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 MANGAN, C. V. Niagara Mohawk Power Corp.
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SUBJECT: Deficiency rept re summary of root causes of improperly oriented blower impeller of DBA hydrogen recombiners, per 870131 rept. Vendor shipped unit w/incorrect impeller orientation. Recombiner blower/motor maint manual revised.

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NIAGARA MOHAWK POWER CORPORATION/301 PLAINFIELD ROAD, SYRACUSE, N.Y. 13212/TELEPHONE (315) 474-1511

February 13, 1987
(NMP2L 0997)

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

Re: Nine Mile Point Unit 2
Docket No. 50-410

Gentlemen:

In a letter dated January 31, 1987 (NMP2L 0988), Niagara Mohawk committed to submit, by February 13, 1987, a summary of the results of the root cause investigation for problems related to the Design Basis Accident (DBA) Hydrogen Recombiners for Nine Mile Point Unit 2. Specifically, the root cause investigation covered the problems associated with the improper installation of the blower impellers and an error found in the vendor qualification report. The investigation is now completed and the summary of the results is provided in the enclosure to this letter.

The DBA Hydrogen Recombiner System has been pre-operationally tested and declared operational by our letter dated January 31, 1987 (NMP2L 0987).

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

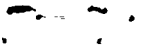
C. V. Mangano
C. V. Mangano
Senior Vice President

LSL/pns
2626G
Attachment

xc: Regional Administrator, Region I
Ms. E. G. Adensam, Project Director
Mr. W. A. Cook, Resident Inspector
Project File (2)

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of]
Niagara Mohawk Power Corporation] Docket No. 50-410
(Nine Mile Point Unit 2)]

AFFIDAVIT

C. V. Mangan, being duly sworn, states that he is Senior Vice President of Niagara Mohawk Power Corporation; that he is authorized on the part of said Corporation to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.

C. V. Mangan

Subscribed and sworn to before me, a Notary Public in and for the State of New York and County of Onondaga, this 13th day of February, 1987.

Beth A. Menikheim
Notary Public in and for
Onondaga County, New York

My Commission expires:

BETH A. MENIKHEIM
Notary Public in the State of New York
Qualified in Onondaga County No. 4804074
My Commission Expires August 31, 1988

RECEIVED
FEDERAL BUREAU OF INVESTIGATION
U. S. DEPARTMENT OF JUSTICE
WASHINGTON, D. C.

ORIENTATION OF BLOWER IMPELLER

Description

As described in our letter dated January 31, 1987, the blower impeller of the DBA Hydrogen Recombiners was found to be improperly oriented. Subsequently, the blower impeller orientation for both recombiners was corrected and appropriate tests performed to verify proper performance.

Summary of the Root Cause Results

The investigation identified two potential root causes which could result in the improper orientation of the blower impellers. These are: 1) the recombiner vendor had shipped the unit with the incorrect impeller orientation, and 2) the maintenance crew at the Nine Mile Point Unit 2 site installed the impellers incorrectly during servicing.

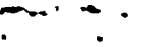
The recombiner vendor, Rockwell International, was requested to investigate the possibility of the blower impeller being shipped in the incorrect position. Rockwell responded that the motor blower assemblies were designed, assembled, and delivered in the correct configuration as noted by the vendor's certified blower performance data. Based on the above information, Niagara Mohawk believes that the recombiners were, in fact, shipped with the blower impellers correctly oriented.

With respect to the other potential root cause, it was determined that the recombiner blower/motor had been serviced during the period from April 25 to August 9, 1986. While performing an alignment of valves in the service water system, water from a valve that had been inadvertently left open flooded the blower/motor assembly in the train "A" division. The train "A" blower/motor was disassembled at the Nine Mile Point Unit 2 site for servicing. The blower/motor for the train "B" was also disassembled for inspection. Subsequently, both blower/motor units were re-assembled.

A review of the instruction and maintenance manual revealed that insufficient information existed to identify to the maintenance crew the correct orientation of the blower impeller. It appears, therefore, that the maintenance crew inadvertently positioned the blower impellers incorrectly during re-assembly. In the absence of precise information, the blower impellers were installed assuming the orientation was that of a typical blower, oriented such that the impeller blades are inclined in the direction of the rotation. However, this assumption is not correct as the proper orientation of the DBA Recombiner blower is such that the impeller blades are inclined in the direction opposite to the rotation.

Corrective Action

The instruction and maintenance manual of the DBA Hydrogen Recombiner blower/motor has been revised to indicate the proper orientation of the blower impeller. In addition, the maintenance procedure of the DBA Hydrogen Recombiner will be revised with specific warning with the regard to the impeller orientation by April 15, 1987.



A review has been performed to determine if other Rockwell supplied equipment exists with a similar blower impeller orientation problem. It has been determined that there is no other safety-related Rockwell supplied equipment utilizing a blower at the Nine Mile Point Unit 2. Therefore, Niagara Mohawk is confident that the incorrect installation of the Rockwell supplied blower impellers is isolated to the DBA Hydrogen Recombiner System.

Furthermore, to prevent making a similar assumption on any blowers, Niagara Mohawk has identified the improper orientation of blower impellers, particularly in the DBA Hydrogen Recombiner, as a topic to be reviewed in the continuing training of mechanical maintenance personnel. A training modification recommendation has been transmitted to the Nuclear Training Department, specifying the following items for inclusion in the mechanical maintenance continuing training:

1. Prior to disassembling a blower, the mechanical maintenance personnel should note the orientation of the blower impeller.
2. A blower impeller can be oriented with the blades inclined to either direction of rotation.
3. During assembly, the proper orientation of the blower impeller should be verified against the maintenance manual. If insufficient guidance existed in the manual to verify correct orientation, the supervisor should be consulted.



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VENDOR QUALIFICATION REPORT

Description

As described in our letter dated January 31, 1987, an error in the vendor qualification report was found during the pre-operational testing of the DBA Hydrogen Recombiner System. Specifically, the maximum calculated horsepower (hp) should be 9.9 hp rather than 8.6 hp as noted in the report.

Summary of the Root Cause Results

The recombinder vendor, Rockwell International, was requested to investigate the cause of the error. Rockwell responded that the error was due to an oversight in their calculation. Specifically, the calculated results did not account for the density correction factor in determining the maximum horsepower.

Corrective Action

Rockwell International has revised the blower/motor qualification report to include the corrected analysis and results, and incorporated as Change No. 1 to the report. The revised report has been reviewed and approved by Stone & Webster Engineering Corporation.

In addition, a review has been performed to determine if other Rockwell supplied equipment with blowers exist with a similar error in their qualification report. It has been determined that there is no other safety-related Rockwell supplied equipment utilizing a blower at Nine Mile Point Unit 2.



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