

## Shockproof monitor system for Navy's M-frigates

*As part of the ministry of defense, the Dutch navy plays an important role in international peace keeping operations. The M-frigates form a substantial part of the Dutch fleet. The monitors in the Technical Center on board of these ships have come to the end of their performing life. Replacement by standard equipment causes problems; it appears that none of the tried options is functioning. Several companies are invited to come up with a solution, without any success.*

### The Challenge

It's not the first time the monitors on board of the M-frigates need to be renewed. In the past, the original CRT monitors were replaced by the present LCD screens. The self made plates, on which the monitors are mounted, are necessary to adapt the LCD's to the original console. To obtain a system that fits perfectly, it's important to come up with a new, custom made mechanical solution.

The main challenge however is the fact that none of the tests with standard available monitors lead to satisfying results. Several companies have come up with suggestions; each time the result was negative. None of the options turned out to be the right one, despite the type of monitor or the suggested mechanical solution. The picture on the replacement



monitor should not fall away or get disturbed when exposed to shocks, which can hardly be avoid on board of a ship. When successful, the replacement of the monitors will be implemented on one of the vessels. The company that comes up with the right answer is most likely to get the order to replace monitors on board of more M-frigates.

### The Solution

Mulder - Hardenberg is the only invited company that decides to test and measure the video signal of the present VME system. M-H finds out that the VME system generates a non standard video signal. This fact is the cause of the problem. After the measurement, a display controller is selected to perform a functional test. M-H selects a special KME display controller; because the initial measurement and tests shows that a standard controller will not perform in an adequate way. In close cooperation with manufacturer KME a demo monitor is made. The functional test is performed with this custom made monitor, with an immediate positive result. The mechanical solution has to be designed without the use of an adapter plate, to avoid loss of space at the operators console. A number of features of the original monitors are also needed in the new version, e.g. dimming backlight. New features, like adjustable picture dimensions and variable position are wanted by the customer and therefore need to be implemented.

The fact that the VME system generates a non standard video signal causes the malfunction of the monitors and is solved by M-H's custom solution. The entire system has to be mechanically improved as well, to avoid the influence of shock and vibrations of the ship.

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**The Implementation**

Supplied by all the input, tests and measurements, M-H writes a concept with drawings and specifications for KME, manufacturer of the new monitor system. KME designs and develops the custom product. After approval of drawings and specs by all parties involved, KME manufactures the final result. The first new batch monitors are successfully installed on board of the ship by an employee of the Dutch navy and a technical specialist of M-H Services.

**The result**

The reactions are overwhelming. The navy is amazed that the designed and implemented product fits immediately and is functioning without any problems. The monitors don't show signs of flickering or loss of signal and the picture performance has improved strongly compared to the former monitors. Moreover, the mechanical solutions by M-H result in a monitor system, according to the specs and desires of the Dutch navy.

One ship is now supplied with the new LCD monitors. Replacement of monitors on a second M-frigate is scheduled for the beginning of the year 2009. At this moment M-H is also developing new monitors for the consoles of the Control Center in the LCF-frigates of the Dutch navy.

Our Websites



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