



36U Integrated Rack & Subsystems

Naval Tactical Data Link



Captec delivered a fully custom-engineered rack system for secure Tactical Data Link communications on next-generation naval platforms. Through close collaboration, complete design and test capability, and compliance with stringent defense standards, Captec provided a certified, long-term solution now deployed across international naval programs.

The customer is a leading defense prime involved in the development of advanced naval technologies. As part of a new program to equip next-generation warships, they required secure, compliant and technically robust equipment infrastructure to support communications and electronic systems.



The Challenge

The customer sought to diversify their supply chain and strengthen program resilience for a new naval program for next-generation warships requiring secure Tactical Data Link communications. Previously dependent on a single supplier, they launched a competitive tender to find an additional supplier partner capable of delivering full design, manufacture, integration, and test services.

The project demanded an exceptionally detailed and complex technical specification, requiring close collaboration to align mechanical, electrical, and compliance requirements. The system had to accommodate varied hardware configurations, segregate secure data channels through red and black management, integrate EMI protection and secure access doors, and meet stringent UK defense standards for shock, vibration, environmental resilience, and third-party certification.

In addition to the engineering challenges, the program required the generation and control of extensive technical documentation to support qualification, acceptance, and lifecycle maintenance. Captec secured the contract by demonstrating proven expertise in naval defense applications, comprehensive engineering support capabilities, and a fully integrated technical product portfolio. Delivering everything from a single source ensured continuity, traceability, and reduced program risk.



The Solution

Captec leveraged its existing reference design portfolio to engineer a variant rack system meeting the project's functional, spatial, and compliance requirements for next-generation naval communication platforms. The design was adapted to increase depth and width for complex communications and encryption hardware, integrating secure access doors, EMI shielding on the control panel, and dual red-and-black cable management to maintain strict data segregation.

A variant Power Distribution Unit (PDU) was also developed from an established Captec reference design, supported by dedicated equipment trays to accommodate hardware of varying form factors, including network switches and encryption modules. The system was engineered in accordance with key UK defense standards including DEF-STAN 59-411, DEF-STAN 00-35, MAP01-470, and TEMPEST. To mitigate technical risk, in-house pre-compliance EMC testing and Failure Mode and Effects Analysis (FMEA) were performed to validate shock and vibration resilience, followed by independent third-party certification with Captec engineering support on site.

Close collaboration throughout the program ensured evolving requirements were captured and translated into a fully defined, tested, and compliant solution, now qualified for deployment across naval environments.



The Outcome

The completed system delivered a precision-engineered and certified rack assembly designed to support secure Tactical Data Link communications on next-generation naval communication platforms. It combined Captec's mechanical, electrical, and compliance engineering expertise to produce a single, fully qualified product ready for deployment on Type 26 warships.

The system achieved compliance with all relevant UK defense standards for shock, vibration, electromagnetic compatibility, and environmental performance. Its robust construction, integrated power distribution, and segregated data architecture provide dependable operation under the demanding conditions of naval service.

Beyond delivery, Captec continues to provide through-life engineering support to ensure long-term sustainability. This includes disciplined document and drawing control, obsolescence management, and proactive change management as design updates or new orders arise.

The program demonstrated the advantages of consolidating design, manufacture, integration, and testing through a single provider, reducing complexity and strengthening configuration control. The resulting platform is now fielded across international naval programs, supporting secure communications with assured reliability.



CAPTEC

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