



Entergy Nuclear Operations, Inc.  
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PNP 2018-001

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

SUBJECT: Supplement to 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"

Palisades Nuclear Plant  
Docket 50-255  
Renewed Facility Operating License No. DPR-20

- REFERENCES:
1. Entergy Nuclear Operations, Inc., PNP 2017-050, *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,"* dated December 7, 2017 (ADAMS Accession Number ML17341A415)
  2. 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)
  3. NRC meeting summary, *Summary of January 4, 2018, Public Teleconference Meeting with Entergy Nuclear Operations, Inc., Regarding Request to Extend Enforcement Discretion for Tornado-Generated Missile Non-Conformances at Palisades Nuclear Plant (EPID L-2017-LLL-0037)*, dated January 10, 2018 (ADAMS Accession No. ML18008A230)

Dear Sir or Madam:

In Reference 1, Entergy Nuclear Operations, Inc. (ENO) submitted a request to extend the expiration date for the period of enforcement discretion provided for tornado-generated missile protection non-conformances in Enforcement Guidance Memorandum (EGM) 2015-002, *"Enforcement Guidance Memorandum 15-002, Revision 1: Enforcement Discretion for Tornado-Generated Missile Protection Non-Compliance"* (Reference 2).

As documented in Reference 3, the Nuclear Regulatory Commission (NRC) had a teleconference meeting with ENO on January 4, 2018 to discuss the extension request. During the meeting, the NRC noted sections in the Reference 1 submittal in which supplemental information regarding prompt and long-term compensatory actions implemented and/or planned in the event of a tornado would be needed. Based on this discussion, ENO is providing the supplemental information in the attachment.

This letter identifies no new commitments and no revisions to existing commitments.

Sincerely,

A handwritten signature in black ink, appearing to be 'JAH' followed by a stylized flourish.

JAH/jse

Attachment: Supplemental Information for Request to Extend Enforcement Discretion for Tornado-Generated Missile Protection Non-Conformances for the Palisades Nuclear Plant

cc: Administrator, Region III, USNRC  
Project Manager, Palisades, USNRC  
Resident Inspector, Palisades USNRC

**PNP 2018-001**

**ATTACHMENT**

**SUPPLEMENTAL INFORMATION FOR REQUEST TO EXTEND ENFORCEMENT  
DISCRETION FOR TORNADO-GENERATED MISSILE PROTECTION  
NON-CONFORMANCES FOR THE PALISADES NUCLEAR PLANT**

## ATTACHMENT

### SUPPLEMENTAL INFORMATION FOR REQUEST TO EXTEND ENFORCEMENT DISCRETION FOR TORNADO-GENERATED MISSILE PROTECTION NON-CONFORMANCES FOR THE PALISADES NUCLEAR PLANT

In Reference 1, Entergy Nuclear Operations, Inc. (ENO) requested in letter number PNP 2017-050 an extension of the expiration date for the period of enforcement discretion provided for tornado-generated missile protection non-conformances in Enforcement Guidance Memorandum (EGM) 2015-002, *“Enforcement Guidance Memorandum 15-002, Revision 1: Enforcement Discretion for Tornado-Generated Missile Protection Non-Compliance”* (Reference 2).

As documented in Reference 3, the Nuclear Regulatory Commission (NRC) held a teleconference meeting with ENO on January 4, 2018 to discuss the extension request.

During the meeting, the NRC noted sections of the PNP 2017-050 attachment where supplemental information regarding prompt (initial) and long-term compensatory actions implemented and/or planned in the event of a tornado is needed. Specifically, the NRC discussed the following topics:

1. Descriptions of site procedural guidance pertaining to the initial compensatory measures in response to a tornado watch or warning listed in DSS-ISG-2016-01, Revision 1, *Clarification of Licensee Actions in Receipt of Enforcement Discretion Per Enforcement Guidance Memorandum EGM 15-002, “Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance,”* Appendix A, item numbers 2 and 3 (Reference 4).
2. Descriptions of site procedural guidance for responding to each of the non-conformances identified during the assessment design reviews and walkdowns, as documented in the PNP 2017-050 attachment, Section 4, *RIS 2015-06 Assessment Scope and Results*.

Based on the above discussion topics, ENO is providing the supplemental information below.

#### **Discussion Topic Number 1**

Descriptions of site procedural guidance pertaining to the initial compensatory measures in response to a tornado watch or warning listed in DSS-ISG-2016-01, Appendix A, item numbers 2 and 3.

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#### Discussion Topic Number 1 Supplemental Information

The supplemental information below describes Palisades Nuclear Plant (PNP) operating procedural guidance pertaining to the initial compensatory measures described in DSS-ISG-2016-01, Appendix A, item numbers 2 and 3. This information is to be inserted in the PNP 2017-050 attachment, Section 5, *Initial Actions*, in a new Subsection e.

#### Supplemental Information for PNP 2017-050 Attachment, Section 5, Subsection e

2. *Verify that procedures are in place and training is current for the following actions to be taken if a tornado watch is issued for the area, such as:*
  - a. *Remove, relocate, or secure potential missiles.*

#### Subsection e Supplemental Information that Addresses Item 2.a:

In the event a tornado watch is declared, the operators are directed by PNP Abnormal Operating Procedure (AOP) 38, *Acts of Nature*, to ensure that potential missile hazards, such as loose equipment, debris, temporary trailers/structures, gas cylinders, chemical drums, and oil drums, are secured or placed within permanent structures.

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

#### Subsection e Supplemental Information that Addresses Item 2.b:

To protect equipment that is important to maintaining safe shutdown conditions, procedure AOP-38 directs the operators to ensure that all staged materials that could affect the switchyard, transformer lines, and the transformer yard are secured. The procedure also instructs the operators to ensure that all exterior doors, windows, equipment vaults, valve pits, roof plugs, and manhole covers are closed. Lastly, the procedure requires that all unnecessary external activities, such as switchyard activities, be stopped and directs the operators to coordinate the removal of any vehicles located on the plant access road, west of the turbine building.

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The procedure directs operators to stop interior site activities that could become hazardous in the event of a loss of power, such as fuel handling, crane movements, and movement of waste. The operators are also directed to raise the hooks and lower the booms for all exterior cranes.

- c. Promptly complete or restore equipment from maintenance activities in progress on equipment important to maintaining safe shutdown conditions.*
- d. Restore equipment important to maintaining safe shutdown conditions if undergoing maintenance or testing, if possible.*

#### Subsection e Supplemental Information that Addresses Items 2.c and 2.d:

Procedure AOP-38 requires that operators evaluate equipment out of service to identify critical equipment to return to service.

In addition, the ENO work scheduling process requires that the risk of maintenance activities be continually assessed by plant operations. In the event of emergent severe weather, these assessments are performed as soon as practical using quantitative and qualitative considerations, and action is taken to minimize plant operation in any unacceptable risk configuration.

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

#### Subsection e Supplemental Information that Addresses Item 2.e:

Procedure AOP-38 requires that operators verify condensate storage tank and primary makeup water tank levels. The operators are also required to ensure availability of the emergency diesel generators (EDGs), ensure that the EDG day tanks and belly tanks are filled, and ensure that the three auxiliary feedwater pumps are available.

The ENO work scheduling process requires that the plant configuration risk due to equipment removed from service for maintenance activities to be continually assessed by plant operations. In the event of a tornado watch, the additional risk is assessed as soon as practical using

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quantitative and qualitative considerations, and action is taken if necessary to restore plant risk to an acceptable level.

The ENO work scheduling process also requires that surveillance test and preventive maintenance completion be monitored and routinely reviewed to ensure that surveillance tests and preventive maintenance are performed within their prescribed intervals.

3. *Verify that procedures are in place and training is current for actions to be taken if a tornado warning is issued for the area, such as:*
  - a. *Warning and protection strategies for site personnel.*

#### Subsection e Supplemental Information that Addresses Item 3.a:

In the event of a tornado warning, AOP-38 requires the operators to announce the threat over the public address system to notify plant personnel to seek shelter indoors. The procedure also requires the operators to provide periodic updates to site personnel on the status of the threat.

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

#### Subsection e Supplemental Information that Addresses Item 3.b:

In the event that a tornado impacts the site, once the tornado has passed, procedure AOP-38 directs operators to initiate recovery actions and to inspect site interior and exterior areas.

If wind speeds at the site are measured at 50 miles per hour or greater, required operator actions include visually inspecting areas known to be susceptible for tornado-generated missiles, such as the spent fuel pool building, the fuel oil storage tank, and the vent lines on the EDG day tanks for damage. Directions are provided for alternate means of venting if an EDG day tank vent line is crimped.

Due to the small site footprint, and the locations of equipment and plant staff, the pre-staging of equipment and plant staff is not necessary in

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order to promptly implement any necessary mitigation actions after a tornado has impacted the site.

#### Additional Discussion

Operator actions to address plant conditions resulting from the tornado-generated missile protection non-conformances are contained within plant operating procedures, as discussed above. Operator cognizance of these procedural actions is ensured via initial and continuing operator training, which includes reviews of procedural guidance for acts of nature.

#### **Discussion Topic Number 2**

Descriptions of site procedural guidance for responding to each of the non-conformances identified during the assessment design reviews and walkdowns, as documented in the PNP 2017-050 attachment, Section 4, "RIS 2015-06 Assessment Scope and Results."

#### **Discussion Topic Number 2 Supplemental Information**

Below is supplemental information for the PNP 2017-050 attachment, Section 7, *Assessment of Long-Term Compensatory Measures Coincident with Other Operator Actions*. This supplemental information, which is provided as a new Section 7 subsection titled *Procedural Guidance for Equipment Non-Conformances*, describes the site procedural guidance that is credited for responding to the identified equipment non-conformances.

#### **Procedural Guidance for Equipment Non-Conformances**

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

Service Water System Non-Conformance – Portions of the service water system (SWS) were found to be susceptible to tornado-generated missile impacts within the screenhouse.



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#### Procedural Guidance:

Abnormal Operating Procedure (AOP) 35, *Loss of Service Water*, provides operator guidance in the unlikely event that a tornado-generated missile results in a SWS pipe rupture. Detailed steps are given in the procedure which would allow the operators to isolate an impacted section of SWS piping from the control room by closing SWS isolation valves. The procedure also provides guidance to the operators to use pressure readings of branches of the SWS to assist in identifying faulted SWS piping that needs to be isolated. If certain SWS pump discharge paths cannot be isolated, guidance is provided within AOP-35 to use the fire protection system pumps as a backup supply to the SWS.

#### Fuel Oil Transfer System Non-Conformance

The fuel oil transfer pump power cables located in the screenhouse are susceptible to missile impact. Damage to these cables could result in an inability to refill the EDG fuel oil day tanks from the fuel oil storage tank (T-10A) using the fuel oil transfer pumps.

Also, portions of the non-credited alternate fuel oil supply piping that are not located within concrete reinforced structures would be exposed to tornado missiles.

#### Procedural Guidance:

In the unlikely event that the fuel oil transfer system power cables are damaged from a tornado-generated missile, PNP System Operating Procedure (SOP) 22, *Emergency Diesel Generators*, provides alternate means of refilling the EDG day tanks. These alternate means involve supplying fuel oil from T-10A or the feedwater purity fuel oil tank (T-926) directly to the day tanks via an alternate fuel oil transfer pump or via a portable, air-operated pump. The procedure also provides direction for refilling the day tanks via an offsite tanker truck. The operators would have sufficient time to refill the day tanks as the tanks have a 13.5-hour supply of fuel oil for an EDG operating under design loading conditions, and significantly more time under non-accident operating conditions.

Tank T-926 provides a backup supply of fuel oil to the credited fuel oil supply in T-10A. To prevent a loss of fuel oil inventory from T-926 in the unlikely event that exposed piping is damaged by a tornado-generated missile, the operators are instructed by AOP-38 to preemptively close isolation valve MV-FO120, as discussed in Section 7 in the Reference 1 attachment.

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#### Emergency Diesel Generator Support Systems Non-Conformance

The vent lines for each of the EDG day tanks are unprotected, and a missile impact could crimp the vent lines, preventing fuel oil transfer from the day tanks to the EDGs.

##### Procedural Guidance:

Procedure AOP-38 directs the operators to visually inspect the fuel oil day tanks to assess for damage following a tornado event. In the unlikely event that a vent line is crimped, the procedure instructs the operators to establish an alternate vent path for the tank by opening the fuel oil day tank external fill valve.

#### Control Room Heating, Ventilation and Air Conditioning (CRHVAC) Intake Non-Conformance

The normal and emergency makeup air intake lines for the CRHVAC system equipment are located on the mechanical equipment room and the service building roofs, respectively, and are unprotected. These lines could be crimped or incapacitated, affecting CRHVAC operation.

##### Procedural Guidance:

In the unlikely event that a tornado-generated missile impacts both CRHVAC intake lines, procedure SOP-24, *Ventilation and Air Conditioning System*, contains guidance for aligning alternate ventilation for the control room due to a loss of the CRHVAC. The guidance directs the operators to block control room doors open and to position a positive pressure fan to exhaust air from the control room to the adjacent turbine building.

#### Auxiliary Feedwater (AFW) System Steam Supply Non-Conformance

The steam supply line for the steam turbine driven AFW pump (P-8B) runs through non-Consumers Design Class 1 portions of the turbine building. Although partially shielded by large equipment, this portion of the supply is not adequately protected from tornado-generated missiles, and failure of the steam supply piping could prevent operation of AFW pump P-8B.

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#### Procedural Guidance:

In the unlikely event that a tornado impacts the site, resulting in a plant trip and failure of the steam supply piping for AFW pump P-8B, either of the motor driven AFW pumps, P-8A or P-8C, is capable of providing the required AFW flow to the steam generators to support plant shutdown.

Following a plant trip, PNP Emergency Operating Procedure (EOP) 1, *Standard Post Trip Actions*, is entered which provides specific guidance on secondary heat removal by monitoring steam generator level. The operators would increase AFW flow through manipulation of the AFW flow control valves or by starting additional AFW pumps as needed to maintain steam generator level. Following completion of EOP-1, operators would transition to other EOPs. These EOPs utilize safety function status checks every 15 minutes, which includes continued monitoring of steam generator level and adjustments of AFW flow as needed.

#### Component Cooling Water (CCW) Surge Tank Non-Conformance

The vented CCW system surge tank is protected from tornado-generated missiles by a 12-inch thick reinforced concrete wall. However, the 12-inch thick wall may not be sufficient to prevent damage to the surge tank from a tornado, and loss of the surge tank could potentially cause a loss of CCW inventory.

#### Procedural Guidance:

In the unlikely event that a tornado-generated missile impact damages the CCW system surge tank, resulting in a loss of inventory, system design would preclude rendering the CCW system non-functional. The surge tank maintains CCW pump suction head, and its physical location is at such an elevation that a loss of surge tank inventory due to missile damage would leave sufficient system suction head to support continued operation of the CCW pumps. If CCW system flow could not be maintained following damage to the surge tank, procedure AOP-36, *Loss of Component Cooling*, directs the operators to shut down the plant and place plant equipment in a safe configuration.

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#### Additional Discussion

The operators maintain cognizance of the tornado-generated missile protection non-conformances by reviewing a report of plant non-conformances every shift, as required by site procedures.

Operator actions to address plant conditions resulting from the tornado-generated missile protection non-conformances are contained within plant operating procedures, as discussed above. Operator cognizance of these procedural actions is ensured via initial and continuing operator training, which includes reviews of procedural guidance for acts of nature.

PNP is in compliance with NRC Order EA-12-049, *Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events* (Reference 5). This Order directed licensees to develop and implement (FLEX) strategies and guidance to maintain or restore core cooling, containment cooling, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event in which ac power and normal access to the ultimate heat sink are lost. ENO has implemented procedures which use equipment staged within a tornado missile protected building to respond to such an event. The FLEX procedures and equipment would be available to address plant conditions resulting from the tornado missile protection non-conformances, in addition to the operator actions described in the procedural guidance above.

#### References

1. Entergy Nuclear Operations, Inc., PNP 2017-050, *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,"* dated December 7, 2017 (ADAMS Accession Number ML17341A415)
2. 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)

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3. NRC meeting summary, Summary of January 4, 2018, Public Teleconference Meeting with Entergy Nuclear Operations, Inc., Regarding Request to Extend Enforcement Discretion for Tornado-Generated Missile Non-Conformances at Palisades Nuclear Plant (EPID L-2017-LLL-0037), dated January 10, 2018 (ADAMS Accession No. ML18008A230)
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. ENO letter, PNP 2015-083, *Notification of Full Compliance with NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events,"* dated December 16, 2015 (ADAMS Accession No. ML15351A369)