



FirstEnergy Nuclear Operating Company

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November 14, 2007
L-07-147

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

**Subject: Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
Supplemental Information in Support of ASME Code Relief Request
PRR6 (TAC NO. MD5600)**

By letter dated May 11, 2007 (Letter Number L-07-066), FirstEnergy Nuclear Operating Company (FENOC) submitted nine 10 CFR 50.55a requests associated with pump testing requirements, and one 10 CFR 50.55a request associated with valve test requirements. FENOC responded to an August 22, 2007 NRC staff request for additional information in a letter dated September 24, 2007 (Letter Number L-07-125).

During an October 22, 2007 telephone conference call, the NRC staff identified a concern regarding one of the pump relief requests (PRR6) forwarded with the May 11, 2007 letter. In response to this NRC staff concern, supplemental information in the form of revised Pump Relief Request PRR6 is provided in the attachment to this letter.

There are no regulatory commitments contained in this letter. If there are any questions, or if additional information is required, please contact Mr. Thomas A. Lentz, Manager - FENOC Fleet Licensing, at (330) 761-6071.

Sincerely,

Peter P. Sena III

Attachment:

Revised Pump Relief Request PRR6

A047
NRR

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c: Ms. N. S. Morgan, NRR Project Manager
Mr. D. L. Werkheiser, NRC Senior Resident Inspector
Mr. S. J. Collins, NRC Region I Administrator
Mr. D. J. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

ATTACHMENT TO LETTER L-07-147

REVISED PUMP RELIEF REQUEST PRR6

PUMP RELIEF REQUEST 6

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)

On the basis that the proposed alternative provides an acceptable level of quality and safety.

ASME Code	2EGF*P21A, Diesel Fuel Oil Transfer Pump, (Class 3)
Component(s) Affected:	2EGF*P21B, Diesel Fuel Oil Transfer Pump, (Class 3) 2EGF*P21C, Diesel Fuel Oil Transfer Pump, (Class 3) 2EGF*P21D, Diesel Fuel Oil Transfer Pump, (Class 3)
Component/System Function:	The Emergency Diesel Generator Fuel Oil Transfer Pumps transfer fuel oil from the underground Emergency Diesel Generator Fuel Oil Storage Tank to the Day Tank in order to provide continuous operation of the Diesel at rated load for up to 7 days during an emergency.
Applicable Code Edition and Addenda:	ASME OM Code-2001, with Addenda through OMB-2003.
Applicable Code Requirement(s):	ISTB-3550, "Flow Rate," states: "When measuring flow rate, a rate or quantity meter shall be installed in the pump test circuit. If a meter does not indicate the flow rate directly, the record shall include the method used to reduce the data." ISTB-3510(a), "Accuracy," states: "Instrument accuracy shall be within the limits of Table ISTB-3500-1. If a parameter is determined by analytical methods instead of measurement, then the determination shall meet the parameter accuracy requirement of Table ISTB-3500-1 (e.g., flow rate determination shall be accurate to within $\pm 2\%$ of actual)."
Reason for Request:	There is no installed instrumentation provided to measure flow rate directly for these Emergency Diesel Generator Fuel Oil Transfer Pumps. However, a level sight glass does exist on the side of the Diesel Generator Fuel Oil Day Tank, and can be used to measure a change in level over time as the pumps transfer fuel oil from the underground Storage Tank to the Day Tank.

PUMP RELIEF REQUEST 6

**Proposed
 Alternative and
 Basis for Use:**

Flow rate will be calculated by measuring the level change over time in the Diesel Generator Fuel Oil Day Tank, and converting this data into Fuel Oil Transfer Pump flow rate during both the Group B tests and Comprehensive tests per 2OST-36.1 and 2OST-36.2 (Emergency Diesel Generator and Fuel Oil Transfer Pump Tests). Restricted flow rate acceptance criteria will be used as follows:

Test	Acceptable Range	Alert Range	Required Action Range	
			Low	High
Group B	0.91 to 1.09Qr	None	<0.91Qr	>1.09Qr
CPT	0.96 to 1.02Qr	0.94 to <0.96Qr	<0.94Qr	>1.02Qr

During this test, each pump is operated with a fixed flow path from the underground Storage Tank (suction) to the Day Tank (discharge). Suction pressure is nearly constant because of the very small change in Storage Tank level (approximately 1.5 inch drop in level during pump operation). This results in no more than a 0.05 psig change in suction pressure during pump operation and the change is considered to be negligible. The normal rise in Day Tank level is approximately 12 inches, which corresponds to a quantity of approximately 350 gallons pumped during the 10 minutes of pump operation, resulting in a typical flow rate of approximately 35 gpm. This small rise in Day Tank level during pump operation could increase pump discharge pressure by as much as 0.4 psig. The resulting increase in pump differential pressure or head (approximately 1 foot) could also decrease pump discharge flow rate by as much as 2 gpm over the course of pump operation based on the shape of the pump curves at approximately 35 gpm for these centrifugal pumps. Therefore, an initial flow rate of approximately 36 gpm would decrease to approximately 34 gpm as the level in the Day Tank rises during the course of the test. The calculation method described above determines an average flow rate (approximately 35 gpm) over the course of the test.

Because flow rate can vary by as much as plus or minus 1 gpm from the average flow obtained, the corresponding calculated flow rate is only accurate to within plus or minus 2.86 percent. In addition, the level sight glass on the side of the Day Tank ranges from 12 inches to 47.25 inches and is in 0.125 inch increments for a calibrated accuracy of plus or minus 0.355 percent. The stopwatch used to measure the time the pump is operating and pumping fuel oil is accurate to within plus or minus 0.3 seconds per minute for a calibrated accuracy of plus or minus 0.5 percent. Combining the accuracy of the flow rate reading, level sight glass and stopwatch, using the square root of the sum of the squares method, results in an overall indicated accuracy of plus or minus 2.93 percent.

PUMP RELIEF REQUEST 6

**Proposed
 Alternative and
 Basis for Use:
 (Continued)**

Since this does not meet the plus or minus 2 percent accuracy requirements of Table ISTB-3500-1, FENOC proposes to use the restricted flow rate acceptance criteria that is more conservative than the current flow rate acceptance criteria in Table ISTB-5200-1 for both the Group B and Comprehensive Tests.

The Acceptable Ranges for flow provided in Table ISTB-5200-1 for the Group B test and Comprehensive Pump Test (CPT) are as follows.

<u>Test</u>	<u>Acceptable Range</u>	<u>Alert Range</u>	<u>Required Action Range</u>	
			<u>Low</u>	<u>High</u>
Group B	0.90 to 1.10Qr	None	<0.90Qr	>1.10Qr
CPT	0.95 to 1.03Qr	0.93 to <0.95Qr	<0.93Qr	>1.03Qr

The accuracy of the proposed flow rate determination and the restricted flow rate acceptance criteria (both described above) meet the intent of the ASME OM Code required accuracy of 2 percent of actual flow rate, since the restricted flow rate acceptance criteria (that provide a more conservative range of acceptable values) listed above compensate for the 1 percent less accurate flow rate determination.

In addition, because these tests are performed at nearly the same conditions (a Day Tank level change from approximately 22 inches to 34 inches over 10 minutes) and use a fixed flow path, repeatable results (for trend analysis) are ensured. FENOC has over 10 years of test experience using this test method (Day Tank level change over time). The method has demonstrated that it provides adequate capability to monitor for a declining trend in pump performance and reasonable assurance of acceptable pump operation.

Although the diesel fuel oil transfer pumps are vertical line shaft centrifugal pumps, the proposed alternative is consistent with the guidelines provided in NUREG-1482, Rev.1, Section 5.5.2 for positive displacement pumps.

Using the provisions of this relief request as an alternative to the requirements of ISTB-3550 and ISTB-3510(a) provides an acceptable level of quality and safety since the alternative provides reasonable assurance of pump operational readiness.

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- Duration of Proposed Alternatives:** The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.
- Precedents:** A request using a similar test method (Day Tank level change over time) with less restrictive flow rate acceptance criteria was approved for the Beaver Valley Power Station, Unit No. 2 Second Ten-Year Inservice Test Interval. The NRC letter authorizing the similar alternative is referenced below.
- Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Relief Request PRR6 for the Second Ten-Year Interval for Pumps and Valves Inservice Testing Program, Dated September 4, 1997, (TAC No. M98909)
- References:** ISTB-3550, "Flow Rate"
ISTB-3510(a), "Accuracy"
Table ISTB-3500-1, "Required Instrument Accuracy"
Table ISTB-5200-1, "Vertical Line Shaft and Centrifugal Pumps Test Acceptance Criteria"
NUREG-1482, Rev.1, Section 5.5.2, "Use of Tank Level to Calculate Flow Rate for Positive Displacement Pumps."