schedule

The U.S. EPR FSAR includes the following COL Item in Section 14.2.11:

> A COL applicant that references the U.S. EPR certified design will develop a test program that considers the following eight guidance components:
>
> - The applicant should allow at least nine months to conduct preoperational testing.
> - The applicant should allow at least three months to conduct startup testing, including fuel loading, low-power tests, and power-ascension tests.
> - Plant safety will not be dependent on the performance of untested SSCs during any phase of the startup test program.
> - Surveillance test requirements will be completed in accordance with plant Technical Specification requirements for SSC operability before changing plant modes.
> - Overlapping test program schedules (for multiunit sites) should not result in significant divisions of responsibilities or dilutions of the staff provided to implement the test program.
> - The sequential schedule for individual startup tests should establish, insofar as practicable, that test requirements should be completed prior to exceeding 25 percent power for SSC that are relied on to prevent, limit, or mitigate the consequences of postulated accidents.
> - Approved test procedures should be in a form suitable for review by regulatory inspectors at least 60 days prior to their intended use or at least 60 days prior to fuel loading for fuel loading and startup test procedures.
> - Identity 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 COL Item is addressed as follows:

During the post-licensing period, preoperational and startup test procedures will be subject to a license condition for NRC inspections to verify that the Initial Test Program (ITP) is implemented. This process shall allow for the performance of necessary plant as-built inspections and walk downs. A test program shall be developed that considers the components identified in FSAR Section 14.2.11 and shall make available to on-site NRC inspectors preoperational and startup test specifications and test procedures at least 60 days prior to their intended use.

14.2.12 Individual Test Descriptions

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

The U.S. EPR FSAR includes the following COL Item in Section 14.2.12.5.1:

> A COL applicant that references the U.S. EPR design certification will provide site-specific test abstract information for the raw water supply system.

The U.S. EPR FSAR includes the following COL Item in Section 14.2.12.7.11:

> A COL applicant that references the U.S. EPR design certification will provide site-specific test abstract information for the circulating water supply system.

The U.S. EPR FSAR includes the following COL Item in Section 14.2.12.8.15:

> A COL applicant that references the U.S. EPR design certification will provide site-specific test abstract information for the turbine island ventilation systems.

The U.S. EPR FSAR includes the following COL Item in Section 14.2.12.8.18:

> A COL applicant that references the U.S. EPR design certification will provide site-specific test abstract information for plant laboratory equipment.

The U.S. EPR FSAR includes the following COL Item in Section 14.2.12.11.27:

> A COL applicant that references the U.S. EPR design certification will provide site-specific test abstract information for personnel radiation monitors.

The U.S. EPR FSAR includes the following COL Item in Section 14.2.12.21.6:

> A COL applicant that references the U.S. EPR design certification will provide site-specific test abstract information for the cooling tower.

These COL Items are addressed in Section 14.2.14.

The U.S. EPR FSAR includes the following COL Item in Section 14.2.12.16.4:

> A COL applicant that references the U.S. EPR design certification will either perform the natural circulation test (Test # 196) or provide justification for not performing the test. The need to perform the test will be based on evaluation of previous natural circulation test results and a comparison of reactor coolant system (RCS) hydraulic resistance coefficients applicable to normal flow conditions.

This COL Item is addressed as follows:

Prior to fuel load, the natural circulation test (Test #196) will be performed or justification will be provided for not performing the test. The need to perform the test will be based on evaluation of previous natural circulation test results and a comparison of reactor coolant system (RCS) hydraulic resistance coefficients applicable to normal flow conditions.

14.2.13 References

No departures or supplements.

14.2.14 COL Applicant Site-Specific Tests

This section is added to provide a location for COL applicants to list site-specific startup tests.

14.2.14.1 {Raw Water Supply System

1. OBJECTIVE

   a. To demonstrate the ability of the Raw Water Supply System and desalinization plant to process raw water and provide a reliable supply for the demineralized water, fire protection, essential service water normal makeup and potable water systems, under normal plant operating conditions.

2. PREREQUISITES

   Raw Water Supply System testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

   a. Construction activities on the Raw Water Supply System (RWSS) have been completed.

   b. RWSS instrumentation has been calibrated and is functional for performance of the following test.

   c. Support system required for operation of the RWSS is complete and functional.

   d. The RWSS intake is being maintained at the water level specified in the design documents.

   e. The RWSS flow balance has been performed.

   f. Construction activities on the desalinization plant have been completed.

   g. Desalinization plant instrumentation is complete and functional and has been calibrated.

   h. Support systems required for operation of the desalinization plant are complete and functional.

   i. Test instrumentation is available and calibrated.

   j. The desalinization plant flow balance has been completed.

   k. RWSS inspection and testing requirements have been completed as described in Section 9.2.9.5.

3. TEST METHOD

   a. Verify desalinization plant component manual control from all locations is per design requirements.

   b. Verify automatic controls function at design setpoints.

   c. Verify desalinization plant pumps and components (e.g., filters, reverse osmosis devices, needle valves, etc) meet individual design requirements.

   d. Verify system flow and output quality meets design specifications.

   e. Verify the desalinization plant provides design rated flow to all systems that are supplied by the desalinated water transfer pumps.

   f. Verify standby desalinated water transfer pumps start on low discharge pressure or a trip of the running pump.

   g. Verify desalinated water transfer pumps trip on low desalinated water tank level.

4. DATA REQUIRED

   a. Pump operating data.

   b. Setpoints at which alarms and interlocks occur.

5. ACCEPTANCE CRITERIA

   a. The desalinization plant components can be manually controlled from all locations per design requirements.

   b. The automatic controls function such that system performance meets or exceeds the design requirements.

   c. The individual design requirements for the desalination plant pumps and equipment (e.g., filters, reverse osmosis devices, automatic valves, etc) have been met.

   d. The RWSS and desalination systems design specifications for system flow and output quality have been met.

   e. The desalinization plant provides design rated flow to all systems that are supplied by the desalinated water pumps.

   f. The standby desalinated water transfer pumps start on low discharge pressure or a trip of the running pump.

   g. The desalinated water transfer pumps trip on low desalinated water tank level.

   h. The desalinization plant operates as described in Section 9.2.9.

   i. The desalinization plant output water quality is in compliance with design specifications.

14.2.14.2 Ultimate Heat Sink (UHS) Makeup Water System

1. OBJECTIVES

    a. To demonstrate the ability of the UHS Makeup Water System to supply makeup water as designed.

    b. To establish baseline performance data for future equipment surveillance and ISI.

    c. Verify electrical independence and redundancy of safety-related power supplies.

    d. To demonstrate the ability of the traveling screens to be automatically rotated and automatically washed off.

2. PREREQUISITES

    Ultimate Heat Sink (UHS) Makeup Water System testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

    a. Construction activities on the UHS Makeup Water System, including the traveling screen wash system and test bypass line, the UHS Makeup Keep-Fill line, and the Post-DBA UHS Makeup Keep-Fill line, have been completed and the system is functional.

    b. Construction activities on the ESW blowdown lines from the ESW system isolation MOVs to the retention basin have been completed, and the lines are isolable from the ESWS and functional.

    c. Hydrostatic/leak testing of the UHS Makeup Water System, including the traveling screen wash system and test bypass line, has been completed with satisfactory results.

    d. UHS Makeup Water System instrumentation is functional and has been calibrated.

    e. Support systems required for operation of the UHS Makeup Water System are complete and functional.

    f. Test instrumentation available and calibrated.

3. TEST METHOD

    a. Verify that each UHS Makeup Water System division can be operated from the main control room and the remote shutdown station.

    b. Verify safety-related automatic valves (MOVs, SOVs, AOVs) respond as designed to each of the applicable open/close signal sources, including time delay circuitry.

    c. Verify valve position indication.

    d. Verify position response of valves to loss of motive power.

    e. Verify air release valves operate as designed on pump start.

    f. Verify each discharge strainer operates as designed.

g. Verify that makeup flow through the test bypass line demonstrates the system can deliver the minimum Technical Specification flow rate to the ESWS Cooling Tower.

h. Verify alarms, interlocks, display instrumentation, and status lights function as designed.

i. Verify head versus flow characteristics for each UHS Makeup Water System pump at design conditions.

j. Verify valve performance data, where required.

k. Verify electrical independence and redundancy of power supplies for safety-related functions.

l. Verify ability of the traveling screens to be automatically rotated and automatically washed off based on the design differential level across the traveling screens and timer basis.

m. Verify adequate system alignment to perform back flushing.

n. Verify the heat tracing systems operate as designed and alarm in the MCR upon failure.

o. Verify the makeup water pump NPSH available is greater than or equal to the NPSH required by the pump manufacturer.

p. Verify the proper operation of the makeup water system valves, instruments and components on both normal power and emergency Class 1E backup power.

q. Verify that makeup flow through the UHS Makeup Keep-Fill line demonstrates the system can deliver the minimum system flow rate to the UHS Makeup Water system due to leakage specified by the owner.

r. Verify that makeup flow through the Post-DBA UHS Makeup Keep-Fill line demonstrates the system can deliver the minimum system flow rate to the UHS Makeup Water system due to leakage specified by the owner.

s. Verify that there is no water hammer indication effects such as noise, pipe movement, pipe support or restraint damage, leakage, damaged valves or equipment, present during manual startup, manual system testing and auto keep-fill of the UHS Makeup Water system.

4. DATA REQUIRED

a. Record alarm, interlocks, and control setpoints.

b. Record pump head versus flow, NPSH required, and operating data.

c. Record valve performance parameters (e.g., stroke time, developed thrust) for baseline diagnostic testing data.

d. Record valve position upon loss of motive power and valve position indication data.

e. Record the UHS Makeup Water Intake Structure pump forebay level

5. ACCEPTANCE CRITERIA

a. Each UHS Makeup Water System division can be operated, as designed, from the main control room and the remote shutdown station.

b. The safety-related automatic valves (MOVs, SOVs, AOVs) respond to the designated open/close signal sources, including time delay circuitry, as designed.

c. The valve position indications properly indicate actual valve position.

d. The position response of valves to loss of motive power is correct.

e. The air release valves operate as designed on pump start.

f. The discharge strainers perform as designed.

g. The makeup flow through the test bypass line demonstrates the system can deliver the minimum Technical Specification flow rate to the ESWS Cooling Tower.

h. The alarms, interlocks, display instrumentation, and status lights function as designed.

i. The head versus flow characteristics for each UHS Makeup Water System pump at design conditions has been met.

j. The valves meet performance data where required.

k. Safety-related components meet electrical independence and redundancy requirements.

l. The traveling screens rotate as designed and the screen wash system provides spray water to wash the traveling screens as designed.

m. Backflushing can be performed via the discharge strainer blowdown line.

n. The heat tracing systems operate and alarm on failure as designed in accordance with the design requirements.

o. The UHS Makeup Water pump NPSH available is greater than or equal to the NPSH required per the pump design requirements.

p. The UHS Makeup Water System valves, instruments and components operate as designed on both normal power and emergency Class 1E backup power.

q. The makeup flow through the UHS Makeup Keep-Fill line demonstrates the system can deliver the minimum system makeup flow rate to the UHS Makeup Water system due to leakage specified by the owner.

r. The makeup flow through the Post-DBA UHS Makeup Keep-Fill line demonstrates the system can deliver the minimum system makeup flow rate to the UHS Makeup Water System due to leakage, as specified by the owner.

s. There is no water hammer indication effects such as noise, pipe movement, pipe support or restraint damage, leakage, damaged valves or equipment, present during manual startup, manual system testing and auto keep-fill of the UHS Makeup Water system.

14.2.14.3 Essential Service Water Blowdown System

1. OBJECTIVES

   a. To demonstrate the ability of the essential service water (ESW) blowdown system, including the emergency blowdown path, to provide blowdown flow for control of ESW chemistry as designed.

   b. To establish baseline performance data for future equipment surveillance and ISI.

2. PREREQUISITES

   Essential Service Water Blowdown System testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

   a. Construction activities on the ESW blowdown system have been completed and the system is functional.

   b. Hydrostatic/leak testing of the ESW blowdown system has been completed with satisfactory results.

   c. Construction activities on and initial testing of the main ESW system have been completed.

   d. ESW blowdown system instrumentation is functional and has been calibrated.

   e. Support systems required for operation of the ESW blowdown system are complete and functional.

   f. ESW system is operating in its normal configuration.

   g. Test instrumentation available and calibrated.

3. TEST METHOD

   a. Verify that the ESW blowdown system operates at the rated flow and design conditions.

   b. Verify alarms, interlocks, display instrumentation, and status lights function as designed.

4. DATA REQUIRED

   a. Record alarm, interlocks, and control setpoints.

   b. Record flow data.

5. ACCEPTANCE CRITERIA

   a. The ESW blowdown system operates at the rated flow and design conditions.

   b. The alarms, interlocks, display instrumentation, and status lights function as designed.

   c. The ESW blowdown system operates per design and as described in Section 9.2.5.

14.2.14.4 Essential Service Water Chemical Treatment System

1. OBJECTIVES

    a. To demonstrate the ability of the ESW chemical treatment system to provide treatment of ESW as designed.

    b. To establish baseline performance data for future equipment surveillance.

2. PREREQUISITES

    Essential Service Water Chemical Treatment System testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

    a. Construction activities on the ESW chemical treatment system have been completed and the system is functional.

    b. Hydrostatic/leak testing of the ESW chemical treatment system has been completed with satisfactory results.

    c. ESW chemical treatment system instrumentation is functional and has been calibrated.

    d. Support systems required for operation of the ESW chemical treatment system are complete and functional.

    e. Test instrumentation available and calibrated.

3. TEST METHOD

    a. Verify that each ESW division's chemical treatment system can be operated from the main control room and/or locally, as designed.

    b. Verify alarms, interlocks, display instrumentation, and status lights function as designed.

    c. Verify valve position indication.

    d. Verify position response of valves to loss of motive power.

    e. Verify each ESW division's chemical treatment system provides the required chemistry conditions in the ESW cooling tower basin, over the full range of operating variables.

    f. Verify valve performance data, where required.

4. DATA REQUIRED

    a. Record alarm, interlocks, and control setpoints.

    b. Record chemical flows and ESW chemistry data.

    c. Record valve position upon loss of motive power and valve position indication data.

5. ACCEPTANCE CRITERIA

   a. Each ESW division's chemical treatment system can be operated, as designed, from the main control room and or locally as designed.

   b. The safety-related automatic valves (MOVs, SOVs, AOVs) respond to designated accident signal, as designed.

   c. The alarms, interlocks, display instrumentation, and status lights function as designed.

   d. The valve position indications properly indicate actual valve position.

   e. The position response of valves to loss of motive power is per design.

   f. Each ESW division's chemical treatment system provides the required chemistry conditions in the ESW cooling tower basin, over the full range of operating variables.

   g. The valves meet performance data where required.

   h. The ESW chemical treatment system operates per design and as described in Section 9.2.5.

14.2.14.5 Waste Water Treatment Plant

1. OBJECTIVE

   a. To demonstrate the Waste Water Treatment Plant's ability to discharge treated liquid effluent safely to the environment and to process dewatered solids for offsite disposal, as designed and in accordance with local and state requirements.

2. PREREQUISITES

   Waste Water Treatment System testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

   a. Construction activities on the Waste Water Treatment Plant have been completed.

   b. Sanitary waste water treatment system instrumentation is complete and functional and has been calibrated.

   c. Support systems required for operation of the Waste Water Treatment Plant are complete and functional.

   d. Test instrumentation available and calibrated.

3. TEST METHOD

   a. Verify manual and automatic control of components per design requirements.

   b. Verify alarm setpoints, valve position indications, and parameter displays.

   c. Verify mechanical, chemical, and biological treatment components operate per design requirements.

d. Verify Waste Water Treatment Plant flows meet design specifications for both normal and maximum loading conditions.

e. Verify sanitary water treatment in accordance with local, state and federal requirements, for both normal and maximum loading conditions.

f. Verify biochemical oxygen demand is within design requirements.

g. Verify total suspended solids is within design requirements.

h. Verify moisture content of dewatered sludge is within design requirements.

4. DATA REQUIRED

a. Pump operating data.

b. Setpoints at which alarms and interlocks occur.

c. Effluent chemical, biological and moisture characteristics.

5. ACCEPTANCE CRITERIA

a. Manual and automatic control of components is per design requirements.

b. The alarm setpoints, valve position indications, and parameter displays are per design.

c. The mechanical, chemical, and biological treatment components operate per design requirements.

d. The Waste Water Treatment Plant flows meet design specifications for both normal and maximum loading conditions.

e. The sanitary water treatment system is in accordance with local, state and federal requirements for both normal and maximum loading conditions.

f. The biochemical oxygen demand is within design requirements.

g. The total suspended solids are within design requirements.

h. The moisture content of dewatered sludge is within design requirements.

i. The Waste Water Treatment Plant operates per design requirements and as described in Section 9.2.4.

14.2.14.6 Fire Water Supply

1. OBJECTIVES

a. To demonstrate the ability of the Fire Water Supply system to provide reliable supply of fire water to hydrants, hose stations and sprinkler systems throughout the plant.

b. To establish baseline performance of the Fire Water Supply System.

2. PREREQUISITES

Fire Water Supply System testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

a. Construction activities on the Fire Water Supply system have been completed.

b. Fire Water Supply system instrumentation is complete and functional and has been calibrated.

c. Support systems required for operation of the Fire Water Supply system are complete and functional.

d. Test instrumentation available and calibrated.

e. Fuel has not yet been brought onsite.

3. TEST METHOD

a. Verify manual control of Fire Water Supply system components from all locations as designed in accordance with NFPA 13 and NFPA 24.

b. Verify Fire Water Supply system pump and system flow meet design specifications and are in accordance with NFPA 20.

c. Verify the head and flow characteristics of the fire water pumps, and the operation of all auxiliaries are per design and in accordance with NFPA 20.

d. Verify control logic in accordance with the design specifications and NFPA 72.

e. Verify automatic operation of pre-action valves in accordance with NFPA 13.

f. Verify the Fire Water Supply system provides design rated flow to all discharge points in accordance with the design specifications and NFPA 13, 14, and 20.

g. Verify Fire Water Supply system jockey pump starts on low (lower setpoint) discharge header pressure in accordance with NFPA 20.

h. Verify Fire Water Supply system jockey pump stops on normal (upper setpoint) discharge header pressure in accordance with NFPA 20.

i. Verify Fire Water Supply system electric motor driven pump starts on low discharge header pressure in accordance with NFPA 20.

j. Verify standby Fire Water Supply system diesel engine driven pump 1 starts on discharge header low pressure, or trip or failure to start of the running pump in accordance with NFPA 20.

k. Verify standby Fire Water Supply system diesel engine driven pump 2 starts on discharge header low pressure, or trip or failure to start of the running pump in accordance with NFPA 20.

l. Verify alarms, indicating instruments, and status lights function as designed in accordance with NFPA 13, NFPA 20, NFPA 22 and NFPA 72.

4. DATA REQUIRED

   a. Pump operating data.

   b. Setpoints at which alarms and interlocks occur.

   c. Flow rates at discharge points/points of supply.

5. ACCEPTANCE CRITERIA

   a. The ability to manually control Fire Water Supply system components from various locations is as designed in accordance with NFPA 13 and NFPA 24.

   b. The Fire Water Supply system pump and system flow meet design specifications and NFPA 20.

   c. The head and flow characteristics of the firewater pumps and operation of all auxiliaries are per design in accordance with NFPA 20.

   d. The system control logic functions per design in accordance with NFPA 72.

   e. The automatic operation of pre-action valves is per system design and NFPA 13 and NFPA 72.

   f. The Fire Water Supply system provides design rated flow to all discharge points in accordance with the design specifications, NFPA 13, NFPA 14 and NFPA 20.

   g. The Fire Water Supply system jockey pump starts on low (lower setpoint) discharge header pressure in accordance with NFPA 20.

   h. The Fire Water Supply system jockey pump stops on normal (upper setpoint) discharge header pressure in accordance with NFPA 20.

   i. The Fire Water Supply system electric motor driven pump starts on low discharge header pressure in accordance with NFPA 20.

   j. The Standby Fire Water Supply system diesel engine pump 1 starts on discharge header low pressure, or trip or failure to start of the running pump in accordance with NFPA 20.

   k. The Standby Fire Water Supply system diesel engine pump 2 starts on discharge header low pressure, or trip or failure to start of the running pump in accordance with NFPA 20.

   l. The alarms, indicating instruments, and status lights function as designed in accordance with NFPA 13, NFPA 20, NFPA 22 and NFPA 72.

   m. The Fire Water Supply system operates per design requirements and as described in Section 9.5.1.

14.2.14.7 Circulating Water Supply System

1. OBJECTIVES

   a. To demonstrate the ability of the Circulating Water System, including circulating water makeup, blowdown, chemical treatment, and the main cooling tower, to provide continuous cooling to the main condensers as designed.

   b. To provide baseline operating data.

2. PREREQUISITES

   Circulating Water Supply System testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

   a. Construction activities on the Circulating Water System have been completed.

   b. Construction activities on the main cooling tower have been completed.

   c. Construction activities on circulating water makeup have been completed.

   d. Construction activities on circulating water chemical treatment have been completed.

   e. Construction activities on circulating water blowdown have been completed.

   f. Circulating Water System, including makeup, chemical treatment and main cooling tower, is complete and functional.

   g. Circulating Water System instrumentation is complete and functional and has been calibrated.

   h. Support systems required for operation of the Circulating Water System are complete and functional.

   i. Test instrumentation available and calibrated.

   j. Alarm functions verified for operability and limits.

   k. The Circulating Water System flow balance has been completed.

   l. The Circulating Water Supply System has been pressure tested to confirm system integrity.

   m. Relief valve (if any) setpoints have been verified.

3. TEST METHOD

   a. Verify Circulating Water System component manual control from all locations.

   b. Verify automatic controls function at design setpoints.

   c. Verify MOV operation and performance.

d. Verify standby circulating water makeup pump starts on low circulating water makeup header pressure.

e. Verify circulating water pumps' discharge head and system flow meet design requirements.

f. Verify auxiliary cooling water pumps' discharge head and auxiliary cooling water flow (with circulating water pumps off) meet design requirements.

g. Verify circulating water makeup pumps' discharge head and makeup flow meet design requirements.

h. Verify circulating water blowdown operates at rated flow and design conditions.

i. Verify chemical treatment provides required circulating water chemistry conditions in cooling tower piping and tower basin.

4. DATA REQUIRED

a. Record of start, trip and alarm setpoints.

b. Record of circulating water pumps' head versus flow and operating data.

c. Record of auxiliary cooling pumps' head versus flow and operating data.

d. Record of circulating water makeup pumps' head versus flow and operating data.

e. Valve performance data, where required.

f. Flow data to basins of the cooling tower.

5. ACCEPTANCE CRITERIA

a. The ability to manually control the Circulating Water System from various locations is per the design.

b. The automatic controls function such that system performance meets or exceeds the design requirements.

c. The MOV operation and performance is per design requirements.

d. The standby circulating water makeup pump starts on low circulating water header pressure.

e. The circulating water makeup pumps discharge head and system flow meets or exceeds design requirements.

f. The auxiliary cooling water pumps discharge head and auxiliary cooling water flow (with circulating water pumps off) meets or exceeds design requirements.

g. The circulating water makeup pumps' discharge head and makeup flow meets or exceeds design requirements.

h. The circulating water blowdown operates at rated flow and design conditions.

i. Chemical treatment provides circulating water chemistry conditions in cooling tower piping and tower basin per the design.

j. The Circulating Water System operates as described in Section 10.4.5.

14.2.14.8 UHS Makeup Water Intake Structure Ventilation Systems (Makeup Pump Room Ventilation System, Intake Structure Personnel Access Area Ventilation System, Traveling Screen Room Ventilation System)

1. OBJECTIVES

a. To demonstrate the ability of the UHS Makeup Water Intake Structure Ventilation Systems to provide cooling and heating sufficient to maintain necessary operating environment for the UHS makeup water pumps, traveling screens, and related equipment.

b. To establish baseline operating data for future equipment surveillance and ISI.

c. Verify electrical independence and redundancy of safety-related power supplies.

2. PREREQUISITES

UHS Makeup Water Intake Structure Ventilation Systems testing shall be completed during the preoperational testing phase. The following prerequisites shall be met:

a. Construction activities on the UHS Makeup Water Intake Structure Ventilation Systems have been completed.

b. UHS Makeup Water Intake Structure Ventilation Systems instrumentation is complete and functional and has been calibrated.

c. Support systems required for operation of the UHS Makeup Water Intake Structure Ventilation Systems are complete and functional.

d. The UHS Makeup Water Intake Structure is in its final configuration (doors and access points installed and wall, ceiling, and floor penetrations in their design condition).

e. Test instrumentation available and calibrated.

f. The UHS Makeup Water Intake Structure Ventilation Systems air flow balances have been completed.

g. The UHS Makeup Water System is available for full flow testing.

3. TEST METHOD

a. Verify control logic and interlock functions for each division.

b. Verify alarms, displays, indications and status lights both locally and in the main control room for each division.

c. Verify operation of dampers and damper controls per design requirements.

d. Verify operation of the fan units (supply and exhaust, air conditioning unit, and air cooled condenser) and dampers per design requirements.

e. Verify each division's air flow (both heating and cooling) meets design specifications.

f. Verify that room temperatures in the pump room, traveling screen room, and the transformer room in each division can be maintained within the design range.

g. Verify proper operation of the intake structure personnel access area ventilation system (including duct heaters) and the traveling screen room ventilation system (including unit heater).

h. Full flow test of the UHS Makeup Water System should be coordinated with UHS Makeup Water Intake Structure Ventilation System testing to simulate the room design heat load.

i. Verify electrical independence and redundancy of power supplies for safety-related functions.

j. Verify proper operation of the air conditioning unit refrigeration system.

4. DATA REQUIRED

a. Fan operating data.

b. Setpoints at which alarms and interlocks occur.

c. Duct heaters, air conditioning unit electric heating coil, and unit heater operating data.

d. Powered damper operating data.

e. Air flow measurements in ducts.

f. Air flow and temperature measurements in inlets and outlets.

g. Cooling water flow and temperature across the air handling unit coils.

h. Temperatures of each division's pump room, transformer room, traveling screen room, and personnel access areas.

i. Air conditioning unit operating data.

5. ACCEPTANCE CRITERIA

a. The control logic and interlocks function per design.

b. The alarms, displays, indications and status lights, both locally and in the main control room, for each division operate as designed.

c. The operation of dampers and damper controls are as per design requirements.

d. The operation of the fan units and dampers are as per the design requirements.

e. Each division's airflow (both heating and cooling) meet design specifications.

f. The room temperatures in the pump room, traveling screen room, and the transformer room in each division can be maintained within the design range of ≥41 °F and ≤104 °F.

g. The systems cooling and heating capacities meet or exceed design requirements as specified in equipment supplier published data, for the as-tested ambient conditions.

h. The UHS Makeup Water Intake Structure Ventilation System operates per design requirements and as described in Section 9.4.15.

i. Safety-related components meet electrical independence and redundancy requirements.

j. Tornado dampers perform as designed.

k. Air conditioning unit operating data satisfies manufacturer specifications.

14.2.14.9 Cooling Tower Acceptance

1. OBJECTIVES

   a. To demonstrate the Cooling Tower is capable of rejecting the design heat load.

2. PREREQUISITES

   Cooling Tower Acceptance testing shall be performed during Phase IV power ascension testing. The test shall be performed at ≥ 98 percent reactor power.

   The following prerequisites shall be met:

   a. Construction activities are complete.

   b. Circulating Water System flow balance has been performed.

   c. Permanently installed instrumentation is functional and calibrated. Test instrumentation available and calibrated.

   d. Plant output is at approximately rated power.

3. TEST METHOD

   a. Perform a measurement of the cooling tower performance using Cooling Tower Institute (CTI) standards.

4. DATA REQUIRED

   a. Cooling water temperature and flows.

5. ACCEPTANCE CRITERIA

   a. The cooling tower performance meets manufacturers design as described in Section 10.4.5.

14.2.14.10 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.

3. TEST METHOD

   a. Ensure that all drains from laboratory equipment that analyze or measure radiation levels are routed correctly and verifying that drains discharge as designed. This could be performed by pouring a liquid down the drain colored with food dye or by some other suitable means and ensure the presence of the food dye in the receiving tank.

   b. Ensure that all drains from laboratory equipment that analyze or measure isotopic concentrations of radioactive samples are routed correctly and verifying that drains discharge as designed. This could be performed by pouring a liquid down the drain colored with food dye or by some other suitable means and ensure the presence of the food dye in the receiving tank.

c. Ensure that ventilation hoods and other engineered radioactive containment devices are vented as designed. This could be accomplished by a tracer gas or some other suitable means.

d. Measure discharge flow rates for ventilation hoods and other engineered radioactive containment devices.

e. Perform vendor supplied startup checks and calibrations for all laboratory equipment that analyze or measure radiation levels.

f. Perform vendor supplied startup checks and calibrations for all laboratory equipment that analyze or measure isotopic concentrations of radioactive samples.

4. DATA REQUIRED

a. Inspection report from verification of laboratory equipment drains.

b. Inspection report from verification of ventilation hood flow and routing.

c. Completed vendor specified laboratory equipment startup and calibration procedures.

5. ACCEPTANCE CRITERIA

a. The laboratory equipment drain interface with the plant systems performs as designed.

b. The laboratory equipment ventilation hood interface with the plant systems performs as designed.

c. The results of the vendor startup check and calibration procedures verify tested laboratory equipment meets design requirements.

14.2.14.11 Personnel Monitors and Radiation Survey Instruments

Personnel Monitors and Radiation Survey Instruments are discussed within the Operational Radiation program described in Section 12.5.

1. OBJECTIVES

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

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

2. PREREQUISITES

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 Personnel Monitors and Radiation Survey Instruments have been completed.

b. Personnel Monitors and Radiation Survey Instruments have been calibrated in accordance with industry and manufacturer standards.

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

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

e. 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 Personnel Monitors and Radiation Survey Instruments have been eliminated.

f. Test instrumentation available and calibrated.

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

3. TEST METHOD

a. Verify alarms, displays, indications and status lights both locally and in the plant access control area are functional.

b. Verify that background levels have been established.

c. Verify that Personnel Monitors and Radiation Survey Instruments are capable of detecting activity levels that are above acceptable limits and activating alarms and displays in response.

4. DATA REQUIRED

a. Background level settings.

b. Setpoints at which alarms and status light displays occur.

5. ACCEPTANCE CRITERIA

a. Alarms, displays, and status lights indicate locally and in the plant access control area.

b. The background radiation level from radon and other sources doesn't reduce the ability to detect radiation releases.

c. The Personnel Monitors and Radiation Survey Instruments are capable of detecting test sources.

14.2.14.12 UHS Makeup Water Intake Structure Communications System

1. OBJECTIVES

a. To demonstrate the adequacy of the UHS Makeup Water Intake Structure intraplant communications system to provide communications between vital plant areas.

b. Verify that non-safety-related communication system functions as designed to limit malfunctions or failures.

c. To demonstrate that the UHS makeup water structure communication systems meet design requirements.

2. PREREQUISITES

UHS Makeup Water Intake Structure 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 shall be in operation.

3. TEST METHOD

a. Verify the intraplant portable wireless communication system functions as designed in the UHS Makeup Water Intake Structure.

b. Verify that the intraplant (PABX) telephone system functions as designed in the UHS Makeup Water Intake Structure.

c. Verify the intraplant sound powered telephone system functions as designed in the UHS Makeup Water Intake Structure.

d. Verify the intraplant public address system functions as designed in the UHS Makeup Water Intake Structure.

e. Verify the security radio system functions as designed in the UHS Makeup Water Intake Structure.

f. Verify that the communication equipment will perform under the anticipated maximum plant noise levels in the UHS Makeup Water Intake Structure.

g. Verify the effectiveness of the exclusion zones established for protecting the safety-related I&C equipment from mis-operation due to EMI/RFI effects from the portable phones and radios of the communications system or verify the adequacy of the lack of exclusion zones in the UHS Makeup Water Intake Structure.

h. Verify that the communication system responds as designed to actual or simulated limiting malfunctions or failures.

4. DATA REQUIRED

a. Record the results of communication attempts from each system and its locations.

5. ACCEPTANCE CRITERIA

a. The intraplant communication system operates in the UHS Makeup Water Intake Structure to the same level of performance as described in the U.S. EPR FSAR Section 9.5.2.

b. The communications equipment in the UHS Makeup Water Intake Structure is capable of operating under maximum noise conditions.

c. Safety-related I&C equipment performance is not adversely impacted by the portable phones and radios of the communications system.}

d. The portable wireless communication system provides radio coverage throughout the plant, except in areas restricted due to potential EMI/RFI considerations.

e. The portable wireless communication system provides an interconnection to the public switched telephone network (PSTN) to allow offsite communications.

f. The digital telephone system provides plant-wide intercom capability.

g. The digital telephone system provides an interconnection to the PSTN to allow offsite communications.

h. The public address and alarm system operates as described in the design specification.

i. The sound powered system operates as described in the design specification.

j. The security communication system operates as described in the design specification.

14.2.14.13 Turbine Island Ventilation Systems

1. OBJECTIVE

a. To demonstrate that the turbine building ventilation system (TBVS) provides a suitable operating environment for equipment and personnel during normal operations.

b. To demonstrate that the switchgear building ventilation system, turbine island (SWBVS) provides a suitable operating environment for equipment and personnel during normal operations.

2. PREREQUISITES

a. Construction activities on the TBVS have been completed.

b. Construction activities on the SWBVS have been completed.

c. TBVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

d. SWBVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

e. Support systems required for operation of the TBVS are complete and functional.

f. Support systems required for operation of the SWBVS are complete and functional.

3. TEST METHOD

   a. Verify control logic.

   b. Verify that operation of inlet air dampers and damper controls meets design requirements.

   c. Verify that operation of the exhaust fan units and dampers meets design requirements.

   d. Verify that operation of protective devices, controls, interlocks, instrumentation, and alarms meets design requirements.

4. DATA REQUIRED

   a. Fan and damper operating data.

   b. Setpoints at which alarms and interlocks occur.

5. ACCEPTANCE CRITERIA

   a. The SWBVS operates as designed (refer to Section 9.4.4)

   b. SWBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

   c. SWBVS fan performance meets design requirements.

   d. SWBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

   e. SWBVS air balance meets design requirements.

   f. The TBVS operates as designed (refer to Section 9.4.4)

   g. TBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

   h. TBVS fan performance meets design requirements.

   i. TBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

   j. TBVS air balance meets design requirements.

14.2.14.14 Fire Protection Building Ventilation Systems

1. OBJECTIVES

   a. To demonstrate that the Fire Protection Building Ventilation System provides a suitable operating environment for equipment and personnel during normal and emergency operations.

b. To demonstrate that the Fire Protection Building Ventilation System Standby Diesel Generator system operates as designed.

2. PREREQUISITES

a. Construction activities on the Fire Protection Building Ventilation System have been completed.

b. Fire Protection Building Ventilation System instrumentation is complete, functional and has been calibrated.

c. Support systems required for the operation of the Fire Protection Building Ventilation System are complete and functional, e.g. Fire Protection Building Ventilation System Standby Diesel Generator.

d. Test instrumentation is available and calibrated.

3. TEST METHOD

a. Verify control logic.

b. Verify operation of dampers and damper controls per design requirements.

c. Verify operation of fan units (supply and exhaust) and dampers per design requirements.

d. Verify each room ventilation air flow meets design requirements.

e. Verify Automatic Bus Transfer Switch function by providing a loss of power signal to the Automatic Bus Transfer Switch.

f. Verify each room unit heaters meet design requirements.

g. Verify that operation of protective devices, controls, interlocks, instrumentation and alarms meets design requirements.

h. Verify Fire Protection Building Ventilation System Standby Diesel Generator can be started manually and automatically in the event of Loss of Offsite Power (LOOP) or in the event of Station Blackout (SBO).

i. Verify Fire Protection Building Ventilation System Standby Diesel Generator capacity to support design requirements.

4. DATA REQUIRED

a. Fan and damper operating data.

b. Setpoints at which alarms and interlocks occur.

c. Unit heater operating data.

d. Standby Diesel Generator operating parameters.

e. Automatic Bus Transfer Switch operating parameters.

f. Air flow and temperature measurements.

5. ACCEPTANCE CRITERIA

a. The Fire Protection Building Ventilation System operates as designed (refer to Section 9.4.16).

b. The Fire Protection Building Ventilation System alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

c. The Fire Protection Building Ventilation System exhaust fan performance meets design requirements.

d. The Fire Protection Building Ventilation System unit heaters performance meets design requirements.

e. The Automatic Bus Transfer Switch transfers to the alternate power source (SDG).

f. The Fire Protection Building Ventilation System dampers performance meets design requirements.

g. The Fire Protection Building Ventilation System Standby Diesel Generator meets design requirements.

14.3 INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

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

The U.S. EPR FSAR includes the following COL Item in Section 14.3:

> A COL applicant that references the U.S. EPR design certification will provide ITAAC for emergency planning, physical security, and site-specific portions of the facility that are not included in the Tier 1 ITAAC associated with the certified design (10 CFR 52.80(a)).

This COL Item is addressed as follows:

The entire set of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for {CCNPP Unit 3}, including Design Certification ITAAC (DC-ITAAC), Site-Specific ITAAC (SS-ITAAC), Emergency Planning ITAAC (EP-ITAAC), and Physical Security ITAAC (PS-ITAAC) are included in Part 10 of the COL application.

The U.S. EPR FSAR includes the following COL Item in Section 14.3:

> Additionally, a COL applicant that references the U.S. EPR design certification will describe the selection methodology for site-specific SSC to be included in ITAAC, if the selection methodology is different from the methodology described within the FSAR, and will also provide the selection methodology associated with emergency planning and physical security hardware.

This COL Item is addressed in Section 14.3.2.

14.3.1 Tier 1, Chapter 1, Introduction

No departures or supplements.

14.3.2 Tier 1, Chapter 2, Structural and Systems Engineering - Inspections, Tests, Analyses, and Acceptance Criteria

The site-specific analyses were reviewed to identify safety-significant features. The results are provided in Table 14.3-1.

The site-specific structures, systems, and components that were considered to be addressed by ITAAC are provided in Table 14.3-2.

The interface requirements contained in Section 4, Tier 1 of the U.S. EPR FSAR are identified in Table 14.3-3, along with the method for addressing them (ITAAC or design information incorporated into the FSAR).

14.3.2.1 Content of Tier 1 System Design Descriptions

No departures or supplements.

14.3.2.2 Selection Criteria for ITAAC

Sections 14.3.2.2.1 through 14.3.2.2.3 are added as a supplement to the U.S. EPR FSAR.

14.3.2.2.1 Site-Specific ITAAC

A table of ITAAC entries is provided for each site-specific structure, system, or component described in the FSAR that meets the selection criteria, and that is not included in the certified design. The intent of these ITAAC is to define activities that are undertaken to verify the as-built system conforms to the design features and characteristics defined in the system design description.

The selection criteria and methodology defined in the U.S. EPR FSAR, Section 14.3.2 were utilized to define the site-specific features to be addressed by SS-ITAAC. In addition, ITAAC are provided to address interface requirements contained in Section 4, Tier 1 of the U.S. EPR FSAR as specified in Table 14.3-3.

14.3.2.2.2 Emergency Planning ITAAC

EP-ITAAC were developed to address implementation of elements of the Emergency Plan. Site-specific EP-ITAAC are based on the generic ITAAC provided in SRM-SECY-05-0197. These ITAAC were tailored, principally the acceptance criteria, to the specific reactor design and emergency planning program requirements.

14.3.2.2.3 Physical Security ITAAC

PS-ITAAC are provided in the U.S. EPR FSAR, Tier 1, Section 3.1.1. These ITAAC are incorporated by reference in Part 10 of the COL Application. In addition, ITAAC are provided in Part 10, Section 2.2, Table 2.2-1, Site Specific Physical Security ITAAC to address interface requirements contained in Section 3.1.2, Tier 1 of the U.S. EPR FSAR as specified in Table 14.3-3.

14.3.2.3 Content of ITAAC

No departures or supplements.

14.3.3 Tier 1, Chapter 3, Non-System Based Design Descriptions and ITAAC

No departures or supplements.

14.3.4 Tier 1, Chapter 4, Interface Requirements

No departures or supplements.

14.3.5 Tier 1, Chapter 5, Site Parameters

No departures or supplements.

14.3.6 Design Acceptance Criteria

No departures or supplements.

14.3.6.1 Human Factors Engineering DAC

No departures or supplements.

14.3.6.2 Containment Isolation Valve Location DAC

No departures or supplements.

14.3.6.3 Piping DAC

The U.S. EPR FSAR includes the following COL Item in Section 14.3.6.3:

> A COL applicant that references the U.S. EPR design certification will identify a plan for implementing DAC. The plan will identify 1) the evaluations that will be performed for DAC, 2) the schedule for performing these evaluations, and 3) the associated design processes and information that will be available to the NRC for audit.

The COL Item is addressed as follows:

The plan for implementing DAC will identify 1) the evaluations that will be performed for DAC, 2) the schedule for performing these evaluations, and 3) the associated design processes and information that will be available to the NRC for audit.

14.3.7 References

{No departures or supplements.}

Table 14.3-1 — {Site Specific Analyses (Safety Significant Features)}

Item #	Safety Significant Design Feature	Part 10 ITAAC Table
1	For the Ultimate Heat Sink (UHS) Makeup Water Intake Structure, fire barriers are provided that protect and separate the UHS makeup pumps and associated electrical equipment.	Table 2.4-7
2	The CCNPP Unit 3 UHS Makeup Water Intake Structure has the following design features: ♦ Interior flood-protection measures to protect UHS makeup pump, traveling screen, and transformer rooms, ♦ The interior and exterior structures are able to withstand the static and dynamic flood forces.	Table 2.4-7
3	For the Switchgear Building, fire barriers are provided that protect the SBO Diesel Generators and their fuel supplies and that separate the SBO Diesel Generators from the normal power supplies.	Table 2.4-11
4	An on-site Operational Support Center is provided.	Table 2.3-1
5	The elevation of the UHS makeup pump suction is sufficiently low.	Table 2.4-22
6	Properties of backfill material (i.e., structural fill) for Seismic Category I structures.	Table 2.4-1
7	Compaction requirements for backfill for Seismic Category I structures.	Table 2.4-1
8	There are at least two preferred power circuits that are physically independent.	Table 2.4-26
9	Forebay is Seismic Category I, and is designed as Seismic Category I	Table 2.4-30

Table 14.3-2 — {Site Specific SSC ITAAC Screening Summary}

(Page 1 of 2)

Site-Specific Structure, System, or Component	U.S. EPR Interface	Selected for ITAAC
Structure		
Fire Protection Building	Yes	Yes
Switchgear Building	Yes	Yes
Turbine Building	Yes	Yes
Security Access Building	Yes	Yes
UHS Makeup Water Intake Structure, including CCNPP Unit 3 Forebay Structure	Yes	Yes
Warehouse Building	Yes	Yes
Central Gas Supply Building	Yes	Yes
Grid Systems Control Building (i.e., Control House)	Yes	Yes
Circulating Water System Cooling Tower Structure	Yes	Yes
Circulating Water System Pump Building	Yes	Yes
Circulating Water System Makeup Water Intake Structure	Yes	Yes
Circulating Water System Retention Basin	No	No
Desalinization / Water Treatment Building (i.e., Desalinization Plant)	Yes	Yes
Waste Water Treatment Facility	Yes	Yes
Engineered Fill	Yes	Yes
Access Building	Yes	Yes
Sheet Pile Wall	Yes	Yes
Buried Ductbanks	Yes	Yes
Buried Pipe	Yes	Yes
Component		
Buried Ductbanks	Yes	Yes
Buried Pipe	Yes	Yes
Waterproofing Membrane for Seismic Category I Concrete Foundations, Walls and Buried Concrete Commodities Exposed to low pH Groundwater	No	Yes
System		
Offsite Power System	Yes	Yes
Power Transmission System (Main Generator, Main Transformer, Protection & Synchronization)	Yes	Yes
Essential Service Water Blowdown System	No	No
Essential Service Water Makeup System Chemical Treatment System	No	No
Normal Essential Service Water Makeup System	No	No
UHS Makeup Water System	Yes	Yes
Potable Water System, including Potable Water Tank	No	No
Sanitary Waste Water System	No	No
Raw Water System, including Desalinization Plant	Yes	Yes

Table 14.3-2 — {Site Specific SSC ITAAC Screening Summary}
(Page 2 of 2)

Site-Specific Structure, System, or Component	U.S. EPR Interface	Selected for ITAAC
Circulating Water System, including support systems (i.e., Cooling Tower Makeup System, Cooling Tower Blowdown System, Chemical Treatment System, Circulating Water System Seal Well, and Circulating Water System Outfall)	No	No
UHS Makeup Water Intake Structure Ventilation Systems	No	Yes
Fire Protection Building Ventilation System	No	Yes
Central Gas Distribution System	No	No
Fire Detection and Alarm Systems for Balance of Plant	No	No
Fire Water Distribution System, including Fire Protection Storage Tanks	Yes	Yes
Fire Suppression Systems for UHS Makeup Water Intake Structure, and Fire Protection Building)	No	Yes
Fire Suppression Systems for Site specific Buildings other than UHS Makeup Water Intake Structure, and Fire Protection Building	No	No
Standpipes and Hose Stations for Site specific Buildings other than UHS Makeup Water Intake Structure	No	No
Standpipes and Hose Stations for UHS Makeup Water Intake Structure	No	Yes

Table 14.3-3 — {Interface Requirements Screening Summary}
(Page 1 of 4)

U.S. EPR FSAR Tier 1 Section #	Interface Requirement	Selected for ITAAC
4.1	Failure of any of the site specific structures not within the scope of the certified design shall not cause any of the Seismic Category 1 structures within the scope of the certified design to fail.	Yes
4.2	The COL Applicant will provide the design of the fire protection storage tanks and building.	No. The design of the fire water storage tanks and Fire Protection Building is discussed in Section 3.7.2.3.3 and Section 3.7.2.8.
4.2	The Fire Protection Building will house the fire protection system and fire pump with the storage tanks in close proximity to the pump building.	Yes
4.3	The COL Applicant will provide the design of the Switchgear Building.	No. The design requirements for the Switchgear Building are stated in Table 3.2-1.
4.3	The Switchgear Building contains the power supply, the instrumentation and controls (I&C) for the Turbine Island and the balance of plant, and the SBO diesel generators; it is located adjacent to and contiguous with the Turbine Building and is physically separate from the NI.	Yes
4.4	The COL Applicant will provide the design of the Turbine Building.	No. The design requirements for the Turbine Building are stated in Table 3.2-1.
4.4	The Turbine Building houses the components of the steam condensate main feedwater cycle, including the turbine-generator.	Yes
4.4	The Turbine Building is located in a radial position with respect to the Reactor Building, but is independent from the NI.	Yes
4.4	The Turbine Building is oriented to minimize the effects of any potential turbine generated missiles.	Yes
4.6	The design of buried conduit and duct banks, and buried pipe and pipe ducts is site-specific. Buried Seismic Category I conduit, electrical duct banks, pipe, and pipe ducts will be analyzed and designed in accordance with the specific requirements of the systems.	No. The design of the buried conduit and duct banks, and buried pipe and pipe ducts is discussed in Section 3.7.3.12 and Section 3.8.4.
4.6	Buried conduit and duct banks, and pipe and pipe ducts will be designed to withstand the effects of soil overburden, surcharge, groundwater, flood, freezing, seismic soil interaction, and the other effects of burial, as well as natural phenomena such as earthquakes, tornados, hurricanes, and external missiles without loss of capability to perform their safety related functions. In addition, buried conduit and duct banks, and pipe and pipe ducts will be designed and installed to maintain divisional separation.	Yes
4.6	Concrete components of buried items will be designed in accordance with ACI 349-2001, including the exceptions specified in RG 1.142.	Yes
4.6	Steel components of buried items will be designed in accordance with ANSI/AISC N690-1994 (R2004), including Supplement 2.	Yes

Table 14.3-3 — {Interface Requirements Screening Summary}
(Page 2 of 4)

U.S. EPR FSAR Tier 1 Section #	Interface Requirement	Selected for ITAAC
4.7 and 2.7.11	Interface requirements for the essential service water system (ESWS) and ultimate heat sink (UHS), including the emergency makeup water system, are provided in Section 2.7.11 and Section 4.6 for buried conduit and duct banks, and pipe and pipe ducts. The site-specific emergency makeup water system provides ≥ 300 gpm makeup water to each ESW cooling tower basin to maintain the minimum basin water level.	Yes
4.7 and 2.7.11	The site-specific emergency makeup water system provides water to each ESW cooling tower basin at a temperature below the maximum ESWS supply temperature of 95°F.	Yes
4.7 and 2.7.11	The site-specific emergency makeup water system is designed in accordance with ASME Section III, Class 3 safety-related SSC and Seismic Category I requirements.	Yes
4.7 and 2.7.11	The site-specific emergency makeup water system provides a means to limit corrosion, scaling, and biological contaminants in order to minimize component fouling for a minimum of 30 days post-DBA.	No. The design of the UHS Makeup Water System is discussed in Section 9.2.5.3.2.
4.8 and 2.7.5	Interface requirements for the fire water distribution system are provided in Section 2.7.5 of Tier 1 of the U.S. EPR FSAR. The raw water supply system (RWSS) delivers makeup water to the Fire Water Distribution System's fire water storage tanks.	Yes
4.9 and 3.1	Interface requirements for security are provided in Section 3.1.2 of Tier 1 of the U.S. EPR FSAR. Access to vital equipment requires passage through at least two physical barriers.	Yes
4.9 and 3.1	Interface requirements for security are provided in Section 3.1.2 of Tier 1 of the U.S. EPR FSAR. Physical barriers for the protected area perimeter are not part of vital area barriers Penetrations through the protected area barrier are secured and monitored. Unattended openings that intersect a security boundary, such as underground pathways, are protected by a physical barrier and monitored by intrusion detection equipment or provided surveillance at a frequency sufficient to detect exploitation.	Yes
4.9 and 3.1	Interface requirements for security are provided in Section 3.1.2 of Tier 1 of the U.S. EPR FSAR. Isolation zones exist in outdoor areas adjacent to the physical barrier at the perimeter of the protected area that allow 20 feet of observation and assessment on either side of the barrier. Areas where permanent buildings do not allow sufficient observation distance between the intrusion detection system and the protected area barrier (e.g., the building walls are immediately adjacent to, or are an integral part of the protected area barrier) are monitored with intrusion detection and assessment equipment that detects attempted or actual penetration of the protected area perimeter barrier before completed penetration of the barrier and assessment of detected activities.	Yes

Table 14.3-3 — {Interface Requirements Screening Summary}

(Page 3 of 4)

U.S. EPR FSAR Tier 1 Section #	Interface Requirement	Selected for ITAAC
4.9 and 3.1	Interface requirements for security are provided in Section 3.1.2 of Tier 1 of the U.S. EPR FSAR. Isolation zones are monitored with intrusion detection and assessment equipment that is capable of providing detection and assessment of activities within the isolation zone.	Yes
4.9 and 3.1	Interface requirements for security are provided in Section 3.1.2 of Tier 1 of the U.S. EPR FSAR. The external walls, doors, ceiling and floors in the last access control function for access to the protected area are bullet resistant.	Yes
4.9 and 3.1	Interface requirements for security are provided in Section 3.1.2 of Tier 1 of the U.S. EPR FSAR. Access control points are established to control personnel and vehicle access into the protected area.	Yes
4.9 and 3.1	Interface requirements for security are provided in Section 3.1.2 of Tier 1 of the U.S. EPR FSAR. Access control points are established with equipment for the detection of firearms, explosives, incendiary devices or other items which can be used to commit radiological sabotage at the protected area personnel access points.	Yes
4.9 and 3.1	Interface requirements for security are provided in Section 3.1.2 of Tier 1 of the U.S. EPR FSAR. A security access control system with a numbered photo identification badge system is installed for use by individuals who are authorized access to protected areas and vital areas without escort.	Yes
4.9 and 3.1	Interface requirements for security are provided in Section 3.1.2 of Tier 1 of the U.S. EPR FSAR. Emergency exits through the protected area perimeter are alarmed with intrusion detection devices and secured by locking devices that allow prompt egress during an emergency.	Yes
4.10 and 2.5.5	Interface requirements for the offsite power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. At least two independent circuits shall be supplied to the station switchyard by the offsite power transmission system.	Yes
4.10 and 2.5.5	Interface requirements for the offsite power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. Each offsite power circuit shall be sized to supply the station safety-related and non-safety-related loads during normal and off normal operation.	Yes
4.10 and 2.5.5	Interface requirements for the offsite power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. Each Emergency Auxiliary Transformer shall be connected to the switchyard via an independent circuit, sized to supply the four Emergency Power Supply System divisions.	Yes
4.10 and 2.5.5	Interface requirements for the offsite power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. The maximum transmission system frequency decay rate is bounded by the RCP free coastdown for a complete loss of forced reactor coolant flow analysis due to a loss of offsite power event.	Yes

Table 14.3-3 — {Interface Requirements Screening Summary}
(Page 4 of 4)

U.S. EPR FSAR Tier 1 Section #	Interface Requirement	Selected for ITAAC
4.10 and 2.5.5	Interface requirements for the offsite power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. The Emergency Auxiliary Transformers and Normal Auxiliary Transformers shall be sized to supply their load requirements. Interface requirements for the offsite power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. There is separation between EATs, and between each EAT and the NATs or the main step-up transformers (MSU). The offsite transmission power, instrumentation, and control circuits shall be independent. Interface requirements for the offsite power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. The switchyard instrumentation for any main control room (MCR) displays and alarms (e.g., Circuit breaker position indication, control voltage) shall be compatible with the certified design I&C systems. Interface requirements for the offsite power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. Lighting protection and grounding is provided for the switchyard.	Yes
4.11	Interface requirements for the power transmission system, including the main transformer, protection & synchronization, are provided in Section 2.5.6 of Tier 1 of the U.S. EPR FSAR. The main generator switchyard circuit breakers shall be sized to supply the load requirements.	Yes
4.12	The COL Applicant will provide the design of the Access Building.	No. The design requirements for the Security Access Building are stated in Table 3.2-1.
4.12	The Access Building controls access to the plant's controlled areas and is independent from the NI.	Yes