PART II

OPERATION BLACKCURRANT

by

CAPTAIN (E) L. A. TAYLOR, C.B.E., R.N.

At 2000 on 7th January, a message was received from the Admiralty directing Flag Officer, Submarines, to supply power to the Royal Dockyards by H.M. Submarines. Such of the Staff that were ashore were recalled and by 2335 all the dispositions had been planned, and instructions had been sent to the various flotillas, together with a general recall.

Because of the security grading an open broadcast recall could not be used. Nevertheless, by messenger and telephone, what was virtually a test mobilization worked admirably ; there were no absentees and by dawn on the 8th January the first submarines having fuelled, and taken onboard additional spare gear and charging leads, had started to move to their allotted station. The first submarine at Portsmouth was connected on the 9th, that at Chatham and Sheerness on the 10th, Devonport on the 15th, and Portland on the 16th January.

By 0800 on 18th January, the situation was as follows :—

	Submarines allocated	*Submarines actually employed*
Chatham	3	3
Sheerness	1	1
Portsmouth	10	7
Devonport	9	5
Portland	1	1
	24	17

The submarines were allocated from those in full commission or in reserve, and that more could not be taken from reserve was due to shortage of manpower. By absorbing the whole of the spare crews, employing submarine-experienced ratings from the repair parties, " bleeding " the submarines in hand for refit, and by some postponement of foreign service leave, it was just possible to scrape together sufficient for a " four " watch bill.

The remaining submarines were employed on basic and A/S training and certain special trials, while the refit programme was not interfered with.

By 0800 on 25th January, after eight full days' operation, a summary showed the following disappointing position :—

		Chatham	Sheerness	Portsmouth	Devonport	Portland
1	Submarines allocated Submarines employed	3 3	1 1	10 6·5	9 5·4	1 1
2	Available Output in kilowatts. (One engine per submarine) ...	1,300	450	4,700	4,200	400
	Actual Average Output in kilowatts over period of 8 days	834	130	1,105	962	265
3	Actual Total Output... / Available Output ...	64%	29%	24%	23%	66%

Actual total output over period	636,464 kwhr.
Available output over period	2,111,600 kwhr.
Percentage actually used	30%
Amount of coal required to produce 1 kilowatt-hour	2 lb. (approx.)

Total coal saved in eight days = 636,464 × 2 lb. = 568 tons.

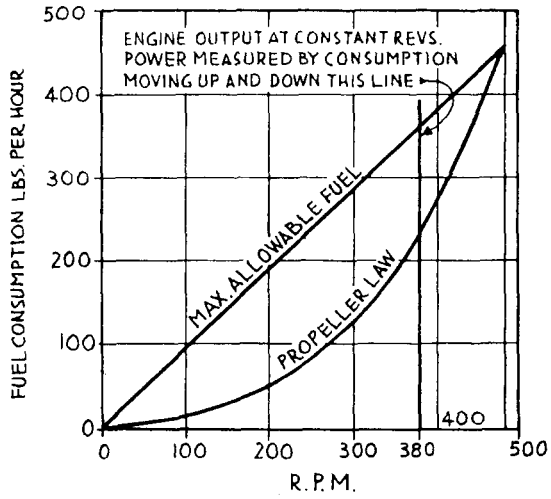

FIG. 1

The situation was in part comparable to the apocryphal story of the marine biologist who wishing to study the reproductive habits of electric eels, placed a couple in a tank in the aquarium only to find the two creatures lay supine, glaring at each other from the remotest opposite corners. It was subsequently established that the lady eel was A.C. while the prospective husband was D.C. In our case the submarines' supply was 220 volts D.C. while the Yards required 440 volts A.C. and D.C.

The original employment of the submarines was that of placing them alongside or near H.M. Ships in hand for refit, and supplying these singly or in groups. This, in turn, prevented the submarines working together, throwing an additional strain on watchkeeping and the boat traffic which collected crews at the change of watches for meals, etc., while the foot and bicycle mileage covered by the visiting duty officers became formidable.

To avoid the evils attending the running of these relatively highly rated engines for long periods on very light loads, an endeavour was made to run

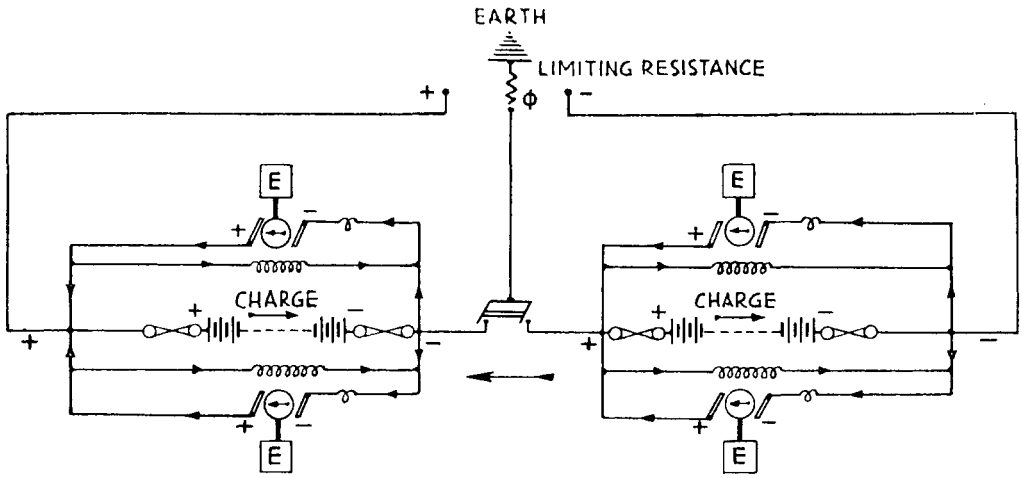

FIG. 2

them at such speed as would allow full electrical load to be supplied up to a maximum of 80% B.M.E.P. In so doing, instead of the normal consumption curves being used, the engine output was estimated by the adjoining specimen chart (*Fig.* 1).

However, due to the very " fluctuating " load required by ships refitting, the full output that might have been supplied by the submarines could never be taken.

To overcome this, a scheme was worked out by the Electrical Department at Devonport and the 3rd Submarine Flotilla placing two submarines in series to supply 440 volts D.C. to a dockyard sub-station.

The circuit diagram is shown in *Fig.* 2.

At first sight this arrangement appeared open to objections in that the engines were not governed, calling for very high standards of watchkeeping, and the circuit prevented the normal routine testing for " earths " in the submarine.

However, after extensive trials, and relying on the circuit breakers in the yard, the main fuses in the submarine, plus the " flywheel " effect of the batteries, it was decided to try this method on load—with entirely satisfactory results. This decision was weighted by the absurdity of seeing one of the receiving ships being obliged to work her electric turrets so as to provide sufficient load in order to avoid damage to the submarine engines.

By degrees, a few adjustments in allocation were made so that certain submarines could re-commence important outstanding trials and experiments which had been interrupted by the operation ; a reduced A/S training programme also became possible. The operation continued monotonously without major incident until 31st March, 1947, when time just permitted the majority of the submarines to return to their Home Ports to give seasonal leave.

As might be expected there were numerous " incidents " among which some of the highlights may be quoted. On the submarine side, one submarine demonstrated the already well-learned lesson that no engine will run for long without a lubricant. A fracture of the shaft driving the engine lubricating oil pump and the consequent complete failure of supply was not noticed, due to indifferent watchkeeping, until serious damage occurred requiring some three to four months to make good by depot and ship's staff.

The time selected to connect H.M.S. *Dolphin* to a separate submarine was just after dusk and Flag Officer, Submarines, " Operations room " was lit by a solitary candle, in which had been stuck a replica of the National Coal Board Flag.

On the Dockyard side a quantity of rubber hose was cut up and supplied as main connecting leads, but even the ubiquitous submarine " amp " was reluctant to pass down this.

Except for the one major breakdown, the performance of the equipment, both mechanical and electrical, was excellent throughout as also was the standard of watchkeeping, observing the comparatively raw and inexperienced post-war complements. One *S* Class, through difficulties on both engines of her sister ship, remained continuously on load for 28 days.

The submarines were taken off load in rotation for maintenance and periodical discharge of batteries, and though there were the expected minor defects involving considerable overtime during silent hours and over the week-ends, the volume of work never swamped the ships' staffs, and this speaks well for the modern submarine engine. Throughout there was always a reserve of power which could not be used.

A weekly examination of all keeps and fastenings was more than justified, in that it revealed visually other embryo defects which were not evident whilst running.

The 5th Flotilla (*Dolphin*) maintained the submarines at Portsmouth, Chatham and Sheerness, 7th Flotilla (*Maidstone*) the submarine at Portland, and 3rd Flotilla (*Forth*), which was brought down from its normal station on the Clyde, the submarines at Devonport.

A summary of the operation is appended below in tabular form for the benefit of those who delight in statistics, and it may also be of interest to the economist.

Period	No. of S/Ms employed by Class	Total Engine Hours	Total Diesel Fuel Expended (Tons)	Total Lub. Oil Expended (Tons)	Units of Electricity Supplied	Estimated Coal Saved (Tons)
First Month	*S.* 9 *T.* 11 *A.* 3	4,710	323·8	12·8	1,018,661	760
Second Month	*S.* 10 *T.* 12 *A.* 3	10,023	843·8	26·8	2,731,241	2,974
Third Month	*S.* 8 *T.* 10 *A.* 2	14,250	1,221·9	36·5	3,813,675	4,156
GRAND TOTALS		28,983	2,389·5	76·1	7,563,577	7,890