



United States Naval Nuclear Propulsion Program



U. S. NAVAL DISPATCH

TO: (blank)	CLASSIFICATION: U/CL
FROM: USS NAUTILUS SSN 571	
ACTION: CO:SUBLANT	
INFO:	
N/OFF DE INVCL -T-YZFF -R-171001Z -FM INVCL -TO YZFF GR 1 BT	
UNTERWAY 1133R ON NUCLEAR POWER BT...	
TOP / 1133R DU/ELT	
FA. / 1133R	
PBR	
1133 R 17 JAN 55	



90,000 TONS OF DIPLOMACY

Anytime, Anywhere



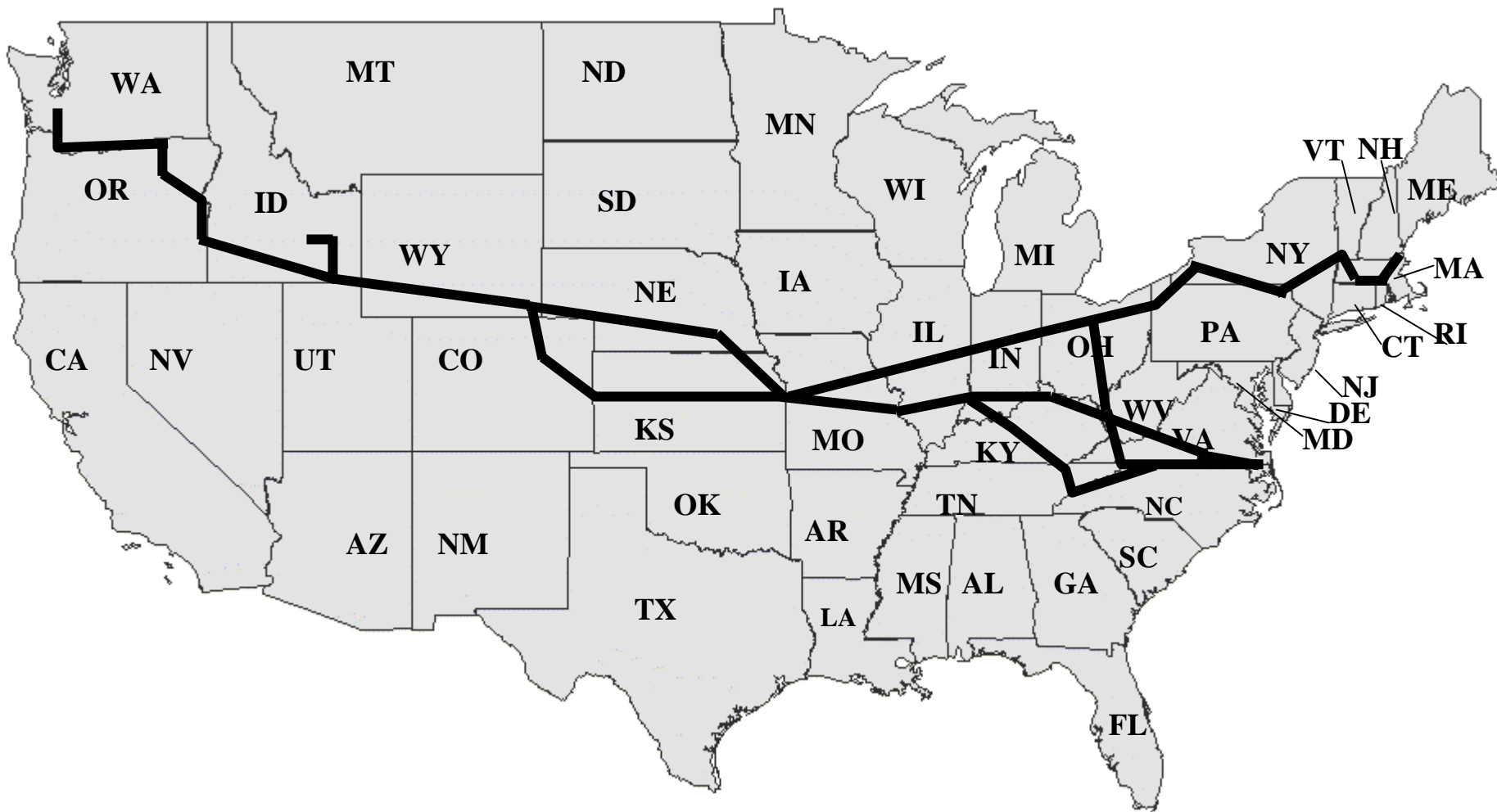
NAVAL SPENT FUEL CYCLE

- ! **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)

March 2, 2004

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



→ Escorted 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**

EXERCISE

Lessons learned:

- ☐ Working with states/tribes to achieve understanding and resolve concerns.
- ☐ Coordinated (shipper/carrier/civilian authorities) response is critical.

NNPP SPENT FUEL RAIL TRANSPORTATION EXPERIENCE LESSONS LEARNED

- **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**

NNPP RAIL TRANSPORTATION EXPERIENCE LESSONS LEARNED

- **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