

May 9, 2005

Mr. L. William Pearce
Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Post Office Box 4
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NO. 1 (BVPS-1) - EVALUATION
OF INSERVICE TESTING (IST) RELIEF REQUEST PR-9 AND PR-10
(TAC NOS. MC5195 AND MC5196)

Dear Mr. Pearce:

By letter dated September 3, 2004, FirstEnergy Nuclear Operating Company (the licensee) requested relief from the requirements of the American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code* (ASME Code), quarterly testing requirements for its auxiliary feedwater system turbine-driven pump 1FW-P-2, and motor-driven pumps 1FW-P-3A and -3B.

The Nuclear Regulatory Commission staff has completed its review and has determined that compliance with the ASME Code requirements is impractical. The licensee's proposed alternative testing provides reasonable assurance of operational readiness. Granting the requested relief pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(f)(6)(i), is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facilities. Therefore, the licensee's requests for relief, PR-9 and PR-10, are granted for BVPS-1 for the remainder of the current 10-year IST interval pursuant to 10 CFR 50.55a(f)(6)(i).

If you have any questions regarding this approval, please contact the BVPS-1 Project Manager, Mr. Timothy G. Colburn, at (301) 415-1402.

Sincerely,

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-334

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
INSERVICE TESTING (IST) PROGRAM RELIEF REQUESTS PR-9 AND PR-10 FOR
FIRSTENERGY NUCLEAR OPERATING COMPANY (FENOC)
BEAVER VALLEY POWER STATION, UNIT NO. 1 (BVPS-1)
DOCKET NO. 50-334

1.0 INTRODUCTION

By letter dated September 3, 2004, FENOC, the licensee for BVPS-1, submitted requests for relief (PR-9 and PR-10) from IST requirements to conduct testing of auxiliary feedwater pumps on a quarterly basis. The licensee's IST program is required to meet the requirements of the American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code* (ASME Code), 1989 edition, Section XI, which references the ASME/American National Standards Institute (ANSI), Operations and Maintenance (OM) Standard, Part 6 (OM-6), 1988 addenda for IST of pumps. Specifically, the licensee requests to defer the quarterly testing and monitoring requirements for pumps in the auxiliary feedwater system at BVPS-1, until periods of cold shutdown or until a refueling outage when plant conditions permit directing flow to the steam generators (SGs). The licensee has submitted this request pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(f)(5)(iii).

2.0 REGULATORY EVALUATION

Pursuant to 10 CFR 50.55a, IST of certain ASME Code, Class 1, 2, and 3, pumps and valves should be performed in accordance with Section XI of the ASME Code and applicable addenda, except where relief has been requested and granted or proposed alternatives have been authorized by the Commission pursuant to 10 CFR 50.55a(f)(6)(i), (a)(3)(i), or (a)(3)(ii). In order to obtain authorization or relief, the licensee must demonstrate that: (1) conformance is impractical for its facility, (2) the proposed alternative provides an acceptable level of quality and safety, or (3) compliance would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

3.0 TECHNICAL EVALUATION

The licensee submitted two relief requests pertaining to testing requirements of its auxiliary feedwater pumps. Relief request PR-9 pertains to the licensee's motor-driven auxiliary feedwater pumps 1FW-P-3A and 1FW-P-3B. Relief request PR-10 pertains to the licensee's turbine-driven auxiliary feedwater pump 1FW-P-2. In both requests, relief is sought from the same ASME Code requirements.

3.1 Code Requirements

ASME/ANSI OM-6, paragraph 5.1, requires that IST must be conducted for all pumps that fall within the scope of the IST program. The testing must be conducted on a quarterly basis. Paragraph 5.2 and subsequent paragraphs identify the testing procedure, and Table 2 identifies that the pump testing must determine and record pump speed, pressure differential, discharge pressure, flow rate, and vibration data.

3.2 BVPS-1, Relief Request PR-9, Revision 1L

3.2.1 Component Identification

The components affected by this relief request are motor-driven auxiliary feedwater pumps 1FW-P-3A and 1FW-P-3B. The pumps are ASME Code, Class 2 pumps, and supply an emergency source of feedwater to the SGs following accident or transient conditions when the main feedwater system is not available. The auxiliary feedwater pumps also provide the normal source of feedwater to the SGs during shutdown, startup, and low-power level conditions.

3.2.2 Basis for Relief Request

The licensee requests relief from the ASME Code quarterly pump testing requirement for motor-driven auxiliary feedwater pumps 1FW-P-3A and 1FW-P-3B at BVPS-1, pursuant to 10 CFR 50.55a(f)(5)(iii) on the basis that the ASME Code testing requirements are impractical.

The licensee indicates that aligning the auxiliary feedwater flow to the SGs is not practical during normal plant operation because the introduction of relatively cold auxiliary feedwater into the SGs produces a potential for thermal shock to both the main feed piping (thermal sleeves) and the secondary side of the SGs. Although the thermal sleeves and SGs are designed for thermal shock, the exposure of the facility to these events should, according to the licensee, be minimized in order to ensure that the benefits of plant-life extension can be realized. In addition, feeding the SGs with relatively cold water would also result in a large level transient in the SGs and could cause a reactor trip. The licensee states that since it is impractical to test these pumps quarterly, a recirculation flow path must be used. However, this flow path does not have installed flow instrumentation that meets the requirements of OM-6.

3.2.3 Proposed Alternative to ASME Code Testing Requirement

The licensee proposes to test the pumps quarterly with the fixed resistance of the minimum flow line. During these tests, all appropriate operational pump parameters will be measured and evaluated with respect to OM-6, Table 2, and associated relief requests with the exception of flow rate.

During instances of cold shutdown or refueling outages, when plant conditions permit the alignment of feedwater pump flow to the SGs, the pumps will be tested under nominal full-flow conditions during pump testing as required by OM-6. All required measurements of parameters will be taken and evaluated in accordance with OM-6, Section 5.

3.2.4 Nuclear Regulatory Commission (NRC) Staff's Evaluation of Relief Request

The licensee requests relief from the test frequency requirements of OM-6, paragraph 5.1, for motor-driven auxiliary feedwater pumps 1FW-P-3A and 1FW-P-3B. The ASME Code requires that IST be run on each pump every 3 months. Aligning the auxiliary feedwater flow to the SGs is impractical during normal operation because introducing relatively cold water into the system produces a thermal shock in the feedwater piping and the SGs. Alternatively, the licensee proposes to test the pumps quarterly using a non-instrumented minimum flow line. The licensee also proposes to test the pumps under full-flow conditions during refueling outages and cold shutdowns, as plant conditions permit, aligning flow to the SGs.

The NRC's Staff Position 9 of Generic Letter (GL) 89-04 states that in cases where flow can only be established through a non-instrumented minimum flow path during quarterly pump testing and a path exists at cold shutdowns or refueling outages to perform a test of the pump under full or substantial flow conditions, the NRC staff has determined that the increased interval is an acceptable alternative to the ASME Code requirements provided that pump differential pressure, flow rate, and bearing vibration measurements are taken during this test and that quarterly testing also measuring at least pump differential pressure and vibration is continued.

The NRC staff has also determined in Staff Position 9 of GL 89-04 that it is more desirable to test pumps with substantial flow than in mini-flow recirculation configurations. Therefore, the NRC staff imposes an additional alternative requirement pursuant to 10 CFR 50.55a(f)(6)(i). The licensee shall test pumps 1FW-P-3A and 1FW-P-3B at least once per refueling outage, and no less than once every 92 days during instances of cold shutdowns and refueling outages when plant conditions permit directing flow to the SGs.

The licensee has provided assurance that its alternative will provide an acceptable level of quality and safety by committing to the testing requirements described in Staff Position 9 of GL 89-04, which, as described above, the NRC staff finds acceptable.

The NRC staff concludes that compliance with the ASME Code requirement is impractical. The licensee shall test pumps 1FW-P-3A and 1FW-P-3B at least once per refueling outage, and no less than once every 92 days during instances of cold shutdowns and refueling outages when plant conditions permit directing flow to the SGs. The proposed alternative testing provides reasonable assurance of operational readiness and will not endanger life or property or the common defense and security. Therefore, the licensee's request for relief, PR-9, is granted pursuant to 10 CFR 50.55a(f)(6)(i).

3.3 BVPS-1, Relief Request PR-10, Revision 1L

3.3.1 Component Identification

The component affected by this relief request is turbine-driven auxiliary feedwater pump 1FW-P-2. The pump is an ASME Code, Class 2 pump, and supplies an emergency source of feedwater to the SGs following accident or transient conditions when the main feedwater system is not available. The auxiliary feedwater pump also provides the normal source of feedwater to the SGs during shutdown, startup, and low-power level conditions.

3.3.2 Basis for Relief Request

The licensee requests relief from the ASME Code quarterly pump testing requirement for turbine-driven auxiliary feedwater pump 1FW-P-2 at BVPS-1 pursuant to 10 CFR 50.55a(f)(5)(iii) on the basis that the ASME Code testing requirements are impractical.

The licensee indicates that aligning the auxiliary feedwater flow to the SGs is not practical during normal plant operation because the introduction of relatively cold auxiliary feedwater into the SGs produces a potential for thermal shock to both the main feed piping (thermal sleeves) and the secondary side of the SGs. Although the thermal sleeves and SGs are designed for thermal shock, the exposure of the facility to these events should, according to the licensee, be minimized in order to ensure that the benefits of plant-life extension can be realized. In addition, feeding the SGs with relatively cold water would also result in a large level transient in the SGs and could cause a reactor trip. The licensee states that since it is impractical to test this pump quarterly, a recirculation flow path must be used. However, this flow path does not have installed flow instrumentation that meets the requirements of OM-6.

The licensee also stated that there is a degree of impracticality associated with the need for the SGs to be on line in order to drive the turbine of pump 1-FW-P-2. In order to have the steam flow necessary to operate the pump and also minimize the thermal and chemical shock to the SGs, the licensee states that it is necessary to test the pump only while the reactor is in Mode 3. This testing configuration will also minimize the probability of a reactor trip due to any thermal transient caused by aligning feedwater pump flow to the SGs.

3.3.3 Proposed Alternative to ASME Code Testing Requirements

The licensee proposes to test the pump quarterly with the fixed resistance of the minimum flow line. During these tests, all appropriate operational pump parameters will be measured and evaluated with respect to OM-6, Table 2, and associated relief requests with the exception of flow rate.

During instances of cold shutdown or refueling outages, when plant conditions permit the alignment of feedwater pump flow to the SGs, the pump will be tested under nominal full-flow conditions during pump testing required by the OM-6. All required measurements of parameters will be taken and evaluated in accordance with OM-6, Section 5.

3.3.4 NRC Staff's Evaluation of Relief Request

The licensee requests relief from the test frequency requirements of OM-6, Paragraph 5.1, for turbine-driven auxiliary feedwater pump 1FW-P-2. The ASME Code requires that IST be run on the pump nominally every 3 months. Aligning the auxiliary feedwater flow to the SGs is impractical during normal operation because introducing relatively cold water into the system produces a thermal shock in the feedwater piping and the SGs. Alternatively, the licensee proposes to test the pump quarterly using a non-instrumented minimum flow line, and during refueling outages and cold shutdowns, as plant conditions permit aligning flow to the SGs, under full-flow conditions.

The NRC's Staff Position 9 of GL 89-04 states that in cases where flow can only be established

through a non-instrumented minimum flow path during quarterly pump testing and a path exists at cold shutdowns or refueling outages to perform a test of the pump under full or substantial flow conditions, the NRC staff has determined that the increased interval is an acceptable alternative to the ASME Code requirements provided that pump differential pressure, flow rate, and bearing vibration measurements are taken during this test and that quarterly testing also measuring at least pump differential pressure and vibration is continued.

The NRC staff has also determined in Staff Position 9 of GL 89-04 that it is more desirable to test pumps with substantial flow than in mini-flow recirculation configurations. Therefore, the NRC staff imposes an additional alternative requirement pursuant to 10 CFR 50.55a(f)(6)(i). The licensee shall test pump 1FW-P-2 according the ASME Code requirements during shutdown or startup following each refueling outage, when the reactor is in Mode 3.

The NRC staff concludes that compliance with ASME Code requirements is impractical. The proposed alternative testing provides reasonable assurance of operational readiness and will not endanger life or property or the common defense and security. Therefore, the licensee's request for relief, PR-10, is granted pursuant to 10 CFR 50.55a(f)(6)(i).

4.0 CONCLUSION

The NRC staff concludes that the licensee's requests for relief, PR-9 and PR-10, may be granted for BVPS-1 for the remainder of the current 10-year IST interval pursuant to 10 CFR 50.55a(f)(6)(i) on the basis that compliance with ASME Code requirements is impractical. The NRC staff further concludes that the licensee shall meet the following alternative requirements pursuant to 10 CFR 50.55a(f)(6)(i). For PR-9, the licensee shall test the pumps according to the ASME Code requirements no less than once every 92 days during instances of cold shutdowns and refueling outages when plant conditions permit directing flow to the SGs. For PR-10, the licensee shall test the pump according the ASME Code requirements during shutdown or startup following each refueling outage, when the reactor is in Mode 3. For both PR-9 and PR-10, the licensee shall test the pumps according to the ASME Code requirements at least once per refueling outage. The licensee's proposed alternative testing provides reasonable assurance of operational readiness. Granting the requested relief pursuant to 10 CFR 50.55a(f)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facilities.

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Date: May 9, 2005

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