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Regulatory

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NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

May 26, 1977

Mr. D. K. Davis, Acting Chief
Operating Reactors Branch #2
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, DC 20555



Dear Mr. Davis:

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Response to 4/7/77 Letter on Diesel Generators

As requested by your April 7, 1977, letter to L. O. Mayer concerning Emergency Diesel Generator operability and alarm indications, the following information is submitted:

- a. Alarmed conditions that render the diesel generators incapable of responding to an automatic emergency start signal are listed below:

NOTE: The alarms listed are the exact wording as it appears on the control room annunciator window except the wording is preceded by the designation No. 11 or No. 12 depending on which of the two diesel generators is involved.

Condition

Alarm

- | | |
|--|--|
| 1. "Auto-Local" hand switch on the engine control panel in the local position. | 1. Diesel Generator Not In Auto.
2. Diesel Generator Maintenance Lockout.
3. Diesel Generator Trouble. |
| 2. Engine control switch in control room in pull to lock position. Switch has positions of pull to lock, stop, auto, and start with spring return to auto from stop and start. | 1. Diesel Generator Not In Auto.
2. Diesel Generator Maintenance Lockout.
3. Diesel Generator Trouble. |

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Condition

Alarm

- | | |
|--|--|
| 3. Overspeed trip (Trip has to be manually reset). | 1. Diesel Generator Not In Auto.
2. Diesel Generator Maintenance Lockout.
3. Diesel Generator Trouble. |
| 4. A.C. control power circuit breaker open. | 1. Diesel Generator Not In Auto.
2. Diesel Generator Maintenance Lockout.
3. Diesel Generator Trouble. |
| 5. D.C. control power circuit breaker open. | 1. Diesel Generator Not In Auto.
2. Diesel Generator Maintenance Lockout.
3. Diesel Generator Trouble. |
| 6. Start system #1 control power circuit breaker open and start system #2 control power circuit breaker open. | 1. Diesel Generator Not In Auto.
2. Diesel Generator Maintenance Lockout.
3. Diesel Generator Trouble. |
| 7. Exciter circuit breaker open. | 1. Diesel Generator Not In Auto.
2. Diesel Generator Maintenance Lockout.
3. Diesel Generator Trouble. |
| 8. Generator phase overcurrent relay trip. Must be manually reset. There is an additional approach alarm before the lockout. | 1. Diesel Generator Lockout. |
| 9. Generator differential overcurrent relay trip. Must be manually reset. | 1. Diesel Generator Lockout. |
| 10. Generator anti-motoring relay trip. Must be manually reset. | 1. Diesel Generator Lockout. |
- b. The conditions that cause the same annunciators listed above to alarm but do not render the diesel generator incapable of responding to an automatic emergency start signal are listed below:

Alarm

Condition

- | | |
|----------------------------------|--|
| 1. Diesel Generator Not In Auto. | 1. Alarm control power circuit breaker open.
2. Start system #1 control power circuit breaker open or start system #2 control power circuit breaker open. |
|----------------------------------|--|

Alarm

Condition

2. Diesel Generator Maintenance Lockout.

3. Starting air compressor #1 or starting air compressor #2 control switches in the off position.

1. Alarm control power circuit breaker open.

2. Start system #1 control power circuit breaker open or start system #2 control power circuit breaker open.

3. Starting air compressor #1 or starting air compressor #2 control switches in the off position.

3. Diesel Generator Trouble.

1. Low lube oil pressure.

2. High crank case pressure.

3. Low cooling water pressure.

4. Insufficient voltage following an emergency start.

5. Unit not at 0 rpm within 15 minutes following a stop signal.

6. Loss of field voltage relay during operation.

7. Generator circuit breaker not closed within 1 second following reaching 870 rpm during a fast start.

8. High or low level in the fuel oil base tank.

9. Low starting air pressure.

10. Engine coolant high temperature.

11. Lube oil low level.

12. Lube oil high temperature.

13. Three unsuccessful automatic start attempts.

14. Service water/emergency service water low pressure.

15. High fuel pump pressures (electric driven or engine driven).

16. Alarm control power circuit breaker open.

17. Start system #1 control power circuit breaker open or start system #2 control power circuit breaker open.

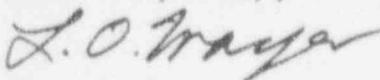
Alarm

Condition

18. Starting air compressor #1 or starting air compressor #2 control switches in the off position.
- c. The conditions that render the diesel generator incapable of responding to an automatic emergency start signal which are not alarmed in the control room are listed below:
1. The loss of D.C. control power to the generator output circuit breaker prevents the generator output circuit breaker from automatically closing. Light indication above the breaker hand switch will be lost if there is no control power available to close the breaker.
 2. The generator output circuit breaker control switch in the control room in the pull-to-lock position will prevent the generator output circuit breaker from automatically closing. It requires deliberate operator action to place the hand switch in this position.
 3. The loss of D.C. power to the diesel generator control power circuit (which also supplies the alarm control power circuit) or to the generator field flashing circuit will render the diesel generator incapable of responding to an automatic emergency start signal.
- d. There are no proposed modifications resulting from this evaluation. All alarmed conditions are immediately investigated by operating personnel to determine the cause of the problem, to determine the status of diesel generator involved and to take the necessary corrective actions. The non-alarmed conditions involve loss of D.C. power sources or a deliberate action by a control room operator. Considering the reliability of the D.C. power supply system, the routine surveillance testing performed on the emergency diesel generators, the once per shift inspections of control room switch and indicating light status, and the redundancy of the diesel generators, additional alarms are not deemed necessary.

The area of particular concern noted in your April 7th letter involving an unreset condition following a local manual stop of the diesel generator does not apply to the Monticello diesel generator system. When a stop signal is given to the diesel generator from either the control room or the local panel, the diesel engine idles for 15 minutes before shutting down. If during the shut-down cycle an automatic emergency start signal is received, the engine returns to operating speed and is ready to accept load if required. After the 15 minute idle time has elapsed, the engine shuts down, the governor is driven to the synchronous speed setting and the unit is ready to accept an automatic emergency start signal.

Yours very truly,



L O Mayer, PE
Manager of Nuclear Support Services

LOM/MHV/ssd

cc: J G Keppler
G Charnoff
MPCA-Attn: J W Ferman

50-263

NRC DISTRIBUTION FOR AT 50 DOCKET MATERIAL

FILE NUMBER

TO: Mr. D. K. Davis

FROM: Northern States Pwr. Company
Minneapolis, Minnesota
L. O. Mayer

DATE OF DOCUMENT
5/26/77

DATE RECEIVED
5/31/77

LETTER
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PROP INPUT FORM

NUMBER OF COPIES RECEIVED
1 SIGNED

DESCRIPTION

Consists of requested information regarding Emergency Diesel Generator operability and alarm indications.....

DISTRIBUTION OF MATERIAL CONCERNING DIESEL ALARM CIRCUITRY FOR DEESEL GENERATORS.

PLANT NAME:
Monticello (4-P)

RJL

ENCLOSURE

ACKNOWLEDGED

DO NOT REMOVE

40 encl

SAFETY	FOR ACTION/INFORMATION	ENVIRO
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PROJECT MANAGER: Snider		PROJECT MANAGER:
LIC. ASST.: Riggs		LIC. ASST.:

INTERNAL DISTRIBUTION			
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