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Irminger Sea: Oct 12
Staying Put by Dallas Murphy

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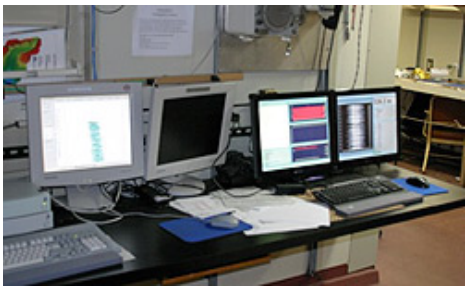

Oct 12 photos by Dan Torres

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We're back out in the middle of the Denmark Strait steaming toward a new study line on a heading of 355 degrees (almost due north). We're in for a blow at about 6:00 pm (1800). Now, about noon, the wind is up to 30 knots, and the seas, though not yet very high, are taking on that ominous streaky look as the wind dissolves their tops into spray. They'll soon get up, however, and even now seas are coming aboard through the "scuppers" and over the starboard rail, since the wind is blowing from 70 degrees, or at almost a right angle to her heading.

Knorr has three 16-cylinder Diesel-electric engines, and one 8-cylinder engine, "three cats and a kitten," as the crew calls them, or "three bigs" and a "small." Steaming now, we're running on two "bigs" at 10 knots, burning about 90 gallons per hour. But when moving only short distances between measurement stations, they use one "big" and a "small" to conserve fuel and protect the machinery.

This is a highly specialized vessel with many adaptations to accommodate the unique requirements of ocean research. She must do routinely what normal ships never do: She must come to a complete stop in the middle of the ocean, and "hold station," often for hours at a time while scientists deploy and retrieve their measuring devices. Knorr has no rudder. Instead, she has two enormous propellers mounted in housings, sort of like household fans, on the stern and one in the bow. Called "thrusters," they can be made to pivot in complete circles, either individually or in unison. So to turn the ship, say, to the right (starboard), you pivot the stern thrusters such that they kick the stern to the left. (Unlike cars, all ships turn by the stern.) By pivoting the bow thruster, you can push the bow in one direction or another, but in normal steaming mode, the bow thruster is retracted up into her hull. When docking or un-docking, the thrusters can work in unison to walk the ship sideways. No normal ship can do that.

Dr. Bob has chosen about 200 "positions" where he wants to measure, among other things, water temperature and salinity from near the surface to near the bottom, a "full-depth profile," in the parlance. At each position, Knorr must be brought to a complete stop, while scientists and technicians lower and retrieve, for instance, the CTD. (Look around the website, you'll find photos of the CTD in action.) To hold station while stopped—that's what the thrusters were designed to accomplish.

Picture the problem: The wind is blowing from one direction; the current is setting in the opposite direction. To keep her stationary you have to balance the forces pressing on her by counteracting them with the thrusters, one pivoted this way the other one in the opposing direction.

The new computer-based Dynamic Positioning System (DPS) has made life easier for the bridge officers and position holding more precise by doing some of the work automatically. Mounted on a console on the bridge, it looks like a big video game complete with a screen, trackball, and joystick. I knew about the DPS when I came aboard, but I thought you just put the ship where you wanted her, then pressed a button, and there she stayed. To some extent that's true; the system will keep her where you tell it to. But here's where seamanship enters the picture:

The CTD, a package of instruments and water-sampling bottles weighing about a ton, is lowered on wire using a winch and boom. Say the package is at depth and it encounters one of those deep currents we've been discussing. Say the current shoves the package back toward the ship or the wind happens to shift. Now the wire is rubbing dangerously against the hull. The DPS doesn't know that. So you have to override the system and move the ship away from the wire. This requires skill and experience, as I learned firsthand yesterday when Derek and the skipper tried to teach me to "keep the wire vertical" in flat seas. I can only imagine how tricky it is when the wind gets up, as now, to around 35 knots.

We'll talk more about her unique adaptations, but let's mention just one more. Knorr is 40 years old, and as technology advanced and her work became more varied, WHOI officials decided in 1993 that she was too small. So what did they do? They sent her to a shipyard in Louisiana where she was cut in half! Then they added about 35 feet of deck and houses to bring her to her present length and capability.

Danmarkstr?de-ip qaqqaa pingaarutilik by Nick M?ller

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