

**Tidal and Water Level Working Group**  
(27-29 April 2010 – Stavanger, Norway)

Paper for Consideration by TWLWG

## Rules for dynamic water level in ECDIS

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<b>Submitted by:</b>	Finland
<b>E Executive summary:</b>	Current rule for legal type approved ECDIS makes it illegal to adjust water level for any reason. At the same time non-regulated ECS equipment widely provide this functionality. Therefore there exists a need to set rules how the dynamic water level adjustment can be allowed in an ECDIS.
<b>Related documents:</b>	N/A
<b>Related projects:</b>	N/A

### Introduction

For many years this topic has been called “Tidal adjust”. In this paper this topic is called as “water level adjust” because there are also other reasons than tidal currents which cause change of water level.

Possible sources for water level adjust value

- a) Adjust value is stored in an object available in a S-57 ENC chart cell. For example in one of the tidal objects
- b) Adjust value is available from VAR (=value added reseller) as part of his value added services in top of S-57 ENC chart delivery
- c) Adjust value is set manually by the end user
- d) Adjust value is received from real-time measurement station

It is foreseen that the first two alternatives are no good for this dynamic adjust. The 3<sup>rd</sup> alternative - adjust value set manually by the user might be acceptable. The 4<sup>th</sup> alternative is the one and only always acceptable source for dynamic adjust of water level.

Other considerations around use of water level adjust value

- 1) In addition to the value itself, the change rate of the value must be available
- 2) The value must have time stamp and the use of the value must expire after a timeout from the timestamp
- 3) There is also a need that a significant change of the value by the change rate should cause expiration of the value even before the value would expire based on timestamp and timeout
- 4) In addition to value itself, the applicable area within which the value can be used must be available
- 5) End user should easily understand from the display of the ECDIS if the dynamic water level adjust is in use
- 6) End user should have easy method to see the unadjusted version of the display of the ECDIS

One open aspect of water level adjust value is if there should be requirement for the content of the S-57 ENC chart cell itself in order that that it can be used for dynamic water level adjust. The S-57 ENC product specification allows the producer to put as many different water depth areas as he likes – somebody may have decimetre level available (e.g. 0.0, 0.1, 0.2, 0.3, ..... ) and another may have only a few levels (e.g. 0.0, 10.0 and 100.0). The issue is that do we need some minimum rule for the content of the S-57 ENC cell in order that it is “dynamic water level adjust compatible”.

Final consideration around the dynamic water level adjust is how it should change (or not change) behaviour of the Safety contour based alarms for real-time own ship, monitored route and planned route.

# Proposal

The following is proposed:

Water level adjust compatible S-57 ENC chart cell

- Must have at least every 1.0 m depth area from +1.0 m to -2.0 m from the adjusted value of the safety contour. An example: original safety contour 10.0 m, adjusted safety contour 6.7 m => Adjust can be performed for a chart with at least depth areas of 7.0, 6.0 and 5.0 m. Adjust cannot be performed for a chart with only 10.0, 5.0 and 0.0 m depth areas.

Content of water level measurement message. At least the following information must be included in a message

- Measured water level adjust value (unit meters)
- Measured water level change rate (unit meters/hour)
- Applicable area at least with 4 corner coordinates, but allowed up to 10 corner coordinates for more complex geometry
- Coordinate of measurement point
- Time stamp of the measurement in UTC
- Name of the measurement point

Operational requirements for the ECDIS

- If water level adjust is in use then it changes water areas in visible display, alarms+indications from own ship safe area and alarms+indications from monitored route
- If possibility for water level adjust is available, then the Route planning must include a method to check the route against adjusted water level. Further it is required that the water level adjust profile of the route plan is stored and that the ECDIS provide at least caution method to indicate if the checked condition of the route plan was different from the current condition when the same route is used for monitoring.
- If water level adjust is in use then the ECDIS must provide a "Single operator action" available to view the unadjusted chart
- If water level adjust has been selected by the user then a permanent indication must show state as below
  - Adjust selected but no water level measurement messages available
  - Adjust selected and currently in use
  - Adjust selected but last water level measurement message has expired
  - Adjust selected but current S-57 ENC chart cell is not compatible with the adjust rules
- If water level adjust has been selected by the user then on demand the ECDIS must be able to show with transparent highlight the applicable area within the chart display
- If water level adjust has been selected by the user then on demand the ECDIS must be able to show following details of the water level measurement messages: name of the measurement point, coordinates of the measurement point, time stamp, measured value, change rate, calculated value by measurement together with change rate

## Conclusion

This paper is intended to be a good start point of serious discussion in order to set rules for allowing dynamic water level adjust in an ECDIS.

## Actions required by TWLWG

The TWLWG2 meeting is invited

- to take note on this information and
- to agree on further actions