Background
Older generation online oil-in-water (OiW) monitors may suffer from fouling of optics due to scales, soaps, emulsions, sludge, etc., resulting in inaccurate (usually low) concentrations. New generation OiW monitors:

• Yield more accurate OiW concentrations
• Improve accuracy of the OiW measurements, allowing operators to optimize water treatment systems so that more product is recovered and less is re-injected or discharged into the environment
• Reduce operator maintenance and recalibration significantly
• Optimize water treatment systems to limit product losses
• Reduce liability for hydrocarbon discharges into the environment

Lessons Learned
The new monitors:

• Have proven more accurate in detecting OiW in upstream produced water and downstream wastewater streams.
• Provide accurate OiW concentrations in disposal water and may be used to monitor flotation unit efficiency since they may detect up to 2% oil.
• Are maintenance-free and correlate concentrations well with grab samples due to the ultrasonic cleaning feature of these monitors.
• Save labor amounts and chemicals used to extract oil from water during implementation.

Best Practices
The new monitors:

• Have proven to increase measurement accuracy and reduce operator maintenance.
• Determine product loss via rejection or surface discharge.
• Track the efficiency of water treatment systems to enhance oil recovery and revenues and reduce liability of environmental discharges.

Challenge
The primary challenge is convincingly conveying that the new monitors out-perform older monitors and are cost-effective investments. The cost of the new monitors is about twice the cost of the older monitors.

Measurement Principles
The measurement technique incorporated in the Advanced Sensor’s monitors is laser-induced fluorescence.

Ultra Vio Fluor (UVF)

Chemical Interference
Many process streams fluoresce, and some fluoresce more than oil. The Advanced Sensor’s monitors incorporate the use of a dual wavelength fluorescence of oil in certain parts of the optical Spectra, creating a data high pass filter.

Chemical Interface

Chemical Interference

Sampling Chamber

Installation on Bencharas Production Platform

Measurement Technique

Conclusions
• The EX1000 installed on Tantawan Explorer has been performing well.
• There is excellent agreement with grab samples - SX with Wilks IR and hexane gravimetry.
• The operators love “maintenance free” monitor.
• The unit installed on Bencharas Explorer performs well after being upgraded to EX-1000, because the interference from the demulsifier was eliminated.
• The EX-100 installed on Tantawan Explorer has been performing well.
• The Measurement Technique incorporated in the Advanced Sensor’s monitors is laser-induced fluorescence.

Advantages of the Advanced Sensor

• The measurement technique incorporated in the Advanced Sensor’s monitors is laser-induced fluorescence.
• The Advanced Sensor’s monitors reduce lab technician time and solvent use/exposure.
• The Advanced Sensor’s OiW monitors provide an immediate alarm to control rooms when the water treatment system is upset.