CSPCWG5-08.4A

5th CSPCWG MEETING
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Paper for Consideration by CSPCWG

Charting bridge supports and detail under bridges

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Executive Summary:	One factor considered in the investigation into the Cosco Busan San Francisco bridge collision was that the pilot may not have recognized the charted bridge supports.
Related Documents:	M4, INT1, email correspondence with IHB Director (Ward February 2008), Media reports (found on Internet)
Related Projects:	Revision of M4, New editions of INT1

Introduction / Background

There are numerous *unofficial* reports on the Cosco Busan collision with Bay Bridge (San Francisco). One frequent issue mentioned is that the pilot did not recognize the charted bridge supports, eg:

'Cota [the pilot] asked Mao Cai Sun, the captain of the Cosco Busan, to point on the display to the center of the bridge span between the Delta and Echo towers on the western side of the Bay Bridge.

"The master pointed that out," Meadows said. "In fact, several times during the trip. That's what the pilot was heading for."

The channel between the two towers is 2,210 feet wide and is marked with a transponder device, which should have been picked up by radar or the electronic chart, mariners say. The channel is commonly used by large ships going to and from the Port of Oakland.

"The pilot had to go along with what the master indicated on the electronic chart display was the center of the span," Meadows said. "That turned out to be the tower instead."

It seems the reports are referring to the ECDIS display, which was actually displaying an ECS, not an official ENC, so the navigators should also have been referring to paper charts. It is believed the paper chart on the bridge was Admiralty (UK) chart 588, on which the bridge supports are clearly charted.

Analysis / Discussion

Most ENC and ECS are derived from paper charts. Therefore, in general, ENC and ECS will only show as much bridge and under-bridge detail as is available on the source paper chart.

At the 4th CSPCWG meeting last year, some attendees discussed the issue of showing bridge supports and other detail under bridges during a break in the meeting. This was because UKHO had been asked by the Port of London Authority for advice on this, for use on their large scale port pilot charts. Following those discussions, UK prepared internal guidance, as follows:

Bridge supports

Bridge supports may well be an obstruction to navigation and should be charted (if the positions are known). It is difficult to be prescriptive about how they should be charted, as circumstances may vary considerably. Some options (which may be combined) are:

- Where bridge supports carry navigation lights (and/or daymarks), chart as small light stars (and/or beacons) with appropriate descriptions. Add a legend, eg 'TOWER', 'Pylon' as appropriate (example chart 3497);
- Where bridge supports are wider than the actual bridge, show to scale in plan outline (usually continuing the bridge sides through the widening, unless it is known that the bridge itself widens at those points) (example chart 736);
- The supports may also be shown as lines across the bridge, even if they do not protrude beyond the width of the bridge or above the bridge (example chart 903);
- For suspension bridges, or others for which the supports extend above the bridge, a position circle symbol with legend should be shown, eg 'TOWER', 'Pylon' (example chart 3497);
- Insert a large-scale inset plan to enable the above actions to be taken (example chart 938);
- Add a profile view diagram (example chart 1159).

Depth under bridges

The physical presence of a bridge can affect the flow of water and hence the location of shoals and deeper channels in its vicinity, including underneath it. Normal sounding selection principles apply in the waters either side of a bridge. If it is appropriate to select a sounding which is under the bridge (either because it is a controlling depth, or because depth varies significantly across the width of a bridge span), then it should be shown as a 'sounding out of position', in accordance with the guidance at M-4 B-412.2. I11 (using a pointer) is to be preferred to I12, as the exact position under the span may be important.

Depth contours should normally be broken at the bridge as it will usually be obvious where the contours go. On very large scale charts, where the bridge is shown to scale and it clarifies the picture, the contours can be continued through the bridge.

Conclusions

The positions of bridge supports are important to the chart user.

The positions of bridge supports on an ENC (or ECS) are likely to be derived from paper charts.

Bridge supports must be charted (if known) wherever a bridge crosses navigable water (at the scale of the chart).

Recommendations

Specifications should be added to M-4 B-381 to give guidance on showing bridge supports, and other important detail under bridges. (These could become B-381.5 & B-381.6)

The UKHO guidance could be adapted and/or adopted as an INT specification, to be added to B-381 at next opportunity. (Graphics could replace the references to chart examples).

Justification and Impacts

The justification for a change is for the safety of the paper and electronic chart users and also consistency of application between HOs.

The impacts of the proposal are some work for the Secretary in advance of the planned revision of M-4 Section B-300.

There may consequently be some changes required to INT1 (and possibly INT3).

Action required of CSPCWG

The CSPCWG is invited to consider:

- whether a new specification is justified;

- if so, what priority should be assigned;
- whether the UKHO guidance is suitable for adoption as the International specification;

Contact must be maintained with TSMAD and CSMWG, regarding their consideration of the matter.