

50-220

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Mr. George Lear

FROM:

Niagara Mohawk Pwr. Corp.
Syracuse, New York
Gerald K. Rhode

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PLANT NAME: Nine Mile Point Unit No. 1

RJL

ENCLOSURE

Consists of information regarding requested review of the alarm and control circuitry for the diesel generators.....

(4-P)

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NIAGARA MOHAWK POWER CORPORATION



300 ERIE BOULEVARD WEST
SYRACUSE, N.Y. 13202

May 18, 1977

REGULATORY DOCKET FILE COPY

Director of Nuclear Reactor Regulation
Attn: Mr. George Lear, Chief
Operating Reactors Branch #3
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555



Re: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Gentlemen:

Your letter of March 28, 1977 requested a review of the alarm and control circuitry for the diesel generators at Nine Mile Point Unit 1. The attachment to this letter addresses those concerns.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION



Gerald K. Rhode
Vice President - Engineering

MGM/sz

Attachment

771430078



DIESEL GENERATOR

Alarm
and
Control Circuitry

I. INTRODUCTION

The automatic start sequence for the diesel generators at Nine Mile Point Unit 1 is based on a low voltage condition at the diesel generator power boards. The following conditions could render the diesels incapable of responding to an automatic start signal.

Loss of control voltage

Insufficient starting air pressure

Depleted fuel storage tanks

Isolation switch in "local start" position

Normal supply breaker control switch locked out

Failure to reset the overspeed trip device

Failure to reset the crankcase pressure switch trip

The wording on the annunciator windows that are associated with failure of diesel generator automatic start are as follows. These are annunciated in the control room.

Diesel Generator 102 Standby Off Normal

Diesel Generator 103 Standby Off Normal

Diesel Generator 102 Start-Run Off Normal

Diesel Generator 103 Start-Run Off Normal

Each of these have many signals which would cause annunciation. Signals which cause annunciation and have individual computer print-outs are as follows:

Diesel Generator 102 Standby Off Normal

Diesel Generator 102 Engine Starting Control Circuit Voltage Fail

Diesel Generator 102 Oil Temperature Low

Diesel Generator 102 Fuel Oil Level Hi-Low

Diesel Generator 102 Starting Air Pressure Low

Diesel Generator 102 Fuel Pump Control Circuit Voltage Fail

Diesel Generator 102 Governor Control Circuit Voltage Fail

Diesel Fuel Oil Tank Level 102-103 Low

I. INTRODUCTION (Continued)

Diesel Generator 102 Start-Run Off Normal

Diesel Generator 102 Overspeed Trip Operated

Diesel Generator 102 Lube Oil Pressure Low

Diesel Generator 102 Starting Fail

Diesel Generator 102 600 RPM Lock Out Operated

Diesel Generator 102 Engine Temperature High

Similar annunciators exist for diesel generator 103. Annunciator Diesel Generator 102 Start-Run Off Normal is also actuated by operation of the field overcurrent relay. This function does not have a corresponding computer printout. The following discussion concerns the ability of the diesel generators to respond to an automatic start sequence.

II. DISCUSSION

Automatic Start Sequence

If the diesel generator, during an automatic start sequence, does not reach 200 RPM in five seconds, a reset in the control circuitry will result and another attempt to start the diesel will be made. During the second starting attempt, 750 RPM must be reached in 2 minutes or a fast stop of the diesel generator will be initiated. For this start sequence, only two starting attempts are allowed. If a successful start has not been accomplished during the second attempt, the diesel is tripped and locked-out. A manual reset is then required of both the alarm circuit and the incomplete sequence circuit to permit initiation of another automatic start sequence and consequently another two attempts to start.

Isolation Switch

The isolation switch is a two position selector switch permitting "Local Start" or "Remote Auto" modes of operation. This switch is located on the diesel engine control panel in the diesel generator room and has no alarm in the control room associated with it. However, the switch has been modified such that a mechanical restraint maintains the switch in the "Remote Auto" position and requires procedural control to place the switch in the "Local Start" position.

II. DISCUSSION (Continued)

Normal Supply Breaker Control Switch

If the normal supply breaker control switch is in the locked-out position, initiation of an automatic start sequence is not possible. The only time that this switch is placed in the locked-out position is for routine switchgear maintenance or maintenance on the diesels. Niagara Mohawk maintenance procedures and Technical Specifications describe conditions for routine switchgear maintenance and operation with an inoperable diesel generator.

Maintenance procedures at Nine Mile Point Unit 1 employ a "markup" procedure for taking equipment out of service. Procedural control also exists for placing equipment back into service.

Diesel Overspeed Trip

The diesel overspeed trip requires manual reset to permit completion of the automatic start sequence.

Crankcase Pressure Switch Trip

The diesel engine has a mechanically-operated crankcase pressure switch to detect positive pressure in the crankcase. Upon positive pressure, it operates to bypass oil going to the main bearings. Bypassed oil returns to the crankcase. This, in turn, results in an engine trip due to main bearing oil low pressure. When this device operates, a local mechanical trip reset is required to allow automatic starting of the diesel generator.

Manual Stop

Normal manual shutdown after test from either the local control station or the control room does not require a reset to enable subsequent automatic operation. The diesel will be ready for the automatic start condition.

III. MODIFICATIONS

As a result of this investigation, the following modification will be made:

Replacement of the existing mechanical crankcase pressure switch with an electrical pressure switch. The new switch will be installed to alarm in the emergency run condition only. The positive crankcase pressure trip function is not required during this mode of operation.

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