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SUBJECT: Forwards response to Suppl 3 to Generic Ltr 89-10,
 "Consideration of NRC-Sponsored Tests of Motor-Operated
 Valves." Evaluation indicates that motor operators capable
 of providing acceptable thrusts.

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March 12, 1991
NMP1L 0573

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

Gentlemen:

Generic Letter 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," requested Licensees to establish a program to provide for the testing, inspection, and maintenance of safety-related Motor-Operated Valves (MOV) and certain other MOVs in safety-related systems. Generic Letter 89-10, Supplement 3, "Consideration of the Results of NRC-Sponsored Test of Motor-Operated Valves," was issued on October 25, 1990. Supplement 3 requested that Licensees perform a plant specific safety assessment within 30 days to verify the generic safety assessments performed by the NRC Staff and BWR Owners' Group were applicable. Our letter dated December 14, 1990, (NMP1L 0556) notified the Staff that a plant specific safety assessment had been completed. In addition, Supplement 3 requested Licensees to provide the Staff, within 120 days, the criteria reflecting operating experience and the latest test data that were applied in determining if deficiencies exist in the applicable HPCI, RCIC, RWCU, and Isolation Condenser MOVs and any MOVs of greater safety significance. Attachment 1 to this letter provides Nine Mile Point Unit 1's 120 day response to Generic Letter 89-10, Supplement 3.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION



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ATTACHMENT 1

SUMMARY

The following is Niagara Mohawk's evaluation of Nine Mile Point Unit 1's (NMP1) Emergency Condenser System and Reactor Water Cleanup System (RWCU) containment isolation valves as requested in Generic Letter 89-10, Supplement 3 (NMP1 does not have a steam driven RCIC or HPCI system). No other valves were identified in which the INEL test data applied and were of a greater safety significance. The requested actions in Supplement 3 were based on the results of motor-operated valve testing by Idaho National Engineering Laboratory (INEL). The specific valves tested were flexible wedge gate valves manufactured by a limited number of vendors (Anchor/Darling, Velan, Walworth, and Powell).

Niagara Mohawk has concluded that the deficiencies identified by INEL do not exist in the RWCU or Emergency Condenser isolation valves at NMP1. The four Emergency Condenser isolation valves (39-07R, 39-08R, 39-09R, 39-10R) were manufactured by Rockwell and are of a unique design called "Equiwedge." The "Equiwedge" design is significantly different than a flexible wedge design and is described in Section A.1 of this attachment. Of the Reactor Water Cleanup (RWCU) isolation valves, two (33-01R, 33-02R) were manufactured by Anchor Darling and are parallel disk gate valves. The third RWCU isolation valve (33-04) is a flexible wedge design which was manufactured by Crane. Therefore, the INEL data, which is limited to flexible wedge design valves, does not directly apply to the Emergency Condenser "Equiwedge" valves or the RWCU parallel disk valves. The Crane flexible wedge valve RWCU 33-04 is similar in design to those tested by INEL. However, design differences do exist as indicated in Section C.1 of this attachment. The fourth and remaining isolation valve is a check valve and therefore not within the scope of Generic Letter 89-10.

In addition to determining the applicability of the INEL test data, the motor operator capabilities have been evaluated for each of the subject valves. In general, the evaluation indicates that the motor operators are capable of providing thrusts greater than the calculated required thrust using 1) the industry standard valve factors of .2 for parallel disk valves and .3 for flexible wedge valves, and 2) the more conservative .5 valve factor which bounded many of the INEL blowdown tests. Details of this evaluation are provided in the following assessments of individual valve motor operators.

A. Emergency Condenser Isolation Valves (39-07R, 39-08R, 39-09R, 39-10R)

1. Valve Design Comparison (Generic)

The 10" valves that were tested by INEL were Anchor Darling, Powell, and Velan flexible wedge gate valves. NMP1 Emergency Condenser isolation valves 39-07R, 39-08R, 39-09R, and 39-10R are Rockwell "Equiwedge" 10" gate valves. The Equiwedge design differs considerably from a typical flexible wedge design. The Equiwedge valve consists of a two-piece gate similar to that used



in parallel slide valves but uses the traditional wedge seat arrangement in the valve body. The gate guiding system consists of guide rails on each gate half which engage guide grooves on each side of the valve body. On opening or closing there is relative sliding motion between the gate and body seating surfaces for only a small portion of valve travel. Outside this range all sliding motion occurs between the hardfaced surfaces on the gate rails and the guide groove in the valve body. By comparison, the INEL test valves were not designed with hardfaced guide surfaces.

In summary, valves 39-07R, 39-08R, 39-09R, and 39-10R are not similar in type, design, or manufacturer to the valves tested by INEL. Therefore, the INEL data collected is not considered directly applicable and no change in the existing motor operator design basis or switch point setting is currently planned.

2. Individual Valve Motor-Operator Capabilities

2.1 Valves 39-07R, 39-08R

Valves 39-07R and 39-08R are Rockwell "Equiwedge" 10" gate valves with a 125 VDC motor operator. 39-07R and 39-08R are designed for a maximum differential pressure of 1250 psid. and provide an outside containment isolation function. Using a .3 valve factor, the required design thrust is calculated to be 12,892 lbs. Using a .5 valve factor, the design thrust is calculated to be 18,303 lbs. Based on the latest diagnostic test, the motor operators are capable of providing over 18,303 lbs. of thrust with the present torque switch setting. Therefore, the thrust available with the current torque switch setting is greater than the thrust calculated using either the industry standard .3 valve factor or the more conservative .5 valve factor.

2.2 Valves 39-09R, 39-10R

Valves 39-09R and 39-10R are Rockwell Equiwedge 10" gate valves with a 550 VAC motor operator. 39-09R and 39-10R are designed for a maximum differential pressure of 1250 psid. and provide an outside containment isolation function. Using a .3 valve factor, the required design thrust was calculated to be 12,892 lbs. Using a .5 valve factor, the design thrust was calculated to be 18,303 lbs. Based on latest diagnostic test results, the motor operators are capable of providing over 18,303 lbs. of thrust with the current torque switch setting. Therefore, the thrust available with the current torque switch setting is greater than the thrust calculated using either the industry standard .3 valve factor or the more conservative .5 valve factor.

3. Conclusion

Based on valve design and actuator thrust capabilities, no deficiencies exist.



B. Reactor Water Cleanup Isolation Valves 33-01R, 33-02R

1. Valve Design Comparison

Valves 33-01R and 33-02R are Anchor Darling 6" parallel disk gate valves which are of a significantly different design than those tested by INEL. The EPRI analysis of the INEL flexible wedge gate valve test program data concluded that excessive friction and damage occurred when the gate valve wedge transitioned from the guide rails to its seat under the high differential flow test conditions. The parallel disk design uses the seats to guide the disk throughout the stroke. Therefore, it is not susceptible to the transition problem experienced on the flexible wedge gate valves tested by INEL. The EPRI analysis also indicated that the lack of hardfacing of the guiding surfaces may have contributed to the excessive friction. The parallel disk valves are guided by the disk seat and body seat ring which are both hardfaced. Therefore, the sliding friction should be less than that experienced by the INEL test valves.

In summary, valves 33-01R and 33-02R are different in design from the valves tested by INEL. Therefore, the INEL test data is not considered directly applicable and no change in the existing motor operator design basis or switch setpoint criteria is warranted.

2. Individual Valve Motor-Operator Capabilities

Valves 33-02R and 33-01R are Anchor Darling 6" parallel disk gate valves with a 550 VAC motor operator. 33-02R and 33-01R are designed for a maximum differential pressure of 1200 psid. and provide a containment isolation function. Using a .2 valve factor, the design thrust was calculated to be 8,571 lbs. The motor operator is capable of providing over 8,571 lbs. of thrust at the current torque switch setting. Therefore, the thrust available with the current torque switch setting is greater than the thrust calculated using the industry standard .2 valve factor.

The motor operator control scheme for valve 33-01R and 33-02R has the torque switch bypassed for the first 95% of the valve travel stroke. Predicted motor actuator torque generating capability (@ degraded voltage conditions) during the torque bypass region is approximately 63% higher than that limited by the existing torque switch setting. This torque capability is sufficient to overcome the calculated thrust requirement utilizing a valve factor of .5.

In summary, the available actuator thrust is greater than the thrust calculated using the standard .2 valve factor. The thrust available during 95% of valve travel (torque switch bypassed) is greater than the thrust calculated using the more conservative .5 valve factor.

3. Conclusion

Based on valve design and actuator thrust capabilities, no deficiencies exist.



C. Reactor Water Cleanup Supply Outboard Isolation Valve 33-04

1. Valve Design Comparison

Valve 33-04 is a Crane 900 lb. class flexible wedge gate valve similar to the valves tested by INEL. The EPRI analysis concluded that hardfacing of the disk guide slots and rails should reduce the friction forces required to move and close the disk. Valve 33-04 has stellite hardfacing on the seating surfaces and disk slots but not on the body guide rails. The EPRI analysis also concluded that rigid guide rails should reduce the potential for internal damage since some of the test valves were found to have bent guides. Valve 33-04 has a guide that is cast with the valve body and consequently should have better rigidity.

In summary, while the design of 33-04 is similar to the valves tested by INEL, the direct application of the INEL test data is questionable. This is based on the following:

1. The INEL test data did not include a Crane valve of similar design.
2. The INEL testing showed various results among valves of similar design making it difficult to project the results to the untested Crane design. The Crane design also has some improvements in the rigidity of the body guide rails and hardfacing of sliding surfaces.

Therefore, the INEL test data is not sufficient to warrant any change to the existing design basis or switch setpoint criteria for valve 33-04 at this time.

2. Individual Valve Motor Capabilities

Valve 33-04 is a Crane 6" flex wedge gate valve with a 125 VDC motor operator. 33-04 is designed for a maximum differential pressure of 1200 psid. and provides a containment isolation function. Using a .3 valve factor, the design thrust required was calculated to be 12,396 lbs. The motor operator is capable of providing over 12,396 lbs. of thrust with the current torque switch setting. Therefore, the thrust available with the current torque switch setting is greater than the thrust calculated using the industry standard .3 valve factor.

The motor operator control scheme for valve 33-04 has the torque switch bypassed for approximately 95% of valve travel in the closed direction. Predicted motor actuator torque generating capability (@ degraded voltage) during the torque bypass region is approximately 100% higher than that limited by the existing torque switch setting. This torque capability is sufficient to overcome the calculated thrust requirement utilizing a valve factor of .5.



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In summary, the available thrust is greater than the thrust calculated using the standard .3 valve factor. The thrust available during 95% of valve travel (torque switch bypassed) is greater than the thrust calculated using the more conservative .5 valve factor.

3. Conclusion

Based on valve design and actuator thrust capabilities, no deficiencies exist.

