

NSHC 33rd Conference

Ostend, Belgium

27-28 March 2008

Report of the 22nd meeting of the NSHC-TWG to the 33rd NSHC Conference

1. Meetings and attendance

The 22nd NSHC-TWG meeting was held at the Agency for Maritime and Coastal Services in Ostend, Belgium on the 25 – 26 October 2017. Representatives from Belgium, Germany, Netherlands, Norway, and France attended the meeting.

2. Current actions

The TWG has continued to work to combine existing national models in order to develop a common reference surface for tidal reduction to Chart Datum in the North Sea. Adjacent are ongoing actions to share new developments on tide gauges, GNSS tidal reduction, and developments on publishing tidal information.

Several countries have their own reference surface related to the ellipsoid. There are discontinuities at adjacent maritime boundaries. During the 22nd NSHC-TWG meeting, the updates of the member country's reference surfaces (LAT) were discussed together with their impact on the bilateral difference calculated as $\frac{\text{difference}}{\text{depth}}$. The group discussed the fact that the bilateral difference along most maritime boundaries exceeds the unanimously accepted 1% mark at some point, normally in shallow waters near the coast where ships cannot sail. It was decided that the group would revisit the arbitrarily chosen 1% norm and redefine it based on something practical such as for example the IHO standard for hydrographic surveys (S44 table). To do this effectively, the TWG recommended to:

- share information on how each country built their respective reference surface as studying the used steps, the used bathymetry, the used number of in situ observations, ... could provide information on the origin of the observed differences
- make error estimates on each reference surface
- ask the NSHC what the goal of the Work Plan item is: is it to obtain a seamless LAT surface for charting (for safe shipping) or for modelling as for charting the observed differences are acceptable, but for studying they are not? Is it necessary to have a seamless surface as we also have a jump at land-sea boundaries TAW-LAT?

The group proposed to decide how the norm should be redefined before the next TWG meeting and to then make an according proposition to NSHC for acceptance.

3. List of deliverables and timing

- Make an overview of existing models, including metadata. Each member sends the information to UK.
- Create an overview of connection between EVRS and Chart Datum. Input expected in 2018.
- Investigate how each country built their respective reference surface. Each member sends the information to the Netherlands.
- Calculate error estimates on reference surfaces.
- Publish information of NSHC-TWG on www.nshc.pro. Each member sends input to BE who will forward it to the webmaster Bernd Vahrenkamp (DE).

4. Recommendations to the 33rd NSHC Conference

The 33rd NSHC Conference is invited to approve and amend, if necessary:

- this report
- publication of minutes on www.nshc.pro
- the work plan for NSHC-TWG, ANNEX A
- the action points, ANNEX B

After a discussion on European initiatives to develop new LAT surfaces, the NSHC-TWG recommends that the NSHC should ensure that any new LAT surfaces, including the new EMODnet LAT surface, are marked as unofficial, not chart datum, and not for navigational purposes.

5. Next meeting of the group

Under rotating chairmanship the 23rd NSHC TWG is to be held in Iceland.

ANNEX A: WORK PLAN NSHC-TWG to be approved by NSHC

| Item Number (TWG/Item) | Objective (Why/Priority) | Task Description (What/How) | HO Involved | Status |
|-----------------------------------|--|--|--------------------|-----------------------------|
| WP 16/04 | Enable GNSS-based tidal reduction and the connection with the vertical datum on land | Follow developments on geoid, MSL and LAT computations for the North Sea area | All | Permanent, see also WP18/01 |
| WP 18/01 | Improve North Sea wide realization of reference surfaces | Explain and reduce differences in reference surfaces at the international boundaries | All | Permanent |
| WP 18/02 | Improve methodologies for GNSS surveys | Exchange between HO's on operational methodologies for GNSS based surveys | All | Permanent |
| WP 22/01 | Ensure common European LAT surface adoption. | Follow the developments of European initiatives on new LAT surfaces. | All | Permanent |

ANNEX B: Action for internal coordination within TWG

| Item Number (TWG/Item) | Objective (Why/Priority) | Task Description (What/How) | HO Involved | Status | Corresponding Work Plan Item |
|------------------------|--|---|-------------|-----------|------------------------------|
| AP 18/01 | Explain differences in realizations of LAT | Exchange on bilateral basis between involved HO's to investigate further the origin of observed differences at the boundaries between national reference surfaces | All | Permanent | WP 18/01 |
| AP 19/03 | Make an overview over existing separation and hydrodynamic models, including metadata | Each member state sends the information to UKHO | All, UK | July 2015 | WP 18/01 |
| AP 20/04 | Gain insight the connection between EVRS and chart datum | Create overview of connection between EVRS and Chart Datum | NL, All | Dec 2018 | WP 16/04 |
| AP 21/01 | Investigate the differences at the BE-FR border between national LAT reference surfaces | Investigate all LAT differences at the border of more than 1 percent (LAT difference/depth) | BE, FR | Dec 2018 | WP 18/01 |
| AP 21/02 | Investigate the differences at the BE-NL border between national LAT reference surfaces | Investigate all LAT differences at the border of more than 1 percent (LAT difference/depth) | BE, NL | Dec 2018 | WP 18/01 |
| AP 21/03 | Investigate the differences at the DK-DE border between national LAT reference surfaces | Investigate all LAT differences at the border of more than 1 percent (LAT difference/depth) | DK, DE | Dec 2018 | WP 18/01 |
| AP 21/04 | Investigate the differences at the DK, NO border between national LAT reference surfaces | Investigate all LAT differences at the border of more than 1 percent (LAT difference/depth) | DK, NO | Dec 2018 | WP 18/01 |
| AP 21/05 | Investigate the differences at the FR-UK border between national LAT reference surfaces | Investigate all LAT differences at the border of more than 1 percent (LAT difference/depth) | FR, UK | Dec 2018 | WP 18/01 |

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| AP 21/06 | Investigate the differences at the DE-NL border between national LAT reference surfaces | Investigate all LAT differences at the border of more than 1 percent (LAT difference/depth) | DE, NL | Dec 2018 | WP 18/01 |
| AP 21/07 | Investigate the differences at the NO-UK border between national LAT reference surfaces | Investigate all LAT differences at the border of more than 1 percent (LAT difference/depth) | NO, UK | Dec 2018 | WP 18/01 |
| AP 21/08 | Investigate the differences at the NO-SWE border between national LAT reference surfaces | Investigate all LAT differences at the border of more than 1 percent (LAT difference/depth) | NO, SE | Dec 2018 | WP 18/01 |
| AP 22/01 | Investigate the differences in national LAT reference surfaces at all borders. | Each member state should supply information on how their LAT surface was built to NL who will analyse this information and compare the surfaces. | NL, All | Dec 2018 | WP 18/01 |
| AP 22/02 | Investigate the differences in national LAT reference surfaces at all borders. | Each member state should supply all LAT updates to NL who will update the LAT differences matrix accordingly. | NL, All | Periodical | WP 18/01 |
| AP 22/03 | Investigate the differences in national LAT reference surfaces at all borders. | Make error estimates in LAT surfaces. | All | Permanent | WP 18/01 |
| AP 22/04 | Explain the differences in national LAT reference surfaces at all borders. | Decide how the arbitrary 1% norm should be redefined to be linked to something practical before the next TWG meeting and make an according proposition to NSHC for acceptance. | All | Dec 2018 | WP 18/01 |
| AP 22/05 | Ensure common European LAT surface adoption. | Follow the developments of European initiatives on new LAT surfaces. | NL | Permanent | WP 22/01 |