

On 9 January Edisto broke her rudder stock and had to terminate all icebreaking operations. The next day she departed for Wellington to undergo repairs. On that day the first MSTS supply ship, USNS Private John R. Towle, arrived with supplies for the forces ashore at McMurdo.

Burton Island led Towle up the channel as far as possible to a mooring against the channel edge. Icebreaking resumed and as the work progressed Towle was escorted closer to McMurdo. Five days after arrival she moored alongside at Winter Quarters Bay. After nineteen days of continued around-the-clock icebreaking, all hands were in good spirits, for the Burton Island had brought the first supply ship for Deep Freeze '70 to McMurdo. Before returning to work a twelve hour liberty was enjoyed by the ship's personnel.

On 21 January Towle, having completed discharging her cargo, departed. From that day until the arrival of the USNS Maumee on 31 January, the Burton Island drove a 6.5 mile long inner channel from the receding edge of the fast ice to Hut Point. Two days were spent conducting scientific projects and making necessary engine repairs.

On 31 January, USNS Maumee, a 620-foot T-5 tanker and largest vessel ever to enter Antarctica waters, arrived at the entrance to Winter Quarters Bay. Because of her length and a draft of 30 feet, it was only through skillful piloting and knowledgeable seamanship that the Maumee was able to moor inside the bay. Upon mooring she discharged over seven million gallons of petroleum products. When she was ready for departure, Burton Island was used as a tug to back her out of Winter Quarters Bay and turn her for her outbound course through the channel.

Burton Island then sailed for Cape Hallett to resupply Hallett Station. The resupply was carried out by one helicopter which made 42 trips and by one LCVP. In 4 1/2 hours 3.5 tons of cargo were off-loaded and 8.7 tons back-loaded for McMurdo. The return trip was long and very uncomfortable due to high winds and heavy seas. One favorable outcome was that the action of the seas had broken up a great deal of fast ice at McMurdo and the high winds had carried it out to sea. By the time Burton Island returned, the third supply ship, USNS Wyandot, had already arrived and was discharging her cargo at McMurdo.

All that remained of operations in the Ross Sea was the breakout of the annual ice runway and a current study program. Three NAVOCEANO personnel went aboard Burton Island to assist with the positioning and recovery of current arrays used in the current survey. After three days of alternately setting drogues and arrays and breaking out the ice runway, Burton Island lost her port propeller when the port shaft sheared just aft of the keyway during icebreaking operations. This made it impossible to continue work on the runway and a few days later Burton Island began her long trip home on one shaft. Edisto was recalled from Wellington to complete the breakout of the ice runway and to evacuate Hallett Station. Having stopped at Wellington for eight days of rest and relaxation, Burton Island departed and then arrived in Long Beach on 27 March.