UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N.W. SUITE 1217
ATLANTA, GEORGIA 30303

JUL 18 1977

Central file
50-390
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In Reply Refer To:
IE:II:DT
50-518 50-327
50-519 50-328
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50-521 50-391
50-259 50-438
50-260 50-439
50-296

Tennessee Valley Authority
ATTN: Mr. Godwin Williams, Jr.
Manager of Power
830 Power Building
Chattanooga, Tennessee 37401

Gentlemen:

The enclosed Circular 77-10 is forwarded to you for information. If there are any questions related to your understanding of the actions required, please contact this office.

Sincerely,

Dudley Thompson
Acting Director

Enclosure:
IE Circular 77-10

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VACUUM CONDITIONS RESULTING IN DAMAGE TO LIQUID PROCESS TANKS

Description of Circumstances

On January 31, 1977, at the Portland General Electric Company's Trojan Nuclear Station, a vacuum was pulled on a Chemical and Volume Control System holdup tank which caused the tank to buckle inwardly and crack at the junction of two buckled areas. (LER 50-344/77-02) Radioactive cover gas escaped from the tank to the fuel building exhaust ventilation and ultimately through the auxiliary building ventilation stack to the environment. During the period of January 31 through February 7, 1977, (date of discovery) approximately 62.5 curies of noble gases were released to the environment. The occurrence was caused by malfunctions of both the primary (waste gas decay tank collection header) and the backup (nitrogen pressurization system) cover gas supply pressure regulators during pumpout of the tank contents. The malfunction of the primary regulator was due to moisture accumulation which led to the formation of a water column on the discharge side of the pressure regulator. The regulator in the backup nitrogen supply system malfunctioned at the same time, but the cause has not been determined. There were no alarms or remote indication for the holdup tank or the gas control header to indicate abnormal pressure or to indicate the operating status of the nitrogen supply system.

A similar event occurred at the Sacramento Municipal Utility District's Rancho Seco nuclear station wherein the Reactor Coolant System Drain Tank partially collapsed under vacuum conditions and in doing so cracked an inlet line attached to the tank (LER 50-312/77-03). The first indication of the condition was detected by the radiation monitor that samples the ventilation exhaust in an area adjacent to the room in which the damaged tank was located. Radioactive gases were released through the failed line between January 12 and February 16, 1977. During this period, approximately 9 curies of radioactive gas were released. The cause of this occurrence was attributed to the tank not being properly vented by the operator during discharge of its liquid contents.

It is recommended that you examine the systems of your reactor facility(ies) that contain low pressure process or holdup tanks and assure that adequate measures have been taken to protect against vacuum conditions that could result in tank inward buckling and failure with subsequent release of radioactive material or cause other detrimental effects with regard to the overall safety of plant operations. It is also recommended that you examine your capability to detect and locate possible leaks of radioactive material from such tanks.

No written response to this Circular is required. If you desire additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

830 Power Building

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

Central File

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July 1, 1977

Mr. Norman C. Moseley, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 818
230 Peachtree Street, NW.
Atlanta, Georgia 30303

Dear Mr. Moseley:

OFFICE OF INSPECTION AND ENFORCEMENT BULLETIN 77-01 - IE:II:NCM 50-327, -328, -390, -391, -438, -439 - SEQUOYAH, WATTS BAR, AND BELLEFONTE NUCLEAR PLANTS - PNEUMATIC TIME DELAY RELAY SETPOINT DRIFT

In response to your April 29, 1977, letter which transmitted IE Bulletin 77-01, our investigations of the Class 1E applications for Sequoyah, Watts Bar, and Bellefonte Nuclear Plants reveals that TVA does not use ITE Imperial time delay relays in Class 1E circuits. The Agastat relays we use at our Sequoyah, Watts Bar, and Bellefonte Nuclear Plants have repeat accuracies less than ±15 percent deviation from set point except for the Agastat 7000 series double header time delay relays which may be used in the diesel generator starter circuits as replacements for the Agastat 2400 double header relays now used (but which are no longer in production). For this application, the starter is not sensitive to repeat accuracy as (1) set point of 1/2 second is used to initiate an air burst from a pressurized tank, (2) up to five bursts will be applied sequentially if needed, and (3) periodic inspections and tests will ensure an acceptable set point maintenance.

Very truly yours,

J. E. Gilleland
Assistant Manager of Power

cc: Dr. Ernst Volgenau, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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Tennessee Valley Authority
ATTN: Mr. Godwin Williams, Jr.
Manager of Power
830 Power Building
Chattanooga, Tennessee 37401

Gentlemen:

Enclosed is IE Bulletin No. 77-01 which requires action by you with regard to your power reactor facility(ies) with an operating license or a construction permit.

Should you have questions regarding this Bulletin or the actions required of you, please contact this office.

Sincerely,

Norman C. Moseley
Director

Enclosure:
IE Bulletin No. 77-01

NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D. C. 20555

PNEUMATIC TIME DELAY RELAY SETPOINT DRIFT

DESCRIPTION OF CIRCUMSTANCES:

Millstone Unit 2 and North Anna Unit 1 facilities experienced repeated diesel-generator starting failures several of which investigation revealed were caused by setpoint drift on the pneumatic time delay relays used in the control circuitry for the diesel-generator. The relays involved are identified as ITE Imperial, Catalog Nos. J20T3/J13P20 and J20T3/J13P30. The affected diesel-generators are Fairbanks Morse Units by Colt Industries.

These types of time delay relays are used in several different applications in the control circuitry for the diesel-generator. One of these relays is used to bypass the normal low oil pressure shutdown functions during diesel-generator startup. At Millstone Unit 2 the relay had drifted approximately 10 seconds from the required 20 second delay which allowed the low oil pressure trip circuit to shut down the diesel-generator before the oil pressure had time to build up. At North Anna Unit 1, excessive drift of similar ITE time delay relays was also observed during preoperational testing of the diesel-generators.

ITE Imperial has identified the time delay relays involved at Millstone Unit 2 as coming from the 1972 and 1973 production runs. The catalog specification for this vintage of relays requires a trip-point setting repeat accuracy of ± 15 percent. Units manufactured in 1974 or later have demonstrated a repeat accuracy of ± 3 to 4 percent, well within the catalog specification of ± 15 percent.

Month and year of production for the time delay relays in question can be determined by the six or seven digit bold white number on the timer head. The first two or three digits indicate the month and year or production. (The last four digits provide other coded information.) For example: 124056 indicates a production date of January 1972; 1234056 indicates a production date of December 1973.

According to the time delay relay manufacturers, the potential for setpoint drift is a common characteristic of most pneumatic relays, irrespective of manufacturer. The magnitude of setpoint drift is related to the repeat accuracy specified for the device and the mode in which it will operate, that is, energized or de-energized. In most cases energized units tend to be susceptible to greater deviations from setpoint because of the temperature effects on the internal parts of the unit.

ACTION TO BE TAKEN BY LICENSEES AND PERMIT HOLDERS:

FOR ALL POWER REACTOR FACILITIES WITH AN OPERATING LICENSE OR CONSTRUCTION PERMIT:

1. If you have been notified of the potential problem, describe the actions taken regarding corrective measures to identify and resolve any setpoint drift problems with the ITE time delay relays.

2. In addition to Item 1 above, pneumatic time delay relays intended for use in safety related systems and specifying a repeat accuracy range of ± 15 percent or greater should be demonstrated to provide satisfactory operation. You are requested to provide your basis for concluding that existing pneumatic time delay relays are functioning as required, or provide your plans to assure satisfactory operation.

Reports for facilities with operating licenses should be submitted within 30 days after receipt of this Bulletin, and reports for facilities with construction permits should be submitted within 60 days after receipt of this Bulletin. Your report should include the date when the above actions were or will be completed.

Reports should be submitted to the Director of the NRC Regional Office and a copy should be forwarded to the NRC Office of Inspection and Enforcement, Division of Reactor Inspection Programs, Washington, D. C. 20555.

Approval of NRC requirements for reports concerning possible generic problems has been obtained under 44 U.S.C 3152 from the U. S. General Accounting Office. (GAO Approval B-180255 (R0072), expires 7/31/77)