FuelSolutions™ Storage System License Amendment Pre-Submittal Meeting

Steven E. Sisley
Licensing/Regulatory Compliance Manager
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Topics

- Objectives of License Amendment
- Applicable Regulation
- Current TS Requirements
- Proposed TS Revisions
- Design-Basis Thermal Analyses
- Licensing Schedule

Objectives of License Amendment

- **Allow Licensee to Choose Method of Periodic Monitoring**
  - Periodic visual inspection of storage cask vent screens

    OR
  - Periodic monitoring of the storage cask liner thermocouple temperature
- **Allow Longer Surveillance Intervals for Casks Containing Canisters with Lower-Than-Design-Basis Heat Loads**
  - ALARA – reduce occupational exposure due to periodic inspections that are not necessary to maintain safe storage

Applicable Regulation

- **10CFR72.122(h)(4) Requires Periodic Monitoring for Dry Spent Fuel Storage**
  - In a manner such that the licensee will be able to determine when corrective action must be taken to maintain safe storage conditions
  - Monitoring period based on spent fuel storage cask design requirements
- **Currently Satisfied by Two Separate Means**
  - Daily visual inspection of the storage cask vents (TS 3.3.1)
  - Daily monitoring of the storage cask liner thermocouple temperature (TS 3.3.2)
  - Redundancy currently provided by TS requirements is not required by regulations

Current TS Requirements

➢ Storage Cask Air Inlet and Outlet Opening (TS 3.3.1)

- Daily visual inspection of storage cask inlet and outlet vent screens to assure they are free of significant blockage or damage
  - > Safety analysis based on flow area of unblocked vent channels/screens
  - > Prevents prolonged blockage or damage of vents that could lead to temperatures that exceed short-term limits
- Applies to Storage Operations
- Actions if Vent Screens Blocked or Damaged:
  - > A.1 - If blocked, clear blockage within 24 hours, OR
  - > A.2 - If vent screens damaged, repair or replace within 24 hours
- If Actions and Times not met, monitor temperatures per TS 3.3.2

Current TS Requirements

➢ Storage Cask Temperatures During Storage (TS 3.3.2)

- **Daily monitoring of Storage Cask liner thermocouple temperature**
  - > Measured temperature ≤ limit (e.g., ≤ 163°F for T_{amb} ≤ 100°F)
    - Limits based on steady-state thermal analyses for design-basis heat load under both normal & off-normal ambient conditions
  - > ΔT between two consecutive days ≤ limit (e.g., ΔT ≤ 83°F plus ΔT_{amb})
    - Limit based on results of blocked vent thermal transient analysis for design-basis heat load
- **Applies to Storage Operations**
- **Actions if Temperature Exceeds Limit:**
  - > A.1 – Administratively verify correct fuel loading within 24 hours, AND
  - > A.2 – Visual check of cask vent screens within 24 hours, AND
  - > A.3 – Check temperature measuring equipment within 24 hours, AND

Current TS Requirements

➢ Storage Cask Temperatures During Storage (TS 3.3.2)

- **Actions if Temperature Exceeds Limit (Continued):**
  - > A.4 – Repair/replace temperature measuring equipment within 48 hours, AND
  - > A.5 – Visually inspect vent channels. If no blockage, visually inspect cask interior within 48 hours, AND
  - > A.6 – Verify cask temperature returns to within limit within 48 hours.
- **If Actions and Times not met:**
  - > B.1 – Initiate actions to cool cask within limit within 96 hours, AND
  - > B.2 – Return Canister to Transfer Cask within 30 days, AND
  - > B.3 – Return Canister to repaired/replaced Storage Cask within 270 days.

Proposed TS Revisions

- **Change Periodic Monitoring TS to Allow Either:**
  - Periodic visual inspection of Storage Cask vent screens, OR
  - Periodic monitoring of Storage Cask liner thermocouple temperature
- **Add *Storage Cask Periodic Monitoring Program***
  - Defines surveillance interval based on Storage Cask heat load
    - > Allows longer surveillance intervals for cask with lower heat loads
  - Define Storage Cask liner thermocouple temperature Limits based on Storage Cask heat loads
    - > Limits based on steady-state thermal analyses for a range of heat loads
    - > Eliminated ΔT limit
- **Revise Actions and Completion Times**
  - Eliminate Actions that are not needed
  - Added previously unstated Actions and revise logical connectors

Proposed TS Revisions

- **Bases for Proposed TS Revisions:**
  - Either Periodic Monitoring method allows a licensee to determine when corrective actions are required per 10CFR72.122(h)(4)
  - Lower heat load casks take longer to reach temperature limits
- **Specific TS Changes**
  - Combine TS 3.3.1 with TS 3.3.2
  - LCO 3.3.2 Revised to Permit Either:
    - > Visual Inspection of Vents, OR
    - > Liner Thermocouple Temperature Monitoring
      - Temperature limits defined by *Storage Cask Periodic Monitoring Program*

Proposed TS Revisions

➢ Specific TS Changes (Continued)

- **Actions if Monitoring by Visual Inspection**
  - > A.1 – If vent screens blocked, clear blockage within 24 hours,
    AND
  - > A.2 – If vent screens damaged, remove damaged vent screens within 24 hours,
    AND
    - If damage reduces flow area but does not increase access to vent channels, repair or replace damage vent screens within 24 hours,
      OR
    - If damage opens vent channels, clear any debris or obstructions from channels and repair/replace damaged vent screens within 24 hours,
      AND
    - Attach repaired/replacement vent screens within 24 hours

Proposed TS Revisions

➢ Specific TS Changes (Continued)

- **Actions if Monitoring by Liner Thermocouple**
  - > A.3.1 – If temperature exceeds limit, check vent screens for blockage or damage within 24 hours, AND
  - > A.3.2.1 – If vent screens are blocked or damaged, perform Actions A.1 and A.2, as necessary,
    OR
  - > A.3.2.2.1 – If not blocked, check temperature monitoring equipment to assure functioning properly within 24 hours, AND
  - > A.3.2.2.2 – Repair/replace temperature monitoring equipment within 48 hours if necessary,
    AND
  - > A.3.3 – Verify temperature returns within the 200°F local concrete long-term temperature limit within 72 hours, AND
  - > A.3.4 – Verify temperature returns within the applicable limit of the *storage cask periodic monitoring program* within 192 hours

Proposed TS Revisions

➢ Specific TS Changes (Continued)

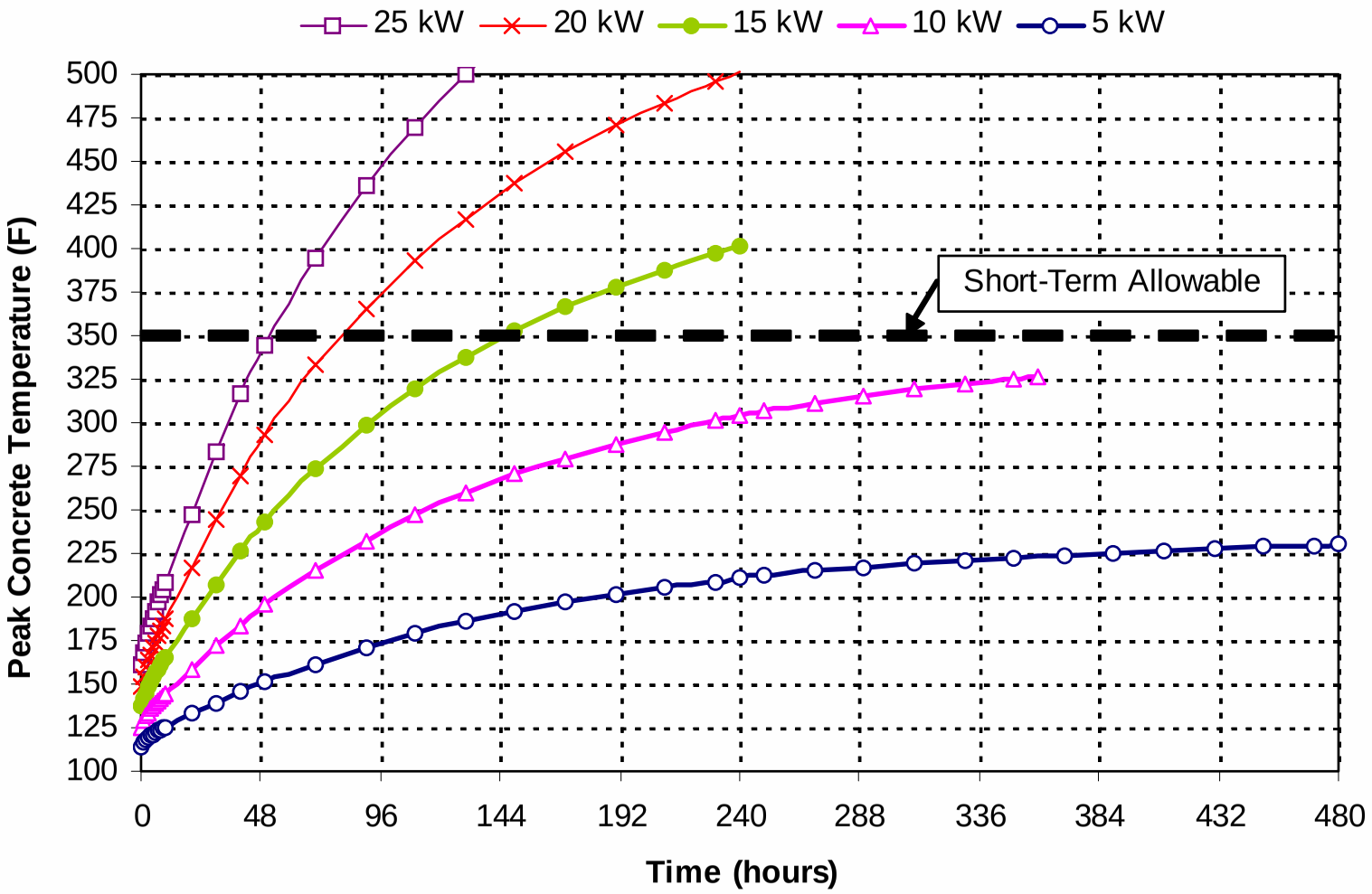
- **If Actions and Times Not Met:**
  - > B.1 – Initiate actions to cool cask within 96 hours,
    AND
  - > B.2.1 – Visually inspect cask interior for ventilation obstructions within 96 hours,
    AND
    - B.2.2.1 – Remove ventilation obstructions within 96 hours, AND
    - B.2.2.2 – Verify temperature returns within limit within 96 hours, AND
    - B.2.2.3 – Verify temperature returns within the applicable limit of the *storage cask periodic monitoring program* within 192 hours

    OR
    - B.2.3.1 – Return Canister to Transfer Cask within 30 days, AND
    - B.2.3.2 – Return Canister to repaired/replaced Storage Cask within 270 days

Design-Basis Thermal Analyses

- **Blocked-Vent Transient Thermal Analysis Performed Reduced Cask Heat Loads**
  - Same computer code and thermal model as generic design-basis evaluation
  - Only magnitude of heat load and length of transient varied
  - Analyses used determine time at which the short-term peak concrete temperature limit is reached after vent blockage
  - Proposed surveillance interval taken as nearest whole-day increment that is at least 25% lower than the calculated time
    - > 25% margin based on SR 3.0.2 – Surveillance frequency met if surveillance performed within 1.25 times the specified frequency
- **Generic Analysis for 25 kW Heat Load Shown to Bound Design-Basis Canister-Specific Analyses**

Design-Basis Thermal Analyses



Design-Basis Thermal Analyses

Cask Heat Load (kW)	Time to Short-Term Temperature Limit (hours)	Proposed Surveillance Interval
28	41	1 day
25	52	1 day
20	80	2 days
15	146	4 days
10	N/A*	1 week
5	N/A*	2 weeks

*Note: Limit not reached for under stead-state blocked-vent condition for cask heat loads ≤10 kW

Licensing Schedule

- **BFS Plans to Submit LAR to NRC in June 2005**
- **BFS and Consumers Requests High Priority for NRC Review**
  - LAR needed to support improved ALARA at operating ISFSI (BRP)
  - Relatively simple changes
  - Direct-final rulemaking?