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APR 28 1982

Docket Nos: 50-443
and 50-444

Mr. William C. Tallman
Chairman and Chief Executive Officer
Public Service Company of New Hampshire
Post Office Box 330
Manchester, New Hampshire 03105

Dear Mr. Tallman:

Subject: Request for Additional Information - Procedures and Test Review Branch

Enclosed is a list of requests for additional information from the NRC Procedures and Test Review Branch (PTRB 640.5-66). After reviewing this list, your representatives should contact the Seabrook Project Manager, Louis Wheeler, (301/492-7792) to make arrangements for forwarding your responses in the most appropriate manner (i.e. through written correspondence or in meetings).

The NRC staff recognizes that the timing of this action does not provide for inclusion of all your responses into a draft now being prepared of the Safety Evaluation Report (SER). However, after reveiwing this list, and considerating recent experience with your representatives in resolving outstanding NRC interests related to the Seabrook OL review, it is believed that these matters can be closed out in a timely manner prior to publication of the SER in September 1982.

Sincerely,

Original signed by
Frank J. Miraglia

Frank J. Miraglia, Chief
Licensing Branch No. 3
Division of Licensing

Enclosure:
Request for Additonal
Information

cc: F. Liberbach, (PTRB)
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DATE	4/28/82	4/28/82					

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STAFF POSITIONS AND REQUESTS FOR ADDITIONAL INFORMATION

SEABROOK NUCLEAR STATION, UNITS 1 & 2

INITIAL TEST PROGRAM

640.4 (1.8) Regulatory Guide 1.139, Guidance for Residual Heat Removal (page 1.8-53). Exception a. is not justified. The use of only safety-grade systems to bring the reactor to cold shutdown is required. The assumption of only offsite or onsite power availability and the most limiting failure implies all components and equipment that are not Seismic Category I and all systems or parts of systems that depend solely on offsite power sources would be inoperable. Therefore, shutdown and cooldown would depend on safety grade systems with some limited operator actions outside the control room allowed. Modify your position on Regulatory Guide 1.139, accordingly.

640.5 (1.8) Regulatory Guide 1.140, Design Testing and Maintenance Criteria for Normal Ventilation Exhaust System Air Filtration and Absorption Units of Light Water-Cooled Nuclear Power Plants (page 1.8-54). The following exceptions to this Regulatory Guide are not justified:

(1) C.2.b - Either reduce the total system flow rate specification to approximately 30,000

ft^3/min or provide technical justification that will assure the staff that the higher flow rate will provide the same operational efficiencies.

(2) C.2.c - Regulatory Guide 1.140 specifies ANSI N510 - 1975 "Testing of Nuclear Air Cleaning Systems" and ANSI/ASME N509-1976, "Nuclear Power Plant Air Cleaning Units and Components," as the standards for the design and testing of atmospheric cleanup systems. ERDA 76-21 as referred to in C.2.c outlines operational standards for the systems. Modify your position to conform to the monitoring requirements of ERDA 76-21.

640.6 (14.2.12) The initial test program should verify the capability of the offsite power system to serve as a source of power to the emergency buses. Tests should demonstrate the capability of each starting transformer to supply power (as the alternate supply) to its unit's emergency buses while carrying its maximum load of plant auxiliaries and the other unit's emergency buses (as preferred supply). Tests should also demonstrate the transfer capabilities of the unit's emergency bus feeders upon loss of one source of offsite power. These tests should be

performed as early in the test program as the availability of necessary components allows. Provide descriptions of the tests that will demonstrate these capabilities.

640.7 (14.2.12) Testing in conformance with Regulatory Guide 1.41 must incorporate the following:

(1) Provide assurance that all sources of power supply to vital buses are capable of carrying full accident loads. If some portions of the power supplies cannot be full-load tested, provide justification.

(2) Verify that testing is conducted with only one power source at a time.

(3) Verify that buses not under test are monitored to verify absence of voltage.

640.8 (14.2.12) We have noted on other plant startups that the capacities of pressurizer or main steam relief valves and turbine bypass valves are sometimes in excess of the values assumed in the accident analyses for inadvertent opening or failure of these valves. Provide a description of the testing that demonstrates that the capacity of these valves is consistent with your accident analysis assumptions.

640.9 (14.2.12) Verify that open and reclosure setpoints for all code safety and relief valves are checked at temperature.

640.10 (14.2.12) Review of licensee event reports disclosed that some instrumentation drift problems are due, in part, to extremes of local temperature and humidity. Provide a description of the inspections or tests that will be performed to minimize setpoint drift due to local temperature and humidity extremes.

640.11 (14.2.12) Identify any of the post-fuel loading tests described in Section 14.2.12, Table 14.2-5 which are not essential towards the demonstration of conformance with design requirements for structures, systems, components. Plant features that meet any of the following criteria should be tested:

(1) Will be relied upon for safe shutdown and cooldown of the reactor under normal plant conditions and for maintaining the reactor in a safe condition for an extended shutdown period.

(2) Will be relied upon for safe shutdown and cooldown of the reactor under transient (infrequent or moderately frequent events) conditions and postulated accident conditions, and for maintaining the reactor in a safe condition for an extended shutdown period following such conditions.

(3) Will be relied upon for establishing conformance with safety limits or limiting conditions for operation that will be included in the facility technical specifications.

(4) Are classified as engineered safety features or will be relied upon to support or assure the operation of engineered safety features within design limits.

(5) Are assumed to function or for which credit is taken in the accident analysis for the facility (as described in the Final Safety Analysis Report).

(6) Will be utilized to process, store, control, or limit the release of radioactive materials.

640.12 (14.2.12) Our review of licensee event reports has disclosed that many events have occurred because of dirt, condensed moisture, or other foreign objects inside instruments and electrical components (e.g., relays, switches, breakers). Describe any tests or inspections that will be performed or any administrative controls that will be implemented during your initial test program to prevent component failures such as these at your facility.

640.13 (14.2.12) Containment Combustible Gas Control System Test (PT 25). Demonstrate the following:

(1) the capability of the combustible gas control system to operate in response to post-LOCA requirements,

(2) that post-LOCA hydrogen monitors function properly,

(3) the operability of the vacuum breakers.

640.14 (14.2.12) Solid Radwaste System Test (AT 17). Modify the acceptance criterion to require that there be no free liquid in the solidification sample or provide technical justification for not including this criteria.

640.15 (14.2.12) Our review of recent licensee event reports disclosed that a significant number of reported events concerned the operability of hydraulic and mechanical snubbers. Provide a description of the inspections or tests that will be performed following system operation to ensure that snubber operation is adequate. These inspections or tests should be performed preoperationally or, if the systems for which the snubbers are being inspected will not be subjected to significant transients prior to fuel loading, then inspections should be conducted following the startup transient tests.

640.16 (14.2.12) Review of licensee event reports disclosed that a number of sensing lines were rendered inoperable due to being frozen and/or blocked with crud, dirt, and entrapped gas. Provide a description of the inspections or tests that will be performed to ensure that the sensing lines are clear prior to utilization.

640.17 (14.2.12) Containment Spray System Test (PT 12). Verify that paths for the air-flow test of containment spray nozzles overlap the water-flow test paths of the pumps to demonstrate that there is no blockage in the flow path.

640.18 (14.2.12) Containment Air Recirculation System Test (PT 26). Verify that the containment recirculation fan motor current is within its design value at conditions representative of accident conditions. Address such issues as air density, temperature, humidity, fan speed, and blade angle.

640.19 (14.2.12) Verify that tests of sampling systems are adequate to verify flow paths, holdup times, and procedures.

640.20 (14.2.12) Provide a preoperational test description to test containment penetration coolers. On those penetrations where coolers are not used, provide a startup test description that will demonstrate that concrete temperatures surrounding hot penetrations do not exceed design limits.

640.21 (14.2.12) Provide a commitment to include in your test program any design features to prevent or mitigate anticipated transients without scram (ATWS) that may now, or in the future, be incorporated into your plant design.

640.22 (14.2.12) Describe the status of the power supplies to the "other" unit to ensure independence during power distribution testing. The descriptions should address both normal and emergency A.C. and D.C. power distribution systems. Provide assurance that crossties will not exist which could cause loss of emergency bus power to one unit due to testing of the other unit.

640.23 (14.2.12) ECCS Performance Test (PT 8). Include the following for the low and high pressure safety injection, cold condition, flow tests:

(1) Demonstrate that adequate margins exist between pump motor trip points and maximum operating conditions for all pump motors.

(2) Demonstrate the adequacy of the electrical power supply by testing under maximum startup loading conditions.

640.24 (14.2.12) ECCS Hot Functional Test (PT 9). Include the following:

(1) Expand the test prerequisites to include those listed in Regulatory Guide 1.79, Regulatory Position C.1.a(2).

(2) In the exception to Position C.1.a(2) (page 14.2-8) reference the "other tests" which will demonstrate the integrated system response to an actuation signal.

640.25 (14.2.3) In Section 14.2.3 verify that the completion of the required preoperational testing that is required prior to fuel loading includes review and approval of test results. If portions of any preoperational tests are intended to be conducted, or their results approved, after fuel loading: (1) list each test; (2) state what portions of each test will be delayed until after fuel loading; (3) provide technical justification for delaying these portions; and (4) state when each test will be completed (key to test conditions defined in Chapter 14). Note that any test that you do not intend to begin prior to fuel loading should be included in your startup test phase instead of the preoperational test phase.

640.26 (14.2.12) Safety Injection Accumulator Blowdown Test (PT 10). Modify the existing abstract or provide additional tests that will demonstrate the operability of the

accumulator check valves at higher-than-ambient temperatures in accordance with Regulatory Guide 1.79, Position C.1.c(3).

640.27 (14.2.12) Include a description of the test(s) (Table 14.2-3) that will be perfo-med to ensure conformance to Regulatory Guide 1.95 Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release. (Note: for a Type 1 control room, refer to Positions C.1, C.2, C.3a, and C.4-6.)

640.28 (14.2.12) Diesel Generators Test (PT 33). The test is presented in insufficient detail to assure the staff that Positions C.2a and C.2b of Regulatory Guide 1.108 will be satisfied. Modify Table 14.2-3 (test abstracts) and Section 1.8, accordingly.

640.29 (14.2.12) The staff was unable to determine that sufficient preoperational testing of the residual heat removal system is to be performed such that the operability requirements of Regulatory Guide 1.139 would be completely demonstrated. Modify the Residual Heat Removal System Test (PT 7), the Integrated Plant Cooldown from Hot Functional Test (PT 42), or provide additional test abstracts to ensure conformance with Regulatory Guide 1.139. Also, with regard to conformance to Regulatory Guide 1.68 (Revision 2), Item (5), specify the circumstances

under which the demonstration of the capability of systems and components to remove residual or decay heat from the Reactor Coolant system will occur during the preoperational hot functional test, the lower power tests, and/or the power ascension test. Provide the appropriate abstract(s).

640.30 (14.2.12) Instrument and Service Air Systems Test (PT 12). Perform the following:

(1) Expand the test prerequisites to encompass those cited in Regulatory Guide 1.80, Preoperational Testing of Instrument Air Systems.

(2) Include testing of the components and systems referred to in Regulatory Guide 1.80, Sections C.2-C.7.

(3) Identify the systems that are dependent on service air and are to be tested and those that are not going to be tested. To ensure conformance with Regulatory Guide 1.80, provide the following:

(a) Sufficiently detailed test abstracts for those systems, dependent on air, that are to be tested.

(b) Sufficiently detailed technical justifications for not testing any systems that are dependent on air.

640.31 (14.2.12) Shutdown From Outside the Control Room Test (ST 33). Modify the test prerequisites to include those set forth in Regulatory Guide 1.68.2, Initial Startup Test Program to Demonstrate Remote Shutdown Capability for Water-Cooled Nuclear Power Plants.

640.32 (14.2.7) Conformance of Test Programs with Regulatory Guides, Regulatory Guide 1.128 (page 14.2-9). Reference is made to FSAR Subsections 8.3.2 and 8.3.3 for a detailed discussion of the utility's position on Regulatory Guide 1.128, Installation Design and Installation of Large Lead Storage Batteries for Nuclear Power Plants. Indicate the degree of compliance with General Criteria 1 and 17 of Appendix A and Criteria III of Appendix B in Subsection 8.3.2.2a and the degree of compliance to IEEE Std. 484-1975 in Subsection 8.3.2.2C.

640.33 (14.2.7) Conformance of Test Programs with Regulatory Guides, Regulatory Guide 1.20-Rev. 2 (page 14.2-5). Regulatory Guide 1.20 requires analysis and either extensive measurements or full inspection for a non-prototype Category I system. Subsection 3.9(N).2.4 of the FSAR refers to inspection of reactor internals. Provide additional discussion of Regulatory Guide 1.20-Rev. 2. Modify Sections 1.8 and 14.2.7, accordingly.

640.34 (14.2.7) (14.2.12) Conformance of Test Programs with Regulatory Guides, Regulatory Guide 1.52-Rev. 2 (page 14.2-5). Either upgrade the technical specifications and appropriate test descriptions involving the control room air cleaning system from non-ESF to ESF or provide additional technical justification for considering this a non-ESF test.

640.35 (14.2.7) (14.2.11) (14.2.12) Conformance to Regulatory Guide 1.68 (Revision 2), Item (2). It is the staff position that the requirements for systems relied on to prevent, limit, or mitigate the consequences of postulated accidents be completed prior to exceeding 25% power. Modify Sections 14.2.7, 14.2.11, and the appropriate test abstracts accordingly.

640.36 (14.2.7) (14.2.12) Conformance of Test Progams with Regulatory Guides. Regulatory Guide 1.79 (page 14.2-7). Your exceptions to Regulatory Guide 1.79, Preoperational Testing of Emergency Core Cooling Systems for PWR's, Regulatory Positions C.1.b.(2) and C.1.c.(2), are not justified. Modify existing abstracts or provide additional technical justification for your exceptions.

640.37 (14.2.11) State that copies of approved test procedures will be available for examination by NRC regional personnel approximately 60 days prior to the scheduled performance of preoperational tests, and not less

than 60 days prior to scheduled fuel loading date for startup tests (NRC possession of the procedures should not impede the revision, review, or refinement of the procedures), or describe the conditions that could be allowed to occur such that the procedures would not be available as planned.

640.38 (14.2.12) Review of your precritical control rod tests indicates there is no testing of decelerating devices. Include this in your test description.

640.39 (14.2.12) Several items required by Regulatory Guide 1.68 for a reactor coolant system flow test have not been addressed. In addition to verifying that flow measureme e conservative with respect to the safety analysis, verify that piping reactions to transients and flows are as predicted for all modes of pump operation. If a prototype plant design is not referenced, differential pressures across the fully loaded core and major components must be measured. Confirmation that vibration levels are acceptable is also necessary.

40.40 (14.2.12) Initial Criticality Test (ST 16). State that the signal-to-noise ratio of source range instrumentation (or temporarily installed detectors) will be greater than two prior to startup or provide technical justification for excluding this requirement.

640.41 (14.2.12) Commit to verifying that adequate shutdown margin exists with the greatest worth rod cluster control assembly (RCCA) stuck out of the core while performing control rod worth measurements (ST 20).

640.42 (14.2.12) The water chemistry control test abstract (ST 42) is incomplete. Include both chemical and radiochemical tests. Verify that both installed analyzers and alarm systems operate properly.

640.43 (14.2.12) Commit to performing your pseudo-rod-ejection test (ST 21) at greater than 10% power or provide justification for performing the test at a lower power level.

640.44 (14.2.12) Incore and excore instrumentation sensitivity to a control rod misalignment must be demonstrated at both 50% and 100% power (ST 31).

640.45 (14.2.12) Your core performance evaluation test abstract (ST 29) does not commit to establishing that a number of important core performance parameters are in accordance with design values. Commit to performing sufficient measurements and evaluations to verify that the following are within design specifications:

(1) Flux distributions.

(2) Departure from nucleate boiling ratio.

(3) Radial and axial power peaking factors.

(4) Quadrant power tilt.

640.46 (14.2.12) Modify the acceptance criteria of the process computer test abstract (ST 43) to include verification of performance calculations and correct process variable inputs separately rather than comparing final results.

640.47 (14.2.12) Branch steam line isolation valves must be verified as to operability and response times. Include this commitment in your main steam isolation valve closure test (ST 47).

640.48 (14.2.12) Specifically include primary containment and steam line tunnels in your ventilation and air conditioning test (ST 46). This test should not simply verify proper operation, but must be designed to ensure that these spaces can be maintained within design limits.

640.49 (14.2.12) The exception taken to Regulatory Guide 1.68, Appendix A, Section 5.m.m., in Subsection 14.2.7, part (9), is not acceptable. Either provide technical justification for the deletion of this startup test including how the proper plant response will be demonstrated during other specified transient tests, or perform the MSIV closure test at 100% power. Modify (ST 47) accordingly.

640.50 (14.2.12) Review of the preoperational and acceptance test phase descriptions disclosed that the operability of several of the systems and components listed in Regulatory Guide 1.68 (Revision 2), Appendix A, may not be demonstrated by tests described in Tables 14.2-3 and 14.2-4. Expand your test descriptions to address the following items:

(1) Preoperational testing

1.a(2)(h) Reactor vessel and internals; including vent valves.

1.a(2)(i) Reactor coolant system safety valves.

1.b(1) Control Rod System Test. As a minimum address the following: control rod drive operation; operation of functions such as withdrawal inhibiting features, runback features, rod worth minimizers, withdrawal sequences; interaction of the control rod drive system and design features; failure mode on loss of power.

1.d(2) Steam line atmospheric dump valves.

1.d(3) Relief valves associated with residual or decay heat removal.

1.d(4) Safety valves associated with residual or decay heat removal.

1.d(8)	Assure the absense of flow instabilities in the emergency feedwater system components, piping, or inside steam generators during normal system startup and opertions.
1.d(9)	Condensate storage system.
1.d(10)	Emergency cooling tower.
1.e(6)	Turbine stop, control, bypass, and intercept valves.
1.h(5)	Cold water interlocks.
1.h(7)	Ventilation, recirculation, and filter systems to minimize radioactive release associated with postulated accidents.
1.h(8)	ECCS water sources.
1.h(10)	Ultimate heat sink. Verify that sources of water used for long-term core cooling are tested to demonstrate adequate NPSH (net positive suction head) and the absence of vortexing over range of basin level from maximum to the minimum calculated 30 days following LOCA.
1.i(3)	Containment isolation valve leak rate tests.
1.i(4)	Containment penetration leakage tests.

1.i(5) Containment airlock leak rate tests.

1.i(8) Primary and secondary containment isolation initiation logic tests.

1.i(10) Containment and containment annulus vacuum-breaker tests.

1.i(11) Containment supplementary leak collection and exhaust system.

1.i(12) Containment air purification and cleanup systems.

1.i(13) Containment inerting system.

1.i(15) Containment penetration pressurization system.

1.i(17) Secondary containment system ventilation.

1.i(18) Containment annulus and cleanup system.

1.j(7) Leak detection system for ECCS and containment recirculating spray systems located outside containment.

1.j(9) Pressure control systems to contain fission product leakage.

1.j(12) Failed fuel detection system or functional equivalent.

1.j(13) Incore instrumentation.

1.j(14) Water transfer instrumentation and control.

1.j(15) Automatic dispatcher control system.

1.j(17) Feedwater heater temperature, level and bypass control systems.

1.j(18) Auxiliary startup instrument tests.

1.j(20) External and internal flooding detection instrumentation.

1.j(22) Postulated accident tracking instrumentation.

1.j(23) Post-accident hydrogen monitors and analyzers.

1.j(24) Reactor control and ESF annunciators.

1.k(1) Personnel and criticality radiation monitor tests.

1.k(2) Personnel monitors and radiation survey instruments.

1.k(3) Radiation level and radioactivity concentration laboratory equipment.

1.l(6) Isolation features for ventilation systems.

1.l(7) Isolation features for liquid radwaste effluent systems.

1.m(1) Spent fuel pool cooling. As a minimum address the following: antisiphon devices, high radiation alarms, and low water level alarms.

1.m(2) Refueling equipment tests. List the equipment involved or cite system description in the FSAR. The equipment must include as a minimum: hand tools,

power equipment, bridge and overhead cranes and grapples.

1.m(3) Operability and leak tests of sectionalizing devices and drains. Leak tests of gaskets or bellows in the refueling canal and fuel storage pool.

1.m(4) Dynamic and static load testing of cranes, hoists, and associated lifting and rigging equipment.

1.m(5) Fuel transfer devices.

1.n(8) Seal water system.

1.n(10) Reactor coolant system purification and cleanup system.

1.n(14) Heating, cooling and ventilation systems for:

(a) spaces housing engineered safety features

(b) primary containment

(d) diesel generator buildings

(e) reactor building

(f) control room habitability systems. Testing or verification of operation of the following: space temperature control; duct leakage rate; toxic chemical and smoke detection.

1.n(15) Shield cooling system.

1.n(16) Refueling water storage tank cooling and heating systems.

1.n(18) Heat tracing and freeze protection systems.

1.o(1) Reactor components handling systems dynamic and static load tests.

1.o(2) Reactor components handling systems protective devices and interlock operability tests.

1.o(3) Reactor components handling system safety device operability tests.

640.51 (14.2.12) We could not conclude from our review that you have addressed all of the startup tests required by Regulatory Guide 1.68, Revision 2. Expand your startup test abstracts or provide additional test abstracts to include the following tests shown in Appendix A.

(2) Initial Fuel Loading and Precritical Tests

2.a. Shutdown margin verification.

2.c. Reactor protection system final functional testing.

(4) Low-Power Testing

4.a. Boron and moderator temperature reactivity coefficients.

4.j. Primary containment ventilation system.

4.k. Steam-driven engineered safety features.

4.t. Performance of natural circulation tests of the reactor coolant system to determine that design heat removal capability exists. Your natural circulation test should comply with our letter to you dated June 12, 1981. We suggest you contact Westinghouse in reference to the Westinghouse letter to the NRC dated July 8, 1981 on the subject of Special Low Power Test Program which complies with the staff position on TMI-2 Action Item I.G.1 requirement. To comply with this requirement new PWR applicants have committed to a series of natural circulation tests. To date, such tests have been performed at the Sequoyah 1, North Anna 2, and Salem 2 facilities. Based on the success of the programs at these plants, the staff has concluded that augmented natural circulation training should be performed for all future PWR operating licenses. Include description of natural circulation tests that fulfill the following objectives:

Testing

The tests should demonstrate the following plant characteristics: length of time required to stabilize natural circulation, core flow distribution, ability to establish and maintain natural circulation with or without onsite and offsite power, the ability to uniformly borate and cool down to hot shutdown conditions using natural circulation, and subcooling monitor performance.

Training

Each licensed reactor operator (RO or SRO who performs RO or SRO duties, respectively) should participate in the initiation, maintenance, and recovery from natural circulation mode. Operators should be able to recognize when natural recirculation has stabilized, and should be able to control saturation margin, RCS pressure, and heat removal rate without exceeding specified operating limits.

If these tests have been performed at a comparable prototype plant, they need be repeated only to the extent necessary to

accomplish the above training objectives and to obtain data for "fine tuning" your simulator (as stated in FSAR Subsection 13.2.1.1.b.5) for natural circulation operation.

(5) Power Ascension Tests

5.d. Xenon transients control.

5.l. Residual or decay heat removal systems and components.

5.o. Reactor coolant leak detection systems.

5.s. Principal plant control systems.

5.v. Main steam and feedwater systems.

5.x. Auxiliary systems required to support the operation of engineered safety features.

5.c.c. Gaseous and liquid radioactive waste systems verification.

5.e.e. Primary containment inerting and purge systems.

5.k.k. Dynamic response due to loss of a feedwater heater.

5.o.o. Vibrations and expansions of ASME Class 1, 2 and 3 systems.

640.52 (14.2.12) List the specific FSAR sections describing Acceptance Tests No. 25, 28, and 35, "Turbine Building Ventilation," "Computer" and "Polar Crane."

640.53 (14.2.12) Change the table of contents title for PT 36 from "Primary Containment Structural Integrity Test" to "Primary Containment Structural Acceptance Test" in accordance with Regulatory Guide 1.18.

640.54 (14.2.12) It is our position that your description of the reactor protection system test (PT 19) does not provide assurance that the total reactor protection system response time is consistent with your accident analysis assumptions. Expand the test abstract.

640.55 (14.2.12) The loss of turbine-generator and offsite power test should be initiated from a sufficient power level and should be maintained for a period of time sufficient to demonstrate that the necessary equipment, controls, and instrumentation are available following station blackout to remove decay heat from the core using only emergency power supplies. It is our position that you initiate this test from at least 100% generator output and maintain the loss of offsite power for at least 30 minutes in order to demonstrate this.

640.56 (14.2.12) Paginate all pages (sheet numbers are acceptable) including pages with tables, figures, and definitions for tables.

640.57 (14.2.12) Provide a corresponding page number with each test listed on the startup test abstracts page.

640.58 (14.2.12) Provide a corresponding page number with each test listed on the acceptance test abstracts page.

640.59 (14.2.12) Provide a corresponding page number with each test listed on the preoperational test abstracts page.

640.60 (14.2.12) Recently, questions have arisen concerning the operability and dependability of certain ESF pumps. Upon investigation, the staff found that some completed preoperational test procedures did not describe the test conditions in sufficient detail. Provide assurance that the preoperational test procedures for ECCS and containment cooling pumps will require recording the status of the pumped fluid (e.g., pressure, temperature, chemistry, amount of debris) and the duration of testing for each pump.

640.61 (14.2.12) Provide test descriptions: 1) that will verify that the plant's ventilation systems are adequate to maintain all ESF equipment within its design temperature range during normal operations; and 2) that will verify that the emergency ventilation systems are capable of maintaining all ESF equipment within their design temperature range with the equipment operating in a manner that will produce

the maximum heat load in the compartment. If it is not practical to produce maximum heat loads in a compartment, describe the methods that will be used to verify design heat removal capability of the emergency ventilation systems. Note that it is not apparent that post-accident design heat loads will be produced in ESF equipment rooms during the power ascension heat phase; therefore, simply assuring that area temperatures remain within design limits during this period will not demonstrate the design heat removal capability of these systems. It will be necessary to include measurement of air and cooling water temperatures and flows and the extrapolations used to verify that the ventilation systems can remove the postulated post-accident heat loads.

640.62 (14.2.12) Our review of licensee event reports has disclosed several instances of emergency feedwater pumps failing to start on demand. It appears that many of these failures could have been avoided if more thorough testing had been conducted during the plant's initial test programs. In order to discover any problems affecting pump startup and to demonstrate the reliability of your emergency

cooling system, state your plans to demonstrate at least five consecutive, successful, cold, quick pump starts during your initial test program.

640.63 (14.2.12) 125 VDC Distribution System Test (PT 31). State your plans to verify that individual cell limits are not exceeded during the design discharge test and to demonstrate that the DC loads will function as necessary to assure plant safety at a battery terminal voltage equal to the acceptance criterion that has been established for minimum battery terminal voltage for the discharge load test. Assure that each battery charger is capable of floating the battery within 24 hours while supplying the largest combined demands of the various steady-state loads under all plant operating conditions.

640.64 (14.2.12) Integrated Plant Cooldown from Hot Functional Tests (PT 42). Expand the cooldown test to assure that adequate control and monitoring is exercised such that an overcooling transient (i.e., thermal shock) will not occur during normal or emergency cooldown modes.

640.65 (14.2.12) Certain terminology used in the individual test description does not clearly indicate the source of the acceptance criteria to be used in determining test adequacy. An acceptable format for providing acceptance criteria for test results includes any of the following:

- Referencing technical specifications (Chapter 16),
- Referencing accident analysis (Chapter 15),
- Referencing other specific sections of the FSAR (eg. 7.4.1.2),
- Referencing vendor technical manuals,
- Providing specific quantitative bounds (only if the information cannot be provided in any of the above ways).

Modify the individual test description abstracts presented below to provide adequate acceptance criteria for all items in the respective test summaries or, if applicable, add a paragraph to Subsection 14.2.12 that provides an acceptable description to each of the following unclear terms found in the identified tables.

(1) Design, functions as per design, design requirements design criteria, as designed, design---requirements, design---conditions, design documents, design assumption.

Table 14.2-3 #1, #2, #6, #13, #14 (twice), #15 (twice), #16 (twice), #17 (twice), #25 (thrice), #31, #32 (twice), #33, #40.

Table 14.2-4 #1 (thrice), #2, #3 (twice), #4 (twice), #5 (twice), #6, #7 (twice), #8, #9, #10, #11, #12, #14, #15, #16, #17 (twice), #24, #25, #28, #34, #35.

Table 14.2-5 #9, #13, #23.

(2) Requirements of safety analysis, safety analysis requirements, technical specification requirements, required---functions, requirements, required, as required.

Table 14.2-3 #8, #13, #14 (twice), #33.

Table 14.2-5 #6 (twice), #7, #8 (twice), #10, #13 (twice), #18, #25, #26, #34, #35, #49.

(3) Technical Specifications

Table 14.2-3 #18 (twice), #19 (twice), #20.

Table 14.2-4 #13, #31.

Table 14.2-5 #13, #27, #42, #50.

(4) Specified test procedure limits, manufacturer's specification, design specifications, plant specifications, manufacturer's guidelines.

Table 14.2-3 #3.

Table 14.2-4 #8, #9, #29.

Table 14.2-5 #15 (twice), #24, #25, #46, #48.

(5) With respect to safety analysis, stated in safety analysis, utilized in safety analysis, contained in safety analysis, established in the safety analysis report.

Table 14.2-5 #11, #12, #17, #18, #19, #20, #21, #29, #30, #31, #38, #41, #47.

(6) Consistent

Table 14.2-5 #17, #18, #19, #20, #24, #30, #41, #42, #45, #46, #47.

(7) Satisfactory, satisfactorily, satisfactory demonstration, satisfactorily completed.

Table 14.2-3 #30, #43.

Table 14.2-4 #6, #32.

Table 14.2-5 #3.

(8) Limits, minimum limit, allowable design limits, design limits.

Table 14.2-3 #31 (twice), #37.

Table 14.2-4 #24.

Table 14.2-5 #8.

(9) Acceptable performance, expected performance, adequate.

Table 14.2-3 #15 (twice), #16.

Table 14.2-5 #29.

(10) Properly, proper settings.

Table 14.2-3 #9.

Table 14.2-5 #2, #44.

(11) Value, desired reference value, warranted value.

Table 14.2-5 #11, #23, #37.

(12) Successfully.

Table 14.2-5 #33 (twice), #48, #49.

(13) Accuracies, specified accuracy.

Table 14.2-5 #14, #28, #43.

(14) Capabilities are verified.

Table 14.2-4 #2.

(15) Operability.

Table 14.2-4 #11, #14.

(16) Ability.

Table 14.2-4 #33 (twice).

(17) Predicted distribution.

Table 14.2-5 #19.

(18) Cause undue stress.

Table 14.2-3 #4.

(19) Maximum differential pressure.

Table 14.2-3 #10.

(20) Sufficient.

Table 14.2-3 #11, #43.

(21) Accordance with FSAR.

Table 14.2-3 #18.

(22) Conforms to requirement---technical manual.

Table 14.2-5 #5.

(23) Survey results.

Table 14.2-5 #41.

640.66 (14.2.12) Several of the acceptance criteria do not reflect complete accomplishment of the test objectives. Modification should be made so that when the acceptance criteria has been met, the test objective will have been achieved. Modify the individual test description abstracts presented below to provide consistency between the test objective and the acceptance criteria.

(1) PT 40. Acceptance criteria implies that all systems and all instrumentation would have to be demonstrated or operated. Objective and Test Method state a limited number.

(2) AT 31. The objective indicates a test must be performed. The acceptance criteria implies that the test has already been completed. The acceptance criteria needs to be changed to "Demonstration of the ..."

(3) ST 1. Acceptance criteria needs to include the completion of a schedule or proposed test sequence.

(4) ST 3. Need to change "procedure" in the acceptance criteria to "test objective" or reference a procedure that provides a detailed list of plant conditions, systems, and equipment necessary for a safe and controlled core loading.

(5) ST 4. Objective is to develop detailed inscructions for loading whereas the acceptance criteria is aimed at completion of loading and its documentation.

(6) ST 10. Acceptance criteria does not assure that the calculations outlined in the test objective were performed.

The following Regulatory Guides were referenced in the preceding questions:

Regulatory Guide 1.18 (Revision 1), "Structural Acceptance Test for Concrete Primary Reactor Containments."

Regulatory Guide 1.20 (Revision 2), "Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Initial Startup Testing.

Regulatory Guide 1.41, "Preoperational Testing of Redundant Onsite Electric Power Systems to Verify Proper Load Group Assignments."

Regulatory Guide 1.52 (Revision 2), "Design, Testing, and Maintenance Criteria for Engineered-Safety-Feature Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants."

Regulatory Guide 1.68 (Revision 2), "Initial Test Programs for Water-Cooled Nuclear Power Plants."

Regulatory Guide 1.68.2, "Initial Startup Test Program to Demonstrate Remote Shutdown Capability for Water-Cooled Nuclear Power Plants."

Regulatory Guide 1.79, "Preoperational Testing of Emergency Core Cooling Systems for Pressurized Water Reactors."

Regulatory Guide 1.80, "Preoperational Testing of Instrument Air Systems."

Regulatory Guide 1.95, "Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release."

Regulatory Guide 1.108, "Periodic Testing of Diesel Generators Used as Onsite Electric Power Systems at Nuclear Power Plants."

Regulatory Guide 1.128, "Installation Design and Installation of Large Lead Storage Batteries for Nuclear Power Plants."

Regulatory Guide 1.139, "Guidance for Residual Heat Removal."

Regulatory Guide 1.140, "Design, Testing, and Maintenance Criteria for Normal Ventilation Exhaust System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants."

Errata

Subsection 14.2.7, Reg. Guide 1.68, part (1)

"Appendix A, Section 1.g." should read "Appendix A, Section 1.g.2."