

BEGIN AT THE BEGINNING

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When investigating unusual defects or falling off in the efficiency of a plant it is so often the case that somebody picks on what appears to be the "most likely cause of the trouble" and before very long the problem as a whole is forgotten and an efficient piece of mechanism "the most likely cause of the trouble" is the subject of searching investigation to the exclusion of everything else thus adding to the problem a "problem" which is not a problem.

These conditions often lead to a tremendous amount of work, mostly repetition work, in search of a defect that doesn't exist, and therefore it is considered essential when unusual conditions arise to start from the beginning with meticulous attention to detail.

A few interesting examples illustrating this point are as follows :—

Destroyer Turbo Generator

One of the turbo generators of the Polish Destroyer *Piorun* (ex *Narissa*) had been unsatisfactory ever since the new construction acceptance trials.

This dynamo when started up from cold would take the full designed load for about an hour and then one of the two control valves would cut out and thereafter the machine would only generate about $\frac{1}{2}$ load.

Ship's staff under the supervision of various Flotilla Officers had stripped the control valve mechanism many times and had even opened up the turbine in an effort to trace the cause of the trouble. It was eventually decided that a re-design of the governor and control valve mechanism was necessary and instructions were given accordingly.

Before the work was undertaken, however, permission was obtained to run the dynamo for the benefit of the re-designers. Thermometers were installed where possible throughout the system and ten minute records of all pressures and temperatures were taken during the course of running.

Very little analysis of these records was necessary to establish the fact that the lubricating oil was not being cooled. The ship's staff were told to remove the oil cooler doors for examination of the water side, which was carried out with a certain amount of reluctance as this factor was considered to be a red herring. The water side of the cooler was completely choked with leaves.

Two hours after the commencement of the running for record purposes the dynamo was back on the board and as subsequent running proved, capable of taking full continuous load, and that was the end of 3 months of trials and tribulations.

During the course of a subsequent glass of vodka it transpired that shortly after completion the ship sailed down the Clyde and whilst the ship's company admired the autumn scenery the ship must have taken on board a load of leaves.

Being a new ship nobody gave a thought to the possibility of a dirty cooler and therefore the lubricating oil temperature had never been taken. The hot oil with a consequential drop in pressure would not permit the oil operated control valves to function correctly.

Destroyer Steering Gear.

During the early period of the war H.M.S. *Tartar* had trouble with the steering gear. This gear failed on several occasions when the ship turned under full helm at or near Full speed. One of the two Williams Janny pumps was suspect but frequent stripping by ship's staff failed to locate the defect. It was assumed that pressure was leaking to the case either past the plungers or across the face joints.

As it was evident that the defect was unusual the drawing was obtained and spread out so that every single item connected with the pump could be checked. The first nut and associated washers and valve removed located the defect. Two dish washers had been assembled snugged into each other instead of opposed as shown on the drawing.

Further examination and subsequent trials proved that this was the only defect, which may not have been discovered for some time if a drawing had not been available.

Merchant Service Diesel Generator

During the course of a monotonous slow convoy trip from Gibraltar to U.K. during the war, the Chief of the ship was questioned about his ship and it transpired that the diesel generators were hopeless and for that reason alone the ship was going back for refit with high hopes of getting new diesel generators. Evidently after 72 hours running there was a terrific amount of blow past and the ship's staff put it down to the liners bulging due to weakness. When questioned about the extent of "bulging" it was very evident that it was an assumption not based on facts.

An offer of assistance was accepted and the stripping of a generator, which had just failed, commenced. All liners were gauged by micrometer and there was no undue wear, and no sign of bulging which disproved the ship's staff theory.

Examination of the pistons, however, shewed that all the piston rings were completely gummed up in their grooves with a liberal amount of carbon, giving perfect blow past conditions.

Further enquiries revealed the fact that local authorities had insisted on the ship's officers taking Admiralty I.C.E. lubricating oil instead of the oil recommended by the contractors for the particular make of engine.

Subsequent correspondence proved that this ship had been a lame duck for many months because unsuitable lubricating oil was innocently used.

Submarine Steering Gear

Occasional erratic operation of the steering gear in an A class submarine since acceptance trials came to a head when failure occurred whilst entering Portland Breakwater and serious damage was narrowly averted.

A great deal of effort had been expended on each occasion of a breakdown to right the trouble, but it transpired that all suspicion and activity had been centred on the perfectly innocent transmitter and receiver.

The defect was evidently unusual by virtue of its erratic nature so a start was made with a critical examination of the whole system. The transmitter was a deck above the receiver and it was found that the pipes between these two had been neatly arranged to fit in with the other machinery present with a result that the pipe-runs were in a series of camels' humps. It appeared most unlikely that all the air could be cleared from these pipes during "pumping round" operations and therefore direct but not very neat runs of piping were

installed obviating ups and downs. This proved to be the answer to the problem.

All Ships

How many times have boilers been tested for suspect leaking tubes when the cause of a high water consumption has been due to an accumulation of minor steam leaks from air cocks, glands and joints. How many times have condensers been blamed for a falling off in efficiency and in some cases inability to develop full power, when in actual fact inefficient auxiliaries have been the cause of the trouble, which could have been bowled out by attention to detail of fuel expenditures, amount of closed exhaust, and pressures and temperatures in the cycle, under various steaming conditions.

To begin at the beginning means an initial delay, but when faced with unusual circumstances it usually pays heavy dividends.