Stop Using DGPS!

I have just read Mike Brissette's interesting article 'Stop Using DGPS' in the Oct 2012 issue of Hydro international and, although I fully agree with many of the points made by Mike I feel that his inference that the current IHO S-44 special order maximum Total Horizontal Uncertainty (THU) is too lax should be not be taken at face value.

The IHO S-44 standard is explicitly aimed at 'hydrographic surveys for the collection of data which will primarily be used to compile navigational charts to be used for the safety of surface navigation and the protection of the marine environment.' (Introduction to IHO S-44 5th edition). For this use, I firmly believe that the minimum 2m THU required to achieve the special order accuracy remains valid.

Although modern precise positioning can certainly achieve better THUs, there is little point in doing so for charting use only because a) the symbolisation of the feature on charts will be much larger than the 2m on the ground THU and b) navigators of ships will not be interested in positioning themselves so close to charted dangers that the 2m THU becomes an issue. Indeed, as was discussed at length during the S-44 work, a single beam/side-scan survey is perfectly adequate for navigational use! S-44 is a minimum standard which, if met, will produce data that can be safely used in chart production. This does not in any way imply that organisations who specify surveys should limit their requirements to those detailed in S-44 and surveyors can be directed to use tighter THUs in part or all of the survey area if such a difference will allow the data to be used for other purposes. With ever decreasing resources and budgets the maxim of 'survey once, use many times' needs to be constantly in mind.

What I think Mike is actually stating is that the IHO S-44 special order is inadequate for hydrographic surveys intended for the large-scale visualisation of seafloor features and I would fully agree with this since features sampled on multiple lines each with a potential 2m THU can, and do, look blurred. Also, any deformation survey will be of little use if the expected deformation is smaller than the THU of the survey attempting to measure it. In all cases, users must implement standards that are applicable to their task and if large scale visualisation is required then tighter THUs must be specified.

I agree with his assertion that high accuracy x/y is equally applicable to surveys as z and that the x/y has largely been subservient to the z. However, improvements in charting surveys are probably best served by improving object detection rather than maximum THU since undetected tall thin features rising from the seafloor present a much greater danger to surface navigation than do detected features that are 2m away from their true position and this topic will be considered carefully in the future development of the IHO survey standards.

In conclusion, therefore, I suggest that even for high-resolution shallow-water surveys where feature detection is a priority (which is true for S-44 special order) DGPS remains a viable positioning method providing it is detection and not visualisation of the feature that is the aim. The high-resolution equipment ensures feature detection while the uncertainties in position are not an issue normally for navigational surveys. If the desire is to visually inspect the feature and hence the high-resolution data is for visualisation and multiple passes will be required (either to cover the feature or to give a time series) then a more precise form of positioning must be used.

The views of Hydro International readership on whether the time has come to reconsider broadening the scope of S-44 to non-navigational applications are welcome. Meanwhile, there are legitimate applications of shallow-water MBES surveys for which DGPS is perfectly suitable. HOs should not be discouraged to use this cost-effective combination.

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Group which created S-44 edition 5.