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NMP1L 1567

Mr. Hubert J. Miller, Regional Administrator
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

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

Subject: ***Response to Comments by the Union of Concerned Scientists Regarding Licensee Event Report 00-03, "Reactor Trip on Low Reactor Water Level While Placing the Reactor Water Cleanup System in Service"***

Dear Mr. Miller:

Niagara Mohawk Power Corporation (NMPC) provides in the attachment to this letter responses to the Union of Concerned Scientists (UCS) questions relative to Licensee Event Report 00-03, "Reactor Trip on Low Reactor Water Level While Placing the Reactor Water Cleanup System in Service", dated October 27, 2000. The attachment contains NMPC's responses to the five questions raised on page 3 of the UCS letter addressed to you, dated December 7, 2000.

Very truly yours,

Richard B. Abbott
Vice President Nuclear Engineering

RBA/TRB/cld
Attachment

xc: U.S. Nuclear Regulatory Commission, Document Control Desk
Ms. M. K. Gamberoni, Section Chief PD-I, Section 1, NRR
Mr. G. K. Hunegs, NRC Senior Resident Inspector
Mr. P. S. Tam, Senior Project Manager, NRR
Records Management

ATTACHMENT 1

RESPONSE TO UNION OF CONCERNED SCIENTISTS QUESTIONS REGARDING LICENSEE EVENT REPORT 00-03, "REACTOR TRIP ON LOW REACTOR WATER LEVEL WHILE PLACING THE REACTOR WATER CLEANUP SYSTEM IN SERVICE"

The Union of Concerned Scientists (UCS), in a letter dated December 7, 2000 to Mr. Hubert J. Miller, NRC Regional Administrator, questioned Niagara Mohawk Power Corporation's (NMPC) Licensee Event Report (LER) 00-03, "Reactor Trip on Low Reactor Water Level While Placing the Reactor Water Cleanup System in Service", concerning the reactor scram that occurred at Nine Mile Point Unit 1 (NMP1) on September 27, 2000.

The UCS has requested answers to five questions. The questions posed by the UCS are based, at least in part, upon the following paragraph contained in LER 00-03:

> "During the initial three minutes after restoring the reactor water cleanup system [to service], reactor level dropped from approximately 66 to 49.5 inches [above instrument zero]. In the following four minutes, operators stabilized reactor water level at approximately 55 inches. A standby reactor water cleanup filter that was drained and isolated prior to placing the reactor water cleanup system in service was found filled after the reactor trip. The standby reactor water cleanup filter isolation valves leaked allowing reactor water to fill the drained standby filter and associated piping. The volume of the drained standby filter and associated piping is approximately the same volume as the reactor water level reduction experienced when the reactor water cleanup system was placed in service."

The UCS letter states, in part, the following:

> "Therefore, it appears credible that the 16.5 inch level drop in the September 27, 2000, event was not caused by leakage past closed isolation valves as postulated by Niagara Mohawk but rather by reactor water filling the reactor water cleanup system piping as in past events. The difference this time was that the condensate system did not automatically step in to cover the operators' mistake as in the past."

NMPC would like to take the opportunity to voluntarily provide answers to each of the five questions posed by the UCS regarding the event. The five questions and NMPC's response to those questions are as follows:

Question #1:

How much water really found its way to the standby reactor water cleanup system filter in the first three minutes of the event?

Response:

A negligible amount of water found its way to the standby reactor water cleanup system filter in the first three minutes of the event. The receipt of the low level scram signal was caused by reactor water filling the voided reactor water cleanup system piping as in past events. However, this event differed from previous occurrences in two respects. Specifically:

1) The condensate system with a high volume (8,000 gpm per pump) make-up rate was unavailable. The make-up source in use was the low volume make-up (65 gpm) control rod drive system.

2) The standby reactor water cleanup system filter had been drained for an extended period of time prior to placing the system in service.

The standby reactor water cleanup system filter was left drained and isolated as part of a maintenance activity prior to the venting and filling of the reactor water cleanup system. Venting and filling of the reactor water cleanup system commenced at 1230 hours on September 26, 2000. Subsequently, at 0118 hours on September 27, 2000, the reactor water cleanup system was placed back into service and shortly thereafter the reactor scram signal was received.

Sufficient time elapsed between the filter isolation and the placing of the reactor water cleanup system back into service for the filter to have been completely filled over a minimum time period of 12.5 hours due to leakage past the butterfly-type valves. Thus, leakage past the isolation valves created voids in the reactor water cleanup system piping that were filled from the reactor vessel inventory when the reactor water cleanup system was placed back into service.

Question #2

Were the isolation valves for the standby reactor water cleanup system filter closed?

Response:

The standby reactor water cleanup system filter inlet and outlet valves were verified closed following the reactor scram.

Question #3

If the isolation valves were closed, what was the leakage rate past them to fill the volume of the standby reactor water cleanup system filter in only three minutes?

Response:

As stated above, the standby reactor cleanup system filter isolation valves were verified to be closed following receipt of the low level reactor scram. Further, as a result of the system conditions, a negligible amount of water found its way to the standby reactor water cleanup filter during the first three minutes of the event. The standby filter had been isolated by the butterfly-type isolation valves for a minimum of at least 12.5 hours prior to the reactor scram signal. Leakage past the isolation valves during this extended time period resulted in the standby filter becoming filled.

Based on the systems operating at the time of the event, engineering analysis of the reactor vessel inventory relocated to the reactor water cleanup system, and the lack of other abnormal system leakage, NMPC concluded that the decrease in reactor vessel level during this event resulted from the filling of the reactor water cleanup system voids. As part of the corrective action program, NMPC continues to pursue ongoing corrective actions to prevent recurrence of this event.

NMPC plans to issue a supplement to LER 00-03 within 60 days of the issuance of this letter to provide additional details of the event on September 27, 2000.

Question #4

Was the reactor water cleanup system piping and associated supports inspected for damage caused by water-hammer?

Response:

The reactor water cleanup system piping and associated supports were not initially inspected for damage caused by water hammer because the primary indicators of water hammer (noise and pipe movement) were not observed.

Water hammer events occur as a series of shocks sounding like hammer blows, which may have sufficient magnitude to deform or rupture the pipe or damage pipe-connected equipment and supports. Post incident interviews were conducted with operators during the root cause investigation. The operators observed no noise or physical system movement that occurred as a result of this incident. A recent walk-down on January 16, 2001 was performed by Technical Support and Structural Engineering personnel experienced in system operation, piping and pipe support design, to specifically inspect the reactor water cleanup system piping and associated supports for damage or telltale signs caused by water hammer such as: markings on pipes in close proximity that might have hit and/or rubbed together, chipped paint, scratched surfaces, deformed insulation at penetrations or through supports, cracked concrete at base plate anchor bolts and/or anchor bolt pullout, etc. The walk-down found no evidence of damage or movement of piping, pipe-connected equipment or supports that could indicate a water hammer event took place.

In general, for water hammer to occur, a mechanism must exist that would nearly instantaneously stop (or start) the pipe flow (usually water). This can happen by the rapid closing (or opening) of a valve in the line or by an equivalent stoppage of flow such as would take place from the instantaneous failure of a motor driven pump. During the subject event, although voids in the system existed, there was no mechanism which would result in a sudden fluid momentum change. Consistent with the operating procedure, the auxiliary reactor water cleanup pump was started with the discharge valve closed. After the pump was started, operators slowly opened the discharge valve to establish system flow. By operating the system in this manner, a water hammer event is precluded.

Question #5

Why don't the Corrective Actions undertaken by Niagara Mohawk include at least an audit of operational experience review (e.g., NRC Information Notices, GE Service Information Letters, et al) to ensure that all appropriate actions have been taken at Nine Mile Point Unit 1?

Response:

A review of internal and external operating experience is an integral part of NMPC's corrective action program and is required by procedure. A review of operating experience was performed as part of the corrective actions for the Deviation/Event Report (DER) generated as a result of the event. There are numerous industry reports about events caused in whole or in part because of less than adequate filling and venting of systems prior to return of the system to service. NMPC generally does not discuss reviews of industry operating experience as a corrective action in its LERs. 10 CFR 50.73 and NUREG-1022, "Event Reporting Guidelines – 10 CFR 50.72 and 50.73", do not require nor provide any guidance on including in LERs discussions of industry operating experience with respect to similar events.

With regard to NRC Information Notice 91-50, "A Review of Water Hammer Events After 1985", and Supplement 1 to Information Notice 91-50, "Water Hammer Events Since 1991", NMPC did not re-perform a review of this operating experience since there was no indication that a water hammer event had occurred as discussed in NMPC's answer to Question #4.