



# Edlow International Company

Transportation of Radioactive  
Materials





# Uses of Radioactive Material

Nuclear Fuel Cycle for Nuclear Power

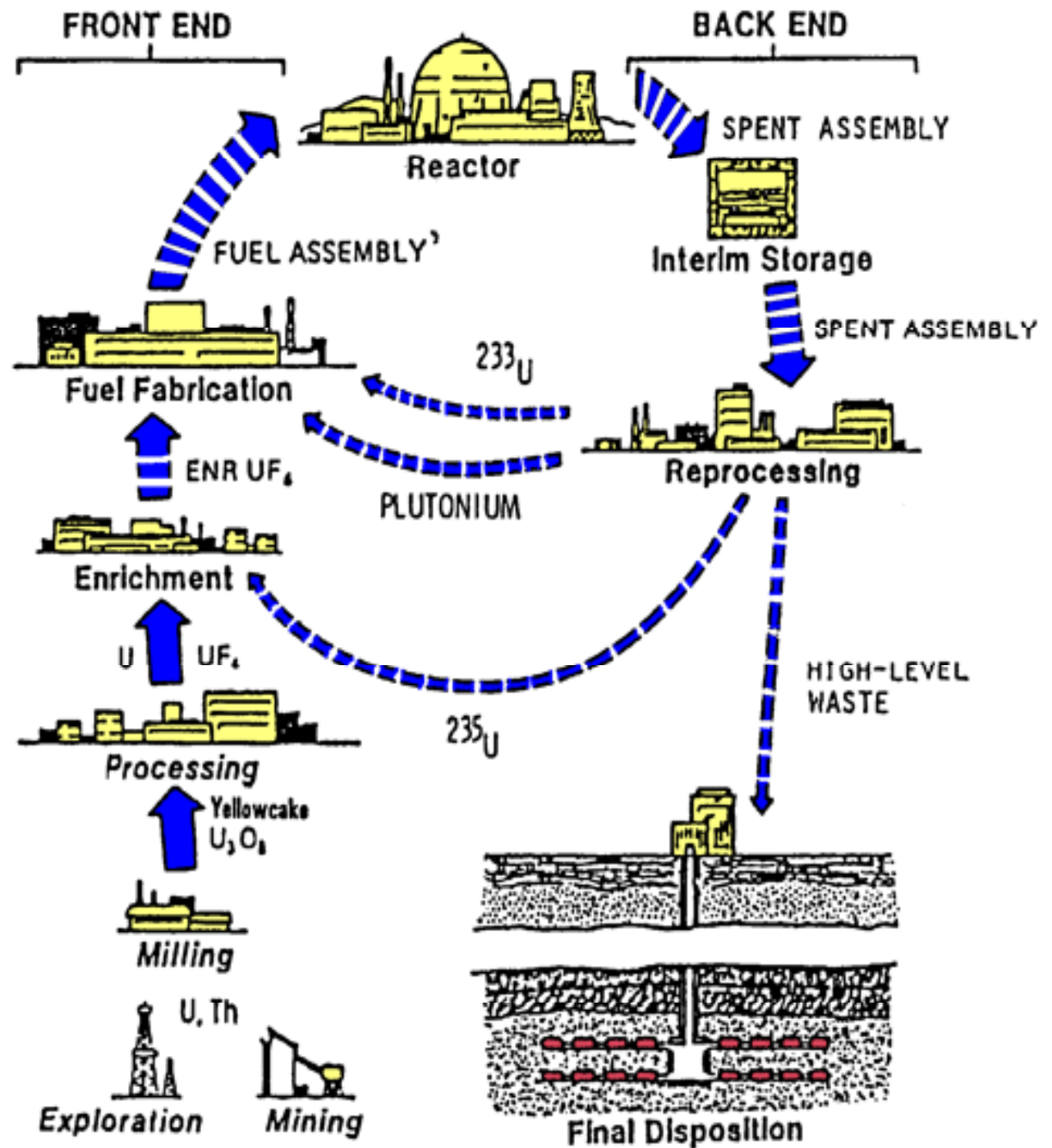
Medical diagnostic and treatment applications

Industrial Applications for home and business

Research

Military

# Nuclear Fuel Cycle











GNFU207664 7  
22P3



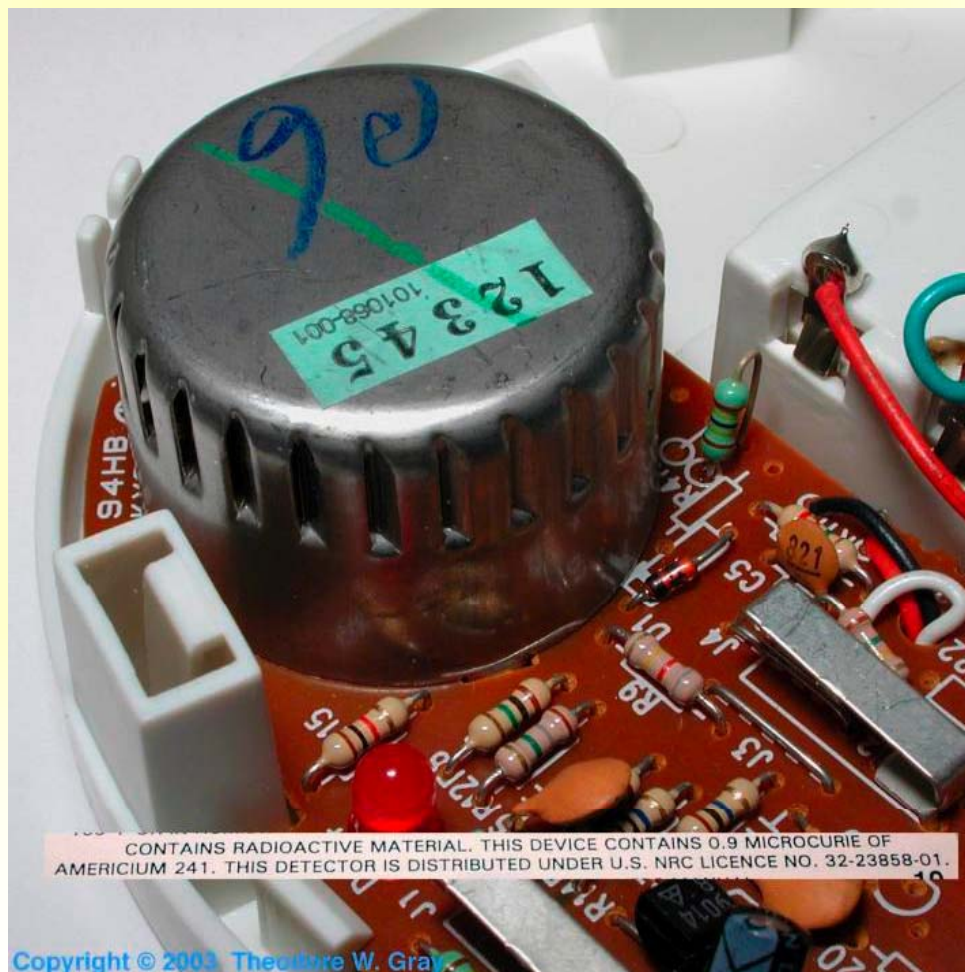
# Cobalt 60 Cancer Therapy Unit







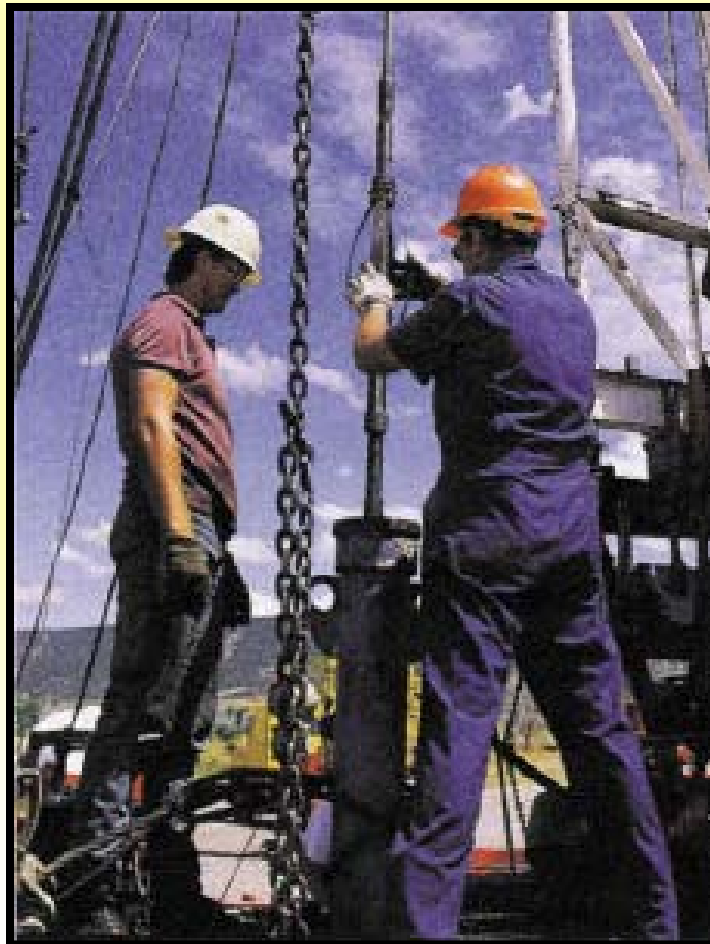
# Home Use Smoke Detector







# Radioactive well logging





# Cobalt Sterilization



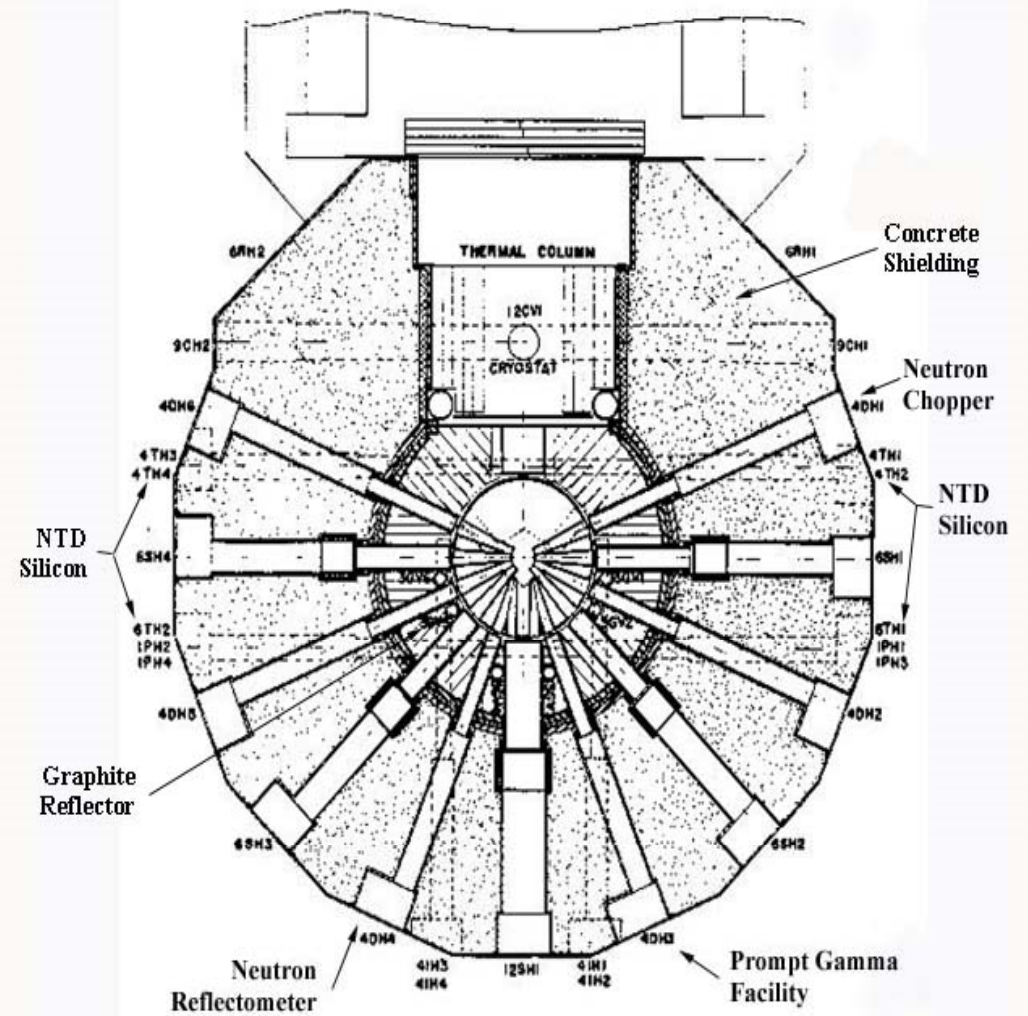
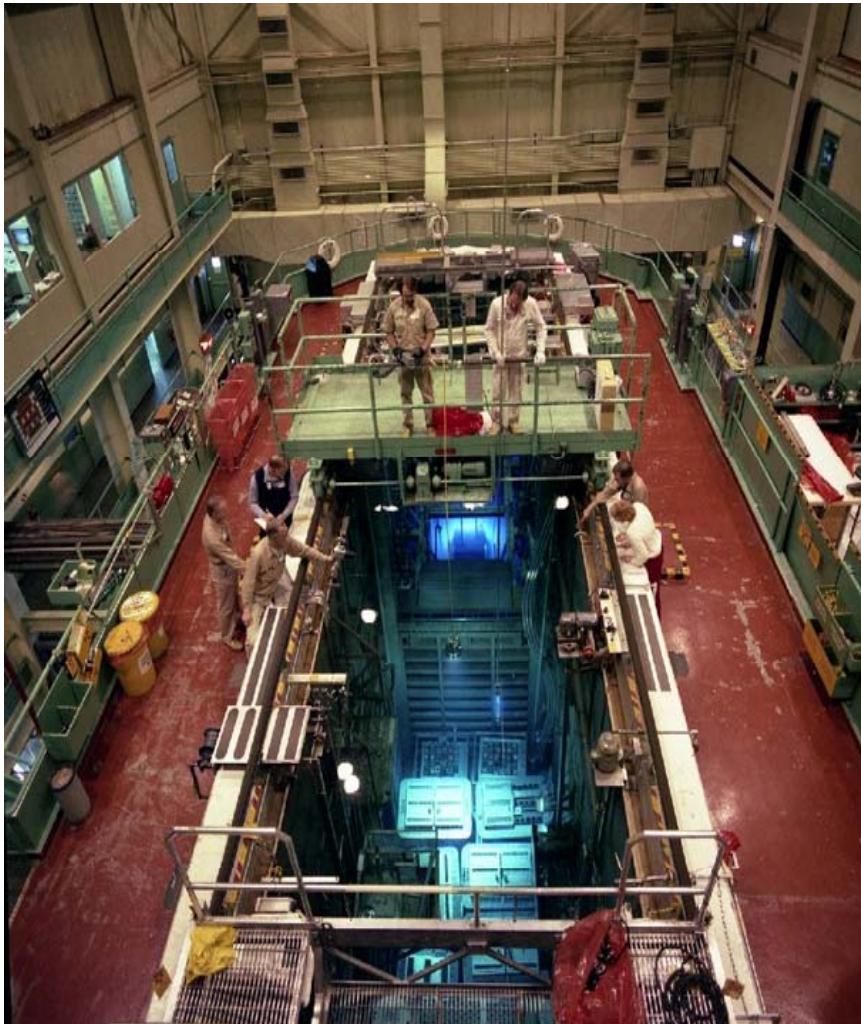




# Food Irradiation



# Research Reactor







## There is a Need for a Larger, Diversified Transportation and Logistics Player to Serve Expanding Global Nuclear Industry

### Strong Market Drivers

There are 436 commercial nuclear power reactors operating in 30 countries and a total of 110 additional reactors under construction or planned as of March 2010 leading to a significant increase in trade flows of nuclear material required to serve increasing demand

Broader global interest in reprocessing of spent fuel but resistance to spread of reprocessing technology. There is an increasing movement of spent fuel to existing reprocessing centers

International push to secure nuclear material held by “non-weapons” countries (under Global Threat Reduction Initiative) through the Nuclear Security Summit process.

Increasing nuclear trade with India and Middle East, and trade between Kazakhstan and the U.S. and Kazakhstan and China.



# Edlow International Company

*Innovation and Experience*

## *50 Years of Excellence*

Edlow International Company (EIC) is renowned for its innovative approach to the transportation of radioactive materials. We provide solutions to complex situations associated with radioactive transport management which can only be accomplished through the broad base of experience uniquely possessed by EIC. For five decades we have achieved an impressive list of accomplishments that have positively influenced the nuclear industry.





# Edlow International Company

*Pioneers in the Nuclear Transport Industry*

- ◆ Samuel Edlow enters the nuclear industry, (1957)
- ◆ Jack Edlow joins the organization (1969)
- ◆ Edlow International Company incorporated (1970)
- ◆ Edlow International Australia Pty.Ltd. Formed (1973)
- ◆ First visit to Peoples Republic of China (1983)
- ◆ Megatons to Megawatts shipments begin (1993)
- ◆ Edlow East West incorporated to facilitate Russian business (1994)
- ◆ DOE FRR program restarted by Edlow Group (1996)
- ◆ GTRI program begun after Edlow initiative (2004)
- ◆ Edlow involvement at the Nuclear Security Summit (2010)



# Edlow International Company

## *EIC's Notable Accomplishments*

- ◆ First return of spent fuel to the U.S.A. under Atoms for Peace (Sweden)
- ◆ First USAEC reprocessing contract for foreign test reactor fuel (Sweden)
- ◆ First commercial export of enriched uranium from the U.S.A.
- ◆ Assisted in negotiation of KRB German reactor Toll enrichment contract
- ◆ First Plutonium export from the U.S.A. to a Euratom facility (Belgium)
- ◆ First export license and shipment from U.S.A. of natural uranium to the Soviet Union for enrichment
- ◆ First export of heavy water from U.S.A. to EU Research Reactor (Italy)
- ◆ Helped formulate the first material transport regulations
- ◆ First bulk U.S. export license for special nuclear material
- ◆ First U.S. sale and export of nuclear transport packages to the People's Republic of China
- ◆ First air shipment of Mox fuel from Russia to Canada
- ◆ First shipment of Uranium from Kazakhstan to India
- ◆ First shipment of Russian spent fuel by sea to Murmansk



# Edlow International Company

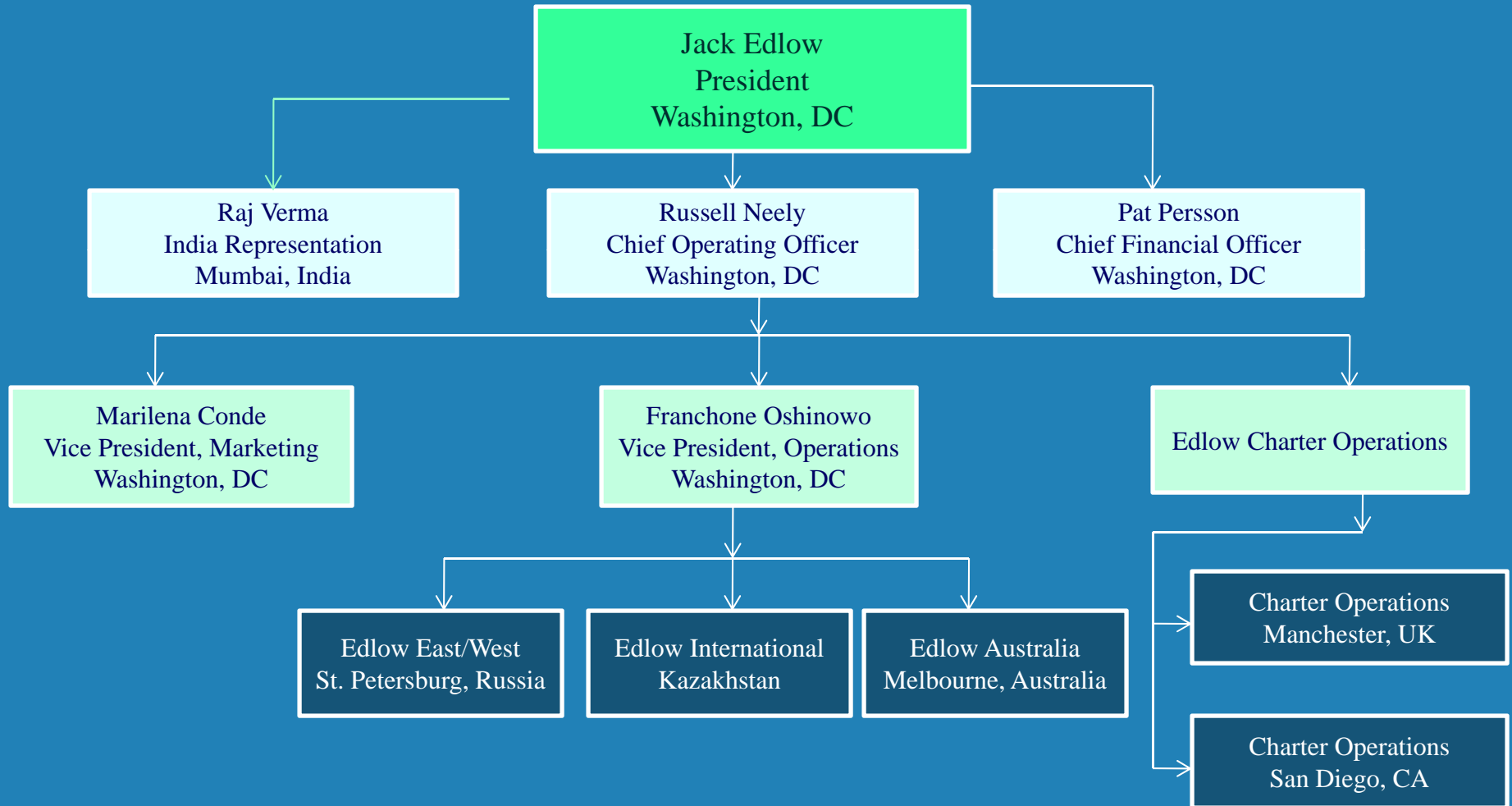
## *Involvement In U.S. Government Approvals*

- ◆ Rochester Gas & Electric / Approval for insertion of four mixed oxide fuel assemblies into Ginna reactor
- ◆ Retransfer of Test Reactor Spent Fuel to U.S. from British Nuclear Fuels, Ltd., Studsvik Energiteknik, Japan Atomic Energy Research Institute
- ◆ Indian Atomic Energy Commission / Tarapur Export Licenses and Presidential Order
- ◆ Sale and transport of heavy water from the Savannah River Plant to the Marviken Reactor in Sweden
- ◆ EIC provided assistance to comply with U.S. DOC requirements in the anti- dumping investigations for uranium imports from CIS Republics



# Edlow International Company

1666 Connecticut Ave., N.W.  
Suite 201  
Washington, D.C. 20009



Staff size: 16



# Edlow International – What We Do

- ◆ manage the transportation of radioactive materials world-wide utilizing skilled vendors and suppliers. Edlow arranges for the safe transportation of radioactive material, it does not take title to any material;
- ◆ provide regulatory assistance to its clients; and
- ◆ offer consulting services to its clients regarding the nuclear fuel cycle.



# Edlow International Company

## *Transport Management Services*

### I. FRONT END of Fuel Cycle:

- ◆ Transportation of Nuclear Material Related to Nuclear Power Reactors
  - Uranium Ore Concentrates ● Uranium Hexafluoride ● Enriched Uranium Oxide ● Mox Fuel Assemblies ● BWR/PWR Fuel ● Research reactor materials

### II. BACK END :

- ◆ Transportation of Spent Fuel arising from Power and Research Reactors
  - BWR Fuel ● PWR Fuel ● Research Reactor Fuel
- ◆ Plutonium and high activity sources

### III. SPECIAL SERVICES:

- Consulting ● Third Party Witnessing

### IV. HEAVY WATER SHIPMENTS:





# Edlow International Company

## Addressing Issues

### ◆ Restart Foreign Research Reactor Return Program

Formed the Edlow Group - a consortium of international research reactors and commercial companies, to encourage US State Dept and DOE to reinstate the program. We were successful in reinstating the program and later getting an extension.

### ◆ Yucca Mountain

While U.S. Congress was deliberating on making Yucca Mt the national final repository for spent fuel, transportation became the focal point for the opposition, Edlow and NAC formed the US Transport Coalition (Renamed the US Infrastructure Council or NIC) to inform congress and the public of the excellent safety record of transporting spent fuel and helped the legislation pass.

### ◆ Global Threat Reduction Initiative

Formed the Global Nuclear Cleanout Coalition to persuade DOE through State Dept, U.S. Congress, OMB to fully implement the GTRI program. Edlow (under GTRS) has since completed four of the five spent fuel repatriations awarded under the GTRI program to date.



# Edlow International – Who We Serve

We serve a customer base of over 100 companies in 50 countries

- ◆ Uranium mines in Australia, Namibia and Kazakhstan;
- ◆ Conversion facilities in Europe, the USA, and Canada;
- ◆ Enrichment and reprocessing companies in the USA, Europe and Asia
- ◆ Fuel fabricators in the USA, Europe, Asia, South America; and
- ◆ Government agencies world-wide, led by our largest single client, the US Department of Energy (under the GTRI Program).



# Edlow International Company

*Ship Chartering*







# Vessel Hold





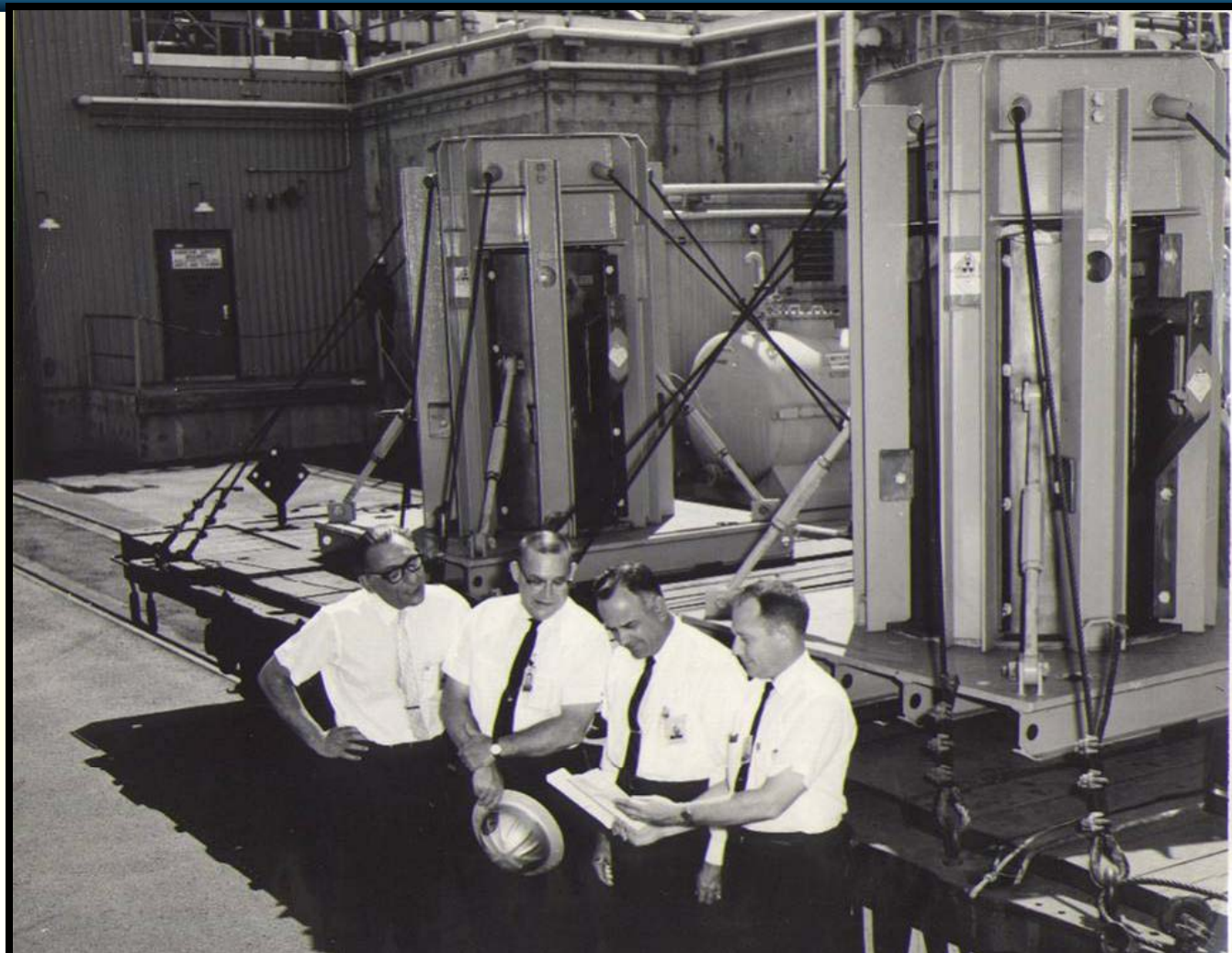
## First shipment of FRR returns to the U.S. in 1963 and leaves Savannah







## Sam Edlow and USAEC officials receive a shipment







A shipment leaves Taiwan, one  
of many to return to the U.S.





Spent Fuel From Columbia



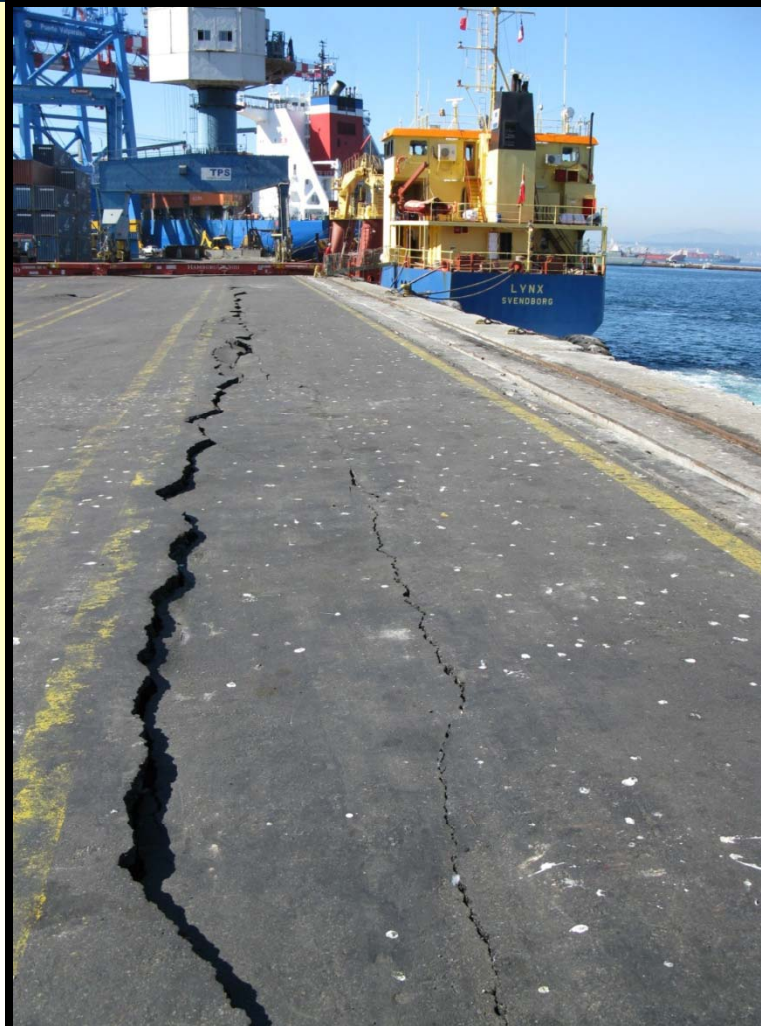
Shipment leaves Bogota by Air







# Earthquake damage in Chile





Eight casks from Europe arrive in  
1994 as emergency relief shipment







# Rail Shipment







# Rail Shipment





# Rail Shipment







# Truck Shipment



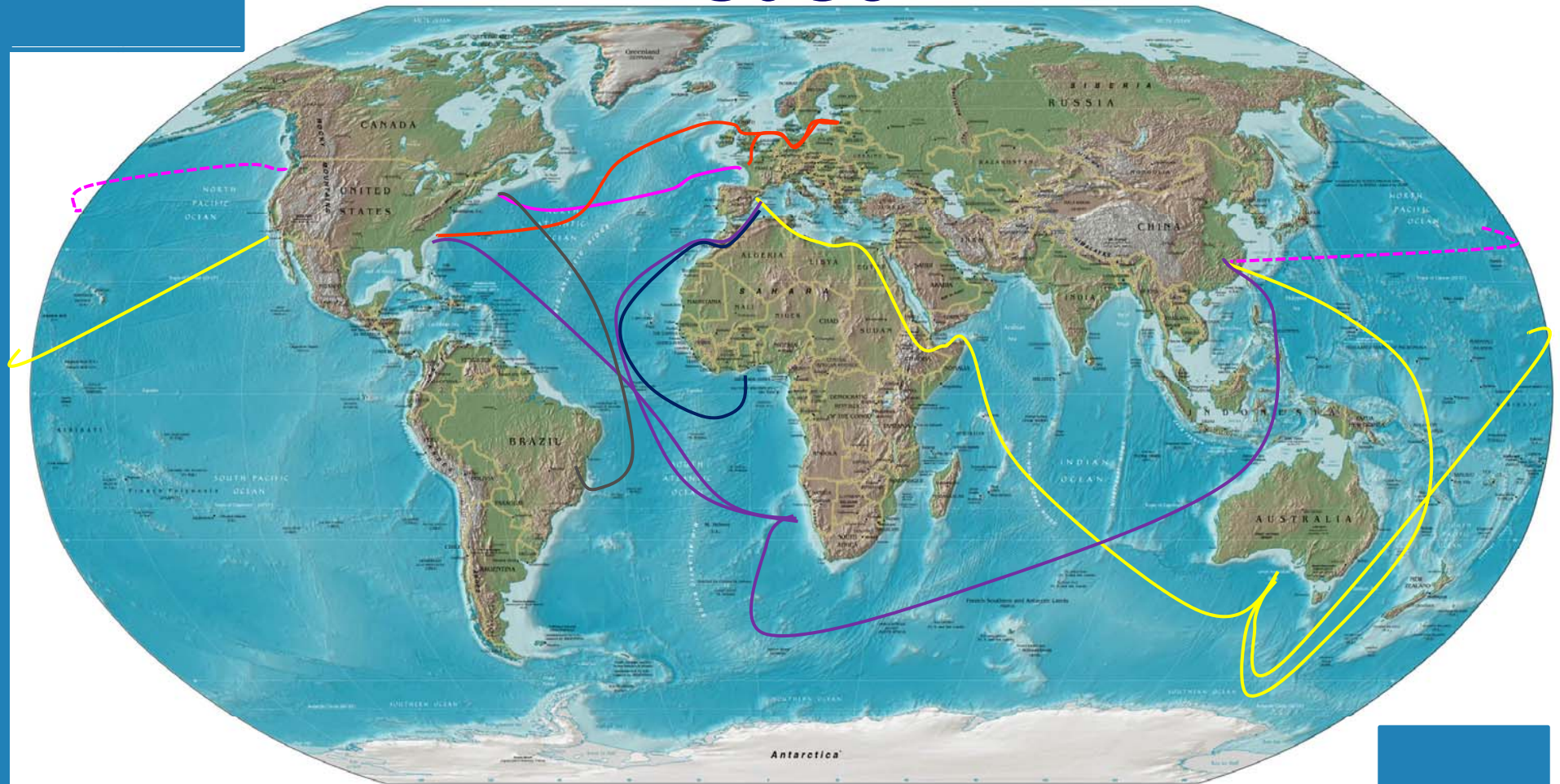


# Truck Shipment





# U308



- |              |          |
|--------------|----------|
| — Australia  | — Canada |
| — Kazakhstan | — Brazil |
| — Namibia    | — Niger  |

# UF6



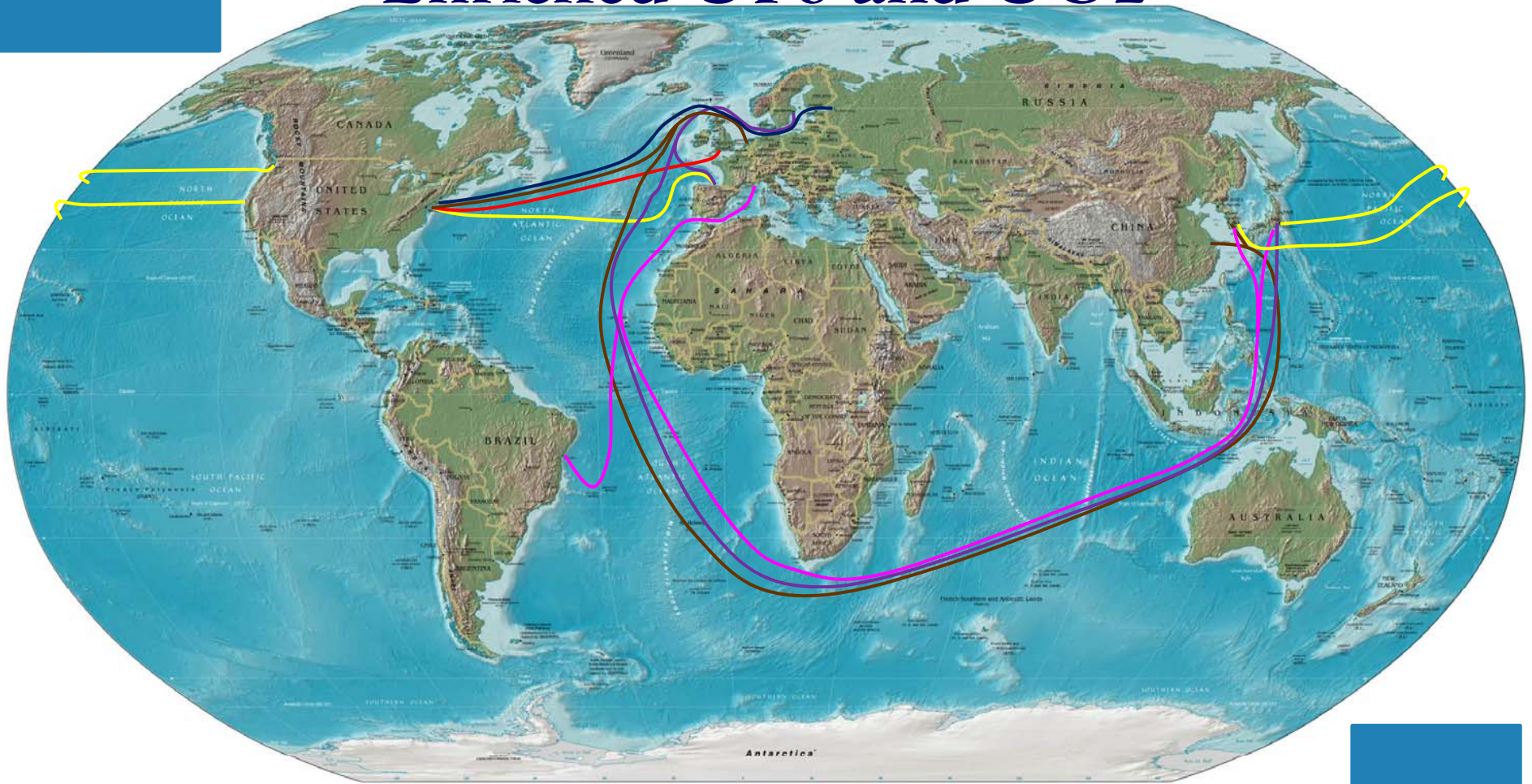
United States

Canada

From	Port Export	To	Lines
United States	Portsmouth	United Kingdom	ACL
United States	Portsmouth	Netherlands	CGM
Canada	Halifax	United Kingdom	ACL
Canada	Halifax	Netherlands	ACL



# Enriched UF<sub>6</sub> and UO<sub>2</sub>



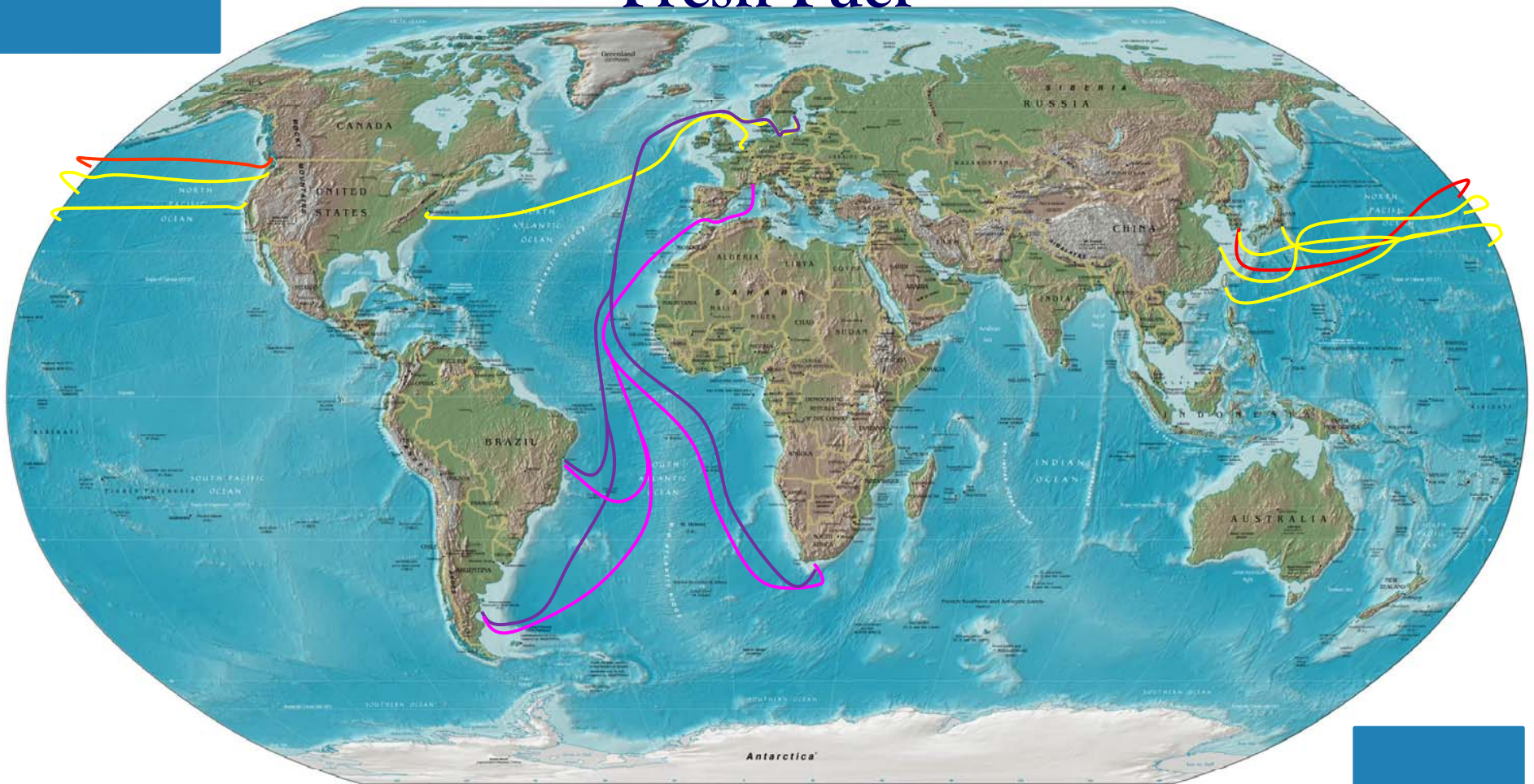
United States  
United Kingdom  
France



Sweden  
Netherlands  
Russia



# Fresh Fuel



— United States  
— Canada

— Sweden  
— France



## US Ports we use

New York/New Jersey  
Philadelphia  
Baltimore  
Norfolk/Newport News  
Wilmington  
Charleston  
Savannah  
New Orleans  
Houston  
Oakland



## Maritime Carriers we use

Atlantic Container Line  
Atlantic Ro-Ro  
Hamburg Sud  
Shipping Corporation of India  
Zim Lines  
Evergreen Lines  
Hanjin Lines  
Hyundai Lines  
Safmarine  
Hapag Lloyd





# Edlow International – The Future

- **Demand for Edlow International's services and expertise continues to grow worldwide** as a result of the nuclear energy renaissance and aggressive government programs in nuclear nonproliferation;
- International commitment, especially Asian, to **new nuclear power will provide growth in the transportation of radioactive materials**, as well as the potential for ramped-up consulting opportunities; and
- US Government focus on nuclear nonproliferation, such as the April 2010 Nuclear Security Summit in Washington, will lead to **new spent fuel transportation opportunities under GTRI**. Additionally other materials types have been identified that will require disposition.



# Edlow International Company

- ◆ **50 Years of Transportation Experience** World Wide
- ◆ Extensive Connection with International and National Regulatory Bodies
- ◆ Competitive Pricing / Flexible Terms and Conditions
- ◆ **Global Representation**
  - Europe ● Russia ● Australia ● Kazakhstan ● India
- ◆ Edlow Agencies: Belgium, France, Spain, U.K., and Republic of Korea, Argentina, Brazil, South Africa
- ◆ **Track Record of Pioneering Successful Firsts** in Transportation
- ◆ Active Membership in Nuclear Industry Organizations:
  - World Nuclear Association ● Nuclear Energy Institute
  - US Nuclear Infrastructure Council



# Edlow International Company

**E**ffective Service

**D**ependability

**L**ogistics Specialist

**O**utstanding Safety Record

**W**orld Wide Presence