Table of Contents

List of Tables

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.

14.2.1 SUMMARY OF TEST PROGRAM AND OBJECTIVES

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

{Nine Mile Point 3 Nuclear Power Plant (NMP3NPP)} will have a site-specific startup organization. As discussed in Section 13.1, the {Startup Manager} reports to the Senior Vice President, Project and Contract Management.

The {Startup Manager} is responsible for startup test programs, including the preparation of test procedures, performance of applicable initial tests, and the preparation of appropriate test related documentation. Test procedures are prepared by AREVA or the accountable {Startup Engineer} with assistance from AREVA, the architect engineer, or other vendors, as required. The {Startup Manager} will ensure that all procedures that affect startup are properly reviewed by the appropriate organizations.

Organizations responsible for conducting startup tests will assure that these tests and their supporting activities are properly planned and completed as scheduled. They will also direct and coordinate execution of work activities that directly affect the startup test program.

The {Startup Manager} directs and controls Startup program technical and functional test activities, including prerequisite work and testing Phases I through IV. The {Startup Manager} is responsible for:

- Approving startup administrative and technical procedures.
- Planning, organizing, scheduling, directing, and controlling Startup activities.
- Managing Startup Program contracts to ensure accurate and timely compliance.
- Approving the Startup Test Schedule.
- Approving work and procedures that are prerequisite to the Startup program.
- Maintaining liaison with the project vendors to keep them informed of status, emerging problems in their respective areas, and support requirements.
- Assigning {Startup Testing Engineer and Preoperational Test Engineer} responsibilities.

The {Startup Manager's} engineering organization consists of {System Engineers} who are responsible for specific systems and {Preoperational Test Engineers and Startup Testing Engineers} who are responsible for testing evolutions and/or specific tests. {System Engineers} and {Preoperational Test Engineers and Startup Testing Engineers} have the following responsibilities:

- {System Engineers}
  - {Responsible for modifications, procedure reviews, and system testing support for specific systems.}
- {Preoperational Test Engineers}
  - {Responsible for overall test program.
  - Provides leadership and technical guidance to individuals involved in the preparation and performance of preoperational test procedures.
  - Assures that test procedures are written and testing is conducted in accordance with the site-specific administrative procedures.}
- {Startup Testing Engineers}
  - {Responsible for the startup test program.
  - Provides leadership and technical guidance to individuals involved in the preparation and performance of startup test procedures.
  - Assures that test procedures are written and testing is conducted in accordance with the site-specific administrative procedures.}

In addition to the {Startup Testing Engineers} and {Preoperational Test Engineers}, the Startup organization will utilize plant personnel, architect - engineer (A/E) personnel and other contract/vendor staff as necessary to successfully complete the startup test program.

The plant operating, maintenance, and engineering personnel are utilized to the extent practicable during the Startup Test Program. The plant staff operates permanently installed and powered equipment for Phases I through IV and subsequent system tests. Plant personnel such as instrument, chemistry, computer, radiation protection, and maintenance personnel are used to perform tests and inspections in the areas in which they will primarily work during plant operation. Utilizing 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 A/E 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 A/E project organization provides technical advice and consultation on matters relating to the design, construction, operation, and testing of systems and equipment. Accordingly, the A/E project organization is responsible for the following:

- Providing the objectives and acceptance criteria used in developing detailed test procedures.
- Providing a designated member of the Test Review Team (TRT). TRT functions are defined in Section 14.2.5.
- Providing representatives to site administrative groups or committees as requested by the {Startup Manager}.
- Reviewing test procedures as requested by the {Startup Manager}.
- Evaluating test results as requested by the {Startup Manager}.
- Providing technical support and liaison with the startup organization to coordinate problem resolution.

UniStar Nuclear Operating Services will augment the site-specific startup organization with staff from other contractors and vendors as deemed necessary. Possible contractors are representatives from the turbine-generator supplier and vendors of various components. Involvement may be in a direct role in the startup organization or in a consulting role.

AREVA Site Startup Organization

AREVA representatives provide technical advice and consultation on matters concerning design, operation, and testing. They report to the {Startup Manager} for day-to-day direction. To achieve this objective, the AREVA site personnel will:

- Provide the objectives and acceptance criteria used in developing detailed test procedures.
- Provide initial procedure drafts of startup test procedures and review proposed changes.

- Provide technical advice and consultation to the plant staff during the conduct of the test program.
- Provide a technical liaison with the AREVA design headquarters to resolve problems.
- Provide a designated member for the TRT. TRT functions are defined in Section 14.2.5.
- Provide other on-site program support as requested by the {Startup Manager}.

14.2.3 TEST PROCEDURES

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

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

This COL Item is addressed as follows:

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

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

14.2.3.1 Test Procedure Preparation and Execution

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

The site approval process is as follows:

- Each draft test procedure is reviewed by the TRT to ensure that procedural requirements are met and any required changes are incorporated.
- The {Startup Manager} approves test procedures and ensures that tests are properly scheduled and performed as scheduled.

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 and all related testing activities placed on hold until the procedure is revised.

14.2.3.6 Maintenance/Modification Procedures

Work authorization documents, controlled in accordance with procedures, are used to initiate maintenance and implement modifications on systems turned over by the construction organization. The work authorization document assigns an organization responsibility for the completion of the activity and specifies retest requirements. Upon completion of an activity, a copy of the executed form is returned to the responsible testing organization to ensure retest requirements are met. Results of retests due to maintenance shall be reviewed by the responsible {Startup Testing Engineer} 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:

> It is the responsibility of the COL applicant to plan, and subsequently, to conduct the plant startup test program. The initial test program is conducted by the startup test group and is controlled by administrative procedures and requirements.

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

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

Following this review, the completed procedure and test report is submitted to the TRT for final review, evaluation and approval recommendation. The TRT review package also includes any completed engineering evaluations, if they were performed.

14.2.5.2 Test Review Team

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

- TRT Chairman
- AREVA Project Representative
- Architect Engineer Project 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.

- Reviews and approves carryover of prerequisites and Phase I tests to Phases II through IV. Ensures that the justification for test deferral requests include a schedule for their performance.

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

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

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

14.2.5.3 Test Expectations

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

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

When carryover testing is required, the {Startup Manager} 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 that must be completed, reviewed and approved before tests in the next category are started. Power ascension tests are scheduled and conducted at pre-determined power levels.

Results of 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.

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.

14.2.8.1 First-of-a-Kind Testing

The U.S. EPR FSAR includes the following COL Item in Section 14.2.8.1:

> The first COL applicant that references the U.S. EPR certified design will commit to review results from European predecessors concerning the new, unique, or novel EPR features such as those previously noted and propose supplemental testing if necessary.

This COL item is addressed as follows:

{Calvert Cliffs Nuclear Power Plant Unit 3 was the first COL applicant that references the U.S. EPR certified design. This COL Item is not applicable to NMP3NPP.}

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:

> In addition, the COL applicant should 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 the following reports:
>
> NUREG-0660 - NRC Action Plans Developed as a Result of the TMI-2 Accident, Revision 1, August 1980.
>
> NUREG-0694 - TMI-Related Requirements for New Operating Licenses, June 1980.

NUREG-0737 - Clarification of TMI Action Plan Requirements.

This COL item is addressed as follows:

To accomplish these requirements, the emergency operating procedures will be performed on the plant simulator for procedure validation and operator training.

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 five 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.
- Overlapping test program schedules (for multi-unit 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.

This COL item is addressed as follows:

A site-specific test program shall be developed that considers the five guidance components and shall provide copies of approved test procedures to the NRC at least 60 days prior to their scheduled performance date.

14.2.12 INDIVIDUAL TEST DESCRIPTIONS

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 information for the circulating water supply system.

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 information for the cooling tower.

These COL Items are addressed in Section 14.2.14.

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 all site-specific startup tests.

14.2.14.1 {Ultimate Heat Sink (UHS) Emergency Makeup Water System

1. OBJECTIVES
   a. To demonstrate the ability of the UHS Emergency Makeup Water System to supply makeup water as designed.
   b. To establish baseline performance data for future equipment surveillance and ISI.
2. PREREQUISITES
   a. Construction activities on the UHS Makeup Water System, including the test bypass line, have been completed and the system is functional.
   b. Hydrostatic/leak testing of the UHS Makeup Water System, including the test bypass line, has been completed with satisfactory results.
   c. UHS Emergency Makeup Water System instrumentation is functional and has been calibrated.
   d. Support systems required for operation of the UHS Emergency Makeup Water System are complete and functional.
   e. Test instrumentation available and calibrated.
3. TEST METHOD
   a. Verify that each UHS Emergency Makeup Water System division can be operated from the main control room and the remote shutdown panel.
   b. Verify safety-related automatic valves (MOVs, SOVs, AOVs) respond as designed to accident signal.
   c. Verify valve position indication.
   d. Verify position response of valves to loss of motive power.
   e. Verify each discharge strainer operates as designed.
   f. Verify flow through the SAQ room cooler in each room of the UHS Makeup Water Intake Structure.

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

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

i. Verify valve performance data, where required.

4. DATA REQUIRED

a. Record alarm, interlocks, and control setpoints.

b. Record pump head versus flow 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.

5. ACCEPTANCE CRITERIA

a. The UHS Emergency Makeup Water System operates per design and as described in Section 9.2.5.}

14.2.14.2 Essential Service Water Blowdown System

1. OBJECTIVES

a. To demonstrate the ability of the essential service water (ESW) blowdown system, including the alternate 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

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 each ESW blowdown system division can be operated from the main control room and the remote shutdown panel.

b. Verify that each ESW blowdown system division's MOVs close automatically in response to an emergency signal.

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

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

e. Verify valve performance data, where required.

f. Verify valve position indication.

4. DATA REQUIRED

a. Record alarm, interlocks, and control setpoints.

b. Record flow data.

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

5. ACCEPTANCE CRITERIA

a. The ESW blowdown system operates per design and as described in Section 9.2.1.

14.2.14.3 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

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

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

d. Verify valve position indication.

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

f. Verify each ESW division's chemical treatment system provides the required chemistry conditions at the emergency makeup pump inlet, in the emergency makeup line, and in the ESW cooling tower, over the full range of operating variables.

g. 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 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.

5. ACCEPTANCE CRITERIA

a. The ESW chemical treatment system operates per design and as described in Section 9.2.1.

14.2.14.4 {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 off-site disposal, as designed and in accordance with local and state requirements.

2. PREREQUISITES

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

14.2.14.5 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

   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.

3. TEST METHOD

   a. Verify manual control of Fire Water Supply system components from all locations as designed.

   b. Verify Fire Water Supply system pump and system flow meet design specifications.

   c. Verify the head and flow characteristics of the fire water pumps, and the operation of all auxiliaries.

   d. Verify control logic.

   e. Verify automatic operation of pre-action valves.

   f. Verify the Fire Water Supply system provides design rated flow to all discharge points.

   g. Verify Fire Water Supply system jockey pump starts on low (lower setpoint) discharge header pressure.

   h. Verify Fire Water Supply system jockey pump stops on normal (upper setpoint) discharge header pressure.

   i. Verify Fire Water Supply system electric motor driven pump starts on low discharge header pressure.

   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.

   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.

   l. Verify alarms, indicating instruments, and status lights function as designed.

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

14.2.14.6 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

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.

n. Cooling tower performance testing requirements comply with Cooling Tower Institute (CTI) standards.

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.

   j. Verify {cooling tower} performance using CTI's ATC-105, "Acceptance Test Code for Water-Cooling Towers," or equal.

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 Circulating Water System operates as described in Section 10.4.5.

14.2.14.7 {UHS Makeup Water Intake Structure Ventilation System

1. OBJECTIVES

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

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

2. PREREQUISITES

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

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

c. Support systems required for operation of the UHS Makeup Water Intake Structure Ventilation System 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 System flow balance has been completed.

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 exhaust fan units 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 in each division can be maintained within the design range under design ambient (heating load and cooling load) conditions.

4. DATA REQUIRED

a. Fan operating data.

b. Setpoints at which alarms and interlocks occur.

c. Unit heater operating data.

d. Powered damper operating data.

e. Air flow measurements in ducts.

f. Air flow measurements in inlets and outlets.

g. Temperatures of each division's pump room.

5. ACCEPTANCE CRITERIA

a. The UHS Makeup Water Intake Structure Ventilation System operates per design requirements and as described in Section 9.4.11.}

14.3 INSPECTION, TEST, ANALYSIS, 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 {NMP3NPP}, 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, SYSTEM BASED DESIGN DESCRIPTIONS AND ITAAC

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

Section 14.3.2.2.1 through Section 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 3.1.2 for the U.S. EPR. These ITAAC are incorporated by reference in Part 10 of the COL Application.

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 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 portion of the Intake Structure that houses the Ultimate Heat Sink (UHS) Makeup Water pumps, fire barriers are provided that protect and separate each division of the UHS makeup system.	Table 2.4-3
2	The portion of the UHS Makeup Water Intake Structure that houses the UHS makeup pumps is Seismic Category I and can withstand water surge and wave forces.	Table 2.4-3
3	For the Switchgear Building, fire barriers are provided that protect the Station Blackout (SBO) Diesel Generators and their fuel supplies and that separate the SBO Diesel Generators from the normal power supplies.	Table 2.4-7
4	Sources of fire protection water are available to support safe plant shutdown in the event of a safe shutdown earthquake (SSE).	Table 2.4- 21
5	The portion of the intake structure that houses the UHS makeup water pumps is divisionally separated by interior flood protection measures.	Table 2.4-3
6	An on-site Operational Support Center is provided.	Table 2.3-1
7	The elevation of the UHS makeup pump suction is sufficiently low.	Table 2.4-19
8	Seismic Category I structures (excluding utilities and intake tunnels), and Seismic Category II - SSE structures (excluding utilities) are founded on bedrock or concrete fill.	Table 2.4-1
9	Seismic Category I utilities and the intake tunnels, and Seismic Category II utilities, are supported on bedrock, structured fill, or concrete fill.	Table 2.4-1
10	Installed Structural fill and backfill for Seismic Category I and Seismic Category II - SSE foundations.	Table 2.4-1
11	There are at least two preferred power circuits that are physically independent.	Table 2.4-24

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

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 Intake Tunnel and Encasement Structures	Yes	Yes
Workshop and Warehouse Building	Yes	No
Central Gas Supply Building	Yes	Yes
Grid Systems Control Building	Yes	Yes
Circulating Water System Cooling Tower Structure	Yes	Yes
Circulating Water System Pump Building	Yes	Yes
Circulating Water System Retention Basin	No	No
Waste Water Treatment Building	Yes	Yes
Meteorological Tower	Yes	Yes
Component		
Buried Duct banks	Yes	Yes
Buried Pipe	Yes	Yes
New and Spent Fuel Storage Racks	Yes	Yes
System		
Off-site 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	Yes	Yes
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 System	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 Balance of Plant	No	No
Standpipes and Hose Stations for Balance of Plant	No	No

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

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 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 Table 3.2-1 and Section 3.10.}
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
4.5	The COL Applicant will provide the design of the new fuel storage racks and the spent fuel storage racks.	No. The design of the new and spent fuel storage racks is discussed in Section 9.1.
4.5	These racks identified as Seismic Category I and are designed, constructed and tested to ASME Code Section III, Division 1, Subsection NF.	Yes
4.5	Materials for fuel storage racks shall satisfy their intended safety functional requirements with regards to fuel sub-criticality.	Yes
4.5	Spent fuel rack materials will be compatible with the pool storage environment.	Yes
4.5	Spent fuel rack structural materials must be corrosion-resistant and compatible with the expected water chemistry of the spent fuel pool.	Yes
4.5	The new fuel and spent fuel storage racks are located in the Fuel Building.	Yes
4.5	The COL Applicant will also demonstrate that the design satisfies the criticality analysis requirements for the new and spent fuel storage racks, and describe the results of the analyses for normal and credible abnormal conditions, including a description of the methods used, approximations and assumptions made, and handling of design tolerances and uncertainties.	No. The design of the new and spent fuel storage racks is discussed in Section 9.1.
4.5	The COL Applicant will also describe the new fuel storage racks, including a description of confirmatory structural dynamic and stress analyses and the spent fuel storage racks, including a description of confirmatory structural dynamic and stress analyses and thermal-hydraulic cooling analyses.	No. The design of the new and spent fuel racks is discussed in Section 9.1.

Table 14.3-3—{Interface Requirements Screening Summary}

(Page 2 of 3)

U.S. EPR FSAR Tier 1 Section #	Interface Requirement	Selected for ITAAC
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 Table 3.2-1, Section 3.7.3.12 and Section 3.8.4.}
4.6	The buried conduit and duct banks, and buried pipe and pipe ducts will be designed for the effects of soil overburden, surcharge, groundwater, flood, seismic soil interaction, and other effects of burial.	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
4.7 and 2.7.11	Interface requirements for the Buried Piping and Pipe Ducts for the Service Water System are provided in Section 2.7.11 of Tier 1 of the U.S. EPR FSAR. The site-specific emergency makeup water system provides makeup water in order to maintain the minimum water level in the ESW cooling tower basins.	Yes
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	Interface requirements for the lightning protection and grounding system are provided in Section 2.5.8 of Tier 1 of the U.S. EPR FSAR. Section 2.5.8 of Tier 1 of the U.S. EPR FSAR does not contain any interface requirements for the lightning protection and grounding system.	Table 2.5.8 of Tier 1 of the U.S. EPR FSAR provides the ITAAC for the lightning protection and grounding system Section 8.3 incorporates the U.S. EPR FSAR lightning protection and grounding system by reference.
4.10 and 2.5.5	Interface requirements for the off-site 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 off-site power transmission system.	Yes
4.10 and 2.5.5	Interface requirements for the off-site power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. Each off-site 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 off-site 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 off-site power system, including the switchyard, are provided in Section 2.5.5 of Tier 1 of the U.S. EPR FSAR. The transmission system will not subject the reactor coolant pumps to a sustained frequency decay of greater than 3.5 Hz/second.	No. The frequency decay analysis is provided in Section 8.2.2.4.

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

U.S. EPR FSAR Tier 1 Section #	Interface Requirement	Selected for ITAAC
4.10 and 2.5.5	Interface requirements for the off-site 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.	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 GEN 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