(2) Prerequisites

The construction tests have been successfully completed, and the SCG has reviewed the test procedure and approved the initiation of testing. All instrumentation and devices associated with the UHS has been properly calibrated. The HVAC System within spray pond pump structure is operational and available. The Reactor Service Water System is operational and available for all anticipated modes of RSW System operation. Sufficient quantity of water are available in the spray pond for use. All of the required interfacing systems shall be available, as needed, to support the specified testing.

(3) General Test Methods and Acceptance Criteria

Performance shall be observed and recorded during a series of component and system testing. This test shall demonstrate that the UHS operates properly as specified in Subsection 9.2.5 and applicable UHS design specifications through the following testing:

(a) Proper operation of instrumentation and various components alarms used to monitor system operation and status, including indications for UHS water level, temperature and blowdown volumes, etc., as specified in Subsection 9.2.5.9.

(b) Proper operating conditions and performance capability of the UHS spray networks during all anticipated modes of the RSW System operations as specified in Subsection 9.2.5.4.1.

(c) Proper operating conditions and performance capability of the UHS in cold weather mode of operation through the bypass line as specified in Subsection 9.2.5.4.2.

(d) Proper operation of the makeup water valve to maintain proper water level in the UHS spray pond through makeup line and maintain water quality in conjunction with the blowdown operation as specified in Subsection 9.2.5.3.4.

(e) Proper operation of blowdown from the UHS spray pond to remove excess water and maintain water quality control through the blowdown line as specified in Subsection 9.2.5.3.4.

14.2.12.1.78 Alternate Feedwater Injection System Preoperational Test

(1) Purpose

To verify the operation of the Alternate Feedwater Injection (AFI) System, including related auxiliary equipment, pumps, valves, instrumentation and controls, is as specified.

(2) Prerequisites

The construction tests have been successfully completed, and the SCG has reviewed the test procedure and approved the initiation of testing. A water source shall be available as the AFI pump suction source and the reactor vessel and feedwater lines A and B shall be sufficiently intact to receive AFI injection flow. The appropriate electrical power sources shall be available as needed, to support the specified testing and the appropriate system configurations.

(3) General Test Methods and Acceptance Criteria

Performance shall be observed and recorded during a series of individual component and integrated system tests. This test shall demonstrate that the AFI System operates properly as specified by Subsection 9.5.14 and the applicable AFI System design specification through the following testing:

(a) Correct implementation and operation of the AFI System controls and instrumentation. This test shall check the system behavior against the functional, performance and interface requirements as specified by the appropriate design documents.

(b) Verification of various component alarms for proper alarm actuation by practically operating the detector of the alarm generating source or using the simulated signal and alarm reset.

(c) Proper operation of all motor-operated valves including opening and closing with the operating switch, valve status indication and travel timing, if applicable.

(d) Proper operation of AFI pump and motor during continuous run tests.

(e) Acceptable pump NPSH under the most limiting design flow conditions.

(f) Verification that the AFI System can be operated normally at each mode and satisfy the NPSH requirement by combining all components, piping and instruments constituting this system through the following testing:

(i) Minimum flow operational test—operate the AFI pump manually using flow path from water source to water source through the minimum flow line until the temperature of the pump and motor bearing is stabilized.

(ii) Rated flow operational test—operate the AFI System at rated flow using the test line to the water source. This test shall be performed continuously from the pump motor start sequence and the minimum flow operating condition.

(iii) Reactor injection test to FW Line A—operate the AFI System to FW Line A at near rated pressure using the injection line to

confirm that the pump flow operation can be verified. For this test, the motor-operated valve to FW Line A will be open and the motor-operated valve to FW Line B will be closed.

(iv) Reactor injection test to FW Line B —operate the AFI System to FW Line B at near rated pressure using the injection line to confirm that the pump flow operation can be verified. For this test, the motor-operated valve to FW Line B will be open and the motor-operated valve to FW Line A will be closed.

(g) Proper AFI pump motor start sequence and actuation of protective devices.

(h) Proper operation of interlocks including operation of all components subject to interlocking.

(i) Proper operation of permissive, prohibit, and bypass functions.

(j) Proper system operation while powered from primary and alternate sources, including transfers, and in degraded modes for which the system is expected to remain operational.

(k) Acceptable pump/motor vibration levels and system piping movements during both transient and steady-state operation. This test can be performed in conjunction with expansion, vibration and dynamic effects preoperational test (Subsection 14.2.12.1.51).

(l) Proper operation of the pump discharge line keep-fill system and its ability to prevent damaging water hammer during system transients.

14.2.12.2 General Discussion of Startup Tests

Those tests proposed and expected to compromise the startup test phase are discussed in this subsection. For each test a general description is provided for test purpose, test prerequisites, test description and test acceptance criteria, where applicable.