Docket No. 50-263 Docket No. 50-282 Docket No. 50-306

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1 13 1977

Northern States Power Company ATTN: Mr. Leo Wachter Vice Fresident Power Froduction and System Operation 414 Nicollet Mall Minneapolis, MN 55401

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The enclosed IE Circular No. 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 G. Reppler Director

Enclosures: 1. IL Circular No. 77-16 2. Listing of IE Circulars Issued in 1977

cc w/encls: L. R. Elisson, Plant Manager F. P. Tierney, Jr., Plant Manager Central Files Reproduction Unit NRC 20b PDR Local PDE NSIC TIC Anthony Roisman, Esq., Attorney

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December 13, 1977 IE Circular No. 77-16.

EMERGENCY DIESEL GENERATOR ELECTRICAL TRIP LOCK-OUT FEATURES

Description of Circumstances:

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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.

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IE Circular No. 77-16

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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. 20-645-E4 Generator Model No. A-20-C2 Control Fanel Model No. 999-20

All holders of operating licenses or construction permits should assure that the appropri te 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:

- 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 test-) 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.
- 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 chicular is required. If you require additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

LISTING OF 1E CIRCULARS ISSUED IN 1977

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CIRCULAR NO.SUBJECTFIRST DATE OF ISSUEISSUE TO77-01Malfunctions of Limitorque Valve Operators1-4-77All holders of Ols or CPs77-02Fotential Reavy Spring Flooding2-15-77All effected holders of OLs77-02AFotential Reavy Spring Flooding2-16-77All effected holders of CPs77-03Fire Inside a Motor Control Center2-28-77All holders of OLs and CPs77-04Inadequate Lock Assemblies3-17-77Safeguard Group I, 11, IV, V, Licensees77-05Liquid Entrapment rables3-24-77All holders of OLs and CPs77-06Effects of Hydraulic Cable4-1-77All holders of OL's and CPs77-07Short Period During Cable4-12-77Holders of DU's and CPs77-08Failure of Foedwater Sample Probe4-13-77All holders of DU's and CPs77-09Improper Fuse Coordination In BWR Standby Liquid Control System Control Circuits7-15-77All holders of DU's or CPs77-10Necuting in Damage to Liquid Process Tanks7-15-77All holders of OL's				
Limitorque Valve OperatorsOLs or CPs77-02Fotential Reavy Spring Flooding2-15-77All affected holders of OLs77-02APotential Reavy Spring Flooding2-16-77All affected holders of CPs77-03Fire Inside a Motor Control Center2-28-77All holders of OLs and CPs77-04Inadequate Lock Assemblies3-17-77Safeguard Group I, II, IV, V, Licensees77-05Liquid Entrapment in Valve Bonnets3-24-77All holders of OLs and CPs77-06Effects of Eydraulic Cable4-1-77All holders of OL's and CPs77-07Short Period During Reactor Startup4-12-77Holders of BWR OLS77-09Improper Fuse Coordination In BWR Standby Liquid Control System Control Circuits5-25-77All holders of EWR OLS or CPs77-10Vacuum Conditions Resulting in Damage to7-15-77All holders of OLs		SUBJECT		ISSUED TO
Spring Floodingholders of OLs77-02APotential Beavy Spring Flooding2-16-77All affected holders of CPs77-03Fire Inside a Motor Control Center2-28-77All holders of OLs and CPs77-04Inadequate Lock Assemblies3-17-77Safeguard Group I, II, IV, V, Licensees77-05Liquid Entrapment in Valve Bonnets3-24-77All holders of OLs and CPs77-06Effects of Bydraulic Fluid on Electrical Cable4-1-77All holders of OL's and CPs77-07Short Period During Reactor Startup4-12-77Bolders of EWR OLs77-08Failure of Feedwater Sample Probe5-25-77All holders of OL's or CPs77-09Improper Fuse Coordination In BWR Standby Liquid Control System Control Circuits7-15-77All holders of DWR OLs or CPs77-10Vacuum Conditions Resulting in Damage to7-15-77All holders of OL's	77-01	Limitorque Valve	1-4-77	
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Fluid on Electrical CableOL's and CPs77-07Short Feriod During Reactor Startup4-12-77 BWR OLs77-08Failure of Foedwater Sample Probe4-13-77 Sof OLs77-09Improper Fuse Coordination In BWR Standby Liquid Control System Control Circuits5-25-77 Sof OLs77-10Vacuum Conditions Resulting in Damage to7-15-77 OLs	77-05		3-24-77	
Reactor StartupBWR OLs77-08Failure of Foedwater Sample Probe4-13-77All holders of OLs77-09Improper Fuse Coordination In BWR Standby Liquid Control System Control Circuits5-25-77All holders of BWR OLs or CPs77-10Vacuum Conditions Resulting in Damage to7-15-77All holders of OLs	77-06	Fluid on Electrical	4-1-77	
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Coordination In BWR Standby Liquid Control System Control CircuitsBWR OLs or CPs77-10Vacuum Conditions Resulting in Damage to7-15-77All holders of OLs	77-08		4-13-77	
Resulting in Damage to OLs	77-09	Coordination In BWR Standby Liquid Control		
	77-10	Resulting in Damage to	7-15-77	

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December 13, 1977

LISTING OF IE CIRCULARS ISSUED IN 1977 (Continued)

CIRCULAP NO.	SUBJECT	FIRST DATE AF ISSJE	ISSUED TO
77-11	Leakage of Con- tainment Isolation Valves with Resilient Seats	9-6-77	All holders of OLs and CPs
77-12	Dropped Fuel Assem- blies at EWR Facili- ties	9-15-77	All holders of BWR Ols or CPs
77-13	Reactor Safety Signals Negated During Testing		All holds s of OLS and CPs
77-14	Separation of Contaminate 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

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IE Circular No. 77-16

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December 13, 1977

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77-02	Fotential Heavy Spring Flooding	2-15-77	All affected holders of OLs
77-02A	Potential Reavy 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, TV, V, Licensees
77-05	Liquid Entrapment in Valve Bonnets	3-24-77	All holders of OLs and CFs
77-06	Effects of Hydraulic Fluid on Electrical Cable	4-1-77	All holders of OL's and CPs
77-07	Short Feriod During Reactor Startup	4-12-77	Nolders of BWR OLs
77-08	Failure of Foedwater 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 Kesulting in Damage to Liquid Process Tanks	7-15-77	All holders of OLs

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December 13, 1977

1E Circular No. 77-16

LISTING OF IE CIRCULARS ISSUED IN 1977 (Continued)

CIRCULAR NO.	SUBJECT	FIRST DATE OF ISSUE	ISSUED TO
77-11	Leakage of Con- tainment Isolation Valves with Resilient Seats	9-6-77	All holders of OLS and CPS
77-12	Dropped Fuel Assem- blies at EWR Facili- ties	9-15-77	All holders of BWR Ols or CPs
77-13	Reactor Safety Signals Negated During Testing		All holders of OLs and CPs
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Enclosure 2 Page 2 of 2

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