



*Enough current is generated in the engine-room to supply the needs of a small town.*

The first five vessels to be fitted with turbo-electric machinery were built during the Great War to special Admiralty "hush-hush" order; the "Rangatira" was only the nineteenth. Simply stated, her motive power is provided by six boilers heated by oil fuel supplying steam to two separate turbo alternators, each fitted with condensing plant and auxiliaries. The alternators drive two electric generators, which in turn develop the current to drive two double-unit synchronous motors, each of which is coupled direct to one of the two propeller shafts. Isolators, also, are provided to enable each alternator to be connected to its respective motor or either of the alternators to both propeller motors. Provision is also made for one half unit of each motor to be isolated when the ship is running only on one turbo alternator set.

The explanation of the machinery given here is very simple, but it would not be helped, probably, by a visit to the "works": in addition to the heat, there are hundreds of controls,

levers, and switches, there are instrument panels, and the whole place bristles with warning devices which sound bells or show red lights as soon as anything is wrong. For instance, take the pumps: there are a ballast pump, bilge pumps, sanitary pumps, an auxiliary bilge pump, fresh-water pumps, oil-transfer pumps, an oil-bilge-well pump, and a distilled-water pump—thirteen of them, all electrically driven. The engineers talk of volts and kilowatts, ratings, phases, and pulses, balancer booster sets and excitation purposes, r.p.m.s, s.h.p.s, and B.T.H.s. The only thing we had no doubt about was that everything went; the only thing we had doubt about was how.

With the propelling and auxiliary machinery the emphasis is on safety; each unit is duplicated, and should there be a breakdown in one section there can be practically instantaneous switch-over to an alternative unit. It is not hard to believe the claim that a turbo-electrically propelled vessel has never been known to have a complete mechanical breakdown.