Tracerco
Providing Insight Onsite

Cyclonic modelling and separations

Tracerco is a world leading industrial technology company providing unique and specialised detection, diagnostic and measurement solutions. Our goal is to drive technical innovation to bring significant benefits to our customers in the petroleum industry and in the security tagging niches we serve.

Detection in oil and gas streams regularly encounters the issue of mixtures of variable stability providing significantly different signals to different instruments.

The industry currently uses cyclonic separators on a large scale to force demulisification of complex mixtures for crude fluid separation, and to clean or purify solid/fluid mixtures. We are interested the applicability of using a cyclonic separator to pre-process oil and water streams prior to an on-line analyser, allowing analysis of the isolated separated phases rather than the bulk.

Project Goals

- Using a provided cyclone to vary the input and output pressure variables, the vortex finder length, and the flow rate, to optimised this design and calculate the best possible separation. Ideally achieving purification from 5% oil to 0.5% oil.
- Modelling of the fluid principles of cyclonic separators to effectively predict the separation outcome for the provided design.
- As part of this, some modelling using ANSYS is required. To speed things up, it is expected that 2 members of the group will spend some time at Tracerco receiving training on fluid mechanics in general and the use of ANSYS.
- Further, some fluids manipulation is required. Given the lack of practical fluids experience you have, we suggest that you speak with some of the Chemistry staff at Durham to provide you with advice and assistance.
- Oil (Lotoxane) and a pump will be provided. You will need to source a variable power supply to power the 24V pump. You should carry out a COSHH and risk assessment prior to starting work.
- See: https://www.youtube.com/watch?v=QfTZUMq-LGI and the work of the previous group working on this – contact Nicky Fernandez at Durham.

Reporting

Please provide a 1-page summary of your work at the end of each week. This will also assist in writing the final report. Tracerco staff will visit the labs regularly to make sure you have what you need.

Figure 1: Modelling of gas/solid cyclonic separators

Figure 2: Tracerco-designed cyclonic separator

Contacts

- Carl Tipton (Development Physicist) carl.tipton@tracerco.com 01642 375593
- Aidan Brierley (Principal Scientist) Aidan.brierley@tracerco.com 01642 375484