

Case study: Production availability of sea water cooling facilities
 Client: Not disclosed
 Location: Singapore
 Time: 2017



Problem

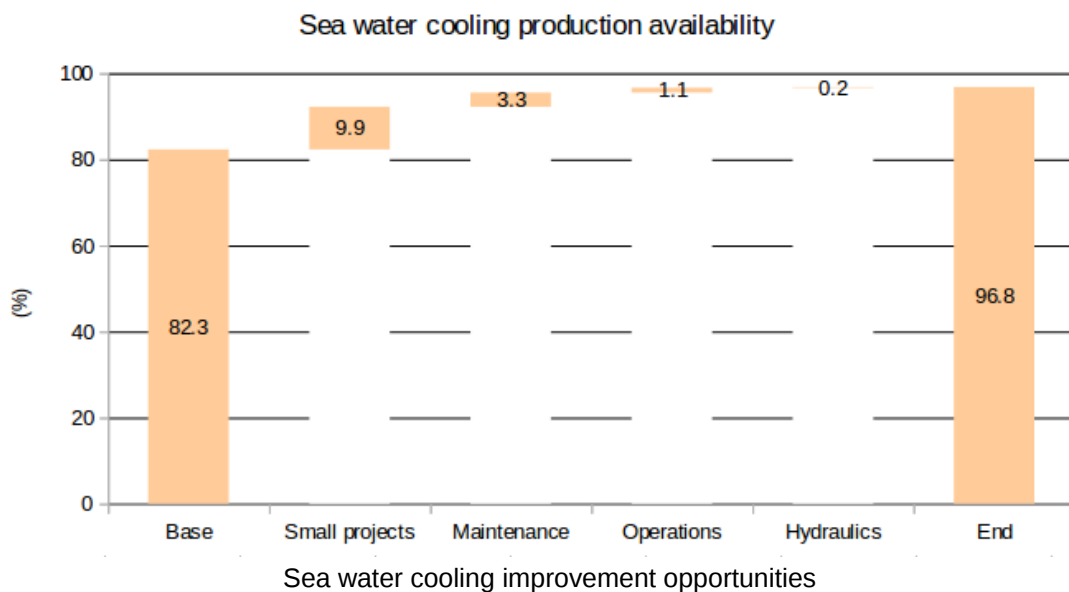
The sea water cooling system is one of the critical utilities that support refinery production but it has experienced many failures over the years, with a production availability of only 82.3%. Due to the many failures, it was difficult to tell the trees from the forest.

SecuoS approach

A production availability study has been carried out and an ARTIS model has been developed to identify where the best value improvements can increase the performance of the sea water cooling system.

Outcome

The pumping stations experience difficulties with a high number of pump failures on the steam turbine driven pumps. Various issues have been identified that contribute to the high failure rates. Among these are the aged pump designs, the poor operability of the Hypo Chloride system that is required to control marine growth on the inlet screens, the valves and other equipment. The steam supply is of major concern as the steam quality is below requirements, leading to water drop out in the turbines, causing rotor failures. The relative value of the identified improvement options is shown below.



The ARTIS model was used to prioritise the many improvement opportunities to increase the current production availability from the base 82% to almost 97%. These improvements are expected to result in the use of fewer pumps, due to their reduced downtime, better utilisation of the pumps and increased cooling water circulation in the system. Some improvement options may require root cause analysis to identify the most effective defect elimination alternatives.

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