

**Omaha Public Power District  
(OPPD)  
Fort Calhoun Station  
Dry Cask Storage**

**Meeting with NRC Spent Fuel Project Office  
September 7, 2006**

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## **Agenda**

- Introduction
- Background
- Options
- Discussion of timeframes for decisions
- Identification of action items
- Public questions
- Closing remarks

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## Introductory Comments

- OPPD
- NRC

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## Background Pre-Exemption

- Loading 10 canisters was the original Fort Calhoun Station (FCS) dry cask campaign scope
- 75-ton capacity auxiliary building crane addressed by use of lighter weight transfer cask
- Use of lighter cask was believed to be allowable without NRC approval under 10 CFR 72.48

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## Background Pre-Exemption

- NRC challenged use of lighter cask during FCS inspection prior to fuel movement
- OPPD determined that processing of exemption request and approval was best way to allow campaign to continue

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## Background Exemption Basis

- Maintain full core off-load capability after fall 2006 refueling
- Allow receipt and storage of new fuel
- Allow better management of decay heat loads within spent fuel pool
  - including minimizing fuel handling
- Inadequate time to process amendment request

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## Background Exemption Limits/Conditions

- Exemption issued on July 21, 2006
- Limit of 4 canisters loaded using lightweight cask
  - Decay heat limited to 11 kW per canister
  - Minimum 16.2 years cooling time for fuel
  - Dose limits of 170 mR/hr axial and 110 mR/hr radial with supplemental shielding (24 kW)

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## Background Need for Loading Additional Canisters

- Next FCS refueling outage is spring 2008
- Loading remaining 6 canisters will:
  - allow better management of decay heat loads within spent fuel pool
  - minimize fuel handling
- Personnel with experience from loading first 4 canisters should be available
- Better efficiency, lower exposure

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## Options Crane Upgrade Discussion

- Background
- Evaluation of 100-Ton Capability
- 100-ton vs. 75-Ton Evaluation
- Dose Impact
- Upgrade Costs
- Schedule Issues
- Conclusions

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## Crane Upgrade Background

- Original Auxiliary Building crane was 100-ton non-single failure proof
- NUREG-0612 (July 1980) required upgrade to single failure proof design

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## **Crane Upgrade Background (Continued)**

- **Original seismic analysis did not include loads on the crane hook**
- **New 75-ton trolley (single failure proof) heavier than 100-ton trolley**
- **75-ton fuel cask weight projected**

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## **Evaluation of 100-Ton Capability**

- **Trolley frame and wheels are adequate**
  - **brakes and gearing require modification**
- **Crane bridge girders are questionable**
- **Crane runway girders and building structure require modification**
- **Rail bay floor is adequate**

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## 100-ton vs. 75-ton Cask Evaluation

- Three vendors provided 75-ton option
- Evaluation criteria
  - Dose impact
  - Crane modifications
    - Upgrade
    - Remote operation
  - Schedule for crane modification
    - Installation
    - Reliability
    - Licensing

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## Total Dose Impact

- Dose for 75-ton design estimated at ~400 mR
- Dose for 100-ton design estimated at ~200 mR
- Industry doses for 100-ton cask estimated from 200 to 1000 mR
- FCS initial campaign averaged ~250 mR per canister

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## Upgrade Cost

- Auxiliary Building and crane analysis
- Engineering design package preparation
- Materials/equipment
- Bridge support installation
- Building support installation
- Qualification & licensing
- Industry OE on crane upgrades is \$3-10M

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## Schedule Issues

- Long lead time for crane upgrade
  - Pit Rack
- Negative OE on crane reliability after modifications
- Additional time required for requalification and inspection

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## Crane Upgrade Conclusions

- Crane capacity upgrade is not cost-effective
  - Structural issues
  - Licensing uncertainty
  - Long lead times
  - Reliability issues
- Very low dose can be achieved with existing crane and lightweight cask

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## Options Future Use of Lightweight Cask

- Experience at Fort Calhoun
- NRC Inspection of TN
- TN Amendment to CoC 1004

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## Experience at Fort Calhoun

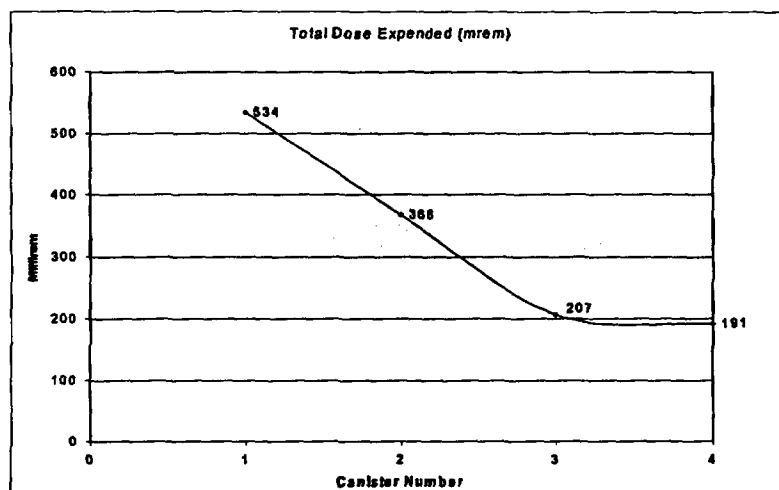
- Exemption issued on July 21
- Four canisters loaded between July 24 and August 17
- Average total exposure was approximately 250 mR per canister
- Dose per canister decreased through campaign

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## Total Doses for Loading Four Canisters



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## NRC Inspection of TN

- Inspection performed August 28 and 29 in TN's Columbia, MD offices
- Inspection addressed the remaining issues identified during previous NRC pre-load inspection of OPPD, and one new issue
- No safety issues identified
- Inspection still ongoing, with TN and NRC actively working toward a conclusion

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## TN Amendment to CoC 1004

- TN committed to submit a Technical Specification (TS) cleanup amendment before April 2007
- Reformat all TS to Improved TS format
- TS 1.2.1 to be revised to remove any reference to cask or HSM dose rates for fuel qualification (no technical change)
- Basis to be revised to clearly state how the qualification tables are developed

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## TN Amendment to CoC 1004 (Continued)

- TS 1.2.7 (HSM Dose Rates) to be removed or clarified:
  - Remove reference to detection of misload
  - Dose rate limits specified for each system
  - Measurement location and configuration will be specified and tied to specific analysis

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## TN Amendment to CoC 1004 (Continued)

- TS 1.2.11 (Transfer Cask Dose Rates) to be removed or clarified:
  - Remove reference to detection of misload
  - Dose rate limits specified for each system
  - Measurement location and configuration will be specified and tied to specific analysis

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## **TN Amendment to CoC 1004 (Continued)**

- **TS 1.2.17a to be removed:**
  - **Provide change to operations chapter of the UFSAR requiring use of helium as backfill gas**
  - **Demonstrate no time limit is required for vacuum drying**
- **Issues addressed by amendment request will depend on outcome of NRC inspection**

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## **Other Options**

- **Re-rack of spent fuel pool is not feasible**
- **Any other vendor system would have similar limitations**

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## Staff Requirements Memo

- Issued August 31, 2006
- FCS exemption is not precedent for similar exemption requests based on insufficient crane capacity
- Generic communications to be issued
- All licensing actions to be processed well in advance of fuel movement
- Inform Commission of insufficient crane capacity

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## Summary

- 4 canisters loaded at FCS
  - Lightweight cask used
  - Average dose consistent with industry performance
  - ALARA met
- OPPD prefers to load remaining 6 canisters before 2008 outage

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## Summary (continued)

- NRC inspection of TN is in progress
- TN will submit an amendment request before April 2007 to resolve NRC inspection issues

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## Suggested Items for Discussion

- Complexity of TN amendment and review process
- Adequacy of industry guidance for implementing 10 CFR 72.48 contained in NEI 96-07
- Rules of Engagement

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# Discussion of Timeframes for Decisions

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# Identification of Action Items

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