Westinghouse Electric Corporation
Energy Systems

Box 355
Pittsburgh Pennsylvania 15230-0355

NSD-NRC-96-4834
DCP/NRC0617
Docket No.: STN-52-003

October 4, 1996

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

ATTENTION: T. R. QUAY

SUBJECT: WESTINGHOUSE RESPONSES TO NRC REQUESTS FOR ADDITIONAL INFORMATION ON THE AP600

Dear Mr. Quay:

Enclosed are three copies of the Westinghouse responses to NRC requests for additional information on the AP600 SSAR Section 9.51, Fire Protection. Responses to RAIs including 280.13, 280.27, 280.28, 280.29 and 280.30 are attached in this transmittal.

The NRC technical staff should review these responses as a part of their review of the AP600 design. These responses close the RAIs.

Please contact Brian A. McIntyre on (412) 374-4334 if you have any questions concerning this transmittal.

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

/nja

Enclosures

cc: T. Kenyon, NRC (w/o enclosures)
C. Li, NRC
N. Liparulo, Westinghouse (w/o enclosures)

E004 1/1

Question 280.13

Re: STAFF FOLLOW ON QUESTIONS AND REVIEW STATUS, SSAR SECTION 9.5.1 - FIRE PROTECTION (June 24, 1996 letter).

9.5.1.6.2 Protection of Safe Shutdown Capability for a Fire Outside the Containment and the Main Control Room.

In SSAR Section 9.5.1.2.1.1, Westinghouse states that outside of the primary containment and the MCR, the arrangement of plant equipment and routing of cable are such that safe shutdown can be achieved with all components (except those protected by 3-hour fire barriers) in any one fire area rendered inoperable by fire. The staff notes that SECY-90-016 recommends that for a fire in any area other than containment or the MCR in an evolutionary ALWR, safe shutdown should be achieved without reliance on any safe shutdown equipment (i.e., components, power and control cabling and instrumentation and controls) in the fire affected area and without entry into that area for performance of operator actions or repairs. SECY-93-087 recommends extension of this enhanced fire protection criteria for passive plants. It is not clear from the SSAR statement given above how AP600 design meets the Commission approved SECY recommendation. Specifically, it is not clear: (1) what components are considered as protected by 3-hour fire barriers in the affected fire areas; (2) how many and which fire areas contain such protected safe shutdown components which are credited in the safe shutdown analysis even though they are in the fire affected areas, and (3) what type of 3-hour fire barriers are provided for each case. On SSAR Page 9.5-5, Westinghouse further states that outside the containment/shield building fire area, MCR and the RSS, 3-hour fire barriers provide complete separation of redundant safe shutdown components including equipment, electrical cables and instrumentation and controls. It is not clear whether the three hour fire barriers referred to above are structural barriers such as 3-hour fire barrier walls, ceilings or floors between redundant safe shutdown components. If they are not, it is not clear how the AP600 design meets the SECY recommendation. For the above reasons, staff's concern relating to how AP600 design meets the SECY recommendation of not relying on any safe shutdown equipment in a fire affected area, for a fire in any fire area outside the containment/shield building, MCR and the RSS is RAI # 280.13 and is designated as Open Item 9.5.1.6-2.

Response:

SSAR subsection 9.5.1.2.1, Revision 8, states that the fire protection system does conform to SECY-93-087, Section I.E., Fire Protection. Conformance with this SECY-93-087 is demonstrated in SSAR Appendix 9A. The specific paragraph from the "Plant Arrangement" portion of subsection 9.5.1.2.1.1 addressed by this Request for Additional Information will be revised as shown below.

SSAR Revision:

"Plant Arrangement" portion of 9.5.1.2.1.1, fifth bullet:

> Outside of the ~~primary containment and the main control room~~ three areas described above, the arrangement of plant equipment and routing of cable are such that safe shutdown can be achieved with all components ~~(except those protected by 3-hour fire barriers)~~ in any one fire area rendered inoperable by fire.

Question 280.27

Re: STAFF FOLLOW ON QUESTIONS AND REVIEW STATUS, SSAR SECTION 9.5.1 - FIRE PROTECTION (June 24, 1996 letter).

9.5.1.6.5 Additional Features to Ensure Safe Shutdown Capability

SSAR Table 7.4-1 lists systems required for safe shutdown. SSAR Tables 9A-2, 9A-3 and 9A-4 list active safe shutdown valves, containment isolation valves inside the containment and containment isolation valves outside containment, respectively. SSAR Table 9A-5 lists the safe shutdown instrumentation provided in the MCR and RSS. Based on its review of the above tables, the staff finds that AP600 design provides for needed instrumentation both in the MCR and the RSS for achieving safe shutdown; however, the staff has the following concern regarding safe shutdown instrumentation:

2. The SSAR Section 9A has neither identified the locations of SG wide range level instrumentation nor described how these safe shutdown instrumentation are protected from fire. This lack of information in the SSAR is RAI # 280.27 and is designated as Open Item 9.5.1.6-16.

Response:

SSAR Appendix 9A, Revision 8, subsections 9A.3.1.1.7, 9A.3.1.1.8, 9A.3.1.1.10 and Table 9A-2 discuss the protection of steam generator wide range level instrumentation. Steam generator wide range level instrumentation are located in fire zones 1100 AF 11300A, 1100 AF 11300B and 1100 AF 11301.

SSAR Revision: None

Question 280.28

Re: STAFF FOLLOW ON QUESTIONS AND REVIEW STATUS, SSAR SECTION 9.5.1 - FIRE PROTECTION (June 24, 1996 letter).

9.5.1.6.5 Additional Features to Ensure Safe Shutdown Capability

SSAR Table 7.4-1 lists systems required for safe shutdown. SSAR Tables 9A-2, 9A-3 and 9A-4 list active safe shutdown valves, containment isolation valves inside the containment and containment isolation valves outside containment, respectively. SSAR Table 9A-5 lists the safe shutdown instrumentation provided in the MCR and RSS. Based on its review of the above tables, the staff finds that AP600 design provides for needed instrumentation both in the MCR and the RSS for achieving safe shutdown; however, the staff has the following concern regarding safe shutdown instrumentation:

3. On SSAR Pages 9A-40 and 9A-41, Westinghouse states that a fire in main steam isolation valves compartment A or B can disable main steam pressure transmitters and that these are not required to achieve safe shutdown. However, these are listed as safe shutdown instrumentation in SSAR Table 9A-5. This inconsistency is identified as RAI # 280.28 and is designated as Open Item 9.5.1.6-17.

Response:

SSAR Appendix 9A, Revision 8, subsections 9A.3.1.2.7.2 and 9A.3.1.2.7.3 includes a safe shutdown evaluation that specifically address the steam generator pressure transmitters. If a fire in Fire Areas 1201 AF 05 or 1201 AF 06 disable the transmitters, redundant instrumentation in fire zone 1100 AF 11300B is sufficient to perform the applicable functions to achieve and maintain safe shutdown.

SSAR Revision: None

Question 280.29

Re: STAFF FOLLOW ON QUESTIONS AND REVIEW STATUS, SSAR SECTION 9.5.1 - FIRE PROTECTION (June 24, 1996 letter).

9.5.1.6.5 Additional Features to Ensure Safe Shutdown Capability

The SSAR does not provide details of man-power requirements for achieving safe shutdown following a fire event in any plant fire area which requires safe shutdown. This is RAI # 280.29 and is designated as Open Item 9.5.1.6-18.

Response:

SSAR Appendix 9A, Revision 8, subsection 9A.2.7.1, parts "Manual Operation" and "Plant Personnel" address the need and assumed availability of man-power requirements for safe shutdown. No manual actions are required to achieve safe shutdown, but one action that will is a scram which can be performed by one operator from the main control room (or if uninhabitable, the remote shutdown workstation). The assumed staff available for manual actions to achieve safe shutdown is the same number as that required for normal plant operations. No additional operators are required as a result of the fire event.

SSAR Revision: None

Question 280.30

Re: STAFF FOLLOW ON QUESTIONS AND REVIEW STATUS, SSAR SECTION 9.5.1 - FIRE PROTECTION (June 24, 1996 letter).

9.5.1.6.5 Additional Features to Ensure Safe Shutdown Capability.

About manual operations, Westinghouse states (SSAR Page 9A-4) that manual actions such as manual operation of valves, circuit breakers and hand switches are utilized in exercising control over shutdown systems, provided sufficient time, personnel and accessibility to shutdown equipment (located anywhere outside the fire area or fire zone) are available. From the above statement, it is not clear whether safe shutdown can be achieved when any one of the above is unavailable. This concern is RAI # 280.30 and is designated as Open Item 9.5.1.6-19.

Response:

SSAR Appendix 9A, Revision 8, subsection 9A.2.7.1, Portion "Manual Operation" states: "Although the typical shutdown sequence does not require manual actions by the operator, fire damage may not be sufficient in many cases to trip the plant. The operator may take appropriate actions to expedite an orderly shutdown. These actions are performed in the main control room. If the fire occurs in the main control room, these actions are performed at the remote shutdown workstation."

SSAR Revision: None