United States Naval Nuclear Propulsion Program
90,000 TONS OF DIPLOMACY
Anytime, Anywhere
Upon refueling/defueling, all naval spent fuel transported by rail to Program’s facility in Idaho for examination to:

- ensure maximum performance of current fuel
- enable design of new fuel with longer lifetimes

For comparison:

- Original NAUTILUS fuel operated 2 years
- Current submarine fuel to operate life of ship (33 years)

Ultimate disposal in geologic repository
TYPICAL NAVAL SPENT FUEL SHIPPING ROUTES

754 CONTAINERS SAFELY SHIPPED
(3/8/57 – 1/20/04)
NAVAL SPENT FUEL SHIPMENTS ARE SAFE

- Nature of the fuel
  - Rugged
- Shipping containers
  - Robust
- Shipping practices
  - Escorts
NAVAL SPENT FUEL CHARACTERISTICS

- Solid metallic form - not flammable, not explosive
- Built for combat - battle shock
  - well over 50 g’s
- Contains fully all long-lived radioactivity (fission products)
- Safe to operate in close proximity to sailors on warships during combat

Bottom line: Exceptionally well-suited for safe transport and storage for long periods.
NAVAL SPENT FUEL SHIPPING CONTAINERS

M-140 Transportation Cask

- 14 INCHES SOLID STAINLESS STEEL
- 350,000 POUNDS
- TYPE B NRC CERTIFIED
NAVAL SPENT FUEL SHIPPING PRACTICES

- Government-owned railcars, inspected and maintained
- Advance arrangements with rail carriers
- Location and status constantly monitored - satellite tracking

ESCORT CABOOSE

Escort by specially-trained Navy couriers

- On-board traffic managers
- On-board first responders
EMERGENCY RESPONSE

• Robust shipping containers provide a formidable barrier to release of radioactive material or significant radiation level increase, therefore courier’s EMERGENCY RESPONSE PRIORITIES ARE:
  * Emergency first-aid
  * Summon assistance
  * Prevent further injury/damage
  * Verify radiological condition

• Navy couriers assist Incident Commander in:
  • Crowd control
  • Communications and public information
  • Initial response actions, e.g., safety boundaries.
EXERCISE BACKGROUND

- EXERCISES ON THE EAST AND WEST COASTS AT NAVAL SHIPYARDS AND INEEL SINCE 1996
- OUTREACH AND EMERGENCY PLANNING FOR NAVY SPENT FUEL SHIPMENTS
- OPPORTUNITY TO EXERCISE EMERGENCY RESPONSE, INCLUDING REMOTE COMMUNICATIONS
Lessons learned:

- Working with states/tribes to achieve understanding and resolve concerns.
- Coordinated (shipper/Carrier/civilian authorities) response is critical.
SAFETY PROVIDED BY THE FORMIDABLE TYPE B PACKAGING

RAIL SYSTEM DRIVEN TOWARD SAFE OPERATIONS
  • Closed system...business incentive is strong

UNENCUMBERED OPERATIONS ENHANCE SAFETY
  • Elimination of self-imposed speed restriction
NNPP
RAIL TRANSPORTATION EXPERIENCE
LESSONS LEARNED

• TRAIN SERVICE
  • Dedicated train service not safer

• CAREFUL RAILCAR SELECTION
  • Suitable for size, weight, and dynamic stability
  • Inspection and maintenance

• EXERCISES ARE VALUABLE
  • Practice emergency response and exercise communications
• ROUTING
  • Routing flexibility for rail carrier translates to safe movements

• RAILROAD SAFETY OVERSIGHT
  • Existing industry/FRA oversight adequate

• RAILROAD POLICE ENGAGEMENT
SUMMARY

• 754 containers over 46 years
• Safe shipments
  – Rugged fuel
  – Robust shipping containers
  – Proven shipping practices/escorts
• Lessons Learned
  – Type B package provides safety
  – Closed system drives safe operations
  – Unencumbered operations enhances safety
  – Dedicated service not safer
  – Routing flexibility promotes smooth operations
  – Railroad safety oversight adequate
  – Careful railcar selection/inspection
  – Coordinate security issues with railroad police
  – Exercises are valuable