10/6/92

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Safety Evaluation Number ISE/MP2-92-049 Revision No. 0

Plant Change Number PDCR 2-114-92 Revision No. 0

Plant Change Title **MAIN STEAM ISOLATION MODIFICATIONS**

1. SUMMARY INFORMATION

1.1 Safety Evaluation Conclusions

The changes proposed in PDCR 2-114-92 are listed below and have been found to be safe and not an unreviewed safety question.

1.2 Description of the Change

Plant systems and setpoints will be changed in the following areas:

1. Diesel start signal will be modified to actuate on SIAS. This will restore the system to operate as it did at plant startup with LNP and SIAS starting the diesel.

2. Containment hi-hi pressure setpoint will be reduced from 27 psig to 9.48 psig so that spray actuation will occur faster.

3. Feedwater regulating valves FW-51A&B will be powered from VA-10/20 rather than VR-11/21 for more reliable operation.

4. MSI Signals from trains A and B will be added to the feed pump discharge valves (2-FW-38A/B) and the feed block valves (2-FW-42A/B). Redundant MSI signals will be provided to the feed regulating valves (2-FW-51A/B), feed bypass valves (2-FW-41A/B) and feed pumps (H5A/B).

These changes are required to quickly isolate feedwater and initiate containment systems to limit peak containment pressure below the 54 psig design limit following a postulated main steamline break (MSLB) or loss of coolant accident (LOCA) inside containment.

PDCR

1.3 Aspects of the Change Evaluated

This integrated safety evaluation (ISE) will address the proposed plant design changes for safety analysis impact and from the following aspects:

1. Diesel start on SIAS raises the possibility of prolonged operation unloaded which can lead to fouling of the exhaust creating a fire hazard. This issue is addressed in References 3 and 6 and in this ISE.

2. Reduction in the containment hi-hi setpoint is evaluated based on the likelihood of inadvertent actuation.

3. Re-powering the feed regulating valves from VA-10/20 is done to eliminate certain single failure scenarios which can lock open the valves. This ISE will ensure that new single failure scenarios are not created.

4. Redundant MSI signals to the feed isolation valves and feed pumps are evaluated based on creating a new means of an inadvertent MSI.

5. This ISE looks at the impact of all the proposed feed isolation changes from a probabilistic risk aspect on overall safety (Reference 5).

6. Impact on the operability of the feed, condensate and heater drain pumps following an inadvertent MSI is addressed in Reference 3 and in this ISE.

7. The capability of the feed pump discharge valves to operate under accident conditions is addressed in Reference 3 and this ISE.

8. Potential impacts on equipment environmental qualification (EEQ) due to changes in the containment temperature profiles are evaluated in Reference 4 and this ISE.

1.4 Malfunctions Evaluated

Those malfunctions created by the plant design changes being evaluated in this ISE are:

1. Inadvertent diesel start due to the added input signal from SIAS.

2. Inadvertent containment spray due to the reduced hi-hi setpoint.

3. Inadvertent loss of power to the feedwater regulating valves due to their being re-powered from VA-10/20.

4. Potential damage to pumps and valves in the feed isolation system.

5. Equipment operability for EEQ due to changes in containment response.

1.5 <u>References</u>

1. PDCR 2-114-92, Main Steam Isolation Modifications

2. SE-91-073-2, PSD Nuclear Electrical Engineering Safety Evaluation "Main Steam Isolation Modifications"

3. Project Services Department Mechanical Technical Evaluation for PDCR 2-114-92, "Modifications for Main Steamline Break Scenario"

4. "Evaluation of Equipment Thermal Response to the Postulated MSLB and LOCA in the Millstone 2 Containment" by R. Depatie dated October 16, 1992

5. Letter from D. A. Dube to Distribution, NE-92-SAB-302 of September 21, 1992 "PRA Review of Main Steam Isolation Modifications at MP2"

6. Letter from G. W. Olson to G. Reardon dated July 27, 1981 "Colt Industries Diesel Generation Low Load Operation"

7. Letter P. W. Wielhouwer to J. A. Camp dated October 9, 1992 OPS-92-1027 "Completion of MP2 LOCA and MSLB Analyses"

2. UNREVIEWED SAFETY QUESTION DETERMINATION

2.1 Impact on Previously Evaluated Accidents

2.1.1 List of Accidents Evaluated

1. Containment response to a MSLB
2. Containment response to a LOCA
3. Core response to a MSLB
4. Core response to a LOCA
5. Loss of Load/Closure of MSIV's
6. Loss of normal feedwater flow

2.1.2 Effect on the Probability of Occurrence of Previously Evaluated Accidents (A.4.1)

The probability of occurence of the accidents listed above will not be affected. None of the proposed changes or failure modes of the changes can initiate a MSLB and LOCA event. All the changes are intended to ensure an adequate margin of safety is maintained for the MSLB and LOCA accidents.

Loss of load type events also are not affected on probability of occurrence by any of the changes in PDCR 2-114-92. PDCR 2-028-92 which installed the containment hi pressure signal to MSI was found to have a small, but negligible, impact on loss of load and the loss of normal feedwater as evaluated in ISE/MP2-92-034. While the changes in this PDCR (2-114-92) add significantly to the quantity of equipment required to isolate feedwater the conclusions of ISE/MP2-034 remain the same. There is no significant increase in the probability of an inadvertent feedwater isolation.

The only new aspects introduced by PDCR 2-114-92 are the re-powering of the feed regulating valves by VA-10/20 and providing redundant MSI signals to feed isolation components. Re-powering of the feed regulating valves should increase the reliability of the power supply for these valves and thus, have no impact on the potential for causing a loss of feedwater. Addition of redundant MSI signals will create an insignificant increase in the probability of an inadvertent feed isolation event for the same reason as was discussed in Reference 2 and ISE/MP2-92-034, (the moderate frequency status of the event will not change).

2.1.3 Effect on the Probability of Occurrence of a Previously Evaluated Malfunction of Equipment Important to Safety (A.4.2)

The probability of occurrence of an equipment malfunction is not significantly impacted by these changes.

1. The probability of an inadvertent diesel generator (DG) start has increased due to the new input from SIAS. Per Reference 6, running the DG unloaded due to an inadvertent start is not expected to reduce its availability.

2. Inadvertent containment spray due to the reduced setpoint is not credible. Containment pressure could never reach actuation levels inadvertently, and a 2/4 logic on the channel level makes an inadvertent actuation there unlikely.

3. Re-powering the feed regulating valves from VA-10/20, as shown in References 1,2 and analysis to support Reference 7, has resulted in fewer ways to lose power to the valves. So the probability of occurrence of valve failure is significantly reduced.

4. Per Reference 3, there will be no negative impact on the pumps and valves required to operate for an MSI, therefore there is no increase in the probability of a malfunction of this type.

5. Malfunctions of equipment important to safety due to harsh environment (EEQ) has been shown not to be significant in Reference 4. While equipment test profiles can be exceeded for short periods of time, Reference 4 concludes that the environment seen by the equipment is unable to reach these elevated temperatures due to lag in the condensate-vapor-air boundary layer surrounding the component.

2.1.4 Effect on the Consequences of the Previously Evaluated Accidents (A.4.3)

The changes included in this PDCR do not impact the consequences (doses) of containment response to a MSLB and LOCA. The changes ensure that the margin of safety provided by the containment design is maintained. The other accidents are not impacted.

2.1.5 Effect on the Consequences of a Previously Evaluated Malfunction of Equipment Important to Safety (A.4.4)

1. An inadvertent diesel start has no significant impact on the reliability of the diesel since the manufacturers recommended operating procedures will be followed (References 3 and 6).

2. Inadvertent containment spray will not result in increased consequences. No design basis accident is initiated or impacted.

3. There will be no effect on consequences due to the re-powering of the feed regulating valves from VA-10/20. A malfunction of these valves has been shown to be less likely (References 1,2). Additionally, the one scenario where no feed isolation occurs has been shown to produce acceptable results (Reference 7).

4. Malfunctions of the feed pumps, condensate pumps, heater drain pumps and feed pump discharge valves due to the rapid feed isolation initiated by changes on this PDCR have been shown in Reference 3 not to be credible. Evaluation of recirculation capability and valve stresses were acceptable. Therefore there is no malfunction to increase consequences.

5. Since there will be no malfunction of equipment due to harsh environment from a MSLB or LOCA, there will be no effect on consequences.

2.2 Potential for a New Unanalyzed Accident

2.2.1 Possibility of an Accident of a Different Type than Previously Evaluated (A.4.5)

No new accidents are created by these changes. All new scenarios created for existing accident types have been evaluated.

2.2.2 Possibility of a Malfunction of a Different Type than Previously Evaluated (A.4.6)

Re-powering of the feed regulating valves creates a new possible failure where a loss of power with failure of VA-10/20 will result in no feed isolation. This case was analyzed in Reference 7 and found to be acceptable and does not create an accident of a different type than previously evaluated.

2.3 Impact on the Margin of Safety (A.4.7)

Since the acceptance criteria of 54 psig maximum containment pressure has been met with the new plant design changes included, there is no impact on margin of safety provided by the containment.

3. SAFETY DETERMINATION

3.1 Qualitative Safety Determination

From a deterministic point of view, the plant changes are safe since all safety analysis criteria are met. In Reference 5 a probabilistic argument is made that the probability of exceeding containment design pressure is reduced, reactor trip frequency increases slightly and frequency of loss of all feedwater increases slightly. Core melt frequency also increases slightly. These are the result of designing plant modifications to protect against highly unlikely accident scenarios. The addition of redundant MSI signals to redundant components to assure feed isolation makes it more difficult to restore feed flow in the case of an inadvertent MSI. While these changes have a small negative impact on core melt frequency, the impact is less than 3E-8/year and can be considered negligible. Thus, the change is considered to be safe.

3.2 Detailed Safety Determination (If ISE and Change is an USQ)

3.2.1 Effect on the Probability of Initiation of an Accident (A.5.1)

N/A

3.2.2 Effect on the Probability that Operators Will Fail to Mitigate an Accident (A.5.2)

N/A

3.2.3 Effect on the Probability that Mitigating Equipment Will Fail (A.5.3)

N/A

3.2.4 Effect on the Consequences of an Accident (A.5.4)

N/A

3.2.5 Safety Determination Conclusion

N/A

4. APPROVAL

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Safety Evaluation Number ISE/MP2-92-037 Revision No. ~~1~~ 2

Plant Change Number PTSCR 2-13-92 Revision No. 0

Plant Change Title Millstone 2 Containment Analysis

1. SUMMARY INFORMATION

1.1 Safety Evaluation Conclusions

This change is determined to be safe and not a USQ.

1.2 Description of the Change

- Table 2.2-1 is being changed to delete the double tier RCS flow specification in the * note at the bottom of the table. Changing the dual tier RCS flow specification must be done because the new safety analysis has been performed at the one flow only, 360,000 gpm. Therefore, the additional Technical Specifications which were necessary at low RCS flow, are no longer required.

- Tables 3.3-3, 3.3-4, 3.3-5 and 4.3-2 are being changed to add the high containment pressure signal as an input to MSI and to reduce the feed isolation portion of MSI from 60 seconds to 14 seconds. Adding the containment high pressure signal as another input to MSI and the reduced feed isolation time will now be credited in the safety analysis. This will ensure that the containment conditions resulting from a steam line break accident are within acceptance limits. ~~Manual initiation of MSI is being added to these Tables as a result of a request from operations that MSI trip buttons be installed.~~

- Containment Spray delay time on the high-high pressure signal is being reduced for the case with no Loss of Power (LOP) and increased for the case with LOP. For the case with no LOP, the change is needed to gain margin in the containment pressure calculation. For the case with an LOP, it is being lengthened, not as a result of deteriorating plant equipment, but because surveillance testing cannot measure the time from actuating signal (9.48 psig containment pressure as changed by this PTSCR) until spray pumps are operating at speed. The actual time assumed by safety analysis from the start of the accident until spray flow start is unchanged. Note that the Technical Specification value of 35.6 seconds remains unchanged; this is because diesel start time has been reduced by 5 seconds.

- Containment Air Recirculation (CAR) system delay time for the case without an LNP is being reduced to gain margin to the 54 psig containment design pressure. The existing Technical Specification had been set conservatively long when containment pressure had been determined to be less than 54 psig with slower CAR system actuation.

- The Bases Section for ESF Instrumentation is being changed to include an explanation of the new containment spray and CAR fan delay times.

- Diesel start time is being reduced from 20 seconds to 15 seconds so that containment spray and containment air recirculation (CAR) systems will start earlier. For the same reason, the containment spray setpoint (high-high) of 27 psig is being reduce to 9.48 psig. Reference 5 used the analysis limit of 11.08 psig for containment spray to calculate a setpoint of 9.48 psig and an allowable value of 10.11 psig. All ESF response times in Table 3.3-5 which include diesel start time are also being reduced by 5 seconds. Delay times for charging pumps, enclosure building filtration and auxiliary feedwater were reduced even for the cases without diesel start included since their delay times had been conservatively assumed to be the slower of the two.

1.3 Aspects of the Change Evaluated

Aspects of the changes in the PTSCR considered are:

- Deletion of the dual tier for a single tier RCS flow specification is evaluated based on its acceptability in the new design basis safety analysis.

- Changes to ESF signals, setpoints and delay times are evaluated based on the ability of plant equipment to meet the stricter requirements and their impact on containment pressure.

- Diesel start on SIAS is evaluated, in addition to its ESF function as stated above, but also from a reliability aspect due to its possibility of running unloaded.

1.4 Malfunctions Evaluated

There is no malfunction associated with the change from a dual tier RCS flow specification to a single tier specification. The RCS will continue to function as before, the additional flow is gained by replacing steam generators.

There is no malfunction associated with the change in containment spray delay time or CAR fan delay time. Each system will continue to function as before.

Adding the containment pressure high signal to MSI will add the possibility of an inadvertent MSI.

1.5 References

1. Letter RIW:034:92 from R. I. Wescott to J. A. Camp dated March 23, 1992, "Proposed Technical Specifications and COLR changes for Millstone Unit 2, Cycle 12".

2. Letter JWH:92:039 from J. W. Hulsman to J. A. Camp dated May 7, 1992, "Impact of High Containment Pressure to MSI on SBLOCA".

3. Letter from J. A. Camp to R. A. Borchert "Accounting for Valve Stroke in Containment Spray Delay Time", NE-92-F-160, dated April 1, 1992.

4. Letter from J. A. Camp to R. A. Borchert "Accounting for Valve Stroke in Containment Air Recirculation (CAR) Delay Time", NE-92-F-336, dated July 30, 1992.

5. CSAS setpoint calculation for MP2, PA-91-073-1273 EE.

6. "Millstone Unit 2 Plant Transient Analysis of Ch. 15 Events with Steam Generator Replacement", SIEMENS Report EMF-92-055 of April, 1992.

7. Letter from Colt Industries, "Millstone 2 Emergency Diesel Generators Low Load Operations", July 27, 1981.

2. UNREVIEWED SAFETY QUESTION DETERMINATION

2.1 Impact on Previously Evaluated Accidents

2.1.1 List of Accidents Evaluated

For the RCS flow specification change:

- Closure of a single main steam isolation valve (MSIV)
- Loss of forced reactor coolant flow
- Reactor coolant pump rotor seizure
- Uncontrolled control rod assembly withdrawal from a subcritical or low power start-up condition
- Control rod mis-operation (dropped rod)
- Control rod ejection

For the ESF changes:

- Containment response to a MSLB\LOCA
- Core response to a MSLB/LOCA
- Loss of External Load/Closure of MSIV's

2.1.2 Effect on the Probability of Occurrence of Previously Evaluated Accidents (A.4.1)

Of the three accidents above, only the loss of load and MSIV closure type event could be affected for probability of occurrence. With this change an inadvertent high containment pressure signal will result in the generation of an MSI signal. While the change does not increase the likelihood of an inadvertent high containment pressure signal, it does introduce another way to get an inadvertent MSI signal. The inadvertent MSI signal will result in closure of both MSIVs. This event is evaluated in FSAR Section 14.2.4 and is one of a number of overheating events analyzed in FSAR Section 14.2. The plant response is very similar to loss of external load and turbine trip. While probability is not addressed in the MP2 FSAR, in general these are considered moderate frequency events. Thus, the addition of another way to generate an inadvertent MSIV closure would not result in a change in probability class. Further, since the high containment signal is 2/4 logic, the impact on the probability of an inadvertent MSIV closure is considered negligible. It should be noted that failures, such as a failure of an ESAS cabinet, would have generated an inadvertent MSI as well as a high containment pressure signal prior to this change. For these types of inadvertent high containment pressure signals, there is no increase in MSIV closure probability.

2.1.3 Effect on the Probability of Occurrence of a Previously Evaluated Malfunction of Equipment Important to Safety (A.4.2)

This is a change to Technical Specifications and will not affect the probability of occurrence of a malfunction of equipment. An inadvertent MSI or SIAS is not made more probable by these changes, therefore, any resultant damage or wear on equipment important to safety, actuated by these signals, would not be increased by these changes. Reduction in the spray setpoint will not increase the probability of an inadvertent CSAS since an increase in containment pressure would actuate numerous alarms and equipment prior to 9.48 psig and an inadvertent actuation at the instrument channel would either actuate regardless of this change or would be subject to the 2/4 logic as with MSI.

Reliability of the diesel generators with actuation now including SIAS, will also not be impacted. The SIAS will not be more probable and procedures from the new manufacturer in Reference 7 will ensure that fuel or oil fouling of the exhaust will not occur.

2.1.4 Effect on the Consequences of the Previously Evaluated Accidents (A.4.3)

Consequences to containment analyses due to LOCA and MSLB will decrease as a result of these changes. Per Reference 1 and 2 core response to these changes will not be impacted.

2.1.5 Effect on the Consequences of a Previously Evaluated Malfunction of Equipment Important to Safety (A.4.4)

As discussed in Section 2.1.2, the identified accidents have no impact or result in events already analyzed and bounded in the FSAR. The only change that has the potential to affect the consequences of a previously evaluated malfunction is adding the high containment pressure signal to MSI. As discussed in 2.1.2, failures, such as a failure of an ESAS cabinet, that generates a MSI signal would also generate a high containment pressure. Thus, for these failures, there is no change in consequences. Since the high containment pressure signal is a 2/4 logic, a single failure would not result in an inadvertent

MSI. The consequences of a failure of a single containment pressure channel is unchanged. Thus, there is no impact on the consequences of previously evaluated malfunctions.

2.2 Potential for a New Unanalyzed Accident

2.2.1 Possibility of an Accident of a Different Type than Previously Evaluated (A.4.5)

The present design bases accidents cover all possible accidents even with this change in place. There is no possibility that this change will create an accident of a different type than previously evaluated.

2.2.2 Possibility of a Malfunction of a Different Type than Previously Evaluated (A.4.6)

The malfunctions identified in Section 2.1.2 have no impact or result in transients already analyzed and bounded in the FSAR. Based upon the discussion in 2.1.2 and 2.1.5, no new malfunctions have been identified.

2.3 Impact on the Margin of Safety (A.4.7)

There is no impact on margin of safety.

Each of the ESF changes proposed in this PTSCR is intended to reduce calculated peak containment pressure by taking advantage of plant equipment improvement or by taking credit for existing equipment which has always functioned to a higher standard than required in the previous analysis. The margin of safety is unchanged since the safety limit of 54 psig is unchanged. Reduced feed isolation delay time to 14 seconds is possible because the previously assumed 60 seconds was overly conservative based on actual signal generation time and valve stroke time. References 3 and 4 provide the basis for containment spray and CAR delay times. Reductions in the delay times without an LOP are possible due to over conservative assumptions being used in the previous analysis. The increase in delay time for spray with an LOP represents no change to the safety analysis; it is due entirely to the method used in the surveillance procedure. The reduced diesel start time is taking advantage of margin to the actual measured start time.

The Technical Specification changes above were each arrived at by evaluating existing margins available in plant equipment and the need to obtain acceptable results to the analysis of containment response to a postulated MSLB/LOCA. The final acceptability of the Technical Specification changes lies in the ability of the existing equipment to meet the stricter requirements and in that each is necessary to maintain margin of safety to containment design criteria.

Margin of safety for the RCS flow change is core DNB. Since the DNB acceptance criteria is unchanged, there is no change in margin of safety. The increased RCS flow specification of 360,000 gpm is made possible by the replacement of the steam generators. Reference 6 shows that all acceptance criteria are met.

3. SAFETY DETERMINATION

3.1 Qualitative Safety Determination

Reanalysis of the MSLB due to steam generator replacement and IE Bulletin 80-04 has identified that the ESF changes covered here are required to maintain calculated peak containment pressure less than the design value of 54 psig.

Based upon the above discussion, it is concluded that these changes are safe and not an USQ. The change does create another way to cause an inadvertent MSIV closure. However, it is considered to have a negligible impact on the likelihood of the event.

3.2 Detailed Safety Determination (If ISE and Change is an USQ)

3.2.1 Effect on the Probability of Initiation of an Accident (A.5.1)

3.2.2 Effect on the Probability that Operators Will Fail to Mitigate an Accident (A.5.2)

3.2.3 Effect on the Probability that Mitigating Equipment Will Fail (A.5.3)

3.2.4 Effect on the Consequences of an Accident (A.5.4)

3.2.5 Safety Determination Conclusion

10/15/92

4. APPROVAL

10/6/92

Preparer's Signature — Date

for N. S. Kai 10/6/92 JSK 10/15/92

Approval Signature — Date
Safety Integration & Analysis Section

10/6/92 JAB 10/15/92

Approval Signature — Date
Safety Analysis Branch

Docket No. 50-336
B14294

Attachment 2
Millstone Nuclear Power Station, Unit No. 2

Proposed Revision to Technical Specifications
Main Steam Line Break Design Limits
Response to Request for Additional Information

Telephone Conference Response

November 1992

Question:

Provide a timeline and basis for operation of the containment air recirculation (CAR) system.

Response:

Completed surveillance forms from the past several outages were reviewed to determine the actual response times of the CAR system. Actual start time for CAR fans is less than [illegible] seconds, actual diesel start plus sequencer time is less than 14 seconds, actual signal generation time is less than 1 second, actual valve stroke time is less than 5 seconds.

Based on the above, assumed timelines to support the new Technical Specification were made which bound measured times. The assumed conservative timelines are:

No Loss of Normal Power (LNP)

0 seconds	SIAS setpoint reached
1	SIAS signal valves start to open and CAR fans start signal
15	valves open and fans running, CAR system is operational

With LNP

0 seconds	LNP
1	SIAS signal valves start to open
16	diesel breaker closes
18.2	sequencer gives CAR start
26	valves open and fans running, CAR system is operational

Question:

Provide a basis for the 14-second feed isolation time.

Response:

Actual stroke times of the valves required to isolate feedwater is 10 seconds or less. Another 2 seconds is included for signal generation. The remaining 2 seconds is additional conservatism.

Question:

Provide a timeline and basis for operation of the auxiliary feedwater (AFW).

Response:

The Technical Specification change requests that the 240-second delay time be reduced to 235 seconds. Although this change would be conservative, it has been determined to be unnecessary. The specification should be left unchanged at 240 seconds.

At some future time, a change will be submitted to delete the note which states that diesel start and sequence times are included. Operation of AFW is independent of the diesel. A timer will automatically initiate AFW on a low steam generator level signal at between 3 minutes and 3 minutes 48 seconds. In the event of an LNP, the diesel will be running when the timer has completed its delay.

Automatic initiation of AFW is only assumed in the main steamline break analysis for peak containment pressure where an early start is conservative; in this case, 3 minutes is assumed. The maximum of 4 minutes from the Technical Specification comes from FSAR Section 14.2.7.8 which shows that one motor driven AFW pump starting within 240 seconds is sufficient for heat removal following a loss of feedwater accident.

Question:

Provide a timeline and basis for operation of the enclosure building filtration (EBFAS) system.

Response:

The Technical Specification times for EBFAS are the same with and without LOP. The total delay time consists of signal generation time, diesel start and sequence time, and the time for the EBFAS fan to reach operating conditions. There are numerous dampers which must operate, however all of these will be powered independently from the diesel, with the exception of the EBFAS fan discharge dampers. Fan powering and damper repositioning will start simultaneously and therefore are included in the surveillance time.

Actual measured times were reviewed when determining the new proposed 45-second limit. The following timeline shows the assumed conservative delay times.

LNP and No LNP

0	SIAS setpoint reached
1	EBFAS signal
16	diesel breaker closes
30.6	sequencer starts EBFAS fans
45	EBFAS is operational

Question:

How does this change affect the units' response to Generic Letter 84-15?

Response:

This change does not alter NNECO's previous response to Generic Letter (GL) 84-15. In a letter dated February 4, 1985,[1] NNECO provided a detailed response to the GL for Millstone Unit No. 2. Page 3-2 of Enclosure 3 (attached), discussed the diesel generator start on loss of voltage on the corresponding 4160-volt AC emergency bus or a safety injection actuation signal.

Subsequent to the GL and our response, NNECO removed the diesel generator start on safety injection actuation signal (SIAS), as discussed in a letter dated February 27, 1987.[2] In response to the Main Steam Line Break Containment reanalysis, NNECO has elected to reinstall the diesel generator start on SIAS. Therefore, the relevance and relationship of this action to GL 84-15 is the same as that presented in the February 4, 1985 response.

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(1) W. G. Counsil letter to D. G. Eisenhut, "Haddam Neck Plant, "Millstone Nuclear Power Station, Unit Nos. 1 and 2 Information Requested By Generic Letter 84-15," dated February 4, 1985.

(2) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 2 Emergency Diesel Generators," dated February 27, 1987.

manufacturers recommendations. The only unprelubed starts occur as a result of loss of voltage on the corresponding 4160-volt AC emergency bus or a safety injection actuation signal.(4)

In Enclosure 1 to Generic Letter 84-15 the Staff expressed a concern regarding testing of diesel generators when emergency core cooling

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(4) We note a difference in the testing procedures concerning the diesel generator at Millstone Unit No. 1 and those at Millstone Unit No. 2. Specifically, the Unit 2 diesels are only "dry-started" (unprelubed start) under accident conditions, whereas, the Unit 1 diesel is dry-started as part of the Unit drill, performed every refueling outage, simulating a loss of coolant accident coincident with a loss of off-site power.

The basis for this difference involves significant bearing wear discovered on the Unit 2 diesels during end-of-Cycle 1 outage maintenance activities. The bearing wear was attributed to dry-starting the Unit 2 diesels after every reactor trip, which occurred with greater frequency during initial start-up of the unit (mid-1970s) than is the case today. To preclude further bearing wear concerns, dry-starting of the Unit 2 diesels was eliminated except following a loss of voltage on a corresponding 4160-volt AC emergency bus or as a result of a safety injection actuation signal. This change in testing procedures has contributed to a significant improvement in the overall reliability of the machines.

Although testing procedures differ in this respect between Millstone Unit 1 and Millstone Unit 2, NNECO maintains that these differences are appropriate and necessary given our experiences with the three machines in use. Further, NNECO hereby provides its position that the intent of General Design Criteria (GDC) 18 is met in that testing of the diesel generators emergency start capabilities is performed "as close to design as practical" in light of the diesel generator unit specific operational and performance history.

NNECO maintains a high confidence in the ability of the Unit 2 diesels to start and operate from dry-start conditions based upon the many successful dry-starts and operation achieved during Cycle 1 without failure. The bearing wear discussed above was subsequently discovered during a planned inspection as part of the outage maintenance activities, and did not result in inoperability of the diesel generator unit at any time.