

Limitations and understanding of Charts and Hydrographic Surveys

This Marine Notice is intended to bring to the attention of ship operators and masters the potential hazards of taking ships into poorly surveyed or unsurveyed areas. Several recent groundings in such areas and evidence of many other passage plans intended for such areas indicate that operators or masters may not be fully aware of the limitations and implications for use and interpretation of these charts.

The quality of a nautical chart is only as good as the quality of the hydrographic surveys on which it is based. Surveys vary widely in quality and even in the 21st century charts may be encountered which have areas based on very old or inadequate data. Digital charts may be no better than their corresponding paper equivalent in this regard.

In Australia all recognised shipping routes are well surveyed and charted. Away from the recognised routes this is definitely not the case. Coastal charts are not compiled from one single survey but are usually made up of a patchwork of surveys of widely varying standards hence many remote areas are covered by old surveys, surveys done to a very low standard, or no surveys at all. Mariners entering these areas may therefore expect to find uncharted or poorly defined dangers.

Care and judgement should be exercised when using such charts, but in simple terms vessels should remain on recognised routes and avoid short cuts or scenic diversions. If a voyage

into more remote areas is contemplated, for whatever reason, it is recommended that the chart is studied carefully to determine the level of risk and local information sought if possible. There is ample information on most Australian charts to do this.

All but the oldest Australian charts clearly indicate with magenta notes those areas which are inadequately surveyed or unsurveyed. Other signs to look for are soundings in upright hairline style; the existence of "reported" depth anomalies; or blank areas devoid of soundings. The presence of any of these indicates that the survey was not of an adequate standard.

Most Australian charts now carry either a Reliability Diagram or a Zone of Confidence Diagram, these diagrams aim to inform the mariner of the standards of the surveys used in compiling the chart.

Reliability Diagrams

From about 1975 the Australian Hydrographic Service (AHS) began to put Reliability Diagrams on charts. These contain extensive details of the surveys on which the chart is based. Unfortunately these diagrams are not simple to interpret by the average mariner and some knowledge of hydrographic surveying techniques definitely helps. Information to look for is the date of the survey, equipment used to measure depth, distance between the lines of sounding and whether the area was swept by sonar.



In very general terms, surveys pre World War II where leadline and horizontal sextant angles were used, surveys of any date where distances between sounding lines are greater than (say) 200 metres, or surveys where no sonar was used, may be inadequate (to varying degrees) for safe navigation in coastal and inshore waters. Further advice should be sought if it is intended to take a vessel into these areas.

Zones of Confidence (ZOC) Diagrams

The AHS is aware of the limitations of the Reliability Diagrams and since 1995 has begun to use a much simpler diagram which has six categories of surveys (ZOC areas). Certainly areas classified as ZOCA and B may be considered well surveyed. ZOC C seems to take in a wide spectrum of surveys from barely adequate to extremely poor. ZOC C areas need to be treated with caution. Areas of even lower category should be avoided.

Notes on Reliability Diagrams and ZOC Diagrams may be found in the Australian Seafarers Handbook or Annual Australian Notices to Mariners. Both these publications are produced by the AHS.

Further advice on the chart diagrams or quality of surveys and charts generally may be addressed to:

Manager
Ship Operations & Qualifications
Australian Maritime Safety Authority
GPO Box 2181
Canberra ACT 2601
Phone 02 6279 5908
Fax 02 6279 5056

Or

The Head of Data Management
Australian Hydrographic Office
Locked Bag 8801
South Coast Mail Centre NSW 2521
Phone 02 4221 8601
Fax 02 4221 8599

Clive Davidson
Chief Executive Officer
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