

# PROJECT OVERVIEW FOR SM-1A FORT GREELY, AK DEACTIVATED NUCLEAR POWER PLANT PROGRAM

## Industry Day Briefing

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US Army Corps of Engineers  
12 Feb 2019

*"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."*



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# AGENDA

- Introduction and Welcome Remarks
  - Brenda Barber
  - Hans Honerlah
  - MAJ Chambers
  - Paula Beck
- Ground Rules
  - MAJ Chambers
- U.S. Army Nuclear Power Program; Deactivated Nuclear Power Plant Program
  - Hans Honerlah
- Regulatory Framework for the Deactivated Nuclear Power Plant Program
  - Hans Honerlah
- Historical Overview SM-1A
  - Hans Honerlah
- Decommissioning Planning
  - Brenda Barber
- Contracting Approach
  - Brenda Barber
- Closing Remarks
  - MAJ Chambers



# ADMINISTRATIVE ANNOUNCEMENTS

- All attendees must sign in
- Briefing is unclassified
- Presentation will be posted to FBO time TBD
- Please silence your cell phones; if you must take a call, please leave the room so you don't disturb others
  
- Questions?



# GROUND RULES

- The purpose of this Industry Day is to discuss the upcoming SM-1A Deactivated Nuclear Power Plant Decommissioning and Dismantlement.
- Active dialogue is encouraged during this presentation and during the one-on-one sessions with our team. Any discussions/dialogue during the Industry Day events are not binding for any party
- All technical and contractual issues discussed during this event are pre-decisional and subject to change as we refine our project requirements
- The USACE team seeks to gain contractor input on the contractual approach to allow our team to ensure an effective solicitation approach and successful project implementation
- Any questions on the project should be submitted to:  
MAJ Trevor Chambers [trevor.l.chambers@usace.army.mil](mailto:trevor.l.chambers@usace.army.mil)



# PROJECT CONTACT INFORMATION

- SM-1A Project Website <http://www.nab.usace.army.mil/SM-1A/>
  - To receive Stakeholder Updates, please call 410-962-2809 or send your e-mail to: [cenab-cc@usace.army.mil](mailto:cenab-cc@usace.army.mil)
- Deactivated Nuclear Power Plant Program website
  - <http://www.usace.army.mil/Missions/Environmental/DNPPP/>

Project Manager – Brenda Barber

Health Physicist and COR – Hans Honerlah

Contract Specialist – MAJ Trevor Chambers (alternate James Greer)

Contracting Officer – Paula Beck



# U.S. ARMY NUCLEAR POWER PROGRAM

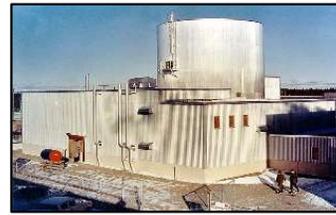
- 1952 Department of Defense (DoD) study to determine the feasibility of developing reactor plants to serve military power needs on land.
- Joint program between DoD and the Atomic Energy Commission.
- Each service participated in the Army managed program.



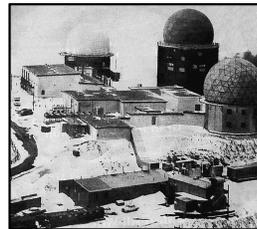
# U.S. ARMY NUCLEAR POWER PROGRAM

- Six DOD power reactors fielded between 1957-1976

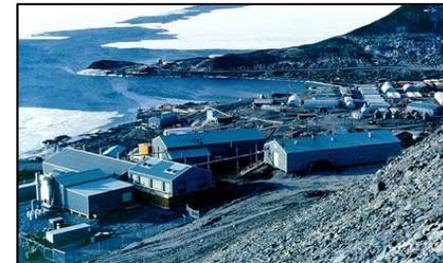
Four Army:



One Air Force:



One Navy:



- Three at National Reactor Testing Station, Idaho



# ARMY DEACTIVATED NUCLEAR POWER PLANT PROGRAM

- PM2A at Camp Century Greenland was fully decommissioned, the three others were placed into SAFSTOR and are controlled under Army issued Permits, and still require decommissioning
- For the three Army deactivated (fuel removed) reactors placed into safe storage, USACE:
  - Ensures the security of the residual radioactive materials present in the reactors
  - Ensures structural integrity of the facilities and performs required maintenance
  - Performs environmental monitoring to ensure exposure to the public is below limits and 'As Low As Reasonably Achievable'
  - Plans and performs final decommissioning within 60 years post-shutdown



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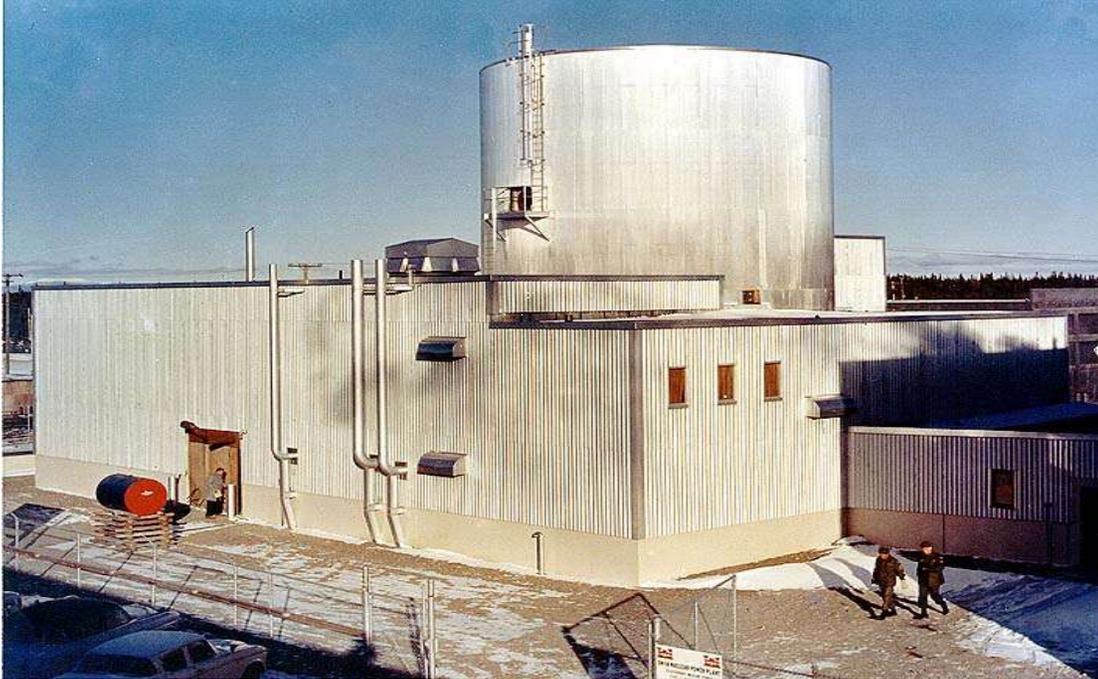


# CURRENT REGULATORY FRAMEWORK AND OVERSIGHT

- Defense Utilization Facilities Authorized by Section 91.b. of the Atomic Energy Act of 1954
  - Section 110.b. of the AEA Excludes DOD Utilization Facilities from AEC/NRC Licensing
- Army Reactor Program (AR 50-7)
  - Compliance With Federal Standards Required
- Army Radiation Safety Program (DA PAM 385-24)
  - USACE Developed Radiation Protection Programs
- Army Reactor Permits Issued to USACE by U.S. Army Nuclear and Countering WMD Agency (USANCA) in G-3/5/7
- Army Reactor Council Provides Oversight



# SM-1A OPERATION AT FORT GREELY, AK



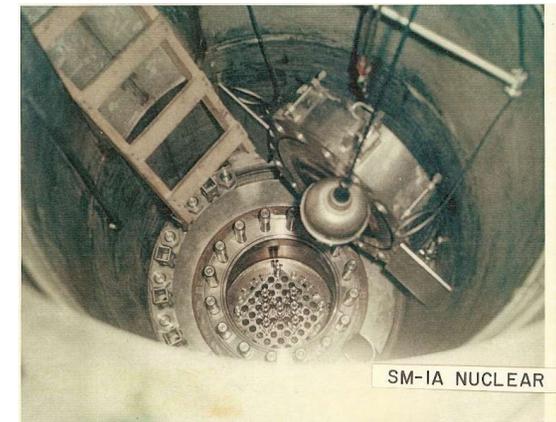
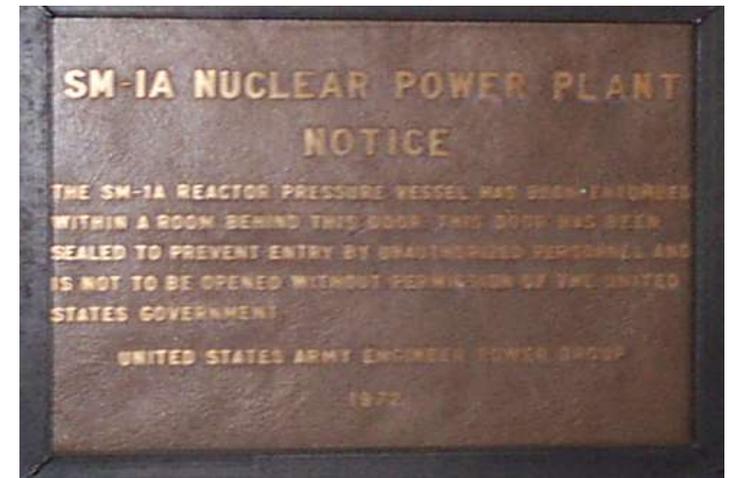
- Stationary, Medium Power, Prototype
- 20 MWt; 1,640 KWe
- First pressure suppression containment
- First steam generator replacement in US
- Deactivated, reactor areas encased, secondary systems converted to fuel boilers

Site is still operational as the Central Heating Plant for the Fort Greely Installation; Doyon Utilities operates the utility plant at the site



# SM-1A TIMELINE: DETAILS

- SM-1A Construction Start: 1958
- SM-1A Reactor Startup: March 1962
  - Core II installed: April 1964
  - Core III installed: Jan 1966
  - Core IV installed: Aug 1970
- Pressure Vessel Annealed: Aug 1967
- Last Operation: March 1972
- Minimal Decommissioning and Entombment: 1973
  - Deactivated, reactor areas encased, secondary systems converted to fuel boilers
- USACHPPM Survey: June 1997
- BRAC Pipeline and Dilution Well Removal: 1997-2000
- Core Component Activation Analysis: 2008
- USACE Historical Site Assessment: 2008
- USACE Gamma Walkover Report: 2011
- USACE Characterization Survey Report: 2014



# INITIAL DECOMMISSIONING ACTIVITIES

- Decommissioning activities are documented in the May 1974 Decommissioning Report
- Fuel, control-rods, absorber elements, and neutron sources were shipped off site
- Primary and secondary system was flushed with a chemical solution
- Fuel handling structure over the spent-fuel pit was removed
- Dilution station capped after it was filled with sand
- Demineralizer Room sealed
  - Waste placed in Demineralizer Room
- Removed wastewater pipeline & dilution station
  - 1997 BRAC action and site closed with a Record of Decision



# INITIAL DECOMMISSIONING ACTIVITIES

- Portions of the SM-1A were encased and include the Vapor Container (VC), Spent Fuel Pit, Hot Waste Tanks, Pipe Pit, Condensate Tank Pit (contaminated materials were included in the encasement)
- New concrete cover placed over the floors of lower reactor building and Building J-5
- Two time capsules placed within the encasement
- Access door to outer Demineralizer Room and other penetrations to it were sealed
- Miscellaneous low level radioactive waste placed in the Demineralizer Room



# ROPCS AND COPCS

- ROPCS – Primary Radionuclides of Potential Concern (half-lives > 5 years)
  - Soil and/or building materials: H-3, Sr-90, Tc-99, Cs-137
  - Primary and secondary systems: Co-60, Sr-90, Cs-137
  - Activated metals: Co-60, Ni-63
  - Activated concrete: Eu-125, Eu-154
- COPCs – Contaminants of Potential Concern
  - Building materials: Asbestos, lead-based paint, PCBs
    - PCB transformers removed in 1994
  - Shielding materials: elemental lead
  - Soil: Lead, petroleum-based hydrocarbons (diesel fuel spills)



# SM-1A DECOMMISSIONING PLANNING

- Decommissioning Planning is underway – anticipate completion by 2021
  - Scope includes:
    - Review of historical documents associated with the All Hazards Analysis
    - Prepare planning documents that will support the Army Reactor Office issuing the USACE a decommissioning permit for the SM-1A reactor
    - Comply with other relevant Federal and State requirements that will support the long-term decommissioning planning
    - Ensure adherence of project activities to Nuclear Regulatory Commission (NRC), Army, and Federal standards and guidance, as well as, other Federal standards and guidance where relevant, and
    - Coordinate with appropriate federal, state, and public parties to support issuance of decommissioning permit and other National Environmental Policy Act (NEPA) requirements
  - Major Decommissioning Planning Documents
    - Final Disposal Plan, Schedule and Cost Estimate
    - Waste Management Plan
    - Environmental Assessment
    - Section 106 Effects Assessment and agreement document
    - Decommissioning Plan



# REGULATORY FRAMEWORK

- Regulators
  - Removal of radioactive materials – Army Reactor Office (ARO)
  - Historical/Cultural – AK State Historic Preservation Office (SHPO)
  - Environmental protection/permitting – EPA and State
- Applicable Regulations
  - Atomic Energy Act
  - National Environmental Policy Act
  - Clean Air Act
  - Clean Water Act
  - Endangered Species Act
  - Others?



# PROJECT STAKEHOLDERS

- Regulators
- Property owners and tenants (Ft. Greely, Army Garrison Alaska, Doyon Utilities)
- Other government agencies (USACE, Defense Logistics Agency, etc.)
- Public interest groups/neighbors
- Local, State, Tribal and Federal elected officials
- Local jurisdictions



# PROJECT TEAM

- Members of the project and oversight team include:
  - Professional Engineers
  - Certified Health Physicists (Radiation Safety)
  - Certified Industrial Hygienists
  - Environmental Scientists
  - Regulatory Specialists
  - Safety Specialists
  - Qualified Technicians

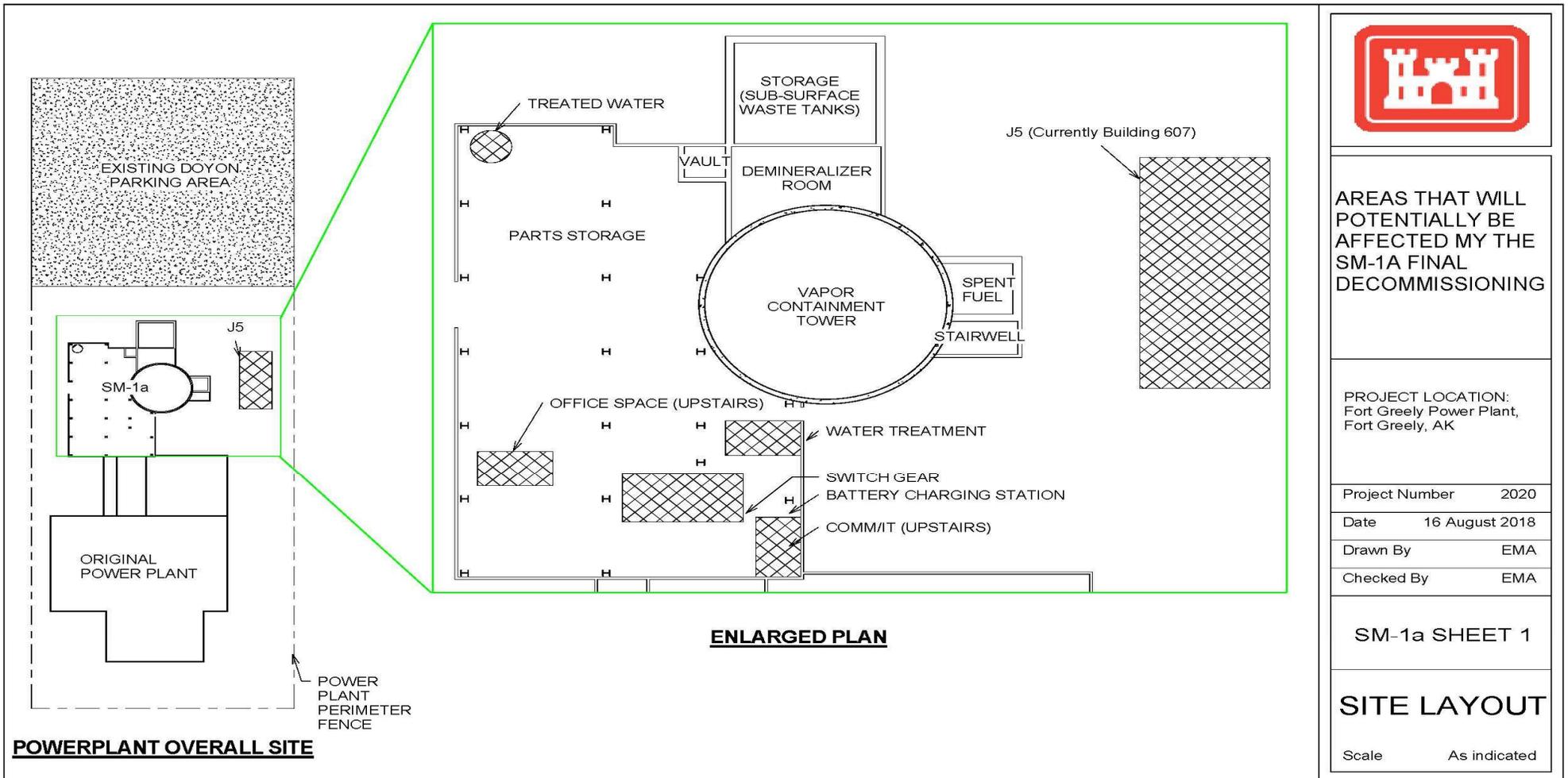


# FEDERAL OVERSIGHT

- U.S. Army Corps of Engineers will provide quality assurance over the contractor and their quality control program
- Corps of Engineers National Environmental Center of Expertise
- Army Reactor Office and Reactor Council
- Oak Ridge Associated Universities – Independent Review



# AFFECTED AREAS OF SM-1A (BLDG. 606)



AREAS THAT WILL POTENTIALLY BE AFFECTED BY THE SM-1A FINAL DECOMMISSIONING

PROJECT LOCATION:  
Fort Greely Power Plant,  
Fort Greely, AK

Project Number 2020

Date 16 August 2018

Drawn By EMA

Checked By EMA

SM-1a SHEET 1

**SITE LAYOUT**

Scale As indicated

# SM-1A CONTRACT ACQUISITION APPROACH

- Contract type will be further refined by the team
- Major Steps:
  - Market Research– planned for late 2019
  - Acquisition Planning – through early 2020
  - Issue Request for Proposal – anticipated 2021
  - Evaluate Proposals – 2021
  - Award Decommissioning Contract - 2022
- This will be a Cost Reimbursable (CR) type Contract with the potential for some Fixed Price elements (requires a DCAA audited cost accounting system)
- Validated Earned Value Management implementation compliant with the guidelines in ANSI/EIA 748 is required
- Work anticipated to take 5 years to implement



# REQUEST FOR PROPOSAL WILL LIKELY INCLUDE THE FOLLOWING REQUIREMENTS

- Combination of large and small companies with capabilities and expertise in the following key areas:
  - Prior experience working in Alaska; familiarity with Alaska working conditions and regulations
  - Project Management
    - Scheduling
    - Cost Estimating
    - Risk Assessment and Analysis
  - Radiological Expertise
  - Health and Safety Expertise
  - Decommissioning Expertise
  - Demolition Expertise
  - Regulatory Compliance
  - Waste Transportation and Disposal



# SM-1A POTENTIAL SCOPE (TO BE REFINED)

- Separate the Doyon Utility Operations from the SM-1A reactor area of the site
- Work would be completed in multiple phases
  - 1<sup>st</sup> phase – install new infrastructure (switchgear, battery charging relocation, water softener system, etc)
  - 2<sup>nd</sup> phase – implement Decommissioning Work; provide temporary storage and space for Doyon personnel, storage, etc.;
  - 3<sup>rd</sup> phase – after Decommissioning work is complete build new office/building/storage space to replace the square footage that was removed during the decommissioning effort



# PROPOSED DOYON RELOCATIONS REQUIRED TO IMPLEMENT WORK SAFELY

1. Replace old switchgear with new switchgear to be installed in an old switchgear room added to other side of building (purchase new asset for Doyon)
2. Move the battery charging area with the new switchgear (relocation of existing asset)
3. Replace water softener system with a newer system in the old centrifuge system area (purchase a new asset for Doyon)
4. Replace secondary treated water system with a new system near new water softener system (purchase a new asset for Doyon)
5. Install a new secondary power feed (purchase a new asset for Doyon)
6. Reroute POL delivery lines outside of the excavation footprint (rework of an existing asset)
7. Provide a new building and/or conex storage boxes for all bench stock items and all items currently stored in Building J5 (Bldg. 607) (provide temporary storage until a new asset can be provided)
8. Move all Doyon staff/offices, labs, break room, restrooms, and parking area to Bldg. 609 and/or another building location (temporary or permanent) (provide temporary space until a new asset can be provided)



## SM-1A DECOMMISSIONING IMPLEMENTATION ACTIVITIES

- The selected contractor will prepare plans that will support the decommissioning of the SM-1A in accordance with contract PWS and the Decommissioning Permit issued to the USACE;
- Decommission/disposal of materials in accordance with final plans, decommissioning permits, and relevant Federal and State requirements; and
  - Project management (cost controls, scheduling, manpower resourcing, etc.)
  - Prepare work plans, safety and radiological plans, and prepare complex engineering assessments
  - Removal of all reactor components and radiologically contaminated materials
  - Prepare all radiological waste for proper shipment; then transport and dispose of the waste
  - Perform radiological surveys
  - Perform demolition of non-contaminated equipment and building components
  - Excavate contaminated soils
- Final site restoration

**Adherence to NRC and Army, as well as other Federal standards and guidance where relevant and as required by the Army Reactor Office and USACE.**



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**Thank you for attending today's event. USACE  
appreciates your input on the SM-1A  
Deactivated Nuclear Power Plant  
Decommissioning and Dismantlement Project.**

**Questions?**

