DOCKET NO. 50-22
Formal File
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Westinghouse

ELECTRIC CORPORATION

TESTING REACTOR

July 8, 1960

P.O. BOX 1075
PITTSBURGH 30, PA.

Mr. H. L. Price, Director
Division of Licensing and Regulation
U.S. Atomic Energy Commission
Washington 25, D.C.

Dear Sir:

Subject: License No. TR-2
Docket 50-22

Attached is a report describing a proposed change in the venting system of the process water head tank of the Westinghouse Testing Reactor (WTR). We consider this modification desirable to provide added protection against the possible release of fission products to the atmosphere.

This change normally would have been made without specific Commission approval in accordance with Paragraph 5.b. (i) of License No. TR-2. Your approval of the proposed change is requested as required by Paragraph 3, Page 2 of your Order dated June 30, 1960.

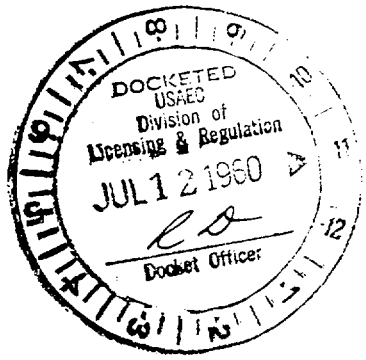
Very truly yours,

E. T. Morris

E. T. Morris
General Manager

Enclosure:

1 copy Report WTR-51



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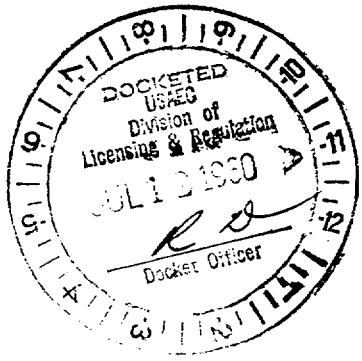


Modification
to
Venting System
for
WTR Process Water Head and Surge Tanks

Introduction

The head tank and the surge tank are continuously purged with air during reactor operation to sweep out hydrogen and gaseous activity released from the primary coolant. Hydrogen results from the dissociation of water under gamma irradiation and the gaseous activity is due mainly to the activation of argon dissolved in the coolant. Most of the release of these gases from the coolant occurs in the surge tank where the heated water from the reactor is discharged from the PC piping over a diffusing cone and is reduced to atmospheric pressure.

The air purge is supplied by a 2000 cfm blower as shown on Drawing No. 783-D-659, attached. The air sweeps over the top of the surge tank and is discharged to the head tank through the 12-inch head tank overflow line. The air is then released to the atmosphere from the head tank vent at an elevation 250 feet above ground level. A sampling line is installed in this vent and the activity of the discharged air is monitored by the head tank monitor.

Description of Modification

The proposed modification of the system shown on Drawing No. 783-D-659, limits the discharge of the radioactivity to permissible concentrations by adding a valve to the head tank vent line and revising the controls of the air supply blower.

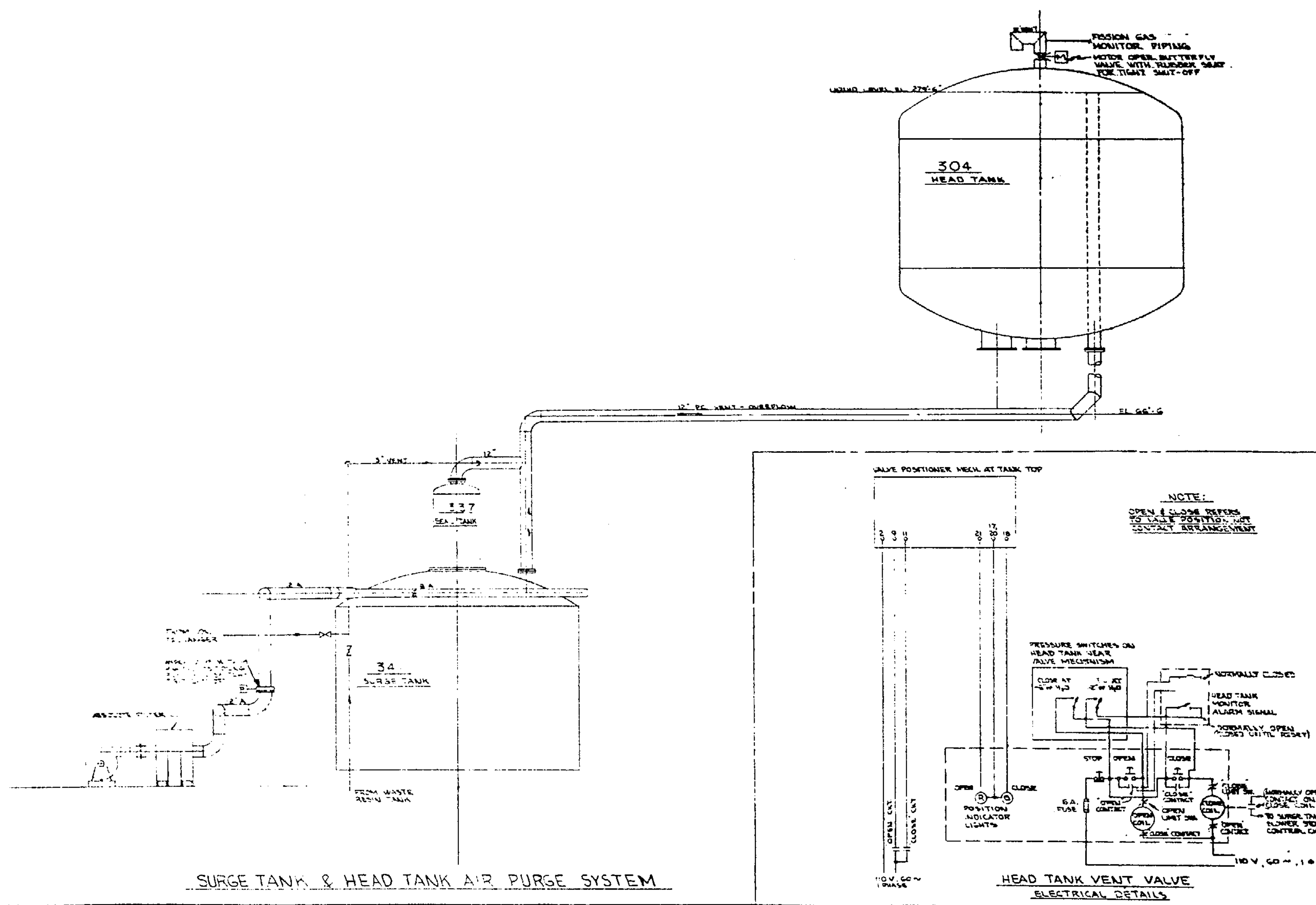
The valve is a butterfly valve with an offset shaft which permits continuous contact between a rubber seat and the valve disc

edge when the valve is closed. Valves of the same design have been used in the WTR vapor container ventilation system and have proven to be leak tight and satisfactory. The valve is opened and closed by an electrical operator mounted on the valve body.

A high level (trip) signal initiated by an activity level of 2.3×10^{-1} $\mu c/ml$* at the head tank monitor will cause the vent valve to close, the supply fan to shut down, and the supply line valve to close. The head tank monitor will remain in operation but will only sample air from the vent past the vent valve. A pressure switch will be installed on the head tank which opens the vent valve if the pressure in the tank drops below atmosphere. The switch will be set to open the valve at minus 6-inches of water and close the valve at minus 2-inches of water. All air flow under these conditions would be into the system. Manual reset of the control system is required after the head tank monitor causes the valve to close.

An alarm point for the head tank monitor will be set at a lower value than the trip signal to permit evaluation of the conditions before the vent valve is closed. If the activity reaches the level required to close the valve, the reactor power will be reduced manually to approximately 5 MW and a survey made of the radiation level in the plant. If a fission break has occurred, it will be easily detectable on the plant area monitors. If such evidence is not found the vent valve circuit will be reset and normal operation resumed.

* Effluent concentration required to produce 1 MPC A^{41} at point of maximum ground concentration under most adverse conditions, i.e., strong inversion and wind velocity of 0.2 meters/sec. If activity is Xe^{133}, then maximum ground activity would be less than 1 MPC.



FISSION GAS MONITOR PIPING
MOTOR OPER. BUTTERFLY VALVE WITH RUBBER SEAT FOR TIGHT SHUT-OFF
304
HEAD TANK
12" PC VENT - OVERFLOW
EL 66'-6
3" VENT
12"
337
SEAL TANK
34
SURGE TANK
FROM WASTE RESIN TANK
SURGE TANK & HEAD TANK AIR PURGE SYSTEM
VALVE POSITIONER MECH. AT TANK TOP
NOTE:
OPEN & CLOSE REFERS TO VALVE POSITION NOT CONTACT ARRANGEMENT
PRESSURE SWITCHES ON HEAD TANK NEAR VALVE MECHANISM
NORMALLY CLOSED
HEAD TANK MONITOR ALARM SIGNAL
NORMALLY OPEN (CLOSED UNTIL RESET)
STOP
OPEN
CLOSE
POSITION INDICATOR LIGHTS
6 A. FUSE
OPEN COIL
CLOSE COIL
OPEN CONTACT
CLOSE CONTACT
OPEN LIMIT SW.
CLOSE LIMIT SW.
NORMALLY OPEN CONTACT ON CLOSE COIL
TO SURGE TANK BLOWER STOP CONTROL CKT.
OPEN CKT
CLOSE CKT
110 V, 60 ~, 1 Φ
HEAD TANK VENT VALVE
ELECTRICAL DETAILS

783D659