

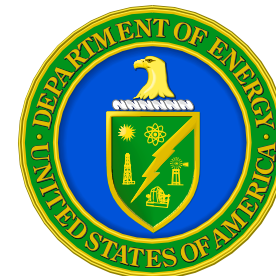


# Barry Miles

Deputy Director, Reactor Refueling Division  
Naval Nuclear Propulsion Program



# United States Naval Nuclear



# Propulsion Program



U. S. NAVAL DISPATCH  
MESSAGE NO. 1987

FROM:	USS NAUTILUS SSN 571	CLASSIFICATION	UNCL
ACTIC	COMSUBLANT		
INFO:	NJOE DE INCL -I-YZF -R-171601Z -FM INCL -TO YZZF GR 1 BT 371 UNDERWAY <del>1133R</del> ON NUCLEAR POWER BT...		
700 / 1133R		VU/ELT	
FA. / 1133R		1133 R	
17 JAN 55			





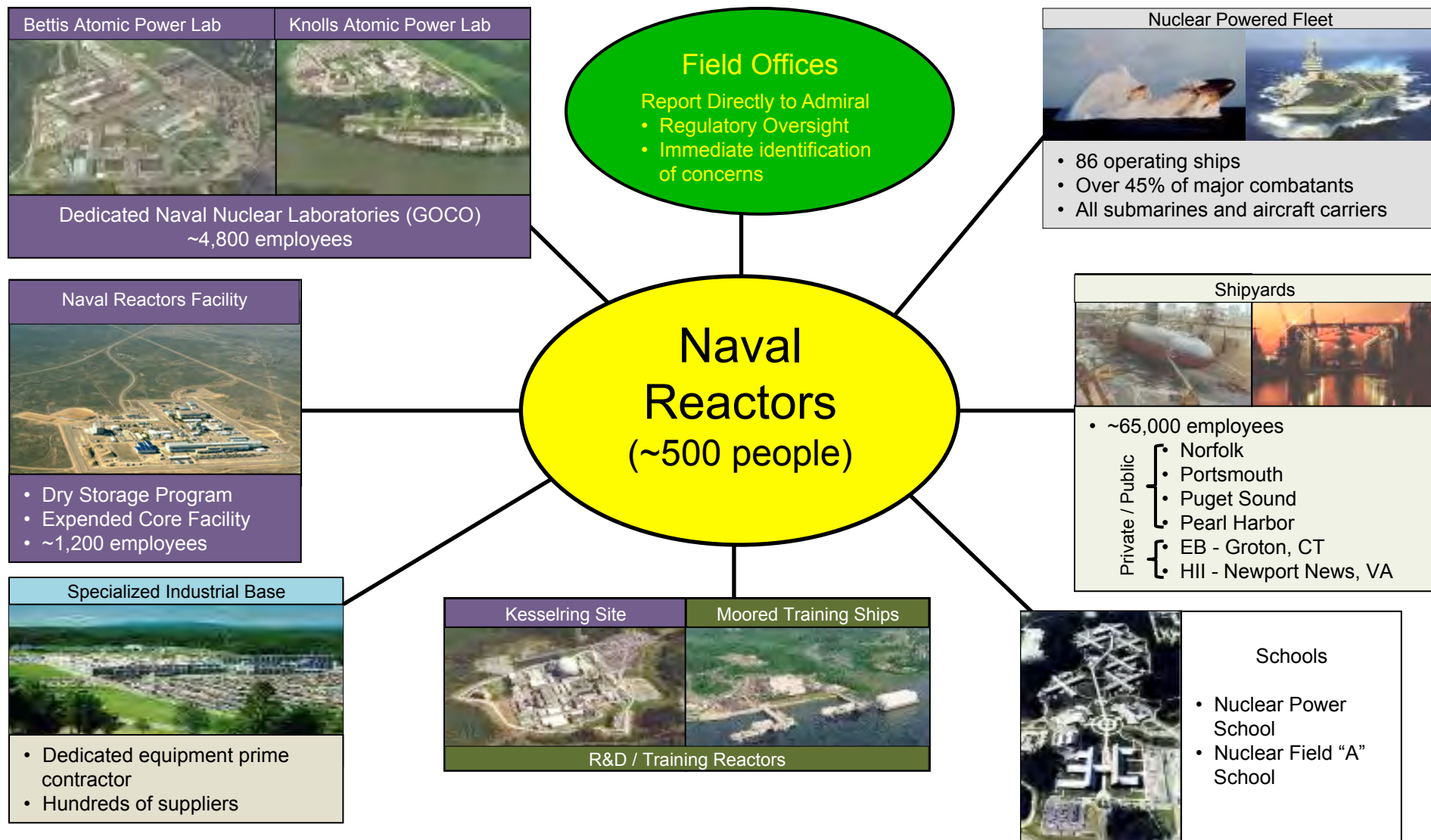
# NNPP Background

- **Naval Nuclear Propulsion Program founded in 1948**
- **Currently operating:**
  - 101 reactors (compared to 99 for the US commercial industry)
  - 11 nuclear powered aircraft carriers (two more under construction)
  - 75 submarines (three more under construction)
  - Two land based prototypes
  - Two Moored Training Ships
- **Nuclear-powered warships comprise more than 45% of all the Navy's major combatants**





# NNPP Organization







# Naval Spent Fuel Cycle

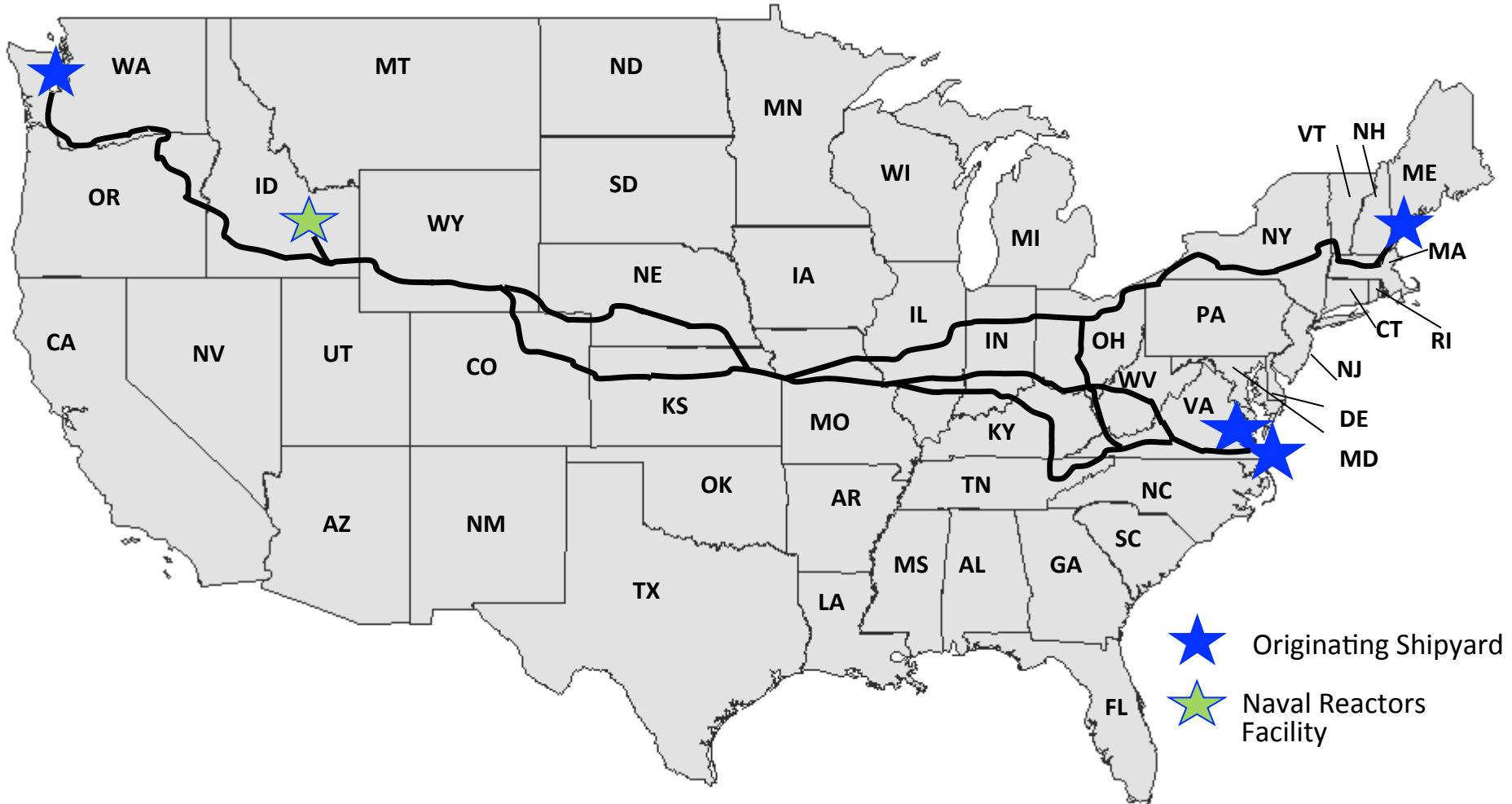
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- **Upon refueling/defueling, all naval spent fuel transported by rail to Program's facility in Idaho for examination to:**
  - Ensure maximum performance of current fuel
  - Enable design of new fuel with longer lifetimes
- **For perspective:**
  - First nuclear powered submarine fuel operated 2 years
  - Current fuel operates for 33 years – the life of an attack submarine
- **Fuel is stored temporarily pending disposal in geologic repository or interim storage site.**



# Naval Spent Fuel Shipping Routes

861 CONTAINERS SAFELY SHIPPED  
(March 1957 to Present)





# Shipment Safety

- | **Nature of the Fuel**
  - **Rugged**
- | **Shipping Containers**
  - **Robust**
- | **Shipping Practices**
  - **Couriers**



**NAVAL SPENT FUEL SHIPMENTS ARE SAFE**



# Naval Fuel Characteristics

- Solid metal; not flammable, explosive, or corrosive
- Built for combat battle shock conditions (over 50g's)
- Fully contains fission products
- Safe to operate in close proximity to sailors on warships



**EXCEPTIONALLY WELL-SUITED FOR SAFE TRANSPORT AND STORAGE  
FOR LONG PERIODS**





# Naval Spent Fuel Type B Shipping Containers

- The M-140 is the only NNPP Type B spent fuel shipping container that travels through New York State:
  - Type B NRC/DOE Certified
  - 14" thick solid stainless steel
  - 350,000 pounds (loaded)
- Thick, solid steel typically results in radiation levels much lower than the safe maximum DOT limits:

	DOT Limit	Naval Container	Typical Chest X-Ray
On contact	200 mR/hr	1 to 5 mR/hr	10 mR
At 2 meters	10 mR/hr	.1 to .5 mR/hr	

- Everyday life exposure to radiation:
  - ~300 mr/yr – soil, rocks, cosmic rays, radon (Source: NCRP Report No. 160)



M-140 Naval Spent Fuel Shipping Container



M-290 Naval Spent Fuel Shipping Container



# Shipping Practices

- | Railcars inspected and maintained at highest standard
- | Location and status constantly monitored via satellite tracking
- | Advance arrangements with railroad operations and railroad police
- | Outreach with civilian authorities, e.g., accident exercises



- | Escorted by specially trained NNPP shipment couriers
  - o 24/7 surveillance
  - o Immediate emergency response



# Accident Derailment Response

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## Emergency Response Priorities:

- Emergency first-aid
- Summon assistance
- Prevent further injury/damage
- Verify radiological condition

## NNPP Couriers assist Incident Commander:

- Shipper Specialist Employee (29CFR1910.120)
- Response priorities
- Communications and public information

**ROBUST SHIPPING  
CONTAINERS  
PROVIDE A  
FORMIDABLE  
BARRIER TO  
PREVENT RELEASE  
OF RADIOACTIVE  
MATERIAL OR  
SIGNIFICANT  
RADIATION LEVELS**



# Naval Spent Fuel Shipment Exercise Objectives

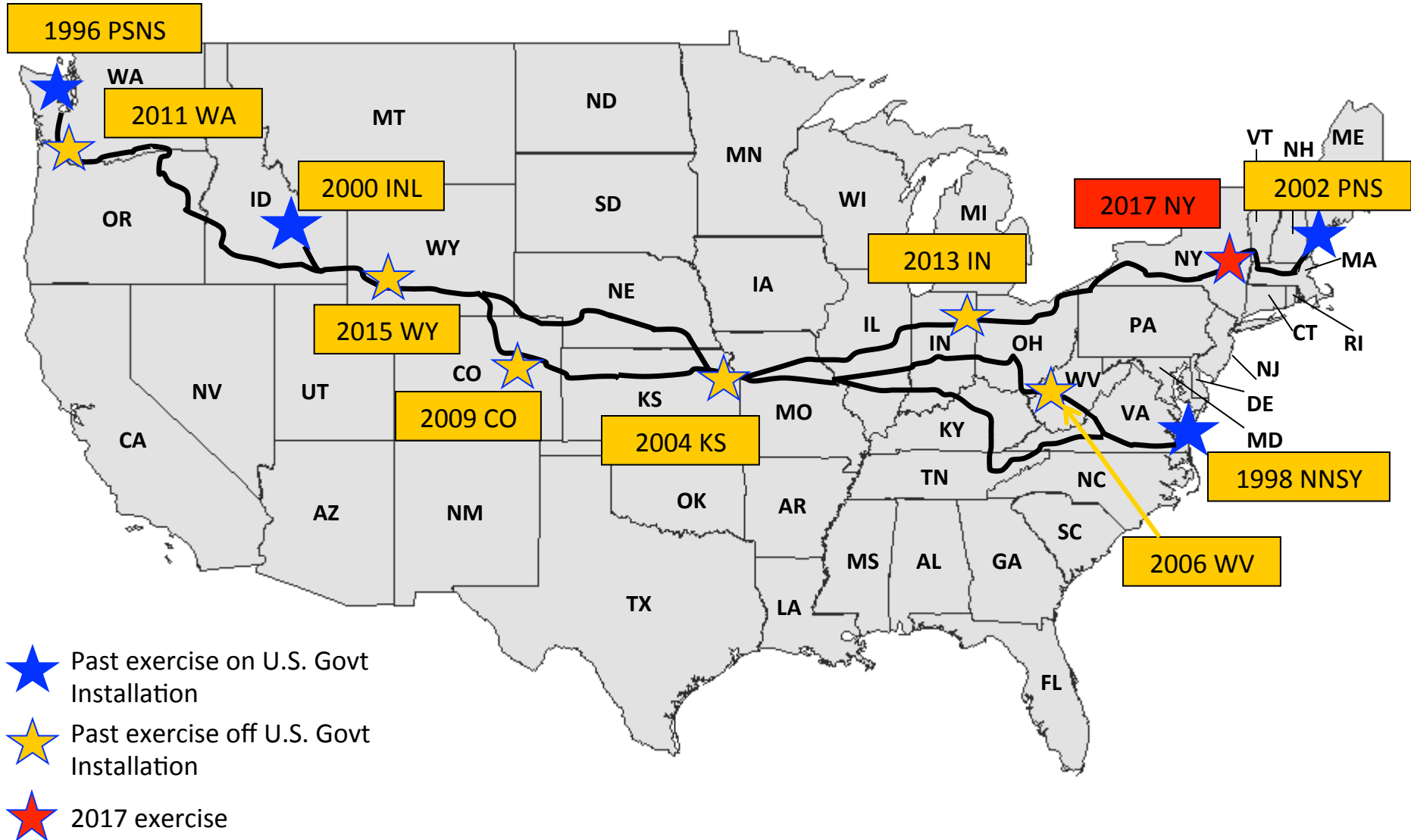
- Familiarize stakeholders with Naval spent fuel shipping container characteristics and shipping practices.
- Evaluate the interactions of NNPP couriers accompanying spent fuel shipments and civilian emergency services representatives.
- Gain an understanding of how communication links would be activated in an accident involving a Naval spent fuel shipment.
- Evaluate the NNPP's ability to integrate into Unified Command and the Joint Information Center (JIC) (if established).







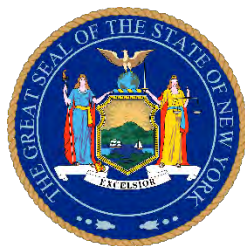
# Naval Spent Fuel Shipment Exercises



**NAVAL NUCLEAR PROPULSION PROGRAM  
CITY OF MECHANICVILLE  
TOWN OF HALFMOON  
SARATOGA COUNTY  
STATE OF NEW YORK  
PAN AM RAILWAYS**

**NEW YORK NAVAL SPENT NUCLEAR FUEL TRANSPORTATION ACCIDENT EXERCISE  
DEMONSTRATION**

**JUNE 1, 2017**



**Department of Health**



**Department of Environmental Conservation**



# Summary of 2017 NYS Exercise Planning

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- Site Assessment – 13 July 2016
- Initial Planning Meeting – 4 November 2016
- Scenario Planning Meeting – 1 March 2017
- Tabletop Exercise – 11 April 2017
- Field Exercise – 3 May 2017
- Demonstration – 1 June 2017



## 2017 NYS Exercise Scenario

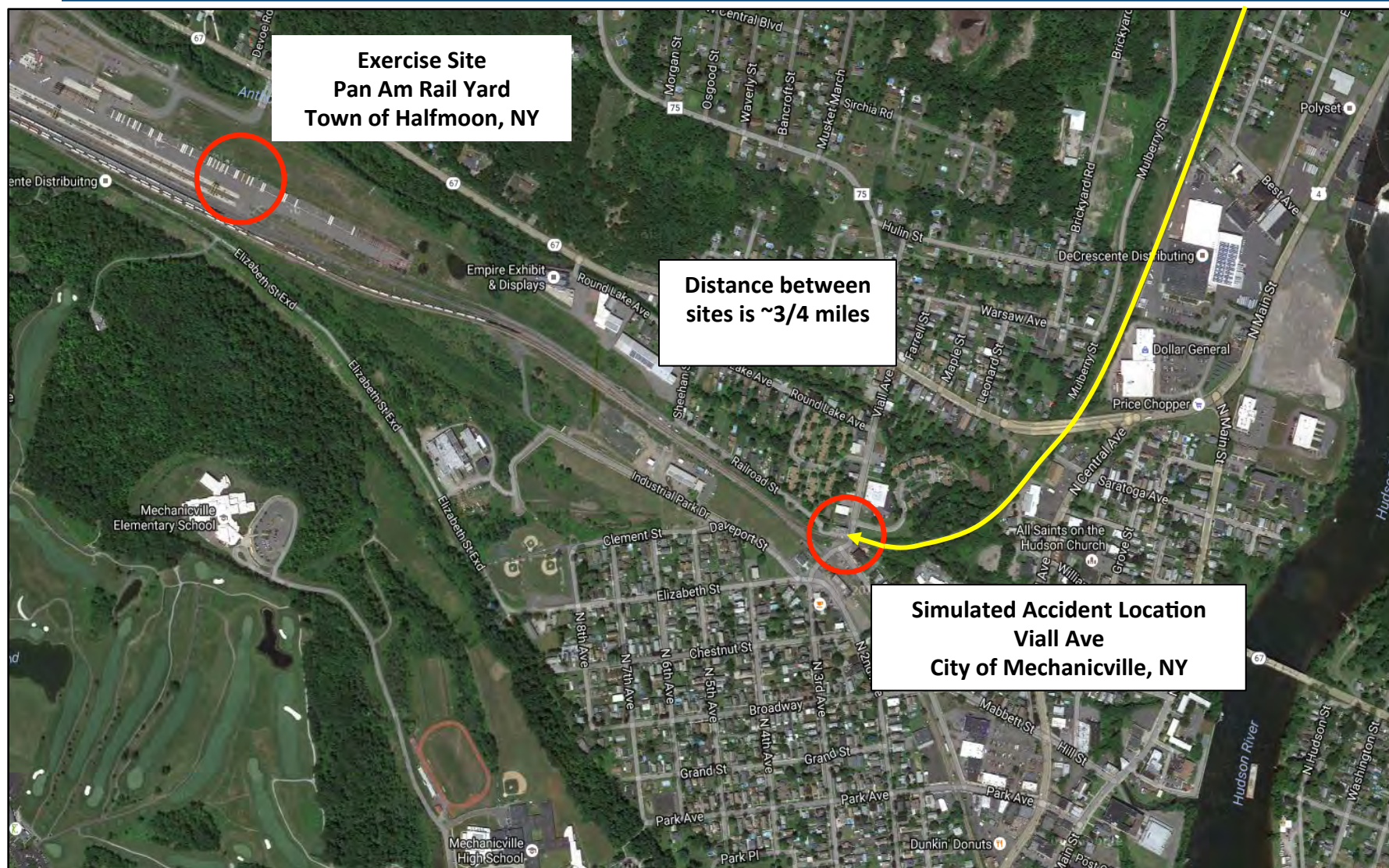
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- Naval spent fuel shipment en route from Portsmouth Naval Shipyard to the Naval Reactors Facility being escorted by two NNPP shipment couriers
- Dump truck collides with the M-140 shipping container railcar at the Viall Avenue railroad crossing in Mechanicville, NY
- Driver is injured; NNPP couriers on scene
- Communications between shipper (NNPP), Pan Am Railways, local responders, and New York State agencies
- Unified Command established
- Local media and resident approach the scene
- Radiological surveys – NNPP couriers, Saratoga County Hazmat Team, and New York State Radiation Monitoring Team
- Radiological condition normal; re-rail and continue shipment





# 2017 NYS Exercise – Saratoga County

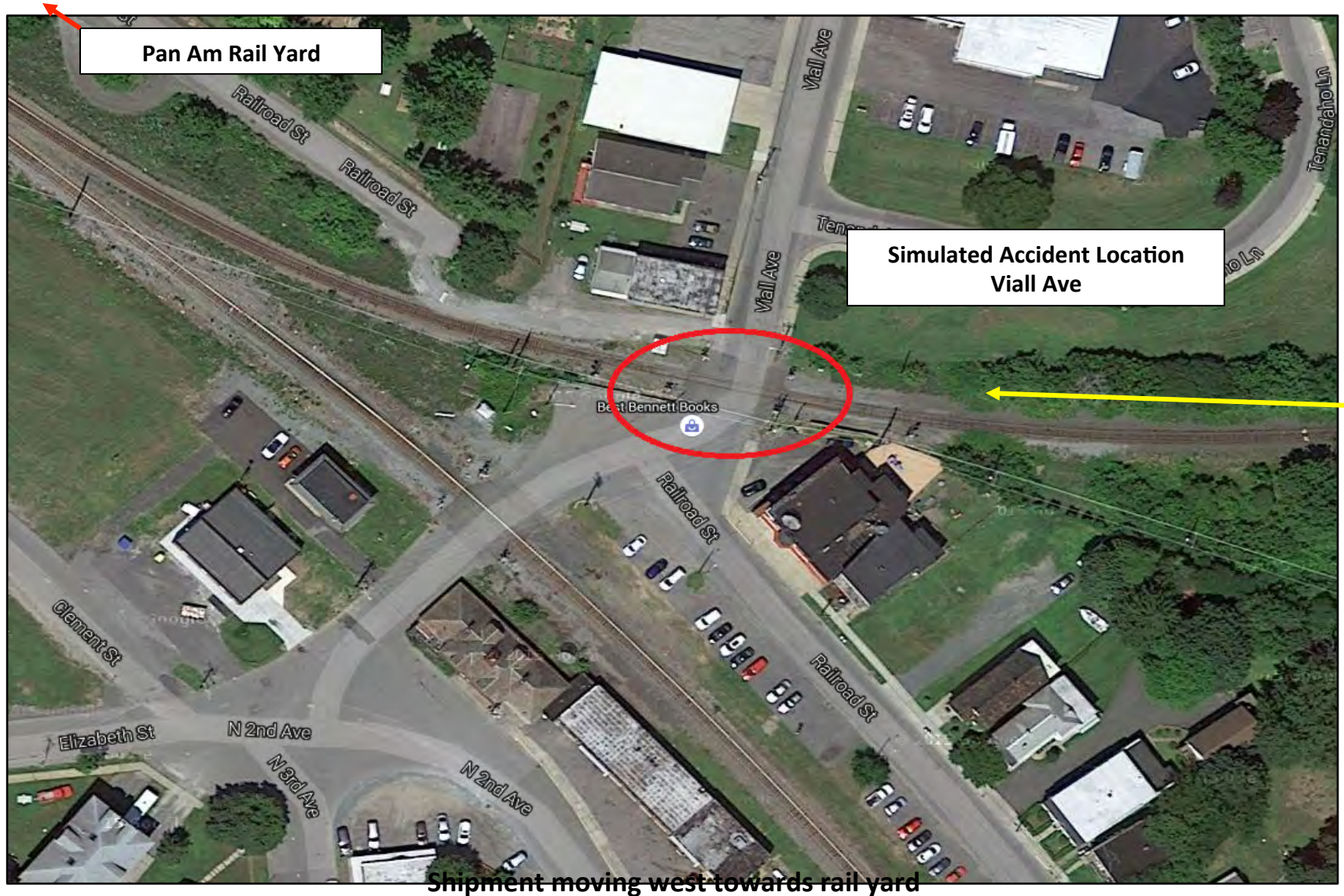


**An M-140 Naval spent fuel shipping container en route from Portsmouth Naval Shipyard to Naval Reactors Facility in Idaho is approaching Mechanicville, NY on Pan Am Railways**





# Simulated Accident Location – Viall Ave



Pan Am Rail Yard

Simulated Accident Location  
Viall Ave

Best Bennett Books

Shipment moving west towards rail yard





# Simulated Accident Location – Vial Ave

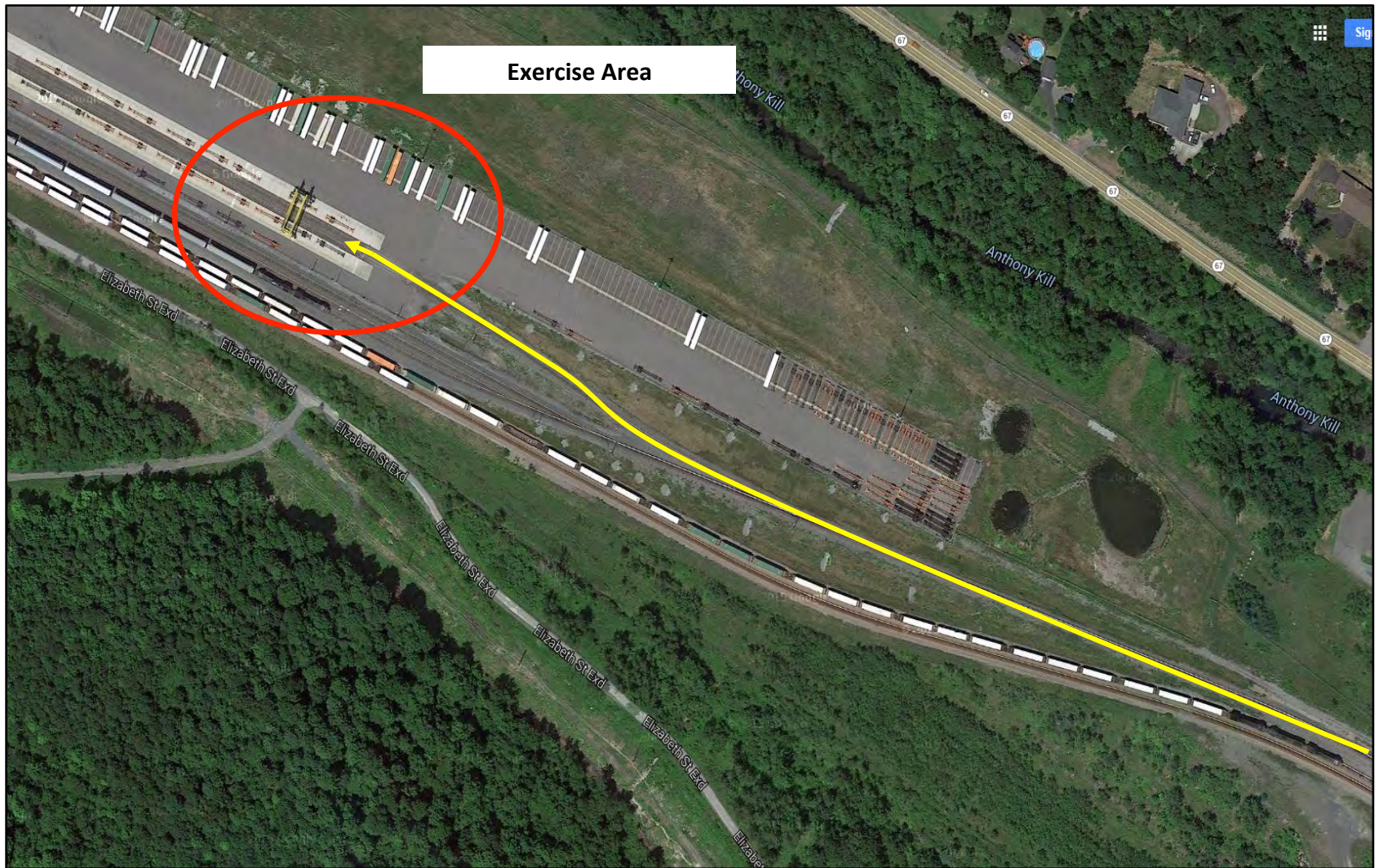


Shipment moving west towards rail yard



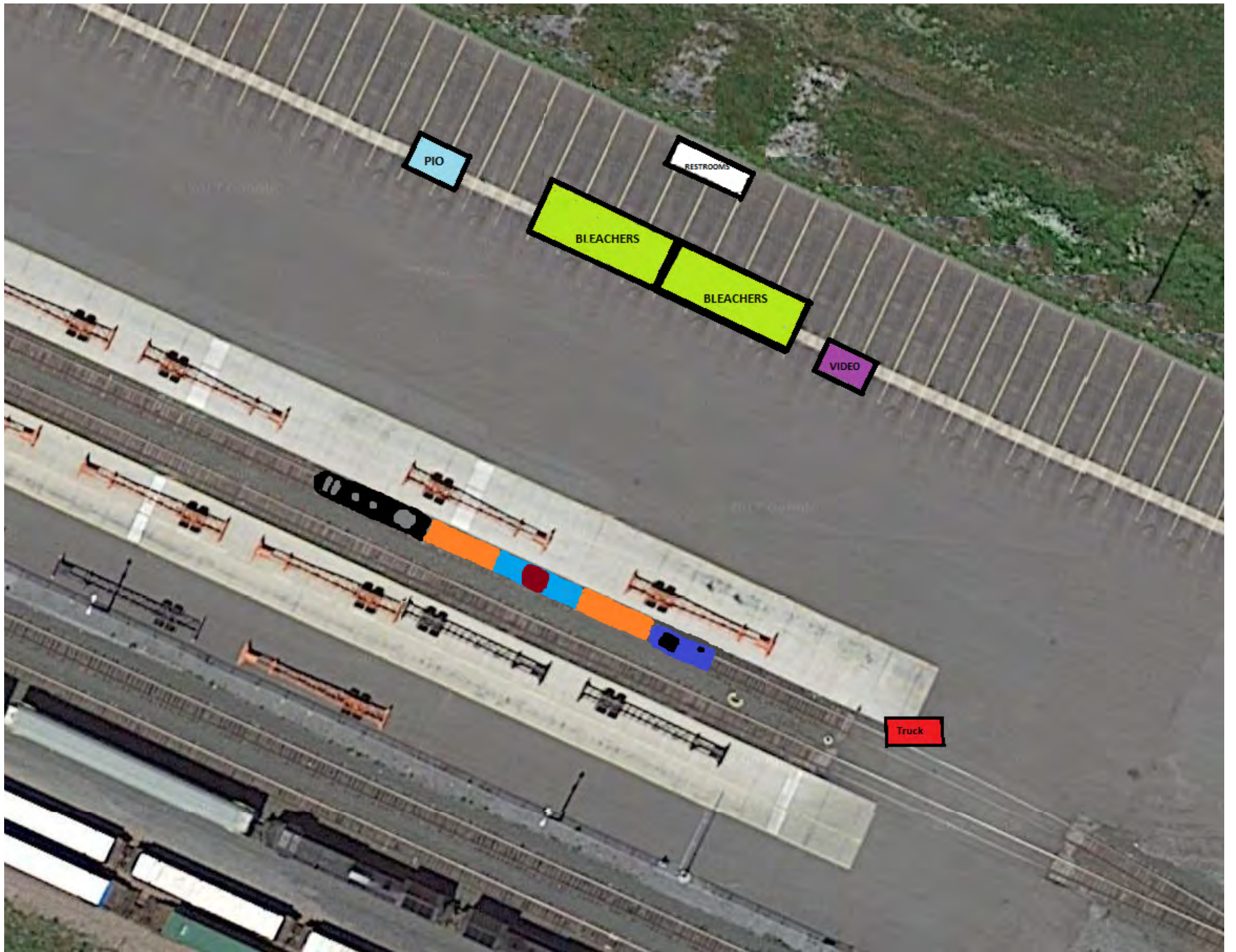


# 2017 NYS Exercise Site – Pan Am Rail Yard



Shipment enters rail yard from the southeast

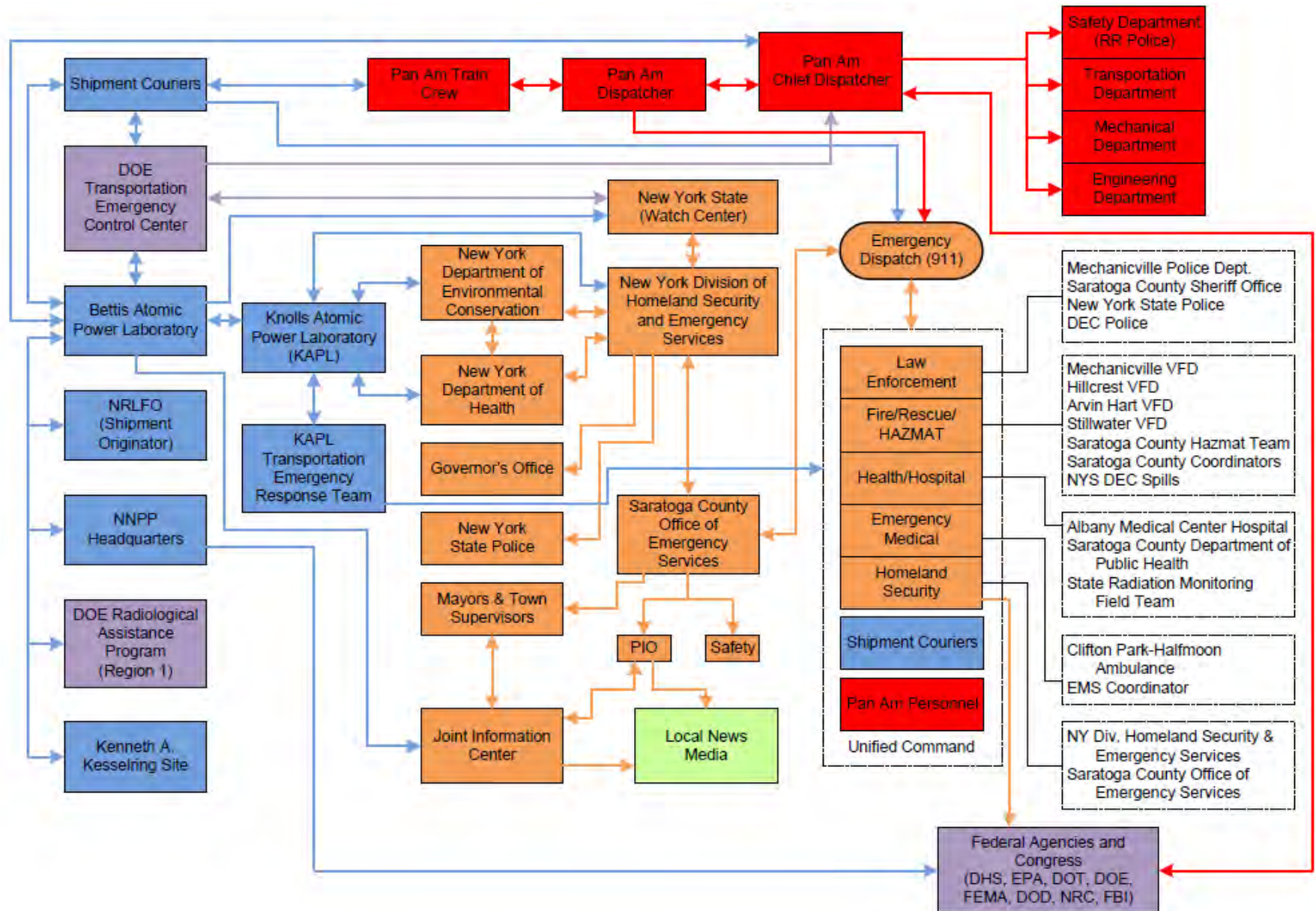








# 2017 NYS Exercise – Communications Diagram





# Naval Nuclear Propulsion Program

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Operating naval nuclear propulsion plants and shipping naval spent fuel safely for over 60 years. Key to the U.S. Navy continuing to meet its national security mission.

**Questions:**  
**Barry Miles**  
**[Barry.miles@navy.mil](mailto:Barry.miles@navy.mil)**  
**412-476-7277**



# Empty M-140 Spent Fuel Shipping Container Accident

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CSXT Frontier Rail Yard Buffalo, NY  
Thursday, 22 Sep 2005  
Approx. 0100 EDT

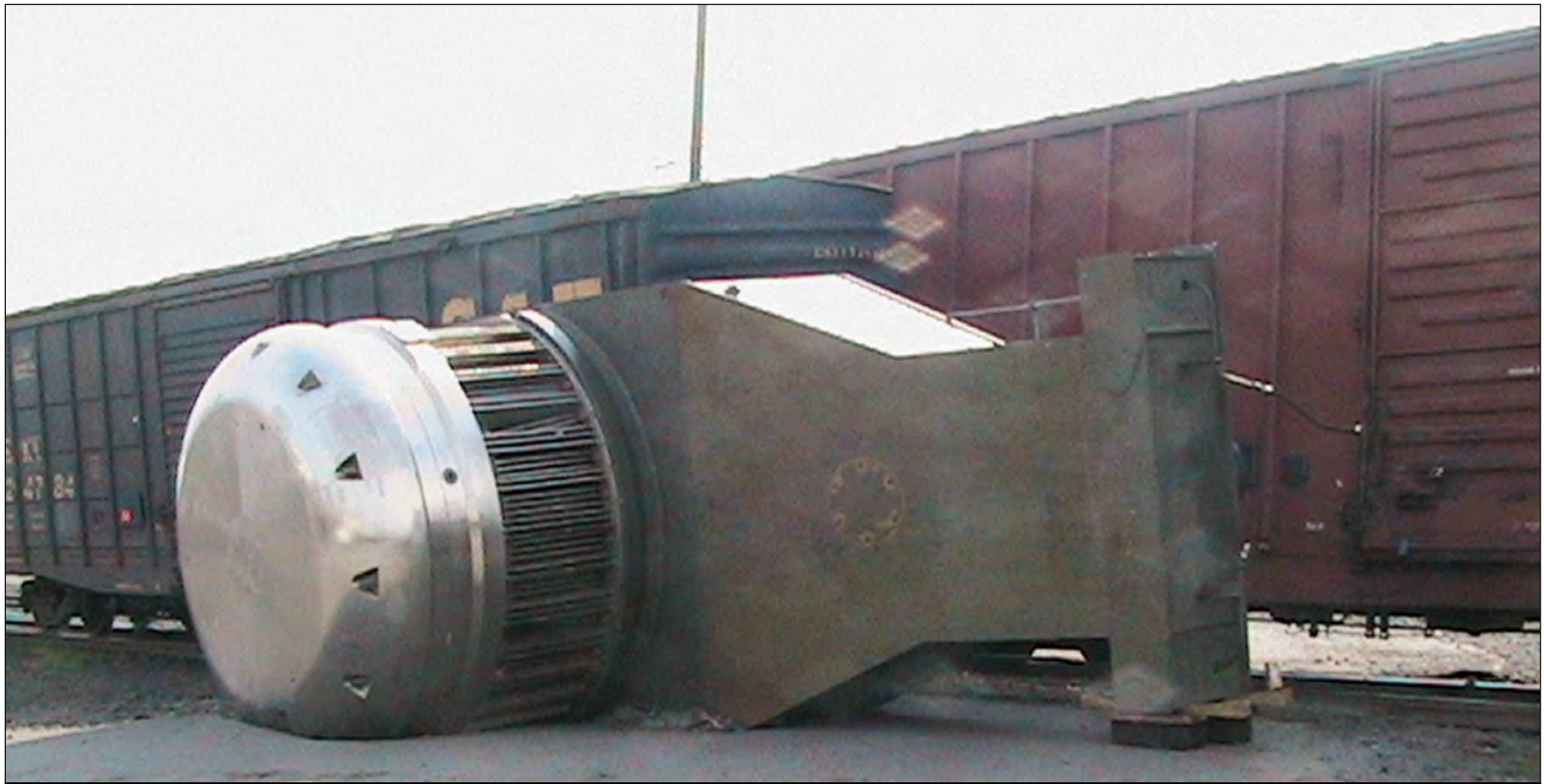


# NNPP EMPTY M-140 SPENT FUEL SHIPPING CONTAINER ACCIDENT

CSXT Frontier Rail Yard, Buffalo, NY  
Approx. 0100 EDT, Thurs., 22 Sep 2005.



Scenario: Low speed, two trains on adjacent tracks being worked to same switch point, M-140 was lead car on train with the blue CSX boxcar behind it. Red boxcars on other train.



- NNPP activated ECCs. Shipper (Idaho facility) the first notified per shipping papers.
- NNPP NY field office at KAPL notified State of NY and kept NY informed.
- NNPP PA field office at Bettis coordinated response/recovery with CSXT.
- NNPP response teams from Bettis, KAPL, and Portsmouth Naval Shipyard start arriving on scene at 1030.
- Confirming radiological surveys by County officials, NNPP personnel, NY State. Shaw Envir. review. Buffalo Fire Dept responded and monitored recovery.
- CSXT called in Winter's Rigging for recovery lifting/handing.





M-140/railcar uprighted 1135, 23 Sep ...  
approx 36 hours after derailment.







M-140 section that was in contact with the ground.



M-140 section that was in contact with the blue boxcar.