



FirstEnergy Nuclear Operating Company

Beaver Valley Power Station
P.O. Box 4
Shippingport, PA 15077

Richard D. Bologna
Site Vice President

724-682-5234
Fax: 724-643-8069

March 15, 2018
L-18-017

10 CFR 50.72

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

SUBJECT:

Beaver Valley Power Station, Unit Nos. 1 and 2
Docket No. 50-334, License No. DPR-66
Docket No. 50-412, License No. NPF-73
Request to Extend Enforcement Discretion Provided in Enforcement Guidance
Memorandum 15-002 for Tornado-Generated Missile Protection Non-Conformances
Identified in Response to Regulatory Issue Summary 2015-06, "Tornado Missile
Protection"

REFERENCES:

1. Nuclear Regulatory Commission (NRC) Regulatory Issues Summary 2015-06, *Tornado Missile Protection*, dated June 10, 2015 (ADAMS Accession Number ML15020A419)
2. NRC Memorandum, Enforcement Guidance Memorandum 15-002, *Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance*, dated June 10, 2015 (ADAMS Accession Number ML15111A269)
3. NRC Memorandum, *Enforcement Guidance Memorandum 15-002, Revision 1: Enforcement Discretion for Tornado-Generated Missile Protection Non-Compliance*, dated February 7, 2017 (ADAMS Accession Number ML16355A286)
4. NRC Interim Staff Guidance DSS-ISG-2016-01, *Clarification of Licensee Actions in Receipt of Enforcement Discretion Per Enforcement Guidance Memorandum EGM 15-002, "Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance," Revision 1*, dated November 2017 (ADAMS Accession Number ML17128A344)

In Reference 1, the NRC issued Regulatory Issues Summary (RIS) 2015-06, "Tornado Missile Protection," to, in part, remind licensees of the need to conform with a plant's current, site-specific licensing basis for tornado-generated missile protection.

In Reference 2, the NRC provided in Enforcement Guidance Memorandum (EGM) 2015-002 guidance to exercise enforcement discretion when an operating power reactor licensee does not comply with a plant's current site-specific licensing basis for tornado-generated missile protection. The NRC would exercise this enforcement discretion only if a licensee implements initial compensatory measures to provide additional protection, followed by more comprehensive, long-term compensatory measures implemented within 60 days of issue discovery. The enforcement discretion would expire three years after issuance of RIS 2015-06 (dated June 10, 2015) for plants of higher tornado missile risk (Group A Plants) and five years after RIS issuance for plants of a lower tornado missile risk (Group B Plants.) The EGM categorizes Beaver Valley Power Station as a Group A plant.

In Reference 3, the NRC issued Revision 1 of EGM 2015-002 to state that licensees may request an extension to their enforcement discretion expiration date if proper justification is provided. This extension would be granted on a case-by-case basis and would remain in place until compliance is achieved.

In accordance with the revised EGM 2015-002, Revision 1, FirstEnergy Nuclear Operating Company (FENOC) hereby requests that the NRC extend the expiration date for the period of enforcement discretion for Beaver Valley Power Station (BVPS) from June 10, 2018 to June 10, 2020.

FENOC has completed a comprehensive assessment for BVPS and has identified non-conforming conditions (NCCs) regarding tornado missile protection requirements that affect the operability of structures, systems or components addressed in the BVPS Technical Specifications. A summary of the assessment methodology, scope, and results is provided in the attachment.

The non-conforming conditions have been documented in the FENOC corrective action program in accordance with FENOC procedures, and all required notifications have been completed, as discussed in the attachment.

Consistent with the guidance provided in NRC Interim Staff Guidance DSS-ISG-2016-01 (Reference 4), initial and long-term compensatory measures have been implemented for the BVPS NCCs, as described in the attachment. Additionally, a collective review of the comprehensive compensatory measures currently in place, including expected operator actions in response to severe weather and a subsequent loss of offsite power, has been performed to confirm that the site can perform these compensatory measures and operator actions in an effective manner.

Beaver Valley Power Station, Unit Nos. 1 and 2

L-18-017

Page 3

These compensatory measures will remain in place until the non-conformances are resolved.

The requested enforcement discretion due date extension would provide FENOC sufficient time to address the non-conforming conditions and achieve compliance. FENOC has concluded that there is no undue risk associated with the requested extension.

FENOC requests NRC approval of this enforcement discretion date extension by May 8, 2018.

There are no regulatory commitments included in this submittal. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager - Fleet Licensing, at (330) 315-6810.

Sincerely,

A handwritten signature in black ink, appearing to read "R. D. Bologna". The signature is fluid and cursive, written over a white background.

Richard D. Bologna

Attachment:

Justification for Request to Extend the Expiration Date for Enforcement Discretion Regarding Tornado Missile Protection Requirements for the Beaver Valley Power Station

cc: NRC Region I Administrator
NRC Resident Inspector
NRC Project Manager
Director BRP/DEP
Site BRP/DEP Representative

Attachment
L-18-017

Justification for Request to Extend the Expiration Date for Enforcement Discretion
Regarding Tornado Missile Protection Requirements for the Beaver Valley Power Station

Page 1 of 14

1. Introduction

This attachment provides the justification for the FirstEnergy Nuclear Operating Company (FENOC) request to extend the expiration date for enforcement discretion regarding tornado missile protection requirements for the Beaver Valley Power Station.

In Reference 1, the NRC issued Regulatory Issue Summary (RIS) 2015-06, "Tornado Missile Protection," to, in part, remind licensees of the need to conform with a plant's current, site-specific licensing basis for tornado-generated missile protection.

In Reference 2, The NRC provided in Enforcement Guidance Memorandum (EGM) 2015-002 guidance to exercise enforcement discretion when a licensee does not comply with a plant's current site-specific basis for tornado-generated missile protection. EGM 2015-002 identified BVPS as a higher tornado missile risk site (Group A), resulting in an enforcement discretion expiration date of June 10, 2018.

FENOC completed a comprehensive tornado missile protection assessment for BVPS and has identified non-conforming conditions regarding tornado missile protection requirements. Compensatory measures were implemented to address the non-conforming conditions, in accordance with regulatory guidance.

FENOC is requesting an extension to the enforcement discretion expiration date to allow sufficient time to address the non-conforming conditions.

FENOC is evaluating the need to submit a license amendment request (LAR) to request approval for the use of Tornado Missile Risk Evaluator (TMRE) methodology, currently under development by the industry, for evaluating the identified non-conformances.

This request to extend enforcement discretion was prepared in accordance with guidance in Appendix B of Revision 1 of Interim Staff Guidance DSS-ISG-2016-01 (Reference 4).

2. RIS 2015-06 Assessment Methodology

The methodology followed by FENOC for the BVPS assessment in response to RIS 2015-06 includes the following three objectives:

- (1) document the BVPS current licensing basis (CLB) for tornados and tornado missile protection,
- (2) evaluate the site's conformance with the tornado missile protection CLB through design review and plant walkdowns, and document any non-conforming conditions, and
- (3) resolve non-conforming conditions within the FENOC corrective action program.

3. Summary of CLB for Tornado and Tornado Missile Protection Design

The Beaver Valley Power Station, Unit Nos. 1 (BVPS-1) and 2 (BVPS-2) CLB for tornadoes and tornado missiles pertinent to the RIS 2015-06 assessment are described in Revision 30 of the BVPS-1 Updated Final Safety Analysis Report (UFSAR), Sections 2.7.2 and 2.7.2.3, respectively and BVPS-2 UFSAR Revision 23, Sections 3.3.2 and 3.5, respectively.

CLB for Tornado Protection Design

The BVPS-1 UFSAR describes tornado missile protection in Section 2.7.2, with specific references to certain equipment in Sections 8.5.2.4, 9.2.1, 9.14, and 10.2. As discussed in BVPS-1 UFSAR Section 2.7.2, the tornado design parameters are: a maximum rotational velocity of 300 miles per hour (mph), a translational velocity of 60 mph, and a pressure drop of 3 pounds per square inch, gage (psig). The BVPS-1 UFSAR states tornado design is necessary only for structures and systems required for safe and orderly shutdown of the reactor. UFSAR section 2.7.2.2 lists the structures and systems designed for wind pressure resulting from a hypothetical tornado and for the associated missile described in Section 2.7.2. These structures include reactor containment concrete structure (including access hatches and penetrations), cable vault and cable tunnel, pipe tunnel to containment from auxiliary building, main steam valve area, pump room below main steam valve area, safeguards area (only portion surrounding former post design basis accident hydrogen control system), auxiliary building concrete structure below elevation 752 foot (ft) -6 inches and for the protection of the following components above elevation 752 ft-6 inches: boric acid tanks, volume control tanks, boric acid transfer pumps, degasifier vent chillers, component cooling surge tank; fuel pool concrete structure (horizontal missiles only), structure containing primary plant demineralized water storage tank, control room, emergency switchgear

and relay room, including battery rooms, air conditioning equipment under control room, diesel generator building, river water pumps and engine-driven fire pump portion of intake structure, waste gas storage area, and Seismic Category I components above elevation 752 ft-6 inches.

The systems protected include:

- a. Piping from main steam line to turbine-driven steam generator auxiliary feedpump.
- b. Main steam piping from steam generators inside containment to the main steam trip and nonreturn valve outside the containment.
- c. River water piping for equipment required to cool down the station.
- d. Carbon dioxide fire protection system for engineered safety features equipment.
- e. Piping, valves, and supports from primary plant demineralized water storage tank to steam generator auxiliary feedpumps.
- f. Fuel oil piping, valves, and supports for emergency diesel generators (EDGs).
- g. Electrical systems for fuel oil transfer pumps.

BVPS-2 UFSAR describes tornado missile protection in Table 3.2-2, with specific references to certain equipment in Sections 3.8.4 and 9.5.4.2. As discussed in BVPS-2, UFSAR, Section 3.3.2, the tornado design parameters are: a maximum wind speed of 360 mph, rotational wind speed of 290 mph, translational speed of 70 mph, damage path diameter of 1,000 feet, pressure drop 3 psi, and average rate of pressure drop of 3 psi in 3 seconds. Tornado-generated missiles are selected and used as a design basis for all Seismic Category I structures. All Seismic Category I systems and components are located in Seismic I structures. Those Category I structures designed to withstand the effects of tornado missiles and the systems and components thus protected are identified in Table 3.2-1 and 3.2-2. BVPS-2 UFSAR Table 3.2-2 lists the structures and systems designed for tornado protection. These structures include reactor containment, service building up to elevation 780 feet, auxiliary building up to elevation 773 ft-6 inches, fuel and decontamination building, emergency diesel generator building, safeguards area, cable vault, main steam valve area, cable tunnel, control building, primary demineralized water storage tank pad and enclosure.

CLB for Tornado Missile Protection Design

Per BVPS-1 UFSAR Section 2.7.2, the most critical missile that might be associated with a tornado is assumed to be a 35-foot utility pole, 14 inches in diameter, and weighing 50 pounds (lb) per cubic foot with a moving velocity of 150 mph.

BVPS-2 UFSAR Table 3.5-5, "Tornado-Generated External Missiles," lists six missiles capable of striking in all directions with vertical velocities equal to 70 percent of the acceptable horizontal velocities except for the steel rod, which has the same speed in all directions.

- 1) Wood plank 4 inches by 12 inches by 12 ft long, weighing 114.6 lb with a velocity of 272 feet per second (fps).
- 2) Steel rod 1 inch diameter by 3 ft long, weighing 8.8 lbs with a velocity of 167 fps.

- 3) Steel pipe 6 inch diameter Schedule 40, 15 ft long, weighing 286.6 lb with a velocity of 171 fps.
- 4) Steel pipe 12 inch diameter Schedule 40, 15 ft long, weighing 749.6 lb with a velocity of 154 fps.
- 5) Utility pole 13.5 inch diameter, 35 ft long, weighing 1124.4 lb with a velocity of 180 fps.
- 6) Automobile having a frontal area of 28 square ft, weighing 3990.4 lb. with a velocity of 194 fps.

4. RIS 2015-06 Assessment Scope and Results

The assessment included design reviews and walk downs of BVPS-1 and 2 Category 1 structures, which were designed to withstand the tornado missiles specified in the CLB.

The non-conforming conditions and affected systems identified by FENOC during the design reviews and walkdowns were documented in the following two condition reports within the corrective action program:

- a. CR-2017-01959, "RIS 2015-06 Tornado Missile Protection BV-1 and BV-2 MSSV ASD Exhaust Stacks."

During walkdowns, the steam discharge flow paths to atmosphere for BVPS-1 and BVPS-2 main steam safety valves (MSSVs) were identified as potentially vulnerable to tornado generated missiles. A tornado could generate missiles capable of striking the steam exhaust piping of the MSSVs, thereby potentially crimping the piping, and resulting in reduced steam flow exhaust capacity. In the worse case (based on multiple missile strikes), all 15 MSSVs at each unit (five per steam line) could be rendered inoperable. The BVPS-2 MSSVs exhaust piping is less vulnerable to horizontal missile strikes than the BVPS-1 MSSVs exhaust piping due to the four sided concrete structure around the steam exhaust piping and each set of exhaust piping located in separate enclosures.

During the walkdowns, the steam discharge flow paths to the atmosphere of the BVPS-1 and BVPS-2 atmospheric dump valves (ADVs) were also identified as potentially vulnerable to tornado generated missiles. A tornado could generate missiles capable of striking the steam exhaust piping of the ADVs, potentially crimping the piping resulting in reduced steam flow capacity. In the worst case, (based on multiple missile strikes), all Technical Specification required ADVs at each unit could be rendered inoperable. The BVPS-2 ADVs exhaust piping is less vulnerable to horizontal missile strikes than the BVPS-1 ADVs exhaust piping due to the four-sided concrete structure around the steam exhaust piping and each set of exhaust piping located in separate enclosures.

- b. CR 2017-07550, "RIS 2015-06, Tornado Missile Protection BV-1 EDG Exhaust Piping."

The emergency diesel generators (EDG) engine exhaust piping for BVPS-1 is potentially vulnerable to tornado generated missiles. The EDG exhaust pipe exhausts through a reinforced concrete enclosure on the EDG building roof. A tee on the end of the pipe directs exhaust out the two open sides of the enclosure. A tornado could generate missiles capable of striking the EDG engine exhaust piping, potentially crimping it, and resulting in reduced engine exhaust flow capacity. In the worst case (based on multiple missile strikes), both BVPS-1 EDGs could be rendered inoperable.

5. Initial Actions

Along with notifying the NRC Resident Inspector, the following initial actions were taken in response to the identified non-conforming conditions, in accordance with EGM 15-002 and Interim Staff Guidance DSS-ISG-2016-01.

- a. The non-conforming conditions were reported by FENOC as an eight-hour notification on February 23, 2017 (Event Number 52571) under the following regulations:
- 10 CFR 50.72(b)(3)(ii)(B), "The nuclear power plant being in an unanalyzed condition that significantly degrades plant safety."
 - 10 CFR 50.72(b)(3)(v)(A), "Shut down the reactor and maintain it in a safe shutdown condition."
- b. Operability determinations were completed and documented in the corrective action program. The non-conforming equipment was initially declared inoperable. Guidance in Revision 1 of EGM 15-002 (Reference 3) was used to declare the equipment operable but non-conforming and to implement enforcement discretion.
- c. Initial compensatory measures were completed per EGM 15-002 and Interim Staff Guidance DSS-ISG-2016-01. The following procedures for performing actions to respond to a tornado are credited:
- Station severe weather abnormal operating procedure (AOP)
 - Station emergency operating procedures (EOPs)
 - Station procedures for the use of FLEX equipment to attain and maintain shutdown conditions.

Additionally, to further satisfy these initial compensatory measures, a heightened awareness of the items described in Section 4 was added to AOP 1/2OM-53C.4A.75.1, "Acts of Nature – Severe Weather." Section 4 items are also being maintained in the Shift Manager turnover notes and Operations Department Standing Order 17-003 for the MSSV and ADV and Standing Order 17-004 for the EDG stack. The immediate compensatory measures for the items in Section 4 are described below.

MSSV & ADV Exhaust Piping

Abnormal Operating Procedure, 1/2OM-53C.4A.75.1 "Acts of Nature - Severe Weather," was reviewed and FENOC concluded that the actions described in this AOP satisfy the DSS-ISG-2016-01, Attachment A requirement for initial compensatory measures to verify procedural guidance is in place for tornado watch, tornado warning, and tornado response. The Operations Department licensed operator training was verified to be current on this procedure, along with any of the other EOP and AOP procedures or severe accident mitigation guidelines (SAMG) that could be required to address loss of steam release capability due to the inadequate missile shielding.

The current procedures in place for mitigating the consequences of a loss of normal shutdown cooling methods used to reach residual heat removal (RHR) entry conditions, provide the necessary actions for operators to safely shutdown the plant and cooldown to the RHR entry conditions. In the case of the loss of all normal shutdown decay heat removal capability, the emergency operating procedure network is available for the operators to mitigate this condition. Operator training on these procedures is current. After the operators reach RHR entry conditions, the MSSVs and ADVs are not needed to maintain the plant in cold shutdown conditions.

EDG Exhaust Piping

FENOC reviewed 1/2OM-53C.4A.75.1 "Acts of Nature - Severe Weather" and concluded that the actions described in this AOP satisfy DSS-ISG-2016-01, Attachment A, requirements for initial compensatory measures to verify procedural guidance is in place for tornado watch, tornado warning, and tornado response. Operations Department licensed operator training was verified to be current on this procedure and the other EOP/AOP/SAMG procedures that could be required to address loss of the emergency diesel generators due to the inadequate missile shielding.

- d. License Event Reports (LER) were issued for the identified tornado missile protection issues.

- License Event Report (LER) 2017-001-00 (Reference 5) was submitted in accordance with 10 CFR 50.73 due to Technical Specification required equipment (MSSV and ADV exhaust piping) not meeting CLB requirements for protection against tornado missiles.
 - License Event Report 2017-002-00 (Reference 6) was submitted in accordance with 10 CFR 50.73 due to Technical Specification required equipment (EDG exhaust piping) not meeting CLB requirements for protection against tornado missiles.
- e. The information below describes BVPS operating procedural guidance pertaining to the initial compensatory measures described in DSS-ISG-2016-01, Revision 1, Appendix A, Item 2.

- Remove, relocate, or secure potential missiles

In the event a tornado watch is declared, the operators are directed by AOP 1/2OM-53C.4A.75.1, "Acts of Nature – Severe Weather" to tour the site for identification of potential missiles. Specifically, Attachment 4 directs operators to identify any objects that could be potential missiles during a tornado strike. The tour should be performed with personnel from Maintenance Services; however, the tour should not be delayed until Maintenance Services personnel are available. Potential missiles that are small enough to be adequately restrained or removed should be done at this time. Potential missiles too large to be adequately restrained or removed in a short period of time are documented and the information is provided to the removal/restraint coordinator.

- From a work management/configuration control perspective, protect equipment important to maintaining safe shutdown conditions.

To protect equipment that is important to maintaining safe shutdown conditions, AOP 1/2OM-53C.4A.75.1, "Acts of Nature – Severe Weather" directs operators to inspect the site for potential missiles. Attachment 4 states that potential missiles close to safety-related components should be promptly reported. Attachment 9 states that the work scheduling process that requires the plant configuration risk - due to equipment removed from service for maintenance activities - to be assessed by plant operations. In the event of a tornado watch or warning, the additional risk is assessed using quantitative and qualitative considerations. Actions would then be taken to restore the plant risk to an acceptable level.

- Promptly complete or restore equipment from maintenance activities in progress on equipment important to maintaining safe shutdown conditions.

FENOC procedures require operators to evaluate equipment that is out of service to identify critical equipment to return to service. NOP-OP-1007, "Risk Management" and 1/2OM-53C.4A.75.1, "Acts of Nature – Severe Weather," Attachment 9 state that when severe weather conditions, including tornado, are present or expected then risk management actions are taken. Generation risk activities in progress should be terminated or completed based on reduced risk. Activities in progress that impact probabilistic risk assessment (PRA) risk should typically be completed. Activities scheduled but not in progress that impact PRA risk should be rescheduled to when severe weather conditions are not expected to be present.

- Restore equipment important to maintaining safe shutdown conditions if undergoing maintenance or testing, if possible.

FENOC procedures NOP-OP-1007, "Risk Management" and 1/2OM-53C.4A.75.1, "Acts of Nature – Severe Weather," Attachment 9 state that if severe weather conditions, including tornado, are present or expected then risk management actions are taken. Generation risk activities in progress should be terminated or restored based on reduced risk. Activities in progress that impact PRA risk should typically be completed. Activities scheduled but not in progress that impact PRA risk should be rescheduled to when severe weather conditions are not expected to be present.

- Verify equipment is ready to use by visual inspection, surveillances and preventative maintenance are current, and review pending equipment maintenance requests.

The FENOC work scheduling process requires the plant configuration risk due to equipment removed from service for maintenance activities be assessed. In addition, surveillance tests and preventative maintenance completion are monitored and routinely reviewed to ensure that surveillance tests and preventative maintenance are performed within their prescribed intervals.

- f. The information below describes BVPS operating procedural guidance pertaining to the initial compensatory measures described in DSS-ISG-2016-01, Revision 1, Appendix A, Item 3.

- Warning and protection strategies for site personnel.

In the event of a tornado warning, AOP 1/2OM-53C.4A.75.1, "Acts of Nature – Severe Weather," requires operators to sound the standby alarm and announce that a tornado warning is in effect – all site personnel take shelter immediately. In addition, notifications are made in facilities outside the protected area to take shelter immediately. The procedure also requires Site Protection to identify all personnel in the protected area.

- Strategies for prompt damage assessment and initiation of restorative actions (pre-staging of equipment and plant staff at safe, strategic locations to promptly implement any necessary mitigative actions.)

In the event that a tornado impacts the site, procedure 1/2OM-53C.4A.75.1, "Acts of Nature – Severe Weather," Attachment 1 states that Unit 1 and Unit 2 main steam safety valve, atmospheric steam dump valve and residual heat removal (RHR) valve exhausts (exterior) and Unit 1 diesel generator exhaust are vulnerable to tornado-generated missile impact. Visual assessment of these exhausts must be made as soon as possible. Operators are dispatched for a visual inspection when the threat has passed. Operators are to visually inspect for damage, initiate recovery actions, and perform a damage assessment. In addition, operators are required to make log entries to record the results of the inspections at each unit.

Safety-related structures, systems and components are to be visually checked for damage, including impediments to accessibility of structures, breaches to plant components or systems, damage to and debris on transformers, and check of overhead lines. Additionally, determination of degraded safety system response or component response is done using control room indications and alarms.

6. Long-Term Compensatory Measures and Actions Implemented and/or Planned

As longer-term comprehensive compensatory measures, the following procedures were revised as described:

Abnormal Operating Procedure, 1/2OM-53C.4A.75.1, "Acts of Nature-Severe Weather," was updated to specifically include the BVPS-1 and BVPS-2 MSSV and ADV exhausts as being vulnerable to tornado generated missiles and direct plant operators to check these components first for damage following a tornado. Also, the AOP was updated to specifically mention the BVPS-1 emergency diesel generator exhausts as being vulnerable to tornado generated missiles and direct operators to check these first for damage following a tornado or when identifying possible missiles around the site before a possible tornado.

Should tornado damage be found, entry into EOP 1OM-53A.1.ECA-0.0, "Loss of All AC Power," and if required, FLEX procedure 1OM-53E.1.FSA-13, "Deploying FLEX 480VAC Generator" would be promptly performed to restore alternating current (AC) power to BVPS-1.

These long-term compensatory measures are in accordance with EGM 15-002, Rev. 1 and Interim Staff Guidance DSS-ISG-2016-01 and will remain in place until the non-conformances are resolved.

7. Assessment of Long-Term Compensatory Measures Coincident with Other Operator Actions

The long-term compensatory measures ensure plant operators have the required training and procedural guidance to ensure that the plant can be safely shutdown via alternative plant cool down methods that do not rely on MSSVs and ADVs. After the plant reaches cold shutdown, the MSSVs and the ADVs are not needed or used to maintain safe shutdown conditions.

Based on the enhanced procedural guidance and availability of alternative methods to perform a plant cooldown, there is sufficient guidance available to successfully mitigate the consequences from a tornado missile event that could impact the steam release capability of the MSSVs and ADVs to perform a plant cooldown. Visual inspection of the MSSV and ADV exhaust piping is prioritized among the post-tornado damage assessment that was already performed in accordance with the AOP.

The long-term compensatory measures ensure plant operators have the procedural guidance to ensure the plant can be safely shut down and AC power restored. Should tornado missile damage be found to EDG exhaust pipe(s), entry into EOP 1OM-53A.1.ECA-0.0, "Loss of All AC Power," and if required, FLEX procedure 1OM-53E.1.FSA-13, "Deploying FLEX 480VAC Generator" would be promptly performed to restore AC power to BVPS-1.

Visual inspection of the BVPS-1 emergency diesel generators' exhaust piping is prioritized among the post-tornado damage assessment that was already performed in accordance with the AOP.

Site procedural guidance for the equipment non conformances listed in Section 4 is described below:

Main Steam Safety Valves and Atmospheric Steam Dump Exhaust Stacks

In the unlikely event that, multiple tornado generated missiles disable all MSSVs and ADV exhaust piping, EOP procedures 1OM-53A.1.FR-H.01, "Response to Loss of Secondary Heat Sink," for BVPS-1 and 2OM-53A.1.FR-H.01, "Response to Loss of Secondary Heat Sink," for BVPS-2 contain guidance for feeding and bleeding the steam generators until the plant reaches RHR entry conditions. The guidance directs the operators to perform cool down by controlling feedwater flow and opening reactor coolant power operated relief valves (PORVs). Once the plant reaches RHR entry conditions, the MSSVs and ADVs are not needed to maintain the plant in cold shutdown conditions.

Emergency Diesel Generators Engine Exhaust Piping

Should an exhaust pipe for one or both BVPS-1 EDGs be damaged such that the EDG cannot operate, plant procedures direct steps for restoration of AC power. 1OM-53A.1.ECA-0.0, "Loss of All Emergency 4KV AC Power" directs operators to verify at least one EDG is operating. If not operating, the operator is directed to attempt to start the EDG(s). Should neither EDG start or run, then the procedure directs operators to check the station blackout cross-tie availability and proceed with required cross-tie actions. The EOP directs operators to cross-tie BVPS-1 to a selected BVPS-2 emergency bus powered by its emergency diesel generator.

Should cross-tie or other AC power restoration actions not be capable of being restored within one hour, procedure 1OM-53E.1.FSA-13, "Deploying FLEX 480 VAC Generator" would be entered. The FLEX generator is capable of supplying one train of emergency AC power. The FLEX generator will operate until offsite power is restored or one or both EDG generators are restored to service.

8. Plans for Permanent Resolution

The enforcement discretion extension of 24 months is requested to ensure there is sufficient time to plan and execute any permanent resolutions that might require a plant modification or re-evaluation. With the current expiration of June 10, 2018, only one refueling outage is available to implement required actions. FENOC is evaluating performing plant modifications to eliminate the non-conformances. Concurrently,

FENOC is evaluating a risk-informed license amendment request for the use of the TMRE methodology, currently in development by the industry. The TMRE methodology would be used to evaluate the identified non-conformances.

9. Bases and Reason for Extension Request

In EGM 2015-002 (Reference 2), the NRC provided guidance to exercise enforcement discretion when an operating power reactor licensee does not comply with a plant's current site-specific licensing basis for tornado-generated missile protection. The NRC would exercise this enforcement discretion only when a licensee implements initial compensatory measures to provide additional protection, followed by more comprehensive, long-term compensatory measures implemented within 60 days of issue discovery. The enforcement discretion would expire three years after issuance of RIS-2015-006, dated June 10, 2015, for plants of a higher tornado missile risk (Group A Plants), and five years after RIS issuance for plants of a lower tornado missile risk (Group B Plants). EGM 2015-002 identified BVPS as a plant of a higher tornado missile risk; therefore its enforcement discretion would expire on June 10, 2018.

In Reference 3, the NRC issued Revision 1 of EGM 2015-002, which stated that licensees may request an extension to their enforcement discretion expiration date if proper justification is provided. The extension would be granted on a case-by-case basis.

In accordance with the revised EGM 15-002, FENOC is requesting an extension to the expiration date for enforcement discretion at BVPS from June 10, 2018 to June 10, 2020.

There is no undue risk associated with this requested extension of the enforcement discretion due date. The identified non-conformances involve limited exposure of equipment to tornado missiles and in part, the equipment is partially protected. In addition, tornado missile scenarios generally do not represent a significant safety concern because their risk is bounded by the initiating event frequency.

A comprehensive assessment of the site regarding tornado missile protection against the current licensing basis has been completed, revealing the non-conformances discussed previously. The compensatory actions implemented for the non-conformances are consistent with the guidance in EGM 15-002 and Interim Staff Guidance DSS-ISG-2016-01 and provide assurance that the consequences of the identified non-conformances are minimized until permanently resolved. Additionally, a collective review was performed to confirm that the site operators can perform the long-term compensatory measures coincident with other actions that may need to be performed in a severe weather event without putting unnecessary burden on the operators. These compensatory measures would remain in-place throughout the period of extended enforcement discretion, until the non-conformances are resolved.

FENOC is evaluating performing plant modifications to eliminate the non-conformances. Concurrently, FENOC is evaluating a risk-informed license amendment request for the use of the TMRE methodology, currently in development by the industry. LARs for implementation of the TMRE methodology at several pilot sites are being submitted, with NRC approval of the pilots expected in 2018. Once the pilot sites have been approved, then other licensees with identified tornado missile protection non-conformances would submit applications for implementation of the TMRE methodology to address non-conformances at their sites.

To address the tornado missile protection non-conformances identified at BVPS, FENOC is evaluating the installation of plant modifications. If the installation of plant modifications does not resolve the non-conformances then FENOC would need to perform a TMRE analysis for the non-conformances, and prepare and submit a LAR for the use of the TRME methodology. The BVPS LAR would be submitted after the LARs for the pilot sites have been approved. Because NRC approvals of the pilot site LARs are not complete, FENOC actions to resolve the non-conformances at BVPS cannot be reasonably implemented in an orderly and cost-effective manner in the time remaining under the existing enforcement discretion.

The requested enforcement discretion expiration date of June 10, 2020 would allow FENOC sufficient time to resolve the tornado missile protection non-conformances and restore the site to compliance. The requested enforcement discretion expiration date of June 10, 2020 would provide sufficient time for FENOC to perform the plant modifications or the TMRE analysis for the non-conformances and to submit a LAR for implementation of the TMRE methodology at BVPS if necessary. FENOC has begun evaluating potential plant modifications and the TMRE analysis for resolving identified non-conformances. If, while performing the plant modifications to resolve the non-conformances, FENOC unexpectedly determines that the non-conformances will not be resolved, the TMRE analysis may be pursued.

If conditions arise such that achieving tornado missile protection compliance at BVPS within the requested extended period of enforcement discretion is not possible, the NRC would be promptly notified.

10. References

1. NRC Regulatory Issue Summary 2015-06, *Tornado Missile Protection*, dated June 10, 2015 (ADAMS Accession Number ML15020A419)
2. NRC Memorandum, *Enforcement Guidance Memorandum 15-002, Enforcement Discretion for Tornado Generated Missile Protection Non-Compliance*, dated June 10, 2015 (ADAMS Accession Number ML15111A269)
3. NRC Memorandum, *Enforcement Guidance Memorandum 15-002, Revision 1; Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance*, dated February 7, 2017 (ADAMS Accession Number ML16355A286)
4. NRC Interim Staff Guidance, DSS-ISG-2016-01, "Clarification of Licensee Actions in Receipt of Enforcement Discretion Per Enforcement Guidance Memorandum EGM 15-002, Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance." Revision 1, dated November 2017 (ADAMS Accession Number ML17128A344)
5. License Event Report 2017-001-00, *Inadequate Tornado Missile Protection Identified Due to Non-Conforming Design Conditions*, dated April 18, 2017 (ADAMS Accession Number ML17110A191)
6. License Event Report 2017-002-00, *Beaver Valley Power Station Unit 1 Inadequate Emergency Diesel Generator (EDG) Tornado Missile Protection Identified due to Non-conforming Design Conditions*, dated September 13, 2017 (ADAMS Accession Number ML17261A193)