Westinghouse Electric Corporation Energy Systems

Box 355
Pittsburgh Pennsylvania 15230-0355

NSD-NRC-96-4902
DCP/NRC0673
Docket No.: STN-52-003

December 6, 1996

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: T. R. QUAY

SUBJECT: RESPONSE TO STAFF COMMENTS ON AP600 INITIAL TEST PROGRAM

Dear Mr. Quay:

In a letter dated November 8, 1996, staff comments were provided on the revision to the AP600 Initial Test Program (ITP) provided in Revision 9 of the AP600 SSAR. Enclosed are responses and draft SSAR revision pages which address these comments. The enclosed responses were provided informally on November 25, 1996 and were discussed with NRC staff during a November 27, 1996 teleconference. Attachment 1 to this letter provides the status of the subject open items as a result of the November 27, 1996 teleconference. The draft SSAR revisions will be included in Revision 10 of the AP600 SSAR.

Please contact John C. Butler on (412) 374-5268 if you have any questions concerning this transmittal.

B. A. McIntyre, Manager
Advanced Plant Safety and Licensing

cc: T. Kenyon, NRC (w/o Attachments)
J. Sebrosky, NRC
J. Peralta, NRC
N. J. Liparulo, Westinghouse

Attachment 1 to NSD-NRC-96-4902
AP600 Chapter 14
Open Item Status Following 11/27/96 Teleconference

OITS Number	Status	
OI 1234	Confirmatory*	
OI 1236	Action W	Add COL item that says COL applicant responsible for preparing information as identified in items a) and b) of page 5 of E-mail.
OI 1238	Confirmatory	
OI 1245	Action N	This will be closed when NRC finds section 3.4 of CDM acceptable
OI 1247	Confirmatory	
OI 1249	Confirmatory	
OI 1252	Confirmatory	
OI 1253	Action N	
OI 1254	Action N	
OI 1255	Action N	
OI 1256	Action N	
OI 1257	Action N	Related to closing item in ITAAC
OI 1258	Confirmatory	
OI 1828	Confirmatory	
OI 1963	Confirmatory	
OI 1964	Confirmatory	
OI 1965	Confirmatory	
OI 1966	Confirmatory	(Fax of word change to Chapter 17 sent by fax 11/27)
OI 1967	Action N	
OI 1968	Confirmatory	
OI 2547	Confirmatory	
OI 2568	Confirmatory	
OI 2570	Action N	
OI 2641	Action N	
OI 2642	Action N	
OI 2646	Action N	
OI 2648	Action N	
OI 2931	Closed	
OI 2932	Closed	

* Confirmatory - Technical resolution of open item has been reached, closure awaits incorporation of agreed upon changes to SSAR

ENCLOSURE TO WESTINGHOUSE LETTER NSD-NRC-96-4902

November 18, 1996

Westinghouse AP600 SSAR Chapter 14, Initial Test Program

1. **Initial Staff Response to Westinghouse Letter to NRC dated August 13, 1996 on "SSAR Chapter 14 - Initial Test Program, Responses to RAIs and Open Items"**

OITS 1234/DSER Open Item 14.2.1-1: "The staff finds, however, that in order to be consistent with the guidance of Regulatory Position (RP) C.1 of RG 1.68, Revision 2, dated August 1978, the third, fourth, and fifth paragraphs in Section 14.2.1 of the SSAR, regarding systems on which preoperational and/or startup testing is to be performed, should be revised as follows:

- Are relied upon for establishing conformance with safety limits or limiting conditions for operation that will be included in the facility technical specifications

- Are classified as ESFASs or are relied upon to support or ensure operation of ESFASs within design limits

- Are assumed to function or for which credit is taken in the accident analysis of the facility, as described in the SSAR, and/or in its design-specific PRA

In addition, Westinghouse should include, in this section of the SSAR (or in another Chapter 14 section, as appropriate), a detailed description of those AP600 plant-specific design features, systems (including those listed in Table 1.5-1 of the SSAR), and/or system configurations or interactions, not being tested and/or simulated within the initial test program scope of Chapter 14 of the SSAR, which meet either of the following criteria:

- are significantly different from those found in light water reactor designs described in 10 CFR 52.47(b)(1)

- utilize simplified, inherent, passive, or other innovative means to accomplish their intended safety functions.

For any such systems or design features identified, Westinghouse should provide appropriate justifications for their exclusion from the ITP, or the applicable test abstract(s) should be modified to encompass them accordingly.

The staff also finds that Section 14.2.1 (or alternatively Section 14.2.8) of the SSAR should be revised to identify, if applicable, any startup tests that are to be performed to demonstrate the operability of structures, systems, and components that are not considered essential to meet the criteria of RP C.1 of RG 1.68 (Revision 2, dated August 1978).

Portions of the issues outlined above were previously identified by the staff as Q260.23. This is Open Item 14.2.1-1."

Westinghouse's Response: "Subsection 14.2.1, has been revised to include the test objectives identified in the August 8, 1994 response to RAI 260.23. In addition, test abstracts for applicable systems identified in Regulatory Guide 1.68, Revision 2, Appendix A have been included."

Staff's Response: In its July 8, 1994 response to RAI 260.23 (not August 8 as indicated by Westinghouse, above) Westinghouse confirmed that there are no tests which demonstrate the operability of structures, systems, and components that are not considered essential to meet the criteria of RP C.1 of RG 1.68. Westinghouse agreed to revise the third, fourth, and fifth paragraphs in Subsection 14.2.1 of the SSAR, as indicated by the staff, above. However, the following items remain unresolved:

a. In Revision 9 to the SSAR, the AP600 design-specific PRA has not been included in (currently) subparagraph 14.2.1(e).

b. Westinghouse has not addressed whether Section 14.2.1, Paragraph (g) needs to be revised to reflect Westinghouse's response to this Open Item that "applicable systems" identified in RG 1.68 have been included (as stated above) or justify why only nonsafety-related SSCs in the RG are "applicable to AP600" as indicated in the current SSAR. If the intent of paragraph (g) is to include any remaining SSCs included in RG 1.68, App A, not identified in the paragraphs (a) through (f), this item should be clarified accordingly.

c. The SSAR will be reviewed to determine if the current (Rev 9) ITP conclusively covers all AP600 plant-specific design features, systems (including those listed in Table 1.5-1 of the SSAR), and/or system configurations or interactions which meet either of the following criteria: (1) are significantly different from those found in light water reactor designs described in 10 CFR 52.47(b)(1), or (2) utilize simplified, inherent, passive, or other innovative means to accomplish their intended safety functions.

Therefore, these portions of **DSER Open Item 14.2.1-1** remain open

Westinghouse's Draft Response

a. Westinghouse did not use the design specific PRA as a criteria for selection of systems, structures or components to be included in the ITP. However,applying this criteria does not capture any additional AP600 SSC not currently captured by the criteria currently provided in section 14.2.1. Therefore, Westinghouse does not believe it is

necessary to add a reference to the design PRA as a criteria for test selection.

b. Item 14.2.1(g) will be revised as follows:

"Other systems identified in RG 1.68 Rev. 2 App. A that are in the AP600 and are not captured by criteria a) through f)."

c. Table 1.5-1 of the SSAR lists specific AP600 design tests that have been performed to assess the performance of components and systems in the AP600 and does not represent a comprehensive list of design features, per se, in the AP600 that are significantly different from currently operating light water reactors or utilize passive systems. However, Westinghouse believes that those design features embodied in the design tests listed in Table 1.5-1 that meet the criteria listed in item c of the staff's response are conclusively tested as part of the AP600 Initial Test Program described in Chapter 14 of the SSAR.

Proposed SSAR Revision: page 14.2-1

14.2 Specific Information to be Included in Standard Safety Analysis Reports

14.2.1 Summary of Test Program and Objectives

The purpose of this section is to describe the test program that is performed during initial startup of the AP600 plant.

The overall objective of the test program is to demonstrate that the plant has been constructed as designed, that the systems perform consistent with the plant design, and that activities culminating in operation at full licensed power including initial fuel load, initial criticality, and power ascension; are performed in a controlled and safe manner.

Preoperational and/or startup testing is performed on those systems that are:

a) 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;

b) Relied upon for safe shutdown and cooldown of the reactor under transient and postulated accident conditions and for maintaining the reactor in a safe condition for an extended shutdown period following such conditions;

c) Relied upon for establishing conformance with safety limits or limiting conditions for operation that will be included in the facility technical specifications;

d) Classified as engineered safety features actuation systems (ESFAS) or are relied upon to support or ensure operation of engineered safety features actuation systems within design limits;

e) Assumed to function or for which credit is taken in the accident analysis of the AP600 as described in the SSAR;

f) Used to process, store, control, or limit the release of radioactive materials.

g) ~~Nonsafety-related~~ Other systems identified in Regulatory Guide 1.68, Revision 2, Appendix A ~~and are applicable to.~~ that are in the AP600 and are not captured by criteria a) through f).

OITS 1236/DSER Open Item 14.2.2-2: "The staff also finds that Section 14.2.2 of the SSAR should be revised to clarify that Westinghouse will provide the COL applicant with scoping documents (i.e., preoperational and startup test specifications) containing testing objectives and acceptance criteria applicable to Westinghouse's scope of design responsibility. Such documents should also include, as appropriate, delineation of the following testing information: (a) specific plant operational conditions under which the tests will be conducted, (b) testing methodologies to be used, (c) specific data to be collected, (d) acceptable data reduction techniques, and (e) any reconciliation methods needed to account for test conditions, methods, or results (if testing is performed at conditions other than representative design operating conditions).

This section (and/or Section 14.2.9, as appropriate) should include the following COL action items to be provided by the prospective COL applicant for staff review: (a) the scoping document (i.e., preoperational and startup test specifications) containing testing objectives and acceptance criteria applicable to Westinghouse's scope of design responsibility. This is COL Action Item 14.2.2-1; (b) the scoping document, and any related documents, which delineate plant operational conditions at which tests are to be conducted, testing methodologies to be utilized, specific data to be collected, and acceptable data reduction techniques to be utilized. This is COL Action Item 14.2.2-2; (c) the scoping document that delineates any reconciliation methods needed to account for test conditions, methods, or results if testing is performed at conditions other than representative of design operating conditions. This is COL Action Item 14.2.2-3; and (d) the approved preoperational test procedures (to be provided approximately 60 days before their intended use, and startup test procedures (to be provided approximately 60 days before fuel loading). This is COL Action Item 14.2.2-4.

These issues were previously identified by the staff in Q260.24. This is Open Item 14.2.2-2."

Westinghouse's Response: "Information to be provided by the COL, related to the plant initial test program, has been added to the SSAR in Section 14.4."

Staff's Response: Although not specifically acknowledged in this response, Westinghouse's previous response to Q260.24 was provided in their 7/22/94 letter to the NRC. In this letter, Westinghouse had stated, in part, that "It is inappropriate for the SSAR to specify the specific form the designers and/or equipment suppliers must supply the information. The optimum form may evolve with information technology and lessons learned from initial plants."

SSAR Section 14.4, "Combined License Applicant Responsibilities," subsections 14.4.2, "Test Specifications and Procedures" and 14.4.3, "Conduct of Test Program" both assert that the COL applicant is responsible for (1) providing test procedures for the preoperational and startup tests for NRC review, and (2) formulating the startup administration manual (procedure) which contains the administration procedures and requirements that govern the activities associated with the plant initial test program, as identified subsection 14.2.3, "Test Procedures."

However, subsection 14.2.3 does not address the responsibility of the COL applicant in preparing the following: (a) the scoping document (i.e., preoperational and startup test specifications) containing testing objectives and acceptance criteria applicable to Westinghouse's scope of design responsibility, and (b) the scoping document that delineates any reconciliation methods needed to account for test conditions, methods, or results if testing is performed at conditions other than representative of design operating conditions. The purpose of Q260.24 and Q260.28 was not to dictate or specify the "specific form the designers and/or equipment suppliers must supply the information." Rather, the issue at hand is the need to explicitly identify and define specific documented information (i.e., "scoping documents" as defined above) that the prospective COL applicant must provide for staff review. Therefore, these portions of **DSER Open Item 14.2.2-2** remain open.

Westinghouse's Draft Response

Section 14.2.3 will be retitled - Test Specifications and Procedures. The contents of current 14.2.3 as currently written applies to either Test Specs or Test Procedures (or both). Test Procedures will be modified to read Test Specifications and / or Procedures where appropriate. A paragraph describing the contents of the test specifications will be provided which includes:

"Criteria for test results evaluation and reconciliation methods and analysis as required."

Test specifications or test procedures for each test performed during the Initial Test Program include testing objectives and acceptance criteria for each test.

Proposed SSAR Revision: Pages 14.2-4 and 14.2-5

- Tests related to initial criticality and those performed at low power (less than 5 percent)
- Tests performed at power levels greater than 5 percent

During performance of the startup test program, the plant operating staff has the opportunity to obtain practical experience in the use of normal and abnormal operating procedures while the plant progresses through heatup, criticality, and power operations.

The general objectives of the startup test program are:

- Install the nuclear fuel in the reactor vessel in a controlled and safe manner.
- Verify that the reactor core and components, equipment, and systems required for control and shutdown have been assembled according to design and meet specified performance requirements.
- Achieve initial criticality and operation at power in a controlled and safe manner.
- Verify that the operating characteristics of the reactor core and associated control and protection equipment are consistent with design requirements and accident analysis assumptions.
- Obtain the required data and calibrate equipment used to control and protect the plant.
- Verify that the plant is operating within the limits imposed by the Technical Specifications.

Abstracts of the startup tests are provided in this section.

14.2.2 Organization, Staffing, and Responsibilities

The Combined License holder is responsible for the establishment of a management organization with overall responsibility for defining the responsibilities, requirements, and interfaces necessary to safely and efficiently test, operate, and maintain the AP600 plant.

The Combined License holder is responsible for developing the specific plant organization and staffing appropriate for the testing, operating and maintaining the AP600 plant.

14.2.3 Test Specifications and Test Procedures

Preoperational and startup tests are performed using test specifications and test procedures.

For the preoperation and startup tests, test specifications are written to specify the following:

- Objectives for performing the test
- Test prerequisites
- Initial test conditions
- Data requirements
- Criteria for test results evaluation and reconciliation methods and analysis as required

For each test, the test procedure specifies the following:

- Objectives for performing the test
- Prerequisites that must be completed before the test can be performed
- Initial conditions under which the test is started
- Special precautions required for the safety of personnel or equipment
- Instructions delineating how the test is to be performed
- Identification of the required data to be obtained and the methods for documentation
- Data reduction analysis methods as appropriate
- ~~Criteria for test results evaluation~~

Available information on operating and testing experiences of operating reactors are factored into the test specifications and test procedures as appropriate.

Copies of the test specifications and test procedures for the startup tests are provided to NRC inspection personnel not less than 60 days prior to the scheduled fuel loading date.

Copies of the test specifications and test procedures are available to NRC inspection personnel approximately 60 days prior to the scheduled performance of the following preoperational tests:

- Tests of systems/components that perform safety-related functions

- Tests of systems/components that are nonsafety-related but perform defense in-depth functions.

~~Submittal to the NRC of~~ Test specifications and test procedures for the preoperational tests of the plant systems/components which perform no safety-related or defense-in-depth functions ~~is not required~~ are available to NRC inspection personnel prior to the scheduled performance of these tests.

Preoperational and startup tests ~~of safety-related functions~~ are performed with the quality assurance requirements as specified in Section 17.4.

14.2.3.1 Conduct of Test Program

Administrative procedures and requirements that govern the activities of the conduct of the initial test program include the following:

- Format and content of test procedures

OITS 1238/DSER Open Item 14.2.2.2-1: "This section (and/or Section 14.2.9, as appropriate) should include the following COL action items to be provided by the prospective COL applicant for staff review: the scoping document (i.e., preoperational and startup test specifications) containing testing objectives and acceptance criteria applicable to Westinghouse's scope of design responsibility. This is COL Action Item 14.2.2-1"

Westinghouse's Response: COL Action Items related to the plant initial testing program have been added to the SSAR in Section 14.4.

Staff's Response: See **OITS 1236/DSER Open Item 14.2.2-2, above.**

Westinghouse's Draft Response

See draft response to OITS 1236 above.

OITS 1245/DSER Open Item 14.2.8-7: "In startup test abstract 14.2.8.2.34, Westinghouse takes exception to RG 1.68 for testing natural circulation as has been done for current pressurized water reactor (PWR) plants. The justification for this exception is that the performance of a natural circulation test is not necessary to demonstrate flow characteristics of the plant. The physical layout of the plant and key components (steam generators, pumps, piping, and reactor vessel) is identical for each unit. Typical manufacturing and construction variations in these parameters will have no significant impact on the natural circulation flow. Since the design and layout is fixed between each AP600 plant, no changes in the natural circulation characteristics will occur. Other system flow and performance measurements taken during the hot functional and power ascension testing will provide assurances that the overall flow characteristics of the plant are equivalent to the reference plant. Therefore, demonstration of the natural circulation characteristics on the first AP600 plant will be sufficient to validate the design characteristics. The natural circulation test is prototypical.

The staff finds this response will be acceptable for startup test abstract 14.2.8.2.34, provided that the following criteria are met: (1) Appropriate justification for this exception to RG 1.68, Appendix A, Item 4.t, is included in Appendix 1A of the SSAR, or Section 1.9.3 of the SSAR, as appropriate. (This justification should provide appropriate reference to Westinghouse's response for NUREG-0737, action item I.G.1, as described in the attachments to the letter from Westinghouse (E.P. Rahe) to the NRC (H.R. Denton), dated July 8, 1981); and (2) Westinghouse identifies this issue, in Section 14.2.9 of the SSAR (or its subsequent equivalent), as a COL action item, which will require COL applicants referencing the AP600 design to perform the following: (a) demonstrate that the physical layout and configuration of the proposed plant and key components (steam generators, pumps, piping, and reactor vessel) remain identical to the reference plant; (b) validate the acceptance criteria, provided by Westinghouse, for the specific values or ranges of values for other system flow and performance measurements that are to be taken during the hot functional and power ascension testing to confirm that the overall flow characteristics of the proposed plant are equivalent to the reference plant. This is COL Action Item 14.2.8-1 and Open Item 14.2.8-7."

Westinghouse's Response: Section 14.3 provides reference to Certified Design Material which commits the COL to conduct the Initial Test Program. As part of that Initial Test Program, the COL will verify the physical layout and configuration of the components, and component parameters important to the natural circulation of fluid in the reactor coolant system. These verifications will establish that AP600 plants subsequent to the

first plant, will achieve natural circulation flow similar to the flow demonstrated by testing in the first plant.

Staff's Response: While the Certified Design Material (CDM) provides that the COL conduct certain testing to satisfy ITAAC requirements, the CDM does not commit the COL to conduct the Initial Test Program. § 50.34, Appendix A to 10 CFR Part 50, and Section XI, "Test Control," of Appendix B to 10 CFR Part 50 **require that a test program be established to ensure that structures, systems, and components will perform satisfactorily in service.**

In order to address the staff's concerns on this issue, Westinghouse needs to (1) confirm that the ITAAC process will (a) demonstrate that the physical layout and configuration of the proposed plant and key components (steam generators, pumps, piping, and reactor vessel) remain identical to the reference plant; (b) validate the acceptance criteria, provided by Westinghouse, for the specific values or ranges of values for other system flow and performance measurements that are to be taken during the hot functional and power ascension testing to confirm that the overall flow characteristics of the proposed plant are equivalent to the reference plant; and (2) include appropriate justification for this exception to RG 1.68, Appendix A, Item 4.t, in Appendix 1A of the SSAR, or Section 1.9.3 of the SSAR, accordingly. (This justification should provide appropriate reference to Westinghouse's response for NUREG-0737, action item I.G.1, as described in the attachments to the letter from Westinghouse (E.P. Rahe) to the NRC (H.R. Denton), dated July 8, 1981); otherwise, Westinghouse should commit to performing the requisite natural circulation testing in accordance with RG 1.68, Appendix A, Item 4.t. **DSER Open Item 14.2.8-7** remains open.

Westinghouse's Draft Response

Section 3.4 of the AP600 CDM as submitted for staff review on November 8, 1996 contains a high level commitment to perform an Initial Test Program by the COL applicant.

Justification for this exception will be provided in Appendix 1A of the SSAR citing the appropriate reference and stating the rationale:

"For the AP600, natural circulation heat removal is not safety-related, as in current plants. This safety-related function is performed by the PRHR. Natural circulation heat removal via the PRHR is tested for every plant. Therefore, Westinghouse has met the intent of the previous licensing commitments for natural circulation testing."

This justification will be provided in Section 1.9.3 of the SSAR. W response to NUREG-0737, action item I.G.1 provided a proposal for low power testing of existing and future W PWRs in Attachment 4 to the letter from Westinghouse (E. P. Rahe) to the NRC (H. R. Denton) dated July 8, 1981. For the AP600, W proposes the following similar exception; noting that the appropriate tests are contained in the AP600 ITP:

1. During hot functional testing, prior to fuel load, with the reactor coolant pumps not running and no onsite power available, the heat removal capability of the PRHR heat exchanger with natural circulation flow is verified (Section 14.2.9.1.3, item e).

2. After fuel loading, but prior to criticality, with the reactor system at no-load operating temperature and pressure and all RCPs operating, the depressurization rate is determined by de-energizing the heaters and pressure is further reduced through use of sprays (Section 14.2.10.1.19).

3. After criticality is achieved and the plant is at ~ 3% power, the plant is placed in a natural circulation mode by tripping all reactor coolant pumps and observing the plant response (Section 14.2.10.3.6).

4. A loss-of-offsite power test is performed with the plant at minimum power level supplying normal house loads. The turbine is tripped and the plant is placed in a stable condition using batteries and the diesel generator (Section 14.2.10.4.26).

5. Data obtained from the natural circulation tests is provided for operator training on a plant simulator at the earliest opportunity.

OITS 1247/DSER Open Item 14.2.8-9: Westinghouse should modify startup test abstract 14.2.8.2.41 in Appendix 1A of the SSAR to include applicability of this testing to subsequent AP600 plants, or to provide appropriate justification for this exception to RG 1.68, Appendix A, Item 5.j.j. This is Open Item 14.2.8-9.

Westinghouse's Response: [EELB] Chapter 14 has been revised to delete testing which simulates a loss of off-site electrical power with the reactor core at power, however, each aspect of a loss of off-site power transient is tested separately. These tests include the RCP flow coastdown test (14.2.10.1.18), the diesel generator start, and load testing (14.2.9.2.17), the rod control system test (14.2.10.1.11), and the rod drop time measurement test (14.2.10.1.14).

Staff's Response: The staff finds that Westinghouse's justification for deleting testing to demonstrate that the dynamic response of the plant is in accordance with design for the condition described in RG 1.68, Appendix A, Item 5.j.j is unacceptable. While results obtained when performing discrete systems tests at separate intervals may be indicative of the overall expected plant behavior during postulated operational transients, such testing is not a substitute for demonstrating that the actual dynamic plant response, including anticipated systems interactions, is in accordance with design during a simulated or actual transient. Westinghouse should revise Chapter 14 to reinstate testing for the condition described in RG 1.68, Appendix A, Item 5.j.j. **DSER Open Item 14.2.8-9** remains open.

Westinghouse's Draft Response

This test will be included as section 14.2.10.4.26.

Proposed SSAR Revision: Pages 14.2-128 and 14.2-129

OITS 1249/DSER Open Item 14.2.8-11: Startup test abstract 14.2.8.2.51 should be modified in Appendix 1A of the SSAR to include applicability of this testing to subsequent AP600 plants, or to provide appropriate justification for this exception to RG 1.68, Appendix A, Item 5.n.n.

Westinghouse's Response: Subsection 14.2.10.4.21 specifies that the 100% load rejection test is to be performed only on the first AP600 plant. This testing provides measurements of the plant parameters including reactor power and primary and secondary pressures and temperatures that occur following this transient. Subsequent plants have similar equipment, control systems, and setpoints. The above first-plant-only test meets the following criteria used to establish which testing is to be performed only on the first AP600 plant: (a) the performance parameter(s) to be measured is not provided by previous certification, qualification, or prototype testing; and (2) construction and installation inspections and other preoperational tests, performed on every plant, demonstrate that the performance parameter(s) does not change from plant to plant.

Staff's Response: The staff finds that Westinghouse's justification for not demonstrating that the dynamic response of the plant is in accordance with design for the condition described in RG 1.68, Appendix A, Item 5.n.n., on all subsequent plants is unacceptable.

RG 1.68, Appendix A, Item 5.n.n., provides for the demonstration that the dynamic response of the plant is in accordance with design for the case of a full load rejection transient with the plant's electrical distribution system aligned for normal full power operation, and in such a manner that the turbine-generator is subjected to the maximum credible overspeed condition. While we may agree that subsequent AP600 plants have similar equipment, control systems, and associated setpoints, this test is not conducted just to demonstrate that the performance parameters do not change from plant to plant. Rather, the purpose of this test is to demonstrate that the integrated dynamic response of the as-built plant, including all associated systems and/or design features, conforms to the postulated plant response when subjected to this anticipated transient. Therefore, subsection 14.2.10.4.21 needs to be modified to include applicability of this testing to subsequent AP600 plants. **DSER Open Item 14.2.8-11** remains open.

Westinghouse's Draft Response

This test will be performed on every plant.

Proposed SSAR Revision: Page 14.2-120

14.2.10.4.25 Thermal Expansion

Objective

Demonstrate that essential nuclear steam supply system and balance-of-plant components can expand without obstruction and that the expansion is in accordance with design. Also, during cooldown, the components return to their approximate baseline cold position. Testing is conducted to resolve discrepancies from hot functional testing as in subsection 14.2.9.1.1, and to test modifications made since hot functional testing was completed. Systems not tested during hot functional testing are tested.

Prerequisite

Temporary instrumentation is installed, as required, to monitor the deflections for the components under test.

Test Method

For the components tested, the following apply:

- During plant heatup and cooldown, record deflection data.
- Verify support movements by recording hot and cold positions.

Performance Criteria

For the components tested, the following apply:

- There is no evidence of blocking of the thermal expansion of piping or component, other than by installed supports, restraints, and hangers.
- Spring hanger movements must remain within the hot and cold setpoints and supports must not become fully retracted or extended.
- Piping and components return to their approximate baseline cold position.

14.2.10.4.26 Loss of Offsite Power

Objective

Demonstrate plant response following a plant trip with no offsite power available.

Prerequisites

- The plant is at minimum power level supplying normal house loads through the unit auxiliary transformers.

- The unit is disconnected from the electrical grid.

Test Method

- The turbine is tripped and the generator output breaker opens, removing ac power from the unit auxiliary transformers.

Performance Criteria

- The reactor trips.
- Both standby diesel generators start and pick up the required loads in the proper sequence.
- Class 1E dc and non-1E dc loads are uninterrupted and are provided by the battery subsystems.
- The primary plant is placed in a stable condition.

14.2.10.4.20 Load Swing Test

Objective

Verify nuclear plant transient response, including automatic control system performance, when 10 percent step-load changes are introduced to the turbine-generator at 30, 75, and 100 percent rated thermal power levels.

Prerequisite

The plant is operating in a steady-state condition at the desired thermal power level.

Test Method

Change the turbine-generator output as rapidly as possible to achieve a step 10 percent load increase or decrease. Monitor and record plant parameters of reactor power, reactor coolant system temperature, pressurizer pressure and level, and steam generator pressure and level during the load transients.

Performance Criterion

The primary and secondary control systems, with no manual intervention, maintain reactor power, reactor coolant system temperature, pressurizer pressure and level, and steam generator levels and pressures within acceptable ranges during steady-state and transient operation. Control system response is reviewed and adjustments to the control systems are made, if necessary, prior to proceeding to the next power plateau.

14.2.10.4.21 100 Percent Load Rejection ~~(First Plant Only)~~

Objective

Demonstrate the ability of the AP600 plant to accept a 100 percent load rejection from full power.

Prerequisites

- The plant is operating at a stable power level of approximately 100 percent rated thermal power. Reactor and turbine control systems are in the automatic mode of operation. Plant temperatures, pressures, levels, and flow rates are within their normal range for full-power operation.
- Startup testing of the reactor and turbine control and protection systems is completed, and final setpoints are installed according to applicable plant technical manuals.
- The incore instrumentation system, including signal processing software, is operational, and all preoperational and startup testing is completed.

OITS 1252/DSER Open Item 14.2.8-14: Westinghouse should revise Section 14.2.8 of the SSAR to reconcile its contents with that of Section 14.2.2 of the SSAR, as discussed above in relation to Q260.24.

Westinghouse's Response: Responses to RAIs 260.24 and 260.28 have been provided [July 22, 1994 letter to NRC]. Section 14.4 has been revised to specify the COL provide appropriate initial test program documents for review by the staff.

Staff's Response: See **OITS 1236/DSER Open Item 14.2.2-2,** above.

Westinghouse's Draft Response

See the draft response to OITS 1236 above.

OITS 1253/DSER Open Item 14.2.8-15: Westinghouse should revise Section 14.2.8 of the SSAR, as well as the individual test methods or performance criteria, to provide specific references to the basis for determining acceptable system and component performance.

Westinghouse's Response: Subsection 14.2.9 has been revised to specify specific references that should be used to determine acceptable system and component performance.

Staff's Response: Based on our initial review of the Rev. 9 submittal, Westinghouse has not satisfactorily provided specific references to the basis for determining acceptable system and component performance. In general, the revised test abstracts provide less detail than did their predecessors. A detailed review of the SSAR will be conducted to determine whether the test abstracts accurately reflect appropriate test conditions. **DSER Open Item 14.2.8-15** remains open.

Westinghouse's Draft Response

Westinghouse believes that specific references have been provided in each preoperational test abstract. These references specify the SSAR section which define the functions performed by each system which are to be tested in the Initial Test Program.

OITS 1254/DSER Open Item 14.2.8-16: See **OITS 1255/DSER Open Item 14.2.8.3-1,** below.

OITS 1255/DSER Open Item 14.2.8.3-1: The staff finds that the preoperational and startup test phase descriptions in Section 14.2.8 of the SSAR do not provide assurance that the operability of several of the systems and components listed in Appendix A of RG 1.68 (Rev. 2, August 1978) will be demonstrated. The test abstracts of Section 14.2.8 of the SSAR should be expanded to address the following items identified in Appendix A to RG 1.68, or Appendix 1A of the SSAR should be revised to provide technical justification for any exceptions taken.

- Preoperational Testing

1.a.(2)(i)	pressurizer safety valves
1.b.(1)	control rod withdrawal inhibit and rod runback functions
1.c	diverse actuation system, which protects the facility from anticipated transients without a scram (ATWS)
1.e.(4)	steam generator pressure safety valves
1.e.(10)	feedwater heaters and drains
1.f.(2)	cooling towers and associated auxiliaries
1.j.(7)	leak detection systems used to detect failures in the emergency core cooling system (ECCS) and containment recirculation systems located outside containment (for example, potential leakage in the normal residual heat removal (RHR) system or the post-accident sampling systems that could be used to recirculate reactor coolant outside containment after an accident)
1.j.(8)	automatic reactor power control system and primary T-average control system
1.j.(13)	excore neutron instrumentation
1.j.(17)	feedwater heater temperature, level, and bypass controls
1.j.(20)	instrumentation used to detect external and internal flooding conditions

1.j.(22)	instrumentation used to track the course of postulated accidents such as containment wide-range pressure indicators, reactor vessel water level monitors, containment sump level monitors, high radiation detectors, and humidity monitors
1.j.(23)	post-accident hydrogen monitors
1.j.(24)	annunciators for reactor control and engineered safety features
1.k.(2)	personnel monitors and radiation survey instruments (As the calibration program applied to these devices will be site-specific, it would be appropriate to identify this as a COL action item.)
1.k.(3)	laboratory equipment used to analyze or measure radiation levels and radioactivity concentrations
1.l.(5)	isolation features for condenser offgas systems
1.m.(4)	static load testing at 125 percent rated load of cranes, hoists, and associated lifting and rigging equipment
1.n.(5)	secondary sampling systems
1.n.(9)	drain systems and pumping systems serving essential areas
1.n.(12)	boron recovery system
1.n.(13)	communications systems relating to offsite emergency notification
1.n.(14)(c)	class 1E electrical room heating, ventilating, and air conditioning
1.n.(14)(f)	main control room (including proper operation of smoke and toxic chemical detection systems and ventilation shutdown devices, including leak tightness of ducts).
1.n.(15)	shield cooling systems
1.o.(1)	dynamic and static load tests of reactor components handling system cranes, hoists, and associated lifting and rigging equipment

1.o.(2) protective devices and interlocks of reactor components handling system equipment

1.o.(3) safety devices for reactor components handling systems equipment

- Initial Fuel Loading and Precritical Tests

  2.f reactor core and other major components differential pressure and vibration testing after fuel loading

- Low Power Testing

  4.i control rod block and inhibit functions

- Power Ascension Tests

  5.m reactor core and major reactor coolant system components differential pressure

  5.r process computer and control room computer

  5.t pressurizer safety valves and secondary system safety valves

  5.c.c gaseous and liquid radioactive waste processing, storage, and release systems (operating in accordance with design)

  5.g.g design features to prevent or mitigate anticipated transients without scram (ATWS)

  5.k.k dynamic response of the plant for loss of feedwater heaters or bypassing feedwater heaters

These issued were previously identified by the staff in Q260.30. This is Open Item 14.2.8.3-1.

Westinghouse's Response: Subsection 14.2.9 has been revised to include test abstracts for appropriate AP600 systems and components as specified in RG 1.68, Revision 2, Appendix A.

Staff's Response: Based on our initial review of the Rev. 9 submittal, Westinghouse has not satisfactorily revised test abstracts to demonstrate the requested items. A detailed review of the SSAR will be conducted to determine whether the test abstracts accurately reflect suitable test methods under the appropriate plant conditions. **DSER Open Item 14.2.8.3-1** remains open. The following items are initial comments derived from a limited review of these items. [SPLB]

- Appendix A to RG 1.68, Section (d) identifies steam line atmospheric dump valves and relief valves to be included in the preoperational testing. In Attachment 3 to the letter of July 16, 1996, Westinghouse listed them [illegible] to be included in SSAR Chapter 14 Sections 14.2 [illegible] and 14.2.9.1.2 respectively. However, the staff could not find the testing of these valves in above two SSAR sections. Westinghouse is requested to add these valves according to Attachment 3.

- Appendix A to RG 1.68, Section (e) identifies steam generator pressure relief valves, turbine control and intercept valves, and main condenser hotwell level control system to be included in the preoperational testing. In Attachment 3 to the letter of July 16, 1996, Westinghouse listed these items to be included in SSAR Chapter 14 Sections 14.2.9.1.2, 14.2.9.2.1, or 14.2.9.4.1. However, the staff could not find the testing of SG pressure relief valves, turbine control and intercept valves in the above SSAR sections. Westinghouse is requested to add these items according to Attachment 3.

- Appendix A to RG 1.68, Section (f) identifies cooling towers and associated auxiliaries, and raw water and service water cooling towers to be included in the preoperational testing. In Attachment 3 to the letter of July 16, 1996, Westinghouse listed these items to be included in SSAR Chapter 14 Section 14.2.9.4.6. However, the staff could not find the testing of cooling towers and associated auxiliaries, and raw water and service water cooling towers in the above SSAR section. Westinghouse is requested to add these items according to Attachment 3.

Westinghouse's Draft Response

Section 14.2.9.1.2 Item a) commits to tests of safety-related valves in the SGS which includes the SG Power-Operated Relief (atmospheric dump) Valves. This section will be revised to delineate these valves specifically under item a).

Section 14.2.9.2.1 lists the other valves mentioned (with the appropriate AP600-specific name).

Test 14.2.9.4.6 does not specifically mention cooling towers for the following reasons:

- the circulating water system cooling tower is not within the scope of the AP600 design certification

- heat removal of an ultimate heat sink (such as a cooling tower) can not be tested during preops due to the absence of core power - commitments are made in 14.2.9.4.6 to test the

ultimate heat sink (cooling tower or other) during hot functionals as appropriate

The service water cooling towers are tested as specified in 14.2.9.2.6.

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- Provide steam generator isolation, including isolation of the main steam lines, feedwater lines, and blowdown lines
- Remove heat from the reactor coolant system and provide secondary side overpressure protection by operation of the steam generator safety valves
- Measure process parameters required for safety-related actuations as described in Sections 7.2, 7.3, and 7.4
- Measure process parameters required for post-accident monitoring as described in Section 7.5

This testing also verifies that the as-installed components properly perform the following defense-in-depth functions as described in Section 10.4:

- Provide heat removal from the reactor coolant system
- Provide overpressure protection for the steam generators to minimize required actuations of the spring-loaded safety valves
- Measure process parameters and provide actuation signals for the diverse actuation system

Prerequisites

The construction tests of the as-installed system have been completed. The reactor coolant system as well as other systems used in power generation are functional since portions of the steam generator system testing is performed during the plant hot functional tests. Prerequisite testing of required interfacing systems are completed to the extent sufficient to support the specified testing and the appropriate system configuration.

General Test Method and Acceptance Criteria

The performance of the steam generator system is observed and recorded during a series of individual component and integrated system testing that characterizes its modes of operation. The following testing demonstrates that the steam generator system operates as specified in Sections 10.3 and 10.4, and appropriate design specifications:

a) Proper operation of the steam generator system safety-related valves including the Steam Generator power operated relief (atmosphere dump valves) is verified by the performance of baseline in-service tests as described in subsection 3.9.6.

b) Proper operation of safety-related and defense-in-depth instrumentation, controls, actuation signals, and interlocks is verified. This testing includes actuation of equipment from the main control room.

OITS 1256/DSER Open Item 14.2.8.4-1: The staff finds that the preoperational and startup test phase descriptions in Section 14.2.8 of the SSAR do not provide assurance that the operability of several of the systems and components listed in the following RGs will be demonstrated. The test abstracts of Section 14.2.8 of the SSAR should be expanded to address the following items, or Appendix 1A of the SSAR should be revised to provide technical justification for any exceptions taken.

- RG 1.68.2, "Initial Startup Test Program to Demonstrate Remote Shutdown Capability for Water-Cooled Nuclear Power Plants" - Preoperational test abstract 14.2.8.1.94, "Remote Shutdown," does not provide sufficient detail to verify conformance with the following Regulatory Positions (RP) of RG 1.68.2:

  - Hot Standby Demonstration (RP C.3), including the following:

    - With initial conditions of the reactor at a moderate power level (10 to 25 percent), demonstrate that plant systems are in the normal configuration with the turbine generator in operation and with the minimum shift crew

    - Using only credited remote shutdown equipment, demonstrate the capability to achieve hot standby status, and maintain stable hot standby conditions for at least 30 minutes.

  - Cold Shutdown Demonstration (RP C.4), including the following:

    - with the plant at hot standby conditions;

    - with the procedurally designated crew positions;

    - using only credited remote shutdown equipment, demonstrate the capability to perform a partial cooldown by performing the following actions:

    - lower reactor coolant pressure and temperature sufficiently to permit operation of the residual heat removal (RHR) system

    - initiate and control operation of the RHR system

    - establish a heat transfer path to the ultimate heat sink

    - reduce reactor coolant temperature approximately 50 F using the RHR system

- RG 1.68.3, "Preoperational Testing of Instrument and Control Air Systems" - Preoperational test abstract 14.2.8.1.6, "Compressed and Instrument Air Systems," does not provide sufficient detail to verify conformance with the following RPs of RG 1.68.3:

  - After coolers, oil separators, air receivers, and pressure-reducing stations (RP C.2)

  - Flow, temperature, and pressure meet design specifications (RP C.4)

  - Total air demand with leakage meets design (RP C.5)

  - Single failure criterion (RP C.7)

  - Sudden and gradual loss of system pressure and appropriate response of air power equipment (RP C.8)

  - Functional test for increase in the air supply system pressure does not cause loss of operability (RP C.11)

- RG 1.140 - Preoperational test abstracts 14.2.8.1.28, "Containment Air Filtration System," 14.2.8.1.29, "Radiologically Controlled Area Ventilation Test," and 14.2.8.1.88, "High-Efficiency Particulate Air Filters and Charcoal Absorbers" do not provide sufficient detail to verify conformance with the following RP of RG 1.140.

  - heaters (RP C.3.a)
  - prefilters (RP C.3.m)
  - HEPA filters DOP tests (RPs C.3.b and C.5.c)
  - ductwork (RP C.3.f)
  - fans and motors mounting and ductwork (RP C.3.i)
  - dampers (RP C.3.l)
  - adsorber sections/cells and activated charcoal (RPs C.3.h and C.5.d)

These issues were previously identified by the staff in Q260.31. This is Open Item 14.2.8.4-1.

Westinghouse's Response: Subsection 14.2.9.1.12 has been revised to include testing to verify the ability to initiate actuation signals to the systems/components required for reactor shutdown from the remote shutdown workstation. Note that the AP600 remote shutdown workstation provides the operator with the same capability to maintain the plant at hot shutdown conditions, or to cool the plant down; as is provided from the main control room. Therefore, the operator does not need to perform manual actions or operate equipment from local control panels. In addition, test abstracts for the instrument and compressed air system and appropriate HVAC systems have been revised.

Staff's Response: Based on our initial review of the Rev. 9 submittal, Westinghouse has not satisfactorily revised test abstracts to demonstrate the requested items. In general, the revised test abstracts provide less detail than did their predecessors. A detailed review of the SSAR will be conducted to determine whether the test abstracts accurately reflect appropriate test conditions. **DSER Open Item 14.2.8.4-1** remains open.

Westinghouse Draft Response

Westinghouse would appreciate specific comments from the staff on the appropriate test abstracts so that we can address the staff's concerns in these areas more readily.

For the instrument and control air systems, and the containment air filtration system, it should be noted that these are non-safety systems in the AP600 and therefore may not require as explicit details for testing these systems.

OITS 1257/DSER Open Item 14.2.9-1: The staff recommended that Section 14.2.9 of the SSAR be retitled as "COL License Information - Initial Test Program." This title would more accurately reflect the purpose of this section within the SSAR (i.e., to identify the information to be supplied to the NRC by COL applicants referencing the AP600 design). In addition, the content of Section 14.2.9 of the SSAR should be revised to include "site-specific aspects of the plant," such as the following systems that may require testing "to satisfy certain AP600 interface requirements":

- electrical switchyard equipment
- site security plan equipment
- personnel monitors and radiation survey instruments
- automatic dispatcher control system (if applicable)

This item corresponds to Q260.32. This is Open Item 14.2.9-1.

Westinghouse's Response: Section 14.3 provides reference to COL information items to verify site specific aspects of the plant that may require testing are within the certification envelope.

Staff's Response: In its July 22, 1994 letter to the NRC, and in response to Q260.32, Westinghouse had agreed to the staff's proposed revisions and recommendations. However, Revision 9 to the SSAR has relocated such information to Section 14.3, "Certified Design Material." In its August 13, 1994 response to this open item, Westinghouse states that Section 14.3 "provides reference to COL information items to verify site specific aspects of the plant that may require testing are within the [design] certification envelope."

Based on the above, the staff requests that Westinghouse identify which subsection of Section 14.3, "Certified Design Material," designates "site-specific aspects of the plant" that may require testing by the COL applicant to satisfy certain AP600 interface requirements, such as those identified in Q260.32. **DSER Open Item 14.2.9-1** remains open.

Westinghouse's Draft Response

Interface requirements as defined by 10CFR Part 52.47 (a)(1)(vii) are discussed in section 14.3, fourth bullet. It is not necessary to provide a list of possible systems that may or may not require testing, as this determination will be made by the NRC at the time of the COL application.

OITS 1258/DSER Open Item 14.2.9-2: The staff finds that the startup administrative manual, described in Section 14.2.2.1 of the SSAR, should be identified in this section [14.2.2.1 Conduct of Test Program], and in others as appropriate, as "COL License Information" (i.e., information to be supplied to the NRC by COL applicants referencing the AP600 design). In addition, Westinghouse should include a description of the organizational units and any augmented organizations or other personnel that will manage, supervise, or execute any phase of the ITP in a manner consistent with the guidance in Section 14.2.2 of RG 1.70. Portions of the issues outlined above were previously identified by the staff in Q260.25.

Westinghouse's Response: Section 14.4 has been revised to include a COL information item to provide a startup administrative manual that will delineate specific permissions required for the approval of test results and the permission to proceed to the next testing phase.

Staff's Response: Section 14.4.3, "Conduct of Test Program," states that the COL applicant is responsible for [developing] a startup manual as identified in subsection 14.2.3, "Test Procedures". It appears that Westinghouse has addressed the specific issues identified in Q260.25. **DSER Open Item 14.2.9-2** is closed pending detail review.

[Closed]

OITS 1828/DSER Confirmatory Item 14.2.7-1: Westinghouse will revise the SSAR to state that the startup administrative manual (procedures) will be the responsibility of the COL applicant, as will other documents that delineate the test program schedule for the initial test program.

Westinghouse's Response: Section 14.4, has been revised to include a COL information item to provide a startup administrative manual that will delineate the test program schedule for staff review.

Staff's Response: See **OITS 1258/DSER Open Item 14.2.9-2**, above.

[Closed]

OITS 1963/DSER COL Open Item 14.2.2-1: The COL applicant should provide for staff review, the scoping document (i.e., preoperational and startup test specifications) containing testing objectives and acceptance criteria applicable to Westinghouse's scope of design responsibility.

Westinghouse's Response: Section 14.4, has been revised to include a COL item to provide preoperational and startup test procedures containing test objectives and acceptance criteria for Westinghouse scope systems/components.

Staff's Response: See **OITS 1236/DSER Open Item 14.2.2-2**, above.

Westinghouse's Draft Response

See the draft response to OITS1236 above.

OITS 1964/DSER COL Open Item 14.2.2-2: The COL applicant should provide for staff review, the scoping document, and any related documents, which delineate plant operational conditions at which tests are to be conducted, testing methodologies to be utilized, specific data to be collected, and acceptable data reduction techniques to be utilized.

Westinghouse's Response: Section 14.4, has been revised to include a COL item to provide preoperational and startup test procedures to delineate test conditions, testing method, data to be collected, and data reduction techniques.

Staff's Response: Section 14.4.3, "Conduct of Test Program," states that the COL applicant is responsible for [developing] a startup manual as identified in subsection 14.2.3, "Test Procedures". It appears that Westinghouse has addressed the specific issues identified in this open item. **DSER COL Open Item 14.2.2-2** is closed pending detail review.

[Closed]

OITS 1965/DSER COL Open Item 14.2.2-3: The COL applicant should provide for staff review, the scoping document that delineates any reconciliation methods needed to account for test conditions, methods, or results if testing is performed at conditions other than representative of design operating conditions.

Westinghouse's Response: Section 14.4, has been revised to include a COL item to provide preoperational and startup test procedures to delineate any reconciliation methods needed to account for test conditions, methods, or results if testing is performed at conditions not representative of design conditions.

Staff's Response: Please identify which subsection of Section 4.4, "Combined License Applicant Responsibilities," includes the COL applicant item identified in **DSER Open Item 14.2.2-3** (See **Open Item 14.2.2-2**, above).

Westinghouse's Draft Response

See the draft response to OITS 1236 above.

OITS 1966/DSER COL Open Item 14.2.2-4: The COL applicant should provide for staff review, the approved preoperational test procedures (to be provided approximately 60 days before their intended use), and startup test procedures (to be provided approximately 60 days before fuel loading).

Westinghouse's Response: Section 14.4, has been revised to include a COL item to provide preoperational and startup test procedures for all safety-related systems, and systems that perform defense-in-depth functions approximately 60 days before their intended use; and to provide approved startup test procedures 60 days before fuel loading.

Staff's Response: [SPLB, HQMB] While Section 14.2.3, "Test Procedures," as referenced in Section 14.4, appears to address the COL item identified above, subsection 14.2.3 appears to also draw an unacceptable distinction between the availability (for NRC review) of preoperational test procedures for systems/components that perform safety-related functions, or of those that are nonsafety-related but perform defense-in-depth functions (in the context of the AP600 design) versus those that do not perform either type of functions but which still satisfy RG 1.68, Regulatory Position (RP) C.1, "Criteria for Selection of Plant Features To Be Tested." RG 1.68 does not provide for this distinction and, therefore, all plant system and/or features identified in accordance with subsection 14.2.1, "Summary of Test Program and Objectives," (once found acceptable) are subject to NRC review and approval. This exception to RG 1.68 is unacceptable and should be deleted.

Additionally, it is inappropriate for this subsection to specify that only safety-related initial test program testing will be conducted in accordance with the quality assurance requirements of SSAR Section 17.4. While RG 1.68 and Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50 both recognize that not all SSCs have to be tested to the same stringent requirements, they both also hold that the test program must be conducted in a manner that establishes that SSCs will perform satisfactorily in service. Westinghouse's statement in this subsection implies that all testing of SSCs that do not perform safety-related functions will be performed in accordance with quality assurance requirements not currently described in SSAR Section 17.4. Westinghouse should delete this statement or, otherwise, supplement SSAR Section 17.4 to include a detail description of the quality assurance program requirements that will govern testing of SSCs that do not perform safety-related functions. **DSER Open Item 14.2.2-4** remains open.

Westinghouse's Draft Response

R.G. 1.68 provides for a "graded approach" and that "While it is required that all SSCs important to safety be tested, it is not

required that all of them be tested to the same stringent requirements." Westinghouse has provided a comprehensive and systematic process to identify SSC necessary to be included in the ITP to "provide reasonable assurance that the facility (AP600) can be operated without undue risk to the public." Based on a review of the AP600 SSCs, the SSCs requiring the highest level test commitments are the safety-related and defense-in-depth systems. The other systems included in the ITP have been provided for completeness, and need not and do not require the same level of test commitment with regards to the ITP.

To clarify the distinction between the most important and least important systems, Section 14.2.3 will be revised to state that: 1) Test specifications and test procedures for SSCs which perform in safety related or defense in depth functions will be available for NRC review prior to performance of the test, and 2) All testing will be performed in accordance with the quality assurance requirements as specified in Section 17.4.

Additionally, Section 17.4 will be revised to include testing within the Quality Assurance program developed by the combined license applicant.

Proposed SSAR Revision: Pages 14.2-5 and 17.1-2

17.4 Combined License Information Items

The Combined License Applicant will address its design phase Quality Assurance program, as well as its Quality Assurance program for procurement, fabrication, installation, construction, and testing of structures, systems, and components in the facility.

The Combined License applicant will also address its Quality Assurance Program for operations.

17.5 References

1. "Energy Systems Business Unit — Quality Management System," Revision 1.

2. WCAP-8370 Revision 12a, "Energy Systems Business Unit — Power Generation Business Unit Quality Assurance Plan."

3. WCAP-8370/7800, Revision 11A/7A, "Energy Systems Business Unit — Nuclear Fuel Business Unit Quality Assurance Plan."

4. Letter NSD-NRC-96-4670, dated March 26, 1996.

OITS 1967/DSER COL Open Item 14.2.2.2-1: The COL applicant should provide the startup administrative manual, which will delineate the review, evaluation, and approval of test results, for staff review.

Westinghouse's Response: Section 14.4, has been revised to include a COL item to provide the startup administration manual which delineates the review, evaluation, and approval of test results.

Staff's Response: Please identify which subsection of Section 14.4, "Combined License Applicant Responsibilities," includes the COL applicant item identified in **DSER Open Item 14.2.2-1.**

Westinghouse's Draft Response

Section 14.4.3 Conduct of Test Program.

OITS 1968/DSER COL Open Item 14.2.8-1: See **OITS 1245/DSER Open Item 14.2.8-7**, above.

Westinghouse's Response: Section 14.3 references Certified Design Material which commits the COL to conduct an Initial Test Program. As part of that Initial Test program, the COL will verify that reactor coolant system parameters are comparable to the first AP600 plant in order to obtain similar natural circulation flows.

Staff's Response: See **OITS 1245/DSER Open Item 14.2.8-7**, above. **DSER COL Open Item 14.2.8-1** remains open.

Westinghouse's Draft Response

See the draft response to OITS 1245 above.

OITS 2547/Q260.39: ITP Test Abstract 14.2.8.1.30, Feedwater Control System. The Test Method subsection should be revised to incorporate verification that automatically initiated valve open/closure cycling and timing meets the system design basis requirements.

Westinghouse's Response: The test abstract for the steam generator system in subsection 14.2.9.1.2, specifies that the proper operation of the main and startup feedwater valves is verified, including automatic open/close valve operation and timing. Additional testing of the main feedwater valves is specified with the reactor at power during the startup testing described in subsection 14.2.10.1.22.

Staff's Response: [SPLB] Subsection 14.2.9.1.2 does not specify that the proper operation of main and startup feedwater valves is verified as noted. **OITS 2547** remains open.

Westinghouse's Draft Response

Section 14.2.9.1.2 bullet (a) verifies proper operation of safety-related valve functions and includes the main feedwater SG isolation valves.

Section 14.2.9.2.2 bullet(a) tests the defense-in-depth valve functions associated with the FWS to verify their proper operation. This section is revised to include verification of the proper functioning of the main feedwater pump and control valves.

Proposed SSAR Revision: Page 14.2-42

General Test Method and Acceptance Criteria

The main and startup feedwater system performance is observed and recorded during a series of individual component and integrated system testing. The following defense-in-depth testing demonstrates that the system operates as described in subsections 10.4.7 and 10.4.9 and appropriate design specifications:

a) Proper operation of defense-in-depth instrumentation, controls, actuation signals and interlocks is verified. This testing includes actuation of startup feedwater pumps and remotely-operated valves from the main control room including isolation of the main feedwater system.

b) The capability of the startup feedwater pumps to operate properly when performing their defense-in-depth function and main feedwater pumps are ~~is~~ verified with the steam generator at normal operating pressure.

c) The capability of the startup feedwater pumps to operate properly with miniflow to the condensate storage tank is verified.

14.2.9.2.3 Chemical and Volume Control System Testing

Purpose

The purpose of the chemical and volume control system testing is to verify that the as-installed system properly performs the following defense-in-depth functions described in subsection 9.3.6 and appropriate design specifications:

- Provide makeup water to the reactor coolant system
- Provide boration of the reactor coolant system
- Provide auxiliary pressurizer spray

Prerequisites

The construction testing of the as-installed chemical and volume control system is completed. The following interfacing and support systems are available as necessary to support testing: component cooling water system; service water system; reactor coolant system; electrical power and distribution systems. Data collection is available as needed to support the specified testing and system configurations.

General Test Acceptance Criteria and Methods

Chemical and volume control system performance is observed and recorded during a series of individual component and integrated system testing. The following testing verifies the system properly performs the defense-in-depth functions described in subsection 9.3.6 and appropriate design specifications:

OITS 2568/Q260.60: In ITP Test Abstract 14.2.8.2.50, "50 Percent Load Rejection," the Performance Criterion subsection should specify the acceptable ranges of the primary and secondary parameters (pressure, level, temperature, etc.) or provide specific acceptance criteria or design basis functional requirements traceable to the appropriate SSAR sections.

Westinghouse's Response: The test abstract for the 50% load rejection test has been deleted. The AP600 is designed to accept a 100% load rejection which is included in the startup testing program in subsection 14.2.10.4.21.

Staff's Response: Westinghouse has not provided adequate description of tests intended to address RG 1.68, Appendix A, Item 5.h.h. Westinghouse needs to (1) establish what constitutes the design load swing for the AP600 design, and (2) identify which test abstract(s) will demonstrate that the dynamic response of the plant to such design load swings for the facility is in accordance with design. **OITS 2568 remains open.**

Westinghouse's Draft Response

Startup tests for 10% step load changes at 30%, 75% and 100% are specified in 14.2.10.4.20. The design basis 100% load rejection is specified in 14.2.10.4.21. Ramp changes are tested as part of load follow testing 14.2.10.4.22. These tests are sufficient to test the design basis load swings discussed in Chapters 5 and 7 of the AP600 SSAR.

OITS 2570/Q260.62: The staff-identified systems should be incorporated into the AP600 ITP. Westinghouse should identify and revise the pertinent test abstracts or summaries to encompass them, or create additional abstracts accordingly.

Westinghouse's Response: Chapter 14 has been revised to include test abstracts as specified in RG 1.68, Revision 2, Appendix A, which includes testing for the systems/components listed. Confirmation of the reactor vessel flood flow areas and insulation arrangement are inspections performed during/after construction.

Staff's Response: [SPLB] In its August 13, 1996, response Westinghouse failed to address the following systems/design features:

- Annex/Auxiliary Building Non-Radioactive HVAC System, conforming to the functions of the system as described in SSAR Section 9.4.2, and RG 1.68, Appendix A, Items 1.n.14.a, 1.n.14.c, 1.n.14.e and 1.h.6.

- Radwaste Building Ventilation System, conforming to the functions of the system as described in SSAR Section 9.4.8, and RG 1.68, Appendix A, Items 1.n.14.a and 1.n.14.e.

- Turbine Building Ventilation System, conforming to the functions of the system as described in SSAR Section 9.4.9, and RG 1.68, Appendix A, Items 1.n.14.a and 1.n.14.e.

- Diesel generator Ventilation System, conforming to the functions of the system as described in SSAR Section 9.4.10, and RG 1.68, Appendix A, Items 1.n.14.a and 1.n.14.d.

- Health Physics and Hot Machine Shop HVAC System, conforming to the functions of the system as described in SSAR Section 9.4.10, and RG 1.68, Appendix A, Items 1.n.14.a and 1.n.14.e.

Westinghouse's Draft Response
The following test abstracts will be added to Chapter 14 and are attached for your review:

- The Annex/Auxiliary Building non-radioactive HVAC System
- Turbine Building Ventilation System
- Health Physics and Hot Machine Shop HVAC System
- Radwaste Building Ventilation System

Testing of the Diesel Generator Ventilation System is specified as part of the testing for the diesel generators in the current Chapter 14.2.9.2.17.

Proposed SSAR Revs: Pgs.14.2-62 & 14.2-63 and 14.2-81 thru 14.2-84

14.2.9.2.20 Primary Sampling System Testing

Purpose

The purpose of the primary sampling system testing is to verify that the as installed components properly perform the following nonsafety-related defense-in-depth functions described in subsection 9.3.3:

- Provide the capability to obtain samples of the reactor coolant, containment sump water, and containment atmosphere

Prerequisites

Construction testing of the primary sampling system has been completed. Component cooling water is being provided to the sample cooler when samples are taken from the reactor coolant system when it is at elevated temperature. The systems/components to be sampled are filled and at their normal pressure and temperature. The liquid radwaste system is available to receive discharged sample fluid. Electrical power is available for operation of the system components and a source of compressed gas is available for operation of the gas sample eductor.

General Test Method and Acceptance Criteria

The performance of the primary sampling system is observed and recorded during a series of individual component tests and testing in conjunction with the reactor coolant system and passive core cooling system operation. The following testing demonstrates that the primary sampling system performs its defense-in-depth functions as described in subsection 9.3.3 and appropriate design specifications.

a) Proper operation of the system's remotely-operated valves and eductor supply pump is verified.

b) Proper calibration and operation of instrumentation, controls, actuation signals, and interlocks are verified.

c) Verify the capability to obtain samples from the reactor coolant, containment sump, and containment atmosphere.

d) Verify the ability to return the sample stream fluid to the containment sump or liquid radwaste system, as appropriate.

e) Verify the capability to route sample streams to the laboratory.

14.2.9.2.21 Annex/Auxiliary Building Non-radioactive HVAC System

Purpose

The purpose of the annex/auxiliary non-radioactive HVAC system testing is to verify that the as installed system properly performs the defense-in-depth function, as described in subsection 9.4.2, to provide conditioned air to maintain the diesel bus switchgear rooms and battery charger rooms (containing DC switchgear) within their design temperature range during operation of the onsite standby power system.

Prerequisites

The construction testing of the annex/auxiliary building HVAC system has been successfully completed. The required preoperational testing of the interfacing systems required for the operation of the above system is completed and these systems are available as needed to support the specified testing and system configurations.

General Test Acceptance Criteria and Methods

The annex/auxiliary building non-radioactive HVAC system performance is observed and recorded during a series of individual component and integrated system testing. The following testing verifies that the system functions as described in subsection 9.4.2 and appropriate design specifications:

a) Proper function of the fans, filters, and dampers is verified.

b) Proper operation of instrumentation, controls, actuation signals, and alarms and interlocks is verified. This testing includes the following:

- Air handling unit and fan flows, controls, and alarms
- Air temperatures, alarms, and controls
- Damper open, close and modulate control in response to monitored parameters

This testing includes operation from the main control room.

c) The ventilated areas are verified to be maintained at a slightly positive pressure relative to the outside air pressure and other areas of the auxiliary building.

d) The switchgear and equipment room subsystem air handling unit supply and return fans are verified to be automatically connected to the onsite standby power supplies on a loss of power to the buses powered by the standby diesels.

14.2.9.4.17 Secondary Sampling System Testing

Purpose

The purpose of the secondary sampling system testing is to verify that the as-installed components properly perform the following nonsafety-related functions, described in subsection 9.3.4:

- Provide the capability to continuously monitor selected secondary water and steam process streams in order to establish and maintain proper water chemistry during plant operation
- Provide the capability to manually analyze additional secondary water and steam process streams

Prerequisites

Construction testing of the secondary sampling system has been completed. Cooling water is being provided to the sample coolers when samples are taken from sample points with fluid temperatures exceeding 125°F. The systems/components to be sampled are filled and operating at their normal pressure and temperature. Electrical power is available for operation of the on-line chemistry analyzers.

General Test Method and Acceptance Criteria

The performance of the secondary sampling system is observed and recorded during a series of individual component tests and testing in conjunction with the plant in operation at normal pressure and temperature. The following testing verifies that the secondary sampling system operates as described in subsection 9.3.4 and appropriate design specifications.

a) Proper calibration and operation of on-line continuous analyzers, data collection and display, controls, and actuation signals to the turbine island chemical feed system are verified.

b) Proper calibration and operation of the portable analyzer are verified.

c) Proper operation of the sample coolers is verified.

d) Capability to obtain grab samples from the sample points is verified.

14.2.9.4.18 Turbine Building Ventilation System

Purpose

The purpose of the turbine building ventilation system testing is to verify that the as installed system properly performs the normal air conditioning and ventilation functions, as described in subsection 9.4.9.

Prerequisites

The construction testing of the turbine building ventilation system has been successfully completed. The required preoperational testing of the central chilled water and hot water heating systems, and other interfacing systems required for the operation of the above systems and data collection is completed and these systems are available as needed to support the specified testing and system configurations.

General Test Acceptance Criteria and Methods

The turbine building ventilation system performance is observed and recorded during a series of individual component and integrated system testing. The following testing verifies that the system functions as described in subsection 9.4.9 and appropriate design specifications:

a) Proper function of the fans, filters, heaters, coolers, and dampers is verified.

b) Proper operation of instrumentation, controls, actuation signals, and alarms and interlocks is verified. This testing includes the following:

- Air handling unit and fan flows, controls, and alarms
- Damper open, close and modulate control

This testing includes operation from the main control room.

14.2.9.4.19 Health Physics and Hot Machine Shop HVAC System

Purpose

The purpose of the health physics and hot machine shop HVAC system testing is to verify that the as installed system properly performs the normal air conditioning and ventilation functions, as described in subsection 9.4.11.

Prerequisites

The construction testing of the health physics and hot machine shop HVAC system has been successfully completed. The required preoperational testing of the central chilled water and hot water heating systems, and other interfacing systems required for the operation of the above systems is completed and these systems are available as needed to support the specified testing and system configurations.

General Test Acceptance Criteria and Methods

The health physics and hot machine shop HVAC system performance is observed and recorded during a series of individual component and integrated system testing. The

following testing verifies that the system functions as described in subsection 9.4.11 and appropriate design specifications:

a) Proper function of the fans, filters, heaters, coolers, and dampers is verified.

b) Proper operation of instrumentation, controls, actuation signals, and alarms and interlocks is verified. This testing includes the following:

- Radiation detectors and alarms
- Air handling unit and fan flows, controls, and alarms
- Air temperatures, alarms, and controls
- Differential air pressure and alarms
- Damper open, close and modulate control

This testing includes operation from the main control room.

c) The health physics and hot machine shop HVAC system is verified to maintain the access control area and hot machine shop at a slightly negative pressure with respect to outdoors and clean areas of the annex building to prevent unmonitored releases of radioactive contaminants.

14.2.9.4.20 Radwaste Building HVAC System

Purpose

The purpose of the radwaste building HVAC system testing is to verify that the as installed system properly performs the normal air conditioning and ventilation functions, as described in subsection 9.4.8, as required for personnel and equipment in serviced areas; and provides the proper filtration of air from potentially contaminated areas.

Prerequisites

The construction testing of the radwaste building HVAC system has been successfully completed. The required preoperational testing of the central chilled water and hot water heating systems, the ac electrical power and distribution systems, and other interfacing systems required for the operation of the above systems is completed and these systems are available as needed to support the specified testing and system configurations.

General Test Acceptance Criteria and Methods

The radwaste building HVAC system performance is observed and recorded during a series of individual component and integrated system testing. The following testing verifies that the system functions as described in subsection 9.4.8 and appropriate design specifications:

a) Proper function of the fans, filters, heaters, coolers, and dampers is verified.

b) Proper operation of instrumentation, controls, actuation signals, and alarms and interlocks is verified. This testing includes the following:

- Radiation detectors and alarms
- Air handling unit and fan flows, controls, and alarms
- Air temperatures, alarms, and controls
- Differential air pressures and alarms
- Damper open, close and modulate control in response to monitored parameters

This testing includes operation from the main control room.

c) The radwaste building is verified to be maintained at a slightly negative pressure with respect to outdoors to prevent unmonitored releases of radioactive contaminants.

14.2.10 Startup Test Procedures

Those tests comprising the startup test phase are discussed in this subsection. For each test a general description is provided for test objective, test prerequisites, test description, and test performance criteria, where applicable. In describing a test, the operating and safety-related characteristics of the plant to be tested and evaluated are identified.

Where applicable, the relevant performance criteria for the test are discussed. Some of the criteria relate to the value of process variables assigned in the design or analysis of the plant, component systems, and associated equipment. Other criteria may be associated with expectations relating to the performance of systems.

The specifics of the startup tests relating to test methodology, plant prerequisites, initial conditions, performance criteria, and analysis techniques are developed by the Combined License applicant/holder in the form of plant, system and component performance and testing procedures.

14.2.10.1 Initial Fuel Loading and Precritical Tests

Tests performed after preoperational testing is complete but prior to initial criticality are described in this section. These tests include those performed prior to core load to verify the plant is ready for core loading, the loading of the core and the tests performed under hot conditions after the core has been loaded but prior to initial criticality.

Tests to be performed prior to and during initial core loading are described in subsections 14.2.10.1.1 through 14.2.10.1.5. These tests verify the systems necessary to monitor the fuel loading process are operational and that the core loading is conducted properly.

After core load, tests are performed at hot conditions to bring the plant to a final state of readiness prior to initial criticality.

OITS 2641/Q260.67: Chapter 14 - Initial Test Program. 14.2.8.1.18, In-Plant Communication System: The Test Methods and Performance Criterion subsections of this abstract need to be revised to demonstrate acceptable performance of all subsystems encompassed by the In-Plant Communication System as described in SSAR Section 9.5.2.

Westinghouse's Response: The test abstract for the plant communication system in subsection 14.2.9.4.13 has been revised to include verification of the proper performance of the system subsystems.

Staff's Response: [HICB] SSAR section 9.5.2 states that the In-plant Communication system includes the following subsystems:

* Wireless telephone system
* Telephone/page system
* Private automatic branch exchange (PABX) system
* Sound power phone system
* Emergency response facility communication system
* Security communication system

The communication system allows each guard, watchman or armed response individual on duty, to maintain continuous communication with an individual at each manned alarm station (access to vital areas) and with off-site agencies as required by 10 CFR 73, Section 55 (e) Detection Aids, and (f) Communication Requirements. Communication equipment used with respiratory protection devices will be designed and selected in accordance with EPRI guidance document NP-6659, "Voice Communication Systems Compatible with Respiratory Protection."

The "General Test Methods and Acceptance Criteria" should include a procedure to verify the above commitments. **OITS 2641** remains open.

Westinghouse's Draft Response

These subsystems will be added to subsection 14.2.9.4.13.

Proposed SSAR Revision: Page 14.2-78

General Test Method and Acceptance Criteria

Plant communications system performance is observed and recorded during a series of individual component and integrated system testing. The inplant communications system includes the following subsystems:

- Wireless telephone system
- Telephone/pager system
- Private Automatic Branch Exchange (PABX) System
- Sound Powered Phone System
- Emergency Response Facility Communication System
- Security Communication System

The following testing verifies that the system functions as described in Section 9.5 and appropriate design specifications:

a) Transmitters and receivers are verified to operate without excessive interference.

b) Proper operation of controls, switches, and interfaces is verified.

c) Proper operation of the public address, including the plant emergency alarms, is verified.

d) The proper operation of equipment expected to function under abnormal conditions such as a loss of electrical power, shutdown from outside the control room, or execution of the plant emergency plan is verified.

14.2.9.4.14 Mechanical Handling System Crane Testing

Purpose

The purpose of the mechanical handling system crane testing is to verify that the as-installed components properly perform their functions. The test ensures operation and adequacy of the reactor building polar crane, which is used to lift and relocate components providing access to the reactor fuel, vessel internals, and reactor components during refueling and servicing operations. The equipment hatch hoist and the maintenance hatch hoist are also tested.

Prerequisites

The construction testing of the heavy lift cranes has been completed. Required support systems, electrical power supplies and control circuits are operational. The heavy load analysis, defining the load paths, has been completed.

OITS 2642/Q260.68: Chapter 14 - Initial Test Program. 14.2.8.1.51, Operations and Control Center System: This test abstract does not reflect the design and configuration of the AP600 Operations and Control Center System. Specifically, the primary plant control system operator interface is a set of "soft" control units that replace conventional switch/light or potentiometer/meter assemblies used for operator interface with control systems. The function-based test analysis serves as the basis for determining the alarms, displays, controls, and procedures in the main control area.

The Test Methods and Performance Criterion subsections of this abstract need to be revised to demonstrate acceptable performance of, and to encompass, these unique AP600 design features.

Westinghouse's Response: The test abstract for the plant control system in subsection 14.2.9.2.12 has been revised to reflect the use of "soft" controls and function-based analysis for alarms, displays, controls, and procedures used in the AP600.

Staff's Response: [HICB] The general test methods and acceptance criteria should include the use of "soft" controls and function-based analysis for alarms, displays, controls, and procedures used in the AP600. **OITS 2642** remains open.

Westinghouse's Draft Response

Westinghouse requests more specific information regarding the comment to include use of "soft" controls in this test abstract. While the term "soft" is not used in this abstract, the test methods do include the use of "soft" controls during testing of the plant control system hardware and software.

OITS 2646/Q260.72: Chapter 14 - Initial Test Program. 14.2.8.1.81, Pressurizer Pressure and Level Control: The Test Method subsection does not include testing of signal selector and isolation devices. Westinghouse should revise this subsection to encompass testing of these devices or should identify the test abstract that encompasses such testing.

Westinghouse's Response: The test abstract for the reactor coolant system in subsection 14.2.9.1.1 specifies that the proper operation of the pressurizer pressure and level control is verified. Additional testing is also performed during the startup testing. Detailed methods for performing this verification, including signal selector and isolation devices, are to be included in the actual test procedures developed by the COL applicant.

Staff's Response: [HICB] The RAI's concern on testing of signal selector and isolation devices was not addressed in subsection 14.2.9.1.1 or any other startup testing sections. Either specify how the COL applicant can develop test procedures to cover those components, or modify the appropriate test abstracts to reflect these tests. **OITS 2646** remains open.

Westinghouse's Draft Response

Consolidated system level tests encompass multiple functions provided by integrated system assemblies. It is the intent that subsections (a) and (d)of subsections 14.2.9.2.12, "Plant Control System. . " include testing of the signal selector, distributed controllers, process bus multiplexers, etc. as related to Pressurizer Pressure and Level Control as well as other significant PLS functions.

OITS 2648/Q260.74: Chapter 14 - Initial Test Program, 14.2.8.2.46, Plant Control System: The scope of this test should be expanded to encompass all other Plant Control System subsystems as identified in SSAR Chapter 7.1. Alternatively, Westinghouse should identify the test abstracts that currently encompass such subsystems.

Westinghouse's Response: The test abstract for the plant control system in Subsection 14.2.9.2.12 has been revised to include the control functions specified in SSAR Section 7.1

Staff's Response: [HICB] Section 14.2.9.2.12 has not addressed all the control functions specified in the SSAR. **OITS 2648** remains open.

Westinghouse's Draft Response

The plant control systems functions to be tested are delineated in the two bullets under the subsection 14.2.9.2.12 labeled "Purpose" and coincide with the functions listed in SSAR section 7.1.3, first paragraph. While each function is not specifically mentioned in the General Test Methods and Acceptance Criteria of subsection 14.2.9.2.12, the general test methods of paragraphs a), b), c), and d) apply to each function described above.

OITS 2931/Q260.75: This issue has been superseded by NSD-NRC-96-4772, dated 7/16/96. **This item is closed.**

OITS 2932/Q260.76: This issue has been superseded by NSD-NRC-96-4772, dated 7/16/96. **This item is closed.**

2. Additional issues/comments:

(a) Specific information already requested via RAIs 260.35 through 260.82 will also be evaluated during subsequent a review. Therefore, **RAIs 260.35 through 260.82** remain open (initial comments provided above on these RAIs were derived from a limited review of these items).

(b) The ITP should be revised to reinstate listings of preoperational and startup test descriptions. These were previously identified as Table 14.2-1 and Table 14.2-2, respectively.

(c) Attachment 3 to the letter of July 16, 1996 provides a comparison table of RG 1.68, App. A, to the Chapter 14 preoperational test abstracts. A similar comparison table for the startup test abstracts would be useful.

Westinghouse's Draft Response

(a) No comment

(b) This information will be provided in the Table of Contents.

(c) A table will be provided as requested.