

# Latest Developments in Damage Control



**Naval vessels are meant to go into harm’s way and, as such, always run the risk of sustaining damage in the accomplishment of their tasks. A vessel that can sustain damage or deal with an emergency with minimal effect to crew or infrastructure stands a greater chance of accomplishing its mission.**

L3 MAPPS has long been at the forefront of developments for damage control and damage management on-board ship, and has never ceased to improve the product and develop new ways to enable ship’s crew to effectively manage emergencies on-board.

Our current state-of-the-art Battle Damage Control System (BDCS) allows operators to plot damage on the ship’s General Arrangement Plan (GAP). It offers unrivalled ease of navigation, using familiar Windows® style navigation methods of pan, tilt, zoom and selection with “rubber band”. The real power of the BDCS is its unique ability to use layering to declutter pages. There is only one GAP page in isometric view and one in 2-D view, and all of the information necessary to obtain the status of the ship is available on that one page. The key to easy navigation is that the information is presented in layers. As the operator drills down or zooms into the page, more and more information becomes available (see figures 1–3). As always, the complete integration of the

BDCS with the Integrated Platform Management System (IPMS) reduces operator workload and improves damage control efficiency by the direct interaction of the systems. On flood detection, automatic sequences can quickly and easily isolate compartments. In an NBC event, positive citadel pressure can quickly and easily be achieved with automatic sequences. Similarly, a fire can be readily identified and prevented from spreading by automatically isolating the ventilation system and closing automatic fire doors.

While the level of functionality of our BDCS is unrivalled, and the ease of navigation completely unique, our research and development team is always seeking ways to further improve the system and help ship’s crews be the most effective.

One area that has been very popular on most advanced programmes is the large screen display. A large screen display, suitably ruggedised for the environment, can be used to display any IPMS mimic page, but normally displays the ship General Arrangement Plan, as shown in figure 1. It is of sufficient size as to be seen from all around the compartment, and provides a high level overview of the ship damage state. While this arrangement is excellent for overview, it can be better optimised for damage management; therefore, our research and development team looked for a means to enable the large screen display to also be used for damage control.



Figure 1

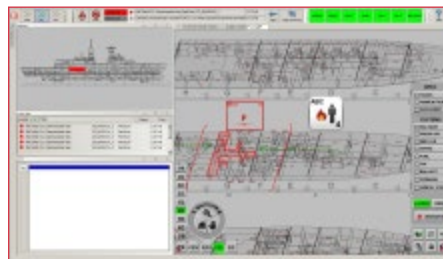


Figure 2



Figure 3

The result is a digital electronic incident board we have called the Interactive Incident Board Management Station or I<sup>2</sup>BMS (figure 4).

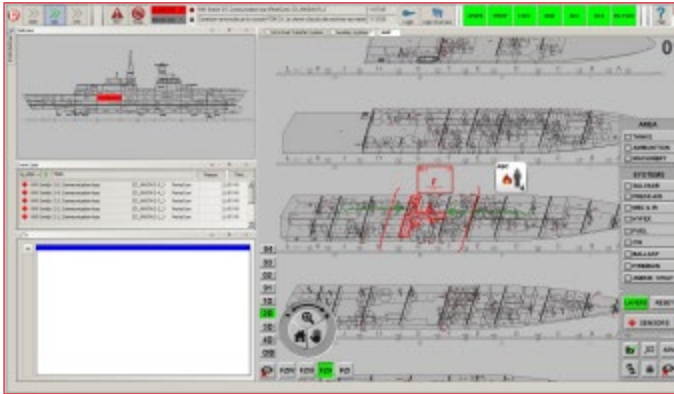


Figure 4

This new development can be regarded as a new damage control console. The console has, as its principles of operation, touch screen input on all three screens, using a pointing device, finger or even gloves if the operator is wearing anti-flash gear. In our studies, we determined that it was important to the task of damage control too never to lose sight of the General Arrangement Plan of the ship. Therefore, the large screen always displays the ship General Arrangement Plan. The two smaller screens are used for displaying Kill Cards or IPMS mimic pages. For example, if a fire is reported in a compartment, the operator would select the fire symbol, and open the related Kill Card page. The Kill Card would not open on the main screen, but rather on one of the smaller side screens. If the Kill Card refers to an IPMS mimic page, that page is opened on the third screen. In this way, the operator can perform all actions required to manage an emergency without ever losing sight of the ship General Arrangement Plan. Although text input is rarely required for damage control purposes, a stowaway keyboard is available for text input, and handwriting recognition allows text to be input directly on the screen (see figure 5).

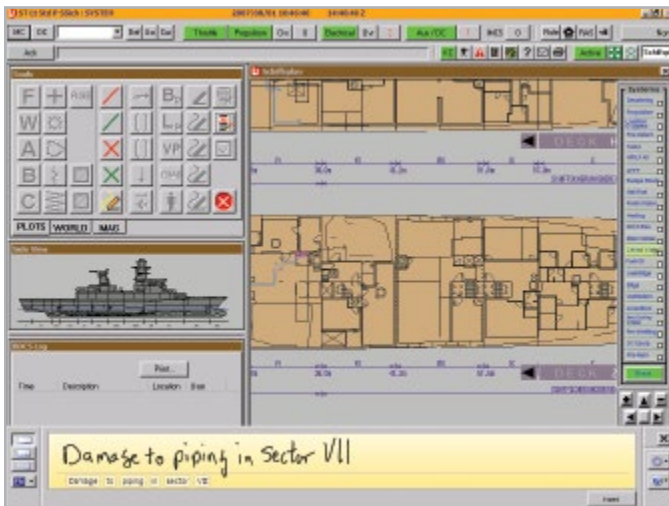


Figure 5

In addition, whereas plotting symbols consistent with the navy's traditional symbology are normally used to plot damage from a plotting palette in the top left corner of the BDCS page, free draw plotting is also now available. In this way, the BDCS can act as a digital representation of the traditional Incident Board (or State Board).

One of the layering features available on all BDCS applications is the ability to turn system layers on or off. This is particularly helpful when displaying complex ship systems like the fire main system or the chilled water system (see figure 6). The BDCS now also offers plotting against a specific layer. If damage is sustained to the chilled water system, and a patch pipe is required to maintain system viability, the repair and information can be plotted directly on that specific layer, and will not clutter other operators' view by displaying it on all layers.



Figure 6

Finally, an "Advice" mode has been added which allows operators to plot without having what they have drawn broadcasted to all users. This is particularly useful for briefing and debriefing damage control exercises.

The I<sup>2</sup>BMS is yet another example of our unyielding commitment to continuous development and improvement.



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