OFFSHORE FLARING REDUCTION – A CASE HISTORY

CURRENT RELEVANCE

This case history is from a period before Herculean Climate Solutions was formed and is about a project for an oil company. However, the project reduced CO_2 emissions by almost **1 million tonnes over 15 years by stopping unnecessary hydrocarbon gas flaring.**

This project demonstrates key skills of the HCS team, including the ability to dig deep into seemingly intractable problems to establish root causes; to identify optimal solutions for the circumstances, focussing on the easiest wins first; and the ability to work with a diverse group of people with competing agendas.

All these qualities are needed to solve the climate crisis.

CLIENT

Oil Major, North Sea, UK, operating a 100,000 barrel/day floating oil production facility. This is a case history of a client of Jerry Joynson prior to joining Herculean Climate Solutions.

BACKGROUND AND CHALLENGE

Oil production required injection water and lift gas, both electrically driven using power from the GT generators. The GT's were dependent on gas from the compressors – a critical interdependency. The compressors had been shutting down every 2 to 3 days over a period of 18 months due to motor overcurrent. The GT generators were unable to switch to diesel fast enough and would shut down following the compressor shutdowns, causing the water injection pumps to stop. Oil production was then shut down to comply with flaring consent limits. Average production was down by 50% causing a huge revenue shortfall of around $350 million per annum. The operations team was unable to get the GT's to switch seamlessly from gas to diesel and were unable get the compressor sot run reliably to ensure a reliable fuel gas supply to the GT's. The field partners were exerting pressure to solve the problem quickly. Efforts were being hampered by a recent merger, diverting effort from addressing the problem in a timely manner.

The new operations manager invited an outside consultant, Jerry Joynson, to manage a team of client engineers to resolve the compressor problems.

RESOLUTION

Superficially the problem appeared to be purely technical. However, the pressure from field partners, internal politics and construction project-execution procurement choices were at the heart of the issue. A new (at that time) remote data access system had been installed. Gaining access required approvals and software to be installed pushing the start of the analysis back 3 months. There was also no opportunity to visit the site. The project P&ID's being used by operations interfaced poorly with the compressor vendor P&ID's supplied with turnkey compressor packages, which included dedicated PLC's that were not fully integrated into the remote data access system. Neither the vendor P&ID's nor the main system P&ID's to which they interfaced described the control system correctly and the teams onshore and offshore could therefore not determine what was wrong or take corrective action using the P&ID's.

Lengthy analysis of the data followed by detailed discussions with the compressor vendor ruled out problems with the electrical system, motor drives and compressors. The P&ID's were redrawn with the correct control system architecture, and four months from the project start, a single controller set point error was identified, proving that major plant modifications would not be required.

The consultant visited the production facility with the compressor vendor, and the vendor corrected the controller setpoint. Having corrected the fault, the compressors continued to operate for the next 6 months without shutdowns; the gas turbines then also continued to operate. The GT supplier was then able to fix the changeover valve controller allowing successful future fuel changeovers.

CLIENT FEEDBACK

The client management team was extremely pleased with the outcome and offered the consultant a position as the Process Technical Authority, which he accepted. The field partners also expressed their sincere appreciation.