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TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

June 9, 1980

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Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

OFFICE OF INSPECTION AND ENFORCEMENT BULLETIN 80-05 - RII:JPO 50-327, -328, -390, -391, -438, -439, -566, and -567 - SEQUOYAH, WATTS BAR, BELLEFONTE, AND YELLOW CREEK NUCLEAR PLANTS

The subject bulletin dated March 10, 1980, required a response for all PWR licensees and permit holders. Enclosed is our response for Sequoyah, Watts Bar, Bellefonte, and Yellow Creek Nuclear Plants.

If you have any questions concerning this matter, please get in touch with D. L. Lambert at FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure
cc: Mr. Victor Stello, Jr., Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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Safety Injection System

Refueling Water Storage Tank - This tank is directly vented to the atmosphere by means of an 12-inch vent line at Sequoyah and a 28-inch vent line at Watts Bar and supplemented at both plants by an 8-inch overflow line. Freeze protection is provided by redundant, electric, internal heaters and tank insulation.

Waste Disposal System

Reactor Colant Drain Tank - This tank has been designed for an external pressure of 60 psig. This exceeds the possible pressure the tank would ever experience. Nitrogen gas line is supplied to this tank as a cover gas via the waste disposal system vent headers.

Triated Drain Collector Tank - This tank is vented directly to the plant vent system via a 2-inch line.

ENCLOSURE

SEQUOYAH, WATTS BAR, BELLEFONTE, AND YELLOW CREEK NUCLEAR PLANTS
RESPONSE TO IE BULLETIN 80-05
VACUUM CONDITION RESULTING IN DAMAGE TO CVCS HOLDUP TANKS

Response for Sequoyah and Watts Bar Nuclear Plants

The following is a list of systems and tanks which are affected by IE Bulletin 80-05 for Sequoyah and Watts Bar Nuclear Plants. All tanks except the RWST are located within the auxiliary or reactor buildings, therefore eliminating the need for freeze protection.

CVCS

Holdup Tank - Vacuum relief valves have been installed to protect against vacuum conditions that could result in tank inward buckling and failure. These relief valves will be checked periodically under the TVA surveillance program. In addition, a 2-inch supply line with open cross-connect valves in the Sequoyah and Watts Bar Nuclear Plants holdup tank vent header is sufficient in size to allow cross-pumping of holdup tanks (i.e., emptying of one into another) at 500 GPM with the holdup tank recirculation pump, without posing any problem in regard to attaining a subatmospheric pressure inside the emptying tank. Nitrogen makeup valves from both the gas decay tanks and the WDS nitrogen supply are furnished in order to maintain holdup tank overpressure with a net efflux of liquid from the system. The combined capacity of the valves is approximately equal to 100 gpm liquid outflow from the holdup tanks (for example, transferring water back to the refueling transfer canal with the recirculation pump following refueling equipment maintenance).

Volume Control Tank - This tank is designed for an external pressure of 15 psig (i.e., a full vacuum). In addition, this tank is supplied with a minimum gas overpressure of 15 psig (normally the gas is hydrogen; nitrogen is used as a purge).

Reactor Coolant System

Pressurizer Relief Tank - This tank, excluding the rupture disk, has been designed for a 100 percent vacuum. A cover gas of nitrogen is supplied to the tank to maintain an overpressure during tank pumpdown.

RESPONSE FOR BELLEFONTE NUCLEAR PLANT

The following is a list of systems and tanks at Bellefonte Nuclear Plant which are affected by IE Bulletin 80-05. All tanks, except the borated water storage tank (BWST) are located inside either the auxiliary building or the reactor building, therefore eliminating the need for freeze protection. BWST freeze protection is discussed below under the decay heat removal (DHR) system.

Chemical Addition and Boron Recovery (CA&BR) System and Waste Disposal (WD) System

Tanks located in the CA&BR and WD systems are listed in the attached Table 1. All of these tanks are connected to either the VH-2 vent header or the VH-3 vent header.

The VH-2 vent header, which may contain hydrogen, is connected to two gas compressors and two waste gas decay tanks (one tank and one compressor are maintained in standby). The VH-2 vent header provides both vacuum relief protection and hydrogen concentration protection. The operation of the vent header and its associated tanks is as follows:

> The header and tanks are initially pressurized with nitrogen to a pressure of 2 lb/in^2g. During operation, as a tank is drawn down nitrogen will flow from the vent header and waste gas decay tank to the tank being drained. The rate of flow of nitrogen cover gas will be sufficient to prevent formation of a partial vacuum in the tank being drawn down. In addition, each tank listed in Table 1 is equipped with a vacuum relief valve for additional protection. Hydrogen concentration protection is afforded by the nitrogen cover gas which will dilute the presence of oxygen.

There are two distillate tanks in the CA&BR system and two other distillate tanks in the WD system. the distillate tanks are connected to the VH-3 vent header. The VH-3 vent header is connected to a gas compressor and to a surge tank. The system operates in the same manner as the VH-2 vent header. Explosive gas mixtures are not expected either in the distillate tanks or the VH-3 vent header. However, a nitrogen cover gas is maintained in the VH-3 vent header and on the distillate tanks to preserve the purity of the distillate water.

Makeup (MU) System

A hydrogen cover gas subsystem is part of the makeup tank. This hydrogen cover gas subsystem is designed to maintain makeup tank pressure under maximum tank drawdown conditions. In order to prevent an explosive mixture of hydrogen and oxygen in the event of a hydrogen leak from the makeup tank, the makeup tank room is maintained with a nitrogen atmosphere.

Decay Heat Removal (DHR) System

The borated water storage tank (BWST) is located in the plant yard. This tank is vented to atmosphere through a screened, 36-inch diameter vent. This vent is designed to provide adequate vacuum protection for the maximum drawdown rate. In addition, this tank is designed to withstand the 3 lb/in^2 tornado depressurization.

Freeze protection for the BWST is afforded by 18-inch concrete walls, the large volume of the tank (740,000 gallons), and heat input from periodic recirculation of the tank's contents. Freeze protection of the BWST vent has been investigated in detail by TVA and found to be suitable as is.

BELLEFONTE NUCLEAR PLANT
BULLETIN 80-05 RESPONSE

Table 1

CA&BR System	Vent Header
Concentrated Boric Acid Storage Tank	VH-2
Reactor Coolant Bleed Holdup Tank	VH-2
Reactor Coolant Distillate Storage Tank	VH-3
Reactor Coolant Bleed Evaporator Distillate Tank	VH-3
WD System	
RC Drain Tank	VH-2
Tritiated Waste Holdup Tank	VH-2
Tritiated Auxiliary Building Sump Tank	VH-2
Waste Evaporator Feed Tank	VH-2
Spent Resin Storage Tank	VH-2
Waste Evaporator Distillate Test Tank	VH-3
Auxiliary Waste Evaporation Distillate Test Tank	VH-3

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RESPONSE FOR YELLOW CREEK NUCLEAR PLANT

The following is a list of tanks which are affected by the statements in Bulletin 80-05. All tanks except the CVCS holdup tank are located in either the containment building or the auxiliary building, therefore eliminating the need for freeze protection.

CVCS Holdup Tank - This tank has a design capacity of 450,000 gallons and is located in the plant yard. The holdup tank is vented to atmosphere through a 1-inch diameter vent pipe. This vent line does not contain any valve which might be closed, thereby preventing continuous venting of the tank. The maximum drawdown rate from the holdup tank is 50 gpm, which is easily accommodated by the 1-inch diameter vent.
The 1-inch diameter vent is insulated from freezing and leads down the side of the tank into an underground pipe tunnel. The insulation and routing will prevent any possibility of freezing of this vent line. Since the holdup tank may contain radioactive water, it has been analyzed for a rupture with the resulting affect on radiation doses both onsite and offsite. This analysis is found in the YCN PSAR, Section 15.4.8. This analysis revealed that the results of a tank rupture are acceptable. The CVCS holdup tank does not provide a required safety function, thus rupture of this tank would not impair the capability of the plant to reach a safe shutdown condition.

Reactor Drain Tank - The design capacity of this tank is 2,850 gallons. It is located inside primary containment.
The reactor drain tank is maintained at all times with a nitrogen cover gas. The cover gas pressure is displayed in the main control room. Also, the reactor drain tank is designed for 15 lb/in^2g external pressure. The reactor drain tank does not perform a safety function, and hence, its rupture will not impair the ability of the plant to reach a safe shutdown condition. Also, rupture of this tank would release any potentially radioactive liquids to the containment floor. Hence, it would not result in any additional radiation exposures.

Equipment Drain Tank - This tank has a design capacity of 10,500 gallons and is located in the auxiliary area.
The equipment drain tank is maintained with a cover gas of nitrogen at all times. Cover gas pressure is indicated in the main control room. This tank is also designed for 15 lb/in^2g external pressure. Rupture of the equipment drain tank would result in the fluid being released to the auxiliary area floors and thence to the auxiliary area sumps. The result would be only a slight increase in radiation to the environs of the plant.

The rupture of the equipment drain tank will not impair the ability of the plant to reach a safe shutdown because it performs no safety function.

In conclusion, TVA feels that for all tanks at Yellow Creek Nuclear Plant applicable under IE Bulletin 80-05, the design is adequate to preclude formation of a vacuum inside the tank, and even if a vacuum were to occur and a tank were to rupture, there would be no detrimental affect on plant or public safety. Also, any gaseous release to the containment or to the auxiliary area would be released to the environment via a monitored plant vent.