



## CYIENT HELPS OIL RIG OPERATOR ENHANCE SAFETY AND REDUCE DOWNTIME

Our visual connected equipment solution limits the necessity for human interaction with potentially dangerous oil rigs

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**Client Name:**

One of the world's largest offshore drilling companies

**Location:** Houston, TX

**Industry:** Energy & Natural Resources

**Client since:** 2013

**Client Challenge:** Offshore oil rig safety

**Cyient's Solution:** Connected Equipment

**Summary of Results:**

Cyient developed data acquisition and video analytics architecture, which helped an offshore drilling company enhance safety and enabled the repair or replacement of assets during downtime periods and further prevented malfunction and safety concerns.

### Overview

As one of the world's largest offshore drilling operators, our client is focused on achieving a safe zero-incident workplace. In order to identify failures and prevent accidents caused by malfunctions of our client's critical rig system, Cyient developed an automated system capable of monitoring and alerting operators of equipment failure, and addressing safety concerns by removing the need for a human spotter at the top of the rig.

Considering the official investigations and recommendations of the Bureau of Safety and Environmental Enforcement, Cyient developed a customized solution that included both the data acquisition (sensors and video) and analytics architecture necessary to provide real-time visual asset monitoring, as well as the collection of pressure data from the system control lines. The solution utilizes visual analytics on a live camera feed to determine when systems malfunction and responds by halting the equipment control system, preventing an unsafe state.



## Client Business Challenge

Safety and operational excellence are a way of life for our client. Fatal accidents, extensive damage to capital equipment, and operation failures (i.e. downtime) can occur if rig systems malfunction. Most oil rigs have a manual spotter responsible for monitoring the equipment during the tripping process; however, our client wanted to remove the spotter to avoid human error, fatigue, specific height requirements (i.e. approximately 100 feet off the drill floor). They also required an automated system to monitor and alert operators of equipment failure.

## Cyient Solution

Our existing client relationship provided the point of entry for this proof-of-concept (PoC). We strengthened our partnership by carefully defining and addressing our client's concerns, executing a strategy that resonated with their key objectives, and delivering a solution that focused on technology and data-driven methodologies.

For the PoC, we leveraged our Connected Equipment solutions, designed to capture data, provide advanced analytics to effectively utilize data and, ultimately, enhance business safety and operations. Cyient's Connected Equipment team worked closely with our client's maintenance and reliability teams to ensure the rig equipment was installed in alignment with their desired specifications and procedures. In addition, our approach consisted of:

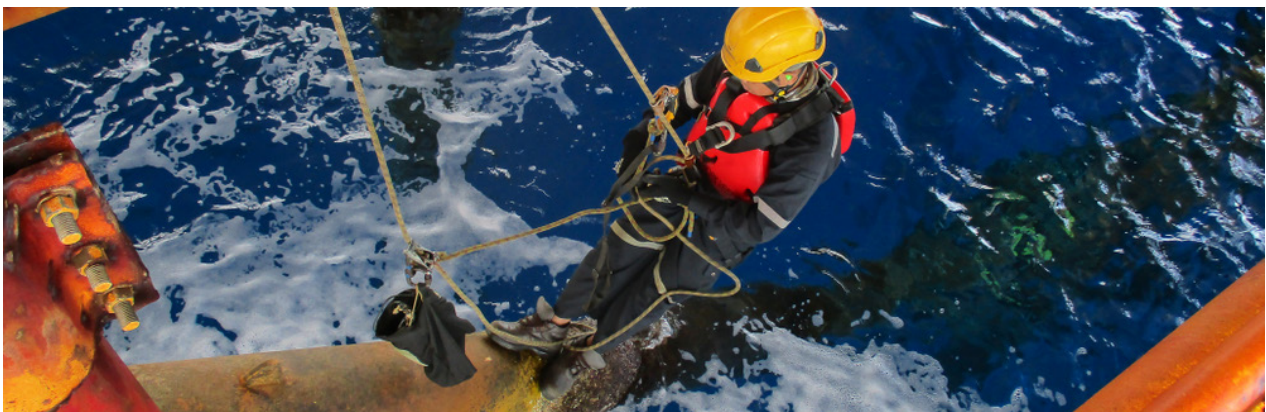
- Developing an on-premise analytics solution, which included day and night cameras, digital pressure sensors, IoT gateways, and machine learning and artificial intelligence (AI) algorithms

- Designing PoC equipment, procedures, and analytics models
- Generating a predictive algorithm that alerts rig staff when failures occur
- Deploying a PoC to rig for data collection and refining models
- Developing "kits" to integrate a live system on all customer rigs
- Supporting system deployment and long-term maintenance
- Setting the camera systems to enable off-line use and the ability to house an internal power source
- Ensuring all system components have the ability to power off during blackouts
- Presenting PoC results, including lessons learned, and success of visual analytics identifying unsafe system behavior

In addition, our Connected Equipment offering automatically identifies failures, prevents unplanned downtime, identifies maintenance needs and, most importantly, prevents accidents caused by dropped objects with a computer vision and industrial IoT sensor monitoring system, which includes:

- Image analysis filtering and background removal
- Identification and localization within images using machine learning and AI algorithms
- Advanced data simulation, mining and analytics to holistically identify and categorize condition states
- Predictive modelling, including handling missing data

The data acquisition architecture includes multiple camera installations, digital pressure sensors on the latch cylinder control lines, data loggers, and remote camera activation to extend battery life.







## Results

With Cyient's Connected Equipment offering, not only has our client enhanced safety, they also have improved oil rig productivity with a more cost effective, easier to maintain, and less time-intensive automated process that also helps them to:

- Prevent safety incidents
- Accelerate condition monitoring for necessary corrective actions
- Optimize assets, maintenance decision-making, and personnel utilization
- Improve detection of malfunctioning equipment with automated alerts
- Maximize uptime by replacing soon-to-fail components at regular maintenance intervals
- Increase system availability, ensuring oil rigs are drill-ready
- Extend battery life with remote camera activation
- Enable visualization and monitoring of asset conditions with a user interface

**WITH CYIENT'S  
CONNECTED  
EQUIPMENT  
OFFERING, NOT ONLY  
HAS OUR CLIENT  
ENHANCED SAFETY,  
THEY ALSO HAVE  
IMPROVED OIL RIG  
PRODUCTIVITY**



## DESIGNING TOMORROW TOGETHER

Cyient's strength in both data analytics and engineering coupled with our oil and gas domain knowledge allows us to not only devise a novel analytical solution to a critical customer problem but also to integrate that solution into potentially less-than-ideal technological oil rig ecosystems and environments. Commonly called "dirty hands" engineering – this approach is not one that most IT, software, data science, and IoT vendors are accustomed to taking as they are usually working in isolated labs or offices and not in the hands-on work environment. However, we believe that our clients thrive when we leverage advanced analytics technologies to add value to business operations, thereby enabling quicker and more intelligent decisions.

[cyient.com](http://cyient.com)

Cyient (Estd: 1991, NSE: CYIENT) is a global engineering and technology solutions company. As a design, build, operate & maintain partner for leading organizations worldwide, we take solution ownership across the value chain and leverage the power of digital technologies and advanced analytics, along with domain knowledge and technical expertise, to solve complex business problems. With more than 15,000 employees in 20 countries, our industry focus includes aerospace and defense, medical, telecommunications, rail transportation, semiconductor, industrial, and energy.

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