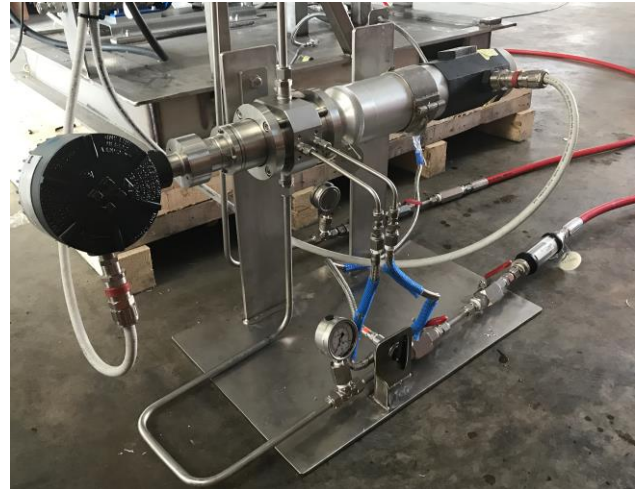




### Key Facts:

Many offshore oil and gas fields producing high sand or solids are not currently measuring Particle Size Distribution (PSD) due to high levels of contamination in the process medium. The Real-Time PSD Analyser works on the principle of presenting solids entrained in fluid (hydrocarbon and/or water) between a high intensity light source and a microscopic camera to measure particle size and concentration without breaking containment.

**Location:** Offshore Malaysia  
**Industry:** Oil & Gas



### Challenges:

- **HSE** – To negate the requirement for manual extraction and handling of samples which pose a risk to personnel due to the presence of TENORM, Mercury and H<sub>2</sub>S.
- **Data Availability** – To provide accurate PSD datasets in real-time as opposed to shipping samples onshore for lab analysis.

### Solution:

- SMS mobilised and installed their **Real-Time Particle Size Analyser** in an online, closed loop configuration to flow sample fluid from existing sample points through the analyser to closed drains.
- The package design specification incorporated a 3-phase side stream mini separator suitable for use under hazardous process conditions. The mini separator ensured samples were suspended in stable base fluid (90% water) to enable accurate particle analysis and provided necessary pressure regulation.
- A batch sampling approach was utilised whereby a known volume of liquid was flowed through the analyser flowcell and the sand particles analysed on a per well basis.
- **Particles of size range 0.7 - 300 microns** were analysed and the respective imaging and distribution data output to a service PC in real-time.

### Results:

- SMS successfully conducted real-time PSD analysis for 27 wells across the field.
- Throughout all phases of the operation, PSD analysis was conducted with a minimum of 6 litres of fluid, three times per well for verification of datasets and optimised data accuracy.
- All sample imaging was recorded in the acquisition software, thus enabling results to be optimised post-job through refinement particle filter thresholding.
- D<sub>n</sub> and D<sub>v</sub> (%) data outputs provided the client with invaluable data to support wellhead desander design specification.



Sense



Understand



Perform

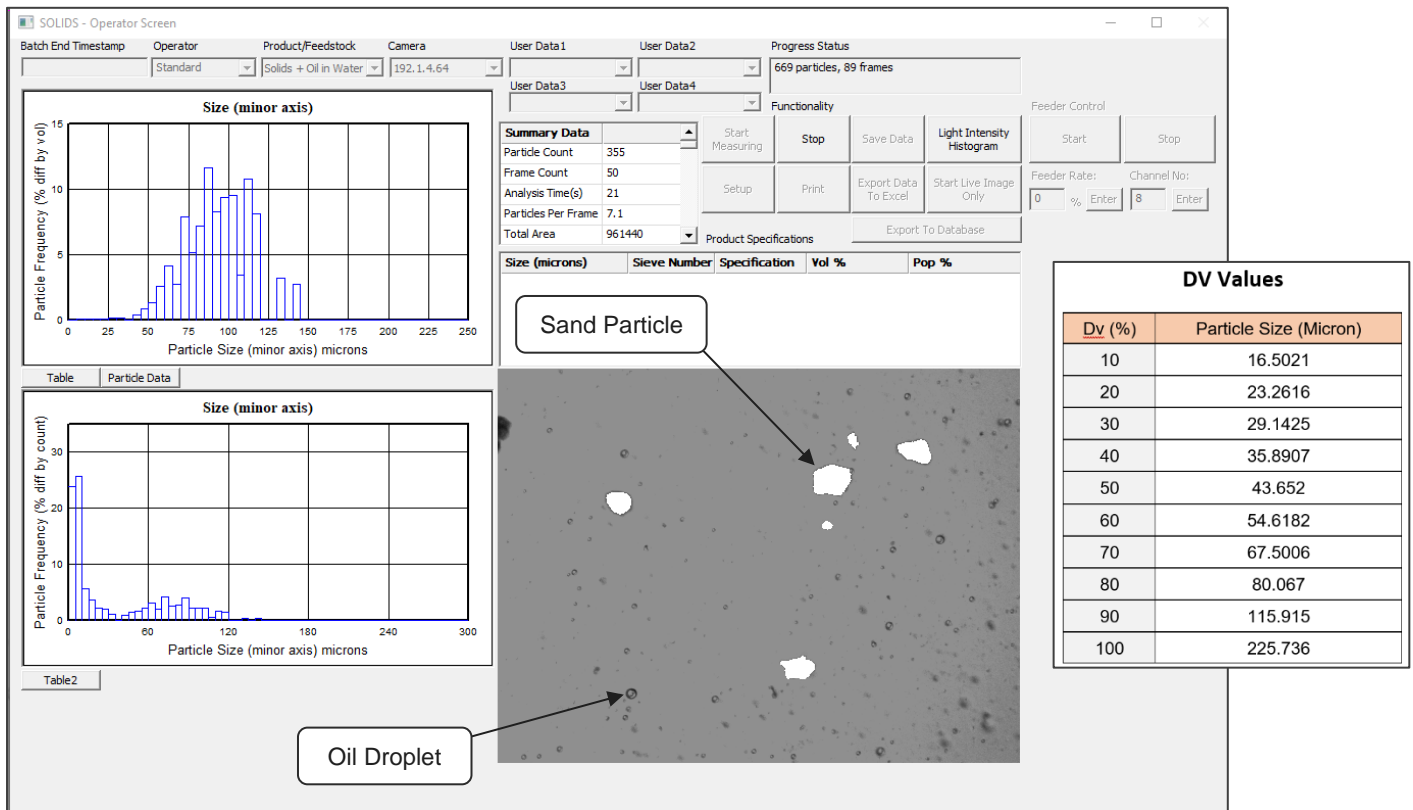


Figure 1: Example Analyser Operator Screen During Real-Time PSD Measurement

### Value Creation:

- **Reduced HSE Risk to Personnel**
  - Closed loop system reducing risk of potential exposure to harmful contaminants
- **Reliable Real-time Data**
  - Immediate data analysis and availability, enabling dynamic decision making
- **Reduced OPEX Cost**
  - Minimal personnel and equipment required on-site
- **Repeatable and Reliable**
  - Batch sampling process is quickly repeatable, multiple runs per well for data averaging and obtaining representative results
  - PSD data obtained direct from well flowline upstream of any process / separation
  - Sufficient solids samples captured for representative sample data