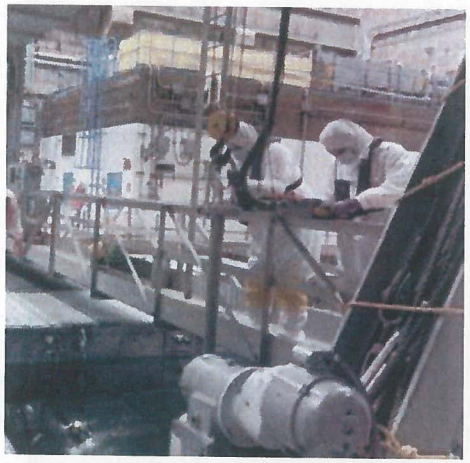
ENCLOSURE 1

PRESENTATION SLIDES FOR JUNE 29, 2022 PRE-SUBMITTAL MEETING

17 pages follow this cover sheet.


Callaway CSA LAR
Pre-Submittal Meeting



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Callaway CSA LAR Pre-Submittal Meeting

Brent Jungmann – *Ameren – Sr. Director, Nuclear Engineering*

- Welcome
- Meeting Purpose
  - Provide the NRC with information on the upcoming License Amendment Request (LAR) to reflect an updated Criticality Safety Analysis (CSA) for the storage of fuel in the spent fuel pool (SFP) at Callaway Energy Center
  - Obtain feedback from the NRC on the proposed LAR to ensure initial submittals address the full desired review scope and minimizes the need for RAIs
  - Mutual understanding of the proposed schedule and corresponding outage need date in order to ensure adequate NRC resource availability

Team Members

Presenters in Bold

Ameren Team Members	Titles
Brent Jungmann	**Senior Director, Nuclear Engineering**
Dan Pallardy	Manager, Design Engineering
Brian Richardson	Supervising Engineer, Reactor Engineering / Safety Analysis / Fuels
Deborah Farnsworth	Sr. Director, Nuclear Plant Support
Todd Witt	Manager, Regulatory Affairs
Tom Elwood	**Supervising Engineer, Regulatory Affairs**
Chris Ehmke	**Reactor Engineering**
Don Rickard	**Consultant Licensing Engineer**
Jim McInvale	Consultant Reactor Engineer

Holtec Team Members	Titles
Debu Majumdar	Vice President of Engineering Analysis
Stefan Anton	Senior Vice President of Engineering
Vadym Makodym	Engineering Analyst
Jameson Hetrick	Engineering Analyst
Brian DiPaolo	Adjunct Program Manager

Agenda

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- Project Purpose / Background
- CSA Description
- Technical Specification Changes
- Schedule
- Questions

Project Purpose / Background

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- Callaway LFA / VQP Program for Framatome GAIA Fuel
- Need Assessment for Revised Spent Fuel Pool Criticality Analysis
  - AOR can require credit for integral absorbers in some cases
  - AOR uses depletion parameters specific to incumbent fuel
- Compliance with Reg Guide 1.240, "Fresh and Spent Fuel Criticality Analyses"
- Acceptance Criteria – 10 CFR 50.68(b)(4)

Spent Fuel Pool Storage Description

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- Current Spent Fuel Storage Racks
  - Approved for installation in 1999 with a criticality analysis that remains the Analysis of Record
  - 15 high density storage racks incorporating BORAL™ fixed neutron absorber
  - Incumbent fuel is Westinghouse 17x17 Standard, Optimized, & Vantage
- No physical changes are being proposed to the Spent Fuel Pool

Spent Fuel Pool Storage Description

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- AOR primary analysis was for Mixed Zone Three Region storage
  - The whole SFP can be loaded (no reserved empty cells) with conditions
    - Region 1 assemblies must be stored on the periphery of the racks
    - Region 1 assemblies must be isolated from one another by one or more high burnup, Region 2 assemblies
    - The periphery row of alternating Region 1 & 2 assemblies must be isolated from internal, Region 3 assemblies by one or more Region 2 assemblies
  - A conventional, checkerboard configuration for Region 1 fuel was also analyzed

Spent Fuel Pool Storage Description (Continued)

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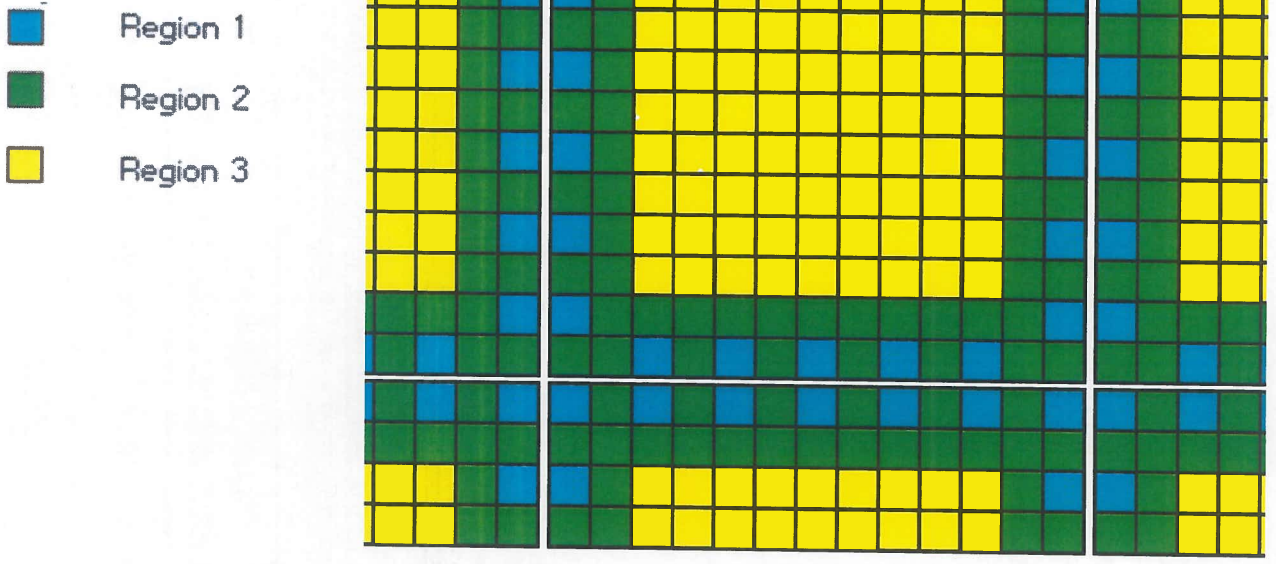

CSA Summary of Changes

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- Alignment with current regulatory standards
- Explicitly model Framatome GAIA fuel design
- Remove credit for integral absorbers
- Simplify storage configurations
- Add credit for cooling time and soluble boron
- Reduce credit for fixed neutron absorber

Technical Specification Changes

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- **TS 3.7.16, "Fuel Storage Pool Boron Concentration"**

LCO 3.7.16 The fuel storage pool boron concentration shall be ≥ 2165 ppm.

APPLICABILITY: When fuel assemblies are stored in the fuel storage pool ~~and a fuel storage pool verification has not been performed since the last movement of fuel assemblies in the fuel storage pool~~.

Conforming change to delete Required Action A.2.1 and A.2.2

A.2~~.1~~	Initiate action to restore fuel storage pool boron concentration to within limit.	Immediately
~~OR~~		
~~A.2.2~~	~~Verify by administrative means that a non-Region 1 fuel storage pool verification has been performed since the last movement of fuel assemblies in the fuel storage pool.~~	~~Immediately~~

Technical Specification Changes (continued)

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- **TS 3.7.17, "Spent Fuel Assembly Storage"**

LCO 3.7.17 The combination of initial enrichment and burnup of each spent fuel assembly stored in Region 2 ~~or 3~~ shall be within the Acceptable Domain of Figure 3.7.17-1 or in accordance with Specification 4.3.1.1.

– Conforming change to SR 3.7.17.1 Frequency

SR 3.7.17.1	Verify by administrative means the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.7.17-1 or Specification 4.3.1.1.	Prior to storing the fuel assembly in Region 2 ~~or 3~~

– Figure 3.7.17-1, "Minimum Required Fuel Assembly Burnup As a Function of Initial Enrichment to Permit Storage in Regions 2 ~~and 3~~," will remove reference to Region 3 and reflect different loading curves based on Fuel Assembly Cooling Time

Continued

Technical Specification Changes (continued)

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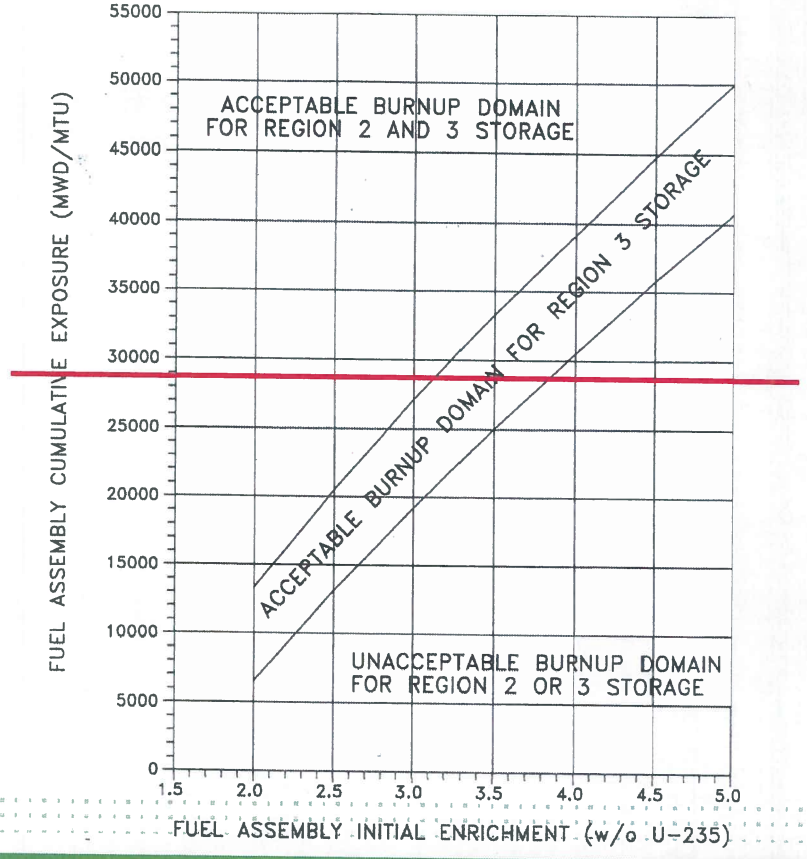
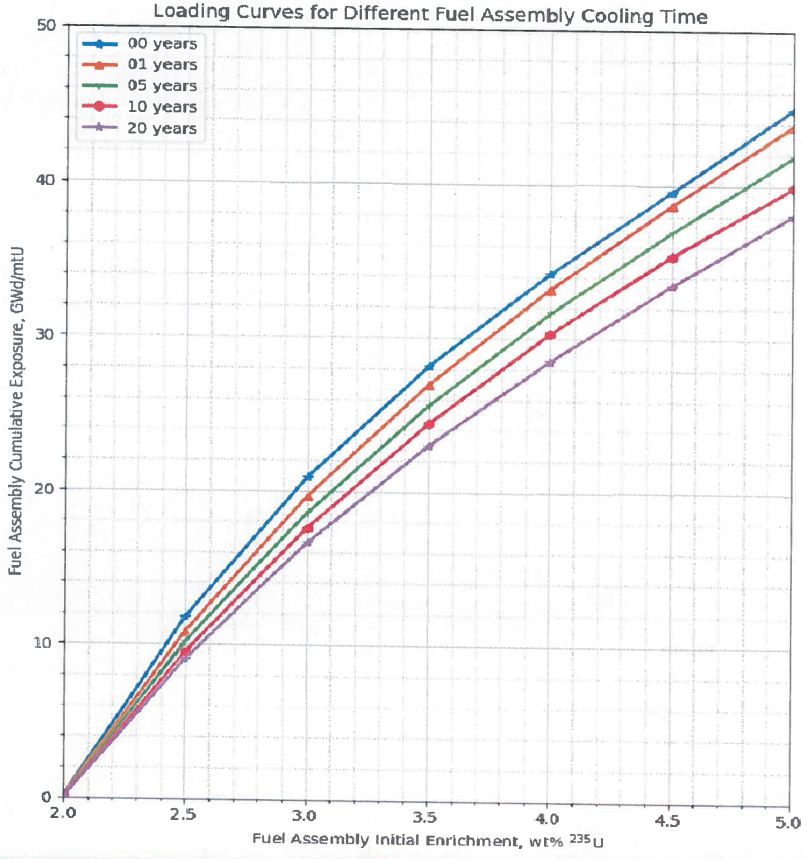
Figure 3.7.17-1 Revision





Technical Specification Changes (continued)

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TS 4.3.1 "Criticality"

- **TS 4.3.1.1** The spent fuel storage racks are designed and shall be maintained with:

  a. Fuel assemblies having a maximum nominal U-235 enrichment of 5.0 weight percent. ~~For fuel with enrichments greater than 4.6 nominal weight percent of U-235, the combination of enrichment and integral fuel burnable absorbers shall be sufficient so that the requirements of 4.3.1.1.b are met.~~

  b. k_{eff} ~~≤ 0.95~~ < 1.0 if fully flooded with unborated water and $k_{eff} \leq 0.95$ if flooded with borated water, which includes an allowance for uncertainties as described in Section 9.1 of the FSAR;

  c. A nominal 8.99 inch center to center distance between fuel assemblies placed in the fuel storage racks;

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Technical Specification Changes (continued)

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- **TS 4.3.1.1** changes continued:

d. Partially spent fuel assemblies with a discharge burnup in the "Acceptable Burnup Domain for Region 2 ~~and 3~~ storage" of Figure 3.7.17-1 may be allowed unrestricted storage in the fuel storage racks, except for the empty cells in the checkerboarding configuration (Region 1);

e. Deleted ~~Partially spent fuel assemblies with a discharge burnup in the "Acceptable Burnup Domain for Region 3 Storage" of Figure 3.7.17-1 may be allowed unrestricted storage, except for the empty cells in the checkerboarding configuration, and except in Region 2 locations in a Mixed Zone Three Region configuration in the fuel storage racks; and~~

f. New or partially spent fuel assemblies with a discharging burnup in the "Unacceptable Burnup Domain for Region 2 ~~or 3~~ Storage" of Figure 3.7.17-1 will be stored in Region 1.

Schedule

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- **LAR submittal** — **August 30, 2022**
  - Pre-submittal Meeting – June 28, 2022
  - Ameren/Holtec can support NRC Audit, if requested
- **Requested NRC approval of LAR** — **June 23, 2023**
  - Supports Receipt of GAIA Fuel for Operating Cycle 27
  - RFO begins October 2, 2023

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Discussion, Feedback or Questions


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