

Case Study 1A - Chemical Injection -Demulsifier

Background

A client contacted Jorin for assistance in optimising the performance of their demulsifier. The client wanted to improve process separation by either optimising the dosage rates or changing the location of the chemical injection point.

Aim

The purpose of this exercise was to improve upstream process separation by trialling both an alternative injection point and an increase in the demulsifier dosage rate.

Results

The site data was primarily collected using Jorin's mobile ViPA technology which is designed and constructed to operate in hazardous environments.

The graphical representation of the results for the oil concentrations are shown in Figure 1 and the mean oil droplet size distribution is shown in Figure 2. The injection regime was changed for the test, so that the demulsifier was injected into the wet topside manifold points instead of to the riser bottoms. During this portion of the test, the total quantity of demulsifier injected to the process remained constant.

To obtain a baseline for comparison data was collected for approximately 5 hours, at which point the demulsifier injection was redirected from the risers to the topside manifold for corresponding riser streams. After 3 hours the dosage of the demulsifier was then increased by 25%, maintaining the new topsides injection location. After a further 45 minutes, the dosage of the demulsifier was increased by a further 25%, still utilising the new topsides injection location.

Conclusions

No benefit was observed to separator performance when the demulsifier was redirected from the riser bottoms to the wet topside manifold. Similarly, no benefit was observed when the dosage was increased by 25% or 50%, the dynamics of the plant appeared to be unaffected. The distributions from this test demonstrated no noticeable change in the critical parameters when the injection was either relocated or rate of the demulsifier dosage was increased.

To further enhance separation performance, achieved by demulsifier injection, consideration should be given to the development of a demulsifier which is able to give faster water separation in the presence of other compatible chemicals.

These results clearly show the benefit of ViPA technology for the monitoring and management of chemical optimisation, providing necessary process data to monitor and optimise performance.

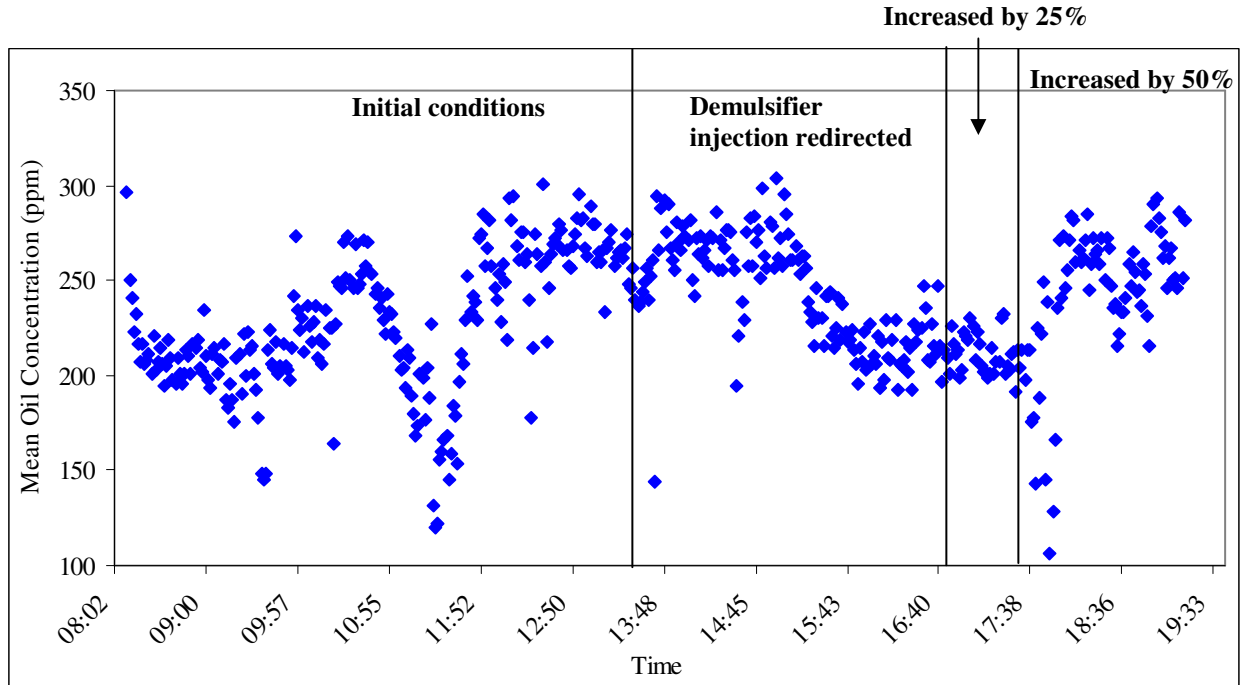


Figure 1: Oil concentrations downstream of the first stage separator

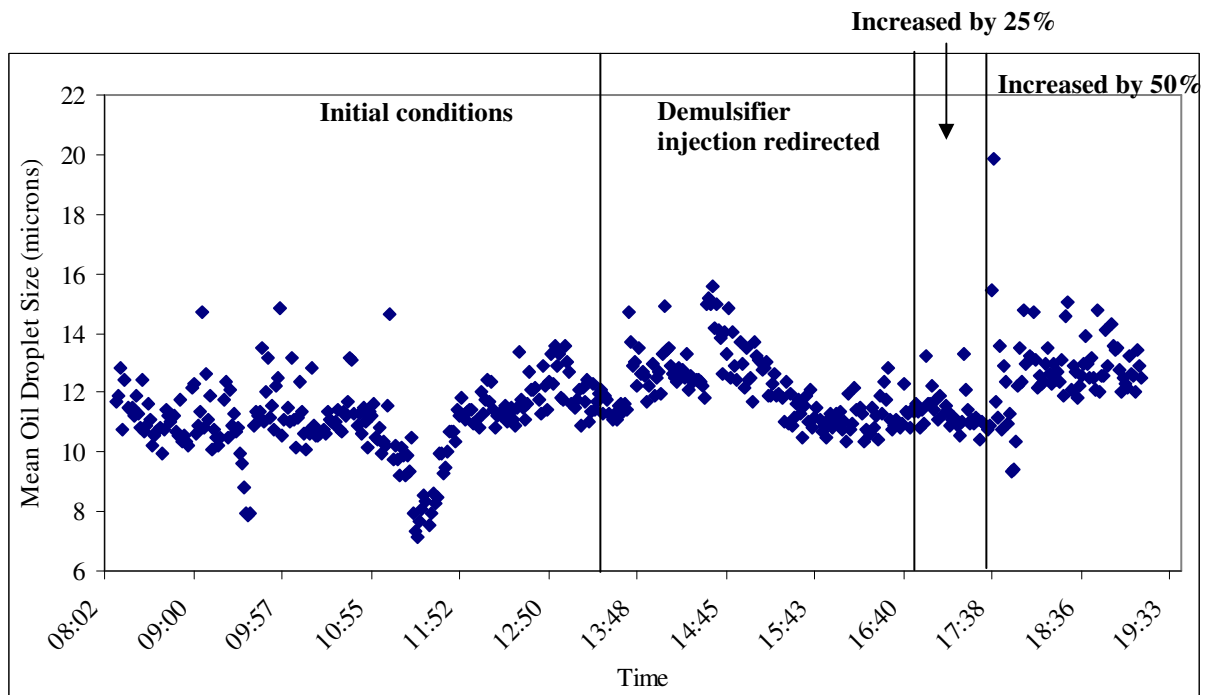


Figure 2: Mean oil droplet size distribution downstream of the first stage separator