



IHB File No. S3/1401/WG

CIRCULAR LETTER 98/2007  
5 November 2007

## REVIEW OF TECHNICAL RESOLUTIONS BY THE IHO TIDAL COMMITTEE

Dear Hydrographer,

1 At its 8<sup>th</sup> meeting in Halifax, Canada from 23 – 25 October 2007 the IHO Tidal Committee reviewed the following Technical Resolutions (TRs) which relate to Tidal Matters: A2.5, A2.8 and A2.9; A6.1 to A6.9; G1.1 to G3.3; and K1.7. The Tidal Committee proposes introducing a new TR A2.16 and amending TRs A2.5, A2.9, A6.4 and K1.7.

### 2 Proposed new TR A2.16

IHO TR A2.5 states that LAT is to be used as Chart Datum (CD) and note 1 to paragraph 2b of TR A2.5 provides guidance on the calculation of LAT. However, until now the vertical datum used on a chart has simply been referred to as CD, with no indication of the date on which it was established.

The level of CD in any given area may be revised from time to time due to changes in the characteristics of the tide caused by tectonic movements, sea level changes etc. and the need to ensure that charts enable ships to make the maximum safe use of the area.

The increasing requirement to handle multiple digital data sets, whether to combine them for example in coastal hydrography and topography, or to compare data from different epochs to assess rates of change, requires that the datum levels used are clearly and unambiguously defined.

Currently there is no guidance on how changes in the level of CD should be recorded. It has long been the practice with horizontal datums to include the epoch or year of their determination in their name for example Clarke (1866), Clarke (1880), WGS72 and WGS84. The Tidal Committee proposes that a similar convention be adopted for CD; for example, CD (2006) or LAT-UK (2000). The decision regarding 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 to decide.

The proposed text for TR A2.16 is at Annex A.

### 4 TR A2.5

In section 1 additional clarification is provided concerning the use of MSL where tidal range is not appreciable. This clarification harmonizes TR A2.5 with "The Chart Specifications of the IHO" (IHO Publication M-4) section B-302.2, B-380.1 and B405.2 and better reflects the views of the Tidal Committee.

In section 2 note ii, the words "an appropriate long term" has been added as it is important that anomalous short term variations are removed from the data.

In section 4 an additional example "ITRS" is included, because reference frames based on the International Terrestrial Reference System are increasingly being used.

5        **TR A2.9**

In section 6 the additional words "to 1 decimal place" are included to bring this TR into alignment with "Chart Specifications of the IHO" (IHO Publication M-4) section B-407.1.

6        **TR A6.4**

Section 3(b) is deleted as this is no longer relevant.

7        **TR K1.7**

K1.7 is deleted in its entirety as this is no longer relevant.

The amendments are shown in detail at Annex A and a voting form is at Annex B. **Member States are requested to return the completed voting form to the IHB by 31 January 2008.**

8        The IHB would like to take this opportunity to thank Commander John Page of the UKHO for his long standing contribution to the work of the IHOTC. Commander Page is stepping down as Chairman of the IHOTC due to his pending retirement from the UKHO, The Directing Committee congratulates Mr Stephen Gill of the USA (NOAA) on his election as the new chairman of the IHOTC for the period 2008 - 2012.

On behalf of the Directing Committee  
Yours sincerely,

A handwritten signature in blue ink, appearing to read "Robert Ward", with a period at the end.

Captain Robert WARD  
Director

Annex A: Amendments  
Annex B: Voting Form

Please note that in the following text all amendments are **highlighted**, new text is in “*italic*” font and deleted text is “~~struck through~~”.

#### 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.*

#### 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 ~~œ~~ 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 World Geodetic System 1984 (WGS84), *or the International Terrestrial Reference System (ITRS)*.

#### 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.

#### 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.
  - ~~b) The IHB continues to issue, on this subject, circular letters which should include the stations listed in the proposal made by France at the 1952 Conference.~~

**K1.7 — COLLECTION AND PUBLICATION OF INFORMATION REGARDING TIDAL DATA**

It is resolved that the IHB shall:

1. — Undertake a study of the most appropriate computer compatible formats for the exchange of tide and tidal current observations and predictions, including values of harmonic constants;
2. — Distribute these formats to be used for this exchange to all Hydrographic Offices;

*See also A6.7, A6.8.*

**Adoption of new / amended Technical Resolutions**

Voting FORM

*(to be returned to the IHB by 31 January 2008  
E-mail: [info@ihb.mc](mailto:info@ihb.mc) - Fax: +377 93 10 81 40)*

**Member State:** .....

**Do you approve TR A 2.16**

**YES**

**NO**

**Comments (if any):**

**Do you approve the amendments to TR A 2.5**

**YES**

**NO**

**Comments (if any):**

**Do you approve the amendments to TR A 6.4**

**YES**

**NO**

**Comments (if any):**

**Do you approve the amendments to TR K1.7**

**YES**

**NO**

**Comments (if any):**

Name / Signature .....

Date: .....