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SUBJECT: Suppls 880929 response to NRC Bulletin 88-008 & suppls re piping configurations having potential to be susceptible to cycling fatigue.Util will continue to monitor & trend emergency condenser return line leakage rates.

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December 16, 1991
NMP1L 0629

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

Re: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63
TAC NO. M69655

Gentlemen:

SUBJECT: NINE MILE POINT NUCLEAR STATION UNIT 1 SUPPLEMENTAL RESPONSE TO NRC BULLETIN NO. 88-08 AND SUPPLEMENTS

This letter supplements our initial response to NRC Bulletin No. 88-08 and its Supplements submitted on September 29, 1988 (NMP1L 0309). In the September 29, 1988 letter, Niagara Mohawk identified three piping configurations as having the potential to be susceptible to cycling fatigue. The Reactor Head Spray line, the Feedwater System at the reactor feedwater nozzles and reactor water cleanup mixing tee, and the Emergency Cooling System condensate return line were so identified. The purpose of this letter is to provide an update to commitments made in the September 29, 1988 letter, the results of completed evaluations and analyses, and to fulfill the reporting requirements of the NRC Bulletin.

The Reactor Head Spray line inspections performed as stated in our September 29, 1988 letter met the requirements of Action 2, specified in NRC Bulletin No. 88-08. During our extended outage, the unisolable section of the Reactor Head Spray Cooling System line was permanently removed from service (Modification No. N1-89-209). Thus, the unisolable section of the Reactor Head Spray System is no longer a concern for the issues identified in NRC Bulletin No. 88-08.

The Feedwater System was identified as having the potential for thermal cycling under conditions of reactor startup or shutdown. Niagara Mohawk has revised its Technical Specification, Section 3.1.8 and its associated Bases, to allow closing the feedwater pump discharge blocking valve, assuring feedwater flow control by the low flow control valve during reactor startup or shutdown. As committed to in the September 29, 1988 letter, Niagara Mohawk rebuilt the feedwater flow control valves during the past extended outage to minimize the possibility of leakage. These changes allow for a new operating mode which assures significantly more stable low flow feedwater control, thereby significantly reducing the number of thermal cycles experienced by the piping in the vicinity of the Reactor Water Cleanup (RWCU) System mixing tee and reactor feedwater nozzle.

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Ultrasonic examinations were performed in accordance with NRC Bulletin No. 88-08, Action 2, in the area of the RWCU mixing tee. Areas examined included welds, heat affected zones, and high stress locations, including base metal exams of the bottom third of the pipe circumference. Inspection data from these examinations revealed no rejectable indications or evidence of cracking in the areas examined. In addition, during power ascension testing, plant walkdowns were performed inside the drywell to verify unrestricted expansion of the feedwater piping near the examination areas discussed above.

Therefore, in accordance with NRC Bulletin No. 88-08, Action 1, no additional actions are required based on the operational changes, inspection results and repairs made to the Feedwater System as described above.

The Emergency Cooling System condensate return line was examined as committed to in the September 29, 1988 response. These examinations included welds, heat affected zones, and high stress locations, including base metal exams of the bottom third of the pipe circumference. Inspection data from these examinations revealed no rejectable indications or evidence of cracking in the areas examined. In addition, during power ascension testing, plant walkdowns were performed to verify unrestricted expansion of Emergency Condenser piping near the examination areas discussed above.

In the September 29, 1988 response, Niagara Mohawk committed to reevaluate the Emergency Cooling System condensate return line isolation valves after modifications to permit Appendix J testing were completed. Niagara Mohawk has requested a schedular exemption from the Appendix J requirements (NMP1L 0626), which would delay this modification to the 1994 refueling outage. This schedule change is appropriate at this time because Niagara Mohawk has been able to evaluate the impact of leakage in the unisolable section of the Emergency Condenser return lines as it relates to thermal stratification.

In order to estimate the level of leakage past the Emergency Condenser isolation valves, Niagara Mohawk commenced monitoring the make-up water rate to the Emergency Condensers and the Emergency Condenser shell temperatures after the 1990 plant startup. This data was used to develop an energy balance for the Emergency Condensers in order to calculate leakage past isolation valves. Utilizing this data along with technological advances in the industry with regard to turbulent penetration, cycling and stratification, as discussed below, Niagara Mohawk has reevaluated the unisolable section of the Emergency Condenser return lines.

The evaluations of the Emergency Cooling System have determined that the unisolable sections of the Emergency Condenser Return lines are not subjected to temperature distributions which would result in unacceptable thermal stresses during normal plant operation. Turbulent Penetration, (i.e., mixing that occurs due to turbulent eddies in the unisolable emergency condenser branch piping due to flow in Recirculation Pump Suction Line) was shown to create mixing in the pipe and prevent the development of thermal stratification during normal plant operation. The evaluation used test data from the EPRI Program on Thermal

Stratification Cycling and Striping, vendor test data, and plant recorded thermocouple data from the industry. These data, coupled with flow and temperature conditions in the Recirculation Pump Suction lines and postulated valve leak rates, formed the basis for the turbulent penetration analysis. Since thermal stratification was shown not to develop in this bounding analysis, pipe bending moments due to stratification that would adversely effect the structural integrity of the subject piping were not produced.

Niagara Mohawk also analyzed the initial phases of startup and the completion of shutdown when there maybe insufficient reactor recirculation loop flow coupled with postulated valve leakage rates, such that full turbulent penetration may not exist throughout the entire unisolable branch section of the Emergency Condenser return line piping. The evaluation of this transient condition determined that if stratification did occur, it would have a minimal effect on the piping for the following three reasons: 1) Existing turbulent penetration would confine stratification to a limited span of piping, 2) the number of postulated stress cycles is low due to hydraulic conditions, 3) startup and shutdowns are infrequent and short duration transient conditions, which prevent the accumulation of sufficient cycles to adversely effect the fatigue state of the pipe. Because of this, Niagara Mohawk has concluded this condition will have minimal impact on the structural integrity of the unisolable section of the Emergency Condenser return piping. Therefore, in accordance with Action 1 of the NRC Bulletin, no additional actions would be required.

In order to confirm that thermal stratification will not adversely impact the structural integrity of the Emergency Condenser System, Niagara Mohawk will continue to monitor and trend the Emergency Condenser return line leakage rates. We are in the process of determining limiting valve leakage rates based on allowable bending stresses. Should valve leakage increase to beyond these limiting leak rates, corrective actions in accordance with or similar to those described in Action 3 of NRC Bulletin No. 88-08 would be implemented during the subsequent refueling outage.

If you have any questions in regards to this response, please contact me.

Very truly yours,

C. D. Terry
Vice President
Nuclear Engineering

NAS/mls
002118GG

xc: Regional Administrator, Region I
Mr. R. A. Capra, Project Director, NRR
Mr. D. S. Brinkman, Senior Project Manager, NRR
Mr. W. L. Schmidt, Senior Resident Inspector
Mr. D. R. Haverkamp, Chief, Reactor Projects, Section 1B
Records Management

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	]	
	]	
Niagara Mohawk Power Corporation	]	Docket No. 50-220
	]	
Nine Mile Point Unit 1)	]	

C. D. Terry, being duly sworn, states that he is Vice President, Nuclear Engineering 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. D. Terry
Vice President
Nuclear Engineering

Subscribed and sworn to before me, a Notary Public in and for the State of New York and County of Onondaga, this 11th day of November, 1991.

Diane R. Kimball
Notary Public in and for
Onondaga County, New York

DIANE R. KIMBALL
Notary Public in the State of New York
Qualified in Onondaga County No. 4[illegible]03
My Commission Expires May 31, 19[illegible]

My Commission Expires: 5/31/[illegible]