U. S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

NUCLEAR WASTE TECHNICAL REVIEW BOARD

SUBJECT: COMPATIBILITY OF EXISTING INTERIM STORAGE SYSTEMS WITH THE WASTE DISPOSAL HANDLING SYSTEMS

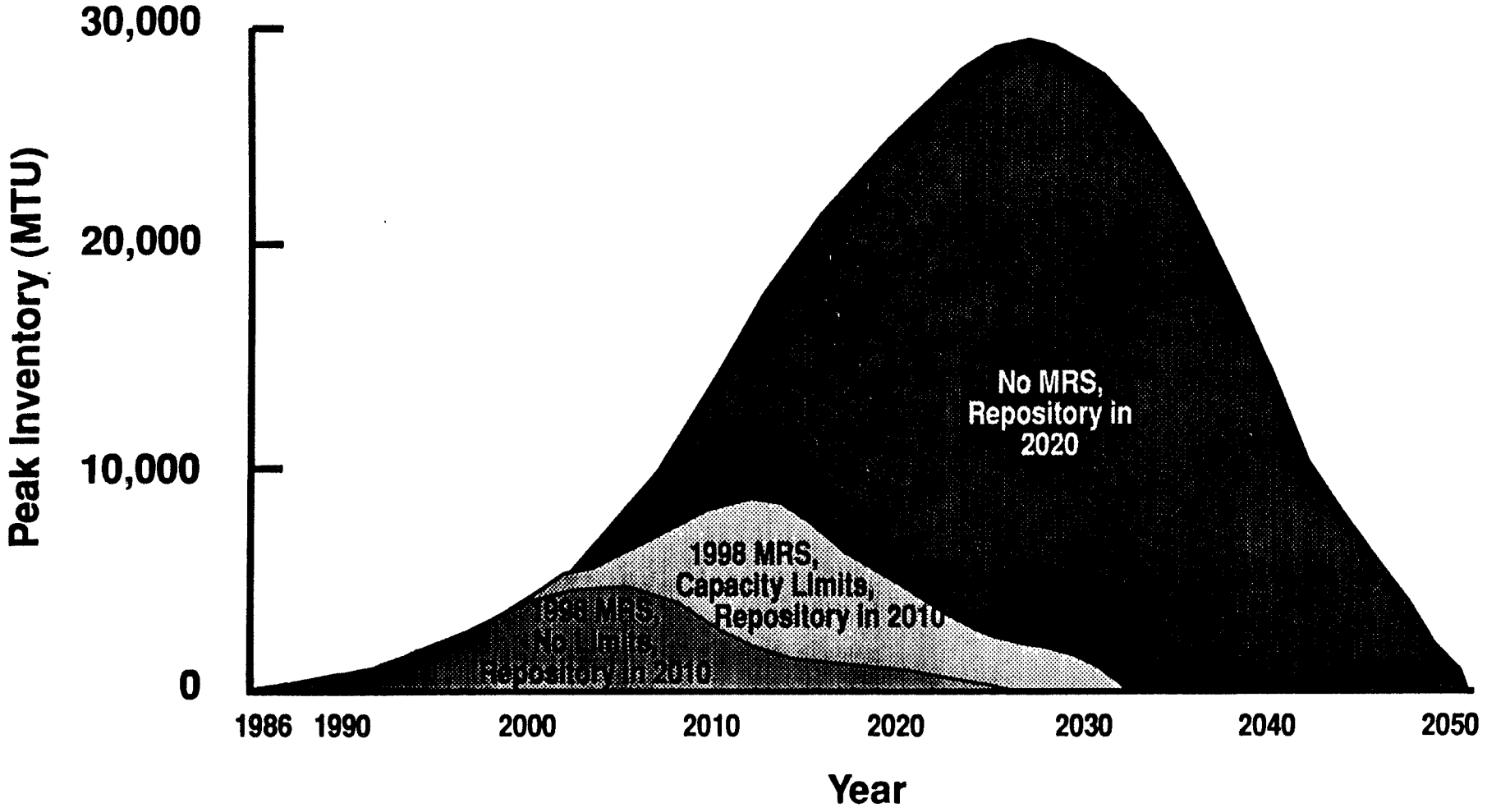
PRESENTER: Jeffrey Williams
Dean Stucker

PRESENTER'S TITLE AND ORGANIZATION: Chief, Facilities Development Branch
Chief, Field Engineering Branch

PRESENTER'S TELEPHONE NUMBER: (202) 586-9620
(702) 794-7275

Dallas, Texas
November 1-2, 1993

Out-of-Pool Storage Comparison



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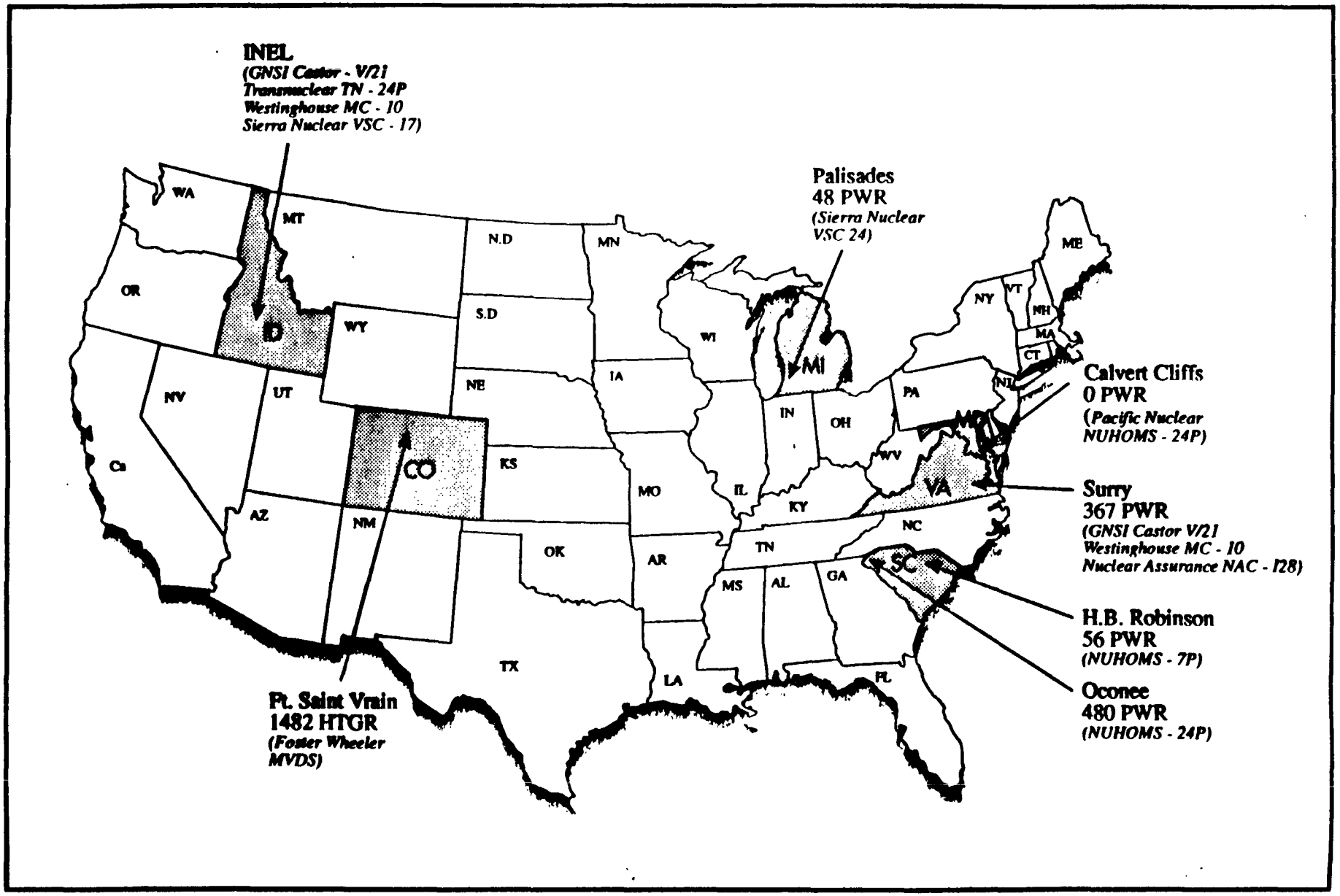

Dry SNF Storage as of October 1993

STORAGE SYSTEMS IN USE

Reactor	Technology
Surry	Metal Casks
H. B. Robinson	Horizontal Concrete Storage Modules
Oconee	Horizontal Concrete Storage Modules
Ft. St. Vrain	Modular Vault Dry Storage
Palisades	Vertical Concrete Casks

DRY STORAGE TECHNOLOGIES IN USE

Metal Casks

Vendor	Where Used	Status	Type
GNS	Surry	Certificate for General License	Castor V-21
Westinghouse	Surry	Certificate for General License	MC-10
Nuclear Assurance	Surry	Certificate for General License	NAC-S/T
Nuclear Assurance	Surry	Certificate for General License	NAC-128-1

DRY STORAGE TECHNOLOGIES IN USE

Concrete Casks

Vendor	Where Used	Status	Type
Pacific Nuclear	HB Robinson	ISFSI License	NUHOMS-7P
Pacific Nuclear	Oconee	ISFSI License	NUHOMS-24P
Foster Nuclear	Fort St. Vrain	ISFSI License	MVDS
Sierra Nuclear	Palisades	Certificate for General License	VSC-24

FUTURE DRY STORAGE TECHNOLOGIES

Vendor	Where Used	Status	Type
Trans Nuclear	TBD	Certificate for General License	TN-24
Trans Nuclear	Prairie Island	Under Review	TN-40
Babcock & Wilcox	TBD	Under Review	CONSTAR
AECL	TBD	Generic Design	MACSTOR
Foster Wheeler	TBD	TSAR for LWR fuel	MVDS
Burns & Roe	TBD	Generic design for storage	Concrete Vault Storage
GNS	TBD	Under Review	CASTOR X

COMPATIBILITY WITH THE WASTE MANAGEMENT SYSTEM

- Existing Storage casks not licensed for Transportation.
- The existing storage technologies unlikely to be licensed for Transportation.
- Need to return to fuel pool for unloading, and reloading into transport casks.
- Consequence of unloading at reactors has been evaluated.
- New Dual Purpose Technologies
  - Once licensed for Storage/Transportation DOE will take appropriate actions to include this as acceptable Waste Form.

COMPATIBILITY OF STORAGE TECHNOLOGIES WITH MRS

- All can be used for storage at the MRS.
  - MRS Conceptual Design Report evaluated vaults, metal casks, NUHOMS, Vertical Storage Cask, and Transportable Storage Casks.
- Receipt of these technologies at MRS not fully evaluated.
  - do not see problems.
  - evaluated opening NUHOMS dry storage canisters.

TECHNICAL ISSUES WITH COMPATIBILITY GOALS

Part 71 Issues

Burnup Credit Criticality Control

Transportation Structural Criteria

Waste Acceptance Criteria

Full Range of SNF Characteristics

System Optimization

COMPATIBILITY OF EXISTING STORAGE SYSTEMS WITH MPC

- Commerce Business Daily Notice
- Response by commercial vendors
  - Pacific Nuclear
  - Nuclear Assurance
  - B&W Fuel Co.
  - Burns & Roe
  - Transnuclear, Inc.
  - Sierra Nuclear Corp.
- MPCs cause small impact on existing storage designs.

SUMMARY

- Several technologies are available.
- At reactor dry storage will increase.
  - an MRS facility can reduce this burden.
- Anticipated that more storage technologies will be developed.
- Existing at reactor storage only technologies are not compatible with DOE-OCRWM program.
- DOE propose to take appropriate action to make anticipated transportation/storage technologies an acceptable waste form for the DOE-OCRWM program.

Repository Requirements

- **Must meet Title 10 CFR Part 60**
  - **Long term criticality control**
    - **Sufficient neutron absorber materials**
    - **Gap only flux trap designs not acceptable**
  - **Thermal output**
    - **Large packages compatible with above boiling thermal loading**
    - **Requires high thermal conductivity basket**
  - **Design life**
    - **Greater than 1000 years**
    - **Materials must survive in the anticipated repository environment**

MGDS Waste Disposal Handling Impacts

- Variety of interim storage systems will have major differences in height, weight, diameter, heat load and radiation dose rate
- Standardization improves surface facilities operations, equipment reliability, maintenance, and safety
- Waste package transporter design more complex due to need for added flexibility

MGDS Waste Disposal Handling Impacts (Continued)

- Management of thermal loading more complex due to variety of waste package heat loads
- Emplacement and retrieval operations more complex due to differences in waste package configurations
- Standardization of waste package configurations reduces MGDS life cycle costs

Interim Storage Strategy Summary

- No existing technical barriers to interim storage
- MRS siting remains key institutional issue
  - MRS host conditions are unknown
- Challenge is to integrate an institutionally acceptable approach into a safe, environmentally sound, cost effective system that meets currently existing storage and transportation requirements, without precluding disposal requirements
- MPC effort is a key part of this work