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TWLWG Workplan Task C.2
Develop a Standard for the transmission of real-time water level data

Introduction

This task was developed in conjunction with TWLWG Work Plan Task C.1, "Liaise with TSMAD on tidal matters relevant to the Dynamic Application of Tides in ECDIS". This standard will provide guidance on the source, quality, and transmission parameters for tidal data to be integrated into an ECDIS requiring dynamic application of tides. It is anticipated that many ECDIS products will be forthcoming from areas classified as non-tidal. For purposes of this document, "tidal" is included in the broader term "water level" as the fundamental issues are the same.

Discussion

The consequences of incorrect real-time water level elevations or miss-applied water level data are potentially severe if an ECDIS user is depending upon water level data to make a decision for a safe transit or docking maneuver, for instance. Thus, a Standard for Transmission of Real-time Tidal Data should provide guidance on data source, data quality, data availability and elevation uncertainty.

1) **Data Source –** water level data must be transmitted from a tide gauge operated in accordance with documented and accepted engineering specifications. This includes proper preventive and corrective maintenance of the tide station components, including proper surveying to ensure vertical stability of the sensor and supporting platform. The sensors must be deployed to ensure measurement of the maximum expected high and low water levels

    - **Backup Data Sources:** Alternate sources of real-time water level data may include data from a backup sensor or from a redundant tide gauge nearby. In addition, after appropriate study of uncertainty and certification for their use in an operational real-time mode, water level data may be from predicted tides or from an interpolation or numerical hydrodynamic tide model.

2) **Data Quality –** observed water level must undergo automated and/or manual quality control review on a 24x7 basis to ensure that erroneous information is not applied. Erroneous data must be flagged for the users or deleted from the transmission to the user. Data quality flags should include checks for tolerances exceeded for parameters such as (but not limited to) rate of change, expected maximum, expected minimum, flat spots, difference between primary and backup sensors, difference between observed and predicted tides.

3) **Data Availability –** quality controlled water level data relative to Chart Datum must be continually available on a 24X7 basis at a time increment not to exceed 15 minutes for most

applications (the USA uses 6-minute interval data, for instance and studies have shown hourly data are not often enough for most real-time applications in tidal areas).

4) **Elevation Uncertainty –** water levels must be known relative to the Chart Datum to within 0.10m (95% confidence interval). The Chart Datum at the water level gauge must be determined from observations using accepted chart datum determination procedures or surveyed –in to the water level gauge from known elevations on nearby survey points.