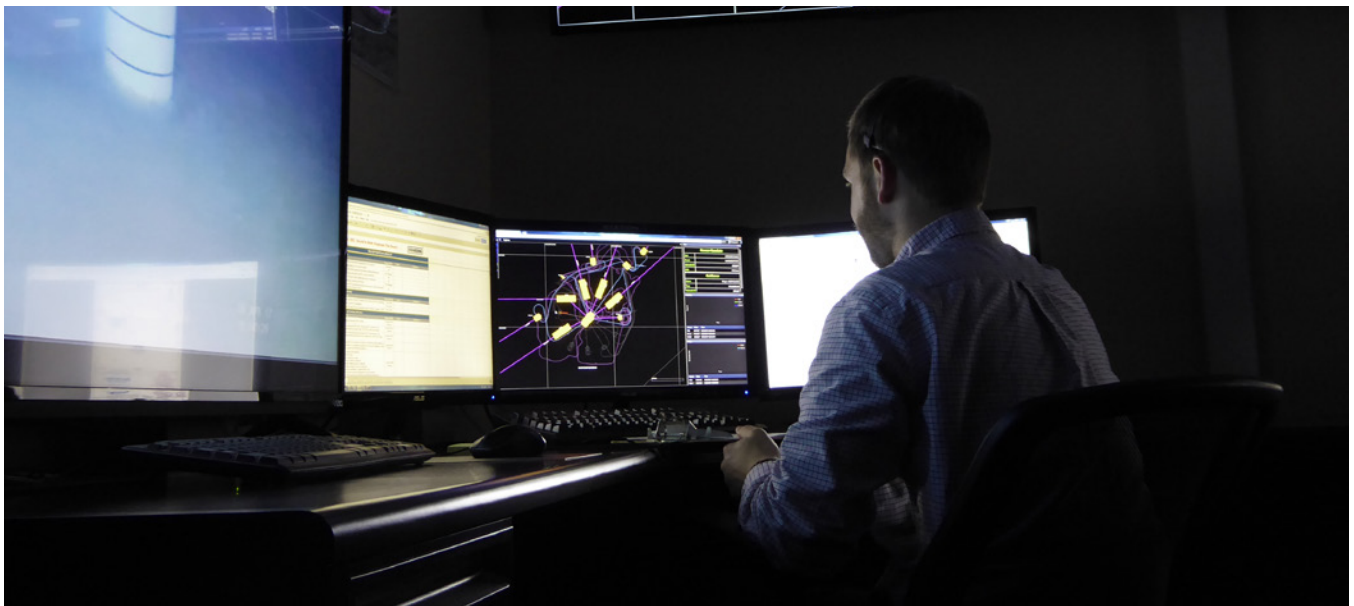


# Oceaneering completes world's first remote metrology project

**Real-time communication and shore-based control deliver efficiency, cost savings**



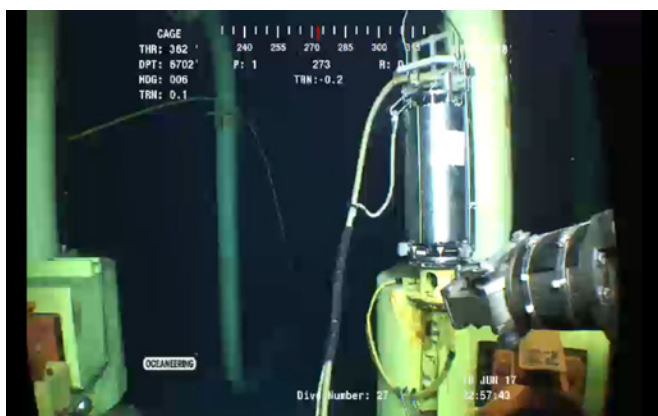
## Project Overview

A major customer in the deepwater Gulf of Mexico was interested in expanding on the Oceaneering-provided remotely operated survey (ROS) services being used on its drilling rigs. The customer had a number of well jumper metrologies scheduled to be performed from the drilling rig, and inquired about the feasibility of performing these metrologies remotely.

In working with the customer, two test metrologies were first performed on two jumpers before performing a successful remote metrology on the jumper in question. The remotely operated metrology solution Oceaneering developed and deployed provided the customer with the data required and resulted in substantial cost savings.

## Challenge

The primary objective was to remove well jumper metrology activity from a vessel—where it was critical-path work that required costly vessel time—and move it to a drilling rig where it was non-critical-path work using idle ROV resources. The metrology could be performed during well completion activities, eliminating the requirement to send additional personnel to the drilling rig to support the metrology-related activities. This reduction in vessel time and personnel mobilization made the remotely operated well jumper metrology exercise very efficient and more appealing.



The customer was also looking for a method to simplify the current process of completing jumper metrology. Especially important in challenging economic climates, the operator sought cost-saving opportunities and areas where they could optimize the use of resources.

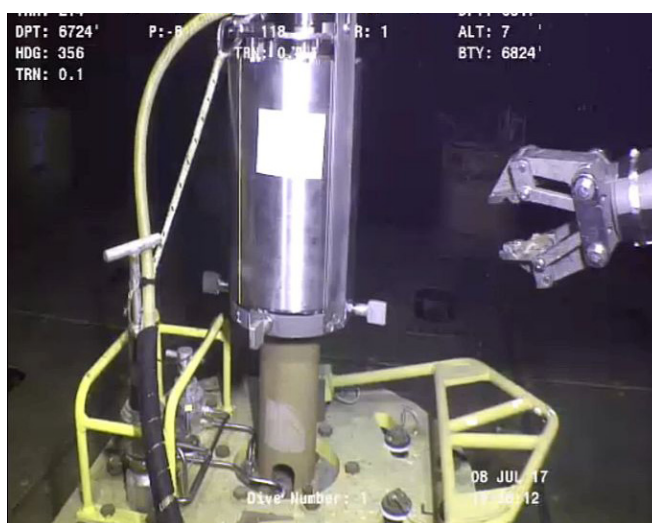
## The Oceaneering Solution

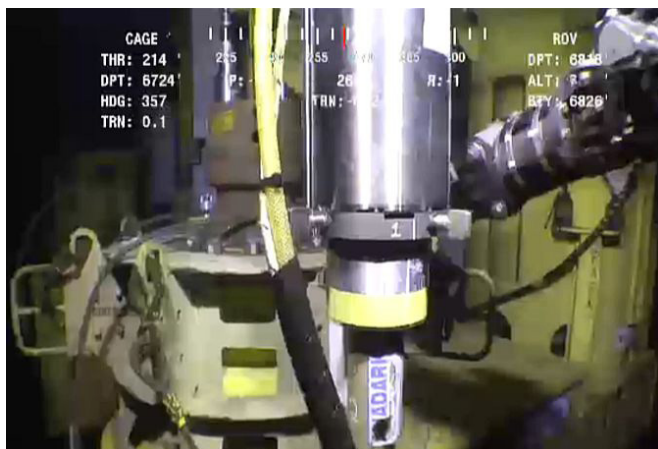
Remote metrology was a new technology that Oceaneering had been working to develop. We entered into a technical appraisal of the technology with our inertial metrology partner, Zupt. Early tests were very encouraging. Onshore testing, followed by offshore testing, resulted in approval for the first-ever global execution of remote inertial metrology.



## Execution Plan

The onshore testing occurred in early 2017. The Oceaneering ROS system was deployed at the test facility location, where the remote metrology equipment was interfaced and used in a test metrology situation. The metrology data were streamed in real-time via the Oceaneering Remote Control and Monitoring Station (RCMS) in Houston. The survey team accessed the live data and simulated the offshore metrology with results yielding repeatability within system accuracies and metrology tolerances. Prior to the offshore evaluation, the design of specialized tooling was conducted through discussions with the customer and its engineering team. Offshore evaluation occurred in June 2017.

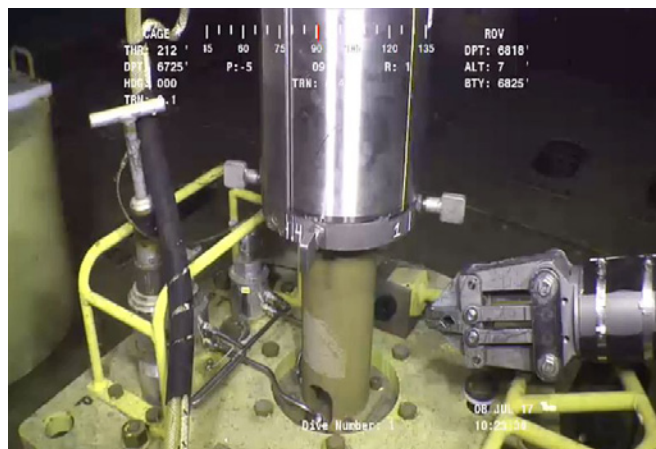




The Oceaneering ROV team had been briefed on the use of the metrology equipment prior to the offshore phase. While offshore, the evaluation included running metrology over two existing well jumpers. The results yielded almost identical results to the previous metrologies. A decision was then made to execute the new well jumper metrology remotely in July 2017. The combined Oceaneering and Zupt survey team was situated in the Houston RCMS, with the remote metrology data delivered through the Oceaneering ROS system. Real-time streaming of the ROV video data and the constant communication with the ROV team enabled successful execution of the well jumper metrology and a report was issued.

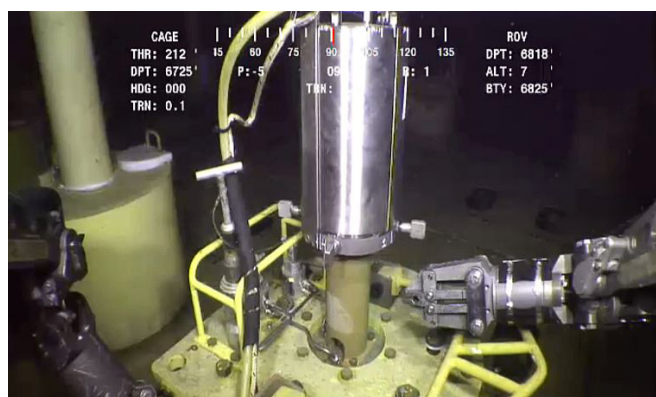
### Challenges

Completing jumper metrology remotely is a pioneering solution and came with challenges the teams worked diligently to overcome. Our ROV crews completed additional training to ensure the operations could be carried out effectively from a remote office location, further proving the benefits of Oceaneering's ability to provide integrated ROV and survey services.



### Results

The customer benefited from a simplified process and a reduction in overall execution time on the way to beginning production from the well. The new solution also resulted in significant vessel rate cost-savings and reduced the offshore headcount, further saving on mobilization costs and mitigating project risk. By performing metrology remotely from the rig, Oceaneering was able to remove the metrology process from the critical path and off of a vessel, further reducing risk and improving safety.



### Project Highlights

The successful execution of the project scope marks the world's first completion of remote metrology and remote inertial metrology.



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