



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

February 22, 2012

Mr. Vito A. Kaminskas  
Site Vice President  
FirstEnergy Nuclear Operating Company  
Mail Stop A-PY-A290  
P.O. Box 97, 10 Center Road  
Perry, OH 44081-0097

SUBJECT: PERRY NUCLEAR POWER PLANT, UNIT NO. 1, RE: SAFETY EVALUATION  
BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATED TO  
REQUEST VR-1, REVISION 1, FOR THE THIRD 10-YEAR INTERVAL  
INSERVICE TESTING PROGRAM (TAC NO. ME7380)

Dear Mr. Kaminskas:

By letter to the U.S. Nuclear Regulatory Commission (NRC), dated October 16, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112900204), FirstEnergy Nuclear Operating Company (FENOC, the licensee), submitted a request to the NRC for the use of an alternative to certain American Society of Mechanical Engineers (ASME) Code of Operation and Maintenance of Nuclear Power Plants (OM) Code requirements at Perry Nuclear Power Plant, Unit No. 1 (PNPP).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(a)(3)(i), the licensee requested to use an alternative on the basis that it provides an acceptable level of quality and safety. The proposed alternative, contained in request VR-1, Revision 1, provides reasonable assurance that the hydraulic control unit valves, 1C11-126, 1C11-127, 1C11-114, and 1C11-115, are operationally ready. The alternative would authorize the licensee to have 177 Category B scram inlet and exhaust valves and 177 Category C scram discharge and charging water header check valves tested on the frequency identified in the Technical Specifications for the facility, in lieu of the ASME Code for Operation and OM Code requirements. All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject request for relief remain applicable.

The NRC staff has reviewed the licensee's request and concludes, as set forth in the enclosed safety evaluation, that PNPP has adequately addressed all of the regulatory requirements set forth in 10 CFR, Section 50.55a(a)(3)(i), and is in compliance with the requirements of the ASME OM Code. Therefore, the NRC staff authorizes the alternative in request, VR-1, Revision 1, for the remainder of the third 10-year inservice testing program interval for PNPP.


V. Kaminskas

- 2 -

If you have any questions, please contact the PNPP Project Manager, Michael Mahoney, at 301-415-3867 or via e-mail at [Michael.Mahoney@nrc.gov](mailto:Michael.Mahoney@nrc.gov).

The NRC staff's Safety Evaluation is enclosed.

Sincerely,

A handwritten signature in black ink, appearing to read "Jacob I. Zimmerman". The signature is fluid and cursive, with the first name "Jacob" being the most prominent.

Jacob I. Zimmerman, Chief  
Plant Licensing Branch III-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. STN 50-440

Enclosure:  
Safety Evaluation

cc w/encl: Distribution via Listserv



UNITED STATES  
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO REQUEST VR-1, REVISION 1, FOR THE THIRD 10-YEAR INTERVAL  
INSERVICE TESTING PROGRAM  
FIRSTENERGY NUCLEAR OPERATING COMPANY  
PERRY NUCLEAR POWER PLANT, UNIT NO. 1  
DOCKET NO: STN 50-440

1.0 INTRODUCTION

By letter to the U.S. Nuclear Regulatory Commission (NRC), dated October 16, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112900204), FirstEnergy Nuclear Operating Company (FENOC, the licensee), submitted a request to the NRC for the use of an alternative to certain American Society of Mechanical Engineers (ASME) Code of Operation and Maintenance of Nuclear Power Plants (OM) Code requirements. The alternative, VR-1, Revision 1, would authorize the licensee to have 177 Category B scram inlet and exhaust valves and 177 Category C scram discharge and charging water header check valves tested on the frequency identified in the Technical Specifications (TSs) for the facility for the remainder of the third 10-year inservice testing (IST) program interval.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(i), the licensee requested to use the proposed alternative in VR-1, Revision 1, on the basis that the alternative provides an acceptable level of quality and safety.

2.0 REGULATORY EVALUATION

Section 50.55a(f) of 10 CFR, "Inservice Testing Requirements," requires, in part, that IST of certain ASME Code Class 1, 2, and 3, components must meet the requirements of the ASME OM Code and applicable addenda, except where alternatives have been authorized or relief has been granted by the NRC pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a.

In proposing alternatives or requesting relief, a licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety (10 CFR 50.55a(a)(3)(i)); (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety (10 CFR 50.55a(a)(3)(ii)); or (3) conformance is impractical for the facility (10 CFR 50.55a(f)(6)(i)). Section 50.55a allows the NRC to authorize alternatives and grant relief from ASME OM Code requirements upon making necessary findings.

PNPP's third 10-year IST program interval began on May 18, 2009, and is currently scheduled to end on May 17, 2019. The applicable ASME OM Code Edition and Addenda for PNPP is the 2001 Edition through the 2003 Addenda.

The NRC's findings with respect to authorizing VR-1, Revision 1, are given below:

### 3.0 TECHNICAL EVALUATION

#### ASME OM Code Requirements

STC-3510, "Exercising Test Frequency", states that, "Active Category A, Category B, and Category C check valves shall be exercised nominally every three months, except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3560, ISTC-5221, and ISTC-5222. Power-operated relief valves shall be exercise tested once per fuel cycle."

ISTC-5131(a), "Valve Stroke Testing", states that, "Active valves shall have their stroke times measured when exercised in accordance with ISTC-3500."

ISTC-5221(a), "Valve Obturator Movement" states that, "The necessary valve obturator movement during exercise testing shall be demonstrated by performing both an open and a close test."

#### Licensee's Proposed Alternative VR-1, Revision 1

Alternative testing was requested for the following hydraulic control unit (HCU) valves (typical of 177 HCU's):

- 1C11-126 - Scram Inlet Valve (Class 2, Category B)
- 1C11-127 - Scram Exhaust Valve (Class 2, Category B)
- 1C11-114 - Scram Discharge Header Check Valve (Class 2, Category C)
- 1C11-115 - Charging Water Header Check Valve (Class 2, Category C)

The licensee states:

These valves operate as an integral part of their respective HCU (typical of 177) to rapidly insert the control rods into the core in support of the reactor scram function. Specifically:

Scram Inlet Valve (1C11-126) has a safety function to open and supply pressurized water to the bottom of the control rod drive piston to rapidly insert the control rod into the core.

Scram Exhaust Valve (1C11-127) has a safety function to open and vent water from above the control rod drive piston to the scram discharge header allowing control rod movement during the scram.

Scram Discharge Header Check Valve (1C11-114) has a safety function to close and prevent reverse flow from the scram discharge header back to the top of the control rod drive piston; during the scram, this check valve has a safety function to open and allow water from above the control rod drive piston to flow into the scram discharge header (with 1C11-127 open) allowing control rod movement.

Charging Water Header Check Valve (1C11-115) has a safety function to close and prevent the loss of water pressure in the event supply pressure to the scram accumulator is lost; during the scram, this check valve opens to allow flow to the bottom of the control rod drive piston (with 1C11-126 open).

Reason for Request:

The NRC granted relief from the requirements of the ASME OM Code, Paragraphs ISTC-5131 and ISTC-5221, at PNPP, based on Request VR-1, Revision 0, in an NRC safety evaluation (SE) dated October 22, 2009 (ADAMS Accession No. ML092890032).

On May 19, 2011, the NRC issued Amendments 156 and 157, for the PNPP TSs that modified the scram time surveillance testing frequency requirements of TS 3.1.4, "Control Rod Scram Times" from 120 days cumulative operation in MODE 1 to 200 day's cumulative operation in MODE 1 (ADAMS Accession Nos. ML111060269 and ML11105A038, respectively). Approval of this proposed alternative to ISTC-3510, as described in VR-1, Revision 1, will align the testing frequencies of the specified ASME code components to the frequencies stated within TS 3.1.4 and TS Surveillance Requirements (SRs), SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3 and SR 3.1.4.4.

The pneumatically operated scram inlet and exhaust valves full-stroke in milliseconds and are not provided with suitable position indication; therefore, to measure stroke times as required by ISTC-5131(a), special test methods or test equipment would be required.

The check valves are not provided with position indication; therefore, to determine if the obturator has traveled to the proper position as required by ISTC-5221(a), special test methods or test equipment would be required.

Approval of this proposed alternative would make the third 10-year IST program consistent with NUREG-1482, Revision 1, "Guidelines for Inservice Testing at water power plants," Section 4.4.6.

Proposed Alternative and Basis for Use:

As discussed in NUREG-1482, Revision 1, Section 4.4.6, the rod scram test frequency identified in the TSs for a facility may be used as the valve testing frequency to minimize rapid reactivity transients and wear of the control rod drive mechanisms. Verifying that the associated control rod meets the scram insertion time limits defined in the TSs can be an acceptable alternative method of detecting degradation of these valves.

The provisions of this request provide a reasonable alternative to the ISTC-3510, ISTC-5131(a) and ISTC-5221(a) ASME OM Code requirements. The proposed method of detecting valve

degradation provides reasonable assurance of the operational readiness of each valve, provides an acceptable level of quality and safety for monitoring the valves, and ensures the valves are capable of performing their control rod drive safety functions.

The TS 3.1.4 SRs place conservative limits on the control rod insertion times, ensuring the necessary quality of the control rod drive system and its components are maintained. Therefore, scram insertion timing per the requirements of SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3 and SR 3.1.4.4, including test frequencies, shall be substituted for individual valve testing. For check valves 1C11-114 and 1C11-115, this includes only open direction testing.

#### NRC Staff Evaluation

By letter dated November 18, 2008 (ADAMS Accession No. ML083370198), FENOC submitted relief request VR-1, Revision 0. Specifically, the licensee requested relief from the requirements of ASME OM Code 2001 Edition through OMB-2003 Addenda, Paragraphs ISTC-5131(a) and ISTC-5221(a) for the control rod drive (CRD) HCU scram valves, 1C11-126 and 1C11-127, and scram discharge header and charging water header check valves, 1C11-114 and 1C11-115 associated with the 177 HCUs. The basis for requesting VR-1, Revision 0 was:

- a. The scram inlet and exhaust valves were not provided with suitable position indication; therefore, measuring the full stroke time in accordance with ISTC-5131(a) would require a special test method and/or test equipment
- b. The check valves were not provided with position indication; therefore, to determine if the obturator has traveled to the proper position as required by ISTC-5221(a) would require a special test method and/or test equipment

The licensee also requested that the scram inlet and exhaust valves and check valves were tested at the frequency designated in TS SR 3.1.4.1 and SR 3.1.4.2, in lieu of every three months, as required by Paragraph ISTC-3510 of the ASME OM Code.

Request VR-1, Revision 0, proposed an alternative to verify proper operation of HCU valves by completion of TS SR 3.1.4.1 which required the scram time for all control rods to be verified prior to thermal power exceeding 40 percent of rated thermal power after each reactor shutdown greater than or equal to 120 days. In addition, TS SR 3.1.4.2 required testing of a representative sample of the control rods at least once per 120 days of operation in MODE 1. The TS SRs assured that the necessary quality of the system and components were maintained.

The Safety Evaluation (SE) (ADAMS Accession No. ML092890032) completed by the NRC staff for VR-1, Revision 0, granted the request from FENOC. The SE stated that the proposed alternative was consistent with the NRC staff position in NUREG-1482, Revision 1, Section 4.4.6, and would therefore provide reasonable assurance of the operational readiness of the CRD valves. After the relief requested by VR-1, Revision 0, was granted, FENOC requested and the NRC approved a change to TS SR 3.1.4.2 that extended the SR testing frequency from 120 to 200 days.

Request VR-1, Revision 1, was initiated due to the fact that PNPP TS SR 3.1.4.2 changed and request VR-1, Revision 0, was granted based on TS SR 3.1.4.2 testing a representative sample of control rods at least once per 120 days of operation in MODE 1. None of the other conditions or attributes noted in Revision 0 of the VR-1 request changed. The change of test interval from 120 days to 200 days does not impact the basis that was used by the NRC in developing the SE for granting the relief requested in VR-1, Revision 0. Requiring exercise testing of the scram inlet and exhaust valves and check valves every three months represents a hardship or unusual difficulty without an increase in the level of quality and safety since these valves can be adequately tested during the scram time testing per the SRs for TS 3.1.4. The proposed alternative in request VR-1, Revision 1, provides reasonable assurance that the valves are operationally ready and remains consistent with the staff position in NUREG-1482, Revision 1, and Section 4.4.6.

#### 4.0 CONCLUSION

Based on the above evaluation, the NRC staff has determined that the proposed alternative in request VR-1, Revision 1, provides reasonable assurance that the HCU valves, 1C11-126, 1C11-127, 1C11-114, and 1C11-115, are operationally ready. All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject request for relief remain applicable. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i), and is in compliance with the requirements of the ASME OM Code.

Therefore, the NRC staff authorizes the alternative in request, VR-1, Revision 1, for the remainder of the third 10-year IST program interval for PNPP, which began on May 18, 2009, and is currently scheduled to end on May 17, 2019.

Principle Contributor: Michael Farnan

Date of issuance: February 22, 2012

V. Kaminskas

- 2 -

If you have any questions, please contact the PNPP Project Manager, Michael Mahoney, at 301-415-3867 or via e-mail at [Michael.Mahoney@nrc.gov](mailto:Michael.Mahoney@nrc.gov).

The NRC staff's Safety Evaluation is enclosed.

Sincerely,

/RA/

Jacob I. Zimmerman, Chief  
Plant Licensing Branch III-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. STN 50-440

Enclosure:  
Safety Evaluation

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NRR-028

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