

CATEGORY 1

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SUBJECT: Part 21 rept re failure of several BWIP pressure switches during operation & initial calibr. Operability determination performed verifying affected components & sys in plant operable.

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NIAGARA MOHAWK

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MARTIN J. McCORMICK JR. P.E.
Vice President
Nuclear Engineering

March 20, 1997
NMP2L 1696

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Unit 2
Docket No. 50-410
NPF-69

Subject: *Part 21 - Borg-Warner Pressure Switches*

Gentlemen:

Pursuant to 10CFR Part 21, Reporting of Defects and Noncompliance, Niagara Mohawk Power Corporation (NMPC) is submitting the attached report. NMPC had previously notified the Commission of this issue on February 20, 1997, via telephone and facsimile. The attached report contains the information required by 10CFR21.21(c)(4).

Very truly yours,

Martin J. McCormick Jr.
Vice President Nuclear Engineering

MJM/KLL/kap
Enclosure

xc: Mr. H. J. Miller, NRC Regional Administrator
Mr. S. S. Bajwa, Acting Director, Project Directorate I-1, NRR
Mr. B. S. Norris, Senior Resident Inspector
Mr. D. S. Hood, Senior Project Manager, NRR
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ATTACHMENT

1. *Name and address of the individual or individuals informing the Commission.*

Mr. Martin J. McCormick Jr.
Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Station
P. O. Box 63, Lake Road
Lycoming, NY 13093

2. *Identification of the facility, the activity or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.*

The affected components are the following Borg Warner Pressure Switches (BWIP) supplied to Niagara Mohawk Power Corporation (NMPC) and installed in Nine Mile Point Unit 2 (NMP2):

- Operator Model Number 85430 (BWIP Part Number 88743), NMPC purchase order number NMP2 - P304Y
- Operator Model Numbers 85960, 86060, and 86040 (BWIP Part Number 88739), NMPC purchase order numbers NMP2-P304Y and NMP2-C051M
- Operator Model Numbers 85960, 86060, 86080, and 86040 (BWIP Part Number 86819), NMPC purchase order numbers NMP2-P304Y and NMP2-C051M

3. *Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.*

Enertech of Brea, California, supplied the subject switches to NMP2.

4. *Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.*

Several BWIP pressure switches have failed during operation and initial calibration. An evaluation has concluded that the switches are unable to consistently hold the correct reset point. According to the manufacturer, the subject switches do not have an accurately adjustable reset value. The relationship between the setpoint of the switches and their reset point is not linear nor consistent between different switches of the same model. They are designed to operate with a maximum setpoint and minimum reset window only. Due to the non-linear reset, setpoint drift over time may place the switches outside their acceptable tolerances. As a result, an excessively high number of the switches are not consistently able to be initially calibrated to the desired setpoint, and once installed and calibrated, several failures have been experienced as the result of setpoint drift.



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The subject switches were supplied and recommended by the vendor as replacements for the original switches of the same model. The vendor is aware of the specific setpoints associated with each switch part number ordered by Niagara Mohawk. However, instead of providing switches designed to operate at the specific setpoint and reset, the vendor supplied replacement switches made to operate somewhere within the maximum setpoint and reset range for all switches of this type. Initial calibration of newly installed switches is then required to set each switch to its required operating range. It is during this initial calibration that a majority of the problem switches are rejected due to difficulties experienced in achieving the acceptable operating ranges for the switches.

Each of the operators identified under section (2) has BWIP switches within its hydraulic controls. The effect of a switch failure on a given operator is a function of the switch application within the operator hydraulic control circuit; i.e., a valve failing open and unable to close, a valve failing closed and unable to open, or a valve failure in place.

For the Control Building Chilled Water System (HVK) or Service Water System (SWP), due to their design and application, switch failure would cause the associated valve to fail in an intermediate open position and unable to modulate. SWP valves 2SWP*TV35A and 35B provide temperature control for the control and relay room chillers. HVK valves 2HVK*T21A, 21B, 22A, and 22B provide individual temperature control for air conditioning units in both the control room and relay rooms. If these valves were to fail, control/relay room temperature potentially could increase beyond its acceptable design range over a period of time if corrective action were not taken. While control or relay room overheating (due to BWIP switch failure) is considered to be a less credible event than a Standby Gas Treatment System (GTS) system failure, these NMP2 components are being reported since this type of system reaction is possible. It is to be noted that redundant air conditioning units are available in addition to the ability to manually control cooling flow if required. However, under design basis assumptions neither are credited as being available.

For GTS (2GTS*MOV2A, 2B, 3A, 3B, 28A, 28B, and 2GTS*PV5A, 5B), a pressure switch failure would prevent correct actuator response. Since the subject valves are located on the entrance, exit, cross-tie, and recirculation lines around each Standby Gas Filter Train, the system may not be able to perform its intended safety functions.

Notwithstanding the fact that all systems are redundant and the ability exists to manually control flow around SWP valves 2SWP*TV35A and 35B, a deviation exists with the pressure switches for HVK, SWP, and GTS systems in that, assuming the coincident common-mode failure of switches or a second unrelated single failure (as required by the design basis and Part 21 guidelines), the switches potentially create a substantial safety hazard as defined by Part 21. In addition, the excessively high failure rate during the initial calibration does constitute a substantial safety hazard as defined by Part 21.



Presently an engineering operability determination is in place that documents reasonable assurance that the switches will operate as required. This determination is based on having passed initial calibration testing (where most of the problem switches have been identified and rejected), positive test data trends of installed switch calibrations, and implementation of additional administrative controls which have established the calibration frequency of the BWIP switches at 18 months. Previous to these actions, switches were adjusted when necessary during actuator preventive maintenance or when problems were experienced with the actuator. NMP2 has experienced a significantly decreasing trend in failures of installed switches since initiating the 18-month calibrations of the switches.

This evaluation concludes that although operable at this time, under the guidance of Part 21, the BWIP pressure switches are reportable.

5. *The date on which the information of such defect or failure to comply was obtained.*

Niagara Mohawk identified the defect on February 18, 1997, as a potential Part 21 reportable condition. The investigation was conducted in accordance with Nuclear Licensing Procedure NLAP-IRG-140.

6. *In the case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part.*

The following table lists the affected NMP2 components and the corresponding BWIP part numbers.

**TABLE: Affected Switches and Components
NMPC Part 21 Report**

NMP2 Component ID#	Procurement Information
2GTS*MOV2A-ACT 2GTS*MOV2B-ACT 2GTS*MOV3A-ACT 2GTS*MOV3B-ACT	Pressure, operator model #85430, originally supplied on NMPC purchase order nos. NMP2-P304Y, BWIP P/N 88743. Spare/replacement parts originally supplied under NMPC purchase order number NMP2-P304Y shall be qualified to BORG Warner Test Report No. 2125, Rev. B
2GTS*MOV28A-ACT 2GTS*MOV28B-ACT 2GTS*PV5A-ACT 2GTS*PV5B-ACT 2GTS*MOV2A-ACT 2GTS*MOV2B-ACT 2GTS*MOV3A-ACT 2GTS*MOV3B-ACT 2SWP*TV35A-ACT 2SWP*TV35B-ACT 2HVK*TV21A-ACT 2HVK*TV21B-ACT 2HVK*TV22A-ACT 2HVK*TV22B-ACT	Pressure, operator model #85960, 86060, and 86040, originally supplied on NMPC purchase order nos. NMP2-P304Y and NMP2-C051M, BWIP P/N 88739. Spare/replacement parts originally supplied under NMPC purchase order numbers NMP2-P304Y and NMP2-C051M shall be qualified to BORG Warner Test Report Nos. 2125, Rev. B and 2140 Rev. A.



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**TABLE: Affected Switches and Components
NMP2 Part 21 Report**

NMP2 Component ID#	Procurement Information
2GTS*MOV28A-ACT 2GTS*MOV28B-ACT 2SWP*TV35A 2SWP*TV35B 2HVK*TV21A-ACT 2HVK*TV21B-ACT 2HVK*TV22A-ACT 2HVK*TV22B-ACT	Pressure, operator model #85960, 86080, 86060, and 86040, originally supplied on NMP2 purchase order nos. NMP2-P304Y and NMP2-C051M, BWIP P/N 86819. Spare/replacement parts originally supplied under NMP2 purchase order numbers NMP2-P304Y and NMP2-C051M shall be qualified to BORG Warner Test Report Nos. 2125, Rev. B and 2140 Rev. A.

Number of BWIP Switches by NMP2 System No.:

GTS - 22 switches
 SWP - 6 switches
 HVK - 12 switches

7. *The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete this action.*

An operability determination was performed which verified that the affected components and systems in the plant were operable. The determination is based on rejection of most of the bad switches during initial calibration, the absence of actuator failures since October 1996, and the significantly decreasing trend in switch failures following the establishment of 18-month calibrations of the switches.

NMP2 will either replace the subject switches with switches designed to operate at the specific setpoints required or replace the affected actuators with a different model. The projected date for completion of the corrective actions is May 1, 1998. Until corrective actions are completed, periodic surveillances will continue to verify operability of the affected NMP2 components.

8. *Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.*

Surveillance frequencies of the affected actuators and/or switches should be increased as necessary to control setpoint drift.



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