

Beaufort Gyre Exploration Project: Dispatch 8: The engine room

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The *Louis S. St-Laurent* has massive engines, a reinforced hull and heavy-duty steering gear for making her way through the Arctic pack ice. Senior Engineer Joshua McInnis treated some of the scientists to a tour of her impressive engine room. The *Louis* has 5 main engines (8000 HP each), three of which can power the ship at her maximum speed of 18 knots (in ice-free conditions) and the extra two can provide more power in the pack ice. The ship carries up to 3.6 million liters of fuel, and uses around 40 thousand liters per day (up to twice as much in heavy ice conditions). Her powerful hydraulic steering gear, working a single rudder, is significantly more substantial than that of other ships this size, but necessary for maneuvering in ice conditions. Josh told us that the same steering gear is used on the passenger liner *RMS Queen Mary* that is more than 7 times the size of the *Louis*.

Distillation systems on board the ship produce freshwater from ocean water, and can generate about 1200 liters of freshwater per hour. An automated chlorine injection system treats the freshwater, which is tested at least once per week to check chlorine levels throughout the ship. The sewage treatment system works by an aerobic bacterial decomposition process and produces processed clear chlorinated water that is pumped over the side. There are also systems that process oily water from the bilge, skimming and filtering oil from the water. The filtered water is kept in a holding tank for discharge when the ship is out of Arctic waters and sailing home in the open North Atlantic Ocean.

The Engineering Department works in 6 four-hour watches per day; each watch monitors all components of the ship on rounds and from a system control room. The *Louis* has a hydraulics workshop, an impressive machine shop with a small and large lathe (the ship's original from the early 1960s), an electronics workshop and a welding room, all with plenty of well-organized extra stock so the engineers can maintain and support the engine room systems up here in the isolated Arctic.

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