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DUKE POWER

October 19, 1995

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

Subject: McGuire Nuclear Station
Docket Nos. 50-369 and 50-370
Revisions 22 and 17 of the Inservice Testing Program for Units 1 and 2 Including Licensee Response to Safety Evaluation Report Dated October 21, 1994

Dear Sir:

Please find enclosed Revisions 22 and 17 of the Inservice Testing (IST) program for Units 1 and 2 respectively.

Attachment 1 summarizes the changes that have been made to the IST program as a result of the Safety Evaluation Reports (SER) dated October 21, 1994, and May 22, 1995. This portion consists mainly of responses to Part 5 of the October 21, 1995, SER.

Attachment 2 contains the enhancements and other changes that have been made to the program, including the addition of an Appendix B (supplemental test) program.

Attachment 3 reflects a summary of the changes that have been made per Revisions 22 and 17 in order to implement program changes.

Attachment 4 lists the actual IST submittal changes.

Should you need additional information or if questions arise, please contact John M. Washam at (704) 875-4181.

Very truly yours,

T.C. McMeekin

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xc: (without attachments)

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ATTACHMENT 1

SER RESPONSES

SER Part 5.1: IST Program does not include a description of (a) how the components were selected, (b) how testing requirements were identified for each component, and (c) the safety function of the valves. Also, the IST program tables do not specify the position indication verification required by the Code. The program should describe the development process, such as a listing of the documents used, the basis for categorizing valves, and the method or process used for maintaining the program current with design modifications or other activities performed under 10 CFR 50.59.

Response to SER Part 5.1: The introductions to each of the four IST sections (McGuire Units 1 and 2, Pump and Valve Inservice Testing Programs), are being revised to include how the components were selected, how testing requirements were identified, categories of safety functions, position indication testing, documents used, the basis for categorizing valves, and the process used to maintain the program current with design modifications and other activities performed under 10 CFR 50.59. Specific safety functions of components are included in the Design Basis Documents and the FSAR. NUREG-1482 Section 2.4.2 only recommends including tests to be performed on valves, and does not specifically address remote indication verification; therefore, this will not be added to the valve tables at this time.

The following paragraph is being added to Section I.1 (Introduction) for the McGuire Units 1 and 2 Pump Inservice Testing Program documents:

Technical Specification 4.0.5 requires inservice testing of ASME Code Class 1, 2 and 3 pumps in accordance with Section XI of the ASME Boiler and Pressure Boiler Code and applicable Addenda as required by 10 CFR 50, Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50, Section 50.55a(g)(6)(i). Pumps were selected for inclusion in the IST Program (Section I.2) which fall within this category, as required by this Technical Specification. Pumps within the above ASME categories which are required to mitigate the consequences of an accident, shutdown the reactor or maintain shutdown are included in the program. Testing requirements are identified for each pump which ensure that the pump will perform as designed in response to an accident, in shutting down the reactor, or in maintaining shutdown. Acceptance criteria are specified in accordance with ASME Boiler and Pressure Vessel Code Subsection IWP. The safety functions of the pumps listed in Section I.2 are included in the Design Basis Documents, and fall within the basic categories of accident mitigation, reactor shutdown, and maintaining shutdown. Post modification testing requirements are included in the applicable Nuclear System Directive; a modification test plan is required to be developed to verify proper operation. The Code

requires the determination of new reference values after pump repair, replacement, or maintenance which could impact operation. These Code requirements and programmatic controls ensure that the pump inservice test program remains current following modifications performed under 10 CFR 50.59. The documents used in development of this program include the following:

- McGuire Technical Specifications.
- Safety Analysis Report.
- ASME Section XI, IWP (1986).
- ASME Operations and Maintenance Standards Part 6 (OM-6), OMa-1988.
- Generic Letter 89-04.
- Supplement 1 to Generic Letter 89-04.
- NUREG 1482, Guidelines for Inservice Testing at Nuclear Power Plants.
- Safety Evaluation Report for the McGuire IST Program dated October 21, 1994.

A similar type paragraph will be added to Section II.1 (Introduction) for the McGuire Units 1 and 2 Valve Inservice Testing Program documents:

Technical Specification 4.0.5 requires inservice testing of ASME Code Class 1, 2 and 3 valves in accordance with Section XI of the ASME Boiler and Pressure Boiler Code and applicable Addenda as required by 10 CFR 50, Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50, Section 50.55a(g)(6)(i). Valves were selected for inclusion in the IST Program (Section II.2) which fall within this category, as required by this Technical Specification. Valves within the above ASME categories which are required to mitigate the consequences of an accident, shutdown the reactor or maintain shutdown, or are pressure relief devices which protect systems or portions of systems which provide these functions, are included in the program. Testing requirements are identified for each valve which ensure that the valve will perform as designed in response to an accident, shutting down the reactor, or in providing relief protection. Valves are categorized in accordance with OM-10 Section 1.4, as Category A, B or C (there are no Category D valves in the program). Valves with remote position indicators are observed locally at least once every 2 years in accordance with the Code. Acceptance criteria are specified in accordance with ASME Boiler and Pressure Vessel Code Subsection IWV. The safety functions of the valves listed in Section II.2 are included in the Design Basis Documents, and fall within the basic categories of accident mitigation, reactor shutdown or maintaining shutdown, or pressure relief for systems providing such. Post modification testing requirements are included in the applicable Nuclear System Directive; a modification test plan is required to be developed to verify proper operation. OM-10 requires the determination of a new reference value after valve replacement, repair or maintenance that could affect its operation. These Code requirements and programmatic controls ensure that the valve inservice test program is maintained current with modifications performed under 10 CFR 50.59. The documents used in development of this program include the following:

- McGuire Technical Specifications.
- Safety Analysis Report.
- ASME Section XI, IWV (1986).
- ASME OM-Code-1987, Part 10 Oma-1988 addenda included.
- Generic Letter 89-04.
- Supplement 1 to Generic Letter 89-04.
- NUREG 1482, Guidelines for Inservice Testing at Nuclear Power Plants.
- Safety Evaluation Report for the McGuire IST Program dated October 21, 1994.

SER Part 5.2: Pump Relief Request 1.3.1 addresses use of vibration equipment which does not meet the ± 5% instrument accuracy required in the Code. Interim relief is granted for one year or until the next refueling outage, during which the availability of vibration instruments which satisfy the Code accuracy requirements or the availability of other calibration laboratories should be investigated.

Response to SER Part 5.2: General Relief Request 1.3.1 for Units 1 and 2 (Section I.3) is being revised to delete the parts addressing relief from the +/- 5% accuracy requirement for vibration amplitude measurements. As of January 1, 1995 the calibration standards used by Duke Power Company were upgraded such that vibraton instrument accuracy would meet the Code required +/- 5 %. As of that time, vibration meters had either been calibrated to these new code requirements or removed from service until calibration could be performed. Therefore, this portion of Relief Request 1.3.1 is no longer needed and is being deleted. (All of these vibration meters have since been calibrated to meet the +/- 5% accuracy.)

SER Part 5.3: Pump Relief Request 1.4.2 does not specifically request relief from Part 6 paragraph 4.6.5 for measuring EDG fuel oil transfer pump flow rate by measuring level rise in the Fuel Oil Day Tank. Also, sufficient information was not provided on why the fuel oil transfer pumps should have a wider acceptance range than that given in paragraph 6.1 Table 3b for internal gear positive displacement pumps. Third, the hardship/impracticality in measuring fuel oil transfer pump discharge pressure was not demonstrated.

Response to SER Part 5.3: The SER follow-up letter dated May 22, 1995 discussed some options for this test, one of which will be pursued as a possible action (establish a range of values [which will be pump-specific] for discharge pressure which is considered a normal operating range, and take some type of corrective action if the measured value goes outside the range). The 5/22/95 letter also granted one year (to 5/22/96) to investigate options for this testing. Pump discharge pressure, flow and vibration data are being recorded in the interim. Specific Relief Request 1.4.2 (both Units 1 and 2) will not be revised at this time.

SER Part 5.4: Pump Relief Requests 1.4.4, 1.4.5, and 1.4.6 for the Residual Heat Removal, Safety Injection, and Centrifugal Charging Pumps appear to request the option of using reference values or pump curves, depending on plant refueling conditions, maintenance performed, and quality of data required in lieu of performing the tests at specified reference values. NUREG-1482, Section 5.2 states that use of pump curves is acceptable if the licensee clearly demonstrates the impracticality of establishing a fixed set of reference values. These relief requests need to be revised to discuss this impracticality and ensure that the IST program includes the seven elements discussed in Section 5.2. Also, specific information is needed on test instrument range and accuracy for relief from the Code's range requirements. This information should be provided as requested in the previous SE (TER Sections 2.5.2, 2.6.1, 2.7.1).

Response to SER Part 5.4: Pump Relief Requests 1.4.4 and 1.4.5 (for Units 1 and 2) are being revised to delete the references to both full flow and reference curve testing. The Residual Heat Removal (ND) (RR 1.4.4) and Safety Injection (NI) (RR 1.4.5) pumps are being removed from full flow IST program refueling outage testing in accordance with NUREG-1482. Question Group 48 for Staff Position 9 of NUREG-1482 states that quarterly mini-flow tests alone are not prohibited by Section XI of the ASME Code if mini-flow recirculation lines are instrumented for flow. Since the ND and NI pump recirculation lines are instrumented, they fall in this category. As a result, concerns over the impracticality of establishing reference values and use of Section 5.2 elements for head curve testing no longer apply. RRs 1.4.4 and 1.4.5 are also being revised to include reference to periodic full flow vibration data, which will be collected as recommended during a telephone conversation with NRR on 9/14/95 (this conversation is documented in a Memorandum to File dated 9/18/95). This full flow vibration data will be collected under the IST Supplemental Program. The Chemical and Volume Control (NV) System centrifugal charging pumps will be full flow tested, since these are non-instrumented recirculation lines.

Regarding instrument range and accuracy, the following applies to Relief Request 1.4.4 and will be added (this is a similar discussion to that of the Component Cooling Water Pump Relief Request, 1.4.3). Typical values for ND suction pressure in mini-flow are 48-81 psig, and discharge pressures are in the 230-260 psig range. Therefore, the process

range for discharge pressure (0-1000 psig) will not meet the three times criteria; the appropriate suction pressure loop can be used, which is within the three times requirement. The accuracy of these process instruments (0.5%) is well below the requirements specified in Table 1 of OM-6 for instrument accuracy (2%). The actual reading error at test pressure due to the process instrument is 2.2 % (0.5 * 1000/230) for discharge pressure at the low end of this range (ND pump procedures specify that instrumentation must meet the three times criteria). If a 0-690 psig gauge was used with 2% accuracy, the reading error would be 6% (2 * 690/230). When the requirements of Oma-1988 Part 6, Section 4.6.1.2.a and Table 1 are combined, the actual instrument error introduced into the test is less than the code allowable (2.2 % vs. 6 % at the low (conservative) end). Using the process instruments for suction and discharge pressure data does not degrade the quality of the test and meets the intent of the instrumentation requirements of the code.

A similar addition regarding instrument range and accuracy will be added to Relief Request 1.4.5. Typical values for NI suction pressure are in the 25-51 psig range, and discharge pressures are in the 1500-1575 psig range. Test equipment used for suction and discharge pressures may not meet the three times criteria, however these instruments will have 0.25% accuracy. The NI pump procedures specify that if a test instrument is needed for suction pressure, a 0-60 psig instrument is preferred, and that the range of the instrument must not exceed 0-100 psig. They also specify that if a discharge pressure test instrument is to be used, 0-2000 psig range is preferred, not to exceed 0-4500 psig. Using the low end suction pressure of 25 psig with the high end allowable gauge, accuracy is 1% (0.25 * 100/25); if a 0-75 psig gauge was used with a 2% accuracy, the code allowable would be 6% (2 * 75/25), so that use of this gauge would be within the code requirements. Using the low end discharge pressure with the high end allowable gauge, accuracy is 0.75% (0.25 * 4500/1500); this is at the three times range, and use of a 2% accuracy gauge would produce a total 6% allowable error. Therefore, using these test instruments for suction and discharge pressure data does not degrade the quality of the test and meets the intent of the instrumentation requirements of the code.

For Relief Request 1.4.6, a full flow point test will be performed as required by Generic Letter 89-04 for non-instrumented mini-flow lines. The relief will be revised to delete discussions regarding a reference curve test, so concerns over the impracticality of establishing reference values and use of NUREG-1482, Section 5.2 elements for head curve testing no longer apply. Lower flow test points will be taken to meet the quarterly test requirement during the refueling outage.

Regarding instrument accuracy during the refueling outage testing (in Relief Request 1.4.6), the range of the highest suction pressure test gauge allowed for the full flow point will be 0-450 psig, and the range of the highest discharge pressure test gauge allowed (for the full flow point) will be 0-4500 psig. Suction pressure is typically 140 to 160 psig, and discharge pressure ranges from approximately 1000 to 2700 psig, so that overall suction and discharge pressure reading accuracy are 0.8 % (0.25 * 450/140) and 1.1 % (0.25 * 4500/1000), respectively. If a 0-420 psig suction pressure gauge was used with 2%

accuracy, allowable accuracy would be 6 % (2 * 420/140), and if a 0-3000 psig discharge pressure gauge was used with 2% accuracy, allowable accuracy would be 6 % (2 * 3000/1000). Therefore, using these test instruments for suction and discharge pressure data (for the full flow point) does not degrade the quality of the test and meets the intent of the instrumentation requirements of the code. A 1% uncertainty is conservatively added for the flow orifice.

Also, Section I.2 for both Units (Pump Inservice Testing General Data) is being revised to "Quarterly" for the Test Frequency of the ND and NI Pumps.

SER Part 5.5: Pump Relief Request 1.4.7 for the Nuclear Service Water Pumps requests relief from measuring vibration frequencies as low as 6.58 Hz because the vibrat ... instrumentation currently in-place cannot be calibrated to that low of frequency. Catawba was granted relief when they agreed to modify the CSI model 2110 vibration instrument to reduce susceptibility to field problems with low frequency measurements. McGuire should commit to using similar instruments, revise the relief request to discuss the accuracy and repeatability of measurements using these instruments, and evaluate whether these pumps are susceptible to degradation mechanisms which result in increased frequencies less than 10 Hz.

Also, Section I.2 for both Units (Pump Inservice Testing General Data) is being revised to delete the reference to RR-1.4.7.

Response to SER Part 5.5: The calibrated frequency range of the CSI model 2110 vibration instrument is presently 5.0 Hz - 1000.0 Hz. The 5.0 Hz frequency meets the 1/3 minimum running speed requirement at MNS. There is a potential that the RN pumps could be affected by vibration frequencies in this range, which is being monitored. This relief request will be deleted.

Also, Section I.2 (for both Units) is being revised to delete reference to RR-1.4.7.

SER Part 5.6: Relief Request RR-NS1 proposes grouping the 6 containment spray check valves to the primary and auxiliary spray headers as one group for disassembly/inspection (of all 6 valves) every 4 refueling outages (6 years), rather than disassembling/inspecting the 4 primary header checks on a staggered basis over 4 refueling outages and the 2 auxiliary header check valves every other refueling outage, based on extreme hardship. The intent of disassembly/inspection of one valve each refueling outage is to provide some degree of assurance that the valve has not degraded and will perform as required; the proposal to perform no inspections for a 6 year period does not provide similar assurance. The difficulties described in the relief request do not meet the examples of extreme hardship provided by the NRC. This alternate inspection schedule cannot be recommended without an evaluation of the affect upon plant safety, industry experience, and a more detailed explanation of the burden.

Response to SER Part 5.6: As shown in the revised deferral (Attachment 4), it has been demonstrated in accordance with Generic Letter 89-04 that extension of this testing is justified based on excellent in-plant historical test data, previous disassembly/inspections which demonstrate the capability of these valves to perform their safey function, a review of industry experience, a review of valve instailation as addressed in the EPRI Applications Guidelines for Check Valves in Nuclear Power Plants, and extreme hardship.

SER Part 5.7: Relief Request RR-VG1 seeks relief from stroke time exercising the control air solenoid valves to the diesel generators because of limitations on available acoustic equipment and a forthcoming modification that will remove these valves from IST requirements. This modification was not installed and further description of the burden in not installing acoustic equipment was requested. In a letter dated February 24, 1994 more detail as to why the diesel start test would be an acceptable alternative was provided, but the burden of using acoustic equipment was not discussed. If these valves are not deleted from the program and relief is still required, means must be provided for detecting valve degradation (e.g., trending diesel start times) and this relief request must be resubmitted.

Response to SER Part 5.7: Relief Request RR-VG1 was deleted per Rev. 21 for the Unit 1, and Rev. 16 for the Unit 2 IST submittal. These valves (VG-115, 116, 117 and 118) are included in the IST program for Movement to Open and Closed testing (this was included in the January 17, 1995 response to the Safety Evaluation). As stated in this response, these valves are ASME Code Class 3, and serve as the pressure boundary between the ASME and non ASME piping. The IST manual was revised to reflect both the open and closed tests, which were already being performed.

SER Part 5.8: Ten of the 95 justification of deferrals for valves identify disassembly/inspection at refueling outage as alternative testing; these should be resubmitted as valve relief requests under Position 2 of GL 89-04:

1(2)-MC-CA2	1(2)-MC-NS2	1(2)-MC-RN5
1(2)-MC-CA3	1(2)-MC-NS3	1(2)-MC-RN6
1(2)-MC-NI22	1(2)-MC-NS4	1(2)-MC-SA1
1(2)-MC-NI24		

Also, deferral 1(2)-MC-RN6 is an open item pending submittal of additional information.

Response to SER Part 5.8: Position 2 of GL 89-04 does not specify that testing deferral to refueling outages for disassembly/inspection requires a relief request. Also, NUREG-

1482 Section 2.4.5 states that "OM-10 allows for a refueling outage frequency if it is impractical to conduct testing quarterly while in operation and during cold shutdown. The licensee must list these valves in the program and include cold shutdown justifications or refueling outage justifications for each valve or group of valves affected. It is recommended that these cold shutdown and refueling outage justifications be included in the IST program and submitted to the NRC." These deferrals are included in the IST program submittal, therefore relief requests are not needed.

Deferral 1(2)-MC-RN6 addresses 1(2)RN-891 and 892 (check valves in the return line from diesel generator cooling water to the essential RN header). These valves were removed, and have been replaced by restricted flow couplings. These deferrals will be deleted, and the valves removed from the program.

SER Part 5.9: Twenty-six of the 95 justification of deferrals that were previously reviewed and documented in the October 12, 1993 SER requested additional information. No additional information has been received to date and the status of these deferrals remains the same:

1(2)-MC-CF4	1(2)-MC-NI20	1(2)-MC-NV8
1(2)-MC-KC1	1(2)-MC-ND2	1(2)-MC-NV13
1(2)-MC-KC2	1(2)-MC-ND3	1(2)-MC-RN1
1(2)-MC-KC3	1(2)-MC-ND4	1(2)-MC-RN2
1(2)-MC-KC4	1(2)-MC-ND5	1(2)-MC-RN3
1(2)-MC-NI3	1(2)-MC-NS1	1(2)-MC-RN4
1(2)-MC-NI6	1(2)-MC-NV1	1(2)-MC-RV1
1(2)-MC-NI8	1(2)-MC-NV2	1(2)-MC-VG1
1(2)-MC-NI11	1(2)-MC-NV5	

Comments and Responses for Part 5.9: (comments are from 10/21/94 SER Table 4.1)

1(2)-MC-CF4: Table questions whether with the valves open, that closing them would cause a feedwater transient; also asks for clarification of the operation of these tempering valves and the conditions under which quarterly testing is assumed to be performed (likely closed above 17% power, but flow diagram shows normally open).

Response: Closing these valves (1(2)CF-104AB, 105AB, 106AB, 107AB) at power would definitely cause a feedwater transient. These valves are normally open at power. This will be added to the deferral.

1(2)-MC-KC1: Table states that 1(2)KC-424B and 425A appear to isolate flow from the reactor vessel support coolers and NC pump thermal barrier heat exchangers, as well as the NC pump motor coolers (the relief only discusses the NC pump motor coolers). The relief does not include the amount of time available after closure of these valves before consequences would result, assuming failure of these valves in the closed position (it is acknowledged that testing should not be performed if the NC pump or NC pump seals could be damaged). The licensee should justify in the deferral why the plant could not achieve a normal shutdown in the event that the valves fail closed during testing, and clarify the function of these valves.

Response: The reactor vessel support coolers are normally isolated, and therefore do not need to be discussed. The deferral will be revised to add that in the event that 1(2)KC-424B or 425A failed closed during testing, that within 15-30 minutes the NC Pumps would be tripped on high bearing temperature, and that an abnormal shutdown (no NC Pumps) would be required.

1(2)-MC-KC2: Table states that the licensee needs to justify why the plant could not achieve a normal shutdown in the event that 1(2)KC-338B (component cooling to NC pump motor coolers isolation valve) failed closed during testing.

Response: The deferral will be revised to add that in the event that 1(2)KC-338B failed closed during testing, that within 15-30 minutes the NC Pumps would be tripped on high bearing temperature, and that an abnormal shutdown (natural circulation) would be required.

1(2)-MC-KC3: Table states that licensee needs to provide additional information in the basis to justify why the plant could not achieve a normal shutdown in the event that one of these valves (1(2)KC-332B, 333A, KC outlet from NCDT heat exchanger) failed closed during testing.

Response: Although a normal shutdown could be achieved per plant procedures, in the event that one of these valves failed closed during testing, the NCDT would overpressurize, and steam would be released to the Containment Floor and Equipment Sump. This test would challenge the overpressure protection of a Reactor Coolant System component. It is concluded therefore that per NUREG-1482 Section 3.1.1 that these valves should be excluded from quarterly testing, and this will be added to the deferral.

1(2)-MC-KC4: Table states that the licensee needs to provide additional information in the basis to justify why the plant could not achieve a normal shutdown in the event that 1(2)KC-320A (KC inlet to the NCDT heat exchanger) failed closed during testing.

Response: The same response as above for 1(2)-MC-KC3 applies in this case, and the deferral will be revised to add this justification.

1(2)-MC-NI3: Table indicates that the deferral of 1(2)NI-147A (recirc to FWST) is acceptable, however the reason for not testing 1(2)NI-115B (NI Pump B miniflow line) quarterly is that this renders B train NI inoperable on safety injection, and with a single failure on A train, there would be a failure of NI altogether; with this logic, none of the ECCS components could be tested. Either this valve should be tested quarterly, or different justification should be provided.

Response: In the event of a loss of offsite power with the loss of 1(2)B diesel generator as the single failure, 1(2)NI-115B would not open, rendering A Train NI inoperable (due to loss of miniflow path). B Train NI would already be inoperable due to the single failure. This will be added to the deferral.

1(2)-MC-NI6: Table states that either 1(2)NI-103A (NI Pump A suction from the FWST) should be stroke timed quarterly, or additional justification should be provided, since the basis is that single failure of the opposite train along with a design basis event during this test would render both trains of NI inoperable (on this basis, no ECCS components could be tested).

Response: In the event of a loss of offsite power with the loss of 1(2)A diesel generator as the single failure when the valve was closed, B Train NV would be lost for sump recirc mode. Since that could happen as fast as 30 minutes and would then be inaccessible due to dose rates, credit could not be taken for manually opening 1(2)NI-103A in this event. A Train NV would already be inoperable due to the single failure. This will be added to the deferral.

1(2)-MC-NI8: Table indicates that 1(2)NI-334B (ND recirc flow to NI pumps) should be quarterly stroked or additional justification should be provided, since the basis is that with the valve closed, a loss of Train B power would render Train A of NI inoperable (the logic is that a single failure on the opposite train with a design basis event during this test will result in a loss of NI altogether; on this basis, none of the ECCS components could be tested).

Response: Failure of 1(2)NI-334B in the closed position does degrade both trains of safety injection. With the single failure of 1(2)B diesel generator, Train A of Safety Injection, which is provided suction from Residual Heat Removal via 1(2)NI-334B or 1(2)NI-136B, would be inoperable (since 1(2)NI-136B is normally closed). Train B of Safety Injection would already be inoperable due to the single failure. The logic above is not used; rather, both trains are impacted by closure of this valve. This will be clarified in the deferral.

1(2)-MC-NI11: Table states that 1(2)NI-332A, 333B (ND recirc flow to NI pumps) should be quarterly tested or additional justification provided, since the justification for not closing 1(2)NI-334B (to prevent FWST injection to the NC system) is not adequate (see the comment on 1(2)-MC-NI8).

Response: Since closure of 1(2)NI-334B degrades both trains of ECCS, stroking these valves at cold shutdown is justified. With the single failure of 1(2)B diesel generator, Train A of Safety Injection, which is provided suction from Residual Heat Removal via 1(2)NI-334B or 1(2)NI-136B, would be inoperable (since 1(2)NI-136B is normally closed). Train B of Safety Injection would already be inoperable due to the single failure. This will be clarified in the deferral.

1(2)-MC-NI20: Table states that either 1(2)NI-136B (ND discharge to NI Pumps) should be stroke timed quarterly, or additional justification needs to be provided on why opening 1(2)NI-136B would render both trains of ND inoperable. It appears that the logic is that a single failure on the opposite train during this test with a design basis event would render both trains of ND inoperable; on this basis, none of the ND components could be tested.

Response: Opening 1(2)NI-136B would seat check valve NV-223 (FWST to charging pump suction) closed, so that if this valve were to fail in the open position, both trains of Chemical and Volume Control (NV) would be inoperable. This will be added to the deferral.

1(2)-MC-ND2: Table states that either 1(2)ND-58A (ND Pumps Discharge to Centrifugal Charging Pumps and Safety Injection Pumps Suction) needs to be stroke time tested quarterly, or additional information needs to be provided to justify why opening this valve

renders both trains of ND inoperable. Valve 1(2)ND29 could be used to ensure that flow from ND Pump 1(2)B could supply all four legs of the NC system.

Response: Opening 1(2)ND-58A would seat check valve NV-223 (FWST to charging pump suction) closed, so that if 1(2)ND-58A failed in the open position, both trains of Chemical and Volume Control (NV) would be inoperable. This will be added to the deferral.

1(2)-MC-ND3: Table states that the basis for not quarterly stroke time testing 1(2)ND-15B, 30A (the ND heat exchanger outlet crossover block valves) as stated in the relief is that one of the ECCS safety analysis assumptions is that each train of ND can supply flow to all four cold legs, and if one of these valves failed closed during testing, then only two cold legs could be supplied by each train of ND (this would make both trains of ND inoperable). The question is why these valves are not among the valves listed in FSAR Section 6.3.2.16, "Motor-Operated Valves and Controls" as having the power disconnected at motor control centers, nor are they listed in Tech. Spec. 4.5.2 as having the power removed. The concern is that inadvertent closure of either one of these valves would violate the single failure criterion.

Response: Power cannot be removed from these valves, since at least one of them must be closed for cold leg recirc. If power was removed from one train valve, a single failure on the opposite train would disable isolation of ND to the cold legs when needed. Isolation of ND to the cold legs is needed when flow is supplied to the charging pumps from ND. This will be added to the deferral.

1(2)-MC-ND4, 5: Table states that the ND to Centrifugal Charging/NI Pumps Suction checks (1(2)ND-70,71) need to either full-stroke exercised quarterly or justification provided as to why opening 1(2)NI-136B (to stroke the valves) would render both trains of ND inoperable. Also, 1(2)ND-14 (on the ND heat exchanger 1(2)B outlet) could be used to ensure that flow from ND Pump 1(2)A could supply flow to all four NC legs.

Response: Opening either 1(2)ND-58A (to test 1(2)ND-70) or 1(2)NI-136B (to test 1(2)ND-71) would seat check valve NV-223 (FWST to charging pump suction) closed, so that if this valve were to fail in the open position, both trains of Chemical and Volume Control (NV) would be inoperable. This will be added to the deferrals.

1(2)-MC-NS1: Table states that justification needs to be provided why opening either 1(2)NS-38B or 43A (ND discharge to auxiliary spray header) renders both trains of ND inoperable. It appears that the logic is that if a design basis event occurred while testing, with a single failure on the opposite train, then both trains would be inoperable; on this basis, none of the ECCS components could be tested.

Response: With cross-connected trains of ND, flow would be diverted from both trains through a failed-open NS-38B or 43A. To isolate one train of ND, it would be necessary to manually secure closed (gag) either 1(2)ND-14 or 29, since these valves fail open on loss of air. This would be an impractical measure to perform the quarterly test. This will be added to the deferral.

1(2)-MC-NV1: Table states that while testing should not be performed if the NC Pump seals could be damaged, the amount of time that 1(2)NV-94AC, 95B (NC seal water return flow isolation valves) could remain closed before seal damage would occur should be evaluated, and justification should be added why the plant could not achieve a normal shutdown in the event the valves failed closed during testing

Response: Fail-closure of these valves would likely result in degradation of the #1 NC Pump seals, with reactor coolant flow out the seal. This would be a loss of system function, and is justification for deferral in accordance with NUREG-1482 Section 3.1.1. This will be added to the deferral.

1(2)-MC-NV2: Table states that justification of why 1(2)NV-7B (letdown isolation valve) cannot be closed needs to be provided. More information is needed on why the plant could not achieve a normal shutdown in the event that this valve failed closed during testing needs to be provided. Information is needed on the time before consequences of this closure would result, following valve failure in the closed position.

Response: This would result in a significant event (total letdown isolation), loss of Pressurizer control, and possible Unit trip (not a normal shutdown). This will be added to the deferral.

1(2)-MC-NV5: Table states that justification of why the plant could not achieve a normal shutdown in the event that 1(2)NV-244A, 245B (normal charging line isolation valves) failed closed needs to be provided. Also, information is needed on time available between

failure closed and loss of pressurizer level/unit shutdown needs to be provided, as well as discussion of the reduced charging flow available through the NC pump seal injection lines.

Response: Total loss of charging flow would be a significant event, resulting in loss of Pressurizer control, and a likely Unit trip (not a normal shutdown), as well as loss of NC pump seal flow. This will be added to the deferral.

1(2)-MC-NV8: Table states that information is needed on time available before charging pump damage would occur after failure in the closed position occurred for valves 1(2)NV-150B, 151A during testing (considering that the charging pumps are normally in full flow during plant operation).

Response: Closure of either of these valves would render both trains of NV inoperable, since on a spurious safety injection event (in which reactor coolant system pressure is increased above normal), this is a relief path back to the Volume Control Tank. This will be added to the deferral.

1(2)-MC-NV13: Table states that the basis for not testing 1(2)NV-261, 263 (pressure isolation off the chemical mixing tank and reactor makeup water storage tank) needs to be clarified (it relies on opening 1(2)NI-121A, which is closed with power removed above Mode 4 per Tech. Spec. 4.5.2).

Response: This deferral will be revised to reflect that this testing requires opening 1(2)ND-58A , which would render both trains of NV inoperable (this would backseat check valve 1NV-223, which provides suction to both trains of NV from the FWST).

1(2)-MC-RN1: Table states that justification needs to be provided why the plant could not achieve normal shutdown in the event that 1(2)RN-252B, 253A (non-essential supply to NC pump coolers) failed closed during testing (how long after failure before pump damage ?).

Response: Closure of these valves would result in a Unit trip from NC Pump motors being manually shut down due to high stator temperatures (within minutes). An abnormal (natural circulation) shutdown would be required. This will be added to the deferral.

1(2)-MC-RN2: Table states that justification needs to be provided why the plant could not achieve normal shutdown in the event that 1(2)RN-276A, 277B (non-essential return from NC pump coolers) failed closed during testing (now long after failure before pump damage ?).

Response: Closure of these valves would result in a Unit trip from NC Pump motors being manually shut down due to high stator temperatures (within minutes). An abnormal (natural circulation) shutdown would be required.

1(2)-MC-RN3: Table states that justification is needed for why the plant could not achieve a normal shutdown if 1(2)RN-42A (non-essential header isolation valve) failed closed during testing. Information is needed on the time available after failure of this valve in the closed position before damage would occur to the Steam Generator Blowdown Heat Exchanger.

Response: This deferral has been deleted (Submittal Rev. 21 for Unit 1, Rev. 16 for Unit 2), and this valve was moved to a quarterly testing frequency (this heat exchanger is not in service, and stroking this valve will not impact the operating unit).

1(2)-MC-RN4: Table states that justification is needed for why the plant could not achieve a normal shutdown if 1(2)RN-63B, 64A (non-essential header supply isolation valves) failed closed during testing. Information is needed on the time available after failure of these valves in the closed position before damage would occur to the Steam Generator Blowdown Heat Exchanger ?).

Response: This deferral has been deleted (Submittal Rev. 21 for Unit 1, Rev. 16 for Unit 2), and these valves were moved to a quarterly testing frequency (this heat exchanger is not in service, and stroking this valve will not impact the operating unit).

1(2)-MC-RV1: Table states that justification of why the plant could not achieve a normal shutdown is needed if valves 1(2)RV-32A, 33B, 76A or 77B failed closed during testing needs to be provided (how long before lower containment temperature would exceed the Tech. Spec. limit following isolation of cooling flow to the Lower Containment Ventilation Units after such a failure ?).

Response: Although the exact time depends on ambient temperature, the Tech. Spec. limit would be exceeded in minutes if cooling flow was isolated to these ventilation units by closure of one of these valves. This will be added to the deferral.

1(2)-MC-VG1: Table states that valves 1(2)VG-17, 18, 19 and 20 (in-line check valves to EDG start air banks) should either be tested quarterly or more information provided. No information is provided in the deferral regarding violation of Tech. Specs. impracticality in performing the test (deferral states that single bank of control air diesel generator start is not justified on a quarterly basis; Table states that testing with one bank is the only method available to ensure that the valves perform their safety function, and cites a case at Palo Verde in which check valve failure was detected by isolating and depressurizing one bank of starting air for test purposes).

Response: The deferral will not be revised at this time, since these valves will likely be removed from the IST program. Modifications were performed during the EOC9 refueling outages which removed the safety function of these valves, which provide control air for the diesel generators. The diesel generators will now start and run without these valves opening.

SER Part 5.10: Additional information is requested on the following deferrals:

1(2)-MC-CF1: Containment isolation testing is not addressed
1(2)-MC-CF3: Containment isolation testing is not addressed
1(2)-MC-KC5: Open testing is not discussed
1(2)-MC-KC7: Open testing is not discussed
1(2)-MC-NC3: Open testing is not discussed
1(2)-MC-NI23: Open testing is not discussed
1(2)-MC-NM1: Open testing is not discussed
1(2)-MC-FW2: Clarify partial opening during quarterly RHR pump testing
1(2)-MC-NV12: Since suction during normal operation is coming from the VCT, it is not clear where the source of highly borated water is coming from. This deferral needs clarification.

1(2)-MC-CF1 and CF3 Responses: No discussion of leak rate testing is required in the deferrals for valves (1(2)CF-26AB, 28AB, 30AB and 35AB - feedwater isolation valves), or valves (1(2)CF-126B, 127B, 128B and 129B - main feedwater startup isolation valves), since these valves are exempt from leak rate testing, as indicated in FSAR Table 6-112 (these are on leak class 1 penetrations, such that containment atmosphere would not be released during a LOCA if valve leakage did occur). These deferrals will not be revised at this time.

1(2)-MC-KC5, KC7, NC3, NI23, and NM1 Response: 10/21/94 SER Table 4.1 states that opening check valves 1(2)KC-280 (KC5), 1(2)KC-279 (KC7), 1(2)NC-259 and 260 (NC3), 1(2)NI-436 (NI23), and 1(2)NM-420, 421 (NM1) is not discussed in the respective deferrals. These valves provide thermal overpressurization protection for their respective containment penetrations, and should be full-stroke exercised during cold shutdowns. The manner in which these valves could be added to the IST program is under review, pending ongoing Code Committee discussion on the issue of thermal overpressurization checks. There is a lack of industry guidance on this issue. These valves will likely be added under the relief valve program, and disassembled/inspected at the OM-1 relief valve frequency. These deferrals will not be revised at this time.

1(2)-MC-FW2 Response: 10/21/94 SER Table 4.1 states that it appears that 1(2)FW-28 (FWST in line check valve to ND pumps suction header) can be part-stroke exercised quarterly in conjunction with ND pump testing. This valve is part-stroke exercised twice quarterly during ND pump tests, however the requirement to full-stroke at cold shutdown still exists since, in accordance with OM-10 Sect. 4.3.2.2d, this testing is practical. This will be added to the deferral.

1(2)-MC-NV12 Response: 10/21/94 SER Table 4.1 states that the deferral needs additional information as to how highly borated water would be introduced to the NC system while leak testing 1(2)NV-1046 (positive displacement pump recirc. loop check valve). To place adequate pressure on this valve, it would be necessary to use ND Pump discharge pressure, which would require opening 1(2)ND-58A. This would inject FWST water to the NC system through the charging pumps, which are also on the discharge of the ND Pumps for cold leg recirc via 1(2)ND-58A. This will be added to the deferral.

SER Part 5.11: Alternative is acceptable but an inadequate technical basis was presented for the following deferrals:

1(2)-MC-KC5	1(2)-MC-NC3	1(2)-MC-RF1	1(2)-MC-VX1
1(2)-MC-KC6	1(2)-MC-NF1	1(2)-MC-VB1	1(2)-MC-WL1
1(2)-MC-KC7	1(2)-MC-NI23	1(2)-MC-VI2	1(2)-MC-WL2
1(2)-MC-KC8	1(2)-MC-NM1	1(2)-MC-VI3	1(2)-MC-YM1
1(2)-MC-NB1	1(2)-MC-NV14	1(2)-MC-VS1	

Response for SER Part 5.11: Testing during power operation is impractical for the valves in the above deferrals since they are located inside containment, as well as the test connection needed to test them. During cold shutdowns, this testing would involve test setups inside containment which could also involve high radiation levels. These deferrals will be revised to include these justifications.

SER Part 5.12: Six systems were reviewed, with the following findings:

- Chemical and Volume Control System (NV):

(1) 1(2)NV96 should be added to the program as a Category A&C valve, since it should close to isolate penetration M256 (this is a thermal overpressurization check bypassing isolation valve 1(2)NV94AC).

Response: 1(2)NV96 is exempted from leak rate testing per FSAR Table 6-112 (this is on a Leak Class 1 penetration; leakage through this valve would not release containment atmosphere during a LOCA). A movement test closed would not provide an additional level of safety. With respect to the thermal overpressurization function in the open position, the manner in which this will be added to the IST program is under review, pending ongoing Code Committee discussion on the issue of thermal overpressurization checks. There is a lack of industry guidance on this issue. This valve will likely be added under the relief valve program, and disassembled/inspected at the frequency used for relief valves. This will be added to the deferral.

(2) 1(2)NV220 (pressure relief valve off the reciprocating charging pump discharge, should be in the program.

Response: 1(2)NV220 protects the reciprocating charging pump (RCP) discharge line. Since the RCP is not used to mitigate the consequences of an accident, this is not a safety function. Damage could only occur to this piping if it was isolated from the rest of the NV system. This valve does not need to be added to the program.

- Safety Injection System (NI):

1(2)NI54A, 65B, 76A and 88B (Cold Leg Accumulator (CLA) discharge isolation valves) should be in the program for position indication only.

Response: These valves are opened with power removed during Mode 3 of startup so that they cannot be closed inadvertently once the plant is in operation. These valves were removed from the test program since they are disabled in their safe position during plant operation (this is a procedural control). Since these valves are no longer in the scope of the IST program, remote indication verification is no longer applicable.

- Residual Heat Removal System (ND):

1(2)ND14, 29 should be fail safe tested (a quarterly stroke time test is shown in the table) (these valves fail open on loss of instrument air.

Response: These valves are fail-safe tested. None of the stroke time tested air operated valves are specified for fail-safe testing in the submittal, since a fail-safe test is inherent to stroke time testing air operated valves (there is no need to specify a separate fail safe test for AOVs in the table).

- Nuclear Service Water System (RN):

All air operated valves in this system requiring support from the Instrument Air (VI) system fail to a safe position on loss of air. The corresponding safe positions for these valves should be identified and added to the valve table.

Response: The safe position of none of the valves is included in the submittal. Listing valve safe positions in the submittal is only a recommendation in NUREG-1482 Section 2.4.2; these will not be added to the submittal at this time.

- General: a review should be performed to ensure that all safety-related valves, fail-safe testing, and position indication verification requirements are adequately identified in the valve table.

Response: Tests performed on valves and Code Class are only recommended to be considered for the valve tables per NUREG-1482 Section 2.4.2; such additions will not be made to the submittal at this time.

SER Part 5.13: Check valves included in deferrals 1(2)-MC-NV10, NV11, NV15, NI12, NI13, NI14, NI15, NI16 and NI17 are to be full flow tested at cold shutdown, which may require alignment to the FWST. If this is necessary, it is recommended that the practical difficulties of dealing with substantial increases in boron concentration from the FWST and potential for over-pressurization when in cold shutdowns relative to refueling outages (with the reactor vessel head removed) be evaluated. It may be preferable to consider a deferral request under Oma-1988 Part 10, paragraph 4.3.2.2(e).

Response to SER Part 5.13: Deferral 1(2)-MC-NV10 includes 1(2)NV-225 and 231 (centrifugal charging pump discharge checks); deferral 1(2)-MC-NV11 includes 1(2)NV-223 (FWST to charging pumps in-line check); deferral 1(2)-MC-NV15 includes 1(2)NV-143 (VCT to charging pumps in-line check); deferral 1(2)-MC-NI12 includes 1(2)NI-15, 17, 19, 21, 347, 348, 349 and 354 (checks in the lines from the charging pumps to the NC cold legs); deferral 1(2)-MC-NI13 includes 1(2)NI-12 (in-line check from the charging pumps to the NC cold legs); deferral 1(2)-MC-NI14 includes 1(2)NI-101 (in-line check from the FWST to the Safety Injection (NI) Pumps); deferral 1(2)-MC-NI15 includes 1(2)NI-116 and 148 (Safety Injection Pump discharge checks); deferral 1(2)-MC-NI16 includes 1(2)NI-124, 128, 156, 157, 159, and 160 (these valves open on flow from the Safety Injection Pumps to the NC hot legs); deferral 1(2)-MC-NI17 includes 1(2)NI-165, 167, 169 and 171 (these valves open on flow from the NI Pumps to the NC cold legs).

This appears to be a valid comment, however, the program will not be revised to defer these to refueling outage frequency at this time (cold shutdown frequency is conservative).

ATTACHMENT 2

ADDITIONAL PROGRAM CHANGES

(1) A new section (Section III) is being added to the IST Program, which applies to both Units. Section III is the Supplemental Test Program, which includes components which have been determined to be important to safety and judged to be prudent to test, but which are not explicitly under the scope of ASME Codes and Standards. This program is now referenced in the Introduction to each Submittal section. As described in the program (in Attachment 4), test methods and acceptance criteria used in testing these components should be approved by the IST program administrator. Deviations from these methods, changes to acceptance criteria, and additions or deletions from the program do not require deferrals, relief requests, or other NRC notification. Such deviations should be approved by the IST program administrator.

(2) Two deferrals are being added (1-MC-NV18 and 2-MC-NV19) are being added to enable testing the letdown orifice isolation valves 1(2)NV-35A, 457A and 458A on a cold shutdown basis (see Attachment 3). As described in the deferrals, this testing often results in reactor coolant leakage past the letdown header relief valve (1(2)NV-6) due to pressure transients causing it to lift during orifice swaps to perform stroke time testing of the above valves. Procedural precautions (such as simultaneous opening/closure of the orifice isolation valves, backpressure reduction using the downstream control valve) have been tried without success. It has been concluded that testing of these valves is impractical and nonconservative during power operation, since it results in pressure transients which have caused this relief valve leakage.

(3) Valve 1(2)NV-164 (check valve on the hydrogen inlet to the Volume Control Tank) has been deleted from the IST program. This valve was in the program because it prevents the loss of VCT inventory, serves as a Class B to non-QA 1 pressure boundary, and prevents a flow path to atmosphere in the event of a break in the hydrogen line coming into the VCT. However, the dose consequences of a VCT rupture have been reviewed, and it has been concluded that such a rupture would be well within the bounds of the licensing basis analyzed rupture of the Recycle Holdup Tank (RHT). In addition, failure of this valve would not degrade ECCS. Therefore, since this valve does not perform a safety function in mitigating an accident, shutting down the reactor, or maintaining shutdown, it has been removed from the test program. Testing of this valve will be included in the IST Supplemental Test Program (frequency to be determined).

(4) Typographical errors: 1NV-0006 was added to Unit 1 valve table, and 2BB-0003 was added to the Unit 2 valve table (and the second 2BB-0001B deleted). The valve data for these valves is already in the tables; the valve numbers were missing.

ATTACHMENT 3

SUMMARY OF IST SUBMITTAL CHANGES

Summary of Attachment 1 Changes

SER Part 5.1
The four section introductions (I.1 (Unit 1(2) Pumps), II.1 (Unit 1(2) valves) are adding information requested.

SER Part 5.2
Relief Request RR-1.3.1 is being revised (both Units) as described in Attachment 1.

SER Part 5.3
No changes at this time; under review.

SER Part 5.4
Pump Relief Requests 1.4.4, 1.4.5 and 1.4.6 (both Units) revised as described in Attachment 1, and Section I.2 (both Units) revised to show Quarterly for ND, NI Pump test frequency.

SER Part 5.5
Pump Relief Request 1.4.7 is deleted (both Units), and Section I.2 (both Units) revised to delete reference to RR-1.4.7.

SER Part 5.6
Relief Request RR-NS1 (both Units) is revised as described in Attachment 1.

SER Part 5.7
No changes required.

SER Part 5.8
Deferral MC-RN6 is deleted (both Units), and valves 1(2)RN-891 and 892 are removed from the valve tables.

SER Part 5.9
The following deferrals are revised as described in Attachment 1:

1(2)-MC-CF4	1(2)-MC-NI3	1(2)-MC-ND2	1(2)-MC-NV1	1(2)-MC-RN1
1(2)-MC-KC1	1(2)-MC-NI6	1(2)-MC-ND3	1(2)-MC-NV2	1(2)-MC-RN2
1(2)-MC-KC2	1(2)-MC-NI8	1(2)-MC-ND4	1(2)-MC-NV5	1(2)-MC-RV1
1(2)-MC-KC3	1(2)-MC-NI11	1(2)-MC-ND5	1(2)-MC-NV8	
1(2)-MC-KC4	1(2)-MC-NI20	1(2)-MC-NS1	1(2)-MC-NV13	

SER Part 5.10
Deferral 1(2)-MC-NV12 is revised as described in Attachment 1:

SER Part 5.11
The following deferrals are revised as described in Attachment 1:

1(2)-MC-KC5	1(2)-MC-NC3	1(2)-MC-RF1	1(2)-MC-VX1
1(2)-MC-KC6	1(2)-MC-NF1	1(2)-MC-VB1	1(2)-MC-WL1
1(2)-MC-KC7	1(2)-MC-NI23	1(2)-MC-VI2	1(2)-MC-WL2
1(2)-MC-KC8	1(2)-MC-NM1	1(2)-MC-VI3	1(2)-MC-YM1
1(2)-MC-NB1	1(2)-MC-NV14	1(2)-MC-VS1	

SER Part 5.12
No changes required.

SER Part 5.13
No changes required.

Summary of Attachment 2 Changes

1) The four section introductions are adding a note referencing the new Supplemental Test Program, which is being added as Part III of the Submittal.

2) Deferrals 1-MC-NV18 and 2-MC-NV19 were added.

3) Unit 1 valve table adds 1NV-006, and Unit 2 valve table adds 1BB-0003 (typographical errors: valve data was present, but valve numbers were missing).

4) Units 1 and 2 valve tables delete 1(2)NV-164 from the IST program; deferrals for these valves also deleted.

ATTACHMENT 4

SUBMITTAL CHANGES

INSTRUCTIONS

The attached pages are to be added to the McGuire IST Submittal, and superceded pages removed. The new Section III is to be added at the end of the Submittal.

Due to the several changes made to the Justification of Deferral Sections, replace the entire Section II.7 for both Units (attached).