Questions for TSMAD to address

Initial comments in blue from Tom Richardson/Barrie Greenslade UKHO

These comments do not represent the views of the TSMAD working group or the UKHO and are seen as input to an ongoing discussion only.

We have addressed the following questions based on an approach which uses ENCs and tide prediction/observation data to enable the ECDIS to produce a dynamic layer. This would display a tide adjusted safety contour and tide adjusted depths. It would use standard ENCs but would clearly provide more accurate information where smaller interval depth areas and additional soundings are included. This approach would require a standard format for the supporting tidal predictions to be specified.

   Q1. Who requires Dynamic Tides?

Feedback from the 2nd S-101 Stakeholders Workshop indicates that mariners wish to see dynamic tides in ECDIS. Vessels using routes or entering ports where maintaining acceptable UKC requires the use of tide need to consider the state of tide when planning and executing voyages. Use of dynamic Tides avoids the need for time consuming tidal adjustments and re-adjustments when changes occur. More detailed depth and tidal information also supports more efficient routing and voyage optimisation as more detailed information may allow for the use of routes currently discounted at the route planning stage.

   Q2. What are the requirements of the users?

   a. Accuracy
   Break accuracy down into vertical and horizontal elements both for the bathymetry and the predictions. Overall accuracy will be a composite of the two, if this was categorised the resulting tide adjusted safety contour could be coloured accordingly. Need to try and develop some sort of Zone of confidence for predictions away from the tidal station and from secondary ports to factor into this. Allowing for better quality data using tidal models and allow for observations supplementing the data in the future.

   b. Timing
   Is this asking the time interval of predictions used? Would consider hourly predictions required with interpolation used between each prediction?

   c. What is the rate of change in range relative to time? i.e. Are the updates to the ECDIS to happen at regular time intervals or only when there is a dramatic change in range >6cm. Keeping in mind that most soundings are stored to the nearest 10 cm or 0.1 foot
   User needs to see both a safety contour and a tide adjusted safety contour. This contour can either be static ie based on the situation now or dynamic ie based on the time the vessel will reach that position. Updating of this would be at a set time interval basing this on the depth changes would be more complex.

d.   What scale/data density is this to be applied to? Are we only looking at ENC Nav 5 and 6?

Primarily Scale Bands 5/6 although some band 4 cells might be considered.

e.   What data density is going to be available in the ECDIS? How are the changes to the soundings going to be shown to the end user? Are the colour bands just going to change colours or are the contours going to change?

Various densities depending on the area and the data held. Suggest that including an additional tide adjusted safety contour is required which can be viewed alongside the ENC derived contour. Soundings within the safety contour could be adjusted and displayed using a different colour to indicate they have been adjusted for tide. By using depth areas at smaller intervals say 1m contours the tidal safety contour would act just like the existing safety contour.

Q3. How will ENC Cells be "Tide" aware?

The consensus here is that ENCs will be Tide Supporting not Tide Aware. Meaning they will contain bathymetry of a suitable quality and captured in the correct manner eg 1m interval depth areas. However this may be for certain areas of the cell only where data exists or where tides are critical.

Q4. What are the legislative framework around tides related to charted depths?
a.   Will SOLAS require updating to encompass UKC and dynamic tides with respect to ECDIS?
b.   Is this a service just for ECDIS-compliant users or for ECDIS and ECS?

Should just specify for ECDIS, ECS is outside of scope. If producers of ECS wish to use the standards they are welcome to.

Q5. What are the data provision and licensing required?
a.   Ownership of the data
b.   Costs of access to data
c.   implication for 3rd party data
d.   Intellectual Property
e.   data quality
f.   liability issues
g.   How is the service to be provided? Eg through HO or RENC
h.   Who tests the data and is a test standard required?
i.   Will the data also need to meet S-63 encryption protocol?
j.   Where does published paper tide tables and digital tide tables fit in this solution?

Feel that these questions are outside the scope of TSMAD. Data quality has been discussed above. Some sort of encryption would be required; potentially S-63 could be used.

A Tidal data supporting such a layer would contain almost all information found in the

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Paper Tide Tables. Therefore it could be used for back of bridge applications or those on the web. Using XML it could also support output of hardcopy Tide Tables using XSL.

k. Are private industry going to form part of the working group to develop this to address their issues on developing code to use the tidal data to interact with their SENC.

As with a common kernel for S-100 a tidal module could be developed and shared or potentially integrated into the S-100 kernel with allowances made for other add ons to be included as with Active X controls etc?

There will need to be interaction with industry - this could be managed through the S-101 Stakeholders Workshops perhaps one could be held focussing on Tides.

Question remains are we realistically going to be able to implement dynamic tides before S-100 ECDIS and S-101 Enc's ?

Yes, through developing an ECDIS layer which is implemented by OEM's, dynamic tides can be included with S-57. Experience from this will then provide useful input to including dynamic tides for S-101 ENCs in future.