

June 24, 1996

MEMORANDUM TO: Frederick J. Hebdon, Director
Project Directorate II-3
Division of Reactor Projects I/II

FROM: Richard H. Wessman, Chief
Mechanical Engineering Branch
Division of Engineering

SUBJECT: TECHNICAL ASSISTANCE REQUEST (TIA 96-007)
REGULATORY ACCEPTABILITY OF PRELUBRICATING VALVES
(TAC Nos. M95274/M95275)

In a memorandum dated April 12, 1996, Ellis W. Merschoff, Director, Division of Reactor Projects, Region II, discussed the determination by Region II inspectors that the licensee of the St. Lucie nuclear power plant had lubricated a containment spray flow control valve prior to performing stroke time testing under Section XI of the ASME Boiler & Pressure Vessel Code. The Region II inspectors considered this pre-lubrication to result in a nonrepresentative test of valve capabilities.

Region II requested the Office of Nuclear Reactor Regulation (NRR) staff to respond to specific questions on the acceptability of the licensee's actions in pre-lubricating valves prior to testing. Attached is our response to those questions.

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Docket Nos.: 50-335
50-389

Attachment: As stated

cc w/attachment: J. T. Wiggins
A. F. Gibson
G. E. Grant
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REGULATORY ACCEPTABILITY OF PRELUBRICATING VALVES
PRIOR TO SURVEILLANCE TESTING
(TIA 96-007)

Technical Assistance Request

In a memorandum dated April 12, 1996, Ellis W. Merschoff, Director, Division of Reactor Projects, Region II, discussed the determination by Region II inspectors that the licensee of the St. Lucie nuclear power plant had lubricated a containment spray flow control valve prior to performing stroke-time testing under Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code. The Region II inspectors considered this pre-lubrication to result in a nonrepresentative test of valve capabilities. Therefore, Region II requested a response to the following questions:

1. Is the practice of lubricating a valve prior to stroke-time testing acceptable under the regulations?
2. Is the purpose of stroke-time testing under ASME Section XI to demonstrate the current and past operability of a valve, the current and future operability of a valve, or both?

Evaluation

The NRC regulations in 10 CFR 50.55a require that nuclear power plant licensees provide valves and pumps within the scope of Section XI of the ASME B&PV Code with access to enable the performance of inservice testing of those valves and pumps for assessing operational readiness as set forth in Section XI of the ASME B&PV Code. Criterion XI, "Test Control," of Appendix B to 10 CFR 50 requires that testing be performed under suitable environmental conditions. The current Inservice Testing (IST) Programs at St. Lucie Units 1 and 2 are based on the requirements of Section XI of the ASME B&PV Code, 1986 Edition, with approved relief to certain requirements. Article IWV-1000 of ASME B&PV Code (1986 Edition), Section XI, states that it provides the rules and requirements for inservice testing to assess operational readiness of certain Class 1, 2, and 3 valves in nuclear power plants, which are required to perform a specific function in shutting down a reactor to the cold shutdown condition, in mitigating the consequences of an accident, or in providing overpressure protection.

Subarticle IWV-3417 of the 1986 ASME B&PV Code states that, if a valve fails to exhibit the required change of valve stem or disk position or exceeds its specified limiting value of full-stroke time by this testing, the licensee shall initiate corrective action immediately with the valve declared inoperative if the condition is not corrected in 24 hours. Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," in Position 8 indicates that, rather than delaying 24 hours, the licensee should make a decision on operability when the data is recognized as being within the required action range. GL 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming

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Conditions and on Operability," provides similar guidance on the timeliness of operability decisions based on test results. IWV-3417 also requires that the test frequency be increased if a significantly longer stroke time is observed since the last test. Finally, IWV-3417 requires that any abnormality or erratic action be reported. The St. Lucie IST Program Plan identifies no differences in interpretation of the NRC regulations or ASME Code when stating that the inservice testing in the plan is to be performed specifically to verify the operational readiness of pumps and valves which have a specific function in mitigating the consequences of an accident or in bringing the reactor to a safe shutdown.

More recent ASME codes and standards have repeated and amplified the importance of evaluating the operability of valves during inservice testing. For example, Subsection ISTC, "Inservice Testing of Valves in Light-Water Reactor Power Plants," of the ASME Operation and Maintenance (OMc) Code states that it establishes requirements for inservice testing to assess the operational readiness of certain valves and pumps used in nuclear power plants. Subsection ISTC 4.2.9 requires that the valve be immediately declared inoperable if the valve exceeds the limiting values of full stroke time. Subsection ISTC 4.2.4 also requires that any abnormality or erratic action be recorded and that an evaluation be made regarding the need for corrective action.

The NRC regulations, and ASME codes and standards, clearly indicate that the purpose of the inservice testing programs is to "assess" the operational readiness of the valves and pumps. Article IWA-9000, "Glossary," of ASME B&PV Code (1986 Edition), Section XI, defines "assess" as determining "by evaluation of data compared with previously obtained data such as operating data or design specifications." More generally, Webster's II New Riverside University Dictionary defines "assess" as "to appraise or evaluate." If maintenance is performed prior to inservice testing that ensures the capability of a valve or pump to operate properly, the licensee's IST program would be unable to evaluate the operational readiness of the component. This is reinforced by the requirement in the ASME Code that, if the stroke-time limits are exceeded, the condition be corrected or the valve be considered inoperable. The St. Lucie IST Program Plan intent "to verify the operational readiness" is more specific regarding the purpose of the testing to determine the capability of the valves to perform their safety function.

The ASME Code recognizes that routine preventive maintenance will be performed by licensees. In some instances, this maintenance may occur shortly before a scheduled test required by a licensee's IST program. The effect of this maintenance on the validity of the test to assess operational readiness should be evaluated. In Section 3.5, "Testing in the As-Found Condition," of NUREG-1482 (April 1995), "Guidelines for Inservice Testing at Nuclear Power Plants," the staff stated that the Code does not specifically require testing to be performed for components in the as-found condition except for safety and relief valves, but does not define as-found even in the context of safety and relief valves. In NUREG-1482, the staff noted its belief that most inservice testing is performed in a manner that generally represents the condition of a standby component if it were actuated in the event of an accident (i.e., no pre-conditioning prior to actuation).

In NRC Information Notice 96-24 (April 25, 1996), "Preconditioning of Molded-Case Circuit Breakers Before Surveillance Testing," the staff stated that the practice of preconditioning molded-case circuit breakers (for example, by lubricating pivot points and manually cycling the breaker) defeats the purpose of the periodic test. The staff stated that such preconditioning does not confirm continued operability between tests nor does it provide information on the condition of the circuit breaker for trending purposes. The applicable licensee planned to revise its procedures before the next surveillance test to correct this situation.

In ASME Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor Operated Valve Assemblies in LWR Power Plants (OM - Code - 1995 Edition; Subsection ISTC)," the ASME provides an alternative to the stroke-time testing requirements of the OM Code to assess the operational readiness of motor-operated valves (MOV's). The code case uses the same language as the NRC regulations and ASME Code in stating that inservice testing is intended to assess the operational readiness of valves. In implementing the code case, the licensee is required to determine the capability of the MOV during inservice testing. The code case requires MOV's to be cycled at least every refueling cycle with diagnostic testing conducted on periodic intervals. The code case allows grouping of MOV's with the information obtained from individual MOV tests applied to other MOV's in the group. In Section 3.3, the code case specifically states that maintenance activities, such as stem lubrication, shall not be conducted if they might invalidate the as-found condition for inservice testing. The performance of maintenance prior to testing would defeat the ability to determine any degradation in the operation of the tested MOV and to apply the test results to other MOV's within the group. This code case is being endorsed (with certain limitations unrelated to preconditioning) for voluntary use by licensees in a forthcoming generic letter.

In summary, the performance of maintenance on a component to ensure its proper operation prior to conducting a test negates the validity of the test in assessing the operational readiness of the component. If the maintenance had not been performed, the component may not have been capable of performing its safety function. Clearly, the conduct of maintenance prevents the licensee from assessing if the component would perform as design, should it be called upon. Further, important information on trending of operating parameters for evaluating degradation would not be available.

EMEB Response

In response to the specific questions from Region II:

1. The performance of maintenance that ensures the capability of a valve to satisfy the stroke-time test requirements of the ASME Code provides a false indication of the operational readiness of the valve. Therefore, a licensee activity to lubricate a valve prior to stroke-time testing for the principal purpose of satisfying the test criteria at that specific time would not be considered to be within the intent of the NRC regulations under 10 CFR 50.55a or Appendix B to 10 CFR 50. It is recognized that routine preventive maintenance, such as valve

lubrication, might coincide occasionally with IST program testing. In those cases, the effect of such maintenance needs to be evaluated to ensure that the ability to assess operational readiness of the valves and to trend degradation in the valve performance are not adversely affected.

2. The NRC regulations, and ASME codes and standards, require licensees to establish IST programs to assess the operational readiness of certain valves and pumps. If a valve fails its stroke-time test, the licensee is required to declare the valve inoperable. Therefore, the stroke-time test is intended to demonstrate current operability. The licensee evaluates past operability since the previous stroke-time test based in part on the most current test results. The ASME Code prescribes comparison of stroke-time test data to previous test data so that licensees may obtain an indication that the valve should remain operable until the next test. It is recognized that the stroke-time test is limited in its effectiveness and, as a result, the ASME developed an alternative IST approach for MOVs in ASME Code Case OMN-1.