Our client, an FPSO operator in West Africa, had been struggling with problems plaguing the Gas Turbine Generators (GTG) on its FPSO for several years.

Problems included process upsets cascading down to gas turbine generators trips and total power loss, power system instability causing frequent black-outs, consistent failure to restart the machines on diesel fuel, frequent gas turbine trips due to unreliable auxiliaries, under-performance of the gas turbines, excessive corrective maintenance.

Availability of the gas turbines was on average about 80%, versus an expected 98%, and the power generation system was in the top-ten of the plant’s worst bad actors, causing significant production risks.
MACH10’s task was to understand the root cause of the problems affecting the GTGs, identify solutions, and plan their implementation. MACH10’s analysis began with a workshop involving various discipline specialists from the client’s engineering, operations, and maintenance teams that helped listing and understanding the issues. An on-site survey was then conducted to collect the required evidence and the issues were analysed by the MACH10 team.

The analysis identified: a fundamental error in the gas turbines operating philosophy that caused the power system instability, a design error in the diesel piping, several maintenance issues on the gas turbine auxiliaries and a number of bad actors.

MACH10 identified, planned, and implemented a change in the operating philosophy of the power system to make it stable, optimized maintenance routines and overhauls for the new philosophy, decoupled process- and GTG-trips, installed a bypass line on the diesel system to correct its design issues, RCA’ed and solved the main bad actors and improved the gas turbines’ performance.

The implementation of solutions was supported and coordinated by two MACH10 consultants, who were deployed to the client’s HQ for one year, while the client was recruiting internal resources for the handover of the execution of the GTGs Performance Improvement Plan.

After MACH10’s involvement, the average GTG’s availability jumped from 81% to over 95%, while power system instability and black-start issues have been completely eliminated and now the power generation system is not in the FPSO’s bad actors list.