

# STURGIS Barge Decommissioning Project

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US Army Corps of Engineers  
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# Agenda

- History of the Army Nuclear Power Program
- History of the STURGIS
- Decommissioning of the STURGIS
  - ▶ Waste Segregation
  - ▶ Safety Measures
  - ▶ Milestones
- Question/Answer Session



# U.S. Army Nuclear Power Program

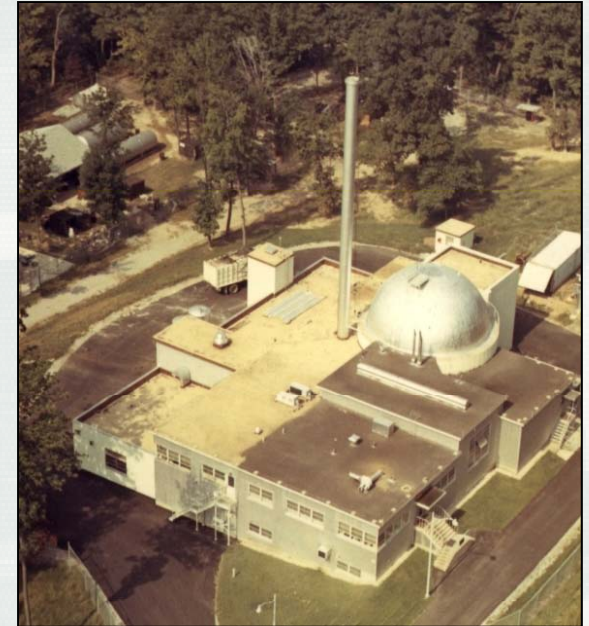
- 1952 Department of Defense (DoD) study to determine the feasibility of developing reactor plants to serve military power needs on land.
- Joint program between DoD and the Atomic Energy Commission.
- Each service participated in the Army managed program.





# U.S. Army Nuclear Power Program

- 6 DoD Reactors
  - 4 Army – SM-1 Fort Belvoir, VA; SM-1A Fort Greely, AK; MH-1A STURGIS; PM-2A Camp Century Greenland
  - 1 Air Force – PM-1 Sundance, WY
  - 1 Navy – PM-3A McMurdo Station Antarctica
- 3 prototype reactors developed at the National Reactor Testing Station in Idaho



The SM-1 served as the Army's primary training facility to train reactor operations personnel.



# Army Power Reactor Deactivation and Safe Storage

- Reactor fuel and control rods removed and returned to Atomic Energy Commission/Department of Energy
- Facility areas decontaminated or restricted from access
- Primary systems grouted or sealed, access doors welded shut
- Planned 50 years storage prior to “free release” and dismantlement



STURGIS MH-1A nuclear reactor core



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# History of the STURGIS





# Historical Use



- Part of President Eisenhower's efforts for peaceful use of atomic energy.
- Former World War II Liberty Ship, *SS Charles H. Cugle*, converted into a nuclear power plant in 1966.
- The first barge mounted nuclear plant to regularly supply power to a shore station.
- The STURGIS' nuclear reactor, MH-1A, was used to generate electricity for military and civilian use in the Panama Canal from 1968-1976.



# Retirement and Storage



- In 1977, the STURGIS returned to Fort Belvoir where the nuclear fuel was removed, and the vessel was prepared for safe long term storage.
- Stored and maintained in James River Reserve Fleet at Joint Base Langley-Eustis, VA since 1978.
- Corps of Engineers has performed quarterly monitoring for the past 36 years.



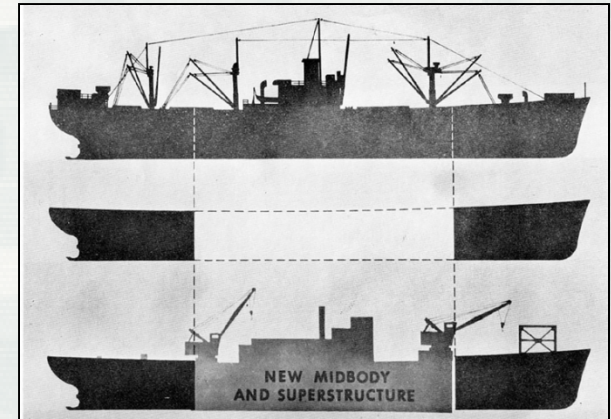


# Decommissioning of the STURGIS



# Environmental Assessment

- The 2013 Environmental Assessment evaluated potential ecological, cultural, water, public health and safety, and waste management effects associated with the proposed decommissioning and disposal of the STURGIS.
- Determined no significant environmental impact at any of the four potential locations as a result of this proposed action.



Design schematic from 1959



# Environmental Assessment

- Considered four potential places: Galveston, TX; Hampton Roads Metropolitan Area, VA; Baltimore, MD; and Charleston, SC.
- Consideration based on proximity to the Corps of Engineers offices, waste disposal facilities, shipyards, and/or ship breaking operations.
- Galveston ultimately chosen based on a best value assessment.





# Historic Preservation

- STURGIS is considered an historic property and eligible for listing in the National Register of Historic Places.
- Consultation with the Virginia State Historic Preservation Office:
  - ▶ Corps prepared a Memorandum of Agreement that addresses the required mitigation efforts for vessel disposal.
  - ▶ Preserving any historic items on the STURGIS, where applicable.



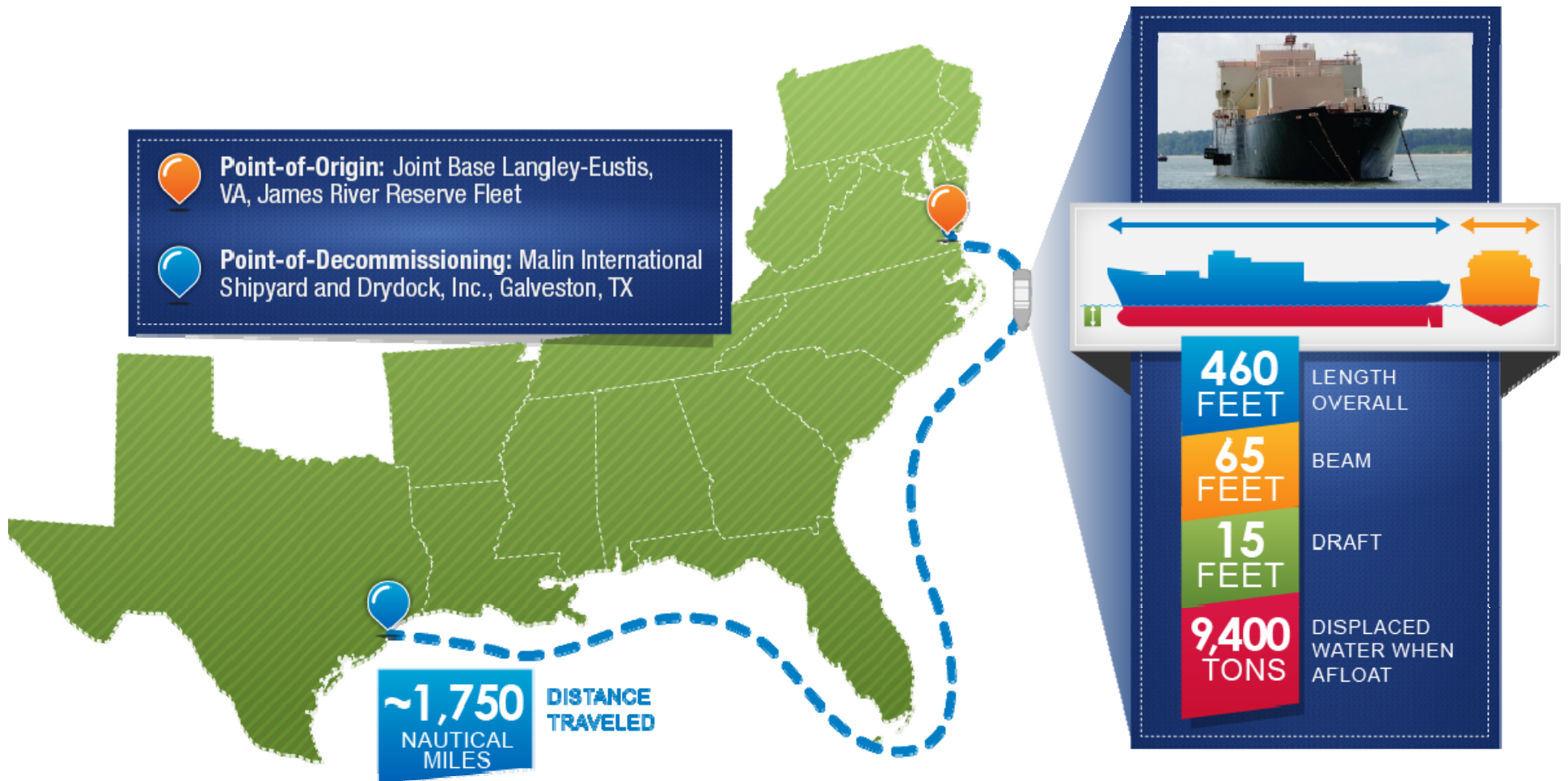
# Primary Objectives



- Decommission, dismantle, and dispose of the STURGIS.
- Segregate waste streams.
- Ensure wastes are disposed of in licensed, permitted facilities.
- Dispose of radioactive material to support the release of the STURGIS for unrestricted use.
- Allow for release of clean materials for recycling.
- Termination of the Army Reactor Office permit.



# Towing Route



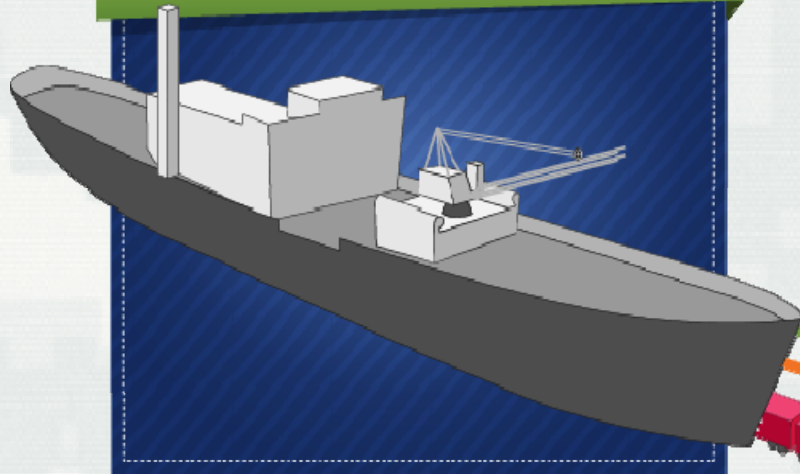


# Path Forward

- Inspection of STURGIS prior to relocation.
- Baseline survey at Malin Shipyard prior to towing.
- Preparation of STURGIS for towing to Malin Shipyard.
- Removing STURGIS' residual radiological and hazardous materials. This includes packaging, certification, transport and disposal.



## WHERE DOES IT ALL GO?



TRAINS/TRUCKS  
TRANSPORT WASTE

### REMOVAL OF RADIOACTIVE WASTE TO A LICENSED DISPOSAL FACILITY

- **RADIOLOGICALLY ACTIVATED**
  - REACTOR PRESSURE VESSEL (RPV)
  - REACTOR COMPONENTS
  - HEAVY METALS
- **RADIOLOGICALLY CONTAMINATED**
  - PRIMARY REACTOR SYSTEM EQUIPMENT
  - LIQUID WASTE MANAGEMENT SYSTEM



### REMOVAL OF NON-RADIOLOGICALLY CONTAMINATED MATERIAL & EQUIPMENT (M&E) WILL BE RECYCLED

- **OVERWHELMING MAJORITY OF M&E FALL INTO THIS CATEGORY**
  - SPARE PUMPS, GASKETS, MANUAL TOOLS
  - CONTROL ROOM CONSOLES
  - ELECTRICAL DISTRIBUTION EQUIPMENT
  - PIPE AND VALVES
  - CREW FURNISHINGS
  - CLEAN VESSEL

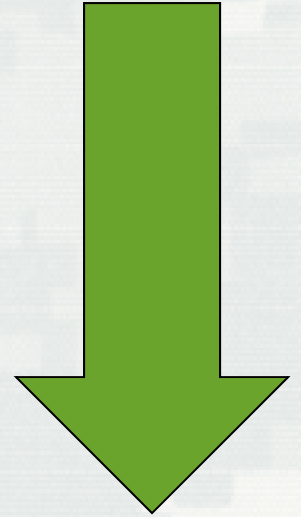
### REMOVAL OF NON-RADIOLOGICALLY CONTAMINATED HAZARDOUS WASTE FORMS

- ASBESTOS INSULATION, FLOOR TILES, MASTICS, ETC.
- LUBRICATION OILS
- DIESEL RESIDUES FROM EMERGENCY GENERATOR
- CLEANING MATERIALS
- UNIVERSAL WASTE



# Risks

- Engineering practices and safety controls will minimize risks to human health and the environment.
- The radiation dose at the release criteria for the STURGIS material is equivalent to watching TV.
- This process will be conducted in a contained area of the barge using proven industry standards.





# Safety Measures

- Proven controls and precautions to address safety and other engineering details throughout the project.
  - ▶ Minimizing the workers' time and exposure to hazardous waste
  - ▶ Maintaining an appropriate distance
  - ▶ Using shielding techniques around higher dose areas



# Hurricane Plan



- Detailed plans will be implemented for severe weather conditions:
  - ▶ Double tie the STURGIS in place and make sure it is water tight.
  - ▶ STURGIS will be left in the shipyard to ride out the storm.
  - ▶ Consistent with what Malin Shipyard has done before during previous hurricanes.



# Highly Skilled and Experienced Contractor Team



**CB&I**  
*Prime Contractor*

Project Management  
Quality Assurance  
Safety and Health  
Radiological Program  
Project Controls

Contract Management  
Procurement  
Decommissioning  
Dismantlement  
Engineering



**EnergySolutions**

Waste Management  
Radiological Controls  
Waste Certifications

Waste Transport  
Waste Disposal  
Regulatory Support



**Malin International**

Towing Plan  
Naval Architect  
Pierside Operations

Decommissioning Facility  
Shipyard Labor  
Drydock (Submersible Barge)



**EMR**

Ship Breaking, Recycling, and Vessel Disposal

STUR\_103\_5



# STURGIS Milestones

**2014**

**Approval of  
James River to  
Galveston  
Towing Plan  
Fall 2014**

**STURGIS  
Arrival in  
Galveston  
Winter 2014**

**2015**

**First  
Radiological  
Waste Shipment  
Spring 2015**

**2016**

**Decommissioning  
Activities/  
Radiological Work  
Complete  
Spring 2016**

**2017**

**Project  
Complete  
Summer 2017**

# QUESTIONS?

