Presentation
TO
MID-WESTERN STATES ENERGY BOARD
DECEMBER 6, 2011

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PRESENTATION OVERVIEW

• OVERVIEW OF WIPP
• REVIEW OF INTERIM STORAGE
• REVIEW OF THERMAL SALT TESTING
• STRATEGIES
  – DECOUPLING DHLW & GHLW FROM SNF
  – REDEFINE HLW PREPARATION
WIPP is America’s only deep geologic repository for the permanent disposal of defense-generated transuranic (TRU) radioactive waste left from research and production of nuclear weapons.
Available Withdrawn Land
Cold War Legacy

- WIPP provides a crucial answer to the question of how to deal with the Cold War legacy of nuclear waste.
- More than 21 nuclear weapons research and production sites across the country cleaned-up.
- WIPP is the best solution for the TRU waste from those locations.
Salt Is The Reason For WIPP’s Location

- Stable geology
- Lack of water
- Easy to mine
- Fractures close
- Plastic quality of salt allows it to close in on the waste

“The great advantage is that no water can pass through salt. Fractures are self healing....”

National Academy of Sciences, 1957
Geologic Profile

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<th>Surficial Sand</th>
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Ground Level:
- Mudstone and Siltstone
- Interbedded Layers
- Waste Repository Level
- Evaporites (Salt)
- Sea Level
- Salt and Anhydrite
History

- 1957 – The National Academy of Sciences recommends deep geologic disposal for radioactive waste
- 1968 – A demonstration, “Project Salt Vault,” is tested at a mine near Lyons, Kansas
- 1971 – State Senator Joe Gant Jr. contacts U.S. Congressman Harold Runnells and suggests that the Atomic Energy Commission take a look at Carlsbad’s salt beds
- 1979 – Congress authorizes WIPP as a research and development facility
- 1981 – The Department of Energy proceeds with construction of WIPP
- 1989 – The DOE completes repository construction
History

- 1998 – The EPA certifies that WIPP meets all applicable regulations
- 1999 – The first shipment of TRU waste arrives at WIPP on March 26. The New Mexico Environment Department issues a hazardous waste facility permit in October
- 2005 – The final TRU waste shipment from Rocky Flats is received at WIPP
- 2007 – The first shipment of RH-TRU waste arrives at WIPP on January 23
- 2011 – 10,000 shipment of nuclear waste safely received and interred at WIPP
TRU Waste

• Clothing, tools, rags, debris, residues and other items contaminated with man-made radioactive elements that are heavier than uranium
Contact-Handled (CH)

- Primarily emits alpha radiation (less penetrating)
- Can be handled without any shielding beyond the container itself
- About 96 percent of waste to be disposed at WIPP

Alpha radiation can be stopped with a piece of paper or a layer of human skin.
Remote-Handled (RH)

- Emits more penetrating radiation than CH-TRU
- Transported and handled in certified casks that provide additional shielding
- About four percent of waste to be disposed at WIPP

Up to 1,000 R/hr
“…The [WIPP transportation] system is safer than that employed for any other hazardous material in the U.S.…”

National Academy of Sciences, WIPP Panel
Safest Shipping Containers on the Road

- Nuclear Regulatory Commission certified Type B Shipping Containers
  - TRUPACT-II
  - HalfPACT
  - RH-72B
  - TRUPACT-III
- Proven leak tight after rigorous testing
  - 30-foot drop
  - Puncture bar test
  - TRUPACT-II tested for 30 minutes in 1,475-degree jet fuel fire
Emergency Responders Trained Along Pre-approved Routes

- Since 1988, more than 30,000 first responders have been trained
  - Exercises
  - State, tribe and hospital personnel training
  - Outreach
Key Regulatory Success

• Environmental Protection Agency
  – Recertification every five years until closure
  – Documents compliance with long-term disposal regulations
  – WIPP recertified for the second time since opening on November 18, 2010

• Hazardous Waste Facility Permit
  – Required for disposal of TRU waste mixed with hazardous materials
  – Original 10-year permit issued by New Mexico Environment Department in October 1999
  – Permit renewed on November 30, 2010
WIPP’s Record of Success
12 Years of Safe Operation

- Three sites cleaned up in 2011
- Total number of TRU waste sites cleaned up to date: 21
- More than 10,000 shipments safely received
- Over 12 million loaded miles traveled
A SOLUTION TO USED FUEL STORAGE
WHAT WILL WE DO WITH NUCLEAR WASTE/SNF?

• Fukushima, tornados, fires, floods, earthquakes have changed the world
• Decisions to build new nuclear plants are being made
• Clean power will require nuclear energy
• We must, however, have a plausible, integrated, durable policy and plan to manage used fuel responsibly.
USED NUCLEAR FUEL STORAGE

- Used fuel inventory June 2010
  - Approximately 63,700 MTU
  - Add 2,000 – 2,400 MTU annually

- Dry storage thru 2009
  - 14,600 MTU

- Dry inventory by 2020
  - Estimating 26,200 MTU
  - At 75 dry storage facilities
  - Fuel from 118 units
USED FUEL CURRENT EVENTS

- Yucca Mountain project being terminated
- New NRC rules for fuel pools & dry cask storage
- Center piece of Blue Ribbon Commission on America’s Nuclear Future recommendations will be centralized interim storage
- Waste Confidence Rule revised
- Fed-Corp legislation introduced last year
- Interim Storage bill introduced this year
40 years of nuclear electricity generation has produced only a small amount SNF—entire inventory would only cover a single football field about 7 yards deep.
USED FUEL STORED IN POOL
WHY CENTRAL INTERIM STORAGE OF USED FUEL?

• Controlled, safe, proven technology

• Reduces risks to high-density populations

• Averts over-packing of used fuel pools due to limited storage space

• Allows decommissioned facilities to move waste off site

• Provides path forward for defense HLW

• Halts fines and settlement payments related to waste disposition

• Allows more time for evaluation of best long-term solution
HORIZONTAL STORAGE SYSTEM

Southern California Edison – SONGS Units 1, 2, and 3
VERTICAL STORAGE CASKS

Yankee Rowe

Connecticut Yankee
EDDY LEA ENERGY ALLIANCE (ELEA)

• ELEA is an LLC that includes the cities of Hobbs and Carlsbad, New Mexico, and Eddy and Lea counties.

• ELEA purchased 1,000 acres of land approximately halfway between Carlsbad and Hobbs, N.M. for potential use.

• Land studied extensively during the Global Nuclear Energy Partnership process.

• Includes land ideal for interim storage.
WHY THE ELEA SITE?

- Remote location
- Geologic stability
- Dry area
- Infrastructure present, including rail
- Preexisting robust scientific and nuclear operations workforce
- Excellent location for future repository nearby
- Highly supportive community
CONCLUSION

• The nation wants and needs more nuclear energy
• The nuclear industry is pursuing integrated approach to used fuel management
• Used fuel inventories in storage will continue to grow
• Dry cask storage can safely accommodate this growth, especially at central interim storage sites
• An implementable and sustainable federal used nuclear fuel management plan must be developed
  – Plan must address all elements of integrated approach: centralized interim storage, recycling and disposal
• A Central Interim Storage Facility is doable
NEXT STEPS

• Find a company or group of companies that can do the job
  – Manage the facility
  – Manage collecting and shipping of used fuel
  – Manage container research
  – Manage container manufacturing

• Interview potential companies (8 RFI Responses)

• Funding opportunities
  – Federal corporation
  – Waste fund
  – Transfer of settlement fund, $15 – 50 billion
TO COMMINGLE OR NOT COMMINGLE?
THAT IS THE QUESTION

DEFENSE AND GOVERNMENT OWNED HIGH LEVEL WASTE

COMMERICAL USED NUCLEAR FUEL

COUPLE

DECOUPLE
WHAT IS THE STATUS

DHLW/GOHLW
- Old, Cold & Worthless
- Ready for Disposal Now
- Financing by DOE
- Significant Storage Costs
- Transportation System by Truck Read Now
- Thermal Studies Complete
- Stops Fines From States
- Step for Confidence

SNF
- Valuable for Reuse
- 30 Years From Disposal
- Financing From NWF
- Significant Storage Costs
- Transportation System Must be Developed
- Thermal Studies 10 Yrs From Completion
- Waiting for Reprocessing Decision
SHOULD COMMINGLING OR SEQUENCING BE THE STRATEGY?

• SNF SHOULD NOT BE LEFT BEHIND
• IT SHOULD BE AT A CENTRAL ISF TO REDUCE RISK & UTILITY LIABILITY UNTIL REPROCESSING OR DISPOSAL DECISION
• DHLW/GOHLW IS READY FOR DISPOSAL & SCIENCE COMPLETE
• DHLW/GOHLW SHOULD PROCEED NOW
• DHLW/GOHLW DISPOSAL PROVIDES ROADMAP & PROOF OF PRINCIPLE FOR SNF THAT WILL FOLLOW

• ONE WASTE STREAM SHOULD NOT STOP OTHER
Public Support, the Most Important Ingredient

• Throughout the process to open WIPP, the public support has been very strong in SE New Mexico.
• Public Education and Outreach was and is a critical component to building and maintaining this kind of support.
• Support for the program remains over 95% locally and even the rest of the state recognizes the success of WIPP and its potential for more.
• Hundreds of enthusiastic citizens showed up at 5 AM to get a chance to speak in favor of expanded operations at a BRC meeting earlier this year in Carlsbad.
Questions???