

**ANTARCTIC INFRASTRUCTURE MODERNIZATION
FOR SCIENCE (AIMS)**

\$90,000,000

The Antarctic Infrastructure Modernization for Science construction project was initiated in FY 2019 with an investment of \$103.70 million, followed by \$97.89 million in FY 2020. The FY 2021 Request amount is \$90.0 million, the third year in a multi-year funding profile with a Total Project Cost of \$410.40 million.

**Appropriated and Requested MREFC Funds
for the Antarctic Infrastructure Modernization for Science Project**

(Dollars in Millions)

		FY 2021	FY 2022	FY 2023	FY 2024	Total
FY 2019	FY 2020	Request	Estimate	Estimate	Estimate	Project
\$103.70	\$97.89	\$90.00	\$90.00	\$28.81	-	\$410.40

The AIMS project will replace several major structures at McMurdo Station, Antarctica, one of three permanent stations that comprise the U.S. presence in Antarctica, to meet anticipated science support requirements for the next 35 to 50 years while reducing operations costs. The project will help ensure enduring U.S. leadership and influence in this strategic region. It will also support critical scientific research and capabilities such as nuclear test detection, earthquake monitoring, and real-time weather data collection for global forecasting.

McMurdo Station’s main purpose is to support both near- and deep-field science in Antarctica, including activities at Amundsen-Scott South Pole Station. AIMS will enable faster, more streamlined logistics and science support by co-locating or consolidating field science support, warehousing, skilled trades work, and personnel and administrative support into more operationally and energy efficient facilities. AIMS will also replace outdated lodging facilities, and provide more effective centers for vehicle and equipment operations and emergency operations, as well as upgrade utilities to support these facilities.

Previously appropriated funds have been used to procure equipment and construction material that will be transported to McMurdo Station in early FY 2020 and FY 2021, in preparation for the beginning of major AIMS site construction. Site preparation work started in FY 2019 and will continue in FY 2020 along with backbone utilities installation. FY 2021 funds will be used to begin construction of the Vehicle and Equipment Operations Center (VEOC), the new lodging facility, and the Central Services building. Site preparation and materials procurement will be done for the water tank and the emergency operations center. The AIMS project is currently anticipated to take up to 10 years to complete.

Baseline History

In 2011, the Office of Science and Technology Policy and NSF convened a Blue Ribbon Panel (BRP) to evaluate the U.S. Antarctic Program (USAP) logistical enterprise. The BRP was asked to conduct a review of NSF facilities and operations supporting science in Antarctica and to ensure that the facilities can support the scientific opportunities articulated by an earlier 2011 National Research Council report entitled *Future Science Opportunities in Antarctica and the Southern Ocean*.¹ The BRP report² made numerous recommendations regarding maintaining and enhancing the U.S.’s world-class science program in Antarctica.

¹ www.nap.edu/catalog/13169/future-science-opportunities-in-antarctica-and-the-southern-ocean

² www.nsf.gov/geo/opp/usap_special_review/usap_brp/rpt/index.jsp

Major Research Equipment and Facilities Construction

NSF responded to the BRP report by immediately addressing issues of safety, implementing operational efficiencies that resulted in a rapid return on investment, and developing long-term plans for each of the three year-round U.S. stations: Palmer, Amundsen-Scott South Pole, and McMurdo. The AIMS project is a pivotal component of the McMurdo Station Master Plan with a specific focus on the primary core functions of this critical logistics hub.

The AIMS project seeks to enhance operational support for science by improving operations efficiency, containing operating costs, and enhancing safety. The following major scope elements are targeted to achieve these goals:

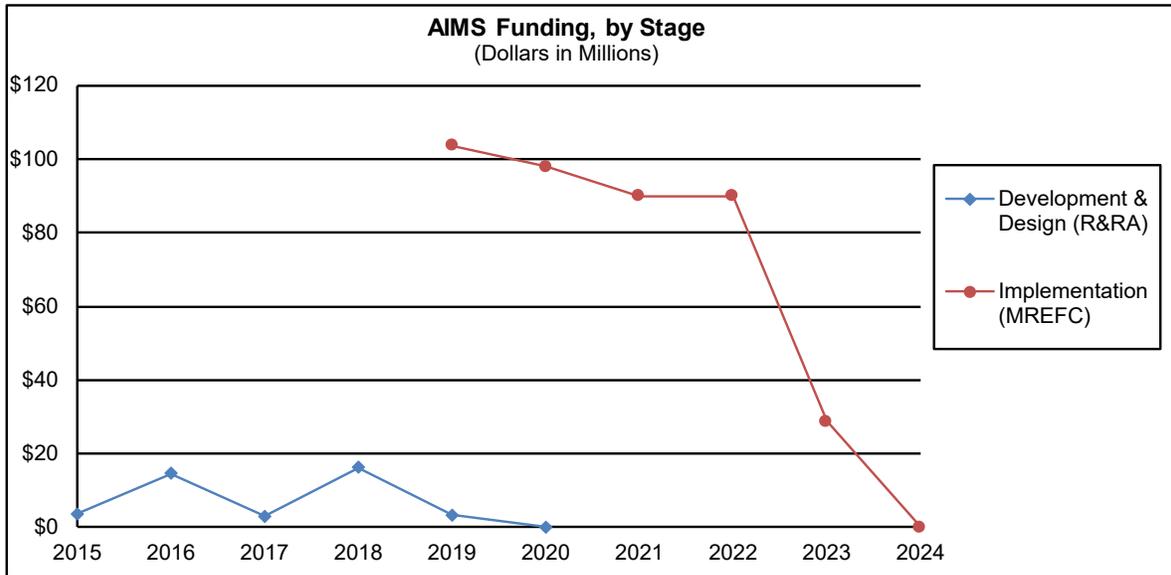
- Construction of a Centralized Services building that replaces and modernizes multiple existing facilities on station including centralized warehousing.
- Construction of an Emergency Operations Center to replace the existing fire station, medical facilities, and fitness and skills development facilities.
- Construction of a consolidated Field Science Support Facility.
- Construction of an Industrial Trades Shop to consolidate existing facilities across the station.
- Construction of a VEOC that facilitates maintenance and repair of both heavy and light equipment ranging from traverse tractors, cranes, loaders, and earth moving equipment to trucks, vans, snowmobiles, and field generators.
- Construction of one new lodging facility to ensure adequate bed space to support near-term needs, including population surges from an influx of construction workers. Importantly, this facility is comprised primarily of single-occupancy rooms recommended by the BRP to promote safety and health. Shared rooms exacerbate sleep disturbance that can arise from widely varying work and travel schedules for the station workforce as well as scientists, and promote the spread of contagious illnesses such as colds and flu.
- Upgrade of utilities distribution networks for fire protection water, domestic water, heating, power, communications, and sanitary sewer.

The Final Design Review was held in October 2018 and the NSB authorized NSF to award a contract for AIMS in February of 2019. The NSB-approved not-to-exceed TPC is \$410.40 million.

Total Funding Requirements for AIMS

(Dollars in Millions)

	Cumulative Prior Years	FY 2019 Actual	FY 2020 Request	FY 2021 Request	ESTIMATES				
					FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<i>R&RA:</i>									
Development & Design	\$37.31	-	-	-	-	-	-	-	-
Subtotal, R&RA	\$37.31	-	-	-	-	-	-	-	-
<i>MREFC:</i>									
Implementation	-	103.70	97.89	90.00	90.00	28.81	-	-	-
Subtotal, MREFC	-	\$103.70	\$97.89	\$90.00	\$90.00	\$28.81	-	-	-
TOTAL REQUIREMENTS	\$37.31	\$103.70	\$97.89	\$90.00	\$90.00	\$28.81	-	-	-



Note: Outyear (FY 2021 through FY 2024) Implementation funding reflects current estimates.

Management and Oversight

AIMS is being accomplished under the Federal Acquisition Regulations (FAR) via an existing contract to Leidos Innovations Corporation as the current Antarctic Support Contractor. OPP works in collaboration with the Division of Acquisition and Cooperative Support (DACCS) to use existing contract mechanisms (e.g., monthly program reviews, earned value reporting, award fee evaluation) to ensure rigorous management and oversight of this work. Appropriate NSF major facility oversight requirements apply, including engagement with the Large Facilities Office (LFO) and use of an Independent Cost Estimate.

Reviews

The Conceptual Design Review (CDR) and Preliminary Design Review (PDR) were passed successfully in FY 2015 and FY 2017, respectively, resulting in an NSB resolution (NSB-2017-20) authorizing NSF to include AIMS in a future budget request.

The Final Design Review (FDR) was conducted in October 2018. The external panel found that the project execution plan was well-developed for the FDR and recommended that the project proceed to the construction stage. They also recommended that NSF attempt to retain all the major science-support capabilities in the original scope, in spite of a cost increase since PDR related to commodity prices and market conditions, in order to realize the long-term benefits to the USAP. An Independent Cost Estimate was also carried out to support NSF’s cost analysis in conjunction with the FDR process.

In addition to daily communications with Leidos’ AIMS project management, NSF conducts a monthly project review. This review covers the monthly project management report produced by Leidos. Also planned are annual Construction Reviews by NSF management, with the first one to take place in May, 2020.

Project Status

Leidos continues to advance the designs with formal intermittent and scheduled design reviews of the different AIMS construction components outlined above, and is completing procurement of long-lead items required to support construction activities.

Cost and Schedule

FY 2021 funds will be used to do site preparation work, procure construction materials, and to begin on-site construction. Construction projects to be initiated will include the core utilities, outside cable plant, and Emergency Operations Center. During FY 2021 construction of the VEOC, lodging facility, and Central Services building will continue. Construction is phased to allow for minimal impact on science support during construction, as well as ensure continuity of operations in the event that subsequent funding is disrupted. Although the actual execution of the entire AIMS project is expected to take up to 10 years, the proposed appropriation profile is shorter in order to reduce procurement risks.

Risks

The two main ongoing risks to the project are the market price uncertainty for labor and materials and the uncertainty in the supply chain—getting appropriately skilled workers and materials from the U.S. to McMurdo Station when needed. NSF and Leidos have implemented a rigorous risk management approach which includes the identification of risks and mitigating actions. NSF holds the risk of cost and schedule increases that are out of control of the contractor, including events such as unpredictably severe weather, icebreaker availability, and macroeconomic changes.

Future Operations Costs

Implementing AIMS will provide a material reduction in the annual cost to maintain and operate McMurdo Station, including an estimated \$1.80 million savings in fuel and \$4.20 million savings in labor and other direct costs in comparison with FY 2018 operating costs. By consolidating the station footprint and using modern energy efficient designs, AIMS will save an estimated 500,000 gallons of fuel per year. Consolidated warehousing and co-located work centers are estimated to reduce the support labor requirement by 80 workers. The new layout will enable improved quality of support and increase the throughput of field science projects.