

# SM-1A Nuclear Power Plant Overview

The SM-1A Nuclear Power Plant is located in central Alaska, approximately 6 miles south of Delta Junction on the Fort Greely Military Reservation. Fort Greely is approximately 100 miles southeast of Fairbanks and 225 miles northeast of Anchorage.

It was designed to be used as an “inservice” test facility for this type of equipment in an arctic environment with its primary mission being to supply electrical power and heating steam for the utility systems at Fort Greely. The secondary mission was to study the economics of operating a nuclear-type electrical plant compared to conventional oil-fired systems in a remote area where fuel costs are high and supply lines unusually long. The SM-1A was a 20.2 megawatt-thermal (MWt) pressurized water reactor which could supply 72,000 pounds of saturated steam per hour. The reactor used uranium oxide, highly enriched in U-235 and clad in stainless steel, as fuel. Due to the high operating costs and the projected cost of replacing the reactor pressure vessel, a decision was made to shut the plant down by 1968.

This decision was reversed when an annealing process was utilized to extend the vessel’s lifetime. Additionally, it was thought that continued operation would offer opportunities for experience and information about the reliability and lifetime of nuclear plants. By modifying an unused core procured for the portable medium-power PM-2A Nuclear Power Plant (Greenland) and using other spare fuel elements, an additional core was assembled, prolonging the active use of the SM-1A for five more years.

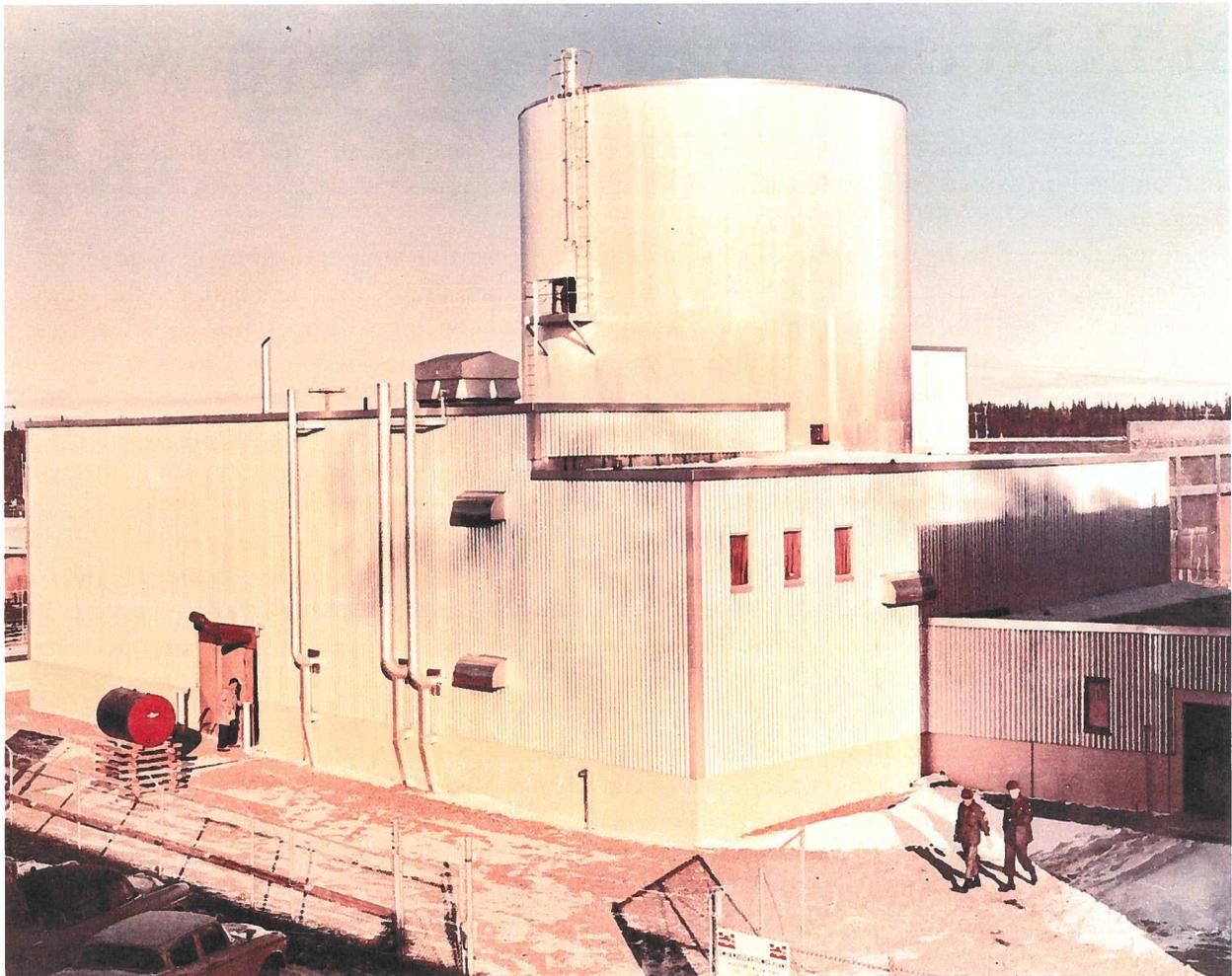
The final shutdown was performed on the SM-1A Reactor in March 1972, in accordance with the SM-1A Decommissioning Plan as approved by the Army Reactor Systems Health and Safety Review Committee (ARCHS). This consisted of removal of the nuclear fuel, minor decontamination, shipment of pre-packaged radioactive waste, encasing certain reactor components (vapor container, waste tanks, and demineralizer room), sealing the pressure vessel, and installing appropriate warning signs and monitoring devices. Certain areas were maintained as restricted areas for radiation safety considerations.

This method of decommissioning was selected due to the low initial cost and low personnel radiation exposure. Future remediation was to take place at a time when radiation levels and quantities of radioactive waste were significantly reduced due to radioactive decay.

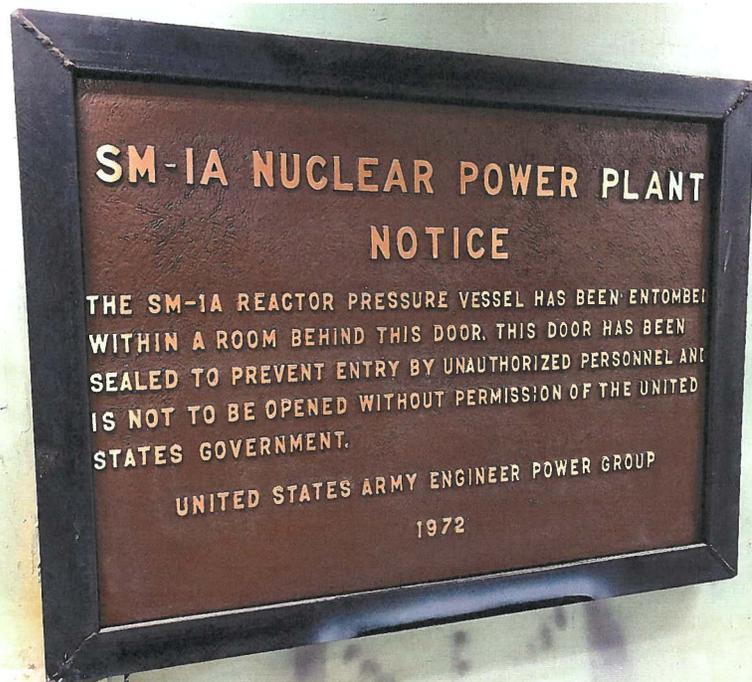
In 1995, Fort Greely was placed on the Base Realignment and Closure list. As part of the BRAC, certain areas associated with the SM-1A were investigated and remediated. Three specific areas were released under a Record of Decision, BRAC Site 90, BRAC Site 132, and Wastewater Pipeline Station 21+25. The AHA process supplies information to support the decommissioning study process outlined in Army Regulation 50-7. This process is performed by USACE, at the direction of the Army Reactor Office, to better define disposal activity costs.

SM-1 A Deactivated Nuclear Power Plant NoticeThe decommissioning strategy that was developed in the 1970's recommended that the deactivated reactors be placed into a safe storage mode that would allow the shorter-lived radionuclides to decay. It was expected that delaying decommissioning would reduce radioactive waste volumes and worker exposures. However, preliminary studies indicated that the levels of contamination present within the reactors would not be reduced by decay sufficiently to allow for release of the facilities without significant decontamination being performed. Additionally, concern regarding the increasing cost and decreasing availability of radioactive waste disposal led the Army Reactor Office (ARO) to recommend that an assessment be performed of the SM-1A reactor to allow for a more accurate decommissioning cost estimate to be developed which addresses projected changes in disposal options.

USACE developed a management plan for conducting an AHA, which contained provisions for four phases of work to be performed. Phase I included a Historical Records Review and Disposal Alternatives Investigation. Phase II, included performing a characterization survey and decommissioning cost estimate. Initial Phase II efforts were completed in 2015. Phases III and IV deal with decommissioning planning, design, and execution.



The construction of the SM-1A at Fort Greely began in 1958 and was completed in 1962 with first criticality achieved on 13 March 1962. The design was based on the concept of the SM-1 reactor at Fort Belvoir, Virginia, a prototype for stationary medium-power plants ("SM"). The "1A" moniker designates it as the first field plant of its type.



## SM-1A Deactivated Nuclear Power Plant

Decommissioning & Dismantlement Progress Update — January 29, 2026

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### Background

The SM-1A was a single-loop, 20.2 MW pressurized water nuclear reactor located at Fort Greely, Alaska. Built as part of the Army Nuclear Power Program between 1958 and 1962, it supplied electrical power and heating steam until its shutdown in March 1972. Following the shutdown and removal of its nuclear fuel, the facility was placed into a safe storage (SAFSTOR) configuration, where it has been monitored for over 50 years. The current project focuses on the complete decommissioning and dismantlement of the facility.

### Key Milestones to Date

The project has made significant progress in preparing the site for and executing the initial phases of dismantlement. Major completed objectives include:

- **Infrastructure and Site-Setup:** Successfully constructed a Waste Storage Area, established comprehensive environmental and radiological monitoring systems, and completed site setup with trailers and temporary power.
- **Demolition of Ancillary Structures:** Abated and demolished several buildings and structures, including Building B607 (J-5) and Building 606N.
- **Vapor Container Work:** Completed the demolition of the upper and lower outer vapor container and the associated steel dome. Initial characterization and surveys have been conducted inside the main vapor container.
- **Weather Enclosure:** A large weather enclosure has been installed over the primary work area to ensure work can continue safely and efficiently through harsh winters.

### Next Steps

The next major phase of the project is the decommissioning and dismantlement of the core reactor components. Key upcoming activities include:

- Installing mechanical, environmental, and electrical systems, including establishing containment around the Inner Vapor Container (28-foot diameter cylindrical chamber containing the reactor components).
- Conducting a Level B (higher respiratory protection) Readiness Review.
- Demolishing the remaining Spent Fuel Pit structure, including the removal of encased debris from the initial closure.
- Demolishing the Inner Vapor Container through a multi-step process: creating a large access opening, removing the steam generator, breaking down the concrete-filled Primary Shield Tank, and removal of shield rings to access the Reactor Pressure Vessel.

## **Safety and Waste Management**

Safety and compliance are core values for the project, resulting in:

- No measurable occupational or public exposure to radiation to date, verified by a robust monitoring program.
- 631 days of operation with no lost-time accidents or injuries.
- 4.9 million pounds of Low-Level Radioactive Waste (144 containers) safely packaged and shipped on a 4,500-mile multimodal journey to a licensed disposal facility in West Texas.

## **Waste Shipping Routes and Proposed Alternatives**

An estimated 100-200 shipments are expected annually through FY28, with 99% being radioactive-exempt waste. Currently, packaged waste leaves Alaska along the following route:

1. Fort Greely to Fairbanks (over the road)
2. Fairbanks to Whittier (Alaska Rail)
3. Whittier to Seattle (barge)
4. Seattle to Texas (majority rail)

The SM-1A team has identified an additional waste route via the Port of Valdez to mitigate weather risks. Valdez would be utilized to ship the Reactor Pressure Vessel should winter weather shut down approved routes, ensuring schedule delivery.

**Connect with the SM-1A team**

Project website: [www.nab.usace.army.mil/SM-1A](http://www.nab.usace.army.mil/SM-1A)  
Stakeholder email list: [CENAB-SM1A@usace.army.mil](mailto:CENAB-SM1A@usace.army.mil)  
Baltimore District social media: [@usacebaltimore](https://twitter.com/usacebaltimore)

