

CASE STUDY

Cooling Water Treatment - LNG



Customer: LNG Producer
Location: Oman
Process System: Cooling Water Loop

APPLICATION: Treatment of Tempered Cooling Water in a Closed Loop for LNG Production

OBJECTIVES OF THE TREATMENT

- To reduce the overall oil concentration in 70 m³ total volume cooling water loop to less than 5 ppm
- To treat a side stream of the full flow continuously, giving constant improvement to cooling loop water quality
- To recover skim oil for laboratory identification of point sources oil leaks within the loop

DATA & CONCLUSIONS

- The cooling loop was contaminated with seal and lube oil at an oil concentration of 1,500 ppm
- Water continuously discharged from MYCELX System at less than 5 ppm oil-in-water
- Despite ongoing oil leaks within the loop, MYCELX discharged at less than 3 ppm oil-in-water for 12 continuous days before achieving final levels of less than 4 ppm oil-in-water within the cooling loop

FLOW RATE:

- Design for average 5 m³/hr – 10 m³/hr

CONTACT / REFERENCE: Upon request

MYCELX DELIVERED:

99% Oil Removal

OIW concentration <4ppm

Pin point source of oil leaks

Training for site team



CHALLENGE

The LNG facility in Oman was facing oil leaks into several of their tempered cooling water loops. Controlling the surface fouling tendencies of contaminants in the loops is crucial to maintaining efficient operations of the associated process heat exchanger units. The particular loop trialled had experienced severe oil loading for 18 months despite the presence of a de-oiler system within the loop and previous attempts to provide a solution by other traditional technology providers. Excessive fouling and associated issues caused by the high oil loading resulted in the plant production being reduced.

To address the above issues, the customer sought to trial the mobile MYCELX equipment on the most contaminated loop as a proof-of-concept. Once proven, this technology is easily being moved around the plant to other cooling loops for treatment of existing or future oil contamination. The customer's main requirements for the system were easy and quick mobilization and operation by plant personnel, fast completion of the work, avoidance of any excessive burden on operations personnel, and minimal operational expense.

SOLUTION

MYCELX provided a customized multi-stage Polisher treatment solution driven by patented technologies for an optimized solution.

The MYCELX Polisher system removed emulsified oils and fine solids to meet effluent requirements using a gradient approach with multiple different types of filters. During the trial, the different configurations of filters were tested by MYCELX so that an optimal design could be provided to the customer for future cooling water contaminations. MYCELX was then able to successfully trial the technology in a timely fashion with a final report that would allow the customer to reduce filter and time requirements by 40% or more in the future.

Daily analysis of outlet water samples by the customer's lab was used to generate reports for both solids and oil removal.

The MYCELX solution provided a robust and mobile system capable of handling inlet oil concentrations greater than 1,500 ppm with unique filter configurations to address conditions in real time. MYCELX solution is also capable of handling higher flow-rates.

An additional advantage of the MYCELX was the ability to extract skim oil which could be used by the customer to identify the point source of oil leaks, thus significantly reducing the time required for the customer to identify and fix existing and future leaks.

IMPACT

The MYCELX oil removal solution delivered enormous benefits by removing free, dispersed and emulsified oils with a single mobile system. Benefits include:

- **99% oil removal** within first 9 days of operation
- **12 days of continuous discharge <3ppm oil-in-water** despite ongoing oil leaks into the cooling loop
- Reduction of cooling loop oil-in-water concentration from 1,500 ppm to **4 ppm**
- 50% of oil volume removed by skimming, which provided the customer with the option to test recovered oil to **determine type and point source of oil leak**
- An **optimal filter configuration** for future cleaning of cooling water loops, dependent upon level of oil contamination in the loop and final desired loop concentration
- **Complete training of the operations personnel** at the customer site, allowing the customer to operate the system as required for emergency oil removal

