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June 21, 2018
L-18-104

10 CFR 50.55a

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

SUBJECT:
Perry Nuclear Power Plant
Docket No. 50-440, License No. NPF-58
10 CFR 50.55a Requests in Support of the Fourth 10-Year In-Service Testing Interval

In accordance with 10 CFR 50.55a, Nuclear Regulatory Commission (NRC) review and approval is requested for five separate proposed alternatives to certain requirements associated with the In-Service Testing Program (ISTP) for the Perry Nuclear Power Plant. Enclosures A through E identify the affected components, the applicable code requirements, the reason for the requests, the proposed alternatives and basis for use, and the duration for each of the 10 CFR 50.55a requests.

The alternatives are proposed for use during the fourth ten-year ISTP interval, which begins on May 18, 2019. FENOC requests approval of the proposed alternatives by May 17, 2019, to coincide with the beginning of the fourth ten-year ISTP interval.

There are no regulatory commitments contained in this submittal. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager - Nuclear Licensing & Regulatory Affairs, at 330-315-6810.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 21, 2018.

Sincerely,

David B. Hamilton

Enclosures:

A. Perry Nuclear Power Plant, 10 CFR 50.55a Request Number PR-1
B. Perry Nuclear Power Plant, 10 CFR 50.55a Request Number PR-2
C. Perry Nuclear Power Plant, 10 CFR 50.55a Request Number SR-1
D. Perry Nuclear Power Plant, 10 CFR 50.55a Request Number VR-1
E. Perry Nuclear Power Plant, 10 CFR 50.55a Request Number VR-2

cc: NRC Region III Administrator
NRC Resident Inspector
NRC Project Manager

L-18-104
Enclosure A

Perry Nuclear Power Plant
10 CFR 50.55a Request PR-1
(3 pages follow)

Proposed Alternative
in Accordance with 10 CFR 50.55a(z)(1)

–Alternative Provides Acceptable Level of Quality and Safety–

1. ASME Code Component(s) Affected

Pump ID	Pump Description	Code Class	Pump Group
1E12-C003	Residual Heat Removal (RHR) Waterleg Pump	2	A
1E21-C002	Low Pressure Core Spray (LPCS) Waterleg Pump	2	A
1E22-C003	High Pressure Core Spray (HPCS) Waterleg Pump	2	A
1E51-C003	Reactor Core Isolation Cooling (RCIC) Waterleg Pump	2	A

The waterleg pumps maintain the discharge piping of safety-related systems full to expedite flow during initiation and minimize the likelihood of system damage due to water hammer.

2. Applicable Code Edition

American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) 2012 Edition.

3. Applicable Code Requirements

ISTB-3400, Frequency of Inservice Tests, states, "An inservice test shall be run on each pump as specified in Table ISTB-3400-1." Table ISTB-3400-1, Inservice Test Frequency, specifies that a Group A pump test shall be performed on a quarterly frequency.

ISTB-3300, Reference Values, states, in part, that:

> Reference values shall be obtained as follows: ... (e)(2) Reference values shall be established at the comprehensive pump test flow rate for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate.

ISTB-5121, Group A Test Procedure and sub-paragraphs (b) and (c), state, in part, that:

> Group A tests shall be conducted with the pump operating as close as practical to the specified reference point and within the variances from the reference point as described in this paragraph. The test parameters shown in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph. The test shall be conducted as follows:

(b) The resistance of the system shall be varied until the flow rate is as close as practical to the reference point with the variance not to exceed +2% or −1% of the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure is as close as practical to the reference point with the variance not to exceed +1% or −2% of the reference point and the flow rate determined and compared with the reference flow rate.

(c) Where it is not practical to vary system resistance, flow rate and pressure shall be determined and compared to their respective reference values.

4. Reason for Request

The waterleg pumps are designed to remain in service during operation at power to ensure the emergency standby systems are maintained pressurized to reduce the likelihood of water hammer. The waterleg pumps run continuously, with flow established through a recirculation line, in order to provide enough head to keep the applicable system's discharge piping full to the highest elevation. During comprehensive pump testing, the waterleg pump normal discharge path must be redirected through drain lines to provide enough flow to establish the applicable flow values. This requires taking the system out of service and racking out safety-related pump breakers for the RHR, LPCS, and HPCS systems or isolating the RCIC system pump to prevent potential system damage due to water hammer or cavitation upon receipt of an auto actuation signal.

Quarterly full flow testing of the listed safety-related waterleg pumps would result in the inoperability of its associated emergency core cooling system (ECCS) without a compensating increase in the level of quality or safety.

5. Proposed Alternative and Basis for Use

The waterleg pumps shall be monitored at their normal operational flowrate on a quarterly basis by observing pump discharge pressure and bearing vibration. These parameters will be evaluated to adequately assess the pump's performance. The pumps will be full flow tested each refueling outage in conjunction with the comprehensive pump test performed in accordance with the requirements specified in ISTB-5123, Comprehensive Test Procedure.

The ECCS is equipped with sensors that continuously monitor pump discharge pressure and provide an alarm in the main control room when the low pressure setpoint is reached. This will provide indication of a low pressure condition that could be indicative of a waterleg pump malfunction and allow operators to respond accordingly. In addition, each of these waterleg pump's supported system pump discharge header is verified to be filled with water in accordance with Technical Specifications Surveillance Requirement (SR) 3.5.1.1, SR 3.5.2.3 and SR 3.5.3.1, which also demonstrates proper waterleg pump performance. The proposed alternative is consistent with the guidance provided in NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," Revision 2, Section 5.11, *Waterleg Pumps*.

In conclusion, using the provisions as delineated in this proposed request provides a reasonable alternative to the Code requirements specified in ISTB-3400, ISTB-3300(e)(2), ISTB-5121, ISTB-5121(b) and ISTB-5121(c) for the waterleg pumps. This is based on the determination that the proposed alternative for monitoring the pumps will continue to provide reasonable assurance of the operational readiness of the waterleg pumps and, thereby, provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1).

6. Duration of Proposed Alternative

The proposed alternative identified in this request shall be utilized during the entire duration of the fourth ten-year IST interval, beginning May 18, 2019, and ending May 17, 2029.

7. Precedent

The Nuclear Regulatory Commission (NRC) approved a similar request (request PR-1) as described in Section 3.1 of the safety evaluation provided with the October 22, 2009 letter to FirstEnergy Nuclear Operating Company, Subject: Perry Nuclear Power Plant - Safety Evaluation of Relief Requests for Third 10-Year Pump and Valve Inservice Testing Program (TAC Nos. ME0191 through ME0198), (Accession No ML092890032).

L-18-104
Enclosure B

Perry Nuclear Power Plant
10 CFR 50.55a Request PR-2
(3 pages follow)

Proposed Alternative
in Accordance with 10 CFR 50.55a(z)(1)

–Alternative Provides Acceptable Level of Quality and Safety–

1. ASME Code Components Affected

Pump ID	Pump Description	Code Class	Pump Group
1E51-C001	Reactor Core Isolation Cooling Pump	2	B
P47-C001A & B	Control Complex Chilled Water Pumps	3	A
1R45-C001A, B, & C	Fuel Oil Transfer #1 Pumps	3	B
1R45-C002A, B, & C	Fuel Oil Transfer #2 Pumps	3	B

2. Applicable Code Edition

American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) 2012 Edition.

3. Applicable Code Requirements

ISTA-3130, Application of Code Cases, subparagraph ISTA-3130(b) states "Code Cases shall be applicable to the edition and addenda specified in the test plan."

ISTB-3000, General Testing Requirements, states, in part, "The parameters to be measured during preservice and inservice testing are specified in Table ISTB-3000-1."

Table ISTB-3000-1, Inservice Test Parameters, identifies the various parameters (pressure, flow rate, and vibration) measured during preservice, Group A, Group B, comprehensive, and pump periodic verification tests.

ISTB-3300, Reference Values, subparagraph ISTB-3300(e)(2) states, "Reference values shall be established at the comprehensive pump test flow rate for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate."

ISTB-3400, Frequency of Inservice Tests, states "An inservice test shall be run on each pump as specified in Table ISTB-3400-1."

Table ISTB-3400-1, Inservice Test Frequency, requires a Group A and Group B test to be performed quarterly and a comprehensive test to be performed biennially.

Table ISTB-3510-1, Required Instrument Accuracy, provides the required accuracy percent (%) for Group A, Group B, comprehensive and preservice tests for the various parameters (pressure, flow rate, and vibration).

Table ISTB-5121-1, Centrifugal Pump Test Acceptance Criteria, provides the required acceptable, alert, and required action ranges for Group A, Group B, and comprehensive pump tests.

4. Reason for Request

ASME Code Case OMN-18, "Alternative Testing Requirements for Pumps Tested Quarterly within ± 20 % of Design Flow," is approved for use in Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability," Revision 2. Table 2 of the RG identifies the approved Code Case, with conditions. However, Code Case OMN-18 is only applicable through the 2006 Addenda of the OM Code and ISTA-3130(b) requires applicability to the Code edition cited in the test plan, which would be the 2012 Edition.

FirstEnergy Nuclear Operating Company (FENOC) is proposing this alternative for the affected Group A pumps (and the Group B pumps that are re-categorized as Group A pumps for testing) listed in Section 1 of this request.

The increased requirements imposed by the proposed alternative on the parameters to be monitored during every quarterly pump test and the more accurate instruments that must consistently be used during quarterly testing of Group A pumps (and the Group B pumps that are re-categorized as Group A pumps for testing), allows better trending of pump performance data due to the more consistent requirements for each of the quarterly tests.

Due to the increased requirements on the parameters imposed by the proposed alternative during quarterly tests, there is no added value in performing the biennial comprehensive test.

5. Proposed Alternative and Basis for Use

As an alternative to the ASME OM Code requirements in Section 3 for performing a comprehensive pump test, each of the pumps identified in Section 1 will have a modified Group A test performed each quarter in lieu of the biennial comprehensive pump test. This modified Group A pump testing would verify pump operational readiness on a quarterly frequency, thus, providing an acceptable level of quality and safety.

FENOC is proposing to use the provisions of Code Case OMN-18 and perform a modified quarterly Group A test in lieu of performing a biennial comprehensive test. The modified quarterly tests will utilize a test flow rate within 20% of pump design flow and the pressure instrumentation used during the quarterly tests will have an accuracy of at least 1/2%. This alternative testing is applicable to those pumps listed in Section 1.

Specifically,

a. Pumps tested quarterly using this alternative must be tested within +/- 20% of pump design flow, as required by Code Case OMN-18.

b. The proposed alternative requires the accuracy of instruments used during quarterly Group A tests to meet the more accurate pressure and differential pressure requirements listed for the comprehensive test in Table ISTB-3510-1 (an accuracy improvement from +/- 2% to +/- 1/2%). Consistent use of more accurate instruments during each quarterly test provides for improved Group A pump performance trend data evaluation.

c. Pumps that would normally be categorized as Group B pumps, but are re-categorized as Group A for testing, will be tested according to the provisions of this alternative. Due to the re-categorization from Group B to Group A, per Table ISTB-3000-1, additional vibration data will be obtained quarterly rather than once every two years for the affected pumps.

d. Use of this alternative provides for consistent acceptance criteria for pump flow and differential pressure tests. FENOC will utilize the Group A test acceptance criteria in Table ISTB-5121-1, except that the upper end values of the Group A acceptable ranges for flow and differential pressure will be 1.06 times the reference flow or 1.06 times the reference differential pressure, respectively. This revised upper end acceptance criteria is consistent with the RG 1.192, Revision 2, Table 2 condition associated with Code Case OMN-18. This modified Group A quarterly testing would be performed rather than the biennial comprehensive test.

e. The proposed testing will fulfill Division 1, Mandatory Appendix V, *Pump Periodic Verification Test Program*, requirements.

Relief from ISTA-3130(b) is requested to implement ASME Code Case OMN-18, since the Code Case applicability extends only through the 2006 Addenda. ISTA-3130(b) requires that Code Cases shall be applicable to the edition and addenda specified in the test plan. The ASME OM Code that will apply to the test plan is the 2012 Edition, with no Addenda. A review of the 2012 Edition of the OM Code and Code Case OMN-18 revealed there are no changes in the applicable Code sections referenced within the Code Case when comparing the 2006 Addenda to the 2012 Edition.

In conclusion, the proposed alternative to utilize the provisions of Code Case OMN-18 in performing a modified quarterly Group A test in lieu of performing a biennial comprehensive test for the subject pumps provides a reasonable alternative to the Code requirements specified in ISTB-3000, ISTB-3300(e)(2), ISTB-3400, Tables ISTB-3000-1, ISTB-3400-1, ISTB-3510-1, and ISTB-5121-1. This is based on the determination that the proposed alternative continues to provide reasonable assurance of the operational readiness of the pumps and provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1).

6. Duration of Proposed Alternative

The proposed alternative identified in this request shall be utilized during the entire duration of the fourth ten-year IST interval, beginning May 18, 2019, and ending May 17, 2029.

7. Precedence

The Nuclear Regulatory Commission (NRC) approved a similar request (request PR-3) as described in the safety evaluation provided with the October 8, 2009 letter to FirstEnergy Nuclear Operating Company, Subject: Perry Nuclear Power Plant, Unit No. 1 – Relief Request PR-3 for Third 10-Year Pump and Valve Inservice Testing Program (TAC No. ME0820), (Accession No ML092640690). There are a reduced number of components relief is being requested for between the current request and the third interval request.

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Enclosure C

Perry Nuclear Power Plant
10 CFR 50.55a Request SR-1
(2 pages follow)

Proposed Alternative
In Accordance with 10 CFR 50.55a(z)(1)

- Alternative Provides Acceptable Level of Quality and Safety -

1. ASME Code Component(s) Affected

Snubbers within the scope of the Perry Nuclear Power Plant (PNPP) Inservice Testing (IST) Program.

2. Applicable Code Edition

American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) 2012 Edition.

3. Applicable Code Requirement(s)

ISTA-3130, Application of Code Cases, subparagraph (b) states, "Code Cases shall be applicable to the edition and addenda specified in the test plan."

ISTD-4252, Subsequent Examination Intervals, subparagraph (c) states, "The duration of examination intervals following the completion of the second refueling outage shall be in accordance with Table ISTD-4252-1."

4. Reason for Request

ASME has approved Code Case OMN-13, Revision 2, which provides alternative rules for establishing the intervals for the visual examination of snubbers. This Code Case is unconditionally approved for use in Regulatory Guide (RG) 1.192, Operation and Maintenance Code Case Acceptability, ASME OM Code, Revision 2. However, Code Case OMN-13 is only applicable to the 1995 Edition through 2011 Addenda of the OM Code. During the fourth ten-year IST interval, PNPP will be implementing the ASME OM Code 2012 Edition and proposes to implement Code Case OMN-13, Revision 2, for snubbers.

5. Proposed Alternative and Basis for Use

An alternative to ISTA-3130(b) is proposed to implement Code Case OMN-13, "Performance-Based Requirements for Extending Snubber Inservice Visual Examination Intervals at LWR Power Plants," Revision 2, since the Code Case indicates applicability through the OM-2011 Addenda and adherence to ISTA-3130(b) would require applicability to the OM-2012 Edition. A review of the ASME OM-2012 Edition and Code Case OMN-13, Revision 2, confirmed that there are no changes in the applicable Code sections referenced within the Code Case when comparing the OM-2011 Addenda to the OM-2012 Edition.

By using Code Case OMN-13, Revision 2, PNPP will be able to alter the visual examination intervals required by paragraph ISTD-4252(c) of the 2012 Edition of the ASME OM Code. ISTD-4252(c) requires each snubber within scope of ISTA-1100 be visually examined in accordance with Table ISTD-4252-1 on a frequency not to exceed 48 months. This Code

Case establishes specific requirements that must be met in order to allow extension of the visual examination interval to once every 10 years if the licensee can demonstrate that the requirements of paragraphs 3.1 through 3.6 of Code Case OMN-13 have been met for one interval in addition to service life monitoring requirements of ISTD-6000. In addition, specific requirements of paragraphs 3.7 and 3.8 will be met for the fourth interval.

Specific requirements of Code Case OMN-13 include:

- Examination for Indications of Degradation or Severe Operating Environments
- Examination Prior to Maintenance or Testing
- Examination Corrective Action
- Frequency of Examinations
- Monitoring of Reservoir Fluid Level
- Review of Operational Readiness Test Data
- Examination During Disassembly
- Transient Dynamic Event Service Life Evaluation

PNPP has met these requirements for the third IST interval to provide equivalent assurance that snubbers remain visually acceptable to perform their safety function.

RG 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 2, Table 1, Acceptable OM Code Cases, lists Code Case OMN-13, Revision 2 (2012 Edition) as acceptable to the NRC for application in a licensee's IST program without conditions.

Using the provisions of this request as an alternative to the requirements of ISTA-3130(b), will provide adequate detection of observable snubber degradation, and, along with the testing and service life monitoring requirements of Subsection ISTD, will continue to provide reasonable assurance of the operational readiness of the PNPP snubbers. Therefore, the proposed alternative provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1).

6. Duration of Proposed Alternative

The proposed alternative identified in this request shall be utilized during the entire fourth ten-year IST interval, beginning May 18, 2019, and ending May 17, 2029.

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Enclosure D

Perry Nuclear Power Plant
10 CFR 50.55a Request VR-1
(3 pages follow)

Proposed Alternative
in Accordance with 10 CFR 50.55a(z)(1)

–Alternative Provides Acceptable Level of Quality and Safety–

1. ASME Code Component(s) Affected

Category B Valves (Typical of 177)

1C11-126, Scram Inlet Valve (Class 2)
1C11-127, Scram Exhaust Valve (Class 2)

Category C Valves (Typical of 177)

1C11-114, Scram Discharge Header Check Valve (Class 2)
[OPEN direction only]
1C11-115, Charging Water Header Check Valve (Class 2)
[OPEN direction only]

These valves operate as an integral part of their respective hydraulic control unit to rapidly insert the control rods in support of a scram function.

2. Applicable Code Edition

American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) 2012 Edition.

3. Applicable Code Requirements

ISTC-3510, Exercising Test Frequency, states, in part, that "Active... Category B, and Category C check valves shall be exercised nominally every 3 mo, except as provided by paras. ISTC-3520, ..."

ISTC-3521, Exercising Requirements, Category A and Category B Valves, paragraph (a) states, "full-stroke exercising of Category A and Category B valves during operation at power to the position(s) required to fulfill its function(s)."

ISTC-3522, Exercising Requirements; Category C Check Valves, paragraph (a) states, "During operation at power, each check valve shall be exercised or examined in a manner that verifies obturator travel by using the methods in para. ISTC-5221."

ISTC-5131, Pneumatically Operated Valves; Valve Stroke Testing, paragraph (a) states, "Active valves shall have their stroke times measured when exercised in accordance with para. ISTC-3500."

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

4. Reason for Request

The affected subject valves have a safety function of ensuring rod insertion during a reactor scram. For example, scram inlet valve 1C11-126 opens to supply pressurized water to the bottom of the control rod drive (CRD) piston to rapidly insert the control rod into the core. Scram exhaust valve 1C11-127 opens to vent water from above the CRD piston to the scram discharge header allowing the 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 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). Check valve 1C11-115 can only be verified closed by securing the CRD pumps and monitoring depressurization of the charging water header. Securing the CRD pumps would result in a loss of cooling water to the reactor recirculation pumps and all the CRD mechanisms, which would be burdensome due to the potential for equipment damage or reactor scram.

The valves listed in Part 1 of this request do not have direct position indication; therefore, to measure stroke times and proper position as required by the Code, special test methods or test equipment would be required. Additionally, exercising these valves more frequently than required by Technical Specifications (TS) could result in a plant trip, which is burdensome without a compensating increase in the level of quality and safety.

5. Proposed Alternative and Basis for Use

As discussed in NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," Revision 2, Section 4.4.6, the rod scram test frequency identified in the plant TS may be used as the valve testing frequency to minimize rapid reactivity transients and unnecessary wear of the CRD mechanisms. Furthermore, verifying that the associated control rod meets the scram insertion time limits defined in the TS can be an acceptable alternative method of detecting degradation of these valves in lieu of valve stroke measurement.

The TS 3.1.4 surveillances 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, FirstEnergy Nuclear Operating Company requests scram insertion timing per the requirements of Surveillance Requirement (SR) 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3 and SR 3.1.4.4, including their test frequencies, be substituted for individual valve testing. For the check valves listed in Part 1 of this request, this includes only open direction testing.

Using the provisions of this proposed request provides a reasonable alternative to the Code requirements delineated in ISTC-3510, ISTC-3521, ISTC-3522, ISTC-5131 and ISTC-5221. This proposed alternative method of detecting valve degradation provides reasonable

assurance of the valves' operational readiness. Therefore, the proposed alternative provides an acceptable level of quality and safety.

6. Duration of Proposed Alternative

The proposed alternative shall be utilized during the entire fourth ten-year IST interval, beginning May 18, 2019, and ending May 17, 2029.

7. Precedent

The Nuclear Regulatory Commission (NRC) approved a similar request (request VR-1) as described in the safety evaluation provided with the February 22, 2012 letter to FirstEnergy Nuclear Operating Company, Subject: Perry Nuclear Power Plant, Unit No. 1, Re: Safety Evaluation by the Office of Nuclear Regulation Related to Request VR-1, Revision 1, for the Third 10-Year Interval Inservice Testing Program (TAC No. ME7380), (Accession No ML120370477).

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Enclosure E

Perry Nuclear Power Plant
10 CFR 50.55a Request VR-2
(3 pages follow)

Proposed Alternative
in Accordance with 10 CFR 50.55a(z)(1)

–Alternative Provides Acceptable Level of Quality and Safety–

1. ASME Code Components Affected

VALVE	DESCRIPTION	CLASS
1B21-F041A	Dikkers Valve – Automatic Depressurization System (ADS)	1
1B21-F041B	Dikkers Valve – ADS	1
1B21-F041C	Dikkers Valve	1
1B21-F041D	Dikkers Valve	1
1B21-F041E	Dikkers Valve – ADS	1
1B21-F041F	Dikkers Valve – ADS	1
1B21-F041G	Dikkers Valve	1
1B21-F041K	Dikkers Valve	1
1B21-F047B	Dikkers Valve	1
1B21-F047C	Dikkers Valve	1
1B21-F047D	Dikkers Valve – ADS	1
1B21-F047F	Dikkers Valve – Low Level Setpoint (LLS)	1
1B21-F047G	Dikkers Valve	1
1B21-F047H	Dikkers Valve – ADS	1
1B21-F051A	Dikkers Valve – LLS	1
1B21-F051B	Dikkers Valve – LLS	1
1B21-F051C	Dikkers Valve – ADS / LLS	1
1B21-F051D	Dikkers Valve – LLS	1
1B21-F051G	Dikkers Valve – ADS / LLS	1

2. Applicable Code Edition

ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) 2012 Edition.

3. Applicable Code Requirement(s)

ISTA-3130, Application of Code Cases, subparagraph (b), states, "Code Cases shall be applicable to the edition and addenda specified in the test plan."

Mandatory Appendix I, Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants, Section I-1320, Test Frequencies, Class 1 Pressure Relief Valves, paragraph (a), *5-Year Test Interval*, states, in part, that:

> Class 1 pressure relief valves shall be tested at least once every 5 yr, starting with initial electric power generation. ...a minimum of 20% [percent] of the valves from each valve group shall be tested within any 24-mo interval. This 20% shall consist of valves that have not been tested during the current 5-yr interval, if they exist. The test interval for any installed valve shall not exceed 5 yr. The 5-yr test interval shall begin from the date of the as-left set pressure test for each valve.

4. Reason for Request

The nuclear boiler system provides reactor pressure vessel (RPV) overpressurization protection by opening the safety/relief valves (SRVs). The SRVs open at their reactor pressure setpoint. Pressure in the vessel is thereby maintained below the American Society of Mechanical Engineers (ASME) Code required limit.

In addition to the above, the ADS and the individual SRVs are capable of being manually operated from the main control room. This provides the capability to manually depressurize the RPV in the event the main condenser is not available as a heat sink.

The nuclear boiler system ADS provides automatic depressurization of the RPV under certain small break loss of coolant accident (LOCA) conditions so that the low pressure emergency core cooling systems (ECCS) can adequately cool the core. The SRVs, those used for ADS as well as those assigned purely for pressure relief, are used for overpressure protection and work together to ensure that the ASME Code limit is not exceeded.

Perry Nuclear Power Plant (PNPP) license amendment number 115 approved a transition from an 18-month fuel cycle to a 24-month fuel cycle. Prior to transitioning to the 24-month fuel cycle, ASME Code requirements could be satisfied by removing and testing approximately one-third of the 19 SRVs each refueling outage in order to comply with the 5-year test interval requirements for Class 1 pressure relief valves imposed by the Code of Record during that time. Since transitioning to the 24-month fuel cycle, FirstEnergy Nuclear Operating Company (FENOC) would have to remove at least one-half of the subject relief valves each refueling outage for testing in order to satisfy the requirements of Appendix I.

The removal of half of the 19 valves versus a third of the valves each outage requires the removal of additional insulation, instrumentation, and other interferences. This additional work results in an undesirable increase in radiation exposure to maintenance personnel.

To provide a technical basis for the proposed alternative, FENOC reviewed the setpoint testing results for the time period from initial operation to the present time (approximately 30 years). There have been five as-found testing failures. Three of those failures involved exceeding the setpoint criteria. Two of the five failures had no as-found setpoint data obtained, due to severe seat leakage. With approximately 186 data points included in this review, the failure rate of the SRVs, at less than three percent, is considered minimal.

FENOC maintains and rotates two individual complete valve assemblies for each SRV application. Historical test results show that the current maintenance and rotation strategy is effective at preventing any age-related failure mechanism.

The ASME OM Committee developed Code Case OMN-17, Alternative Rules for Testing ASME Class 1 Pressure Relief/Safety Valves, which is published in the 2012 Edition of the OM Code. Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 2, Table 1 identifies Code Case OMN-17 as an acceptable Code Case. However, the inquiry and reply within Code Case OMN-17 indicates that its applicability to the OM Code is to the 2001 Edition through the 2006 Addenda of Appendix I, Section I-1320. ISTA-3130(b) requires Code Cases to be applicable to the Edition and addenda specified in the test

plan, which would be the 2012 Edition. Therefore, prior NRC approval is needed to use Code Case OMN-17 for testing of the subject relief valves.

5. Proposed Alternative and Basis for Use

As an alternative to the Code required five-year test interval per Appendix I, paragraph I-1320(a), FENOC proposes that the subject Class 1 pressure relief valves be tested at least once every three refueling cycles (approximately 72 months) with a minimum of 20% of the valves tested within any 24-month interval. This 20% would consist of valves that have not been tested during the current three-cycle interval, if they exist. The test interval for any individual valve would not exceed 72 months, except that a 6-month grace period is allowed to coincide with refueling outages to accommodate extended shutdown periods. Prior to placing these valves in service, the valves shall be disassembled and inspected after as-found set-pressure testing to verify that parts are free of defects resulting from time-related degradation or service-induced wear. As-left set-pressure testing shall be performed following maintenance and prior to returning the valve to service . Each valve shall have been disassembled and inspected at least once during the 72-month test interval. Disassembly and inspections performed prior to the implementation of this alternative may be used.

Relief from ISTA-3130(b) is requested to implement Code Case OMN-17, since inquiry and reply within the Code Case indicates that its applicability is to the 2001 Edition through the 2006 Addenda of Appendix I. ISTA-3130(b) requires Code Cases to be applicable to the Edition and addenda specified in the test plan. The ASME OM Code that will apply to the test plan is the 2012 Edition with no Addenda. A review of the 2012 Edition of the OM Code and Code Case OMN-17 confirmed that there are no changes that would affect use of this Code Case relative to the applicable Code section referenced within the Code Case when comparing Appendix I of the 2001 Edition through the 2006 Addenda to Appendix I of the 2012 Edition.

The proposed alternative of increasing the test interval for the subject Class 1 pressure relief valves from five years to three fuel cycles (approximately 72 months) would continue to provide an acceptable level of quality and safety. This proposed alternative meets the requirements stated in Code Case OMN-17, which is approved for use in RG 1.192, Revision 2. The proposed alternative will continue to provide assurance of the valves' operational readiness and provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1).

6. Duration of Proposed Alternative

The proposed alternative identified in this request shall be utilized during the entire fourth ten-year IST interval, beginning May 18, 2019, and ending May 17, 2029.

7. Precedence

The Nuclear Regulatory Commission (NRC) approved a similar request (request VR-6) as described in the safety evaluation provided with the October 22, 2009 letter to FirstEnergy Nuclear Operating Company, Subject: Perry Nuclear Power Plant - Safety Evaluation of Relief Requests for Third 10-Year Pump and Valve Inservice Testing Program (TAC Nos. ME0191 through ME0198), (Accession No ML092890032).