



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 138 TO FACILITY OPERATING LICENSE NO. DPR-28
VERMONT YANKEE NUCLEAR POWER CORPORATION
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

1.0 INTRODUCTION

The NRC staff has determined that the risk from station blackout (SBO) is such that actions to improve emergency diesel generator (EDG) reliability would have a significant safety benefit. By letter dated July 2, 1984, the NRC issued Generic Letter (GL) 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability." GL 84-15 contained recommendations for changes to the Technical Specifications (TSs) to reduce the number of fast starts and improve reliability.

By letter dated August 4, 1993, Vermont Yankee Nuclear Power Corporation (the licensee) submitted a proposed TS change for the Vermont Yankee Nuclear Power Station (VYNPS) following the guidance of GL 84-15. The proposed change would revise TS 4.10.A to: (1) change the requirement for EDG fast start testing from "once a month" to "once each six months," while revising the monthly test requirement to allow a slow EDG start, (2) allow engine prelubrication and warmup procedures for EDG surveillance test starts, and (3) rearrange existing requirements to enhance usability. The proposed TS change would necessitate a change to the licensee's inservice testing (IST) program for EDG air start inlet and vent valves. Therefore, the licensee's submittal included a proposed revision to Relief Request RR-V03 of the licensee's third ten-year interval IST program. The original relief was granted by the staff on September 3, 1993.

2.0 EVALUATION

2.1 Proposed Technical Specification Change

The licensee has proposed specific changes to improve the reliability and availability of the EDGs at the VYNPS based upon the recommendations of GL 84-15.

- (A) The licensee proposes to modify the requirements of TS 4.10.A.1 for monthly surveillance testing of the EDGs. The existing TS require the licensee to conduct fast start and loading of each EDG "once a month." The proposed TS would allow slow start and gradual loading of the EDGs during the monthly surveillance test and would require conduct of the fast start test "once each six months, in lieu of"

the monthly test. Slow start and Gradual loading of the generator decreases the stress on both the generator and the diesel engine. It, therefore, would avoid premature wear of the engine and lead to greater EDG reliability and availability. This change is consistent with the guidance contained in GL 84-15 and is acceptable.

- (B) The licensee proposes to add a note to TS 4.10.A.1 stating that "all diesel generator starts may be preceded by an engine prelube and warmup procedures." The staff concluded in GL 84-15 that overall improvement in diesel engine reliability can be gained by performing diesel generator starts using engine prelubrication to reduce engine stress and wear. The staff also concluded that allowing prelubrication and prewarming increases the margin of safety by increasing the reliability and availability of EDGs, thereby decreasing the risk of SBO. Therefore, this change is acceptable.
- (C) The proposed change moves existing TS requirements within TS 4.10.A.1 as follows: (1) engine startup using the undervoltage automatic starting circuit from 4.10.A.1.b to 4.10.A.1.a.1; (2) testing of diesel fuel oil transfer pumps from 4.10.A.1.a to 4.10.A.1.c; (3) EDG operating cycle test from 4.10.A.1.c to 4.10.A.1.b.1; and (4) air compressor monthly test from 4.10.A.1.a to 4.10.A.1.a.2. These changes are editorial in nature and do not change the existing requirements. Therefore, these changes are acceptable.

2.2 Relief Request RR-V03, Revision 1

2.2.1 Background

The Code of Federal Regulations, 10 CFR 50.55a, requires that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where alternatives are authorized or relief is granted by the Commission pursuant to 10 CFR 50.55a(a)(3)(i), 10 CFR 50.55a(a)(3)(ii), or (f)(6)(i). In order to obtain authorization or relief, the licensee must demonstrate that: (1) the proposed alternative provides an acceptable level of quality and safety, (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, or (3) conformance is impractical for its facility. Guidance on acceptable alternatives to Section XI requirements was provided in GL 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," for certain aspects of IST.

Furthermore, in rulemaking to 10 CFR 50.55a effective September 8, 1992, (See 57 Federal Register 34666), the 1989 Edition of ASME Section XI was incorporated in paragraph (b) of 50.55a. The 1989 Edition provides that the rules for IST of valves shall meet the requirements set forth in ASME Operations and Maintenance Standards Part 10 (OM-10), "Inservice Testing of Valves in Light-Water Reactor Power Plants." Pursuant to 50.55a(f)(4)(iv), portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met, and therefore, relief is not required for those IST that are conducted in accordance with

OM-10, or portions thereof. Whether all requirements are met is subject to NRC inspection. In response to a request by the licensee dated August 13, 1992, the staff approved the use of OM-10 for the VYNPS third ten-year interval IST program pursuant to 10 CFR 50.55a(f)(4)(iv) (reference NRC letter dated September 3, 1993).

2.2.2 Relief Request

The licensee requests relief from the stroke time measurement requirements of OM-10, ¶ 4.2.1.4(b), for the EDG starting air inlet and vent valves, AS-24-1A, -1B, -2A, -2B, AV-24-1A, and -1B. The licensee proposes to assess valve operational readiness by measuring diesel generator start times during EDG testing once every 6 months using both air start trains. In addition, the licensee will verify that at least one of the two parallel air start inlet valves open, and the vent valve closes, during monthly slow start testing by ensuring that the EDG starts. Also, the EDG start times using one air start train will be measured once each operating cycle. (The operating cycle test was approved by the NRC in Revision 0 of this relief request in a letter dated September 3, 1993.)

2.2.3 Licensee's Basis for Requesting Relief

Relief is requested on the basis that compliance with the Code requirements is impractical and that the proposed alternatives would provide an acceptable level of quality and safety. These valves do not have remote position indication. Measuring the stroke time of these valves by observing stem travel would require disassembly of the operator.

Testing of the inlet valves individually would require the lifting of the power leads to the other valve. Since the stroke timing of these valves is performed by the indirect indication of the respective EDG start time, to lift leads each quarter and perform the necessary EDG fast starts to verify each valve's stroke time would be an undue hardship. Because excessive EDG fast starts are a known contributor to decreased EDG reliability and owing to the criticality of the EDGs as part of the emergency core cooling system, the overall impact of testing these valves in accordance with Code requirements would be an overall decrease in plant safety. Furthermore, since the air start system is not totally redundant (e.g., they share common piping components and initiating logic), testing of these valves individually on a quarterly basis would not increase the quality and safety of the system.

2.2.4 Alternate Testing

During EDG slow start testing performed each month, indirect indication that at least one of the two parallel air start inlet valves opens, and the vent valve closes, will be performed by ensuring the EDG starts. During EDG fast start testing performed every 6 months, indirect measurement that at least one of the two parallel air start inlet valves opens promptly, and the vent valve closes promptly, will be performed by ensuring the EDG starts within the TS limit of 13 seconds. Measuring the EDG start time gives indication of possible valve degradation (as a pair) since any significant changes in valve stroke time will be identified by longer than normal EDG start times. In

addition, to further assess the operational readiness of each air start inlet valve, an independent operability test is performed once per operating cycle. This test will be accomplished by alternately lifting the power leads to one of the two air start valves, and then measuring the EDG fast start time with the remaining valve in operation.

2.2.5 Evaluation

OM-10, ¶ 4.2.1.4(b) requires measurement of the full-stroke times of power-operated valves to monitor for changes that could be indicative of valve degradation. This results in retesting degraded valves and corrective action to repair seriously degraded valves prior to their reaching the point where they are incapable of performing their function. The licensee proposes to verify operational readiness of these valves by measuring diesel generator start times during EDG fast start testing once every 6 months using both air start trains. In addition, the EDG start times using one air start train will be measured once per operating cycle and indirect indication that at least one of two parallel air start inlet valves opens and the associated vent valve closes will be observed based upon the satisfactory starting of the associated EDG during monthly surveillance testing.

The change to this relief request is minor in that the principal testing of the air start inlet and vent valves once each operating cycle remains the same. The indirect observations that the valves operate satisfactorily during more frequent EDG surveillance testing are modified slightly. These changes do not change the staff's findings, as noted in the safety evaluation issued September 3, 1993, that: (1) the modifications necessary to directly measure the stroke time of these valves would be burdensome to the licensee; (2) that it is impractical to alternately lift the leads of the air start inlet valves to individually test them every 6 months; or (3) that the licensee's proposal to perform individual start tests each operating cycle should provide adequate assurance of the operational readiness of the EDG air start valves.

Therefore, based on the determination that compliance with the Code requirements is impractical and burdensome, and considering the proposed alternate testing, the proposed revised relief from the Code requirements pursuant to 10 CFR 50.55a ¶(f)(6)(i) is granted.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Vermont State Official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC 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 issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (58 FR 62157). 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.

5.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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