Sargent & Lundy LLC

Don K. Schopfer
Senior Vice President
312-269-6078

March 26, 1998
Project No. 9583-100

Docket No. 50-423

Northeast Nuclear Energy Company
Millstone Nuclear Power Station, Unit No. 3
Independent Corrective Action Verification Program

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Enclosed are discrepancy reports (DRs) identified during our review activities for the ICAVP. These DRs are being distributed in accordance with the Communications Protocol, PI-MP3-01.

I have enclosed the following twelve (12) DRs for which the NU resolutions have been reviewed and accepted by S&L.

DR No. DR-MP3-0132
DR No. DR-MP3-0318
DR No. DR-MP3-0325
DR No. DR-MP3-0385
DR No. DR-MP3-0441
DR No. DR-MP3-0456
DR No. DR-MP3-0601
DR No. DR-MP3-0705
DR No. DR-MP3-0947
DR No. DR-MP3-0989
DR No. DR-MP3-1008
DR No. DR-MP3-1014

I have also enclosed three (3) DRs for which the NU resolutions have been reviewed but not accepted. S&L's comment on these resolutions have been provided.

DR No. DR-MP3-0418
DR No. DR-MP3-0616
DR No. DR-MP3-0851

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PDR ADOCK 05000423
P PDR

Please direct any questions to me at (312) 269-6078.

Yours very truly,

D. K. Schopfer
Senior Vice President and
ICAVP Manager

DKS:spr
Enclosures
Copies:
E. Imbro (1/1) Deputy Director, ICAVP Oversight
T. Concannon (1/1) Nuclear Energy Advisory Council
J. Fougere (1/1) NU
m:\icavp\corr\98\nr0326-a.doc

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-0132

Review Group: Programmatic
Review Element: Corrective Action Process
Discipline: Mechanical Design
Discrepancy Type: Corrective Action
System/Process: DGX
NRC Significance level: NA

DR RESOLUTION ACCEPTED

Potential Operability Issue
( ) Yes
(•) No

Date FAXed to NU:

Date Published: 9/22/97

Discrepancy: Corrective Actions not identified for inadequate review of PDCR process.

Description: ACR M3-97-0327 identified an inadequacy with a calculation which was updated due to the instalation of an additional filter in the diesel air starting line. The ACR identified that the calculation update did not consider the pressure drop through the after-cooler, coalescing filters and the after-filter. The discussion in the ACR also identifies that the calculation was not reviewed at the time of initiation or completion of the affected PDCR. The identified corrective action provides for redoing the calculation but does not address the programmatic issue of why reviews were not performed.

		Valid	Invalid	Review Needed	Date
Initiator:	Wrona, S. P.	☒	☐	☐	9/5/97
VT Lead:	Ryan, Thomas J	☒	☐	☐	9/12/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	9/16/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	9/17/97

Date:

INVALID:

Date: 3/20/98

RESOLUTION: Disposition

NU has concluded that the issue reported in Discrepancy Report, DR-MP3-0132, does not represent a discrepant condition. The ACR referenced in the DR was written on 1/30/97. At that time, revision 2 of RP4 was effective. Step 1.6.6 of RP4 rev. 2 states:"IF corrective actions to prevent recurrence are not required (level D significance) DOCUMENT on Form RP4-7, (only pages 3 and 4 required) and IDENTIFY corrective actions."ACR M3-97-0327 was classified as level D. Level D ACRs are treated as isolated incidents where no programmatic failure is found to exist. The DCM provides adequate guidance to ensure that the PDCR / DCR process is thorough. The event described in the ACR was an isolated error with no programmatic implications and no impact on system operability.Significance level criteria do not apply as this is not a discrepant condition.

Conclusion

NU has concluded that the issue reported in Discrepancy Report, DR-MP3-0132, does not represent a discrepant condition. The level D ACR was written and resolved while rev. 2 of RP4 was effective. Step 1.6.6 does not require action to prevent recurrence to be completed for level D ACRs because they are

not categorized as programmatic failures. Significance level criteria do not apply as this is not a discrepant condition.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Navarro, Mark	☒	☐	☐	3/20/98
VT Lead:	Ryan, Thomas J	☒	☐	☐	3/23/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:					

SL Comments:

Review Group: System
Review Element: System Design
Discipline: Electrical Design
Discrepancy Type: Calculation
System/Process: DGX
NRC Significance level: 4

DR RESOLUTION ACCEPTED

Potential Operability Issue
○ Yes
◉ No

Date FAXed to NU:

Date Published: 12/14/97

Discrepancy: Short Circuit Current at 4160 volt Buses 34A and 34C

Description: Calculation NL-051, Revision 3, CCN No. 2 determines the short circuit current at the 6900, 4160, and 480 volt swithchgear. The short circuit current is relatively high compared to the circuit breaker ratings at 4160 volt buses 34A and 34C when the emergency diesel generator is undergoing routine testing. In order to demonstrate that the switchgear at these two buses is operated within their ratings, additional calculation steps are performed to refine the output of the PSS/U (OPAL) computer program that is used to perform short circuit calculations.

Attachment IV calculates the momentary (close and latch) current for the Nodes 34A and 34C (3NNS-SWG-A and 3ENS*SWG-A) in a manner that is less conservative than allowed by the ANSI standards that define the rating and application of medium voltage circuit breakers. In the ANSI standards the momentary current is calculated as 1.6 times the E/X current. Attachment IV replaces this multiplier with a lower multiplier representing the ratio of the rms total current at 1/2 cycle divided by the symmetrical current. While this adjustment is allowed by some other standards bodies, the multiplier of 1.6 is used in the ANSI standards no matter how low the X/R ratio at the fault, as shown in the example on pages 40 and 41 of ANSI / IEEE Standard C37.010-1979. Section 4.5.4.1 of IEEE Standard 141-1993 ("Red Book") also shows the use of a fixed multiplier to account for assymetry. If supporting documentation is available to support the calculation methodology, it should be included as an attachment to the calculation.

Attachment IV recalculates the motor contribution at Node 34A based on the actual motor short circuit time constants. The values of the subtransient (locked rotor) current for each motor is taken directly from the PSS/U output for the momentary current. ANSI C37.010-1979 states that the momentary contribution for 2 pole motors rated 250 hp or less and all other motors rated 1000 hp or less is the subtransient current divided by 1.2. If PSS/U calculates the motor contribution in accordance with the ANSI standards, the decay in the motor contribution was accounted for twice in the calculation, once from the standard reactance multiplier and once by the application of the time constant. The hand calculation of the motor contribution did not remove the effect of this standard decrement factor before applying the decrement factor calculated from the short circuit time constant. Because of using two decrement factors, the decay in the motor short circuit contribution would be overstated, and the contribution of the motors to the fault current would be greater than stated in the calculation. However, an examination of the

ratio of the motor momentary and interrupting short circuit calculations suggests that PSS/U may be treating all motors as large motors. Since the motor contribution is significant in a power plant auxiliary sytstem, the method of calculating the motor contribution in PSS/U needs to be documented, especially where it differs from ANSI C37.010.

As stated in the calculation, Attachment IV applied the AC decrement factor to the impedance of the motor plus that of the feeder cable to evaluate the motor contribution at Bus 34A. The decrement factor only applies to the motor impedance. This approximation understates the motor contribution. As pointed out in the calculation text, this is compensated for by using the standard multipliers given in ANSI C37.010 for the motors on Node 34C. These standard multipliers generally overstate the motor contribution, and Nodes 34A and 34C are electrically close to each other. In this case where the calculation shows little margin in the short circuit current, a more rigorous approach should be taken.

The calculation assumes that both diesel generators are tested simultaneously, while the operating procedures only allows one diesel generator to be tested at a time. This was done to simplify the preparation of the calculation. The presence of the extra diesel generator is conservative, since it will contribute to the short circuit current. However, the relatively high impedance between the two 4160 volt NSST and RSST windings will limit this additional contribution. The amount of conservatism introduced by this simplification is not known.

Based on the above comments, there is little short circuit margin at Buses 34A and 34C. While we realize that the circuit breakers are tested to currents that are slightly higher than those given in the standards, the calculation documentation should be refined and the calculation bases documented to support the calculation's conclusions.

The calculation assumed that the bus ties of all double ended unit substations were open. However, operation with the tie closed can increase the motor contribution to the short circuit and may result in the circuit breaker rating being exceeded in some cases. This may represent a more severe case. Operation with the bus tie closed should be addressed.

In addition, the calculation does not address loading conditions that may result in higher short circuit currents than the normal operation case used in the calculation. For example assuming that the emergency diesel generator is not in operation, the short circuit current during the injection phase of a LOCA may be higher at the Class 1E buses since the motor contribution from the Class 1E motors is higher while there is no reduction in the contribution from the non-Class 1E loads. Either a number of loading conditions should be considered or the calculation should demonstrate that the loading conditions studied are the

most severe case.

There are also a few numerical errors in the calculation. These arithmetic errors do not affect the conclusion of the calculation, but should be corrected.

On page 3 of Attachment 1 for Node 322AL, the fault current after adjustment for the prefault voltage is 79% of the circuit breaker rating, not 86% as shown; at Node 323AL the fault current after adjustment for the prefault voltage is 67% of the circuit breaker rating, not 68% as shown.

On page 2 of Attachment II, the interrupting current is 95% of the circuit breaker rating for Nodes 34A and 34C, not the value of 89% shown.

On page 3 of Attachment 2, the fault current at Node 32A is 86% of the circuit breaker rating, not 87% as shown. Tthe fault current at Node 322AL is 80% of the circuit breaker rating, not 81% as shown.

		Valid	Invalid	Review Needed	Date
Initiator:	Bloethe, G. William	☒	☐	☐	11/22/97
VT Lead:	Nerl, Anthony A	☒	☐	☐	11/29/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	12/5/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	12/8/97

Date:

INVALID:

Date: 3/24/98

RESOLUTION: NU has concluded that issue # 8 in Discrepancy Report, DR-MP3-0318, has identified a condition not previously discovered by NU which required correction.

Issue # 8)

The calculated margin in CCN#2 of NL-051, Rev. 3 for Node 322AL and 323AL is 79.4% and 67.3% respectively. These values were rounded up to the next higher values of 80% and 68%. No further correction is necessary.

On page 2 of Attachment II, the interrupting current should be 95% of the circuit breaker rating for Nodes 34A and 34C, not the value of 89% shown. This is a minor error and will be corrected in the next revision of the calculation. This is a deferrable item.

CCN#1 of NL-051, Rev. 3 correctly calculated the % of short circuit breaker rating of 87% for Node 32A and 81% for Node 322AL. These values are calculated values rounded up to the nearest whole number.With the exception of the minor error, this item is not considered a discrepancy.

Condition Report (CR) M3-97-4834 was written to provide necessary corrective actions to resolve issue #8. Approved Corrective Action Plan (CAP) attached.

Since issue # 8 is administrative in nature and does not affect outcome of the calculation, NU considers this DR to be a Significance Level 4 issue.

During review of calculation NL-051, Revision 3, "Millstone Unit 3 - 6.9 kV, 4.16 kV, 480 V Short Circuit & Equipment Duty Analysis" in response to Deficiency Report DR-MP3-0318, NU identified that incorrect impedance values were used for Reserve Station Service Transformer "A" (15G-23SA) in the OPAL database. Consequently, the short circuit contribution from the grid to the 4160V busses and, the contribution made from one 4160V bus to the other is inaccurate in the short circuits analysis calculation. In addition, because Calculation NL-038 (plant voltage profile) is also generated from the OPAL database, the plant voltage profiles are also inaccurate.

The vendor test data sheet for transformer RSST A was reviewed and it was determined that the tap numbers and associated voltages in "Additional Impedance and Load Loss Measurements @ 85°C" table were inconsistent. Specifically, tap 1 denoted transformer ratios 351,038 and 357,075V:4160V, tap 3 denoted transformer ratios 338,963 and 351,038V:4160V and taps 3 & 4 denote a transformer ratio of 338,963:4160V. It is impossible to have the same tap number with different voltage ratios.

NU Protection and Controls Engineering in Berlin was contacted and the discrepancies discussed. The RSST B data sheet was reviewed and no abnormalities were present. A field walkdown was also performed to obtain nameplate data from both the RSST A & B transformers. The following taps and their associated voltages were observed:

RSST A	RSST B
Tap 1 - 351038	Tap 1 - 357075
Tap 2 - 345000	Tap 2 - 351038
Tap 3 - 338962	Tap 3 - 345000
Tap 4 - 332925	Tap 4 - 338963
Tap 5 - 326888	Tap 5 - 332925

Reviewing the RSST A & B Data Sheets, it was determined that because the RSST B transformer was tested 4 days before the RSST A transformer, the voltages for the additional secondary and tertiary tests on the RSST B data sheet were transcribed to the RSST A Data Sheet, assuming that they were the same.

The tap settings on the RSST A data sheet are correct. Tap 2 (nominal) is not shown for the additional secondary and tertiary tests since it is present on another page showing impedance values between windings using nominal tap settings. The correct tap voltages are written in next to the typed voltages on the RSST A Data Sheet.

With these corrected voltages, the primary to secondary impedance using the 351.038kV tap is 6.17%, not 6.28% used in the calculation. For the primary to tertiary impedance using the 351.038kV tap, the new value is 6.46%, not 6.39% used in the calculation.

When these new impedance's are used to calculate fault currents, the worst case maximum E/X fault current occurs on bus 34C. Assuming an infinite bus on both the primary and tertiary windings, the MAXIMUM additional fault current provided by RSST A is 120A at a voltage of 1.0 pu. This does not adversely impact equipment capabilities.

The new impedance values decrease the voltage drop from primary to secondary (34C) and only slightly increase the voltage drop from primary to tertiary (34D), thus the plant voltage profile calculation (NL-038) is also slightly changed.

Since this error has minimal impact on the results of either calculation, it can be corrected when each calculation is revised. This is a deferrable item.

Condition Report (CR) M3-97-4834 was written to provide necessary corrective actions to resolve this issue. Approved Corrective Action Plan (CAP) attached.

NU also concluded that issues 1, 2, 3, 4, 5, 6 and 7 in Discrepancy Report, DR-MP3-0318, do not represent discrepancy conditions.

Issue # 1)

Typically a multiplier of 1.6 is used to determine the total asymmetrical rms current from the symmetrical rms current if the X/R ratio of the power system at the point of the fault is unknown. This value is derived from the same formula shown in Attachment IV using an X/R ratio of 25 and in general, it is intended to envelope most power system X/R ratios at the medium/high voltage levels.

Because our X/R ratio is considerably less than 25 at the point of the fault, using a 1.6 multiplier would unjustly penalize fault current values that already have conservatism built in.

For example, only the fault current contributions from motors connected to Bus 34A have been adjusted in Attachment IV, even though motors from Bus 34C also contribute to a fault on

Bus 34A and 34C. (See No. 3) Since the X/R ratio is known, the DC offset multiplier can be calculated as shown in Attachment IV.

Based on the above, this item is not considered a discrepancy.

Issue # 2)

The PSS/U defaults to a subtransient reactance multiplier of 1.0 for all motors since it cannot distinguish between motors using a 1.0 multiplier and those that could use a 1.2 multiplier per ANSI C37.10-1979. Since all motor contribution values calculated by the PSS/U in Attachment IIB use a reactance multiplier of 1.0, the reactance is adjusted only once when the motor fault contribution is calculated in Attachment IV.Therefore, this attachment correctly calculates the motor fault contribution using short circuit time constants.

The method of calculating motor fault current contribution in fault calculations is documented in the PSSU users manual.

Based on the above, this item is not considered a discrepancy.

Issue #3)

Page 28 of 169 in CCN#2 of NL-051, Rev. 3 discusses the application of the decrement factor to both the impedance of the motor AND the cable. It is understood that the motor fault current contribution is reduced by using this method. However, there are two reasons that this is acceptable. 1) Because the cable reactance is significantly less than the motor reactance, the error introduced by applying the factor to the cable is insignificant. 2) Only the fault current contributions from motors connected to Bus 34A have been adjusted in Attachment IV even though motors from Bus 34C also contribute to a fault on Bus 34A and 34C.

Based on the above, this item is not considered a discrepancy.

Issue # 4)

The method is conservative and therefore, this item is not considered a discrepancy.

Issue # 5)

As previously stated in Item No. 3, only the fault current contributions from motors connected to Bus 34A have been adjusted in Attachment IV, even though motors from Bus 34C also contribute to a fault on Bus 34A and 34C. Thus, there is more margin than demonstrated within the calculation. Hence, the calculation has conservatively determined that the switchgear components can tolerate the calculated fault current

magnitudes.

Based on the above, this item is not considered a discrepancy.

Issue # 6

The loadcenters or substations are not double-ended. They are single units supplying busses that have cross-tying capability. Operational procedures allow two 480V load centers (transformers) to be paralleled only long enough to tie their busses and disconnect the undesired loadcenter.

Cross-tying is typically performed during power operations to mitigate bus overvoltage conditions. If the various cross-tie combinations are evaluated for short circuit, the additional fault current contribution from the cross-tied bus does not result in exceeding the MCC feeder breaker interrupt rating of 25,000A rms symmetrical or the 4160V breaker capabilities. This data can be extrapolated from Attachment IIB and Attachment IV as applicable. However, since cross-tying busses is typically not required to mitigate overvoltage done during power operations, the highest probability of fault occurrence will be in the uncross-tied condition. Hence the reason it is analyzed.

Based on the above, this item is not considered a discrepancy.

Issue # 7

Attachment IIB shows short circuit data for 4160V busses 34C & D with the plant loads fed from the NSST and with the EDGs operating. A review of the locked rotor data, clearly shows that for a fault on the 4160V busses, the total motor short circuit contribution (<4700A/train, excluding cable attenuation), from all of the 4160V connected accident mitigation pumps, is not nearly as high as the fault current contribution from the EDGs (»6200A each) when they are operating on the bus. Therefore, the scenario analyzed is the most severe.

Based on the above, this issue has been previously considered and therefore, this item is not considered a discrepancy.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Bloethe, G. William	☒	☐	☐	3/24/98
VT Lead:	Neri, Anthony A	☒	☐	☐	3/24/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/24/98				

SL Comments: NU's explanations of the issues raised in DR-MP3-0318 are acceptable. For the purpose of discussion, the issues raised in the original discrepancy report will be discussed in numerical order.

Issue 1, Calculation of the close and latch current:
NU stated that "because our X/R ratio is considerably less than 25 at the point of the fault, using a 1.6 multiplier (for accounting for dc offset) would unjustly penalize fault current values that already have conservatism built in". We understand that a future draft of ANSI Standard C37.010 will allow accounting the effect of dc offset current based on the X/R ratio. Based on this information, NU's position is acceptable.

Issue 2, Calculation of motor contribution current:
NU's explanation of the operation of the PSS/U program satisfactorily resolves our original concern about the proper calculation of the short circuit current contribution of the power plant motors. We agree that this is not a discrepancy.

Issue 3, Calculation of the decrement of the decay in motor contribution:
We agree with NU that the impedance of the motor connecting cables is much less than that of the motor. We would have preferred that this approximation not have been used because there is little margin between the calculated short circuit current and the breaker rating. However we accept NU's position based on other conservatisms in the calculation, such as Issue 4.

Issue 4, Effect of testing both diesel generators simultaneously:
We agree with NU that "the method (of treating the diesel generators as being tested simultaneously) is conservative and therefore, this item is not considered a discrepancy". This item was originally cited as an element of conservatism in the calculation that offset some other issues that were not conservative.

Issue 5, Refinement of the calculation methodology:
This issue summarizes our concerns about the original calculation. We agree with NU's position that there are conservatisms in the calculation that help to offset this concern.

Issue 6, Double ended unit substations:
NU's statement that "if the various cross-tie combinations are evaluated for short circuit, the additional fault current contribution from the cross-tied bus does not result in exceeding the MCC feeder breaker interrupt rating of 25,000 A rms symmetrical or the 4160 V breaker capabilities" addresses our concern. Based on this explanation, we agree that this is not a discrepant condition.

Issue 7, Short circuit currents during other operating conditions:
NU's explanation that "a review of the locked rotor data, clearly shows that for a fault on the 4160V busses, the total motor short circuit contribution (<4700A/train, excluding cable attenuation), from all of the 4160V connected accident mitigation pumps, is not nearly as high as the fault current contribution from the EDG's (approximately 6200A each) when they are operating on the bus" adequately addresses this issue. We agree that is not a discrepancy.

Issue 8, Miscellaneous errors:
We agree that these errors are minor in nature and that they can be corrected after start up. Therefore, we are reclassifying this discrepancy report as Level 4.

Review Group: System
Review Element: System Design
Discipline: Mechanical Design
Discrepancy Type: Component Data
System/Process: RSS
NRC Significance level: 4

DR RESOLUTION ACCEPTED

Potential Operability Issue
○ Yes
◉ No

Date FAXed to NU:

Date Published: 11/15/97

Discrepancy: Inconsistencies with FSAR Table 6.3-1 motor operated valve closure time requirements.

Description: Item 1

FSAR Table 6.3-1 requires eight inch and smaller motor operated valves to open or close within 10 seconds. Containment recirculation system motor operated valves 3RSS*MOV38A,B are four inch valves. Containment recirculation system components are described in FSAR Section 6.3 to be included in the emergency core cooling system.

Containment Recirculation System Design Basis Summary Document, (DBSD), 3DBS-NSS-003 Revision 0, Section 12.5.3.3, requires valves 3RSS*MOV38A,B to open or close within 60 seconds. The basis for the DBSD requirement is calculation NM-027 Revision 2. The calculation states that there is no specific stroke time basis for valves 3RSS*MOV38A,B, but for conservatism, 60 seconds is recommended from the ANSI N271-1976 guidelines identified in Regulatory Guide 1.141 for containment isolation.

Valve design specification 2282.050-676 through Revision 1 shows valves 3RSS*MOV38A,B to have a design open or close time of twenty seconds or less.

Item 2

FSAR Table 6.3-1 requires eight inch and smaller motor operated valves to open or close within 10 seconds. Containment recirculation system motor operated valves 3RSS*MOV8837A,B and 3RSS*MOV8838A,B are eight inch valves. Containment recirculation system components are described in FSAR Section 6.3 to be included in the emergency core cooling system.

Containment Recirculation System Design Basis Summary Document, (DBSD), 3DBS-NSS-003 Revision 0, Section 12.5.5.2, requires valves 3RSS*MOV8837A,B and 3RSS*MOV8838A,B to stroke within 60 seconds. The basis for the DBSD requirement is calculation NM-027 Revision 2. The calculation states that 60 seconds is the required stroke time from the ANSI N271-1976 guidelines identified in Regulatory Guide 1.141 for containment isolation.. The DBSD does not infer that the 60 second stroke time includes a sequence of events such as diesel loading.

Valve design specification 2282.050-676 through Revision 1 shows valves 3RSS*MOV38A,B to have a design open or close time of twenty seconds or less.

		Valid	Invalid	Review Needed	Date
Initiator:	Feingold, D. J.	☒	☐	☐	10/30/97
VT Lead:	Neri, Anthony A	☒	☐	☐	10/31/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	11/6/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	11/11/97

Date:

INVALID:

Date: 3/24/98

RESOLUTION: Disposition:

NU has concluded that DR-MP3-0325 identifies a condition previously discovered by NU which has been corrected.

NU concludes this discrepancy report DR-MP-0325 to be a significance level 4 as the requirement for the above valve stroke times have always been in calculation NM-027-ALL and that the FSAR did not correctly identify the requirements.

FSARCR 97-MP3-325 was originated on 6/30/97 as a result of the 10CRF50.54f review of the FSAR. The FSARCR was prepared to delete valve opening and closing times from Table 6.3-1 of the FSAR. The section of the FSAR did not delineate all MOV's in the ECCS and it did not encompass all the opening and closing times for MOV's in the ECCS. The stroke times identified in FSAR Table 6.3-1 were inconsistent with calculation NM-027-ALL which documents the requirements for the valves to support design basis plant response stroke times for active valves.

There is no conflict between Specification 2282.050-676 and calculation NM-027-ALL. Specification 2282.050-676 is a purchase specification and reflects original purchase requirements. Calculation NM-027-ALL reflects the current stroke time requirements for the valves to support design basis plant responses and lists both the required stroke time and specification time. Calculation NM-027-ALL was issued as revision 3 on 1/29/98 however the information regarding the above MOV stroke time is the same.

Conclusion:

NU has concluded that DR-MP3-0266 identifies a condition previously discovered by NU which has been corrected.

NU concludes this discrepancy report DR-MP-0325 to be a significance level 4 as the requirement for the above valve stroke times have always been in calculation NM-027-ALL and that the FSAR did not correctly identify the requirements.

FSARCR 97-MP3-325 was originated on 6/30/97 as a result of the 10CRF50.54f review of the FSAR. The FSARCR was prepared to delete valve opening and closing times from Table 6.3-1 of the FSAR. The section of the FSAR did not delineate all MOV's in the ECCS and it did not encompass all the opening and closing times for MOV's in the ECCS.

The stroke times identified in FSAR Table 6.3-1 were inconsistent with calculation NM-027-ALL which documents the requirements for the valves to support design basis plant response stroke times for active valves.

There is no conflict between Specification 2282.050-676 and calculation NM-027-ALL. Specification 2282.050-676 is a purchase specification and reflects original purchase requirements. Calculation NM-027-ALL reflects the current stroke time requirements for the valves to support design basis plant responses and lists both the required stroke time and specification time.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Feingold, D. J.				
VT Lead:	Neri, Anthony A	☒	☐	☐	3/24/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☒	☐	☐	3/24/98
Date:	3/24/98	☐	☐	☐	

SL Comments: Northeast Utilities' corrective action as documented in their resolution to the discrepancy report is acceptable. However, the reported discovery date by Northeast Utilities, as documented by FSARCR 97-MP3-325, is after the ICAVP "cut-off" date of 5/27/97. Therefore, Sargent & Lundy considers the subject discrepancy not to be previously discovered.

Review Group: System
Review Element: System Design
Discipline: Electrical Design
Discrepancy Type: Calculation
System/Process: DGX
NRC Significance level: 4

DR RESOLUTION ACCEPTED

Potential Operability Issue
○ Yes
◉ No

Date FAXed to NU:

Date Published: 12/8/97

Discrepancy: Calculation NL-038 (Station Services Studies- Voltage Profiles)

Description: Calculation NL-038 uses the OPAL data base to calculate the voltages in the 6900, 4160, and 480 volt portions of the electrical auxiliary system. Steady state calculations are performed using the Power Technologies' PSS/U program, while transient voltages are calculated using the PSS/E program.

Diversity factors are used to determine the loading of the 480 volt buses. The basis for some of the diversity and demand factors used in the calculation are obtained from NL-025. No reference is given for the diversity factor in Assumption 5a. The basis for the diversity factors is not explained in this calculation and additional backup material was not provided in NL-025. See Discrepancy Report DR-MP3-0690 on NL-025.

Assumption 13 determined the maximum generator voltage based on the turns ratio of the main transformer. However, the generator voltage will also be affected by the voltage drop through the transformer caused by load current. Therefore, the maximum generator voltage is a function of the generator loading and main transformer impedance as well as the main transformer turns ratio and switchyard voltage. This may have the effect of increasing the maximum generator voltage. The effect of this on the maximum voltages of the loads should be evaluated.

The calculation of motor locked rotor currents is not consistent. The per unit locked rotor current of 6.5 per unit is sometimes applied to the nameplate rating of an individual load (normal practice) and sometimes is applied to the "demand kVA". The reasoning for calculating the starting kVA differently for differing loads should be documented. The locked rotor current value of 6.5 per unit of the rated current is reasonable.

There is an implied conversion factor of 1 horsepower of rated output being equivalent of 1 kVA of electrical load input in Appendix V. This is a reasonable approximation, but it should be documented. In other cases, such as 3HCV*ACU1A, a different factor is used, which is also not documented. The value of starting kVA for 3HVC*FLT1A 3HVK-P4A, etc. is different from the other loads. The reason for the difference in starting current should also be documented. The extra 4 kVA resistive load used on page 3 of Attachment V should be documented. On page 12 of Attachment V, the kW load is computed using a power factor of 0.85 for all loads. Elsewhere in Attachment V, a power factor of 0.85 is used for motor loads and a power factor of 0.9 is used for resistive loads. This is an apparent inconsistency that should either be eliminated or the reason for the difference explained.

The PSS/E runs used to calculate transient voltages included dynamic models of various motors. Based on the data listing, there were only two rotor circuits included in the induction motor models. Fitting the parameters of an induction motor model to the actual motor characteristics requires considerable trial and error, and if two rotor circuits are used, some compromises in the modeling may be requried at certain speeds. The accuracy of the motor models used was not documented. Documentation comparing the behavior of the PSS/E models with the actual motor characteristics should be provided.

According to assumption 1 on page 7, all 480 volt bus ties are assumed open. However, operation with one of the two sources to a double ended unit substation out of service and the bus tie closed is more severe. Emergency operation with the bus tie closed should be examined for key buses. Assumption 5b states that the load on motor control centers during a LOCA is the same as during normal operation. However, since many of the loads on the Class 1E portion of the auxiliary system are required only for mitigating a LOCA, this assumption needs to be examined for the Class 1E motor control centers.

There are several minor errors in transcribing the voltage results of Computer Run 605 to the table in Attachment I:

Bus	Computer Run Value	Table Value
32Y	0.910	0.911
34C172	0.897	0.898
34C22	0.900	0.901
325TL	0.914	0.915
32R	0.917	0.918
322RL	0.916	0.917
34C92	0.899	0.900

There are several minor errors in transcribing the voltage results of Computer Run 606 to the table in Attachment I:

Bus	Computer Run Value	Table Value
32Y	0.910	0.911
34C172	0.897	0.898
34C22	0.900	0.901
325TL	0.914	0.915
32R	0.917	0.918

321RL	0.914	0.915

There is an error in transcribing the voltage data from Computer Run 614 to the table in Attachment I:

Bus	Computer Run Value	Table Value
34D82	0.8657	0.8634

There are several errors in transcribing the voltage data from Computer Run 615 to the table in Attachment I:

Bus	Computer Run Value	Table Value
34C212	0.901	0.902
32T	0.918	0.919
324TL	0.915	0.916
325TL	0.916	0.917
321RL	0.916	0.917
321UL	0.907	0.906

There are several errors in transcribing the voltage data from Computer Run 616 to the table in Attachment I:

Bus	Computer Run Value	Table Value
32Y	0.912	0.913
34C212	0.901	0.902
32T	0.918	0.919
324TL	0.915	0.916

There are several errors in transcribing the voltage data from Computer Run 619 to the table in Attachment 1:

Bus	Computer Run Value	Table Value
32Y	0.947	0.948
34C172	0.932	0.933
32R	0.953	0.954
322RL	0.952	0.953

There are several errors in transcribing the voltage data from Computer Run 620 to the table in Attachment 1:

Bus	Computer Run Value	Table Value
34C182	0.932	0.933
34C22	0.935	0.936
322TL	0.952	0.953
323TL	0.952	0.953
34C72	0.933	0.934
34C92	0.934	0.935

The terminal voltage values taken from Computer Run 614 on pages 3 and 4 of Attachment VI do not match those in the corresponding PSS/U report from Attachment I.

The data for some of the large loads on page 13 of Attachment V do not match the corresponding values on pages 14 and 20 of the same attachment.

		Valid	Invalid	Review Needed	Date
Initiator:	Bloethe, G. William	☒	☐	☐	11/18/97
VT Lead:	Neri, Anthony A	☒	☐	☐	11/19/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	12/1/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	12/4/97

Date:

INVALID:

Date: 3/24/98

RESOLUTION: Disposition:

NU has concluded that the issues # 3, 4, 5 and 7 in Discrepancy Report, DR-MP3-0385, have identified a condition not previously discovered by NU which requires correction. Condition Report (CR) M3-97-4550 was written to provide the necessary corrective actions to resolve these issues.

Issue 3) Specific locked rotor current data was used for all the large motor loads (6.9KV, 4.16KV and 480V loadcenter motors).

The 6.5 multiplier was used for the smaller motor loads which were lumped as equivalent motor in the calculations. This is a reasonable assumption. The CR M3-97-4550 was written and corrective action plan evaluated the clarity of this assumption.

Issue 4) The EDG loading is addressed by calc. NL-033. The need to maintain this portion of the calculation to demonstrate adequate voltage to the Class 1E system when supplied by the EDGs isochronously is questionable. The calculation evaluates the minimum and maximum permissible voltages when supplied

by the off-site supply. The EDG voltage regulation will be well within the extremes of the off-site supply. The CR M3-97-4550 was written and corrective action plan evaluated the potential to void this portion of the calculation.

Issue 5) The motor modeling used for the transient studies are believed to be more than adequate at this time. The CR M3-97-4550 was written and corrective action plan examined and provided additional clarification in the calculation.

Issue 7) The data was transferred as computer files into spreadsheet applications. Minor rounding up or down was observed (i.e. .932pu to .931pu). This has not impact on the calculation results. The CR M3-97-4550 was written and corrective action plan evaluated the need for calculation clarification.

Approved Corrective Action Plan (CAP) for CR M3-97-4550 (attached) will correct these issues post startup.

NU also has concluded that issues # 1,2 and 6 in Discrepancy Report, DR-MP3-0385, have identified conditions previously discovered by NU which require correction.

This DR addresses discrepancies as well as comments/observations associated with earlier versions of MP3 Load Flow and Voltage Profile Calculation No. NL-038.

This calculation was reviewed under the MP3 50.54(f) calculation assessment. Issues found during this review were addressed in CR No. M3-97-0119 and LER 97-010.

Issue 1) This issue was identified during the implementation of the corrective action plan for CR M3-97-0119. The load flow and voltage profile calculations have been superseded in CCN Nos. 7 & 10 to NL-038, Rev. 2. The diversity factor for the Class 1E MCC loading was changed to 1.0 to ensure the relay setpoints are bounding.

Issue 2) The new load flow and voltage profile calculations discussed in above address the minimum and maximum voltage conditions. This assumption was not used in these new load flow calculations.

Issue 6) This issue was addressed in the corrective action plan for CR M3-97-0119.

The new calculation were completed assuming no cross-ties were permissible in modes 1 thru 4. This become a design

constraint addressed in the implement design change DCR No. M3-97030 and associated Safety Evaluation S3-EV-97-0139. This was a previously identified issue.

Since the significant issues for this DR have been previously identified by CR M3-97-0119, the issues/comments that remain are a Significance Level 4, this DR should be reclassified as a Significance Level 4. No work is required in the field.

Conclusion:

NU has concluded that the issues # 3, 4, 5 and 7 in Discrepancy Report, DR-MP3-0385, have identified a condition not previously discovered by NU which requires correction. Condition Report (CR) M3-97-4550 was written to provide the necessary corrective actions to resolve these issues.

Approved Correct Action Plan (CAP) for CR M3-97-4550 (attached) will correct these issues post startup. NU also as concluded that issues #1, 2 and 6 in Discrepancy Report, DR-MP3-0385, have identified conditions previously discovered by NU which require correction.

Theses discrepancies as well as comments/observations associated with earlier versions of MP3 Load Flow and Voltage Profile Calculation No. NL-038, were reviewed under the MP3 50.54(f) calculation assessment and were addressed in CR M3-97-0119 and LER 97-010.

Since the significant issues for this DR have been previously identified by CR-M3-97-0119, the issues/comments that remain are a Significance Level 4, this DR should be reclassified as a Significance Level 4. No work is required in the field.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Warner, I.	☒	☐	☐	3/24/98
VT Lead:	Neri, Anthony A	☒	☐	☐	3/24/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:					
SL Comments:					

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-0441

Review Group: System
Review Element: System Design
Discipline: Mechanical Design
Discrepancy Type: Component Data
System/Process: HVX
NRC Significance level: 4

DR RESOLUTION ACCEPTED

Potential Operability Issue
(●) Yes
( ) No

Date FAXed to NU:

Date Published: 10/23/97

Discrepancy: SLCRS Filter Unit Prefilter

Description: During review of the component data for the Supplementary Leak Collection and Release System (SLCRS) filter units 3HVR*FLT3A/B discrepancies regarding the prefilters were identified.

FSAR Section 6.2.3.2 states that each filter bank includes a moisture separater, electric heater, prefilter, upstream HEPA filter, a charcoal adsorber, and downstream HEPA filter.

FSAR Section 6.5.1 states that the supplementary leak collection and release system is classified as an ESF filter system.

FSAR Table 3.2-1 states that the SLCRS filter trains are in accordance with ANSI N509. ANSI N509-1976 Section 4.1states that prefilters are required in ESF units.

FSAR Table 6.5-1 states that the SLCRS is in compliance with Regulatory Guide 1.52, Rev. 2 position C.2.a for sequence of filter elements and position C.2.c regarding prefilter design, construction, and testing. FSAR Table 1.8-1 does not take exception to these Regulatory Guide positions. Regulatory Guide 1.52, Rev. 2 position C.2.a states that the systems should consist of the following sequential components: (1) demisters, (2) prefilters (demisters may serve this function), (3) HEPA filters before the adsorbers, (4) iodine adsorbers, (5) HEPA filters after the adsorbers.

Vendor drawing 2170.430-065-022D shows the prefilters in the SLCRS filter units.

P&ID EM-148E-10 does not show the prefilter as one of the components in the SLCRS filter units. NU has stated in M3-IRF-00398 that no design document exists for the deletion of the prefilter because it was deleted during design development by SWEC in the 1982-1983 time frame. The reason was to reduce system pressure to the capability of the fans. AWOs M3-86-10989 and M3-86-10987 document the removal of the prefilters for SLCRS filter units 3HVR*FLT3A/B.

		Valid	Invalid	Review Needed	Date
Initiator:	Stout, M. D.	☒	☐	☐	10/9/97
VT Lead:	Neri, Anthony A	☒	☐	☐	10/9/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	10/14/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	10/16/97

Date:

INVALID:

INVALID:

Date: 3/24/98

RESOLUTION: First Response:

NU has concluded that the Discrepancy Report, DR-MP3-0441, has identified a condition not previously discovered by NU which requires correction.

NU considers the condition identified by DR-MP3-0441 to be a Significance Level 4. The SLCRS filter unit configuration is in compliance with Reg. Guide 1.52, Rev. 2. Therefore, the SLCRS meets its licensing and design basis. The filter unit drawings discrepancies should be categorized as Significance Level 4 discrepancies.

As noted in DR-MP3-0441, Regulatory Guide 1.52, Rev. 2 position C.2.a states that the atmosphere cleanup"systems should consist of the following sequential components: (1) demisters, (2) prefilters (demisters may serve this function), (3) HEPA filters before the adsorbers, (4) iodine adsorbers, (5) HEPA filters after the adsorbers,...." The SLCRS filter unit consists of a moisture separator, electric heater, upstream HEPA filter, a charcoal adsorber, and downstream HEPA filter. The SLCRS moisture separators (demisters) are designed constructed and tested in accordance with Reg. Guide 1.52, Rev. 2. The SLCRS moisture separators perform the function of the prefilter to remove the larger particles to prevent excessive loading of the HEPA filters. Therefore, the SLCRS filter unit configuration without the prefilter is in compliance with Reg. Guide 1.52, Rev. 2.

CR M3-97-3878 was initiated and the associated corrective action will revise SLCRS filter unit vendor drawings including drawings 2170.430-065-022 and 2170.430-065-081 to reflect the filter unit configuration. FSAR Tables 1.8-1 and 6.5-1 will be revised, as required, to include clarification to Reg. Guide 1.52, Rev. 2, section C.2 requirement for SLCRS prefilters. CR M3-97-3878 corrective actions will be completed prior to startup.

FSARCR 97-MP3-369 was initiated, on 7/28/97 to revise FSAR Section 6.2.3 to reflect the removal of the SLCRS prefilters. FSARCR 97-MP3-369 was initiated as a result of the CMP FSAR annotation process.

Second Response:

NU has concluded that the Discrepancy Report, DR-MP3-0441, has identified a condition not previously discovered by NU which requires correction.

Millstone Unit 3 is committed to follow the guidance of Regulatory Guide 1.52, Rev. 2 as stated in FSAR Sections 6.2.3, 6.5, and 9.4.3. Reg Guide 1.52, Rev. 2 does not make reference to sections of ANSI N509-1976 which provide prefilter requirements. ANSI N509-1976 prefilter requirements are not

part of the Millstone Unit 3 licensing bases. Therefore, changes to the FSAR are not required with regard addressing ANSI N509-1976 prefilter requirements.

CR M3-97-3878 corrective action plan was revised to clarify the corrective actions to include changes to the specification and vendor technical manual. NU considers the condition identified by the reissued DR-MP3-0441 to be a significance Level 4 based on the specification and vendor manual discrepancies.

Attachements:
CR M3-97-3878, CR Change Form, dated 3/6/98.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Stout, M. D.	☒	☐	☐	3/24/98
VT Lead:	Neri, Anthony A	☒	☐	☐	3/24/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/24/98				

SL Comments: Comments on First Response:

Response does not address ANSI N509-1976 requirements that prefilters are required in ESF units.

CR M3-97-3878 does not address revisions needed to specification 2170.430-065 and vendor manual.

Comments on Second Response:

DR classification changed to Level 4

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-0456

Review Group: System
Review Element: System Design
Discipline: Mechanical Design
Discrepancy Type: Licensing Document
System/Process: RSS
NRC Significance level: 4

DR RESOLUTION ACCEPTED

Potential Operability Issue
○ Yes
◉ No

Date FAXed to NU:

Date Published: 11/15/97

Discrepancy: Calculation US(B)-322

Description: The purpose of Calculation US(B)-322, Rev. 2 is to determine the maximum and minimum temperatures for the recirculation spray system (RSS) in the event of a Loss of Coolant Accident (LOCA). The calculation uses the LOCTIC computer program (SWEC proprietary) to determine the extreme temperatures of the water on the containment floor and of the recirculation spray water, following a postulated LOCA. The results are to be used for the qualification of the RSS cooler discharge valves and RSS piping.

One discrepancy was identified in Calculation US(B)-322.

The initial containment temperature and dew point used for both the hot and cold cases is 120F (Attachment 1, page 1 and Attachment 2, page 1). This differs from the initial containment temperature of 80F and dew point of 55F, identified as minimum values in Calculation US(B)-253, Rev. 4, page 18 (US(B)-322 Ref. 2).

The lower initial containment temperature and dew point should be evaluated for their impact on the cold extreme temperatures of the water on the containment floor and of the recirculation spray water, following a postulated LOCA.

		Valid	Invalid	Review Needed	Date
Initiator:	Wakeland, J. F.	☒	☐	☐	10/30/97
VT Lead:	Neri, Anthony A	☒	☐	☐	10/31/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	11/6/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	11/11/97

Date: 10/16/97

INVALID:

Date: 3/24/98

RESOLUTION: DISPOSITION:

NU has concluded that Discrepancy Report DR-MP3-0456 has identified a condition not previously discovered by NU which requires correction.

More recent calculations, US(B)-352, Rev. 0 and US(B)-353, Rev.0, have been performed to evaluate RSS piping thermal transients. Twenty-five different cases were considered in US(B)-352 which include evaluations for variations on the initial containment pressure and temperature, the service water (SW) and RWST temperatures, the structure heat transfer, break

effluent/SI water mixing, as well as single failures associated with loss of diesel-generator (DG), loss of service water (SW) and loss of MCC. Seven of the scenarios from US(B)-352 were then chosen for a more detailed analysis using the RELAP5 code in calculation US(B)-353. These scenarios envelope both the hottest and coldest piping temperatures. However, calculation US(B)-322 was not updated to reflect that the cold case was covered by a later calculation. CR-M3-0619 was written on 2-5-98 to identify this discrepancy and to develop corrective action.

Design Control Manual, Revision 6, controls calculations with new plant modifications. Additionally, extensive work is being performed to develop the Passport database with verification of as-built conditions for existing calculations defined as critical to the design basis. The updates and data entry are addressed in ARs 97029822-01, 97029822-07 and 97029822-10 for MP3. These changes to Passport provide additional information for active calculations by identifying key design bases and installed verification status. As such, the past and future design control issues with calculations are enhanced by the Passport updates.

The approved corrective action plan for CR M3-98-0619 will revise calculation US(B)-322 to refer to calculation US(B)-353. AR 98002805 will track the corrective actions to closure. Because the system meets its licensing and design basis and the DR condition represents a documentation/administrative condition envolving calculation control, NU considers this a significance level 4 discrepancy. Since this discrepancy is administrative in nature, the corrective action will be completed after startup. No field modifications are required.

CONCLUSION:

More recent calculations, US(B)-352 and US(B)-353, have been performed to evaluate RSS piping thermal transients. The scenarios in these calculations envelope both the hottest and coldest piping temperatures. Calculation US(B)-322 will be revised to take into account calculations US(B)-352 and US(B)-353.

The approved corrective action plan for CR M3-98-0619 will revise calculation US(B)-322 to refer to calculation US(B)-353. AR 98002805 will track the corrective actions to closure. Because the system meets its licensing and design basis and the DR condition represents a documentation/administrative condition envolving calculation control, NU considers this a significance level 4 discrepancy. Since this discrepancy is administrative in nature, the corrective action will be completed after startup. No field modifications are required.

Initiator: Wakelandy, D P		☒	☐	☐	3/24/98
VT Lead:	Nori, Anthony A	☒	☐	☐	3/24/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/24/98				

SL Comments: Sargent & Lundy concurs that the corrective action plan of CR M3-98-0619 will address this discrepancy.

Sargent & Lundy also concurs that the condition identified in DR-MP3-0456 is an NRC Significance Level 4 discrepancy. The 80F initial containment temperature condition is enveloped by existing stress analysis inputs. For the piping stress anayses, the minimum and maximum operating temperatures are used to determine temperature stress. The minimum temperature used for RSS risers and spray headers is 70F. Two of the twenty-five scenarios analysed in Calculation US(B)-352, Rev. 0/CCN 1 use the 80F initial containment temperature condition in determining LOCA containment temperature and pressure responses for input into RSS piping stress anayses. Thus the possibiitiy has already been explored that the greater mass of air in containment at an 80F initial temperature could increase the maximum containment pressures and, thus, increase the maximum containment temperatures.

Because the 80F initial containment temperature case has been enveloped by existing stress analysis inputs, Sargent & Lundy concludes that it will not result in any further increases in piping temperature stress. The resolution of DR-MP3-0456 may be deferred until after Unit 3 restart.

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-0601

Review Group: System
Review Element: System Design
Discipline: Electrical Design
Discrepancy Type: Calculation
System/Process: UGX
NRC Significance level: NA

DR RESOLUTION ACCEPTED

Potential Operability Issue
○ Yes
◉ No

Date FAXed to NU:

Date Published: 11/24/97

Discrepancy: Setting of Bus Tie Overcurrent Relays for Buses 34C and 34D (Calculation 418CA)

Description: This calculation determines the settings of the overcurrent relays protecting the bus tie from the Class 1E 4160 volt buses. It also verifies that these relays coordinate with the main feed relays and with the relays of downstream loads.

The setting of the bus main breaker is based on a load current of 3123 amperes. However, the circuit breaker and bus are only rated 3000 amperes and the cable between the circuit breaker and the transformer has an ampacity of less than 2900 amperes according to page 4 of Calculation NL-026. The load current used for selecting the taps of the main and tie overcurrent relays should be consistent with the ratings of the switchgear and interconnecting cable.

The maximum loading on the main breaker is about 2740 amperes and the maximum loading on the tie breaker is about 2120 amperes based on the loadings in Calculation NL-38 and adjusting the current to account for operation at the analytical limit voltage of 3671 volts. Therefore, the equipment is adequately sized and it is only necessary to change the relay setting to use the actual equipement rating as a basis.

The coordination curve on Revision 1 of page 418B1 shows that the relay used to protect the load center transformer is a General Electric type IAC-53. However, the load tabulation (page GM-60-03.413) shows this relay as a General Electric type IFC-53. The model and style number shown in Calculation 413CA as well as these documents should be revised to agree with the relays that are installed at the switchgear.

		Valid	Invalid	Review Needed	Date
Initiator:	Bloethe, G. William	☒	☐	☐	11/15/97
VT Lead:	Neri, Anthony A	☒	☐	☐	11/18/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	11/18/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	11/20/97

Date:

INVALID:

Date: 3/24/98

RESOLUTION: NU has concluded that the issues reported in Discrepancy Report, DR-MP3-0601, do not represent a discrepant condition.

The DR contained two issues associated with the MP3 Electrical Protection Specification SP-EE-269.

Issue 1- The DR questioned the basis for the 4.16kV bus relay settings. The issue was reviewed and determined not to be a discrepancy as the relays are set in accordance with the specification philosophy.

The basis for setting the phase time-overcurrent relays associated with the 4160 volt emergency bus supply and tie breakers are documented under sections 2.2.1 and 2.2.2 of Specification SP-M3-EE-269 Rev. 1. Consistent with the relay setting criteria given in SP-M3-EE-269 Rev.1, the 4160 volt bus 34C and bus 34D reserve supply breaker phase overcurrent relays (Devices 51/AR and 51/BR, type IFC-53) applied for bus and feeder phase fault backup protection. These relays are set to coordinate with the emergency bus-tie breaker relays, and the largest motor-feeder relays with minimum pickup no less than 1.15 times the maximum forced-cooled rating of the Reserve Station Service Transformer winding.

Issue 2- The DR noted an error on the overcurrent curve for the load center transformer (Curve 418B1). The Curve is correct as the device shown is the back-up overcurrent relaying for non-safety related loadcenters. The safety loadcenters use IFC53 relay which is the electrical equivalent to the IAC53 with seismic qualification. The setting for the safety loadcenter relays are bounded by the non-safety settings as the safety loadcenters are set @ tap 12, TD 7.9 and the non-safety related is set @ tap 12, TD 8.2.There are no discrepancies. Significance Level criteria do not apply here as this is not a discrepant condition.

Previously Identified by NU? ○ Yes ◉ No **Non Discrepant Condition?** ◉ Yes ○ No

Resolution Pending? ○ Yes ◉ No **Resolution Unresolved?** ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Bloethe, G. William	☒	☐	☐	3/24/98
VT Lead:	Neri, Anthony A	☒	☐	☐	3/24/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/24/98				

SL Comments: NU's setting of the overcurrent relays for the main breaker is acceptable based on their stated setting philosophy. NU's explanation of the discrepancy in the unit substation overcurrent relay curve is also acceptable.

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-0705

Review Group: System
Review Element: System Design
Discipline: Mechanical Design
Discrepancy Type: Component Data
System/Process: HVX
NRC Significance level: 4

DR RESOLUTION ACCEPTED

Potential Operability Issue
○ Yes
◉ No

Date FAXed to NU:

Date Published: 12/8/97

Discrepancy: Remote Instrumentation and Alarms for ESF Filter Systems

Description: During the review of supplementary leak collection and release system (SLCRS) filter units 3HVR*FLT3A/B and auxiliary building ventilation system (ABVS) filter units 3HVR*FLT1A/B discrepancies regarding the remote instrumentation and alarms required by ANSI N509-1976 were identified.

FSAR Table 3.2-1 states that the ESF filter trains satisfy the requirements of ANSI N509.

ANSI N509-1976 Section 4.8.2 requires that the following items be provided at a central control room instrument panel:

Air temperature upstream of adsorbers
Calibrated volumetric flow indicator and recorder
High/low airflow alarms

As shown on P&IDs EM-148A-24 and EM-148E-12:

High temperature upstream of the adsorbers is not monitored
A calibrated volumetric flow indicator and recorder is not provided
High airflow alarms are not provided

		Valid	Invalid	Review Needed	Date
Initiator:	Stout, M. D.	☒	☐	☐	11/22/97
VT Lead:	Neri, Anthony A	☒	☐	☐	11/22/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	12/1/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	12/4/97

Date:

INVALID:

Date: 3/24/98

RESOLUTION: First Response

NU has determined that the issue reported in Discrepancy Report DR-MP3-0705 does not represent a discrepant condition.

As stated in FSAR section 3.2.1, Table 3.2-1 specifies the seismic requirements for the components on that list, and that the applicable code is ANSI N509. Although this reference does not apply to the monitoring, alarming, and recording of flow rates, the subject is addressed in FSAR Table 1.8-1, "NRC Regulatory Guides" (R.G. No. 1.52, section 6.5.1.2, paragraph C.2.g, as ammended by FSAR CR 97-MP3-105), "The filter trains are not instrumented to monitor, alarm and record flow

rates in the control room. Flow through the filters are verified on a monthly basis....."

We have temperature alarms upstream and downstream of the adsorbers. The upstream alarms are shown downstream of the heaters and alarm at VP1 in the control room. The downstream alarms are shown on the downstream side of the adsorber bank but are physically located on the downstream supports for the adsorber banks. These alarms go to the fire protection console in the control room. The standard does not state that the upstream temperature alarm must be immediately upstream of the adsorber bank, so we are in full compliance on this issue.

Significance Level Criteria do not apply since this is not a discrepant condition.

Second Response:

NU has concluded that Discrepancy Report DR-MP3-0705 has identified a condition previously discovered by NU which requires correction.

A copy of FSAR CR97-MP3-105 is attached to this transmission. Note that this change to the MP3 FSAR takes certain exceptions to the instrumentation requirements of R.G. 1.52 as detailed in ANSI N509. Licensing basis / design basis not affected; NU concurs that this issue is Significance Level 4.

Attachments:FSAR CR 97-MP3-105

Previously Identified by NU? (●) Yes ( ) No Non Discrepant Condition? ( ) Yes (●) No

Resolution Pending? ( ) Yes (●) No Resolution Unresolved? ( ) Yes (●) No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Stout, M. D.	☒	☐	☐	3/24/98
VT Lead:	Neri, Anthony A	☒	☐	☐	3/24/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/24/98				

SL Comments: Comments on NU's First Response

Additional information is required to complete review of NU's response to DR-MP3-0705.

1. FSAR CR 97-MP3-105 was not identified as a pending FSAR change in the listing transmitted with M3-IRF-00141 nor was it included with NU's DR response. NU is requested to provide a copy of this FSAR CR.

2. Agree that FSAR Table 6.5-1 states that filter units are in partial compliance with Reg. Guide 1.52, Rev. 2, paragraph C.2.g and refers to FSAR Section 6.5.1.5 which states that flow indicators and recorders are not necessary. However, FSAR Table 1.8-1 which addresses compliance with Reg. Guides does

not take exception to paragraph C.2.g. FSAR Table 1.8-1 should be revised to include this exception

3. Agree that FSAR Table 3.2-1 specifies the seismic requirements for the components in the table. Per FSAR Section 3.2.5, the table provides a concise compliation of the safety classes, codes, and design classifications of the structures, systems, and components in Table 3.2-1 that are QA Category I. This implies that the ESF filter units meet the requirements of ANSI N509-1976. Therefore, exceptions to ANSI N509-1976 should be identified and justified in the FSAR.

4. The temperature switches / alarms shown downstream of the heaters are associated with the heater thermal overloads. This does not satisfy the ANSI N509 requirement to monitor the air temperature upstream of the adsorbers. This should be identified as an exception to ANSI N509-1976 requirements in the FSAR.

Comments on NU's second response.:

1) Copy of FSARCR 97-MP3-105 provided with response

2) Agree that FSARCR 97-MP3-105 revises FSAR Table 1.8-1 to include exceptions to RG 1.52 paragraph C.2.g. Based on the FSARCR date this item was previously discovered by NU.

3) After further review on the purpose of FSAR Table 3.2-1 contained in SRP 3.2.1 and 3.2.2, agree that Table 3.2-1 is not the FSAR section that should address exceptions and clarification to ANSI N509 requirements.

4) SER 6.5.1 states "the applicant has demonstrated that the design of the ESF atmosphere cleanup systems meets the guidelines of RG 1.52 and the ANSI N509 and N510 industry standards, as referenced in the SRP". SRP 6.5.1 Table 6.5-1 provides the minimum instrumentation, readout, recording, and alarm provisions for ESF atmospheric cleanup systems. The filter units do not have the temperature indication between the heater and prefilter (upstream of adsorber) required by ANSI N509 and SRP Table 6.5-1. This exception to ANSI N509 and the SRP should have been addressed in FSAR Table 1.9-2. Since the lack of temperature indication does not prevent the filter units from performing their design function and FSAR Table 1.9-2 is considered a "historical" section by NU this item is considered non-discrepant.

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-0947

Review Group: System
Review Element: System Design
Discipline: Structural Design
Discrepancy Type: Calculation
System/Process: HVX
NRC Significance level: 4

DR RESOLUTION ACCEPTED

Potential Operability Issue
○ Yes
◉ No

Date FAXed to NU:

Date Published: 1/17/98

Discrepancy: Embedded plate calculation discrepancy

Description: We have reviewed EMB. PLATE Calculation No. BK5CAX-C735.1 THRU C735.176, Rev.2.
Based on this review we have noted the following discrepancy.

This EMB. PLATE Calculation is referenced by NU Response ID M3-IRF-01015 for Duct Support calculation NP(B)-Z545G-852. The calculation does not address the embedment angle to which the duct support is attached. Therefore review can not be completed.

		Valid	Invalid	Review Needed	Date
Initiator:	Patel, A.	☒	☐	☐	1/7/98
VT Lead:	Neri, Anthony A	☒	☐	☐	1/7/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	1/12/98
IRC Chmn:	Singh, Anand K	☒	☐	☐	1/13/98

Date:

INVALID:

Date: 3/24/98

RESOLUTION: NU has concluded that Discrepancy Report, DR-MP3-0947, has identified a condition not previously discovered by NU which requires correction. This discrepancy meets the criteria specified in NRC letter B16901 and 17010. It has been screened per U3 PI-20 criteria and found to have no operability or reportability concerns and meets the Unit 3 deferral criteria. CR M3-98-0967 has been written to develop and track resolution of this item per RP-4.

Previously Identified by NU? ○ Yes ◉ No **Non Discrepant Condition?** ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No **Resolution Unresolved?** ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Klaic, N	☒	☐	☐	3/24/98
VT Lead:	Neri, Anthony A	☒	☐	☐	3/24/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	

Date: 3/24/98

S&L Comments: S&L reviewed the impact of the applied loads from calculation no. NP(B)-Z545G-852 to determine the impact on the embedded plate that was not addressed in the calculation no. BK5CAX-C735.1 through C735.176. Based on the results of this review, it has been determined that the embedded plate will not be overstressed. Therefore, this is not a startup issue.

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-0989

Review Group: System
Review Element: Modification Design
Discipline: Mechanical Design
Discrepancy Type: Licensing Document
System/Process: NEW
NRC Significance level: NA

DR RESOLUTION ACCEPTED

Potential Operability Issue
( ) Yes
(•) No

Date FAXed to NU:

Date Published: 2/9/98

Discrepancy: Conclusion in SE-EV-97-499 with respect to CR M3-97-3607 and specification 2280.000-582

Description: Safety evaluation SE-EV-97-499 is provided as part of DCR M3-97094. The conclusion in the safety evaluation with respect to CR M3-97-3607 is inconsistent with the fill times determined in calculation US(B)-270, Revisions 5 and 6.

According to page 2 of safety evaluation SE-EV-97-499, a reportability determination associated with CR M3-97-3607 concluded that removal of the "time delay" in Emergency Operating Procedure EOP 35 ES-1.3 is not reportable. A time delay had been placed in the procedure to delay the closure of the 3RSS*MOV20A/B valves before diverting flow to the emergency core cooling system pumps by opening valves 3RSS*MOV8837A/B. The purpose of the time delay was to purge air from the RSS piping during a small break loss of coolant accident without a containment depressurization actuation signal. The safety evaluation concludes that the time delay is not necessary because there is an inherent time delay of about 30 seconds in which valves 3RSS*MOV20A/B remain open before valves 3RSS*MOV8837A/B open. However, calculation US(B)-270, Revisions 5 and 6, show that more than 30 seconds is required to fill the RSS piping through the RSS heat exchangers, considering the maximum fill time. Revisions 5 and 6 calculate the fill times for the RSS before and after installation of the flow restriction orifices via DCR M3-97045, respectively.

		Valid	Invalid	Review Needed	Date
Initiator:	Feingold, D. J.	☒	☐	☐	2/3/98
VT Lead:	Neri, Anthony A	☒	☐	☐	2/3/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	2/4/98
IRC Chmn:	Singh, Anand K	☒	☐	☐	2/5/98

Date:

INVALID:

Date: 3/23/98

RESOLUTION: Disposition:

NU has concluded that the issue reported in Discrepancy Report, DR-MP3-0989, does not represent a discrepant condition. Unit 3 Design Engineering prepared Safety Evaluation S3-EV-97-0499 for the RSS Loop Seal Detection modification and to address the removal of the "time delay" note from Emergency Operating Procedure EOP 35 ES-1.3.

Significance Level criteria does not apply here as this is not a discrepant condition.

The fill time referenced in the safety evaluation is based on a partial fill of the RSS system piping (i.e., the RSS pump discharge to valves 3RSS*MOV20A/B and 3RSS*MOV8837A/B), and is supported in the Reportability Determination for CR #M3-97-3607(attached). The fill times utilized in calculation US(B)-270 Rev. 5 & 6 determine the time to fill the entire RSS system piping (i.e., between the RSS pump discharge and the RSS spray headers). The difference in the calculated fill times between these documents is due to the difference in the amount of the RSS system being filled. Therefore, there is no discrepancy between the referenced fill times in each of these documents and no corrective action is required.

Conclusion:

NU has concluded that the issue reported in Discrepancy Report, DR-MP3-0989, does not represent a discrepant condition. Unit 3 Design Engineering prepared Safety Evaluation S3-EV-97-0499 for the RSS Loop Seal Detection modification and to address the removal of the "time delay" note from Emergency Operating Procedure EOP 35 ES-1.3.

Significance Level criteria does not apply here as this is not a discrepant condition.

The fill time referenced in the safety evaluation is based on a partial fill of the RSS system piping (i.e., the RSS pump discharge to valves 3RSS*MOV20A/B and 3RSS*MOV8837A/B), and is supported in the Reportability Determination for CR #M3-97-3607(attached). The fill times utilized in calculation US(B)-270 Rev. 5 & 6 determine the time to fill the entire RSS system piping (i.e., between the RSS pump discharge and the RSS spray headers). The difference in the calculated fill times between these documents is due to the difference in the amount of the RSS system being filled. Therefore, there is no discrepancy between the referenced fill times in each of these documents and no corrective action is required.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ◉ Yes ○ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Feingold, D. J.	☒	☐	☐	3/24/98
VT Lead:	Neri, Anthony A	☒	☐	☐	3/24/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/23/98				

SL Comments: Sargent & Lundy concurs that the Reportability Determination for CR #M3-97-3607 demonstrates that there is adequate margin in the RSS fill/vent time to support the ECCS recirulation mode following a postulated LOCA without CDA. This margin existed

under past system configurations and exists under the current, post-M3-97045 configuration. The margin does not depend on a 30-second time delay step in the emergency operating procedures. Therefore Sargent & Lundy agrees that the issue raised in DR-MP3-0989 is not a discrepant condition.

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-1008

Review Group: Operations & Maintenance and Testing
Review Element: Change Process
Discipline: Other
Discrepancy Type: O & M & T Implementation
System/Process: RSS
NRC Significance level: NA

DR RESOLUTION ACCEPTED

Potential Operability Issue
○ Yes
◉ No

Date FAXed to NU:

Date Published: 2/5/98

Discrepancy: Inconsistent and incomplete documentation of PDCR for Containment Penetration

Description: PCDR 3-94-162 installed test ring flanges on the four RSS suction pipes located in the floor of the Containment Structure Sump. Three discrepant conditions were identified.

1. The description of the change included the statement that "Following the test, the blind flange will be removed and foreign material exclusion (FME) bolts will be installed in the bolt holes." No documentation was provided that could be used to verify this requirement has been proceduralized or implemented.

2. DCM Form B Rev. 0 Item 16 I., a copy of this form is included in the PDCR package, identified the following procedures as needing to be revised to complete the PDCR.
SP3612B.4 and OPS Forms -80, -81, -82, & -83
SP3612A.1 and OPS Form -1
OPS Forms 3306-1 & -2
No documentation was provided that could be used to verify SP3612A.1 and OPS Form-1, CONTAINMENT INSPECTION, were revised to inspect the Containment Structure Sump as part of the Containment Inspection and verify the blind flanges were removed and the FME bolts installed.

No documentation was provided that could be used to verify OPS Forms 3306-1 & -2, VALVE LINE UP FOR CONTAINMENT RECIRCULATION SPRAY SYSTEM (TRAIN A & B), were revised to reflect the new flanges.

OPS Forms 3612B.4-80, -81, -82, & -83 were revised to indicate that "AWO to MNTC-blank flange to be installed in the CTMT sump". No documentation was provided that could be used to verify an AWO to maintenance or some other method of controlling the removal of the blind flange after the local leak rate test (LLRT) was generated.

3. Memo MP3-DE-2515 dated December 22, 1994 Subject: Resolution of PORC Comment on PDCR MP3-94-162., a copy of this memo is included in the PDCR package, includes a comment on the subject PDCR that was raised during PORC meeting 3-94-206. The comment ". . .involves confirmation that blind flanges installed during LLRT testing are later removed. The LLRT test procedure SP3612B.4 addressed removal of equipment installed for testing. However, as an added measure, this confirmation could also be added to the containment close out list, containment sump cover installation process, or other appropriate vehicles." No documentation was provided that could be use to verify PORC's comments were incorporated,

proceduralized, or dispositioned.

		Valid	Invalid	Review Needed	Date
Initiator:	Spear, R.	☒	☐	☐	1/27/98
VT Lead:	Bass, Ken	☒	☐	☐	1/28/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	1/29/98
IRC Chmn:	Singh, Anand K	☒	☐	☐	2/2/98

Date:

INVALID:

Date: 3/25/98

RESOLUTION: Disposition:
NU has concluded that the issue reported in Discrepancy Report, DR-MP3-1008, does not represent a discrepant condition.

1. After the completion of PDCR MP3-94-162, an NRC Investigation Team raised questions about the presence of the thread protection bolts increasing the possibility of introducing foreign material into the containment sump. EWA M3-96056 and DCN DM3-S-0336-96 were written and completed to remove the bolts. OPS Form 3612A.1-2, "Containment Sump Close-Out", was revised to verify thread protection bolts have been removed at containment close-out.

The LLRT is controlled by SP3612B.4. The specific penetrations in the RSS Sumps are controlled by OPS Forms 3612B.4-80,81,82,83. On page 5 of 5 of the preceding OPS forms, "Type C LLRT Valve Lineup and Restoration", there is a sign-off requirement that the blank flanges be installed and removed at the beginning and end of the LLRT, respectively. Accompanying the signature is a note that there be an AWO to MNTC for this to be performed. The AWO outlines the installation/removal of the blank flange.

2. For the listed procedures and OPS Forms, the following determinations were made and documented:
□SP3612A.1□□- no changes required per memo MP-3-O-912
□3606-1□□□- no changes required per memo MP-3-O-912
□3606-2□□□- no changes required per memo MP-3-O-912
□3612A.1-2□□- updated for storing test flanges in containment per memo MP3-DE-95-

122

□3612A.1-1 - no changes required per memo MP3-DE-95-116
3612B.4-80□□- updated to read AWO to MNTC in notes and signoff
□3612B.4-81□□- updated to read AWO to MNTC in notes and signoff
□3612B.4-82□□- updated to read AWO to MNTC in notes and signoff
□3612B.4-83□□- updated to read AWO to MNTC in notes and signoff

3. Memo MP3-DE-95-116 dated May 21, 1995 from S.V. Dumas

to T. Kirkpatrick, "Ops Procedure/Forms Update - RSS Containment Sump Flanges", makes specific reference to memo MP3-DE-94-2515. The memo contains proposed changes to listed procedures and Ops Forms and, in certain instances, why the changes are listed. Two changes listed are referenced to the PORC comments. Memo MP-3-O-912 is the response memo from Operations for all specific changes accomplished.

Significance Level criteria do not apply here as this is not a discrepant condition.

Conclusion:
NU has concluded that the issue reported in Discrepancy Report, DR-MP3-1008, does not represent a discrepant condition. The LLRT is controlled by SP3612B.4 and provides for the documentation which represents the resolution to the procedure changes and flange accountability as shown in the attached documents.
Significance Level criteria do not apply here as this is not a discrepant condition.

Previously Identified by NU? ○ Yes ◉ No **Non Discrepant Condition?** ◉ Yes ○ No

Resolution Pending? ○ Yes ◉ No **Resolution Unresolved?** ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Spear, R.	☒	☐	☐	3/25/98
VT Lead:	Bass, Ken	☒	☐	☐	3/25/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/25/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/25/98				

SL Comments:

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-1014

Review Group: System
Review Element: System Design
Discipline: I & C Design
Discrepancy Type: Calculation
System/Process: NEW
NRC Significance level: 4

DR RESOLUTION ACCEPTED

Potential Operability Issue
(●) Yes
( ) No

Date FAXed to NU:

Date Published: 2/7/98

Discrepancy: Incorrect methodology and use of inputs for calculation SP-3RSS-3, Rev. 1

Description: The stated purpose of Revision 1 of calculation SP-3RSS-3 is to determine the new low pressure alarm setpoints for pressure switches 3RSS-PS43A/B/C/D based upon the implementation of design modification DCR M3-97045 which reduces the flow rate through the RSS pumps by installing a flow reducing orifice plate in the discharge line of each pump. SP-3RSS-3 Rev. 1 incorrectly calculates the probable errors (uncertainties) associated with the pressure sensing instrument loop configuration; therefore, the Total System Normal Channel Uncertainty is incorrect.

The stated premise that the calculation "demonstrates that the overall loop inaccuracies will not exceed 15% of the discharge pressure" is based upon a non-conservative assumption about the amount of air that may become trapped in each pressure transmitter sense line when the respective RSS pumps are started. A calculation that considers the minimum and maximum possible air entrapment demonstrates that for a desired process setpoint of 79.6 psig (dec), the pressure "seen" by the transmitter will lie between 65.6 psig (vertical portion of sense line full of water) and 79.6 psig (vertical portion of sense line void of water). And, including the probable channel instrumentation errors, the actual process pressure will lie between 59.1 and 86.1 psig when the low pressure alarm is actuated. A pump discharge pressure of 59.1 psig is 37% below the design pump discharge pressure which is greater than the 15% design value. An alternative means to reduce this error may be necessary to achieve the design intent.

		Valid	Invalid	Review Needed	Date
Initiator:	Reed,William.	☒	☐	☐	2/2/98
VT Lead:	Neri, Anthony A	☒	☐	☐	2/2/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	2/2/98
IRC Chmn:	Singh, Anand K	☒	☐	☐	2/3/98

Date:

INVALID:

Date: 3/23/98

RESOLUTION: Disposition:

NU has concluded that Discrepancy Report, DR-MP3-1014, has identified a condition not previously discovered by NU which requires correction. The issue raised by this DR is that calculation SP-3RSS-3 incorrectly calculates the probable errors

associated with the amount of air that may become trapped in each pressure transmitter sense line when the respective RSS pumps are started, thereby exceeding the 15 % overall loop inaccuracy as stated in the purpose of this calculation.

To compensate for the elevation difference between transmitters and the discharge pipe, the transmitter zero adjustment is suppressed by 14 psig. This accounts for the head correction when the sensing lines are filled with water and void of air. The concern arises from the fact that the RSS system is a normally dry system that causes the pressure transmitter's impulse lines to drain and when the system starts air in the sensing lines is then trapped and compressed replacing the expected water column. This results in a sufficient shift of the setpoint due to the reduction in the required head correction for these transmitters thereby, causing the pressure switches to actuate at a lower system pressure. The subject calculation considered this effect as a bias term that was added to the random errors to determine the upper and lower limits of the instrument accuracy range to ensure that the overall loop inaccuracies do not exceed 15%.

During the review of the subject calculation it was determined that the calculation contained several discrepancies. CR M3-98-0710 was initiated to document these discrepancies associated with the method used to determine the amount of trapped air in the sensing lines and the application of the bias term. The following provides an alternative method of determining the effects of the trapped air on the setpoint uncertainty calculation. This alternative method determined that the overall loop inaccuracy was 11.95 % which is less than 15% therefore, the objective of calculation 12179-SP-3RSS-3, Rev. 1 has been meet.

Tubing OD = 1/2 From Drawing No. 12179-EK-526016
1/2 - ICN - 9 instrument tubing has a wall thickness of 0.065"
From MS12179-424E
Tubing ID = 0.5 - 2 * 0.065 = 0.370 inches
d2 = (0.5 - 2 * 0.065)^2 = 0.1369 inches^2
Pi / 4 = 0.7854
Volume from Tee to 3RSS-PT45D (Values Obtained from Drawing No. 12179-EK-526016)

Feet	Inches	Elev Change(a)	adjacent(b)	Total Length
*** 1	4	0.625	16.000	16.012
	6.5	6.500		6.500
1	3.25	15.250		15.250

*** x = (a^2 + b^2)^0.5 used to determine the hypotenuse length (graphic included on hardcopy)

Elevation change from Tee to 3RSS-PT45D = 22.3750 inches

Tube Length from Tee to 3RSS-PT45D = 37.762 inches

VT-PT45D = (Pi / 4) * d^2 * h = 0.7854 * 0.1369 inches^2 * 37.762 inches = 4.060 inches^3

Volume from Tee to 3RSS-PT25D (Values Obtained from Drawing No. 12179-EK-526016)

Feet	Inches	Elev Change	adjacent	Total Length
	7.4375	7.438		7.438
1	3.25	15.250		15.250

Elevation change from Tee to 3RSS-PT25D = 22.688 inches

Tube Length from Tee to 3RSS-PT25D = 22.688 inches

VT-PT25D = (Pi / 4) * d^2 * h = 0.7854 * 0.1369 inches^2 * 22.688 inches = 2.439 inches^3

Volume from Tee to 3RSS-PT25D and 3RSS-PT45D

VAbove-Tee = VT-PT45D + VT-PT25D = 4.060 inches^3 + 2.439 inches^3 = 6.499 inches^3

Total Tubing Volume:

Process tap to Common Tee:

Feet	Inches	Elev Change(a)	adjacent(b)	Total Length
2	7.25	0.000		31.250
1	8.50	20.500		20.500
	3.00	3.000		3.000
*** 2	7.75	2.000	31.750	31.813
1		12.000		12.000
3	2.875	38.875		38.875
3	10.25	46.250		46.250
4	1.875	49.875		49.875
4		48.000		48.000
4	0.25	48.250		48.250
	6.75	6.750		6.750
*** 4	9.50	11.875	57.500	58.713
1	4.00	16.000		16.000
3	8.975	44.975		44.975
	5.8125	5.813		5.813
***	4.125	4.000	4.125	5.746
	6.00	6.000		6.000

Length from Process Tap to Tee = 364.163 inches

From Connecting Tee to 3RSS-PT45D

Feet	Inches	Elev Change(a)	adjacent(b)	Total Length
* 1	4.0	0.625	16.000	16.012
*** *	6.5	6.500		6.500
* 1	3.25	15.250		15.250

From Connecting Tee to 3RSS*PT25D

Feet	Inches	Elev Change(a)	adjacent(b)	Total Length
	7.4375	7.438		7.438
1	3.25	15.250		15.250

* Not included in the Elev. Change since it is paralleled with

3RSS*PT25D

*** x = (a^2 + b^2)^0.5 used to determine the hypotenuse length (graphic included on hardcopy)

Total Elevation Change:

ht = 386.85 Note: There is a 3/4 inch difference between using the elevation on the EK drawing vs the
elevation changes when the rise of instrument tubing is added up.

Vsensing Line = (Pi / 4) * d^2 * Total Length
= 0.7854 * 0.1369 inches^2 * 534.259inches = 57.444 inches^3

P1 * Vsensing Line = P2 * V2
P1 = 14.7 PSI Assume tubing is dry and at 1 ATM pressure when the system is drained.
Vsensing Line = 57.444 inches^3 Total volume of the sensing line when dry
P2 = 79.6 PSI The desired Process Alarm Setpoint
V2 = Unknown The sensing line volume at the desired setpoint
V2 = (P1 * Vsensing Line) / P2 = (14.7 PSI * 57.444 inches^3) / 79.6 PSI = 10.608 inches^3

Common tubing (from process tap to Tee) Volume:

Vc = V2 - VAbove-Tee = 10.608 inches^3 - 6.499 inches^3 = 4.109 inches^3

Height of air column in the common sensing line:

h = Vc / ((Pi / 4) * d^2) = 4.109 inches^3 / (0.7854 * 0.1369 inches^2) = 38.219 inches

The air column extends 38.219 inches below the Tee at the desired setpoint

Water column at desired setpoint with a column of air:

Wc = hProcess-Tap-to-Tee - hair-column = 364.163 inches - 38.219 inches = 325.944 inches

Head correction when both 3RSS-PT45D and 3RSS*PT25D have been vented:

Headvented = ht / 27.7 inches/PSIG = 386.85 inches / 27.7 inches/PSIG = 13.966 PSIG
Headvented = 14 PSIG (approx.)
Note: Calibration of the transmitter zero shifts to compensate for the head
correction by 14 PSIG therefore, this value will be used to determine the error.

Head correction when 3RSS-PT45D and 3RSS*PT25D has not

been vented:

Headnot-vented = ht / 27.7 inches/PSIG = 325.944 inches / 27.7 inches/PSIG = 11.767 PSIG

Error due to Water Column:

Error = Wc-desired - Wc-acutal = 386.850 inches - 325.944 inches = 60.906 inches
Error = Headvented - Headnot-vented = 14 PSIG - 11.767 PSIG = 2.233 PSIG In terms of PSI
Error = 2.233 PSI / 300 PSI = 0.7443 % In terms of % span

Total loop error is given by:
Note: Assumption that the uncertainties that are not associated with the trapped air in sensing lines are correct.

[((0.477)^2 + ((0.3)^2 + ((0.49)^2 + ((2.3)^2 + ((0.087)^2 + ((0.194)2]^0.5 Term is obtained from Calculation 12179-SP-3RSS-3 Rev. 1.

Positive uncertainties = +[((0.477)^2 + ((0.3)^2 + ((0.49)^2 + ((2.3)^2 + ((0.087)^2 + ((0.194)2]^0.5 + (0.7443 %)
= + 3.172 %
= + 9.52 PSIG

Negative uncertainties = -[((0.477)^2 + ((0.3)^2 + ((0.49)^2 + ((2.3)^2 + ((0.087)^2 + ((0.194)2]^0.5
= - 2.428 %
= - 7.28 PSIG

Desired Process Alarm Setpoint = 79.6 PSIG
Upper Limit of Instrument Accuracy Range = 79.6 PSIG + 9.515 PSIG = 89.12 PSIG
Lower Limit of Instrument Accuracy Range = 79.6 PSIG - 7.28 PSIG = 72.32 PSIG
Maximum % Loop Error = (9.515 PSIG / 79.6 PSIG) * 100 = 11.95 %

The overall loop inaccuracies determine to be 11.95 % which is less then 15% therefore, the conclusion of calculation 12179-SP-3RSS-3 Rev 1 has been meet. The approved correction action plan for CR M3-98-710 will revise calculation SP-3RSS-3 post startup. Based on the conclusion of calculation SP-3RSS-3 remaining valid, NU considers this to be a Significance Level 4 issue.

Conclusion:

NU has concluded that Discrepancy Report, DR-MP3-1014, has identified a condition not previously discovered by NU which requires correction. The approved corrective action plan for CR M3-98-0710 will correct the methodology used for determining the amount of trapped air in the sensing lines and the application of the bias term. The stated premise and conclusion for calculation 12179-SP-3RSS-3, Rev. 1 remains unchanged and

the overall loop inaccuracies do not exceed 15% of the discharge pressure for the desired setpoint, NU has concluded that Discrepancy Report, DR-MP3-1014, is not a Significance Level 3 Discrepancy and should be downgraded to Significance Level 4.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Reed,William.	☒	☐	☐	3/23/98
VT Lead:	Neri, Anthony A	☒	☐	☐	3/23/98
VT Mgr:	Schopfer, Don K	☒	☐	☐	3/23/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/23/98				

SL Comments: S&L finds NU's resolution acceptable. In light of the analysis provided by NU in their response, this DR should be downgraded to a Significance Level 4.

Review Group: System
Review Element: System Design
Discipline: Mechanical Design
Discrepancy Type: Calculation
System/Process: SWP
NRC Significance level: 4

DR RESOLUTION REJECTED

Potential Operability Issue
( ) Yes
(•) No

Date FAXed to NU:

Date Published: 1/17/98

Discrepancy: The minimum wall calculations were reviewed and several discrepancies were found.

Description: Serveral calculations were found to be using allowable stress values that did not coincide with the referenced ASME code for the specified piping material and at the given temperatures. The following calculations used different allowables that resulted in non-conservative minimum wall thicknesses to be determined.

Calculation MW(B)-91 rev. NA, used an allowable stress value of 9500 instead of 8740 as listed in ASME VIII - Div. 1, Table UNF-23.2 Winter 72 Addendum, for temperature of 95°F.

Calculation MW(B)-92 rev. NA, used an allowable stress value of 10000 instead of 8530 as listed in ASME VIII 1971 - Div. 1, Table UNF-23.2 Winter 73 Addendum, at a temperature of 95°F.

Calculation MW(B)-93 rev. NA, used an allowable stress value of 8706 instead of 7440 as listed in ASME VIII - Div. 1, Table UNF-23.2 Winter 73 Addendum, for temperature of 95°F.

Calculation MW(B)-94 rev. NA, used an allowable stress value of 8706 instead of 7440 as listed in ASME VIII - Div. 1, Table UNF-23.2 Winter 73 Addendum, for temperature of 95°F.

Calculation MW(B)-95 rev. NA, used an allowable stress value of 8706 instead of 7440 as listed in ASME VIII - Div. 1, Table UNF-23.2 Winter 73 Addendum, for temperature of 95°F.

Calculation MW(B)-96 rev. NA, used an allowable stress value of 8706 instead of 7440 as listed in ASME VIII - Div. 1, Table UNF-23.2 Winter 73 Addendum, for temperature of 95°F.

Calculation MW(B)-97 rev. NA, used an allowable stress value of 8706 instead of 7440 as listed in ASME VIII - Div. 1, Table UNF-23.2 Winter 73 Addendum, for temperature of 95°F.

Several calculations were found to be using a weld joint efficiency different than that specified for the given material as follows:

Calculation MW(F)-337, Rev. NA used a factor of 1.0 instead of 0.85 as referenced in ASME VIII 1971 - Div. 1, Table UNF-23.2 note 5, for material SB-467.
Calculation MW(F)-339, Rev. NA used a factor of 1.0 instead of 0.85 as referenced in ASME VIII 1971 - Div. 1, Table UNF-23.2 note 5, for material SB-467.

Several calculations had design inputs that could not be verified due to either the documents being referenced were superseded, labeled as 'for information only', unretrievable documents (not in NU system), or the incorrect reference for the given design inputs. This affected the following documents:

MW(B)-83, rev. NA	MW(B)-84, rev. NA
MW(B)-91, rev. NA	MW(B)-92, rev.NA
MW(B)-93, rev. NA	MW(B)-94, rev. NA
MW(B)-95, rev. NA	MW(B)-96, rev. NA
MW(B)-97, rev. NA	MW(B)-98, rev. 1
MW(B)-99, rev. NA	MW(B)-100, rev. NA
MW(B)-101, rev. NA	MW(B)-106, rev. NA
MW(B)-107, rev. NA	MW(B)-133, rev. NA
MW(B)-140, rev. NA	MW(B)-168, rev. NA
MW(F)-7, rev. NA	MW(F)-60, rev. NA
MW(F)-69, rev. NA	MW(F)-80, rev. 1
MW(F)-81, rev. 1	MW(F)-168, rev. NA
MW(F)-178, rev. NA	MW(F)-336, rev. NA
MW(F)-337, rev. NA	MW(F)-338, rev. NA
MW(F)-339, rev. NA	MW(F)-342, rev. NA
MW(F)-346, rev. NA	MW(F)-347, rev. NA
MW(F)-353, rev. NA	MW(F)-52, rev. NA

It was noted in calculations MW(B)-106, rev. NA and MW(B)-107, rev. NA that an incorrect pipe material was noted as SA515 gr. 70 instead of SA516 gr. 70. Calculation MW(F)-342 rev. NA notes the material as SA466 and should be SB466 per piping class 158.

The title for calculation MW(B)-168, rev. NA stated that it is for a 'T' fitting, which per pipe class 158 should be either material SB-61 or SB-62 instead of SB-466 that was noted. This also led to an incorrect allowable stress to be used.

In calculation MW(F)-178, rev. NA the pipe material is listed as SB467 or SB466 No. 766. The allowable stress value used indicates that SB467 No. 706 is used (S=7400). If this is the material that is used, the weld joint efficiency should be 0.85 instead of 0.80. If SB466 No. 706 is the material used, then the allowable stress is conservative.

Calculation MW(F)-346 rev. NA notes the nominal pipe thickness as 0.095" (for 3" pipe). This calculation is determining the minimum wall thickness for a 2" pipe and should be comparing the calculated minimum wall thickness to 0.083" instead of 0.095".

Calculation MW(F)-353 rev. NA does not state the nominal pipe size that is applicable to this calculation. From the OD stated, it

can be determined that the pipe size is 2", however, the nominal thickness noted is for a 2.5" special schedule pipe. The information as to the appropriate size pipe this calculation applies to is conflicting.

Due to the numerous discrepencies in both the conservative and non-conservative directions the actual effect to each of the minimum wall calculations can't be determined.

		Valid	Invalid	Review Needed	Date
Initiator:	Dionne, B. J.	☒	☐	☐	12/18/97
VT Lead:	Neri, Anthony A	☒	☐	☐	12/19/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	12/23/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	1/13/98

Date:

INVALID:

Date: 3/23/98

RESOLUTION: Disposition:
NU has concluded that the issue reported in items 1, 2, 4, 6, and 7 of Discrepancy Report, DR-MP3-0418, have identified conditions not previously discovered by NU which require correction. The approved corrective action plan for CR M3-98-0437 (attached) will facilitate the revision of the applicable calculations as follows:

1) Revise calculations MW(B)-91, 92, 93, 94, 95, 96, and 97 to delineate the correct stress allowable.

2) Revise calculations MW(B)-337 and 339 to address the correct stress intensification factor.

4, 6 & 7) Revise the affected calculations to correct the specified discrepancies.

The affected calculations were reviewed and it was determined that the conclusions based upon the results will not be affected by the revisions to these calcs. As such there is no effect on the license or design basis, therefore NU has concluded this to be a Significance Level 4 issue.

NU has concluded that the issue reported in items 3, 5 and 8 of Discrepancy Report, DR-MP3-0418, does not represent a discrepant condition.

3) For the list of 34 calcs which reference superseded or info only documents, the auditor must be referring to the FSK's which is reference number 4 on the generic NEAM 41 form. The FSK's were the original design basis documents for pipe size and pipe class, but they were replaced by the P&ID's and the Line Designation Table. Since these calcs were most likely done to accept a wall thickness less than that specified in pipe class 158, for a specific section of piping, the FSK reference was valid at that time and is appropriate. Any other discrepancies could not

be determined.

5) The Subject/Title of calculation MW(B)-168, "3SWP-003-362-3 (Fitting T) Minimum Wall Calculation Line/Spool No." does not indicate that the purpose of the calculation was to evaluate the minimum wall thickness requirements for a 3" tee. All the information referenced and documented on this now historical calculation indicates that it is for the 3" pipe (stress, wall thickness, schedule, etc.), not the tee. The reference to the "Fitting T", in the calculation title was to help locate the minimum wall area of the pipe, 3SWP-003-362-3 (also in the calculation title) to be evaluated. Therefore, the correct material, SB-466 and the correct stress allowable was used for this calculation.

8) A review of the referenced piping specification, 2280.000-582, page 180, Table "Special" (attached), determined that a wall thickness for both 2" and 2-1/2" is 0.083.

Significance Level criteria do not apply here as this is not a discrepant condition.

Conclusion:

NU has concluded that the issue reported in items 1, 2, 4, 6, and 7 of Discrepancy Report, DR-MP3-0418, have identified conditions not previously discovered by NU which require correction. The approved corrective action plan for CR M3-98-0437 (attached) will revise the applicable calculations to delineate the correct stress allowable, address the correct stress intensification factor, and address other discrepancies as required post startup. The affected calculations were reviewed and it was determined that the conclusions based upon the results will not be affected by the revisions to these calcs. As such there is no effect on the license or design basis, therefore NU has concluded this to be a Significance Level 4 issue.

NU has concluded that the issues reported in items 3, 5 and 8 of Discrepancy Report, DR-MP3-0418, do not represent discrepant conditions.

3. The FSK's were the original design basis docu ·its for pipe size and pipe class. Using the FSK's as a reference was valid at that time and is appropriate.

5. The Subject/Title of calculation MW(B)-168 does not indicate that the purpose of the calculation was to evaluate the minimum wall thickness requirements for a 3" tee.

8. A review of the referenced piping specification, 2280.000-582, page 180, Table "Special" (attached), determined that the wall thickness for both 2" and 2-1/2" is documented as 0.083.

Significance Level criteria do not apply here as this is not a discrepant condition.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Dionne, B. J.	☐	☒	☐	3/23/98
VT Lead:	Neri, Anthony A	☐	☒	☐	3/24/98
VT Mgr:	Schopfer, Don K	☐	☒	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/23/98				

SL Comments: It is agreed that items 5 and 8 are non- discrepant given the above noted response. Item 3 however, is a discrepant condition in that there were other references besides the FSK's that were superseded, for information only, unretrievable or incorrect. These included memos and IOC's that were unretrievable; incorrect ASME codes that were listed for the materials used; E&DCR's (i.e. "P-T-") and FSK's (i.e. "12179-FSK-") that were only partially listed so that retrievability or cross-referencing was not possible; and references listed but not cross-referenced to the pertinent design inputs.

Review of the documents referenced for the minimum wall calculations should be added to the scope of CR M3-98-0437.

Based on review of CR M3-98-0437 and the affect of the above noted problems with these calculations, it will not significantly affect the result to impact licensing or design basis issues and can be downgraded to a level 4 significance level.

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. **DR-MP3-0616**

Review Group: System
Review Element: System Design
Discipline: Mechanical Design
Discrepancy Type: Licensing Document
System/Process: RSS
NRC Significance level: 4

DR RESOLUTION REJECTED

Potential Operability Issue
- ○ Yes
- ◉ No

Date FAXed to NU:

Date Published: 11/15/97

Discrepancy: RSS Pump Actuation Time in Design Basis Summary Document

Description: 3DBS-NSS-003, Rev. 0 states that in a LOP event, the RSS pumps will be energized from the EDG load sequencer in no more than 19 seconds.

The discrepancy is that a 19-second actuation time is not consistent with the design basis of the RSS system:

1. According to LSK-24-9.4A, the emergency generator load sequencer delays the start of RSS pumps A and B 650 seconds after receipt of CDA signal and delays the start of RSS pumps C and D 660 seconds after receipt of CDA signal. The load sequencer delays start of the RSS pumps to allow an adequate supply of water to accumulate in the containment sump.

2. According to TS Surveillance Requirement 4.6.2.2.c, the maximum allowable error in the emergency diesel sequencer timer for RSS is 20 seconds.

3. According to Attachment B to US(B)-253, "Documentation of LOCTIC Data Deck for Millstone Unit #3 LOCA Analysis," the maximum time required for the emergency diesel generator to start, come up to speed and connect to the essential bus is 14.0 seconds.

Therefore the maximum actulation time for RSS pumps A and B is 684 seconds (650 sec + 20 sec + 14 sec). For RSS pumps C and D it is 694 seconds (660 sec + 20 sec + 14 sec).

		Valid	Invalid	Review Needed	Date
Initiator:	Wakeland, J. F.	☒	☐	☐	11/2/97
VT Lead:	Neri, Anthony A	☒	☐	☐	11/3/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	11/6/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	11/11/97

Date:

INVALID:

Date: 3/24/98

RESOLUTION: DISPOSITION:

NU has concluded that the issue reported in Discrepancy Report, DR-MP3-0616, does not represent a discrepant condition. This is based on the following discussion:

RSS pump actuation times are covered in the following paragraphs in DBS-NSS-003:

8.6 "...diesel start time (conservatively assumed to be 14 seconds), sequencer time (655 seconds, time delay after CDA (containment depressurization actuation) signal for pump start), and an allowance for sequence timer tolerance (20 seconds)..."

12.2.6 "Containment recirculation spray pumps shall start automatically 660 seconds (± a timer tolerance of twenty (20) seconds) following receipt of a CDA signal..."

12.2.7 "On a LOP event, the containment recirculation spray pumps shall be energized from the emergency diesel generator load sequencers. ..... The start time used in the current analysis is nineteen (19) seconds (fourteen (14) seconds for the diesel generator start plus five (5) seconds for the load sequencer)..."

12.2.11 "On a LOP event, the containment recirculation spray pumps shall be energized from the EDG load sequencer in less-than-or-equal-to nineteen (19) seconds (fourteen (14) seconds for diesel generator start plus five (5) seconds for the load sequencer."

LSK-24-9.4A depicts the following:

Recirculation Pump A start at 650 seconds and Recirculation Pump C start at 660 seconds after Diesel Generator breaker close under either CDA or CDA and LOP combined. This is further depicted on LSK-24-9.4Q and R and encompasses DBS paragraphs 8.6 and 12.2.6 requirements.

Recirculation Pump A starts at 0 seconds and Recirculation Pump C starts at 5 seconds after Diesel Generator breaker close under LOP with the CDA recirculation mode signal present. This is further depicted on LSK-24-9.4Q and R and encompasses DBS paragraphs 12.2.7 and 12.2.11 requirements.

Technical Specification 4.6.2.2.c says to verify that on a CDA test signal, each recirculation spray pump starts automatically after a 660 ± 20 second delay. This verifies DBS paragraphs 8.6 and 12.2.6 requirements.

DBS paragraph 8.6 uses the average sequencer time of 655 seconds (650 and 660 seconds) for the Recirculation Spray pumps instead of the worst case value as depicted in the other sections listed above. However, since it is being used in that section to establish a conservative requirement for spray header fill time rather than establish actual start times it is considered acceptable to use the average value.

Start times for the RSS pumps can vary from 19 seconds (14 seconds for diesel start time plus 5 seconds for sequencer time) to 694 seconds (14 seconds for diesel start time plus 660 seconds for sequencer time plus 20 seconds timer tolerance) for conditions which vary from LOP during a CDA while in

recirculation mode to LOP during a CDA prior to recirculation. Therefore, the design basis for the RSS actuation times is correct as presented in the DBS. There does appear to be some ambiguity in the DBS with respect to the varying scenarios and their effect on the time for starting the recirculation spray pumps on LOP. CR MP3-97-4493 has been initiated to clarify these scenarios in the applicable DBS paragraphs.

Significance Level Criteria do not apply here as this is not a discrepant condition.

CONCLUSION:

NU has concluded that the issue reported in Discrepancy Report, DR-MP3-0616, does not represent a discrepant condition. The design basis for the RSS actuation times is correct as presented in the DBS. Two separate scenarios exist which key on whether the LOP occurs with or without RSS in recirculation mode which results in different actuation times. However, since it does appear there is some ambiguity in the DBS with respect to the time to start the recirculation spray pumps on LOP after initiation of the recirculation mode, CR MP3-97-4493 has been initiated as an enhancement to have the applicable paragraphs in the DBS revised to make these two different scenarios clear. Significance Level Criteria do not apply here as this is not a discrepant condition.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Wakeland, J. F.	☐	☒	☐	3/24/98
VT Lead:	Neri, Anthony A	☐	☒	☐	3/24/98
VT Mgr:	Schopfer, Don K	☐	☒	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	
Date:	3/24/98				

SL Comments: Sargent & Lundy concurs that, following a postulated LOCA, if there were a LOP after ECCS suction switchover is completed, RSS pumps A and B would restart immediately upon EDG breaker closure (14 seconds) and RSS pumps C and D would be sequenced to start 5 seconds after EDG breaker closure (19 seconds). This, however, does not change our interpretation of DBS-NSS-003, Sec. 12.2.7 and 12.2.11.

The statements in Sec. 12.2.7 and 12.2.11 of the RSS design basis summary document are incorrect:

Sec. 12.2.7 states that the start time used in the containment temperature / pressure response analysis is 19 seconds. The start time used in the analysis (prior to modification M3-97045) was 689 seconds.

Sec. 12.2.11 states that the start time following LOP is 19 seconds, but the design basis LOP occurs simultaneously with a

LOCA resulting in RSS start times of no more than 684 seconds for the A and B pumps and no more than 694 seconds for the C and D pumps. It is not part of the Millstone Unit 3 design basis to assume that a LOP commences after ECCS suction switchover following a postulated LOCA. The only way to interpret Sec. 12.2.11 of the RSS design basis summary document is that the RSS pumps start within 19 seconds of a simultaneous LOP/LOCA.

Sargent & Lundy concludes that DR-MP3-0616 is a discrepant condition.

Sargent & Lundy has determined that the NRC Significance Level should be downgraded to level 4. This is because the discrepancy is only an editorial issue in the design basis summary documents. There is no error on this issue in the design drawings, calculations or evaluations which form the design basis of the RSS system. Therefore, closeout of CR MP3-97-4493 and issuance of change documents to correct DBS-NSS-003 may be deferred until after Unit 3 restart.

Northeast Utilities
Millstone Unit 3

ICAVP
Discrepancy Report

DR No. DR-MP3-0851

Review Group: System
Review Element: Modification Design
Discipline: Mechanical Design
Discrepancy Type: Installation Implementation
System/Process: SWP
NRC Significance level: 4

DR RESOLUTION REJECTED

Potential Operability Issue
○ Yes
◉ No

Date FAXed to NU:

Date Published: 1/22/98

Discrepancy: PDCR 3-94-090 Implementation and Test Requirement Discrepancies

Description: PDCR 3-94-090, which involved replacement of several pipe spools, in some cases with spools of the same [CuNi lined] material and in some cases with different [Monel] material, was reviewed and the following discrepancies noted.

1. The mod package lists two work orders [AWOS] under the "Implementation and Testing" Section - AWO M3-94-19304 and AWO M3-96-06860. However, AWO M3-94-19304 could not be found in PMMS and therefore could not be verified to have controlled the work activities as required by PDCR 3-94-090. AWO M3-96-06860 indicated that it controlled portions of the work per ASME Section XI Repair/Replacement, and indicated that it [AWO M3-96-06860] was a "continuation of AWO M3-94-19304," which could not be located. NU, in response to a request for this item, indicated that it "could not be found in Nuclear Plant Records and is therefore unavailable." [See IRF M3-IRF-01193.]

2. Under the "Retest Requirements" section of PDCR 3-94-090 Procedure EN 31603 "ASME XI ISI System Pressure Tests" is listed as the procedure to be used to conduct the hydrotest upon completion of the modification. However, work order AWO M3-9604810 [found in PMMS] indicated that it was a "retest of M3-94-19304" [which could not be located - see above] but instead listed Procedure EN 31090 "Elevated Pressure Test" as the governing procedure. Procedure EN 31603 indicates that it is applicable for testing at "normal operating pressures" while Procedure EN 31090 indicates that it is applicable for "testing components at elevated pressures." The mod package documentation was insufficient to determine which procedure was appropriate.

		Valid	Invalid	Review Needed	Date
Initiator:	Tenwinkel, J. L.	☒	☐	☐	12/19/97
VT Lead:	Neri, Anthony A	☒	☐	☐	12/19/97
VT Mgr:	Schopfer, Don K	☒	☐	☐	12/23/97
IRC Chmn:	Singh, Anand K	☒	☐	☐	1/17/98

Date:

INVALID:

Date: 3/24/98

RESOLUTION: Disposition:

NU has concluded that Discrepancy Report, DR-MP3-0851, has

identified a condition not previously discovered by NU which requires correction. This discrepancy meets the criteria specified in NRC letter B16901 and.17010 It has been screened per U3 PI-20 criteria and found to have no operability or reportability concerns and meets the Unit 3 deferral criteria. CR M3-98-0655 has been written to develop and track resolution of this item per RP-4.

Conclusion:

NU has concluded that Discrepancy Report, DR-MP3-0851, has identified a condition not previously discovered by NU which requires correction. This discrepancy meets the criteria specified in NRC letter B16901 and.17010 It has been screened per U3 PI-20 criteria and found to have no operability or reportability concerns and meets the Unit 3 deferral criteria. CR M3-98-0655 has been written to develop and track resolution of this item per RP-4.

Previously Identified by NU? ○ Yes ◉ No Non Discrepant Condition? ○ Yes ◉ No

Resolution Pending? ○ Yes ◉ No Resolution Unresolved? ○ Yes ◉ No

		Acceptable	Not Acceptable	Review Needed	Date
Initiator:	Tenwinkel, J. L.	☐	☒	☐	3/24/98
VT Lead:	Neri, Anthony A	☐	☒	☐	3/24/98
VT Mgr:	Schopfer, Don K	☐	☒	☐	3/24/98
IRC Chmn:	Singh, Anand K	☐	☐	☐	

Date: 3/24/98

SL Comments: With regard to the NU Disposition provided in response to the DR, S&L disagrees that this item meets the screening criteria for deferral, because it cannot be currently shown from the documentation provided and reviewed that the replaced piping segments [in the SW return lines from the "B" Diesel Generator Coolers] were installed and tested to appropriate controlled procedures prior to returning the system to service. Therefore operability is not assured. NU has agreed in their Disposition that the item requires correction. Please provide details relative to NUs plan to correct this discrepancy. This should be provided prior to startup or justification furnished to support deferral.

[In reviewing this disposition it was also noted that there is a typographical error in Item 2 of the original DR Description prepared by S&L - the ASME Section XI System Pressure Test procedure referenced as EN 31603 should read EN 31063.]