PRESENTATION TO
THE NUCLEAR WASTE TECHNICAL REVIEW BOARD

SUBJECT: OVERVIEW OF OCRWM TRANSPORTATION PROGRAM

PRESENTER: CHRISTOPHER A. KOUTS

PRESENTER'S TITLE AND ORGANIZATION: TRANSPORTATION BRANCH CHIEF
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY

PRESENTER'S TELEPHONE NUMBER: (202) 586-9761

AUGUST 21, 1989
TRANSPORTATION PROVISIONS OF THE NUCLEAR WASTE POLICY ACT

- DOE RESPONSIBLE FOR TRANSPORT OF SPENT FUEL AND HIGH-LEVEL WASTE
- DOE TAKES TITLE AT REACTOR (SHIPPER OF RECORD)
- PRIVATE SECTOR TO BE USED TO "FULLEST EXTENT POSSIBLE"
- COSTS OF TRANSPORTATION TO BE COVERED BY WASTE FUND
TRANSPORTATION PROVISIONS OF THE NUCLEAR WASTE POLICY AMENDMENTS ACT OF 1987

- SECTION 180 (A) — USE NRC CERTIFIED TRANSPORTATION PACKAGE
- SECTION 180 (B) — PRENOTIFY STATES/LOCAL GOVERNMENTS UNDER NRC REGULATIONS
- SECTION 180 (C) — PROVIDE TECHNICAL ASSISTANCE AND FUNDING TO TRAIN LOCAL GOVERNMENTS & TRIBES ON ROUTINE TRANSPORTATION & EMERGENCY RESPONSE
FOUR MAJOR GOALS OF OCRWM TRANSPORTATION ACTIVITIES:

- PROTECTION OF PUBLIC HEALTH AND SAFETY
- PUBLIC PARTICIPATION IN ACTIVITIES
- USE OF PRIVATE INDUSTRY TO THE FULLEST EXTENT POSSIBLE
- COST EFFECTIVENESS
SAFETY

• SAFETY IS A PRIMARY PROGRAM OBJECTIVE
• THERE IS A 40-YEAR HISTORY OF SAFE TRANSPORT OF RADIOACTIVE MATERIALS
• SAFETY OF CASK DESIGNS WILL BE CERTIFIED UNDER NRC REGULATIONS
• TRANSPORT WILL BE CONDUCTED UNDER DOT REGULATIONS
REMOVABLE FUEL BASKET
STAINLESS STEEL INNER SHELL
CAVITIES FOR 24 PWR OR 49 BWR FUEL ASSEMBLIES
FUEL ASSEMBLIES
GAMMA SHIELD (LEAD)
STAINLESS STEEL OUTER SHELL
IMPACT LIMITER
SHIELD PLUG
CLOSURE LID
REMOTABLE THUNNIONS
REMOTABLE SKID SUITABLE FOR RAIL OR BARGE SHIPMENT
NEUTRON / THERMAL SHIELD (CONCRETE WITH INTEGRAL COPPER FINS)
REMOTABLE COPPER COOLING FIN ASSEMBLY
SHEAR PADS
0407 0038RJ 2/10/89
WASTE PACKAGE EMPLACED IN REPOSITORY

ROOM FLOOR OR WALL
BOREHOLE COVER
BOREHOLE LINER
HOST ROCK
CANISTER
SPENT FUEL
AIR GAP
DISPOSAL CONTAINER
FEDERAL REGULATION OF TRANSPORTATION

NUCLEAR REGULATORY COMMISSION
(10 CFR 71, 73)
- CASK DESIGN & TESTING
- PHYSICAL PROTECTION
- PRENOTIFICATION

DEPARTMENT OF TRANSPORTATION
(49 CFR 106-399)
- OPERATIONAL PROCEDURES
- LABELING, MARKING
- PLACARDING
- ROUTING
- DRIVER TRAINING
Overview of the OCRWM Transportation Participants.
OCRWM TRANSPORTATION ACTIVITIES FALL INTO FOUR MAJOR AREAS

OCRWM TRANSPORTATION PROGRAM

- CASK SYSTEMS DEVELOPMENT
- ECONOMIC AND SYSTEM STUDIES
- OPERATIONS
- INSTITUTIONAL
CASK DESIGN EFFORTS ARE COMPOSED OF FOUR INITIATIVES

- FROM-REACTOR CASKS
- FROM-MRS-TO-REPOSITORY CASKS
- NON STANDARD SPENT FUEL AND COMPONENT (SPECIALTY) CASKS
- DEFENSE HIGH LEVEL WASTE CASKS
CASK DEVELOPMENT FROM-REACTOR CASK INITIATIVE

NEW CASK BENEFITS

- INCREASED CASK CAPACITIES
- DECREASED NUMBER OF SHIPMENTS
- LOWER TRANSPORT RISK
- LOWER TOTAL OPERATING COSTS
# EXISTING vs. OCRWM CASK CAPACITIES

## DESIGNATION

<table>
<thead>
<tr>
<th>Designation</th>
<th>PWR</th>
<th>BWR</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXISTING CASKS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NLI 1/2</td>
<td>1</td>
<td>2</td>
<td>TRUCK</td>
</tr>
<tr>
<td>TN-8/TN-9</td>
<td>3</td>
<td>9</td>
<td>OVERWEIGHT TRUCK</td>
</tr>
<tr>
<td>IF-300</td>
<td>7</td>
<td>18</td>
<td>RAIL</td>
</tr>
<tr>
<td><strong>OCRWM CASKS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GA-4/GA-9</td>
<td>4</td>
<td>9</td>
<td>TRUCK</td>
</tr>
<tr>
<td>W TITAN-COMMON USE</td>
<td>3</td>
<td>7</td>
<td>TRUCK</td>
</tr>
<tr>
<td>NAC-CTC</td>
<td>26</td>
<td>52</td>
<td>RAIL/BARGE</td>
</tr>
<tr>
<td>NUPAC 140-B</td>
<td>21</td>
<td>48</td>
<td>RAIL/BARGE</td>
</tr>
<tr>
<td>B&amp;W BR-100</td>
<td>21</td>
<td>52</td>
<td>RAIL/BARGE</td>
</tr>
</tbody>
</table>
CASK SYSTEM TECHNOLOGY DEVELOPMENT

- Addresses technical issues that provide common benefits to cask design
- Involves analysis and tests with goals to:
  - Take credit for reduced reactivity of spent fuel (burnup) in criticality calculations
  - Establish allowable leakage rates using technically defensible approaches to determining spent fuel source terms
  - Improve structural and thermal analysis methods
  - Establish specifications for cask materials suitable for incorporation into national standards
ECONOMIC AND SYSTEMS ANALYSIS

- TECHNICAL DATA BASE/MODEL MANAGEMENT
- TECHNICAL ANALYSIS
- MRS/REPOSITORY SUPPORT
EXPANDED AND MORE DETAILED DATA ARE BEING COLLECTED TO ENHANCE TRANSPORTATION ANALYSES USING CURRENT, MODIFIED OR NEWLY EMERGING MODELS

- DEVELOP DATA BASES
  - COLLECTED ACCIDENT RATES FOR RAIL AND ROAD TYPE
  - DEVELOPED UNIT COST AND RISK FACTORS FOR NATIONAL TRANSPORTATION NETWORK ANALYSES

- DEVELOP MODELS
  - TRICAM DEVELOPED FOR OPTIMIZATION ANALYSES
  - CASKCOM APPLIED TO LIFE CYCLE COSTS ANALYSES
  - MODIFYING RADTRAN FOR MORE SPECIFIC ROUTE ANALYSES
  - UPDATING AND EXPANDING HIGHWAY AND INTERLINE FOR MODAL ANALYSES
  - MODEL VERIFICATION AND DOCUMENTATION
COSTS AND RISKS OF VARIOUS TRANSPORTATION ALTERNATIVES/OPTIONS ARE EVALUATED IN TECHNICAL STUDIES

- COST/RISK STUDIES
  - PREPARING ANALYSES ON DEDICATED TRAINS AND TRUCK CONVOYS
  - ANALYZING OF SPENT FUEL CHARACTERISTICS AND THEIR IMPACT ON CASK CAPACITY

- SPECIAL STUDIES
  - HUMAN FACTORS EFFECTS ON OPERATIONAL SAFETY
  - NEAR-SITE INFRASTRUCTURE STUDY INITIATED
MRS/REPOSITORY SUPPORT

- ANALYZED TRANSPORTATION IMPACTS OF VARIOUS MRS SCENARIOS IN SUPPORT OF SYSTEM ANALYSES SUBMITTED TO THE MRS REVIEW COMMISSION

- PROVIDED TRANSPORTATION INPUT TO THE YUCCA MOUNTAIN SITE CHARACTERIZATION IMPACT REPORT (SECTION 175 REPORT) TO CONGRESS
OPERATIONS

SYSTEM PLANNING AND INTEGRATION

OPERATIONS SYSTEM DEVELOPMENT

SYSTEM IMPLEMENTATION
SYSTEM PLANNING AND INTEGRATION

- Performing Functional Analysis of Transportation Operations System
- Analyzing Management Structure Options
- Identifying Requirements and Constraints of Standard Utility Contracts
- Analyzing Existing Commercial Cask Fleet to Supplement OCRWM Cask System
- Evaluating Reactor Site Handling and Loading Capabilities
OPERATIONS SYSTEM DEVELOPMENT

- CARRIAGE DESIGN
  - EVALUATING LIGHT-WEIGHT TRACTOR SPECIFICATIONS
  - INTERFACING WITH CASK SYSTEM TRAILER DESIGN
  - DEVELOPING DEMONSTRATION PROGRAM

- SERVICING AND MAINTENANCE
  - PERFORMING CASK MAINTENANCE FACILITY FEASIBILITY STUDY
  - ANALYZING TECHNOLOGY FOR CASK MAINTENANCE

- FIELD OPERATIONS
  - OBSERVING CURRENT DOE AND UTILITY SHIPMENT ACTIVITIES
  - PARTICIPATING IN PREPARATIONS FOR NEAR-TERM R&D SHIPMENTS
OPERATIONS SYSTEM IMPLEMENTATION

- CASK DEVELOPMENT SUPPORT
  - DEVELOPING CHECKLIST OF OPERATIONAL CONSIDERATIONS FOR CASK DESIGNS
  - DESIGN REVIEW AND RECOMMENDATIONS FROM OPERATIONAL PERSPECTIVE

- OPERATIONAL TESTING PLANS FOR
  - VEHICLES
  - CASKS
  - FACILITIES
  - PROCEDURES

- OPERATIONS PLANNING
  - ASSESSING SYSTEM SCENARIOS
  - DEVELOPING GENERIC SYSTEM PLANS
  - DEVELOPING SITE-SPECIFIC SERVICING PLANS
Institutional Programs

- Communications and Outreach
- National/Regional Issue Studies
- Policy/Regulatory Analysis
- MRS/Repository Support
OCRWM TRANSPORTATION COMMUNICATIONS AND OUTREACH

- PUBLICATIONS (OCRWM BULLETIN, BACKGROUNDERS, FACT SHEETS)
- SLIDES, AUDIOVISUALS, EXHIBITS
- TRANSPORTATION COORDINATION GROUP MEETINGS
- REGIONAL/NATIONAL STATE ASSOCIATION MEETINGS
- NATIONAL INDIAN ASSOCIATION MEETINGS
- UTILITY COORDINATION GROUP MEETINGS
- COORDINATION WITH OTHER DOE OFFICES
- MEETINGS WITH OTHER FEDERAL AGENCIES
1989 COOPERATIVE AGREEMENTS BETWEEN OCRWM TRANSPORTATION BRANCH AND SEVERAL NATIONAL AND REGIONAL GROUPS

- SOUTHERN STATES' ENERGY BOARD (SSEB)
- WESTERN INTERSTATE ENERGY BOARD (WIEB)
- MID-WEST OFFICE OF THE COUNCIL OF STATE GOVERNMENTS (COSG)
- NATIONAL CONGRESS OF AMERICAN INDIANS (NCAI)
- NATIONAL CONFERENCE OF STATE LEGISLATURES (NCSL)
- COMMERCIAL VEHICLE SAFETY ALLIANCE (CVSA)
- COUNCIL OF RADIATION CONTROL PROGRAM DIRECTORS (CRCPD)
- AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
GENERAL SCHEDULE FOR TRANSPORTATION ACTIVITIES

1989

- COMPLETION OF PRELIMINARY "FROM-REACTOR" CASK DESIGNS
- STUDY OF TECHNICAL CASK-DESIGN ISSUES
- ISSUANCE OF TRANSPORTATION DOCUMENTS
- CONDUCT SYSTEM STUDIES
- REVIEW MODIFICATIONS TO RISK METHODOLOGIES

1990

- REVIEW PROGRESS ON OWT UNIFORM PERMIT
- DECISION ON USE OF OWT
- COMPLETE FINAL DESIGN OF "FROM REACTOR" CASKS
- DEVELOP & RELEASE STRATEGY FOR IMPLEMENTING TRAINING-ASSISTANCE REQUIREMENTS
GENERAL SCHEDULE FOR
TRANSPORTATION ACTIVITIES (CONT.)

1991-1997

- COMPLETE TRANSPORTATION STUDIES FOR EIS
- SUBMIT SAFETY ANALYSIS REPORTS TO NRC FOR CASK DESIGNS (FROM-REACTOR)
- DETERMINE NEEDS FOR MRS CASKS, SPECIALTY CASKS, DEFENSE-WASTE CASKS AND INITIATE DEVELOPMENT, IF APPROPRIATE
- DETERMINE PREFERRED OPTION FOR MANAGING TRANSPORT OPERATIONS
- FINALIZE PLANS FOR TRAINING ASSISTANCE
- INITIATE EQUIPMENT ACQUISITION
GENERAL SCHEDULE FOR TRANSPORTATION ACTIVITIES (CONT.)

1998-2002

- DRAFT OPERATIONAL PROCEDURES
- DEVELOP LIMITED SHIPPING CAPABILITY, IF NEEDED
- IDENTIFY MODAL MIX
- IDENTIFY POTENTIAL ROUTES FOR EMERGENCY PREPAREDNESS PURPOSES
- BEGIN PROVIDING TRAINING ASSISTANCE
- ISSUE CASK-FLEET CONTRACT

2003

- INITIATE OPERATIONS