



Westinghouse  
Electric Corporation

Energy Systems

Box 355  
Pittsburgh Pennsylvania 15230-0355

DCP/NRC1243  
NSD-NRC-98-5554  
Docket No.: 52-003

February 2, 1998

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

ATTENTION: T. R. QUAY

SUBJECT: AP600 RESPONSE TO FSER OPEN ITEMS

Dear Mr. Quay:

Attachment 1 of this letter provides the Westinghouse responses to FSER open items on the AP600. A summary of the enclosed responses is provided in Table 1. Included in the table is the FSER open item number, the associated OITS number, and the status to be designated in the Westinghouse status column of OITS.

The NRC should review the enclosures and inform Westinghouse of the status to be designated in the "NRC Status" column of OITS.

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

Brian A. McIntyre, Manager  
Advanced Plant Safety and Licensing

jml

Enclosure

- cc: W. C. Huffman, NRC (Enclosure)
- T. J. Kenyon, NRC (Enclosure)
- J. M. Sebrosky, NRC (Enclosure)
- D. C. Scaletti, NRC (Enclosure)
- N. J. Liparulo, Westinghouse (w/o Enclosure)

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<b>Table 1</b>		
<b>List of FSER Open Items Included in Letter DCP/NRC1243</b>		
<b>FSER Open Item</b>	<b>OITS Number</b>	<b>Westinghouse status in OITS</b>
480.1131F	6555	Action N
480.1137F	6561	Confirm W
480.1138F	6562	Action N
480.1140F	6564	Action N
480.1142F	6566	Confirm W
480.1143F	6567	Confirm W
480.1150F	6574	Confirm W
480.1163F	6587	Confirm W

Attachment 1 to Westinghouse  
Letter DCP/NRC1243

February 2, 1998

Attachment 1 to Westinghouse  
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Question: 480.1131F (OITS #6555)

Why is the format of the surveillance requirements for TS 3.5.8 different from that for TS 3.5.7?

Response:

The first 3 surveillances of LCO 3.5.8 are identical to the first 3 LCO 3.5.6/ 3.5.7 surveillances, except that "IRWST and cavity" have replaced "cavity," since, during refueling, the IRWST water may be moved to the refueling cavity. This transfer of water is acceptable provided the combined volume, boron concentration and temperature meet surveillance limits.

SSAR Revision: None.





**Question:** 480.1137F (OITS #6561)

The Applicable Safety Analyses discussion in the BASES for TS 3.6.4 states that the external pressure load from inadvertent containment spray system actuation was evaluated. It is the staff's understanding that inadvertent containment spray was not a credible event for AP600. Please provide an explanation of this statement.

**Response:**

As agreed at the NRC / Westinghouse meeting of January 28, 1998, the reference to Inadvertent Containment Spray Actuation will be removed from the BASES for TS 3.6.4, because inadvertent containment spray actuation is not a credible event for AP600.

**SSAR Revision:** See attached markup.

BASES

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APPLICABLE  
SAFETY ANALYSES  
(continued)

The containment was also designed for an external pressure load equivalent to 3.0 psig. The limiting negative pressure transient is a loss of all AC power sources coincident with extreme cold weather conditions which cool the external surface of the containment vessel. The initial pressure condition used in this analysis was -0.2 psig. This resulted in a minimum pressure inside containment, as illustrated in reference 1, which is less than the design load. Other external pressure load events evaluated include:

- Failed fan cooler control
- Malfunctional of containment purge system
- Inadvertent Incontainment Refueling Water Storage Tank (IRWST) drain
- Inadvertent Passive Containment Cooling System (PCS) actuation
- ~~Inadvertent Containment Spray System actuation~~

Since the containment external pressure design limits can be met by ensuring compliance with the initial pressure condition, NUREG-1431 LCO 3.6.12, Vacuum Relief System is not applicable to the AP600 containment.

Containment pressure satisfies Criterion 2 of the NRC Policy Statement.

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LCO

Maintaining containment pressure at less than or equal to the LCO upper pressure limit ensures that, in the event of a DBA, the resultant peak containment accident pressure will remain below the containment design pressure. Maintaining containment pressure at greater than or equal to the LCO lower pressure limit ensures that the containment will not exceed the design negative differential pressure following negative pressure transients.

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APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. Since maintaining containment pressure within limits is essential to ensure initial conditions assumed in the accident analyses are maintained, the LCO is applicable in MODES 1, 2, 3, and 4.

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(continued)



**Question: 480.1138F (OITS #6562)**

The Applicable Safety Analyses discussion in the BASES for TS 3.6.5 states that such things as worst single failures of Residual Heat Removal and the Containment Spray System were considered in the postulated DBAs. This discussion is clearly not applicable to AP600 and should be corrected.

**Response:**

The BASES for TS 3.6.5 has been modified in response to FSER Open Item 480.1088, submitted in DCP/NRC1180 on December 12, 1998. The description of the inoperable systems resulting from the worst single failure assumed in the applicable safety analyses was modified to state:

"The postulated DBAs are analyzed with regard to containment Engineered Safety Features (ESF) systems, assuming the loss of one Class 1E Engineered Safety Features Actuation System (ESFAS) Division, which is the worst case single active failure, resulting in the Containment Cooling System flow path being rendered inoperable."

No additional modifications are required.

**SSAR Revision:** None.





**Question:** 480.1140F (OITS #6564)

The Applicable Safety Analyses discussion in the BASES for TS 3.6.6 states: "The analyses and evaluations assume a unit specific power level of 1933 MWt, one passive containment conditions of 120 F and 1.0 psig." This statement does not make sense as written and should be corrected.

**Response:**

The statement above has been removed from the BASES for TS 3.6.6 in response to FSER Open Item 480.1088, submitted in Docket/NRC1180 on December 12, 1998. No additional modification is required.

**SSAR Revision:** None.



**Question:** 480.1142F (OITS #6566)

The words "with the reactor shutdown" in the applicability statement of TS 3.6.7 and its BASES are unnecessary and should be deleted.

**Response:**

As agreed at the NRC / Westinghouse meeting of January 28, 1998, the words "with the reactor shutdown" will be removed from the applicability statement of TS 3.6.7 and its BASES.

**SSAR Revision:** See attached markup

## 3.6 CONTAINMENT SYSTEMS

## 3.6.7 Passive Containment Cooling System (PCS) - Shutdown

LCO 3.6.7 The passive containment cooling system shall be OPERABLE.

APPLICABILITY: MODES 5 and 6 with reactor shutdown and with the calculated reactor decay heat &gt; 6.0 MWA.

## ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One passive containment cooling water flow path inoperable.	A.1 Restore flow path to OPERABLE status.	72 hours
B. water storage tank temperature not within limit.  <u>OR</u>  Water storage tank volume not within limit.	B.1 Restore water storage tank to OPERABLE status.	8 hours

## BASES (continued)

## APPLICABILITY

OPERABILITY of the PCS is required in MODES 5 and 6 ~~with the reactor shutdown~~ and the calculated reactor decay heat greater than 6 MWt for heat removal in the event of a loss of nonsafety decay heat removal capabilities.

With the decay heat less than 6 MWt, the decay and sensible heat can be easily removed from containment with air cooling alone.

The PCS requirements in MODES 1, 2, 3, and 4 are specified in LCO 3.6.6, Passive Containment Cooling System (PCS) - Operating.

## ACTIONS

A.1

With one passive containment cooling water flow path inoperable, the affected flow path must be restored to OPERABLE status within 72 hours. In this degraded condition, the remaining flow path is capable of providing greater than 100% of the heat removal needs after an accident. The 72 hour Completion Time was chosen in light of the remaining heat removal capability and the low probability of DBA occurring during this period.

B.1

If the cooling water tank is inoperable, it must be restored to OPERABLE status within 8 hours. The tank may be declared inoperable due to low water level or temperature out of limits. The 8 hour Completion Time is reasonable based on the remaining heat removal capability of the system and the availability of cooling water from alternate sources.

(continued)



**Question:** 480.1143F (OITS #6567)

TS 3.6.7 and its corresponding BASES should be consistent. The TS references water storage tank volume, whereas, the BASES discusses IRWST level. The correct terminology should match the display of the instrumentation used in the control room.

**Response:**

As agreed at the NRC / Westinghouse meeting of January 28, 1998, the BASES of TS 3.6.7 will be revised to refer to IRWST "volume" instead of "level."

**SSAR Revision:** See attached markup



## BASCS (continued)

## APPLICABILITY

OPERABILITY of the PCS is required in MODES 5 and 6 with the reactor shutdown and the calculated reactor decay heat greater than 6 MWt for heat removal in the event of a loss of nonsafety decay heat removal capabilities.

With the decay heat less than 6 MWt, the decay and sensible heat can be easily removed from containment with air cooling alone.

The PCS requirements in MODES 1, 2, 3, and 4 are specified in LCO 3.6.6, Passive Containment Cooling System (PCS) - Operating.

## ACTIONS

A.1

With one passive containment cooling water flow path inoperable, the affected flow path must be restored to OPERABLE status within 72 hours. In this degraded condition, the remaining flow path is capable of providing greater than 100% of the heat removal needs after an accident. The 72 hour Completion Time was chosen in light of the remaining heat removal capability and the low probability of DBA occurring during this period.

B.1

If the cooling water tank is inoperable, it must be restored to OPERABLE status within 8 hours. The tank may be declared inoperable due to low water ~~level~~ or temperature out of limits. The 8 hour Completion Time is reasonable based on the remaining heat removal capability of the system and the availability of cooling water from alternate sources.

volume

(continued)



AP600

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400-1143F-a



**Question:** 480.1150F (OITS #6574)

TS 3.6.8, LCOs (a) and (b), should have similar wording (i.e., 3.6.8b should read: One door in each air lock closed or, if open, the containment air locks shall be clear of obstructions such that an air lock door can be closed prior to steaming into the containment).

**Response:**

As agreed at the NRC / Westinghouse meeting of January 28, 1998, the wording for TS 3.6.8, LCO (b), will be made similar to the wording of LCO (a) as suggested above.

**SSAR Revision:** See attached markup.



3.6 CONTAINMENT SYSTEMS

3.6.8 Containment Penetrations

LC0 3.6.8 The containment penetrations shall be in the following status:

- a. The equipment hatches closed and held in place by [four] bolts or, if open, clear of obstructions such that the hatches can be closed prior to steaming into the containment.
- b. One door in each air lock closed <sup>if open</sup> or, the containment air locks shall be clear of obstructions such that they can be closed prior to steaming into the containment.
- c. The containment spare penetrations, if open, shall be clear of obstructions such that the penetrations can be closed prior to steaming into the containment.
- d. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:
  - 1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or
  - 2. capable of being closed by an OPERABLE Containment Isolation signal.

APPLICABILITY: MODES 5 and 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Restore containment penetrations to required status.	1 hour

(continued)





**Question:** 480.1163F (OITS #6587)

Table 16.3-1 should be corrected to indicate two AC power sources [2(1)] for reduced inventory conditions.

**Response:**

As agreed at the NRC / Westinghouse meeting of January 28, 1998, this editorial comment will be incorporated.

**SSAR Revision:** See attached markup



Table 16.3-1

## LIST OF INVESTMENT PROTECTION SHORT-TERM AVAILABILITY CONTROLS

Systems, Structures, Components	Number Trains (a)	MODES Operation (b)
1.0 Instrumentation Systems		
1.1 DAS ATWS Mitigation	2	1
1.2 DAS ESF Actuation	2	1,2,3,4,5,6 (3)
2.0 Plant Systems		
2.1 RNS	1	1,2,3
2.2 RNS - RCS Open	2	5,6 (2,3)
2.3 CCS - RCS Open	2	5,6 (2,3)
2.4 SWS - RCS Open	2	5,6 (2,3)
2.5 PCS Water Makeup - Long Term Shutdown	1	1,2,3,4,5,6 (4)
2.6 MCR Cooling - Long Term Shutdown	1	1,2,3,4,5,6
2.7 I&C Room Cooling - Long Term Shutdown	1	1,2,3,4,5,6
2.8 Hydrogen Ignitors	1	1,2,5,6 (2,3)
3.0 Electrical Power Systems		
3.1 AC Power Supplies	1	1,2,3,4,5
3.2 AC Power Supplies - RCS Open	2 (1)	5,6 (2,3)
3.3 AC Power Supplies - Long Term Shutdown	1	1,2,3,4,5,6
3.4 DC Power Supplies - DAS	2	1,2,3,4,5,6 (3)

Alpha Notes:

- (a) Refers to the number of trains covered by the availability controls.
- (b) Refers to the MODES of plant operation where the availability controls apply.

Notes:

- (1) 2 of 3 AC power supplies (2 standby diesel generators and 1 offsite power supply).
- (2) MODE 5 with RCS open.
- (3) MODE 6 with upper internals in place and cavity level less than full.
- (4) MODES 5 and 6 with the calculated core decay heat greater than 6 MWt.

