

4th IHO-HSSC MEETING
Taunton, UK, 25-28 September, 2012

Paper for Consideration by HSSC

S-32: Definitions of Altitude, Elevation and Height

Submitted by:	UK (CSPCWG Chairman)
Executive Summary:	The definition of altitude, elevation and height have been changed in S-32, despite substantive objections raised by UK, some other MS and CSPCWG
Related Documents:	IHO Circular Letters (CL) 11 and 76/2012; HSSC4-05.9A (Report of HDWG)
Related Projects:	None

Introduction / Background

After lengthy preparatory work, HDWG's report to HSSC3 (HSSC3-09.5A) listed a very large number of revised definitions for S-32 (Hydrographic Dictionary). HSSC was not the appropriate forum to discuss the technical detail and this was not done. However, HSSC3 did endorse the proposal to put all the revised draft definitions to MS by CL (Action HSSC3/16 refers). Accordingly, CL11/2012 was issued to MS, with the outcome announced by CL76/2012.

Throughout the development process, CSPCWG had raised concerns with HDWG regarding the proposed changes to the existing definitions of 'Altitude', 'Elevation' and 'Height'. CL76/2012 reports that the proposal to change these definitions had been discussed with the chairmen of CSPCWG and TWLWG; it did not make clear that they had not been agreed by CSPCWG. However, the subsequent HDWG report (HSSC4-05.9A) does acknowledge that '*there may be a requirement for further consideration of these definitions in the light of the comments received*'.

CSPCWG considered these draft definitions in detail at its meeting in November 2011. An action resulted to produce papers explaining the issues (pros and cons) of the revised draft definitions for Elevation, Height and Altitude; ideally to be included as annexes to the CL. An alternative course was proposed by Secretary HDWG, to remove these 3 definitions from the list submitted to MS in the CL and to include an explanation that further discussion would be undertaken.

In the event, neither course was adopted: the CSPCWG papers were not included in CL11/2012; and the 3 definitions were retained in CL11/2012. So the issues were not brought to the attention of MS during the voting process.

UK and some other MS submitted their reservations individually in response to CL76/2012 (summary annex to CL refers) but, of course, these were not visible to voting MS until CL76/2012 was published. CL76/2012 further states that MS' comments which were editorial – rather than substantive – had been taken into account in the final published versions. However, no response or changes were made regarding the substantive comments regarding the proposed definitions of Altitude, Elevation and Height. With respect to the particular comments by UK (and other MS), the response was merely that 'HDWG did not fully agree'; no explanation is provided.

Analysis / Discussion

The detailed reasoning against the subject revised definitions is provided at Annex.

Conclusions

The full set of revised definitions has been endorsed by MS with the required number of votes (CL76/2012).

However:

- reservations about individual definitions (including specific disagreements) have been submerged in the large number of definitions presented in CL11/2012;
- MS were not presented with all the arguments for and against the proposed revisions;
- HDWG has not explained their reasons for not accepting the arguments and reservations of UK (and some others) and CSPCWG.

Recommendations

These 3 changed definitions require further consideration and scrutiny by the relevant WGs recognising that, for the reasons outlined, the original work was incomplete. Accordingly, a new work item is placed on HDWG, with support from CSPCWG and TWLWG.

Noting:

- this was the preferred route proposed by CSPCWG and (former) Secretary HDWG;
- HDWG's report (HSSC4-05.9A) states that '*there may be a requirement for further consideration of these definitions in the light of the comments received*';
- an assumption that, with the endorsement of the revised definitions by MS and their subsequent implementation in S-32, the new definitions must be retained for now, and cannot be reversed, notwithstanding the further scrutiny recommended.

CSPCWG will continue to forward new items to HDWG for consideration as they arise (e.g. the ongoing revision of S-4).

Action required of HSSC

HSSC is invited to:

- Endorse the recommendations above.
- Consider whether there are any lessons in terms of the adequacy of process.

Revised S-32 definitions: ‘elevation’, ‘height’, ‘altitude’

Introduction

1. Changes to the S-32 definitions of ‘elevation’, ‘height’ and ‘altitude’ were proposed in order to provide a clear distinction between the terms, as defined in the IHO S-100 Geospatial Information Registry, to remove ambiguity. A view that such a distinction may not be valid for paper charts and in general usage was raised in earlier correspondence between HDWG, CSPCWG and TWLWG.
2. At meeting CSPCWG8, November 2011, the delegates agreed that UK and AU would write separate papers outlining the two sides of the debate. These papers were prepared but, ultimately, were not included in CL11/2012 which requested Member States to vote on the revised draft definitions.

Discussion

3. It does not seem appropriate to redefine words to accommodate the needs of one particular product (ENC); where possible, definitions should be product neutral.
4. These words have been used synonymously for centuries on paper charts and in common English usage. (See similar situation with coastline and shoreline). The Oxford English Dictionary (OED) is an authority for the English language and has the following definitions:

elevation (OED definition 2): height above a given level, especially sea level.

height (OED definition 2): elevation above ground or a recognized level (typically sea level).

altitude: the height of an object or point in relation to sea level or ground level.

These are virtual synonyms in the geographic context (although the definition of height adds ‘above ground’, which is covered by the second S-32 definition).

5. Suggesting that ‘elevation’ should always be used for the surface of the earth, ‘height’ for the top of objects and ‘altitude’ for above the surface of the earth has no basis in common usage and causes particular problems. For example:
 - A ‘spot height’ always refers to the earth’s surface measured from sea level.
 - The ‘elevation’ of a light refers to the focal plane of a man made object.
 - Although ‘altitude’ is not generally used on English language charts, in French ‘altitude’ is used with exactly the same meaning as ‘height’ and ‘elevation’.
6. An assessment of many national charts shows that the English language notes below the title almost always refer to ‘Heights’ and cover all heights on the chart including: drying heights above CD (Chart Datum); heights above a sea level datum including heights of hills and the tops of objects; heights of the tops of objects above the ground.
7. Additionally, the official language versions of INT1 (and most national equivalents) refer to: heights of cliffs and islands in the introduction and K10; in relation to relief at C10-14; to heights of objects in sections D and E; to drying heights at H20 and I15. Elevation is only used in relation to lights, at P13. It is true, however, that a minority of countries use ‘elevations’ in exactly the same context and meaning as the majority use ‘heights’.
8. There seems no good reason why, in the proposed [now new] definitions, elevations are considered to be ‘usually referred to Mean Sea Level’, whereas

heights are 'usually referred to a High Water datum'. Both should state 'a sea level datum' as the actual datum will vary according to tidal/water level range and national practice, which should be stated on the chart.

9. Additionally, in one email exchange, an HDWG member stated that '*in the process of discussing the revised definitions, we conceded the synonymous use of the terms "elevation" and "height" in regard to paper charts, and have retained this in the definitions*'. And yet, in the revised definition of height, there is absolutely no indication that it could have any meaning other than the measurement of the **top of an object** (either above a specified datum or the ground). There is no mention that it can be synonymous with elevation (e.g. in its very common usage as a spot height).

Conclusions

10. There has never been a distinction between 'elevation' and 'height' in normal English usage or on most paper charts. Any distinction only applies to ENC and has been generated for the particular needs of that product. Attempting to apply the distinction more widely will result in either:
 - a requirement to make major changes to most paper charts and INT1 (and its national equivalents), which may confuse the chart user, or
 - S-32 differing from the reality of conventional charting practice.
11. Rather than introducing an arbitrary and belated hydrographic distinction, we should accept that there is none, and indicate in S-32 that the terms are usually synonymous (as far as the first definitions apply; there is no disagreement with the 2nd and 3rd definitions).

Recommendations

12. Recommended alternative definitions (based on the fact that 'height' is by far the commonest word used in this context):
 - Elevation** (1): see HEIGHT. On ENC, elevation excludes the vertical distance of the top of an object measured from a specified datum.
 - Height** (1): The vertical distance of a LEVEL, a point or the top of an object measured from a specified datum. On ENC, height only refers to drying heights and the top of an object affixed to the surface of the EARTH.
 - Altitude** (1): see HEIGHT.
13. It is further recommended that the definitions of 'spot height' and 'spot elevation' in S-32 should be reversed, as the former is the more common English usage by chart producers.