



Palisades Nuclear Plant

Pre-Submittal Call for Request to Extend Enforcement Discretion for Tornado Missile Non-Conformances

November 27, 2017

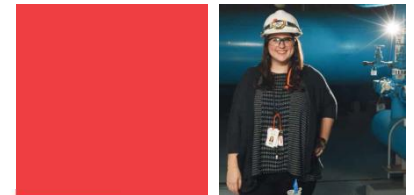


Introductions and Meeting Purpose

Introductions

Meeting purpose:

- To discuss Palisades' plans to submit a 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."
- The submittal will request extension of enforcement discretion from June 10, 2018 to June 10, 2020.
- This presentation describes the information that will be included in the submittal.



Agenda

- Overview
- RIS 2015-06 Assessment Methodology
- Summary of CLB for Tornado and Tornado Missile Protection
- RIS 2015-06 Assessment Scope and Results
- Initial Actions
- Long-Term Compensatory Measures
- Assessment of Long-Term Compensatory Measures
- Plans for Permanent Resolution
- Basis and Reason for Extension Request
- Submittal Schedule

Overview

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

Enforcement Guidance Memorandum (EGM) 2015-002 provided guidance to exercise enforcement discretion when a licensee does not comply with a plant's current site-specific licensing basis for tornado-generated missile protection.

EGM 2015-002 identified Palisades as a higher tornado missile risk site (Group A), resulting in an enforcement discretion expiration date of June 10, 2018.

Entergy completed a comprehensive tornado missile protection assessment and identified non-conforming conditions regarding tornado missile protection requirements.

Compensatory measures were implemented to address the non-conforming conditions.

Overview

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

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

The request to extend enforcement discretion will be prepared in accordance with guidance in Appendix B of Revision 1 of Interim Staff Guidance DSS-ISG-2016-01, which requests the following documentation:

- a. description of non-conformances where the EGM was applied
- b. description of the prompt compensatory actions
- c. description of the long-term compensatory actions
- d. comprehensive assessment of all compensatory measures
- e. basis for need for additional enforcement discretion time
- f. timeline for restoration of licensing basis compliance

RIS 2015-06 Assessment Methodology

The RIS 2015-06 assessment methodology included the following three objectives:

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

Summary of Current Licensing Basis

The Palisades CLB for tornados and tornado missiles pertinent to the RIS 2015-06 assessment are described in Revision 33 of the Updated Final Safety Analysis Report (UFSAR), Sections 5.3 and 5.5, respectively.

CLB for Tornado Protection Design

As discussed in UFSAR Section 5.3, the design basis tornado has a tangential velocity of 300 miles per hour (mph) and a translational velocity of 60 mph, simultaneously combined with a differential pressure of 3 pounds per square inch, gage (psig).

Other than the enclosure over the spent fuel pool, Consumers Design Class 1 structures (containment, auxiliary building and additions, intake structure, auxiliary feedwater pump room, and turbine building electrical penetration enclosure) were designed in accordance with the described wind loads. The enclosure over the spent fuel pool was not designed for tornado loads.

Per UFSAR Section 5.2.2.1, Consumers Design Class 1 structures, systems and components (SSCs) are defined as those SSCs whose failure could cause uncontrolled release of radioactivity or those essential for safe shutdown of the nuclear steam supply system and long-term operation following a loss of coolant accident.

CLB for Tornado Missile Protection Design

Per UFSAR Section 5.5.1.1, Consumers Design Class 1 structures were designed, except as noted on the next slide, for the following CLB tornado missiles:

- A 4-inch thick by 12-inch wide by 12-foot long wood plank traveling end-on at a velocity of 300 miles per hour (mph).
- An airborne 4,000-pound passenger automobile traveling at a velocity of 50 mph, not more than 25 feet above the ground.

CLB for Tornado Missile Protection Design

The Consumers Design Class 1 auxiliary building technical support center/electrical equipment room/mechanical equipment room addition was designed to resist the following missiles:

- An 8-pound, 1-inch diameter by 3-foot long steel rod, traveling at a velocity of 317 feet per second (ft/s)
- A 108-pound, 4-inch thick by 12-inch wide by 12-foot long wood plank traveling end on at a velocity of 440 ft/s.
- A 1490-pound, 13.5-inch diameter by 35-foot long utility pole, traveling at a velocity of 211 ft/s.
- An airborne 4000-pound automobile traveling at a velocity of 106 ft/s.

CLB for Tornado Missile Protection Design

Systematic Evaluation Program (SEP)

As discussed in UFSAR Section 5.5.1.3, the capability of the Consumers Design Class 1 structures to resist the effects of tornado missiles was evaluated in Topic III-4.A of the NRC SEP.

Additionally, nine Consumers Design Class 1 systems identified as "safe shutdown systems" by the SEP program were evaluated.

CLB for Tornado Missile Protection Design

Systematic Evaluation Program (continued)

The NRC review of the nine Consumers Design Class 1 systems determined that the following safety related equipment was vulnerable to tornado missiles:

- Condensate storage tank
- Intake and exhaust vents for the emergency diesel generators
- Safety injection and refueling water (SIRW) tank
- Vent stacks for the atmospheric dump valves
- Vent stacks for the main steam safety relief valves

In addition, the steel frame enclosure over the spent fuel pool, the emergency personnel access enclosure, and the compressed air system supply for various Consumers Design Class 1 system valves were determined to be vulnerable to tornado missiles.

The NRC concluded that any damage that might occur to the above-mentioned SSCs would not adversely affect the safe shutdown capability of the plant, as discussed in the UFSAR.

RIS 2015-06 Assessment Scope and Results

The assessment completed reviews and walk downs for Consumers Design Class 1 structures, which were designed to withstand the tornado missiles specified in the CLB.

The non-conforming conditions, and affected systems, identified during the design reviews and walkdowns were documented in the following six condition reports :

a. CR-PLP-2017-01248: Service Water System (SWS)

During walkdowns, portions of the SWS were found to be susceptible to tornado generated missile impacts within the screenhouse. First, five intake fans are located along the exterior of the screenhouse, providing a straight line path to the SWS common header. Second, several of the ventilation paths provide a straight line path to the cable tray containing the power to the SWS pumps (P-7A, B, and C). Finally, a roll-up door is located in a position that could allow a missile to impact the SWS pumps, albeit via a somewhat tortuous path due to intervening equipment.

RIS 2015-06 Assessment Scope and Results

b. CR-PLP-2017-01249: Fuel Oil Transfer System

Portions of the safety-related fuel oil transfer system are susceptible to tornado generated missile impacts. First, the power cables for the fuel oil transfer pumps (P 18A and B) are located in the same cable tray that is susceptible to missile impact in the screenhouse. Second, portions of the fuel oil piping are not located within concrete reinforced structures and therefore would be exposed to tornado missiles. The exposed piping is considered to be safety-related but is not part of the flow path from credited fuel oil storage tank (T 10A) to the emergency diesel generators, so its failure would not affect the supply of fuel oil to the generators.

c. CR-PLP-2017-01250: Emergency Diesel Generator (EDG) Support Systems

During walkdowns of the exterior of the EDG rooms, which are part of the auxiliary building, the vent lines for each of the EDG day tanks (T-25A and T-25B) were found to be unprotected. A missile impact could crimp the vent lines, preventing fuel oil transfer from the day tanks to the EDGs. The vent lines are located in separate compartments, minimizing the potential for coincident failures of the vent lines.

RIS 2015-06 Assessment Scope and Results

- d. CR-PLP-2017-01251: Control Room Heating, Ventilation and Air Conditioning (CRHVAC) Intake

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

- e. CR-PLP-2017-01252: Auxiliary Feedwater (AFW) System Steam Supply

The steam supply line to the steam-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.

RIS 2015-06 Assessment Scope and Results

f. CR-PLP-2017-01253: Component Cooling Water (CCW) Surge Tank

The CCW system is a closed-loop cooling system for potentially radioactive equipment. The CCW surge tank (T-3) for the system is protected by a 12-inch thick reinforced concrete wall. However, studies have shown that a 12-inch wall is typically not sufficient to prevent damage during a tornado. Loss of the surge tank could potentially cause a loss of CCW inventory.

Initial Actions

The following initial actions were taken, in accordance with EGM 15-002 and Interim Staff Guidance DSS-ISG-2016-01.

- a. The non-conforming conditions were reported by ENO as an eight-hour notification under 10 CFR 50.72, and a licensee event report was submitted per 10 CFR 50.73.
- 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 was used to declare the equipment operable but non-conforming and to implement enforcement discretion.
- c. As initial compensatory measures, the following procedures for performing actions to respond to a tornado were verified to be in-place:
 - Station severe weather emergency and abnormal operating procedures.
 - Station procedures for the use of FLEX equipment to attain and maintain cold shutdown conditions.
- d. In addition, to heighten station awareness, discussions of existing procedural guidance and initial actions for operators to mitigate the risk of a tornado-missile impact for vulnerable systems were added to the operations narrative log. These discussions will be described in detail in the submittal.

Long-Term Compensatory Measures

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

- Operating procedures were revised to address the exposed fuel oil transfer piping by closing isolation valves, and steps were added for alternate vent paths for the EDG day tanks. This ensures that EDG day tank venting would be available if the exposed EDG day tank vents were damaged by a tornado missile.
- Operating procedures were revised to provide steps to align alternate control room ventilation in the event of a tornado generated missile strike that damages the CRHVAC system.
- The basis documents for operating procedures were revised to heighten awareness that a tornado event may require entry into the procedure, and to identify the potentially unprotected equipment within the SWS and the CCW system.

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

Assessment of Compensatory Measures

The submittal will include an assessment of long-term compensatory measures coincident with other operator actions.

- The long-term compensatory measures and other expected operator actions in response to severe weather and a subsequent loss of off-site power (LOOP) were collectively assessed. The assessment concluded that the implemented long-term compensatory measures along with other required actions in a severe weather LOOP event can be completed without putting unnecessary burden on the operators.
- An assessment of time-critical actions/time-sensitive actions (TCAs/TSAs) was also performed. This TCA/TSA assessment confirmed the ability of site operators to complete the long term compensatory measures, along with TCAs and TSAs, in response to severe weather and a subsequent LOOP.

Plans for Permanent Resolution

ENO plans to submit a risk-informed LAR 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.

In the event that an approved TMRE methodology is not available for use, ENO would consider either the use of the Electric Power Research Institute (EPRI)-developed TORMIS methodology to evaluate the identified non-conforming conditions, or performing plant modifications to eliminate the non-conformances, or a combination of the two.

Basis and Reason for Extension Request

The submittal will state that:

- 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 many of the non-conformances, 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.
- 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.
- A collective review was performed to confirm that the site operators can perform the long-term compensatory measures coincident with other standard required actions in a severe weather LOOP event without putting unnecessary burden on the operators.

Basis and Reason for Extension Request

- LARs for use of the TMRE methodology at several pilot sites are being submitted, with NRC approval of the LARs not expected until 2018. Once these LARs have been approved, then other licensees with non-conformances would submit LARs, based on the approved pilot LARs, for implementation of the TMRE methodology at their sites.
- To address the non-conformances identified at PNP, ENO would need to perform a TMRE analysis for the non-conformances, and prepare and submit a LAR for use of the TMRE methodology. The PNP LAR would be submitted after the LARs for the pilot sites have been approved. If the TMRE methodology did not resolve all of the non-conformances at PNP, then the use of the TORMIS methodology and/or the installation of plant modifications would need to be pursued. This would all need to be completed by the current enforcement discretion expiration date of June 10, 2018.
- The requested enforcement discretion expiration date of June 10, 2020 would allow ENO sufficient time to resolve the tornado missile protection non-conformances and restore the site to compliance.

Submittal Schedule

Entergy plans to submit the request to extend enforcement discretion from June 10, 2018 to June 10, 2020 in the next two weeks.



QUESTIONS?

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