

November 8, 1999

Southern Nuclear Operating Company, Inc.  
ATTN: Mr. H. L. Sumner, Jr.  
Vice President  
P. O. Box 1295  
Birmingham, AL 35201-1295

SUBJECT: MEETING SUMMARY - DISCUSSION OF SPENT FUEL TRANSPORTATION  
TO THE INDEPENDENT SPENT FUEL STORAGE INSTALLATION - DOCKET  
NOS. 50-321 AND 50-366

Dear Mr. Sumner:

This refers to the closed management meeting that was conducted at your request at the NRC Region II Office on November 4, 1999, to discuss the cradling device used to transport spent fuel casks to the Independent Spent Fuel Storage Installation (ISFSI). A list of attendees and a copy of your presentation handouts are enclosed.

It is our opinion that this meeting was beneficial in that we were able to review your progress and accomplishments with respect to the ISFSI. The meeting also provided the NRC an opportunity to discuss your initiatives and future plans for onsite storage of spent fuel.

In accordance with Section 2.790(a) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

Should you have any questions concerning this meeting, please contact us.

Sincerely,  
(Original signed by  
Pierce H. Skinner)

Pierce H. Skinner, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Docket Nos. 50-321, 50-366  
License Nos. DPR-57, NPF-7

Enclosures: 1. List of Attendees  
2. Licensee Presentation Handouts

cc w/encls: (See Page 2)

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cc w/encls:

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cc w/encls cont'd: (See Page 3)


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cc w/encls: Continued  
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List of Attendees

Nuclear Regulatory Commission

P. Skinner, Chief, Reactor Projects Branch 2, Division of Reactor Projects (DRP)  
G. Belisle, Chief, Maintenance Branch, Division of Reactor Safety (DRS)  
B. Holbrook, Senior Project Engineer, DRP  
C. Rapp, Senior Project Engineer, DRP  
T. Fredette, Resident Inspector, Hatch, DRP  
W. Gloersen, Senior Fuel Facility Project Inspector, Division of Nuclear Materials Safety (DNMS)  
D. Seymour, Senior Fuel Facility Project Inspector, DNMS  
R. Chou, Reactor Inspector, DRS  
P. Narbut, Spent Fuel Projects, Office of Nuclear Materials Safety and Safeguards

Southern Nuclear Operating Company, Inc. (SNC)/ Southern Company Services (SCS)

D. Bland, Manager, Dry Storage Project, SNC  
J. Wade, Hatch Licensing Engineer, SNC  
T. Springfield, Technical Services, SCS  
S. Walden, Engineering Lead, SCS  
C. Howard, Dry Storage Licensing Lead, SNC  
G. Bockhold, General Manager, Nuclear Technical Services, SNC

## **Agenda**

- Overview
- Licensing Requirements
  - Part 50/Part 72
- Design Basis
  - R/B crane, lift yoke, railcar, gantry crane, transfer pad, cradle
- Summary

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## **Overview**

- Purpose
  - Describe handling cradle design basis and licensing requirements
- History
  - Practical limitations
- Operational handling
  - In building, movement to tip-up pad, handling operations, relocation to ISFSI

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## **History**

- HI-STORM / HI-STAR
- Unit 1 Reactor Building
  - ┆ Floor loading
  - ┆ Horizontal versus vertical
  - ┆ Railcar - airlock door
- Part 72 SFP lift device
  - ┆ Regulatory position

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## **Operational Handling - Part 50**

- Hatch Unit 1 Reactor Building
- Flatbed railcar
  - ┆ load spread, horizontal position - cradle
- Unit 1 R/B overhead crane - main hook
  - ┆ NUREG 0612 - single failure proof
- Special lift device
  - ┆ vendor designed and supplied for lift trunnions

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## Operational Handling - Part 72

- Railcar
  - ┆ horizontal, cradle
  - ┆ position under gantry crane
- Gantry crane
  - ┆ lift HI-STAR, in cradle - horizontal
  - ┆ rotate cradle to vertical
- Crawler
  - ┆ relocate HI-STAR to pad - vertical

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## Licensing Basis - Part 72

- Technical Specification LCO 2.1.3
  - ┆ lift height restrictions
    - ┆ 21" vertical
    - ┆ 72" horizontal
  - OR**
  - ┆ lift devices designed iaw ANSI N14.6 & redundant drop prevention
  - OR**
  - ┆ site specific analysis to ensure drop accident impact loads remain within HI-STAR 100 TSAR limits of 60g

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## **Licensing Basis - Part 72**

- Certificate of Compliance
  - pad and foundation characteristics for drop & tipover analyses
- HI-STAR 100 TSAR
  - Chapter 8 handling requirements
    - site cask handling procedure
    - evaluation

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## **Licensing Basis - Part 50**

- Comply with commitments made in NUREG-0612 Safety Evaluation Report
  - NUREG-0554 single failure proof crane
  - ANSI N14.6 lift yoke
  - safe load paths
  - heavy loads movement procedure

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## Heavy Loads

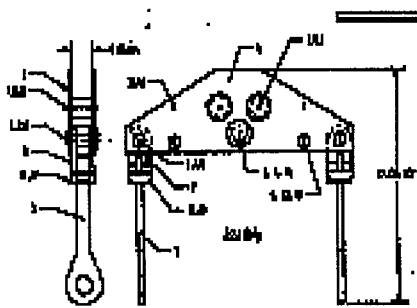


### ■ R.B. Overhead Crane Main Hoist

- Per SER 50-321/366  
TER -C5257-095/446  
meets NUREG 0612
- Single Failure Proof

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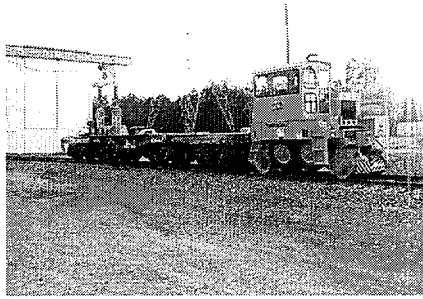
## Lift Yoke



- Load Limit 250,000
- Meets ANSI N14.6  
Stress limits 6 and 10  
Tested to 300%
- Hoist Load Factor 0.15

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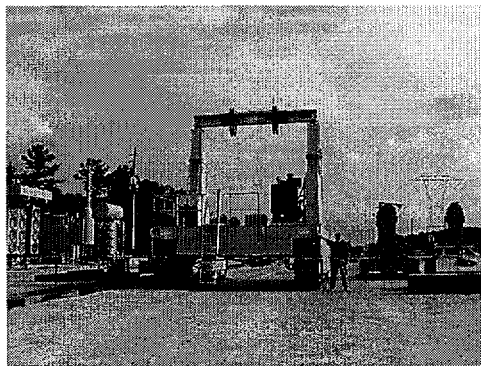
## Railcar (commercial)



- Design loads (spec.) <72 kips/axle
- No overturning, seismic
- Rail line walkdown
- Height of deck - limit bottom cask <72"
- Per CoC 2.1.3, LCO not applicable when SFSC is on railcar

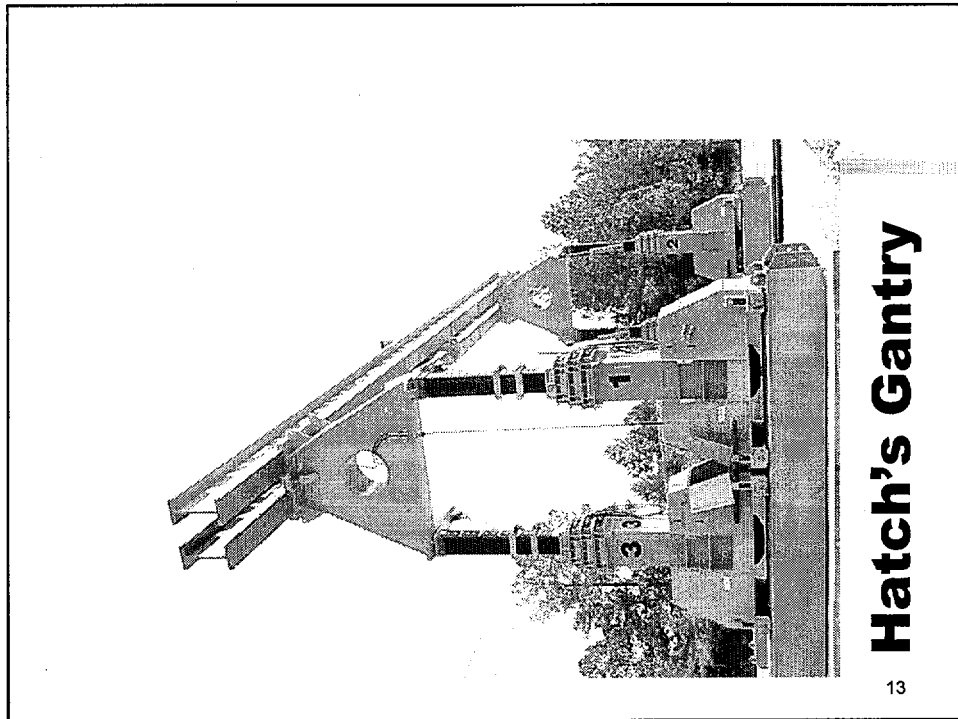
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## Crawler (commercial)



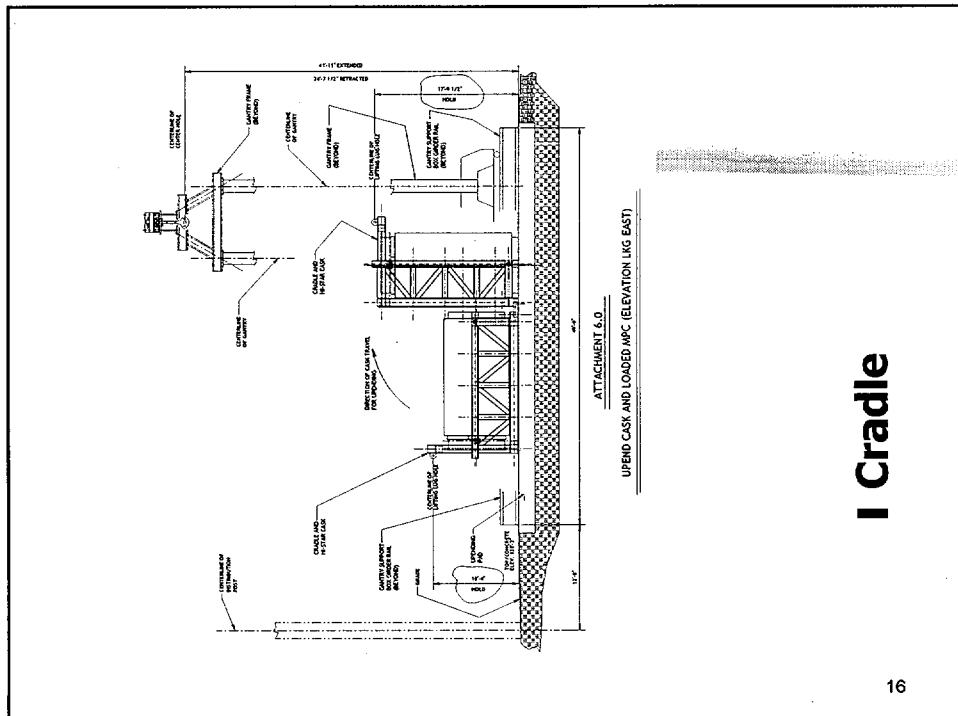
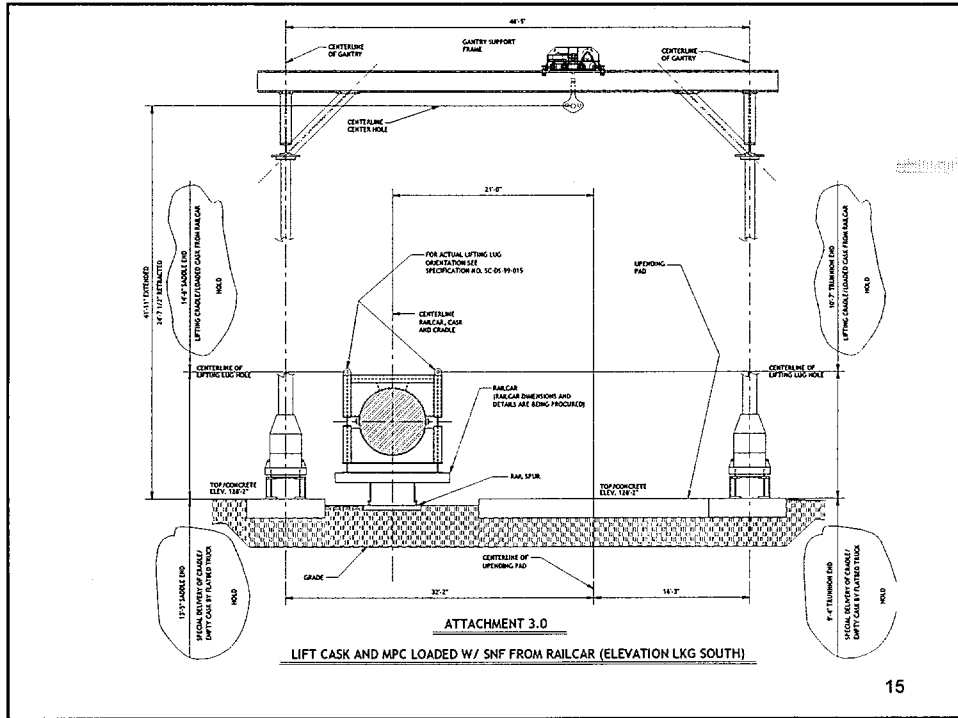
- Used HI-STORM /HI-STAR
- Designed 180 tons tested to 125%
- Limit lift height <21" (HI-STAR)
- In TSAR

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## **Gantry (commercial)**

- Used for HI-STAR only.
- Design Specification defines the loading criteria (various lift configurations) for gantry.
- Tested to 125% of load.



# I Cradle

## **Cradle**

- Designed for horizontal movement from R.B.
- Designed for Upending
- Lift height restrictions - TSAR (72" H., 21" V.)

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## **Cradle (Analysis)**

- Designed to AISC for upending, horizontal, and seismic load conditions.
- Credible drop and non-mechanistic tipover.
  - Lawrence Livermore methodology
  - LS-DYNA3D dynamic model
  - Concrete pad and soil modulus of elasticity
- Designed to limit impact forces to fuel in cask to < 60g.

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## **Upending Pad Requirements (same as storage pad)**

- Designed for HI-STAR
- HOLTEC - supplied standard pad design with concrete and soil parameters
- Use Lawrence Livermore method
- Soil Classification (ASTM D 2487) and compare to NUREG/CR-6608)
- Load Combination (ACI 349)
- Construction (ACI 318) per NUREG 1536

## **Testing**

- Gantry
  - ┆ 125% rated, tip up operations
- Crawler
  - ┆ 125% rated, 100% load on-site
- Railcar
  - ┆ 100% anticipated
- Cradle
  - ┆ 100% anticipated, tip up operations

## **Summary**

- Existing facility limitations
- Standardized operating practice
- Commercial lifting equipment
  - conflicting design issues
  - tested
- Assume commercial items fail
- Within bounds of licensing basis
- No safety issues