

Mator News

08/2003

Provider of innovative consultancy services in **gas/oil/water separation technology** and **condition based maintenance technology** for the oil and gas industry

How to ensure a successful separator modification?

What are the true causes of reduced performance of an inlet three-phase separator:

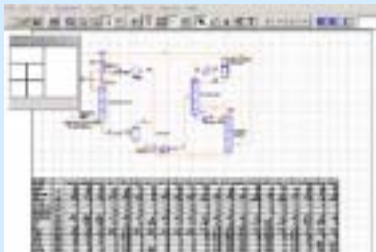
- ◆ *Difficult fluid properties and behaviour upstream the separator?*
- ◆ *Skewed liquid distribution at the inlet pipe?*
- ◆ *Gas carry-under?*
- ◆ *Clogging of internals?*
- ◆ *Mal design of inlet section or internals thereby emulsification in the separator?*
- ◆ *Short-circuiting or mal distribution of liquid in the separator?*

It is often difficult to obtain correct information prior to modification of an inlet separator in a gas/oil/water separation process. A high number of different factors influence the performance simultaneously and at various places, masking the true cause to the reduced performance of the inlet separator.

How to access more correct understanding of the functionality of the separator?

Probably the most correct methodology includes the following:

1. **Review of operational data and all existing test and evaluation work in order to list possible causes to the reduced performance.**
2. **Evaluate cost/benefit of performing more detailed investigation, in order to increase the possibility for a successful modification.**
3. **Utilize the unique opportunity to gather information by testing at different rates. The majority of equipment have a window of operation that might be examined.**
4. **Combine different methods in order to increase the accuracy of the data gathered.**



Simulations



Offshore testing

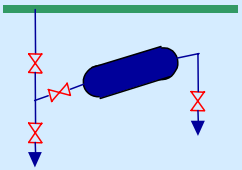
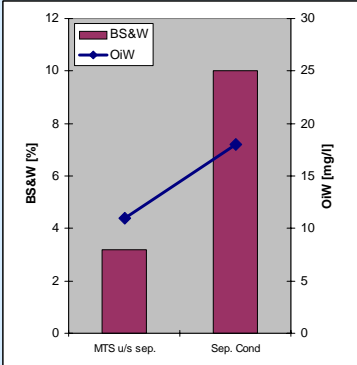
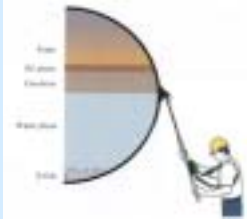
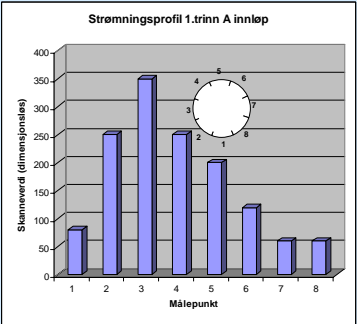
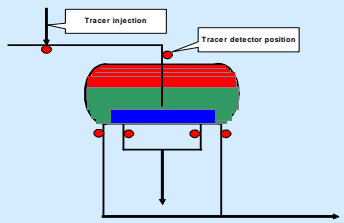
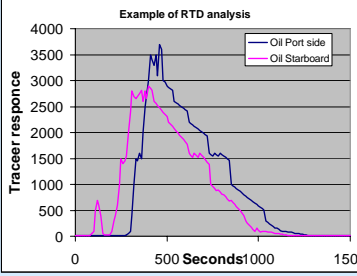


Onshore testing



MATOR

Offshore testing examples

Possible problem cause	Method	Results	Conclusion
Suspicion of emulsifying conditions within the separator	MTS – separation testing 		Results indicate that the separator itself is causing negative effects on both water and oil phases. Further work to address this.
Suspicion of skewed distribution at separator inlet	Neutron Backscattering 		Results show clearly skewed distribution. Risk of gas carry-under with possible increased foaming and/or emulsification.
Suspicion of short circuiting or clogged internals in the separator	RTD analysis using tracers 		Different oil retention time in separator and evident short circuit current on one side.

Recent Mator projects:

- ◆ **Norsk Hydro Heimdal:** Tuning of the separation process
- ◆ **Statoil Heidrun:** Produced water mapping and separator scanning
- ◆ **Statoil Staffjord C:** Start-up of low pressure operation
- ◆ **Total North Alwyn, UK:** Glycol plant investigation
- ◆ **Statoil Snorre A:** Scanning of 2. stage separator for verification of internals



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