



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 13

TO FACILITY OPERATING LICENSE NO. NPF-49

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

INTRODUCTION

By letters dated November 19, 1987 and November 24, 1987, Northeast Nuclear Energy Company (NNECO) proposed changes to Millstone Unit 3 Technical Specification section 4.8.4.1.a.2. This section provides surveillance requirements for the containment penetration conductor overcurrent protective devices. Redundant overcurrent protective devices are provided on electrical penetration circuits to protect the electrical penetrations against fault currents that could cause the loss of the mechanical integrity of the penetration. The surveillance requirements call for periodic testing of a representative sample of the circuit breakers that provide this protection. NNECO is proposing that the tolerances for the acceptable values of fault current that some of the circuit breakers are tested to be increased.

EVALUATION

Section 4.8.4.1.a.2 of the existing Millstone Unit 3 Technical Specification calls for testing the instantaneous element of containment penetration conductor lower voltage circuit breakers by injecting a current equal to $\pm 20\%$ of the pickup value of the element and verifying that the circuit breaker trips instantaneously with no intentional time delay. The same test of the instantaneous element is specified for both low voltage air circuit breakers and molded case circuit breakers (and by implication for unitized starters as well). In their letter dated November 19, 1987, NNECO has proposed a technical specification change which separates the testing requirements of molded case circuit breakers and unitized starters from

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those of low voltage air circuit breakers. The requirements for testing low voltage air circuit breakers and the time delay element of molded case circuit breakers and unitized starters remain the same as in the existing technical specifications. The test requirements for the instantaneous element of the molded case circuit breakers and unitized starters, however, has been changed.

The proposed new requirement is that the instantaneous element of molded case circuit breakers and unitized starters (a frame size of 250 amps or less) be tested by injecting a current value which falls within +40% (of the upper limit) and -25% (of the lower limit) of the manufacturers instantaneous trip current range and verifying the breaker trips instantaneously with no intentional time delay. If single pole test results fall outside these tolerances, additional testing is to be conducted using two poles in series, including A-B, B-C, and C-A phase combinations. All combination test results must fall within the specified tolerances.

The reason provided by NNECO for requesting this change is that the technical specification surveillance of the instantaneous element of the molded case circuit breakers and unitized starters is not in agreement with the National Electrical Manufacturers Association Standard NEMA AB 2-1980 ("Procedure for Verifying the Performance of Molded Case Circuit Breakers"). This standard provides tolerances for the field testing of the instantaneous element of molded case circuit breakers which are generally wider than those specified in Underwriters Laboratory Standard UL489. UL 489 ("Standard for Molded Case Circuit Breakers and Circuit Breaker Enclosures") is the basis for the performance standards for all molded case circuit breakers bearing the UL label. However much discussion is provided in NEMA AB 2-1980 with regard to the impracticality of obtaining field test results which duplicate results obtained in the laboratory because of the difficulty in providing precise control of test conditions.

In NNECO's letter dated November 19, 1987, the licensee states that three unitized starters were declared inoperable as a result of functional testing to the tolerances specified in the existing technical specification at Millstone Unit 3. The licensee also states that the additional 40% tolerance proposed in the revised technical specification is necessary for testing of molded case circuit breakers to assure the operability of the instantaneous trip element. He states that if the magnitude of the injected current pulse is restricted to $\pm 20\%$ of the limits of the manufacturers instantaneous trip current range, it may be possible that

the thermal element causes the trip before the magnetic element reacts. This same problem with testing is also pointed out in NEMA AB 2-1980.

The staff makes no judgement on the difficulty or practicality of testing the instantaneous element of molded case circuit breakers or unitized starters to the tolerances specified in the existing Millstone Unit 3 Technical Specifications. Whatever tolerances or procedures that are chosen, however, must provide assurance that the circuit breakers will provide protection of the electrical penetration against the full range of fault currents they could be exposed to. If expanded testing tolerances can still provide this assurance while providing additional ease of testing, the expanded tolerances would be acceptable.

With regard to this, NNECO in their November 19, 1987 letter, states that a review has been performed to ensure that the new test current values for instantaneous elements are within the thermal capability of the electrical penetrations. The review utilized penetration protection curves provided in an engineering study (NERM 71, "Electrical Penetration Protection") dated December 3, 1985. These curves provided a plot of the overcurrent devices' time vs. current characteristic together with the electrical penetration thermal limit curve (time vs. current). The revised test current value was reviewed for each circuit against the penetration thermal limit curve provided in NERM 71. The licensee states that in each case the reviewed test current value was within the penetration's thermal limit. Because the expanded tolerance of the test current values provided in the revised technical specification still provide for protection of the penetration against the full range of fault currents they could be exposed to the staff finds them acceptable.

NNECO also stated in its November 19, 1987 letter that the Millstone Unit No. 3 FSAR will be revised to state that all future design changes involving circuits passing through the electrical penetrations will be reviewed against NERM 71 to

ensure compliance with Regulatory Guide 1.63, and NERM 71 will be revised to add the design criterion that the maximum test current value be within the thermal capability of the penetration. The staff finds this provision acceptable to ensure that any future design change will also result in the protection of the thermal capability of the penetration.

With regard to the provision in the revised technical specification that allows series combination pole tests, the staff had additional concerns. If single pole test results on the instantaneous element of molded case circuit breakers or unitized starters fall outside the revised specification tolerances the specification allows additional testing to be conducted using two poles in series, including A-B, B-C, and C-A phase combinations. If all the combination test results fall within the specified tolerances the circuit breaker can be declared operable. The staff was concerned that this provision could allow a circuit breaker to be declared operable with the instantaneous element on one pole very much out of calibration. If the circuit breaker was then used in a grounded distribution system and a line-to-ground fault developed on the line that the uncalibrated pole was monitoring, sufficient fault current might flow for a sufficient period of time to damage the penetration.

NNECO addressed this concern in its November 24, 1987 letter. It states that the 480V, 3-phase electrical distribution system at Millstone Unit No. 3 is an ungrounded system. A ground detection system located in each 480V load center and alarmed in the control room is employed to detect any grounds occurring in the 480V system. The licensee states that per Operations Procedure No. 3344A Section 8.3, the operator is required to investigate, locate, and clear any grounds which occur. In its November 24, 1987 letter NNECO also provided clarification in the revised technical specification that the series combination pole testing is only applicable to the instantaneous elements of molded case circuit breakers/unitized starters used in 480V circuits.

The staff finds the above provisions taken with regard to the series combination pole tests to be acceptable because:

- a. The proposed specification has been clarified to indicate that the series combination pole testing is only applicable to the instantaneous elements of molded case circuit breakers/unitized starters used in 480V circuits.
- b. The 480V distribution system is ungrounded.
- c. A single line-to-ground connection on the ungrounded system will not produce any fault current.
- d. A line-to-line fault occurring on the ungrounded system will produce fault current flowing through at least two poles of the circuit breaker, which is the case for which the circuit breaker has been satisfactorily tested by the series combination pole tests.
- e. Procedures exist to ensure that the 480V distribution system will be maintained as an ungrounded system.

NNECO has proposed changes to the Millstone Unit 3 Technical Specifications with regard to the surveillance testing of containment penetration conductor overcurrent protective devices. The staff has reviewed the licensee submittals and concludes the following:

- a. The expanded test current tolerances for the instantaneous element of molded case circuit breakers/unitized starters is acceptable because the revised levels still provide for protection of the penetration against the full range of fault currents they could be exposed to.

- b. The provisions NNECO has taken to ensure that future design changes also provide for protection of the penetration against the full range of fault currents they could be exposed to are also acceptable.
- c. The series combination pole tests called for in the revised technical specification is acceptable because the circuit breakers so tested are only used in an ungrounded distribution system that is monitored for grounds.

EMERGENCY CIRCUMSTANCES

These Technical Specification changes are being issued before the expiration of the notice period to preclude an unnecessary delay in plant startup from the current outage. The licensee has provided the Commission with an explanation of emergency circumstances based on a proposed startup date of December 17, 1987. The licensee stated in its November 19, 1987 submittal that:

Recently, three unitized starters were declared inoperable as a result of functional testing per Technical Specification Section 4.8.4.1.a.2 surveillance requirements. Millstone Unit No. 3 was in Mode 5 at the time of testing. On November 13, 1987, while investigating the reasons for the above failures of the unitized starters to satisfy the surveillance test requirements, it was noticed that the test current values specified in the existing Technical Specification for the above devices do not agree with the industry standard (NEMA AB 2-1980). NNECO failed to identify the above discrepancy at the time of certification of the Millstone Unit No. 3 Final Draft Technical Specifications. In addition, this discrepancy was not noticed until this Technical Specification section was exercised during this outage for the first time since Millstone Unit No. 3 received its operating license. In a telephone conference on November 16, 1987, NNECO informed the NRC of the findings of the investigation and indicated that a license amendment may be necessary to clarify surveillance testing requirements for molded case circuit breakers and unitized starters.

The NRC staff reviewed the licensee's actions and found that the licensee used its best efforts to apply for the subject amendment in a timely manner and that it had not acted in a manner as to create the emergency to take advantage of these procedures. However, by letter dated December 11, 1987, the licensee stated that the emergency circumstances no longer existed because startup would be delayed until the end of February 1988 to inspect and repair the reactor coolant pumps. Therefore, the staff's notice provided for a 30 day comment period.

By letter dated December 24, 1987, the licensee stated that the inspection and repair of the reactor coolant pumps will be completed more promptly so that plant startup may begin by January 22, 1988. This improved startup date results in emergency conditions once again. The staff finds that the licensee has not acted in a manner to create the emergency to take advantage of these procedures.

FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards considerations if operation of the facility in accordance with the amendment would not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- (3) Involve a significant reduction in a margin of safety.

The staff has confirmed the basis of the no significant hazards findings described in the notice published in the Federal Register on December 30, 1987. (52 FR 49229).

The proposed changes do not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated because the proposed changes for selecting the test current values are in accordance with manufacturer's recommendations for field testing of molded case circuit breakers and unitized starters and these new test current values for instantaneous elements are within the thermal capability of the electrical penetration.
2. Create the possibility of a new or different kind of accident from any previously evaluated because no design changes are being made. The proposed changes only involve revising the test current values used for allowing the licensee to safely determine the operability of the molded case circuit breakers and unitized starters. The proposed change does not modify the plant response.
3. Involve a significant reduction in a margin of safety because the change of test current values for molded case circuit breakers and unitized starters are in accordance with the industry standards for field testing these devices. The revised test current values remain well within the electrical penetration's thermal limits.

Accordingly, we conclude that this amendment involves no significant hazards considerations.

STATE CONSULTATION

In accordance with the Commission's regulations, consultation was held with the State of Connecticut by telephone. The State expressed no concern either from the standpoint of safety or of our no significant hazards consideration determination.

ENVIRONMENTAL CONSIDERATION

This amendment changes surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously published a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: January 20, 1988

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