

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

June 23, 1982

Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Chief
Licensing Branch No. 4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Ms. Adensam:

In the Matter of the Application of) Docket Nos. 50-390
Tennessee Valley Authority) 50-391

Section 9.5.1.5 of the Watts Bar Nuclear Plant Safety Evaluation Report documented a TVA commitment to provide an analysis which shows that the askarel-insulated transformers will not fail in a manner which would damage adjacent safety-related equipment needed for safe shutdown. Enclosed is a summary of the TVA analysis and conclusions.

If you have any questions concerning this matter, please get in touch with D. P. Ormsby at FTS 858-2682.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills
L. M. Mills, Manager
Nuclear Licensing

Sworn to and subscribed before me
this 23rd day of June 1982

Paulette N. White
Notary Public

My Commission Expires 9-5-84

Enclosure

cc: U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

BOO 1

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 ASKAREL TRANSFORMERS

NRC Concern

TVA should provide assurance that askarel-insulated transformers located in various areas of the plant will not fail in a manner which would damage adjacent safety-related equipment required for safe shutdown. The following locations contain askarel-filled transformers:

- (1) Intake pumping station, elevation 711.0'
- (2) Auxiliary building, elevation 692.0', east and west ends
- (3) Auxiliary building, elevation 772.0', room A-10 mechanical equipment room
- (4) Auxiliary building, elevation 737.0', coordinates 4 and A3

Failure modes to be considered are as follows:

Explosion due to electrical fault conditions which (1) result in explosive blast forces, (2) generate missiles, and (3) generate liquid jet forces.

TVA Response

An analysis has been performed to determine if, in the event of the worst case electrical fault within the transformer, considering failure of the primary circuit protection system, the resulting gases could produce one or more of the above failure modes.

The analysis has concluded that the worst case fault would be a three-phase bolted fault on the secondary side with a duration of 1.8 seconds (1.8 seconds assumes failure of the primary protective device with the backup protective device clearing the same fault within the 1.8-second timeframe).

Gas generation resulting from the above fault over the 1.8-second duration would be 39.34 ft^3 ($21.8 \text{ ft}^3/\text{s}$). The relieving capacity of the Qualitrol series 208-60 pressure relief valve installed on each transformer is 10,000 scfm ($166.7 \text{ ft}^3/\text{s}$), and full valve opening occurs within 2 milliseconds.

Therefore, under the worst case fault conditions, assuming single failure of the primary circuit protective device, the relief valves on the Watts Bar Nuclear Plant class IE shutdown transformers will adequately handle the gas generation due to arcing within the case. The transformer case will not rupture, and no blast effects, missiles, or liquid jet streams will be generated.