viewed via the radar and shown on the chart.

Keeping in mind what we have said about integrating radar and ECDIS, let's look at how malfunctioning navigational systems may affect ECDIS performance.The most dangerous malfunctions are due to cartographic errors; charts should never be considered absolutely trustworthy. So, the question is whether the navigator is able to determine errors of this kind.

Of all ECDIS functionality, radar overlay is the most effective in such situations, as acknowledged in IMO circular #255. Mismatch between a coastline on the chart and the radar image might be an indicator of a cartographic error, although the other possible causes of visual distortions mentioned above should be kept in mind.

Positioning system errors can also occur. Although GPS (GLONASS) devices have proven reliable, they sometimes malfunction, showing errors of up to 100 m. But how can the navigator determine this?
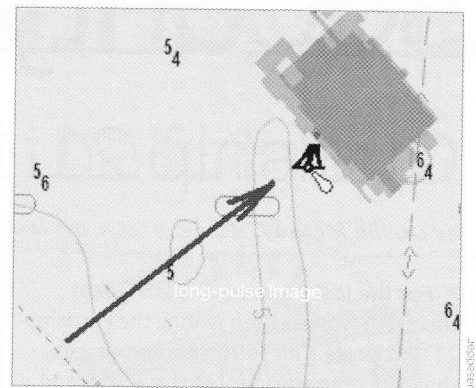
Radar image analysis is the best method. If a coastline shows a constant degree of shift
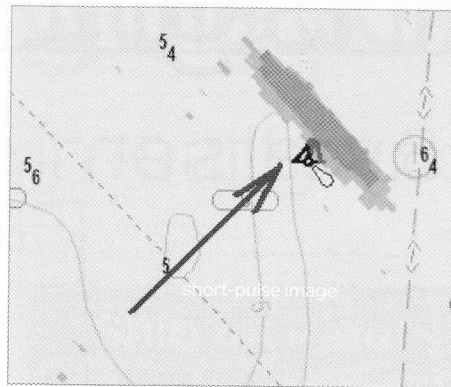
The further from the radar, the bigger the screen image will be

when a radar image is overlaid on a chart, this is strong evidence of a systematic GPS error. With GPS running correctly, both coastlines will coincide fairly accurately.

Sensor errors may also misinform the navigator about the course of a vessel and also produce false bearings to targets. Radar overlay can help in this instance by displaying a radar image that appears to be rotated, with respect to the chart, around the current ship position by an angle of error.

AIS information, mandatory on board SOLAS vessels since 2008, can also be checked against radar images. As long as AIS is functioning correctly, AIS targets on an ECDIS coincide with radar reflections by angle and range. The same is true for ARPA. ◀

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