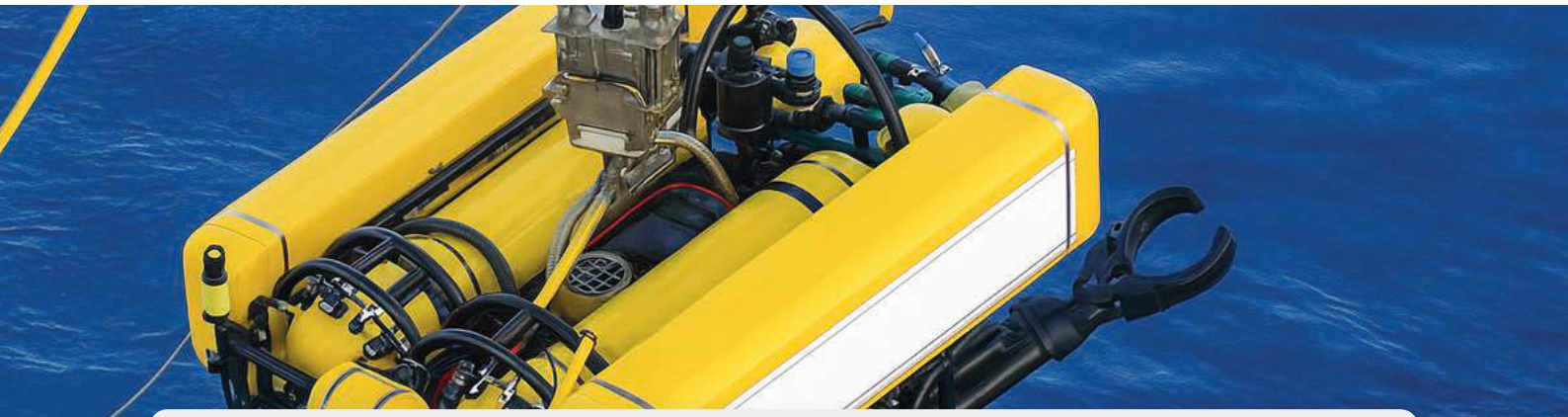
2U Rugged Industrial Server

Oil & Gas Real-Time Subsea ROV Control



To support next-generation subsea maintenance ROV and robotic manipulator control, Captec engineered a rugged 2U industrial server capable of withstanding extreme offshore conditions. Combining robust mechanical design, advanced graphics performance, and assured lifecycle continuity, the solution delivers long-term reliability, high availability and consistent performance across global deep-water operations.

The customer is a global provider of advanced subsea robotics and manipulator systems, supporting deep-water exploration and maintenance. Their remotely operated vehicles (ROVs) are deployed worldwide in demanding offshore environments, where precision, reliability, and real-time control are critical to maintaining productivity and mission success.

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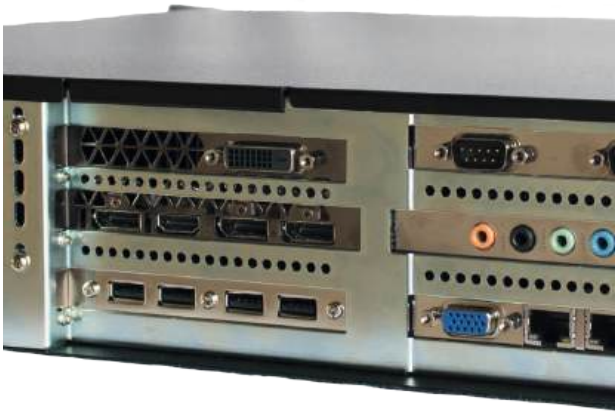
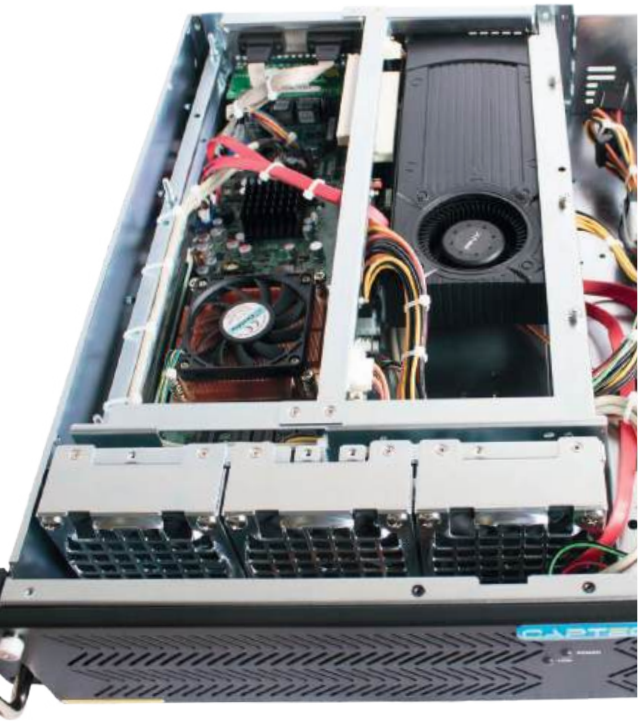
The Challenge

As a leading manufacturer of remotely operated vehicles (ROVs) and robotic manipulator arms, the customer sought to enhance deep-water productivity through more reliable subsea control. However, frequent mobilisation between offshore sites exposed their existing computers to extreme vibration, shock, and handling stresses, often resulting in in-field failures and costly downtime. Off-the-shelf hardware could not withstand the harsh transportation and operational conditions or deliver the high-end imaging performance their real-time ROV control demanded.



The customer required a compact, industrial-grade computing platform that could securely house critical components, improve airflow and accessibility, and meet specific I/O requirements for their control and simulation systems. Above all, it had to guarantee consistent, long-term reliability and supply continuity across a ten-year product lifecycle.

The Solution



Captec engineered a custom 2U rugged industrial server purpose-built to meet the operational and environmental demands of subsea ROV control. Designed from the ground up for resilience, the system features a heavy-duty cold rolled steel chassis that provides robust protection against shock and vibration encountered during frequent mobilisation. Custom-engineered internal brackets secure all components, safeguarding critical hardware during transport and operation.

To meet the customer's performance and imaging requirements, the system integrates high-end GPUs and optimised thermal management, ensuring sustained real-time graphical processing in simulation and control environments. PSU and cable routing were reconfigured to improve accessibility, airflow, and serviceability, while custom I/O and HD audio integration enhanced operator experience.

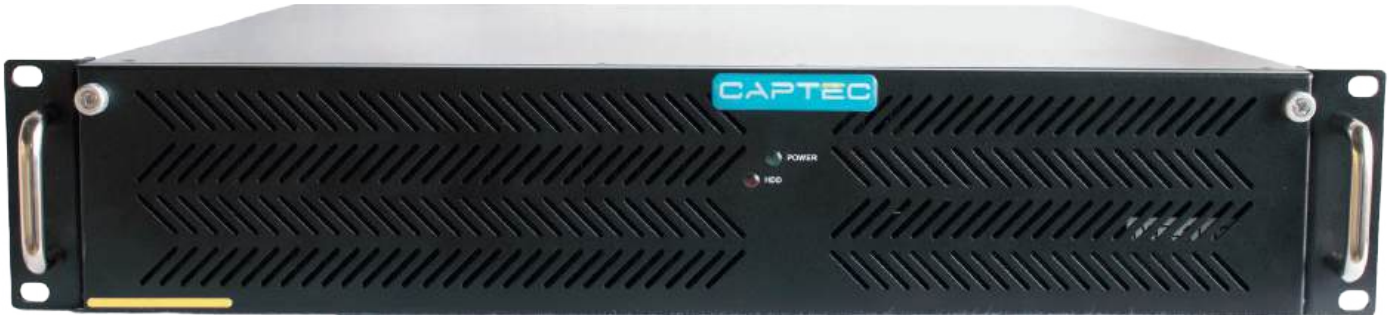
Beyond engineering, Captec implemented proactive obsolescence management and scheduled deliveries to ensure consistent availability and quality. This approach not only mitigated supply-chain risks but also enabled seamless transition planning for future system generations, delivering a cost-effective, application-ready computing solution that continues to perform reliably across hundreds of deployed units worldwide.

The Outcome

The deployment of the custom-engineered 2U rugged server has delivered a significant improvement in the reliability, performance, and maintainability of the customer's subsea ROV control systems. Field data confirmed exceptionally low failure rates across hundreds of deployed units, even under severe transportation and operational stress. This has reduced downtime, increased mission confidence, and directly improved operational efficiency in offshore environments where dependability is critical.

The partnership also established a new benchmark for lifecycle assurance. Through early engagement and proactive component monitoring, Captec was able to identify and secure end-of-life components over a year in advance, ensuring uninterrupted continuity while a next-generation platform was developed. The introduction of scheduled manufacturing and delivery cycles further strengthened supply consistency and cost predictability across the programme.

Today, the solution continues to support both control and simulation training systems worldwide, delivering predictable high performance, minimal maintenance demand, and long-term value. By combining mechanical resilience, thermal efficiency, and supply stability, Captec has enabled the customer to focus on innovation and productivity rather than hardware risk. This has cemented trust in a proven partner for mission-critical computing in the most demanding environments.



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