

The Knowledge Bank at The Ohio State University

Ohio State Engineer

Title:	The Heart of the Ship
Creators:	Bangert, Charles, Jr.
Issue Date:	Dec-1939
Publisher:	Ohio State University, College of Engineering
Citation:	Ohio State Engineer, vol. 23, no. 2 (December, 1939), 9-10.
URI:	http://hdl.handle.net/1811/35660
Appears in Collections:	Ohio State Engineer: Volume 23, no. 2 (December, 1939)

The Heart of the Ship

By Charles Bangert, Jr.

This article is based on a series of statements made by Comdr. Reuben R. Smith.

THE engineer finds his concept of beauty in the whirring of the ship's turbines, and the chugging of pumps.

From the composition of the sound he hears, an experienced engineer can stand far above the operating platform and tell within a knot of speed what the engines are making.

Each speed has a different tempo. When the ship is loafing along at ten knots for instance, the pumps are doing a lazy stroke and ending with a soft thump at each end. The turbines are so quiet you can hardly hear them. As the speed increases, you can tell it by the faster pump beats, the drum-like sound of the whirring turbines, the heavy chugging of the mighty air pumps and the whining song of the smaller turbines. After a little experience you know at once which pump is operating too fast or too slowly, and the officer on watch is not a little surprised when you tell him about it as you reach the floor plates.

The first hour after getting underway is the hardest. Maybe the ship is fighting a head wind or is being helped by a following sea. It makes a lot of difference. If you are bucking the weather, everything has to work a little harder to make the required engine revolutions, and the gauge readings that you used on the last trip for the same speed are too low. They must be boosted up. Or maybe the ship has been lying at anchor for a week and the oil in the tanks is cold.

If a piece of machinery has been overhauled, it may give a little trouble until it is adjusted.

But finally everything is set. The burners at the boilers have been adjusted so that they are generating the right amount of steam and the pressure on the main steam line is steady. The big salt water circulators are running at the right speed to condense the steam back to water. If they run too fast, the water is over-cooled, and that is wasteful because the water must go back to the boilers and require additional fuel to heat it. Once things are adjusted, the going is easy and it is just a question of watching the hundreds of gauges and thermometers.

There is satisfaction in watching just the right wisp of steam floating over the steam sealed ends of the big turbines or looking into the illuminated oil wells, where the lubricating oil discharges from the bearings for inspection. When the discharge is too clear, the oil has not been working, but if it's cloudy like a well whipped salad oil you know that the bearings have been properly lubricated. If the oil is streaky with water something is amiss and you search for trouble.

There are thermometers along the different stages of the turbines, and while you believe them, you touch the inspection plates with the palm of your open hand as you pass along. The last one is always cold, or it should be, because at that point the steam is only seventy degrees Fahrenheit. It is actually cooler in-

side the turbine at this stage than it is outside in the engine room!

Strange as it may seem, no one has ever seen steam. What you really see of course, is the condensed vapor. It is amazing how much "steam" can come from even the smallest steam pipe. If a little pipe to a heating system breaks, the entire compartment is at once a blind spot. The noise is terrifying and you think that the main steam line has carried away. You never know what has happened and you never know what valve to twist close. The problem is usually settled by cutting out the entire section from a master valve. One of the compensating things about casualties is to find out how really splendid the men act during an emergency. There is always one fellow from whom you expected least who is the whole show.

The firemen constantly watch a battery of gauges. Should the steam drop, fuel pressures must go up or more burners cut in. If a shift is made to a cooler oil tank the heater must have more steam. Each oil burner with a hole at its tip no bigger than the point of a pencil is watched for streaks of black. If a burner shows black streaks, another is quickly cut in and the dirty one is shifted before the bridge calls down to tell them that they are making smoke. There is no fuss or excitement here.

A bell rings from the engine room to tell them that when the annunciator is rung up the speed will be increased five knots. That means that the whole set-up must be changed. Blowers are speeded up, water feed pumps stroke faster, more burners are cut in and the oil pressure is boosted. Everything is then closely adjusted for the new speed. To make things

simpler, some of the firerooms keep on as they are, all the changes being made in one fireroom designated as the control fireroom.

Sometimes, particularly on destroyers where the unexpected is always expected and where speed changes are frequent, a signal will suddenly come for a full stop. And the engine room stops. If there is time to ring "Stop" to the firerooms, they will, but if there is no time, they will have to look out for themselves. If they are snappy enough they can get things under control, but if they are not, the safety valves blow with a mighty roar. An admiral once said that the blowing of safety valves was a noisy exhibition of bad management in the fireroom.

When the ship is steaming along and all is serene below, there may suddenly come a signal, "Full Speed Astern".

In the engine room there is a mad spinning closed of the ahead throttle wheels, and without waiting for the shafts to stop, the astern throttles are opened wide. Everyone prays that the turbine blading will not be carried away by the shock of reversal.

In the firerooms there are a few seconds when the burners must be cut off as the throttles are closed; then immediately there is a demand for all the steam that can be furnished. This signal always means an emergency on the bridge, and while the engines are backing there are tense moments below. Everyone expects a terrific impact from ahead or what is worse—to see the bow of some ship come nosing into the fireroom or engine room with a terrific rending of plates. When it does happen it means many casualties, and it has happened.