

ViewFinder® CASE STUDY

QinetiQ's ViewFinder® Combat Management System evaluated against existing RN CMS proving best practise of utilising Networked Data available within the UK Royal Navy surface fleet.



“...the system provided very real benefits to both the operator and command in threat classification and reduction and presentation of all available track information/data in one place thereby reducing operator workload as well as providing significant improvement in picture compilation.” – Trials Observer

QinetiQ Maritime Solutions deploy the advanced ViewFinder® Combat Management System on the UK Type23 Frigate platform to prove the currently unrealised benefits of data fusion of supporting track and intelligence related data available to the ship.

In collaboration with BAE Systems, QinetiQ undertook a series of trials to investigate the potential uses of the networked data available to the UK Royal Navy surface fleet in the provision and distribution of the surface and air tactical pictures.

BAE Systems provide the current Combat Management System (CMS) to the Duke Class Type 23 Frigates. It has long been recognised that huge amounts of data that could potentially be made use of to improve the Situational Awareness of the Operations Room crew by utilising the available networked data not being made available to the CMS. The Maritime Exploitation of Networked Data (MEND) trial was designed to assess the impact of this new level of information upon the effectiveness and operational capacity of the platform in an at-sea operational environment.

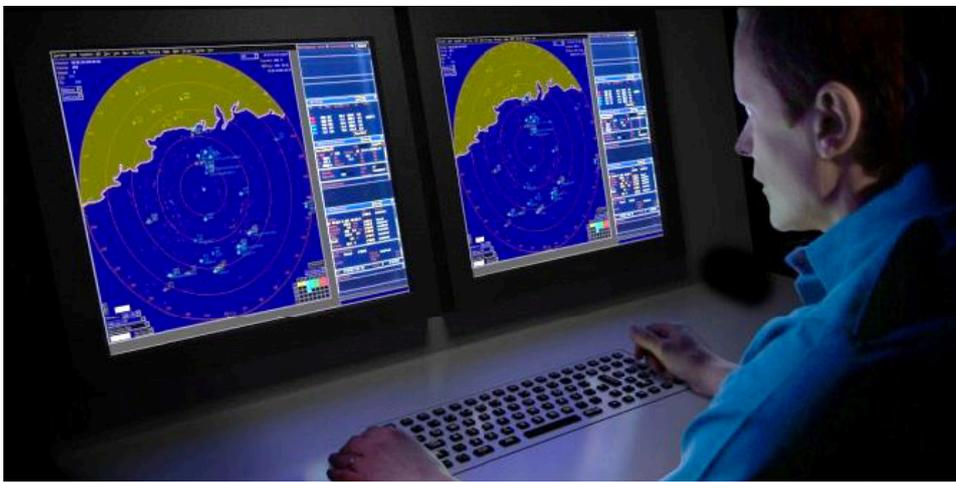
QinetiQ's ViewFinder® was integrated onto the ship's data highway and deployed to sea into the MEND serials to provide fully automated Tactical Picture provision and track identity assessments. Independent of the fully worked-up Operations room team using the extant CMS, a two man team was provided with the Tactical Picture from ViewFinder®. Advanced track behaviour recognition software provided identity recommendations based on track movement, history, encyclopaedic knowledge and intelligence data. Track level Data Fusion hypothesis provided the force wide tactical picture correlations.

The ViewFinder® Tactical Picture was measured using Single Integrated Air Picture (SIAP) metrics. Independent analysis of ViewFinder's picture compared its output with the picture being generated by the extant CMS

and the Ships Operations room team. This analysis indicated that the Ops room team was being consistently outperformed in terms of picture completeness, clarity, timeliness, accuracy and continuity by ViewFinder®.

About the Project

The UK MoD's Director Equipment Capability (Above Water Effects) (DEC(AWE)) wished to integrate a number of data sources available to a Type 23 and determine whether such integration provided cost effective military benefit. The MEND trials were agreed to deliver, at an early stage of systems development, the capability to integrate an agreed set of data sources and test them at sea.



“The MEND capability addresses serious shortfalls in picture compilation and goes a considerable way towards resolving the issue of dispersed data sources resulting in information being missed by operators at all levels.” – **Trials observer**

The integrated data sources included:

- AML (additional military layers);
- AIS (Automatic Identification System);
- ACO (airspace control orders);
- ADS-B (automatic dependant surveillance – broadcast);
- ATO (air traffic orders) and
- other planning information from the Command Support System (CSS).

“What the Ship’s staff found particularly impressive was that on all occasions during both live ADEXs and the Thursday War MEND was able to detect and classify the initial raid well before the ship’s team and indeed alerted the ship of the raid. On at least two occasions during the Thursday War MEND detected air tracks that had been unobserved by the task group and were within 15 nm of the force” – **Trials observer**

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It was believed that integration of these data sources would, without some automated support, overload the operator. The MEND programme exploited ViewFinder to provide effective and scalable data integration.

After witnessing the MEND trials, a number of subject matter experts (SME) expressed the view that the MEND capability had the potential to:

- address serious shortfalls in picture compilation;
- assist with resolution of integrating data from dispersed sources;
- prevent information being missed by operators at all levels and
- Increase significantly the time available to react to threats
- Substantially reduce the workload of the operators.

Key Challenges within the project

A key technical challenge was to gain access to the supporting data available within the ship but not currently used by the existing systems and integrating it to provide the best possible Situational Awareness to the ViewFinder Operators.

The ship’s crew were initially suspicious of the upgrade in functionality, but over the period of the trials serials came to trust and accept the system threat recommendations for target behaviour and the construction of the data fused tracks. Initially

the system was set to have every recommendation manually confirmed by the operator.

Within a short space of time, the system had gained the trust of the operators who were then using the system in full automatic mode.

A key challenge was correctly providing Track Identity based on observed track behaviour either supported by or contradicted by conflicting AIS, ADS-B, IFF and datalink information. When measured using independent means, the ViewFinder system correctly identified all threat targets, all neutrals and all friendlies. ViewFinder® detected and highlighted emergent threats were highlighted considerably faster than the extant CMS and ops room crew, in some serials theoretically saving the ship.

The role and value of QinetiQ Mission Systems

QinetiQ Maritime Solutions provided ViewFinder, integrated the new system onto the Duke Class Type 23 Frigate. With BAE Systems, QinetiQ provided the independent SIAP analysis teams who produced the assessment of the tactical picture being generated by ViewFinder® compared to the full operations room team using the existing Combat Management System.

