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

Central file
50-390
391

DEC 13 '77

In Reply Refer To:
RII:JPO
50-438, 50-439
50-259, 50-260
50-296, 50-518
50-519, 50-520
50-521, 50-553
50-554, 50-327
50-328, 50-390
50-391, 50-566
50-567

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

Gentlemen:

The enclosed Circular 77-16, is forwarded to you for information. If there are any questions related to your understanding of the suggested actions, please contact this office.

Sincerely,

James P. O'Reilly
Director

Enclosure:
IE Circular 77-16

cc w/encl:
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NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

December 13, 1977

IE Circular 77-16

EMERGENCY DIESEL GENERATOR ELECTRICAL TRIP LOCK-OUT FEATURES

Description of Circumstances:

On June 15, 1977, Duquesne Light Company (Beaver Valley 1) reported that during the performance of a test of the diesel-generator (D/G) trip lock-out features in the emergency mode of operation, the D/G output circuit breaker opened when the field voltage trip interlock was tested. This is contrary to a requirement for this facility that, in the emergency mode, all D/G output breaker trips except generator differential and overcurrent be automatically disabled. The engine overspeed trip, which shuts down the diesel engine (but does not affect breaker operation) is also expected to be operable during the emergency mode of operation.

An investigation conducted by the licensee disclosed that the unexpected opening of the output breaker was due to deenergizing a field voltage sensing relay which was supplied by the vendor but had not been disconnected during the on-site acceptance testing of the D/G nor disabled by the protection circuitry logic. A redundant field voltage relay which was supplied by the licensee is correctly by-passed during fast start conditions and emergency operation.

A design change was initiated by the licensee which removed the field voltage trip feature. This was accomplished by disconnecting the set of relay contacts to the trip circuitry of the D/G output breaker. Subsequent testing of the D/G was performed by the licensee which demonstrated satisfactory operation.

This is an example of an event which resulted from inadequate test procedure performance. The procedures as performed had not previously identified the type of deficiency described in this circular.

The safety significance of this situation is that the premodified protection circuitry would have opened the circuit breaker if a loss of field voltage occurred while running in the emergency mode of operation.

The D/G Units for the above facility were supplied by the Electro Motive Division (EMD) of General Motors. The model numbers for the D/G Units are:

Engine Model No. 20645-E4
Generator Model No. A-20-C2
Control Panel Model No. 999-20

All holders of operating licenses or construction permits should assure that the appropriate D/G protection trip circuits are provided with automatic by-pass features that prevent them from negating automatic starting or tripping of D/Gs during fast start or emergency operations. It is recommended that the following be considered in your reviews of this matter:

1. Facility procedures should specifically determine whether the protection circuitry that trips the D/G set or the associated output breaker is in accordance with the facility Technical Specifications.

2. Test procedures for your D/G sets (e.g. acceptance preoperational and surveillance tests) should be reviewed to assure that D/G system performance is demonstrated by these tests to be in accordance with related operational requirements specified in the facility Technical Specifications.

3. Strengthening of management controls should be reviewed as necessary to assure adherence to D/G test procedures by plant personnel.

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

LISTING OF IE CIRCULARS ISSUED IN 1977

CIRCULAR NO.	SUBJECT	FIRST DATE OF ISSUE	ISSUED TO
77-01	Malfunctions of Limitorque Valve Operators	1-4-77	All holders of OLs or CPs
77-02	Potential Heavy Spring Flooding	2-15-77	All affected holders of OLs
77-02A	Potential Heavy Spring Flooding	2-16-77	All affected holders of CPs
77-03	Fire Inside a Motor Control Center	2-28-77	All holders of OLs and CPs
77-04	Inadequate Lock Assemblies	3-17-77	Safeguard Group I, II, IV, V, Licensees
77-05	Liquid Entrapment in Valve Bonnets	3-24-77	All holders of OLs and CPs
77-06	Effects of Hydraulic Fluid on Electrical Cable	4-1-77	All holders of OL's and CPs
77-07	Short Period During Reactor Startup	4-12-77	Holders of BWR OLs
77-08	Failure of Feedwater Sample Probe	4-13-77	All holders of OLs
77-09	Improper Fuse Coordination In BWR Standby Liquid Control System Control Circuits	5-25-77	All holders of BWR OLs or CPs
77-10	Vacuum Conditions Resulting in Damage to Liquid Process Tanks	7-15-77	All holders of OLs

LISTING OF IE CIRCULARS ISSUED IN 1977 (Continued)

CIRCULAR NO.	SUBJECT	FIRST DATE OF ISSUE	ISSUED TO
77-11	Leakage of Containment Isolation Valves with Resilient Seats	9-6-77	All holders of OLs and CPs
77-12	Dropped Fuel Assemblies at BWR Facilities	9-15-77	All holders of BWR OLs or CPs
77-13	Reactor Safety Signals Negated During Testing	9-22-77	All holders of OLs and CPs
77-14	Separation of Contaminated Water Systems From Noncontaminated Plant Systems	11-22-77	All Power and Test Reactor, Fuel Cycle, and major By-product material processor facilities with OLs or CPs
77-15	Degradation of Fuel Oil Flow to the Emergency Diesel Generators	12/1/77	All holders of OLs and CPs