

**FOCUS ON:**

# Warfighter Support Enhancement

## DLA Energy helps science survive

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One of the coolest logistics missions supported by the Defense Logistics Agency is Operation Deep Freeze. During the Antarctic summer period from November to April, the agency coordinates with other Department of Defense partners to arrange for delivery of fuel and dry cargo to remote locations in Antarctica, including the South Pole, in support of Operation Deep Freeze.

This year, DLA Energy procured the fuel, arranged for transportation and assured the fuel quality when it was issued to the USNS Richard Matthesen from the Motor Oil Hellas refinery in Thessaloniki, Greece, Dec. 12. DLA Energy quality assurance rep-

resentative Matthew Sheers monitored loading of unleaded gasoline, marine gasoil, and two types of aviation turbine fuel, JP5 and AN8. The shipment is slated to arrive in Antarctica in late January.

This annual resupply to U.S. research stations in Antarctica was first established for the 1955-1956 season and represented a build-up of capabilities to allow continued scientific study by the National Science Foundation. The construction mission itself was tasked to the U.S. Navy, which had led expeditions of its own since 1839 to chart the waters, photograph coastlines and map inland features. The Navy had established the Little America I base in 1929 to allow personnel to “winter over” and explore further inland.

With Deep Freeze I, even more permanent camps were created at McMurdo Station and later at Amundsen South Pole Station. These facilities were part of a focused, long-term effort to study the region’s waters, land areas, weather, glacier movements, and wildlife.

A year before Deep Freeze I’s construction, the icebreaker USS Atka searched out potential coastal landings and harbors suitable for tankers and freight vessels. The following Antarctic summer and after, Deep Freeze was officially in motion to help build the permanent base camp at McMurdo Station.

Petroleum needs were met through a combination of packaged products and bulk shipments of arctic grade diesel and

aviation gasoline to construction personnel. A construction battalion center at Davisville, R.I., loaded the USS Wyantdot with more than 840,000 gallons of diesel fuel



Two U.S. Navy Yard Oiler Ships lie frozen into the annual sea-ice at the McMurdo Station construction site in 1956. These were used as fuel storage facilities while the base was being built. National Science Foundation photo by Navy Cmdr. Jim Waldron.

# arctic freeze

in 55-gallon drums bound for Antarctica.

While above-ground storage tanks were being built by U.S. Navy Seabees, static storage was created by allowing two fuel vessels to freeze in the ice off shore. The tanker Nespelen and U.S. Navy oiler YOG-34 supplied the bulk petroleum.

On land, the team constructed a pipeline using flexible hoses to deliver product from the tankers to the new tank farm.

The Deep Freeze fuel resupply missions have continued each year since, executed today by Military Sealift Command and DLA Energy. Two MSC ships – one tanker and one dry cargo ship, each with hulls and machinery specially designed to withstand the harsh environment – and their civilian, contract crews have made this voyage every year since the station was established by the National Science Foundation in 1955. Since the 1980s, MSC's government-owned T-5 tankers have been the tankers of choice for the mission.

For DLA Energy, the remote locations and cold operating conditions of the Antarctic dictate the acquisition strategy. Past suppliers have been based in Greece and Australia. Tankers are the most practical way to deliver bulk fuel economically. Normally, bids are solicited in September for a delivery window of Dec. 1 - Jan. 31, plus a 30-day carry-over period. This represents the optimum time to avoid a literal deep freeze.

DLA Energy procures a variety of petroleum products for McMurdo Station, including midgrade unleaded gasoline, marine gas oil and two grades of kerosene-based aviation turbine fuel—JP5 and AN8. The fuels are additized for use in extreme cold weather conditions. The contract calls for

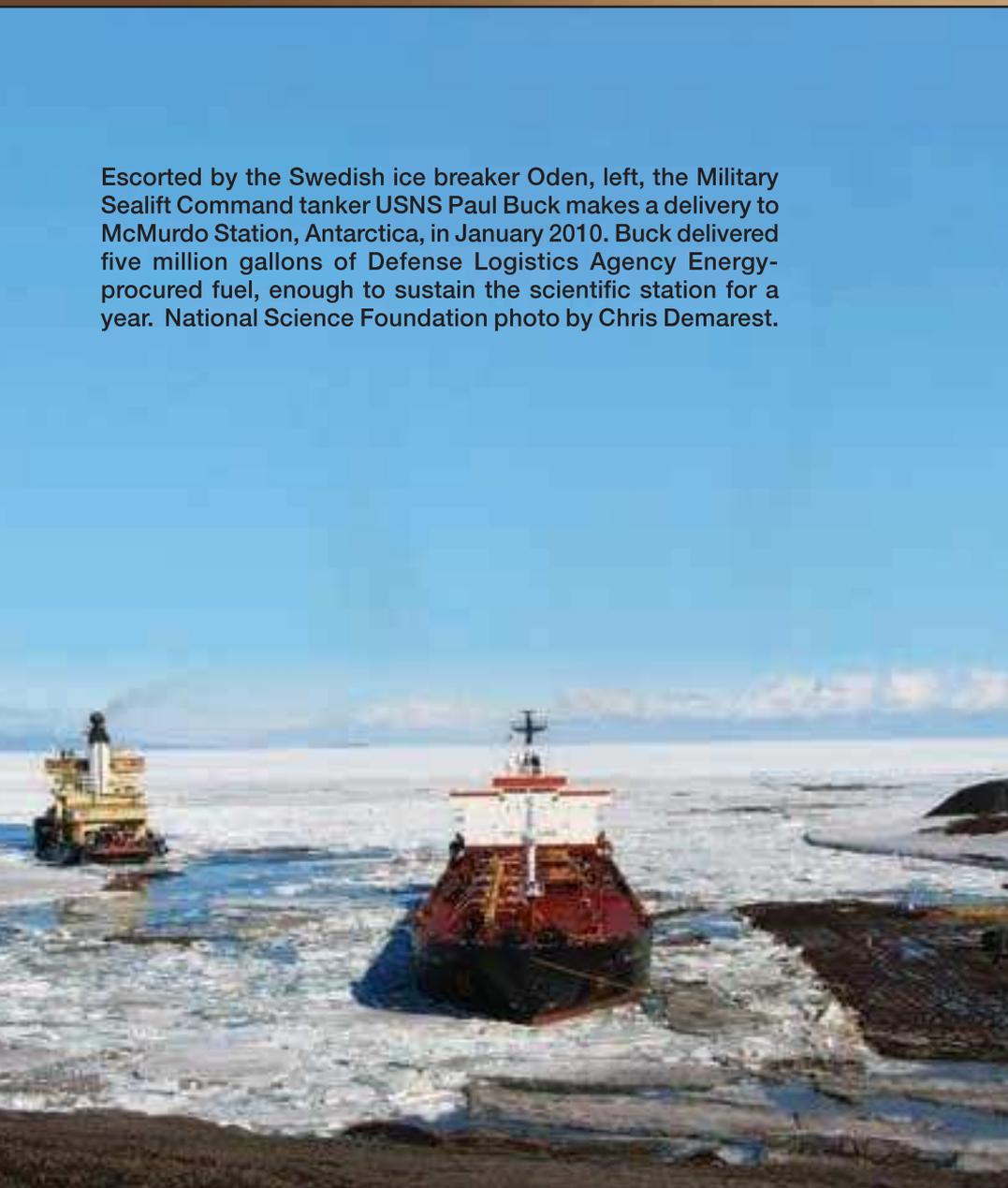
Drummed diesel fuel is loaded at the construction battalion center, Davisville, R.I., into the No. 2 hold deep tanks of the USS Wyandot in 1955. In support of the first Operation Deep Freeze, 840,515 gallons of diesel fuel were transported to the Antarctic, most of it in 55-gallon drums. U.S. Navy historical photo.



Workers construct the One Mile Pump Station at McMurdo Station in 1956. (U.S. Navy historical watercolor by Standish Backus.) "Six miles of unbreakable sea ice at the southern end of McMurdo Sound necessitated establishing a portable pipeline through which aviation gasoline and arctic diesel oil were discharged from the ships to waiting tanks erected by Seabees at one-mile intervals. These camps also doubled as the Antarctic version of the drive-in restaurant, sometimes providing hot coffee for the pipeline patrol and crews of the passing tractor trains. At the ice-edge in the background, offloading cargo, lies the Coast Guard icebreaker Eastwind, next to the tanker Nespelen, and YOG-34," then-Commander Backus said.



Escorted by the Swedish ice breaker Oden, left, the Military Sealift Command tanker USNS Paul Buck makes a delivery to McMurdo Station, Antarctica, in January 2010. Buck delivered five million gallons of Defense Logistics Agency Energy-procured fuel, enough to sustain the scientific station for a year. National Science Foundation photo by Chris Demarest.



Class E5 gasoline, the highest volatility classification. Aviation turbine fuel grade JP5 is familiar to many as U.S. Navy specification aircraft fuel; its high flash point limit (minimum 60 degrees Fahrenheit) makes for safer handling on carriers and other vessels. Additionally, aviation turbine fuel grade AN8 is an actual arctic grade with lower freezing point properties. That ensures product will flow at the low temperatures for aviation and heating purposes. That performance property is crucial for flights into South Pole Station and for activities there during winter no-fly conditions.

For the 2009-10 iteration of Deep Freeze, DLA Energy awarded a contract to BP Australia Pty Ltd Bulwer Island Refinery in Australia for a combined total of more than 5 million gallons of AN8, JP5 and gasoline. Quality Assurance Representative Bill Davenport, from DLA Energy Pacific's Guam office, provided the on-site quality assurance for the free-on-

board-origin cargo. Davenport ensured the product met all specification requirements as it was loaded on MSC's T-5 tanker USNS Paul Buck, and he accepted it for the U.S. Government.

To get from eastern Australia or New Zealand south to McMurdo Station's ice pier, vessels like MSC's tanker USNS Paul Buck and MSC-chartered dry cargo ship MV American Tern must follow a route that can involve some of the worst sea conditions and hazards anywhere. During the one to two week voyage, a vessel endures unpredictably harsh weather and miles of floating ice. While the Antarctic region is considered most accessible in January and February, icebreakers, such as the Swedish vessel Oden used during the last delivery operation, still become necessary 17 miles from the destination. They are necessary to break a channel through the ice shelf. Expert navigation and cooperation between crews of the ice breaker, tanker and freighter are required.

On arrival, MSC personnel flown in advance to McMurdo Station oversee the vessels off-loading. In this case, Cargo Operations Officer Larry Larsson and Navy Cmdr. Scott Shackleton provided support for the fuel and dry cargo delivery, respectively. Shackleton is a distant relative of Sir Ernest Shackleton, an explorer who made many journeys to Antarctica in the early 20<sup>th</sup> Century.

Overall, responsibility for Operation Deep Freeze lies with the U.S. Air Force-led Joint Task Force – Support Forces Antarctica, which oversees both air and sea components. Once the MSC-delivered cargoes arrive at McMurdo Station, the Air Force takes over. The distribution of fuel and supplies to even more remote stations by air and over the snow supports uninterrupted research operations throughout the year, until the next Deep Freeze operation ramps up. 