

Review of Relevant IHO Technical Resolutions – Submitted by the IHB

In the annex to this document you will find all the extant Technical Resolutions (TRs) of the IHO which, in the view of the IHB, fall within the remit of the TWLWG for review.

All resolutions were reviewed by the IHOTC over the course of the last 3 years and the recommendations from the IHOTC have been approved by Member States and incorporated.

It is therefore unlikely that further revision is currently required, however the TWLWG are requested to consider them at each meeting and identify any changes that become necessary.

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A2.5 DATUMS AND BENCH MARKS

- 1.- It is resolved that heights on shore, including elevations of lights, should be referred to a HW datum. Heights should be referred to Mean Sea Level (MSL) where the tidal range is not appreciable. The datum used should be clearly stated on all charts.
- 2.- a) It is resolved that the datum for tide predictions shall be the same as chart datum (datum for sounding reduction). It is further resolved that the Lowest Astronomical Tide (LAT), or as closely equivalent to this level as is practically acceptable to Hydrographic Offices, be adopted as chart datum where tides have an appreciable effect on the water level. Alternatively the differences between LAT and national chart datums may be specified on nautical documents. If low water levels in a specific area frequently deviate from LAT, chart datum may be adapted accordingly.
- b) It is resolved that Highest Astronomical Tide (HAT) be adopted as the datum for vertical clearances where tides have an appreciable effect on the water level. Alternatively the differences between HAT and national datums for vertical clearances may be specified on nautical documents. If high water levels in a specific area frequently deviate from HAT, the datum for vertical clearances may be adapted accordingly. It is further resolved that a HW datum be used for vertical clearances in non-tidal waters.

Notes:

- i) LAT (HAT) is defined as the lowest (highest) tide level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions. It is recommended that LAT and HAT be calculated either over a minimum period of 19 years using harmonic constants derived from a minimum of one year's observations or by other proven methods known to give reliable results. Tide levels should, if possible, reflect the estimated error values obtained during the determination of these levels.
- ii) In non-tidal waters, in order to allow the development of regional solutions, it is recommended that an appropriate long term range of low/high water definitions of the lower/upper 94-100 percentile be adopted.
- 3.- It is resolved that chart datums (datums for sounding reduction), the datums of tide prediction and other tidal datums shall always be connected with the general land survey datum, and, in addition, with a prominent and permanent fixed mark in the neighbourhood of the tide gauge, station, observatory etc.
- 4.- It is resolved that ellipsoidal height determinations of the vertical reference marks used for tidal observations should be made, in order to support the production of seamless data sets; i.e. to allow the translation between data sets with differing vertical datums. It is further resolved that such observations should relate to a geocentric reference system, preferably the International Terrestrial Reference System (ITRS) or one of its realizations e.g. the World Geodetic System 1984 (WGS84).

A2.8 USE OF TERMS "TIDE", "TIDAL STREAM" AND "TIDAL CURRENT"

- 1.- It is resolved that the term "tide" or its equivalent in another language shall be used for designating the periodical vertical movement of the water, and the terms "tidal stream", "tidal current", or their equivalents for designating the periodical horizontal movement of the water.

A2.9 DESCRIPTION OF CURRENTS AND TIDAL STREAMS

- 1.- It is resolved that a current shall be described by the direction towards which it is running.

- 2.- It is resolved that tidal streams shall be defined by the direction towards which they flow.
 - a) If desired, the terms "flood stream" and "ebb stream" may be used for designating the horizontal movement of the water when the tide is respectively rising or falling, but to avoid any ambiguity, in the case of streams which do not turn at about the time of local high or low water, an indication shall be given of the direction towards which the stream flows.
- 3.- It is resolved that information relating to tidal streams shall be referred to the time of high or low water at a port for which tidal predictions are given in the Tide Tables.
- 4.- It is strongly recommended that the port selected for reference be preferably a port for which daily predictions are given in Tide Tables (standard ports) and where the tides have similar characteristics to those of the currents under consideration.
- 5.- The rules of the above paragraphs 3 and 4 would not be applicable for those countries which publish Current Tables giving daily information relating to tidal streams with reference to the hours of the day. In such instances, it is recommended that the reference be made to the time of slack or maximum current at a place for which daily tidal stream predictions are given in such Tables.
- 6.- It is resolved that velocities shall be given in knots to 1 decimal place.
- 7.- It is recommended that the effect of prevailing winds or long-continued weather conditions on local currents be recorded in Sailing Directions.

A2.16 NAMING CONVENTION FOR THE VERTICAL DATUM OF CHARTS

1. It is resolved that the vertical datum used on navigational charts, Chart Datum (CD), be defined without ambiguity in order to enable subsequent bathymetric data comparisons to be conducted in an efficient and reliable manner and for the accurate combination of datasets using different vertical datums.
2. It is recommended that a designated epoch for example CD (2006) or LAT-UK (2000) be used. The decision as to when a change in CD for a given area is necessary and the name given to that specific definition of CD remains a matter for each Member State based on their national requirements.

A6.1 EXCHANGE OF TIDAL INFORMATION

- 1.- It is resolved that published tidal information shall be freely exchanged.
 - a) The exchange of tide and tidal current observations and predictions shall be made as far as possible in a form directly usable in electronic computers.

A6.2 ADVANCE SUPPLY OF TIDAL PREDICTIONS

- 1.- It is resolved that advance copies of tidal predictions shall be supplied on request to those Member States who require them for inclusion in their own published tables.
2. - It is strongly recommended that these advance copies be supplied in sufficient time to be in the hands of the publishing authority not later than twelve months before 1 January of the year of predictions.
- 3.- It is recommended that when tidal constituents or values of harmonic constants are changed from those used for tidal predictions for the previous year, the tidal constituents should also be supplied to the producer nation upon request together with the national tidal predictions.

4.- It is recommended that tidal predictions supplied to other countries be in the form of the times and heights of high and low waters, unless these values are not normally predicted or are requested in another form.

A6.3 ISSUING AUTHORITIES FOR TIDAL PREDICTIONS

1.- In the general interests of navigation it is resolved that tidal predictions to be used for any important commercial port or approach areas within a country's territorial waters shall be those established by the appropriate authority in which the port or the approach area is situated or is being maintained. It may be necessary to establish the authority for predictions if such predictions are made on a regional co-operative basis where several narrow stretches of water separate States.

- a) In this connection, it is strongly recommended that Member States extend their tidal observations to those areas, and prepare and publish their predictions.

A6.4 EXTENSION OF WORLD NETWORK OF TIDAL OBSERVATIONS

1.- It is recommended that the world network of tide stations be extended, that some well-distributed stations operate continuously, and that special efforts be directed towards the establishment of stations on the outer sea coast of the continents and oceanic islands.

2.- It is recommended that governments which do not possess departments organized for this purpose be advised by the IHB as to the desirability and means of undertaking the installation of tide gauges, the analysis of the resulting records and the preparation of Tide Tables. This work, carried out for selected stations, is of importance both in the interests of navigation and of science.

- a) It is possible that such work might be financed by commercial corporations or by other institutions if they were brought to appreciate its utility.

3.- Concerning the extension of the world network of tidal stations with a view to improving cotidal line charts, it is recommended that:

- a) Hydrographic Offices give increased attention to the need for additional observations of tides and tidal streams in many areas not now adequately examined. It is noted that in certain regions observations extending over 29 days of tides and tidal streams are sufficient.

A6.5 STUDY OF MEAN SEA LEVEL

1.- It is recommended that the IHB encourage Member States to carry out systematic, long-term tidal observations, in view of the importance of monthly and secular variations of mean sea level in connection with tidal prediction.

2.- It is recommended that Member States make such data available for publication by the Permanent Service for Mean Sea Level of the International Council of Scientific Unions, since that service publishes regularly monthly and annual values of mean sea level for tidal stations throughout the world.

A6.6 GEOGRAPHICAL POSITIONS OF TIDE STATIONS

1.- It is recommended that when giving tidal information about stations whose identification on the chart is not obvious, the approximate geographical positions of such stations be indicated.

A 6.7 **COLLECTION AND PUBLICATION OF TIDAL DATA**

1. It is recommended that Member States gather tidal data from as many locations as feasible and maintain sets of harmonic constants in National Tidal Constituent Data Banks.
2. It is recommended that Member States make public, using their WEB site or other suitable means, a list of locations included in their own Tidal Constituent Data Banks.

A 6.8 **NATIONAL TIDAL CONSTITUENT BANKS**

It is resolved that the National Tidal Constituent Banks should store the following information for each location:

Location identification by number, name, country, body of water, and geographic coordinates;

Source, date, time zone, and duration of data used in analysis;

Identification of geodetic levelling datum, and date of reference to this datum, elevation of mean sea level and, where applicable, the connection to and identification of the appropriate bench mark(s);

Listing of values for tidal constituents giving amplitudes in metres and Greenwich phase lags in degrees and designation of organization responsible for analysis. (Tidal constituents used should form part of those in the Standard List prepared by the IHOTC and published on the IHO website.)

See also A 6.1, A 6.2

A6.9 **RELEASE OF TIDAL DATA TO COMMERCIAL ORGANIZATIONS**

1. Recommendations for a Strategy concerning the Release of Tidal Data to Commercial Organizations

1.1 Definition of a Commercial Organization

A "commercial organization" is an organization which sells or distributes products. This definition does not refer to national authorities when they sell or distribute products in the context of their duties as a public service.

1.2 Definition of Tidal Data

The term "tidal data" for this document includes any data leading to and including tidal and tidal stream predictions.

1.3 General considerations

In the interest of safe navigation, effective oil and hazardous material spill response, efficient search and rescue and improved environmental management, the following statements are intended as a framework for Hydrographic Offices to make arrangements with commercial organizations.

As the development of quality-assured tidal predictions is a complicated matter, comprehensive knowledge and experience of tidal theory and practice are absolute prerequisites.

Computer technology can provide valuable support in presenting tidal predictions to users in convenient forms. However, the methods to present such information must be applied in an appropriate manner or data quality may suffer. Some Hydrographic Offices may find it unnecessary to develop all the products which are desired by all users; some development may be left to commercial organizations.

1.4 Recommendations

- 1.4.1 The Hydrographic Offices should NOT be responsible for the correctness of any predictions developed and distributed by commercial organizations.
- 1.4.2 Official tidal predictions should be released by Hydrographic Offices only. Hydrographic Offices may, however, authorize recognized institutions to calculate and/or distribute these official predictions. Hydrographic Offices or these institutions authorized by them may release their own harmonic constituents, but not those of other Member States, as may be deemed appropriate.
- 1.4.3 Any product of a commercial organization should only be supplementary to obligatory official information required in terms of international conventions.
- 1.4.4 Authorized tidal differences or harmonic constituents should be supplied by the Hydrographic Offices for secondary stations.
- 1.4.5 In addition to the products outlined above, Hydrographic Offices should have the right to produce, market and distribute any tide related products.
- 1.4.6 Where applicable, commercial organizations should be allowed to distribute official tide related products with the permission of the producing Hydrographic Office.

2. **Recommendations for Standards to be applied in connection with the Release of Tidal Data**

- 2.1 Predictions used for primary stations should only be those provided by the Hydrographic Offices, unless a specific agreement is made between an HO and some other body.
- 2.2 For secondary stations, predictions based either on tidal differences or on harmonic constituents may be published, in all cases including the method, source, date of analysis and the relevant primary station. This applies to numerical as well as graphical representation.
- 2.3 If a Hydrographic Office believes that, by using information obtained from a commercial product, a danger to life, property or the environment may result, the Hydrographic Office should take such action as it may deem appropriate to fulfil its responsibilities in the field of maritime safety. This should not be construed, however, to mean that Hydrographic Offices have responsibilities for inspecting the products of commercial organizations (*see Section 3 below*).
- 2.4 Legal matters, matters of copyright and of charges to be paid are different in each country and are very complex. They are left to the discretion of each Member State.
- 2.5 Commercial organizations developing products *should* be required to state clearly on their products the following:
 - i. That the information being presented does not replace obligatory navigation material.
 - ii. That where the original data were provided by a Hydrographic Office, a disclaimer should appear that, as the Hydrographic Office has no control over the product, it cannot accept any responsibility for it, except for those parts of the product which are a complete and true reproduction of official predictions issued by the Hydrographic Office.
- 2.5.1 A sample product may be required to be made available to the Hydrographic Offices responsible and/or to each donating authority prior to distribution, to ensure the imposed conditions are honoured. The Hydrographic Offices concerned should respond within a mutually acceptable time scale.
- 2.5.2 The data remain the property of the donating agencies.

3. Recommendations for Standards to be applied in connection with the inspection of the products of Commercial Organizations

Inspection of commercial products by Hydrographic Offices *is not recommended* as examination may imply approval with its attendant responsibilities and liabilities.

G1.1 MEAN SEA LEVEL SYMBOLS

1.- It is resolved that the following symbols shall be used in nautical publications to denote:

- Zoo : The best practical figure which can be obtained for the height of mean sea level, referred to the datum in general use.
- Zo : Height of mean sea level, as obtained from any individual analysis, above chart datum.
- So : Height of mean sea level, as obtained from any individual analysis, above the zero of observations.
- Ao : Height of mean sea level, as obtained from any individual analysis, above an arbitrary datum, different from chart datum or the zero of observations.

G1.2 TIME TO BE USED

- 1.- It is resolved that the time system employed shall be that actually used at the port.
- 2.- It is resolved that daylight saving time shall not be used in the predictions in the Tide Tables but that a notice or caution relative to its use and the period of its application shall be included therein.

G 2.1 TRANSLATION OF HEADINGS, etc.

1.- It is recommended, principally for those Tide Tables which are not published in Roman characters, that the headings of divisions and columns include a translation in English, French or Spanish, in order to increase the international usefulness of the publication.

G3.1 INFORMATION TO BE GIVEN IN TABLES

It is resolved that Tide Tables shall include:

- 1) Detailed predictions for the ports chosen as standard ports ; these predictions may consist of either the time and height of high and low water or the hourly heights of the tide;
- 2) Special tables giving data required for calculating, from the predictions for the standard ports, the corresponding predictions for the secondary ports.

G3.2 MEAN SEA LEVEL

1.- It is resolved that the height of mean sea level above chart datum (Zo) shall be stated clearly in Tide Tables and in a concise manner on charts.

See also G1.1.

G3.3 MENTION OF ORIGIN OF TIDAL PREDICTIONS

1.- It is recommended that the Hydrographic Offices which publish predictions supplied by other countries give the origin of such predictions in their Tide Tables.