NIAGARA MOHAWK POWER CORPORATION

NIAGARA MOHAWK

300 ERIE BOULEVARD WEST
SYRACUSE, N.Y. 13202

November 28, 1973

AOR 73-11-20

Mr. Donald J. Skovholt
Assistant Director for Reactor Operations
Division of Reactor Licensing
United States Atomic Energy Commission
Washington, D. C. 20545

Re: Provisional Operating License: DPR-17
Docket No.: 50-220

Dear Mr. Skovholt:

On November 20, 1973 at approximately 0230 hours at Nine Mile Point Nuclear Station, Unit #1, eleven (11) control rod drives failed to insert to notch position 00 following a Reactor Scram. Persuant to Technical Specification 1.13 d.,

> Failure of one or more components of an engineered safety feature or Station system that causes or threatens to cause the feature or system to be incapable of performing its intended function,

this is an abnormal occurrence and was reported by telephone and photocopy to the Director of Regulatory Operations, Region Office I on November 20, 1973.

Prior to the occurrence a routine startup was in progress with reactor power being increased, using reactor recirculation flow, following a scheduled shutdown for Operator Demonstration criticals. Reactor power had reached the 77% level, water level was normal, reactor pressure was 988 psig, the generator was on line with all systems operating normally for a routine start-up.

A sudden increase in recirculation flow rate occurred at 77% power causing an increase in positive reactivity (the result of voids being "swept" more rapidly from the core i.e. better moderation) resulting in a high flux reactor scram and anticipatory turbine generator trip. The control room operator immediately decreased recirculation flow when it became obvious that recirculation flow was on an upward ramp and neutron instrumentation began steadily increasing, however his proper action could not prevent the high flux flow bias reactor scram. The recirculation flow ramp increase will be the subject of an unusual event letter before December 20, 1973. All systems operated normally for this transient except the control rod drive system. The operator noted that upon resetting of the scram eleven (11) control rods indicated position 02 instead of 00. The operator immediately inserted the control rods to 00 using the reactor manual control system with normal control rod drive pressure.

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U.S. Atomic Energy Commission

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The apparent cause of this occurrence has been identified as damaged stop piston seals causing excessive leakage past these seals. This was determined from stall leakage flow tests and scram testing of each of the affected control rods prior to unit power generation on the succeeding start-up. Excessive flow past the stop piston seals instead of thru the buffer holes (the number of those holes decreases as the control rod is inserted) will result in slowing down of the control rod over the last 5% of its travel.

Throughout the preceding transient and during the period of time that the eleven (11) control rods were at position 02 no hazard was presented to the general public. The reactor was highly subcritical and could not have been made critical using these eleven control rods at position 02.

To correct this situation, the control rods affected will be overhauled during the Spring 1974 refueling outage as well as any others which indicate the high stall leakage flows.

In the past replacement of control rod drives during refueling outages has been determined in part by high stall leakage flows. The deterioration of the stop piston seals of the General Electric control rod drive mechanism appears to increase with increasing drive pressure required to operate the control rod. Orders have been issued to operations to maintain the drive pressure within normal limits during rod withdrawals. However those control rods with existing deteriorated seals will have to be moved using higher than normal pressure.

Very truly yours,

Rudolph R. Schneider
Vice President - Electric Operations

RRS:cm

cc: Mr. James O'Reilly
RO:I