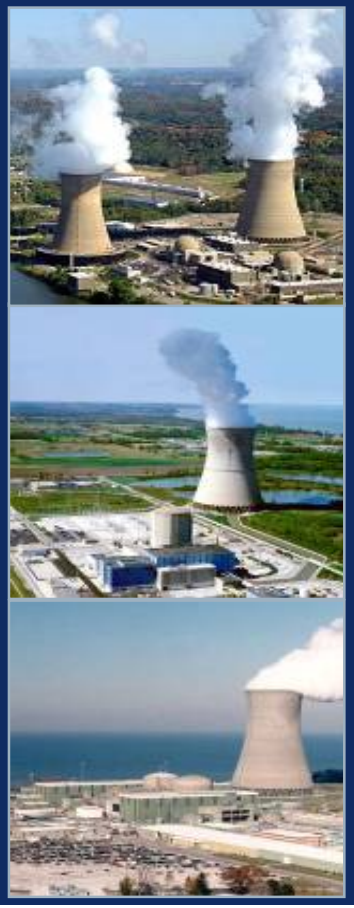
FENOC™
FirstEnergy Nuclear Operating Company

Drywell General Area Heat Detectors License Amendment Request

Pre-Submittal Meeting

Perry Nuclear Power Plant

February 21, 2018



Safety. Teamwork. Performance. Pride.

Drywell General Area Heat Detectors License Amendment Request

- **Introductions:**
  - Mike Koberling, Manager, Perry Design Engineering
  - Phil Lashley, Supervisor, FENOC Fleet Licensing
  - Marc Kuntz, Supervisor, Perry Nuclear Electrical/I&C Engineering
  - Jim Emley, FENOC Fleet Licensing
  - Aaron Cyphert, Perry Nuclear Electrical/I&C Engineering

Drywell General Area Heat Detectors License Amendment Request

- **Agenda**
  - Purpose of Proposed Change in Perry Fire Protection Program
  - Regulatory Bases
  - PNPP Design
  - Technical Justification
  - Summary
  - Open Discussion

Drywell General Area Heat Detectors License Amendment Request

- **Purpose of Proposed Change in Perry Fire Protection Program**
  - The drywell general area heat detection system is degraded due to high temperatures in the drywell.
  - Temporary modifications and supplemental actions have been put in place to compensate for the degraded condition.
  - Engineering evaluation has concluded that the function of the drywell general area fire detection is no longer required.
  - Proposed License amendment requesting NRC approval to abandon the drywell general area heat detectors in-place is planned.

Drywell General Area Heat Detectors License Amendment Request

- **Regulatory Bases**
  - PNPP Fire Protection Program (FPP) was reviewed under NUREG-0800, Section 9.5-1; BTP CMEB 9.5-1; and 10 CFR 50, Appendix R.
  - PNPP is not a 10 CFR 50, Appendix R, “Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979” plant.
    - PNPP’s Operating License (OL) was issued in March 1986.
  - In SER Supplement 8, dated January 1986, NRC concluded that the PNPP FPP satisfied BTP CMEB 9.5-1 and GDC 3.

Drywell General Area Heat Detectors License Amendment Request

- **Regulatory Bases (continued)**
  - PNPP Operating License contains standard fire protection license condition.
    - Licensee can make changes as long as the changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.
  - NRC Generic Letter 86-10 provided guidance on the process for making FPP changes.
    - If the change impacts the FPP that could result in a non-conformance with 10 CFR 50, Appendix R or some other aspect of the approved FPP, then NRC approval is required.
  - The proposed PNPP change is in non-compliance with BTP CMEB 9.5-1.

Drywell General Area Heat Detectors License Amendment Request

- **Regulatory Bases (continued)**
  - NRC Regulatory Guide 1.189 provides guidance on making FPP changes.
    - Reiterates standard license condition wording concerning “adverse impact.”
    - FPP changes that adversely affect the ability to achieve and maintain safe shutdown in the event of a fire and are not in compliance with regulatory requirements need prior NRC approval.

Drywell General Area Heat Detectors License Amendment Request

- **Regulatory Bases (continued)**
  - NEI 02-03, “Guidance for Performing a Regulatory Review of Proposed Changes to the Approved Fire Protection Program”
    - Provides guidance for determining whether prior NRC approval is required for changes to the approved FPP.
    - “Not adversely affected” means to ensure that one train necessary to achieve hot shutdown is free of fire damage AND that fire damage to at least one train necessary to achieve cold shutdown is limited.
    - Per NEI 02-03, an example that could require NRC approval is removing detection systems from areas having low combustible loading because the evaluation demonstrates that fire damage would be limited to a single safe shutdown train.

Drywell General Area Heat Detectors License Amendment Request

- **PNPP Drywell Fire Protection Design**
  - Two independent methods exist for achieving safe shutdown. The drywell contains equipment for both shutdown methods.
  - Combustibles contained within this drywell area are primarily comprised of cable insulation, lubricating oil, hydraulic fluids, grease, and motor winding insulation.
    - Total drywell fire loading is less than 52,000 BTU/square foot.
    - Corresponds to a fire severity of approximately 39 minutes.
  - Drywell walls and penetrations above the suppression pool have a three hour fire rating.

Drywell General Area Heat Detectors
License Amendment Request

- **PNPP Design (continued)**
  - Two heat detection systems located within the drywell.
    - One system is used for fire warning and local suppression system activation for the reactor recirculation pumps.
    - The second system is for general drywell area heat detection used for fire warning.
  - The drywell general area heat detectors consist of 39 detectors located within the drywell.
    - When a general area heat detector reaches its actuation temperature, an alarm signal is sent to the fire and security computer located in the fire control monitoring station located in the control room.

Drywell General Area Heat Detectors License Amendment Request

- **PNPP Design (continued)**
  - In addition to the two primary fire detection systems located in the drywell, additional means of drywell temperature monitoring are available to the control room
    - Drywell cooling system includes temperature detectors mounted in the ductwork and temperature detectors located in the drywell.
    - Containment atmosphere monitoring system has temperature detectors located in the drywell.

Drywell General Area Heat Detectors License Amendment Request

- **Technical Justification of Proposed Change**
  - The safe shutdown analysis evaluated the fire zone against the requirements of 10 CFR 50, Appendix R, Section III.G.
    - If a fire occurred in this fire zone, either Method A or Method B would be available to achieve and maintain safe shutdown.
    - Redundant methods are separated by distance or radiant energy shields in accordance with 10 CFR 50, Appendix R, Sections III.G.2.d and III.G.2.f.

Drywell General Area Heat Detectors License Amendment Request

- **Technical Justification of Proposed Change (continued)**
  - The installation of a fire detection system and an automatic fire suppression system in this fire zone, in accordance with 10 CFR 50, Appendix R, Section III.G.2.e., was not credited to protect safe shutdown components and circuits.
  - If a fire was detected by the drywell general area heat detectors during normal operation, the time to enter the drywell would exceed the burn time associated with the drywell combustible loading.
    - The plant response would effectively be the same with or without the drywell general area heat detection.

Drywell General Area Heat Detectors License Amendment Request

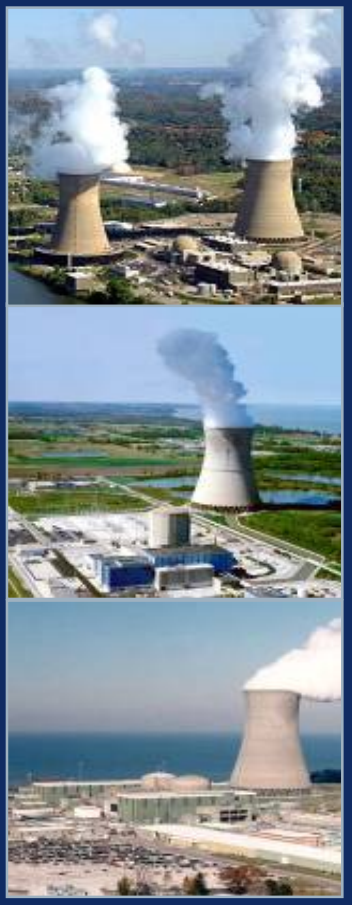
- **Technical Justification of Proposed Change (continued)**
  - Drywell three-hour fire barrier protection.
    - An exposure fire from other areas affecting equipment in this fire zone is not credible.
  - Most combustible material is concentrated in the area of the reactor recirculation pumps.
    - Carbon dioxide system with dedicated heat detection, will continue to provide detection and mitigation for these hazards.
  - Cable insulation is a large component of the combustible material in the drywell fire zone.
    - The majority of this cable is routed in conduit. Extensive damage from a fire in this fire zone is not reasonably expected.

Drywell General Area Heat Detectors License Amendment Request

- **Summary**
  - The proposed license amendment will request approval of a change to Perry FPP to abandon the drywell general area heat detection system in-place.
  - The proposed change deviates from BTP CMEB 9.5-1, therefore NRC approval is required.
  - Evaluation of the change concludes that the change is technically acceptable.
  - The license amendment is planned to be submitted to the NRC in April 2018.
  - NRC approval is requested by February 2019 to support the spring 2019 refueling outage.

FENOC™
FirstEnergy Nuclear Operating Company

Open Discussion



Safety. Teamwork. Performance. Pride.