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# James A. FitzPatrick License Amendment Request: Pre-submittal Meeting

## Update to the FitzPatrick Fuel Handling Accident Analysis with Impacts to Technical Specifications

Date: June 26, 2023

Presenter: Abul Hasanat, Christopher Staum

# Proposed Change:

- The FitzPatrick Fuel Handling Accident (FHA) analysis is being revised to account for two major changes to support the transition from a Triangular Mast to an NF-500 Mast in 2024.
- These changes would increase dose consequences sufficiently that prior NRC approval is required.
- Changes:
  - A single updated radial peaking factor (RPF) for both GNF2 & GNF3 fuel.
  - Redefinition of recently irradiated fuel as it relates to Secondary Containment (SC) and Control Room Ventilation (CREVAS) operability.

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# Proposed Change (cont.):

- Technical Specification (TS) impacted by way of TS Bases updates:
  - Recently Irradiated Fuel definition changing from 96 hours to 24 hours:
    - TS Table 3.3.6.2, Secondary Containment Isolation Instrumentation, Items #3 & #4: RB Exhaust Radiation & Refueling Floor Exhaust Radiation
    - TS 3.6.4.1, Secondary Containment
    - TS 3.6.4.2, Secondary Containment Isolation Valves (SCIVs)
    - TS 3.6.4.3, Standby Gas Treatment (SGT) System
  - Recently Irradiated Fuel definition changing from 96 hours to 104 hours
    - TS 3.3.7.1, CREVAS System Instrumentation
    - TS 3.7.3, CREVAS System
    - TS 3.7.4, Control Room Air Conditioning (AC) System
    - TS 3.8.2, Electrical Power Systems/AC Sources — Shutdown
    - TS 3.8.5, Electrical Power Systems/DC Sources — Shutdown
    - TS 3.8.8, Electrical Power Systems/Distribution Systems-Shutdown

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# FitzPatrick FHA Licensing Basis History

- FitzPatrick FHA analysis implemented 10 CFR 50.67 “Accident Source Term” in 2002 (ML022350228).
  - JAF-CALC-RAD-04410, Rev. 1

- FitzPatrick FHA analysis further updated with two revisions by way of 10 CFR 50.59 Screening and Evaluation.
  - JAF-CALC-RAD-04410, Rev. 2 (2018) utilized higher RPF with the fuel (GNF2) in use at that time.
  - JAF-CALC-RAD-04410, Rev. 3 (2021) incorporated new GNF3 fuel type.

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# Dose Analysis Updates:

- **Existing** FitzPatrick FHA analysis (JAF-CALC-RAD-04410, Rev. 3) models:
  - Both the Triangular Mast & NF-500 Mast with differing RPF
  - Both GNF2 & GNF3 Fuel with differing RPF
  - No credit for CREVAS
  - Credit for SC from 0 – 96 hours post reactor shutdown.
    - Requires automatic action within 2 minutes.

| 0 – 96 Hours | | | |
|---|---|---|---|
| | Control Room | EAB | LPZ |
| Dose | 1.95 | 2.72 | 0.304 |
| Limit | 5 | 6.3 | 6.3 |

| ≥96 Hours | | | |
|---|---|---|---|
| | Control Room | EAB | LPZ |
| Dose | 4.68 | 2.74 | 0.306 |
| Limit | 5 | 6.3 | 6.3 |

# Dose Analysis Updates (cont.):

- **Revised** FitzPatrick FHA analysis (JAF-CALC-RAD-04410, Rev. 4) models:
  - Only the NF-500 Mast with fixed RPF (1.70)
  - Both GNF2 & GNF3 Fuel with fixed RPF (1.70)
  - Credit for CREVAS from 24 – 104 hours post reactor shutdown.
    - Requires Operator manual action within 8 minutes.
  - Credit for SC from 0 – 24 hours post reactor shutdown.
    - Requires automatic action within 2 minutes.

| 0 – 24 Hours | | | |
|---|---|---|---|
| | Control Room | EAB | LPZ |
| GNF2 Dose | 2.13 | 2.98 | 0.333 |
| GNF3 Dose | 2.03 | 2.84 | 0.317 |
| Limit | 5 | 6.3 | 6.3 |

| 24 - 104 Hours | | | |
|---|---|---|---|
| | Control Room | EAB | LPZ |
| GNF2 Dose | 4.95 | 0.541 | 0.0605 |
| GNF3 Dose | 4.71 | 0.515 | 0.0576 |
| Limit | 5 | 6.3 | 6.3 |

| ≥ 104 Hours | | | |
|---|---|---|---|
| | Control Room | EAB | LPZ |
| GNF2 Dose | 4.94 | 0.285 | 0.0319 |
| GNF3 Dose | 4.71 | 0.271 | 0.0303 |
| Limit | 5 | 6.3 | 6.3 |

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# Technical Justification:

- Fuel Mast and RPF modeling:
  - Utilization of the NF-500 mast for refueling is planned starting with refueling outage J1R26 (September 2024). The existing FHA analysis does not support the RPF with current core loading strategies and the NF-500 mast. Therefore, changes to the RPF and elimination of the triangular mast were introduced into the FHA analysis.

- Credit to SC and CREVAS:
  - Transition of crediting the SC to CREVAS after 24 hours was determined to provide relief for outage planning and management. The existing FHA does not credit CREVAS. Modeling of CREVAS at 24 hours necessitates an operator manual action of 8 minutes.
  - Operator manual action is controlled by procedure AOP-44. Expected operator response to be under 4 minutes.
  - Additional cases at 104 hours post reactor shutdown demonstrated that neither SC or CREVAS are needed to produce acceptable FHA results.

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# Proposed Schedule:

- Target Submit Date: ***3 August 2023***
- Requested Approval Date: ***3 August 2024***
- Implementation Date: ***2 September 2024***