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Your ref: Docket No. 52-006
Our ref: DCP/NRC1676

February 4, 2004

SUBJECT: Transmittal of Revised Responses to AP1000 DSER Open Items

This letter transmits Westinghouse revised responses to Open Items in the AP1000 Design Safety Evaluation Report (DSER). A list of the revised DSER Open Item responses transmitted with this letter is Attachment 1. The non-proprietary responses are transmitted as Attachment 2.

Please contact me at 412-374-4728 if you have any questions concerning this submittal.

Very truly yours,

A handwritten signature in black ink, appearing to read "R. P. Vijuk".

R. P. Vijuk, Manager
Passive Plant Engineering
AP600 & AP1000 Projects

/Attachments

1. List of the AP1000 Design Certification Review, Draft Safety Evaluation Report Open Item Responses transmitted with letter DCP/NRC1676
2. Non-Proprietary AP1000 Design Certification Review, Draft Safety Evaluation Report Open Item Responses dated February 4, 2004

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Attachment 1

List of
Non-Proprietary Responses

Table 1 “List of Westinghouse’s Responses to DSER Open Items Transmitted in DCP/NRC1676”	
13.6-1, Revision 1 14.3 Meeting Item, Revision 1 14.3.3 - ITAAC Item	

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Attachment 2

**AP1000 Design Certification Review
Draft Safety Evaluation Report Open Item Non-Proprietary Responses**

AP1000 DESIGN CERTIFICATION REVIEW

Draft Safety Evaluation Report Open Item Response

DSER Open Item Number: 13.6-1 Revision 1

Original RAI Number(s): None

Summary of Issue:

The staff has not completed the review of the applicant's change to the security plan. At this time, the staff plans to issue a supplemental DSER that will address the AP1000 security plan, including the COL action items and any additional ITAAC. This is Open Item 13.6-1.

Westinghouse Response:

In Westinghouse letter NRC/DCP1596 dated June 6, 2003, Westinghouse submitted the AP1000 Security Assessment report that documents the compliance of the AP1000 plant to the applicable security-related requirements.

NRC Comment provided by email on January 6, 2004:

Westinghouse should include a COL information item to address specific material control measures as required by 10 CFR Part 70. Westinghouse should also ensure that the COL applicant addresses the guidance provided in ANSI N15.8-1974, "Nuclear Material Control Systems for Nuclear Power Plants."

Westinghouse Response (Revision 1):

Westinghouse will add a COL information item to address specific material control measures as required by 10 CFR Part 70 and the guidance provided in ANSI N15.8-1974. Please see the "Design Control Document (DCD) Revision:" portion of this DSER Open Item Response for specific DCD changes.

Design Control Document (DCD) Revision:

Add new subsection 13.6.13.4 as follows:

13.6.13.4 Nuclear Material Control System

Combined License applicants referencing the AP1000 certified design will address specific material control measures as required by 10 CFR Part 70 and the guidance provided in Reference 7.

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Add Reference 7 to section 13.7 as follows:

7. ANSI N15.8, "Nuclear Material Control Systems for Nuclear Power Plants," 1974.

Add Item 13.6-4 to Table 1.8-2 as follows:

Item No.	Subject	Subsection
13.6-4	Nuclear Material Control Requirements	13.6.13.4

PRA Revision:

None

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Draft Safety Evaluation Report Open Item Response

DSER Open Item Number: 14.3 Meeting Item (Response Revision 1)

Original RAI Number(s): None

Summary of Issue:

NRC comment from the NRC / WEC meeting on October 30, 2003

Westinghouse should evaluate the need for an ITAAC related to as-built condition of power cables.

Westinghouse Response:

The cable pulling process will be governed by the construction procedures for the plant. Regarding cable pulling tension, proper calculations and procedures will be used to ensure that the pulling tension does not exceed the cable manufacturer's specification for maximum pulling tension. The Quality Assurance program for procurement, fabrication, installation, construction, and testing of structures, systems, and components in the facility will cover the cable pulling process, as well as other installation processes. As stated in DCD section 17.5, this QA program is the responsibility of the Combined License applicant. ITAAC's were not provided for the cable pulling process for any of the three licensed designs. No additional ITAAC are needed for this purpose.

Furthermore, the AP1000 is a passive plant. AC power is not required for pumps, fans, and other motors to keep the plant safe. The Class 1E cables are therefore relatively small, not sized to carry high power, and are simpler to install than larger, heavier power cables.

NRC Follow Comment:

Operational experience has shown that inadequate cable installation procedures and cable pulling could cause safety-related as well as non safety-related cables (low voltage as well as medium) to fail and could challenge the performance of systems that are important to safety, i.e. RTNSS. Therefore, the staff has determined that ITAAC for systems important to safety should be added to verify that damage did not occur during storage, handling, and installation of all cables (power as well as instrumentation & control) whether they are Class 1E (safety), non-Class 1E, or RTNSS. The following guidance should be used in preparing the ITAAC:

IEEE Std. 422-1986 Section 10.2, "Installation," provides information such as handling or pulling cables, cable pulling lubricants, pulling winches, cable reels, pulling tension and bends. This could cause damage to the cables' sheathing, jacketing, or conductors. Section 11 provides guidance for the testing of cables after installation but before their connection to equipment, and includes cable terminations, and connections. The purpose of the tests is to verify that major cable damage did not occur during storage and installation. The following tests should be performed in conjunction with the cable manufacturer's recommendation:

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- 1) The insulation resistance tests for low-voltage power, instrumentation and control cables should measure the insulation resistance between the conductors in the same cable and between each conductor and station ground.
- 2) The insulation resistance tests should be performed for the shielded and unshielded medium-voltage cables.

In addition to IEEE Standards 422 and 690, the following NRC Information Notices and EPRI study should be reviewed for preparation of the electrical cable ITAAC:

IN 87-08,
IN 87-52,
IN 92-01, and
EPRI Final Report NP-7485, June 1992, "Practices to Assure Cable Operability." The EPRI report reviews power plant practices to assure cable operability, including installation and in situ testing.

Westinghouse Response (Response Revision 1):

Westinghouse has reviewed the IEEE standards, the Information Notices, and the EPRI report as they relate to the AP1000 design and has concluded the following:

1. Westinghouse agrees that inadequate cable installation and handling can cause cables to fail and could challenge the performance of systems that are important to safety.
2. Proper cable installation procedures should and will be followed. DCD Tier 2 Section 8.3.1.3.1 states that the installation of cable will comply with IEEE Std. 422.
3. As stated in EPRI NP-7485 (page 8-41), "A universally acceptable simple in-situ cable test or cable condition monitoring method that directly indicates the cable condition or its capability to withstand accident conditions does not exist."
4. Both IEEE standards 422 and 690 allow a functional test at full voltage as an alternative to insulation resistance tests of low-voltage cable. The existing DCD Tier 1 tests of instrumentation and electrical equipment provide functional tests that serve as alternatives to insulation resistance tests of low-voltage cables.
5. High potential testing of Class 1E medium-voltage cables is required by IEEE Std. 690; however, AP1000 does not have any Class 1E medium-voltage cables.
6. None of the non-Class 1E medium-voltage cables that have been identified as RTNSS-important are in locations that will require them to withstand accident conditions.

High-potential testing of the non-Class 1E medium-voltage cables is not consistent with the approach to Tier 1 that provides less detail for systems and components that are not identified as safety-related.

As stated in the initial response, the cable pulling process will be governed by the construction procedures for the plant. The Quality Assurance program for procurement, fabrication,

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installation, construction, and testing of structures, systems, and components in the facility will cover the cable pulling process, as well as other installation processes.

DCD Tier 2, Section 14.3.2.1 (third bullet on page 14.3-5) states,

"In general, the certified design descriptions do not address the processes that will be used for designing and constructing a plant that references the AP1000 design certification..."

The programmatic aspects of the design and construction processes (training, qualification of welders, and the like) are part of the licensee's programs and are subject to commitments made at the time of combined license issuance. Consequently, these issues are not addressed in the AP1000 Certified Design Material."

In summary, Westinghouse understands the concerns regarding proper cable installation and handling; however, Westinghouse, for the reasons stated above, does not believe that changes to DCD Tier 1 are needed.

Design Control Document (DCD) Revision:

None

PRA Revision:

None

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DSER Open Item Number: 14.3.3 - ITAAC Item

Original RAI Number(s): None

Summary of Issue:

The circulating water system (CWS), which is identified in Tier 2 to as being "partially out of scope" is not listed in the Tier 1 table of contents. This is inconsistent other "partially out of scope" systems, e.g. the cathodic protection system (EQS). Westinghouse should rectify this inconsistency.

Westinghouse Response:

Westinghouse will revise the Tier 1 document to include appropriate circulating water system information as shown in the "Design Control Document (DCD) Revision:" portion of this DSER Open Item Response.

Design Control Document (DCD) Revision:

Revise Tier 1 Master Table of Contents as noted below. Note that the new item should be underlined.

2.4.7 Circulating Water System

2.4.7-1 |

Revise page 2.4.7 in Tier 1 as follows:

2.4.7 Circulating Water System

No entry for this system. |

PRA Revision:

None