CSPCWG8-08.12A

Paper for Consideration by CSPCWG

Depiction of Limits of Adequately Surveyed Area

Submitted by:	Japan
Executive Summary:	When a disaster caused a significant reduction of the reliability of depths, the identification of areas where contains high reliable depths is important after the survey. Japan proposes the method of the depiction, limits of such areas.
Related Documents:	IHO S-4 B-417 , B-439.1, INT 1
Related Projects:	None

Introduction / Background

An earthquake and a tsunami that occurred in Japan on 11th march 2011, there happened differences between the current situation and what the charts show in affected ports, such as quays collapsing, underwater obstructions existing, and large changing depth. Therefore, Japan conducted adequate surveys, and nautical charts were updated with the results. Limits of the survey areas are shown by magenta dotted lines in charts. Currently, in S-4, there is no provision of such a symbol showing survey areas. As for Japan's action to charts of the ports affected after the earthquake disaster, see Appendix.

Analysis / Discussion

After the removal of obstructions, in the passage in affected ports adequate surveys were conducted in the passage and along major quays. Results of the surveys are adopted on the charts. Charted depths derived from the pre-quake surveys are unreliable. In order to distinguish between the areas surveyed before and after the disaster, a Zones of Confidence (ZOC) diagram was prepared.

However, chart users, such as pilots and captains in Japan required that limits of survey areas were shown on the charts. That's because it is difficult to identify the limits of survey only with the Zones of Confidence (ZOC) diagram. So the limits are depicted by magenta dotted lines on the charts.

Area with inadequate depth information is described in B-417.

B-417.1 Warning of potential hazards. There are no simple rules for deciding when and how to warn mariners of the greater degree of risk in certain areas. ……

The situation of the charts affected by the disaster fell into the above case. Existing symbols, such as magenta dashed lines, were not considered

appropriate to show the limits. Japan thought that it was necessary to use new symbols such as dotted lines.

We discussed existing symbol as follows:

B417.7 Cautionary notes in situ. Where a bold line cannot easily be drawn around an inadequately surveyed area, an alternative is to insert a legend (eg: '*Depths (see Source Diagram)*' or '*Caution: incomplete survey*') in an appropriate location. A reference may be made to the Source or ZOC diagram. ……

Cautionary notes cannot indicate the limits of area clearly.

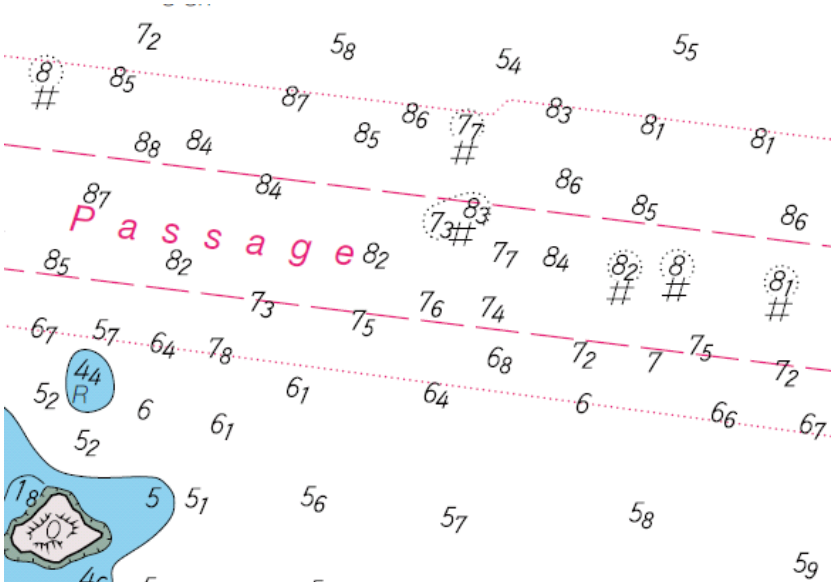
B-417.6 Areas delimited by a bold line. In some rocky or coral reef waters, depth information may be so inadequate that a very positive form of warning is required. Such areas must be shown by bold dashed black or magenta limits, with the legend.

This line is used to enclose areas inadequately surveyed or of unreliable depth information, which is not appropriate to show a safe area.

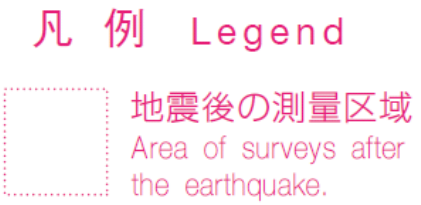
B439.1 The limits of non-restricted areas must be represented by a dashed line……

The limits depicted by dashed lines (Black or Magenta), it would become difficult to distinguish with the other lines, and the chart would be complicated.

So magenta dotted lines are adopted to easily distinguish areas, survey after the earthquake or survey before the earthquake.



Also, because it is not listed in INT-1, the following legend is depicted in the chart.



Examination of the symbol

If the limits are depicted on the chart alone, it is difficult to identify which side of the limit is the newly surveyed area. Therefore, the limits of survey area should be used in combination with Zones of Confidence (ZOC) diagram.

A limit of new survey area is important information for a chart of affected ports. So mariners may want to copy the limit of survey area from the ZOC diagrams into the main chart. But it is difficult to copy the limit accurately from the ZOC diagrams, as shape of survey area is complicated.

Magenta dotted lines are inconspicuous. So the lines have advantage that they do not disturb reading depth and planning navigation.

Conclusions

In charts of coastal areas affected by a major disaster, it is important to clarify newly surveyed areas, where ships can navigate safely referring the charts. In such case, magenta dotted line symbol give advice, in the adequacy and accuracy of the charted depths and their positions, for mariners and planning navigation. Therefore, Japan believes that the lines should be adopted with the ZOC diagram, to show survey after the disaster such like this time.

Recommendations

The following recommendation is proposed.
- Insert dotted magenta lines for indicate the extent of the survey areas, ' line that indicates areas surveyed after a catastrophe; in B-417.8 or B-439.1.

Justification and Impacts

The areas of the survey after a catastrophe for the earthquake and the tsunami, they can be become easier to distinguish.

Action required of CSPCWG

CSPCWG is invited to check the status of each country of a Zones of Confidence (ZOC) diagrams and magenta dotted lines, and to discuss the need.

Appendix

Report

Action for nautical charts which cover harbours and ports affected by the great earthquake and tsunami

Introduction / Background

An earthquake and a tsunami that occurred in Japan on 11th march 2011, there happened differences between the current situation and what the charts show in affected ports, such as quays collapsing, underwater obstructions existing, and large changing depth. We surveyed adequately along major quays and within passages, and then these survey results were used to update the affected charts. We started to add Source Diagrams on the affected charts, to help chart users to distinguish new survey areas (i.e. areas surveyed after 3.11) from old survey areas (i.e. areas surveyed before 3.11). In our Source Diagrams, new survey areas are filled with solid blue and it provides information about Zones of Confidence of the survey. In addition to these options, we also started to show the limit of new survey areas on the affected charts, with dotted lines in magenta.

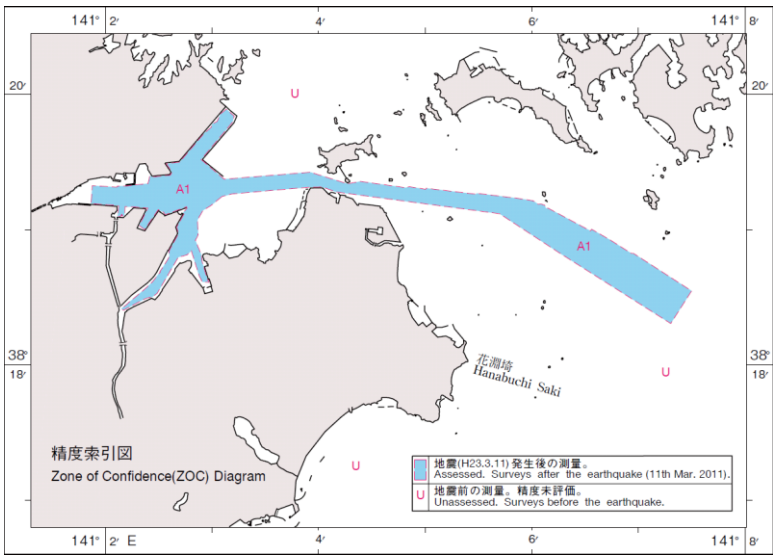
Activities

1. Fill the new survey areas with solid blue on Zones of Confidence (ZOC) diagrams

Measure for use of colour on Source Diagrams is provided in S-4 B-297.5 and this paragraph says that we should see B-293 and B-293.3. According to B-293.8, special measures for B-293.3, we may adopt some special measures to highlight the channels.

B-293.8 Special measures may be taken in cases of particular importance to highlight more clearly where channels lie in relation to the limits of the source data, ……

We used solid blue to show the new survey areas more clearly, based on B-293.8. As we cannot spare enough space on the charts to describe all ZOC categories, distinction about survey ‘before’ and ‘after’ the earthquake only is shown. The rest of ZOC categories are notified in Notice to Mariners and our website.

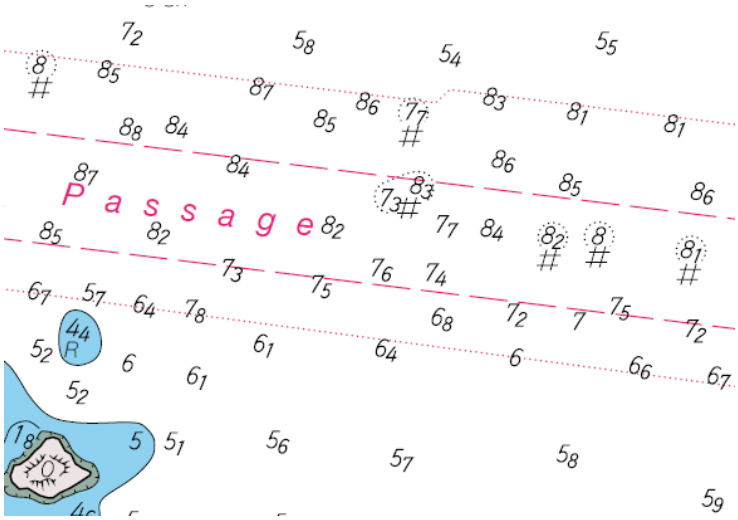


2. Limits of the survey areas are shown by magenta dotted lines in charts

After the removal of obstructions, in the passage in affected ports adequate surveys were conducted in the passage and along major quays. Results of the surveys are adopted on the charts. Charted depths derived from the pre-quake surveys are unreliable. In order to distinguish between the areas surveyed before and after the disaster, a ZOC diagram was prepared.

However, chart users, such as pilots and captains in Japan required that limits of survey areas were shown on the charts. That’s because it is difficult to identify the limits of survey only with the ZOC diagram. So the limits are depicted by magenta dotted lines on the charts.

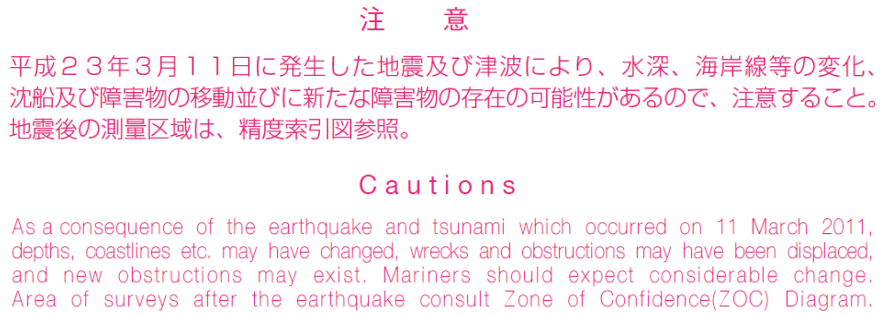
So magenta dotted lines are adopted to easily distinguish areas, survey after the earthquake or survey before the earthquake.



Also, because it is not listed in INT-1, the following legend is depicted in the chart.

3. Add a cautionary note

After the earthquake, Hydrographic and Oceanographic Department added a cautionary note to affected harbour-scale charts and berthing-scale charts. Whole text of this note is ‘As a consequence of the earthquake and tsunami which occurred on 11 March 2011, depths, coastlines etc. may have changed, wrecks and obstructions may have been displaced, and new obstructions may exist. Mariners should expect considerable change.’ And, after we completed new survey, we added another sentence ‘Area of surveys after the earthquake consult Zone of Confidence(ZOC) Diagram.’ to this note.



4. Action for outside areas of new survey

Areas not surveyed adequately after the earthquake came under areas with inadequate hydrographic information, as described in B-417. However, as a result of consideration 2., we decided not to modify outside area of new survey, but to provide new information with a cautionary note, dotted line in magenta that show the limit of new survey, and ZOC Diagrams.

Conclusions

In charts of coastal areas affected by a major disaster, it is important to clarify newly surveyed areas, where ships can navigate safely referring the charts. In such case, magenta dotted line symbol give advice, in the adequacy and accuracy of the charted depths and their positions, for mariners and planning navigation. Therefore, Japan believes that the lines should be adopted with the ZOC diagram, to show survey after the disaster such like this time.

In Japan, we will continue to show the limit of new survey areas on the affected charts, with dotted lines in magenta and new survey areas are filled with solid blue on ZOC Diagrams.