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Docket No.: STN-52-003

February 14, 1997

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

TO: T. R. QUAY

SUBJECT: AP600 DESIGN CERTIFICATION: PROTECTION OF FIRE PUMPS AND AIR COMPRESSOR

REFERENCE: 1. NRC Letter, "Summary of Telephone Conference to Discuss Westinghouse AP600 Fire Protection Analysis Open Items", dated January 8, 1997.

2. NRC Letter, "Summary of Meeting to Discuss Westinghouse AP600 Fire Protection Analysis", dated February 6, 1997.

3. FAX transmittal, Don Hutchings to Diane Jackson dated February 6, 1997.

Dear Mr. Quay:

This is to formally respond to OITS #321 of Reference 1 and both items 2 of Reference 2. Attached is a copy of Reference 3. Reference 3 describes the AP600 approach to protection of the fire main, the fire pumps, and the high-pressure breathing compressor in the turbine building. This information was discussed in the NRC/Westinghouse meeting on February 10, 1997. In that meeting the NRC stated that our arrangement meets the SRP, but that we needed to add 12 more air bottles for the fire brigade. Item 321 remains Action W pending changes to the AP600 SSAR to reflect this addition.

If you have any questions on this letter please call J. W. Winters (412-374-5290).

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

jml
Attachment: FAX from Hutchings to Jackson dated 02/06/97

cc: D. F. Hutchings, Westinghouse
W. E. Cummins, Westinghouse

Westinghouse

FAX COVER SHEET

RECIPIENT INFORMATION		SENDER INFORMATION	
DATE:	February 6, 1997	Name:	Don Hutchings
TO:	Diane Jackson	LOCATION:	ENERGY CENTER - EAST
PHONE:		PHONE:	Office: 412-374-5109
COMPANY:	US NRC	Facsimile:	win: 284-5535 outside: (412)374-5535
LOCATION:			

Cover + Pages 1 + 4

The following pages are being sent from the Westinghouse Energy Center, East Tower, Monroeville, PA. If any problems occur during this transmission, please call:

WIN: 284-5489 (Wanda)/4031 (Delina) or Outside (412)374-5489/4031.

COMMENTS:

Diane,

The attached is our response related to how we ensure protection of the fire pumps and air compressors from a major fire in the turbine building. These questions were raised during our Jan. 7 1997 meeting.

WE WILL FOLLOW THIS WITH AN OFFICIAL LETTER ANSWERING YOUR LETTER.

Jim

cc: Lindgren
McIntyre
Ron Vijuk
Winters

ISSUE

The NRC has voiced concerns relative to protecting the fire pumps which are located in the turbine building in the event of a large turbine building fire.

DISCUSSION

Postulated Loss of Fire Main in the Turbine Building

The fire protection main includes an underground yard loop and a yard main extension that distributes water to suppression systems and hose stations within the main plant buildings. If the yard main extension in the turbine building is damaged due to a fire or any other reason, the damaged portion of the main can be isolated using installed sectionalization valves. With the damaged portion isolated, the underground yard loop is still capable of supplying fire hydrants on the yard loop and supplying the other buildings connected to the yard main extension. Isolation of the yard main extension in the turbine building results in loss of the ability to fill the PCS storage tank. However, the inventory of the PCS tank remains available to supply hose stations in areas containing safety-related equipment.

Postulated Loss of Fire Pumps

The motor and diesel driven fire pumps are located in separate fire rated enclosures. These enclosures are designed to prevent the spread of fires within the turbine building to the fire pumps. The turbine building is provided with fire detection and suppression systems designed to detect fires, extinguish fires, and limit fire damage. With these systems functioning properly, a general turbine building fire that causes structural damage to the building and subsequent collapse resulting in loss of the fire pumps is considered unlikely.

Even if the fire detection and suppression systems do not function properly, it is unlikely that the turbine building structure would collapse due to fire. As the turbine building is designed for tornado and seismic loads, structural members are larger than required for other load conditions. The building is laterally braced in both the north-south and east-west directions. The structural steel members are designed for temperatures up to 1000°F. Allowable stress values for the steel members are reduced for the increased temperatures. The turbine building's large steel members would have to be exposed to very high temperatures for several hours before even minor warping or distortion might occur. This provides significant time for fire fighting activities.

The location of the fire pump rooms in the heavily braced northwest corner of the turbine building make it unlikely the fire pumps would be damaged even if building collapse did occur. The fire pumps are located on the basemat at el. 100'-0". The turbine building floors directly above the fire pumps are lightly loaded, i.e., the secondary sampling laboratory on el. 117'-6", the electrical switchgear room on el. 135'-3", and an open portion of the operating deck on el. 161'-0". There is no

heavy equipment located above the pumps that might cause the structure above the pump rooms to collapse during a fire

However, should a fire in the turbine building result in a loss of the fire pumps, this would not affect the ability of the plant to shut down. As the turbine building is separated from areas containing safety-related equipment by 3-hour rated fire walls, a fire in the turbine building is not postulated to result in fire damage in any area containing safety-related equipment. Following loss of the fire pumps, fire hose stations in safety-related areas will continue to be supplied from the PCS storage tank. The fire pumps and any damaged portions of the fire protection yard main extension in the turbine building can be isolated. It is anticipated that a fire pump truck could be used on a temporary basis to charge the fire protection main until the fire pumps were replaced.

ISSUE

The NRC has voiced concerns relative to protecting the high-pressure breathing compressor which is located in the turbine building in the event of a large turbine building fire.

REQUIREMENTS:

BTP CMEB 9.5-1, Paragraph C.3.c states in part:

> "At least 10 [self-contained breathing apparatus] masks shall be available for fire brigade personnel."
>
> "Service or rated operating life shall be a minimum of one-half hour for the self contained units."
>
> "At least two extra bottles should be located onsite for each self-contained breathing unit."
>
> "In addition, an onsite 6-hour supply of reserve air should be provided and arranged to permit quick and complete replenishment of exhausted supply air bottles as they are returned. If compressors are used as a source of breathing air, only units approved for breathing air shall be used; compressors shall be operable assuming a loss of offsite power."

10CFR50, App. R, Paragraph III.H. states in part:

> "At least 10 [self-contained breathing apparatus] masks shall be available for fire brigade personnel."
>
> "Service or rated operating life shall be a minimum of one-half hour for the self contained units."
>
> "At least a 1-hour supply of breathing air shall be located on the plant site for each self-contained breathing unit."
>
> "In addition, an onsite 6-hour supply of reserve air should be provided and arranged to permit quick and complete replenishment of exhausted supply air bottles as they are returned. If compressors are used as a source of breathing air, only units approved for breathing air shall be used and the compressors shall be operable assuming a loss of offsite power."

PRESENT AP600 SSAR STATEMENT:

AP600 SSAR Table 9.5.1-1, Fire Protection Program Compliance with BTP CMEB 9.5-1, Item 33 states in part:

> "A breathing air compressor is provided in the compressed and instrument air system (CAS) to replenish the exhausted air supply bottles used by the fire brigade."

PRESENT AP600 POSITION:

After reviewing the requirements of BTP 9.5-1 paragraph C.3.c and 10CFR50, App. R, paragraph III.H. AP600 considers that we are in compliance with these requirements.

AP600 goes beyond the minimum requirement which specifies "...an onsite 6-hour supply of reserve air should be provided..." and notes that there is no requirement that the 6-hour supply of reserve air be located in a place where a fire cannot occur.

AP600 provides a breathing-air compressor and an air receiver in the turbine building in order to replenish exhausted SCBA air bottles in the event of a fire. This design should be acceptable as it is capable of providing far more air than the required 6-hour supply.

However, in order to minimize concerns relative to a large turbine building fire damaging the "6-hour supply of reserve air" (i.e. the breathing-air compressor and an air receiver), AP600 proposes to utilize the self-contained compressed breathable air bottles stored inside the MCR pressure boundary to provide up to six additional hours of breathable air for up to eleven people. - See SSAR 6.4, section 5.4.2 Breathing Apparatus relative to control room habitability.

PROPOSED AP600 SSAR STATEMENT:

AP600 SSAR Table 9.5.1-1, Fire Protection Program Compliance with BTP CMEB 9.5-1, Item 33 states in part:

> "A breathing air compressor *and receiver* is provided in the compressed and instrument air system (CAS) to replenish the exhausted air supply bottles used by the fire brigade. *Additionally, an equivalent 6-hour supply of reserve air will be maintained in an area located outside of the turbine building. (e.g. the 6-hours of compressed breathable air bottles stored inside the MCR pressure boundary for up to 11 people.)*