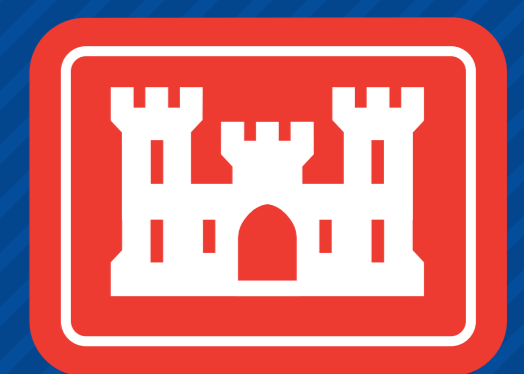
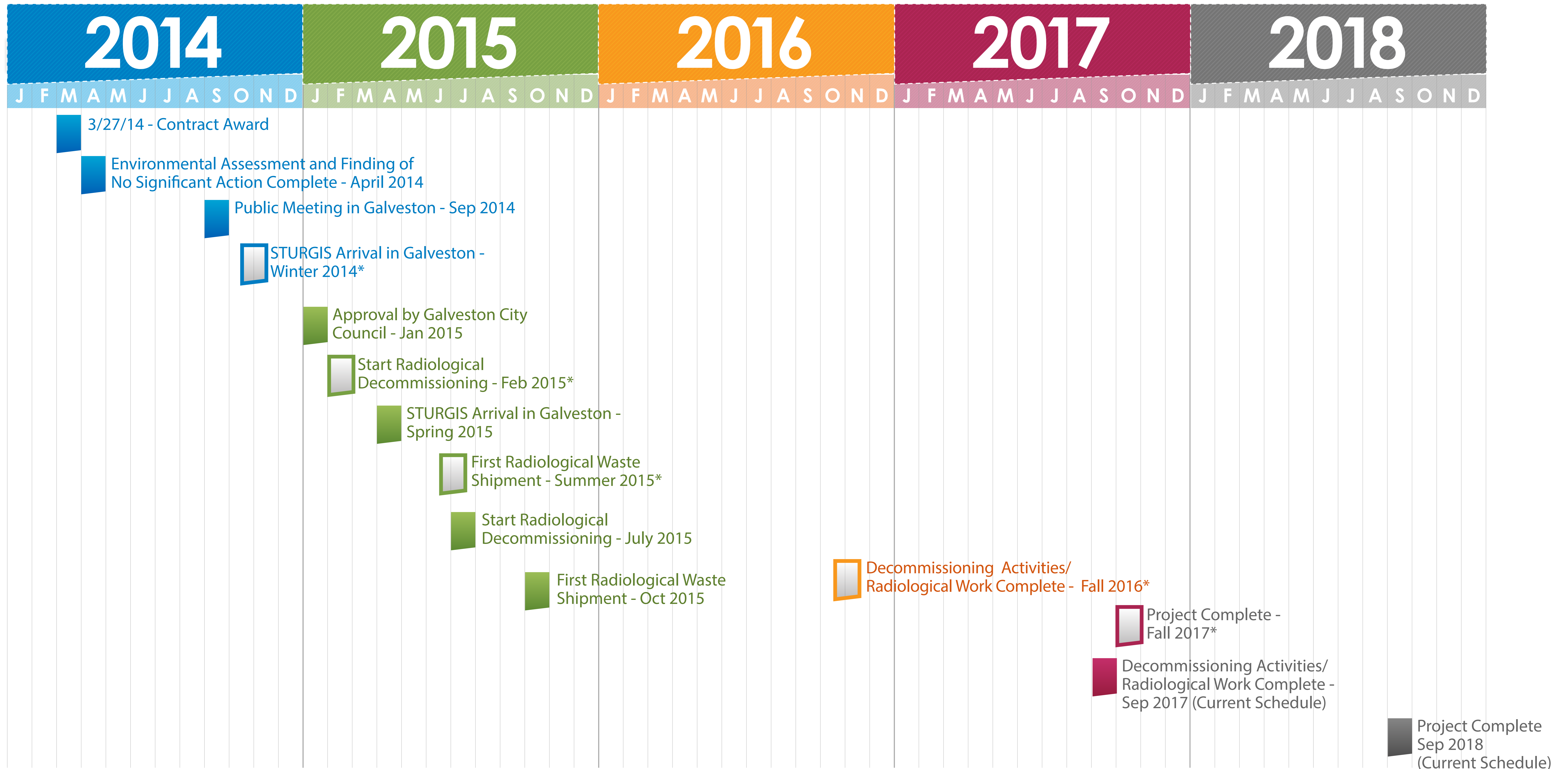


TIMELINE/SCHEDULE

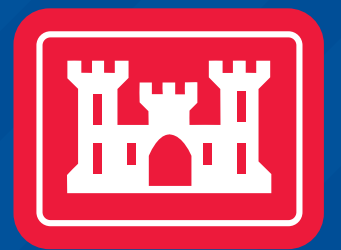


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* Pertains to Original Schedule

PROPOSED ACTION



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DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action is to decommission, dismantle, and properly dispose of the STURGIS. The work will be completed by CB&I Federal Services LLC, a domestic company technically capable of dismantling a vessel with a nuclear reactor onboard. The STURGIS will be towed to Malin Shipyard in Galveston, Texas for decommissioning activities. The purpose of the Proposed Action is to segregate waste streams requiring removal, ensure wastes are disposed of in licensed/permitted facilities, reduce residual radioactivity to levels supporting the release of STURGIS for unrestricted use, allow for release of clean materials for recycling, and termination of the US Army Reactor Office permit. The Proposed Action is needed now to reduce costs associated with maintaining STURGIS and to meet the US Army Corps of Engineers mission objectives to decommission their nuclear reactors and terminate their possession permits.

FINAL – REVISION 1 Environmental Assessment Decommissioning and Dismantling of STURGIS and MH-1A



April 15, 2014



Prepared by the
U.S. Army Corps of Engineers
Baltimore District
10 South Howard Street
Baltimore, MD 21201-1715
(410) 962-0030

FINAL

DEPARTMENT OF DEFENSE DEPARTMENT OF THE ARMY FINDING OF NO SIGNIFICANT IMPACT (FNSI) FOR DECOMMISSIONING AND DISMANTLING OF STURGIS AND MH-1A

Pursuant to the Council on Environmental Quality regulations, 40 *Code of Federal Regulations* (C.F.R.) §§ 1500-1508, implementing procedural provisions of the National Environmental Policy Act (NEPA) and the provisions of 32 C.F.R. § 651, the United States Army Corps of Engineers (USACE) gives notice that an Environmental Assessment (EA) and Finding of No Significant Impact (FNSI) have been prepared for the decommissioning and dismantling of the vessel STURGIS and associated mobile high power nuclear plant MH-1A (hereafter referred to as STURGIS), which is currently moored at the Maritime Administration (MARAD) James River Reserve Fleet (JRRF), Ft. Eustis, Virginia and an Environmental Impact Statement (EIS) is not being prepared.

Proposed Action:
STURGIS has been inactive, and the onboard MH-1A reactor has been in long-term Safe Storage (SAFSTOR), as a monitored deactivated defueled nuclear plant, for over 35 years. The USACE has no anticipated current or future needs for the vessel or onboard reactor.

The Proposed Action is to decommission, dismantle and dispose of the STURGIS by contract with a domestic company technically capable of dismantling a vessel with a nuclear reactor onboard.

The purpose of the Proposed Action is to reduce residual radioactivity associated with the MH-1A to levels that allow release of STURGIS for dismantlement, and termination of the Army Reactor Office permit. All wastes will be segregated and disposed of at licensed/permitted facilities and remaining materials will be recycled (e.g., steel). The Proposed Action is needed now to reduce costs associated with maintaining STURGIS and meet the USACE mission objectives to decommission their nuclear reactors and terminate their long term storage permits.

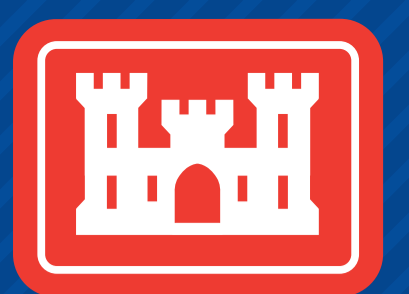
Existing Conditions:
JRRF is located on the James River in Ft. Eustis, Virginia, and hosts moored ships, all of which are within the MARAD inventory and designated for disposal. JRRF is the oldest National Defense Reserve Fleet site, having begun operations during World War I.

Alternatives Analyzed: The Proposed Action may be implemented at private sector facilities located in one of four alternative locations (1) Hampton Roads Metropolitan Area, VA; (2) Baltimore, MD; (3) Charleston, SC; and (4) Galveston, TX. If the Charleston, SC, or Galveston, TX, Alternative is selected, then facilities at Brownsville, TX or Baltimore, MD would be used to complete the vessel dismantling. The EA analyzes four Proposed Action Alternatives and the No-Action Alternative.

The project sites, at JRRF and at the four alternative locations, are located in developed areas along the waterfront and have restricted access. If the USACE decides to implement the Proposed Action, no construction of new facilities would be required. Moreover, no dredging

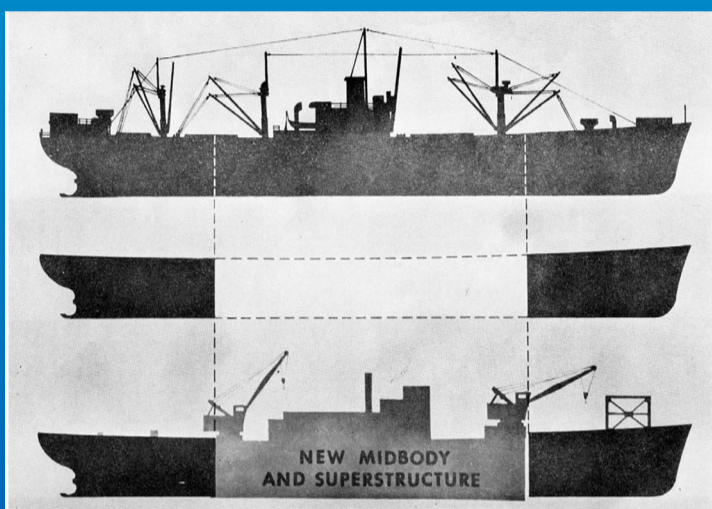
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TIMELINE FOR THE MH-1A AND STURGIS



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1959
 • USACE Marine Design Division requested to design a nuclear power barge



1966
 • Conversion of the SS Charles H. Cugle completed. It was then renamed STURGIS and towed from Alabama to Fort Belvoir, VA for testing



1968-1976
 • Moored in the Panama Canal Zone and was the first barge mounted nuclear plant to regularly supply power to a shore station



1978
 • The STURGIS was placed in the James River Reserve Fleet located near Joint Base Langley-Eustis, VA for long-term storage



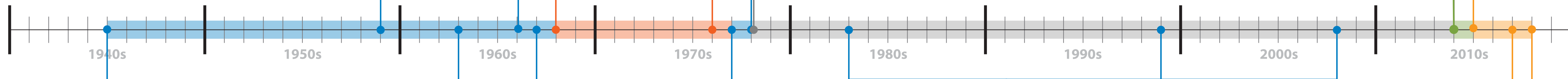
1978-2014
 • USACE performs quarterly monitoring to ensure protectiveness of human health and the environment



2014
 • USACE Baltimore completed the National Environmental Policy Act and National Historical Preservation Act documentation to support the issuance of a Decommissioning Permit from the US Army Reactor Office
 • Public Meeting hosted by USACE in Galveston, TX (September 9, 2014)



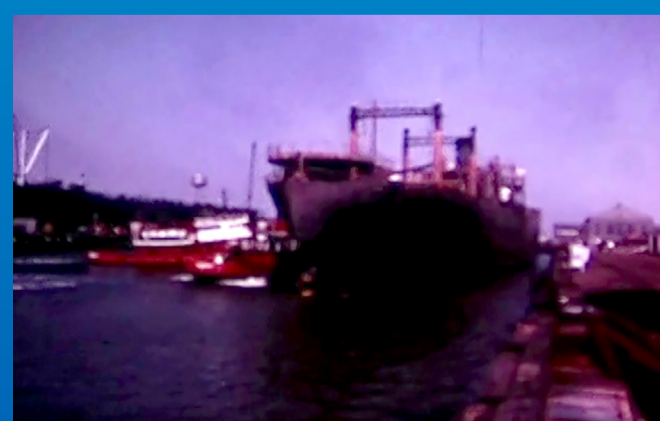
2015
 • Approval from Galveston City Council (January 22, 2015)
 • Transfer of STURGIS to Galveston
 • Arrival of STURGIS in Galveston (April 30, 2015)
 • Radiological Decommissioning Start (July 9, 2015)
 • First radiological waste shipment (October 20, 2015)



1945
 • Liberty Ship SS Charles H. Cugle launched



1963
 • The US Army selected the SS Charles H. Cugle for conversion to the barge mounted nuclear reactor in Mobile, AL



1967
 • The MH-1A Reactor, which mounted within the STURGIS went critical and testing began



1977
 • The STURGIS returned to Fort Belvoir where the nuclear fuel was removed and the vessel was prepared for safe storage status/long-term storage



1983, 1999 and 2008
 • STURGIS was dry docked to perform inspections and maintenance



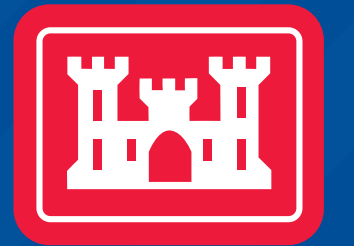
September 2017
 • STURGIS MH-1A radiological decommissioning complete

September 2018
 • STURGIS project complete

LEGEND

- Historical individual dates
- Service in Panama Canal
- Storage time in VA
- Decommissioning Planning
- Decommissioning

WASTE SEGREGATION PROCESS



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WHERE DOES IT ALL GO?



TRAINS/TRUCKS
TRANSPORT WASTE

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 RADIOACTIVE WASTE TO A LICENSED DISPOSAL FACILITY

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

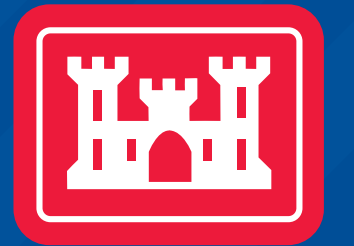


REMOVAL OF NON-RADIOLOGICALLY CONTAMINATED HAZARDOUS WASTE FORMS

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



TOWING PROCESS



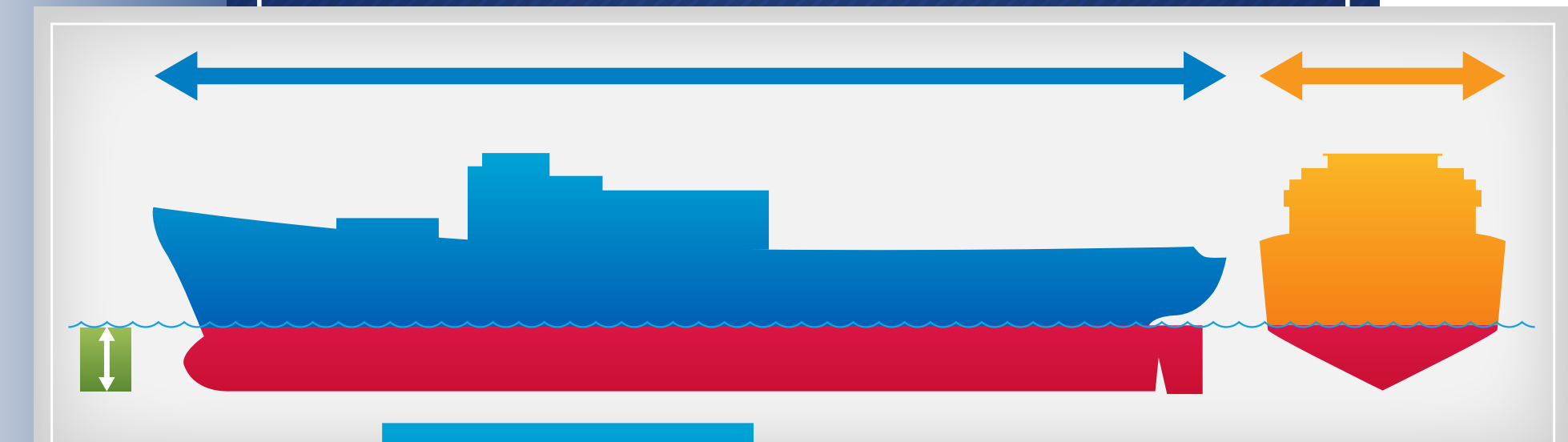
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Point-of-Origin: Joint Base Langley-Eustis,
VA, James River Reserve Fleet



Point-of-Decommissioning: Malin International
Shipyards and Drydock, Inc., Galveston, TX



460
FEET

LENGTH
OVERALL

65
FEET

BEAM

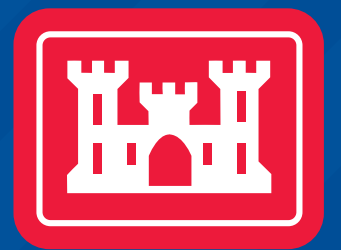
15
FEET

DRAFT

9,400
TONS

DISPLACED
WATER WHEN
AFLOAT

RADIATION, RADIOACTIVITY, AND RISK



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WHAT IS RADIATION?

RADIATION

Invisible energy moving through space

NON-IONIZING RADIATION

Light, sound, heat or infrared waves, microwaves, radio waves, low frequency power line radiation

IONIZING RADIATION

A Alpha particles (fast moving helium nucleus)

B Beta particles (fast moving electron)

N Neutrons

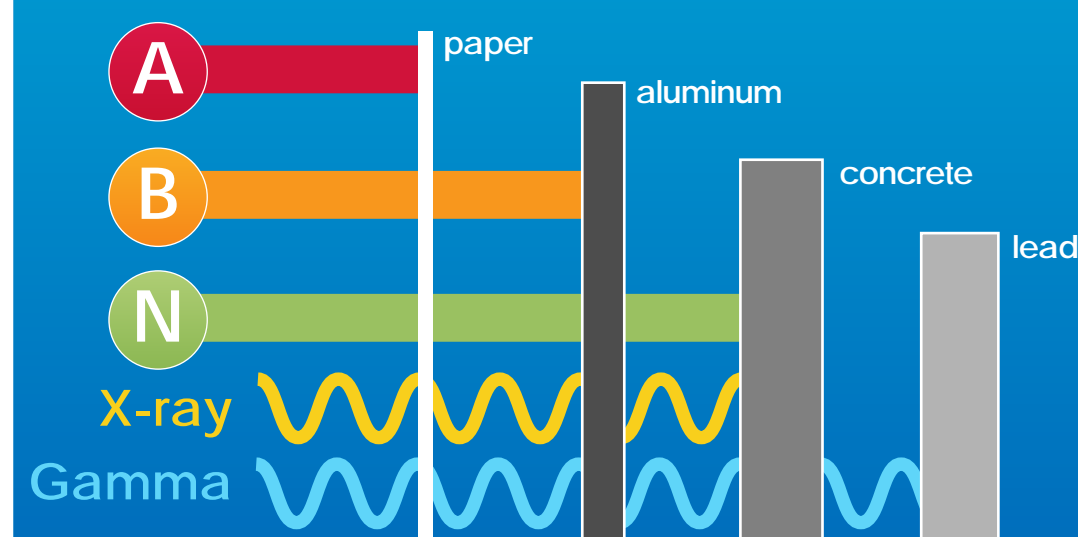
Gamma, X-ray

QUANTIFYING RADIATION EXPOSURE

REM (millirem - 1/1000 REM)

Unit of absorbed dose in the body measuring the damage done by the energy deposited

DIFFERENT TYPES OF RADIATION HAVE DIFFERENT PENETRATING POWERS



WHAT IS RADIOACTIVITY?

RADIOACTIVITY

Spontaneous emission of radiation
Is reduced as radioactive atoms decay

RADIOACTIVE ATOMS

Are unstable
Change or decay until they become stable
Give off surplus energy by emitting radiation

HALF LIFE

The time it takes for decay to half the previous radioactivity

QUANTIFYING RADIOACTIVITY

Disintegration per second (d/s)
The number of atomic nuclei that decay each second

SOME HALF LIVES

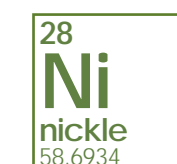
5.27 years

COBALT-60



100.1 years

NICKLE-63



4.5 billion years

URANIUM-238



WHAT IS RISK ASSESSMENT?

RISK ASSESSMENT

Evaluating benefits versus risk
Is a smoke detector worth its radiation risk?

NO ANSWER TO THE QUESTION:

What is a safe level of radiation exposure? (What is a safe driving speed?)

APPROPRIATE QUESTION TO ASK IS:

What is the risk associated with a given exposure? (What is the risk of injury for this situation and speed?)

HEALTH RISKS FROM RADIATION COMPARED WITH OTHER SITUATIONS

	Average Days of Life Expectancy Lost
Unmarried Male	3500
Smoke 20 cigarettes per day	2370
Unmarried Female	1600
Overweight by 20%.....	985
All Accidents combined.....	435
Auto Accidents.....	200
Alcohol Consumption (U.S. average)	130
Home Accidents.....	95
1000 millirem per year for 30 years, calculated	30
Natural background radiation calculated.....	8
Medical Diagnostic X-rays	6
Coffee drinker.....	6

RADIATION DOSES IN MILLIREM FROM VARIOUS EXPOSURES

(ANNUAL DOSE UNLESS OTHERWISE STATED)

5,000 mrem
2,000 mrem
1,500 mrem

US OCCUPATIONAL DOSE LIMIT

TOBACCO SMOKING

UNDERGROUND URANIUM MINES

620 mrem

AVERAGE ANNUAL RADIATION PUBLIC DOSE

200 mrem

RADON IN THE AIR

100 mrem

NUCLEAR REGULATORY COMMISSION PUBLIC DOSE LIMIT

40 mrem

FOOD AND WATER

10 mrem

CHEST X-RAY

1 mrem

WATCHING TV

1 mrem

RELEASE CRITERIA FOR STURGIS MATERIAL

TERRESTRIAL RADIATION

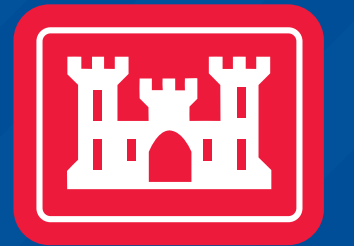
TERRESTRIAL SOURCES ARE NATURALLY RADIOACTIVE ELEMENTS IN THE SOIL AND WATER SUCH AS URANIUM, RADIUM, AND THORIUM.

US (average)	26 mrem/year
Denver, CO.....	63 mrem/year
Nile Delta, Egypt	350 mrem/year
Paris, France.....	350 mrem/year
Kerala, India.....	400 mrem/year
McAlpe, Brazil.....	2,448 mrem/year

mrem =

MILLIREM = 1/1000 REM UNIT OF ABSORBED DOSE IN THE BODY MEASURING THE DAMAGE DONE BY THE ENERGY DEPOSITED

SAFETY MEASURES – STURGIS



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RISKS?

Safety is our number one priority. There will be minimal risk to the public as we implement this project. USACE has a highly skilled team of engineers, scientists, and contractors dedicated to the project. It is important to note that the MH-1A reactor, which is installed on the STURGIS barge, has zero nuclear fuel.

#1
priority

PUBLIC AND
WORKER
SAFETY

100
percent

DEDICATION
TO PROJECT

100
percent

COMPLIANT



minimal

RISK TO
PUBLIC

0

nuclear fuel

MH-1A
REACTOR