

North Sea Hydrographic Commission – Meeting Report

Attendees:

NSHC

Belgium:	Flemish Hydrography	(IVD, JD, JV)
Denmark:	Danish Geodata Agency	(SH-C, LH)
France:	SHOM	(BF, LL)
Germany:	BSH	(TD, SG)
Iceland:	Icelandic Coast Guard	(AThV, NBF)
Ireland:	Irish Maritime Administration and GSI	(DB, CM, SC, ROT)
Netherlands:	NLHO	(MCJvdD, LD)
Norway:	Norwegian Hydrographic Service	(BNB, EF)
Sweden:	Swedish Maritime Administration	(PW)
UK:	UKHO and MCA	(TL, JS, MD, AC)

Organisations

IHO	(MJ)
GEBCO	(PW)
Fugro	(MF)
SeaID	(KH)
Seven Cs	(EF)

Apologies:

Teledyne CARIS	(PS)
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Overview

The following notes provide a record of dialogue and discussion during the 33rd NSHC meeting at Ostend, Belgium. These notes are an effort to capture the information and sentiments expressed - errors and omissions are the responsibility of the author. Once these notes have been appropriately reviewed they will form the basis of the minutes for each session of NSHC 33.

Session 1: Tuesday 27th March 2018

A. Administrative / Organizational issues

A.1 Formal Opening - CHAIR

- Welcome especially Secretary General Mathias Jonas –head of IHO - noted to be considered ideal fit for the role by all present
- Notes data held by NSHC members in room represents a significant resource for management of marine planning and environmental issues
- Offers thanks for support from members and for papers submitted

- Considered suggestions from previous meeting of NSHC 32 regarding potential improvements and inter-session activity and based on feedback resolved to keep NSHC 33 open session.
- CARIS send apologies – only change to listed attendees
- Belgium cover housekeeping considerations

A.2 Agenda -CHAIR

- Modified to include French report
- Action point NSHC 32 open/closed session – no response so meeting kept open session

A.3 Report 32nd Conference - CHAIR

- Thanks to Netherlands for circulating
- No comments received so NHSC32 report adopted

A.4 Review Conclusions from NSHC 32 - CHAIR

- Review of action items conducted...
- Balance between open and closed structures – closed action item 2016/1
- Closed series of action items as per updated list of actions
- Agreement to revisit status of certain action items throughout meeting

B. Report of IHO Bodies

B.1 IHO – Mathias Jonas

- Instead of reviewing previous NSHC report –hoping to provide talking points which may trigger discussion on revised IHO common themes and efforts
- Noted 7/10 NSHC members are also sitting members of the IHO council.
- Major difference compared to current assembly – ability to put heads together in order to consider strategic issues – no politics!
- Noted role of Secretary General is first servant of the organisation and stated intention to carry out his duties in that capacity
- Noted the Strategic Plan Review Working Group (SPRWG) considered a positive asset in facilitating bilateral conversations between countries who do not usually get to talk
- Next council meeting will organise same opportunities, noting price of travel and the need for meetings to have impact
- Reshape of the Finance Committee, noted that time-lines are tight, the presence of a new external auditor
- Offered thanks to UKHO for nominating the vice-chair, noted that current Chair is from Monaco
- Discussed need to attract new members, stating a target of 100 members by 2021 (centenary anniversary of IHO)
- Noted that majority of new members are seeking Capacity Building (CB) support while very few potential candidates are citing the need for further standardization as a motive for membership.
- Noted that some members are in arrears and despite the altruistic desire to assist in CB efforts related to these countries that IHO regulations must be adhered to and these countries face suspension.
- Commented on INT chart and Electronic chart production coordination noting long history (S-57 standards from 1993). Mentioned historic milestones including; full ECDIS carriage requirement, Norwegians with encryption, ARCS UKHO and the agreed introduction of AIS.

- Noted progression from point where ports denied ECDIS as a legitimate means of navigation to the present situation where paper charts are in decline and are being produced directly from ENC (A paradigm shift in human digital standards).
- Noted new paradigm shift in relation to S-100 machine digital standards
- Noted that while the Secretariat is more cognisant of technology – it is becoming more dependant emphasising the need this bring for standardisation.
- INTtoGIS: Secretariat has finalised hosting agreement with Korean HO who are providing a service to maintain underlying technical infrastructure
- WEND activities: Quality matters, CATZOC issues, ENC coordination centre, ENC overlap – over-shading by political issues - how can industry access ENC content under license.
- Capacity Building: this issue matters for potential new members, Australia raised the issue of how to raise more funding, SG commented that stewardship of developed offices to new comers is a more promising strategy. This has been addressed by an action item, SG gave the example of Norway with Angola encouraging stewardship by members saying “do it and tell others”
- Crowd Sourced Bathymetry (CSB): Engagement is ongoing at Secretariat. Completion of guidance is due by end of 2018. Highlights that it is a technical but also a legal issue, citing the requirement for technical demonstrator projects – not limited to fisheries and leisure boats but perhaps onboard professional survey platforms. Noted also that “Law should follow real life” and that there are many legal questions to be answered – however it would be wise to continue implementation.
- IHO GIS and Databases: Notes work of Japan –progressing GIS solutions, to what extent these outputs will be made open or limited is to be discussed in C2. CATZOC what is the value? Question of access...work is underway on question of IHO communication.
- International Hydrographic Review: Noted contribution of BELGIUM for the amount of work put in. Oldest publication now seems to be in some kind of crises. SAIHC (South Africa) proposal to adapt publication to the digital age – questioning of whether sending two issues a year to relevant recipients in envelopes is the right way forward, commented that all ideas are welcome from NSHC members.
- Question of how to contribute to IHO on a strategic level
- CHAIR: Flagged chart maintenance issues, noted that younger generation of mariners are in some cases not used to seeing paper charts. Noted also that IHR is of good benefit to researchers in terms of developing and growing their profile within the hydrographic community, highlighting the importance of maintaining it.

Comment:

- Norway: issues of quality and quantity in terms of WEND noting the presence of East Asian countries – question of to what extent other East Asian will countries join? Noted that CATZOCs reporting to the Arctic Council Working Group are the most important source of information in terms of data adequacy. Asked NSHC members to consider who the chief audience of the IHR publication are.

**** Ends ****

B.2 IHO Council Activities – GERMANY

- Noted that NSHC32 defined regulations for the selection of members. Comments on role and goals of IHO, Agreement that there was no desire for a new layer of bureaucracy. The council established the Strategic Plan Review Working Group. In terms of future work; Council meetings before and after a session of the IHO assembly should take place in Monaco. Notes that UK offered to host C2.

Comments

- Netherlands: Impressed by chairing, noted that it was an effective meeting which allowed the prioritisation of three work plans and the provision of guidance to the Secretariat, noted that this in itself was a success.

****Ends****

B.3 Strategic Plan Review Working Group (SPRWG) update -FRANCE

- ToR proposed by the council to IHO members
- ToR a two stage process - scoping – 6 months after which a new strategy plan can be drafted. Stage 1 (scoping) will be presented to IHO August 2018
- Scoping process 1) Strategic assumptions for success in 2026 2) Consider appropriate goals 3) Establish management plan (note: there will be some overlap between processes 1 and 2)
- Members Working Group – 23 Nations (not all council members)
- Topics: How to include stakeholders views, Data, Technology, Webpage IHO site. On stakeholders: initial organisation, On data: Blue economy fuel – consequences for IHO. IHO is a specialised group and not the only marine data organisation. – question of what is the scope of the IHO's activity on marine data. On the speed of technology: Slow historically but rapid speed of technological developments need consideration. On Communications: The issue of awareness of hydrography was flagged as a communication issue.
- Scope of strategic plan WG discussed, including: directions, objectives/target values, goals. The need to ensure articulation with IHO WP and the group's activities are consistent with expected resources
- Timelines available at the IHO website
- SPRWG happy for contributions from other IHO members

Comments:

- NORWAY: Reminder – Little time but highlights the opportunity for NSHC. Notes inputs from the UK, US and Netherlands. Opportunity for things that NSHC want to address as a body, notes that this opportunity is in fact the core business of what the NSHC is about. Raises question to the UK: after reading UK's input notes that UK would like SPRWG output to be more concrete with more tangible result measurements. Notes broad span of NSHC and wonders how the suggested prioritisation of one area over others could affect the resourcing of other areas. Do NSHC see room for helping other non SOLAS users? Could these non-SOLAS users suffer from the suggestion put forward by UK?
- NETHERLANDS: Point of Order: NSHC works for the council, suggests separate side meeting for potentially sensitive conversations
- UK: Concur with those thoughts comments that it is not for the UK to answer where the IHO is going. Yes to the notion that the UK agrees that a conflict of priorities exists – no to the idea that it will offer priority for outputs, notes that it is difficult to deliver across all areas. Suggests that new member's Capacity Building should be considered in the Strategic Plan, with safety of the mariner at the heart of these considerations. Agrees to a side margin for further discussion but comments that it would be unfair of the UK to determine the way ahead.

****Ends****

B.4 IHO EU Network WG (IENWG) update – GERMANY

- Working group functions as a facilitator for movement of dialogue between IHO and EU
- WG and network of EU Members chaired by France with Germany representing NSHC
- RHC open to all IHO members and other HC representatives
- Recent meeting: Discussed MSP, EU projects etc. Noted that several DGs were present. For example: DG-MARE and DG Research, notes opportunity to link DGs through the mechanism of this WG.
- IENWG able to facilitate discussion on important topics in terms of projects within the framework of the IHO/EU network. Including Coastal Mapping (Portal funded until 2018), EMODnet Phase 3 – notes the danger associated with these projects in that they are time limited.
- Invites the Chair to take note of IENWG report, to discuss future perspectives, to decide on the NSHC representative for communication with the Member States.
- Invites NSHC members to make more use of the network

Comment

- CHAIR: Notes unanimous agreement towards GERMANY continuing as the NSHC representative at the IENWG from Member States. Returns to the floor for further comment.
- GERMANY: Confirms that it is happy to continue in the capacity of representative for the NSHC.

****Ends****

B.5 World Wide Electronic Navigational Chart Database (WEND) WG report – UK

- New INT chart scheme?
- RENCs – harmonised licences to all vessels including leisure

Comment

- NORWAY: Noted attendance of NORWAY and NETHERLANDS at most recent meeting. WEND decided to go for a new ENC catalogue, notes that it is a good tool for use outside of the IHO. Question: Aim to make output available in world projection? And what about Arctic Region output? Noted that RENC's recognition was significant. Notes that in relation to IRCC – if WEND is involved, this should be reflected in the ToR.
- 7Cs: Raises question/requires clarification on time span of license periods
- NORWAY: In service of non-SOLAS regulated vessels notes that while official data is available for SOLAS regulated vessels some commercial products provide no updates. Highlights the fact that leisure craft/non-SOLAS vessels may be using years old data. States that WEND is committed to the provision of authoritative (updating) information. Should consider providing this authoritative information to all mariners. RENC to ensure non SOLAS ships have access?
- NETHERLANDS: Elaborates, Non ECDIS = Non SOLAS? Mentions other services and that RENCs are to report at next meeting.
- UK: Notes that group members should be careful with terminology as SOLAS applies to all vessels – not just regulated SOLAS vessels, highlights the importance of this distinction.
- FRANCE: Offers agreement with UK's comments – ENCs updated to IHO standards according to WEND resolution. Question: If ENC chart usage is to widen beyond ECDIS – How should distribution of updated ENCs to users be organized?
- 7Cs: Comments that their end customers are typically paperless vessels, notes the use of ENCs by accident investigation authorities and highlights ongoing necessity for integration of web

based ENC chart data with aviation chart data noting that restrictions need to be revised in relation to these services.

- CHAIR/IRELAND: offers agreement to the validity of 7Cs comments in light of tragic R116 incident which resulted in the loss of a coastguard helicopter and a subsequent sustained SAR effort in Irish territorial waters.
- NORWAY: States that 7Cs make a good point, and notes that in the context of the developed Geo-View Portal; Member States must allow use of their data for these purposes. Also notes that not everyone is happy about the use of ENCs for non-navigational applications and suggests that hesitant organisations should reconsider. Notes the European Maritime Safety Authority's interest in a single harmonised portal for ENCs and draws attention that this is a requirement that has just been echoed by industry (7Cs).
- Netherlands: Suggests that this topic should be addressed in the Strategic Plan with a view towards establishing IHO opinion in relation to ENC data dissemination.

Ends

B.6 Report of North Sea International Charting Co-ordination Working Group – UK

- INT Charts NSICCWG?
- INT charting changes since NSHC32
- States that TOR are set out in Annex A of NSHC 32 Report
- NSEHWG?
- Highlighted elements have been transferred
- States that small and medium scale ENCs should only be considered
- INTtoGIS – 288 INT charts breakdown
- Omission of Detail (OOD) line?
- NSHC asked to approve draft TOR

Comment

- CHAIR: Asks members to agree changes to TOR.
- FRANCE: Asks that in relation to TOR reference to charting region D – include in paragraph 2.1 -0 reference to region
- **CHAIR: Change to TOR approved by NSHC**
- FRANCE: Also asks for clarification in relation to small to medium scale bands 1-3
- UK: Replies that in some instances (where sharing territorial limits) Band 4 is also considered.
- CHAIR: Asks assembly if there is any user feedback?

****Ends****

B.7 Tidal Working Group Report – BELGIUM

- 22nd working group meeting took place in Ostend
- Theme of information sharing in terms of tidal measurement, GNSS Tidal Reduction, New Techniques for accuracy – considering the inclusion of error fields and how these may improve outputs.
- Discussed a common LAT reference surface. Members have been providing their LAT information to Dutch colleagues. The amalgamation of this information serves to highlight discontinuities at the borders of LAT surfaces. WG aimed to discuss and further understanding of these vertical differences
- Presented a colour coded matrix of areas where the percentage differences between overlapping (bordering) LAT surfaces are less than or greater than a nominal value of 1%

- Addressed the question of the provenance of the 1% difference figure and questioned whether it was arbitrarily arrived at, highlighting the fact that if so then this metric is not data based (qualitative not quantitative).
- Raised questions on how the LAT reference surface was created, stating that the action points lists suggest that data should be shared with Netherlands colleagues for collation
- Highlighting the potential utilisation of error fields in relation to reference surface accuracy, - questions the utility of constructing a European reference surface (multiple territorial boundaries) with vertical accuracy error margins of e.g. +/- 5% -with the established metric of 1% difference for comparing reference surfaces.
- In relation to NSHC Goal of Work Plan item 18/01 – seamless surface (unsure check reference) – suggests that the error margin should be strict.
- Informs NSHC members that the EMODnet project is working on a new LAT surface, the TWG agreed that they should work to stimulate the development of new surfaces
- Notes that it should be made clear that these surfaces are unofficial and should not be used for Navigation and that they do not bear relation to official Chart Datum - Ensuring this point is widely understood is an action point from the Working Group.
- Asks NSHC permission to publish the minutes of the 22nd TWG meeting

Comment

- GERMANY: Notes that in relation to differences between reference surfaces, there was an understanding that Denmark and Germany had already undertaken work to tackle these issues.
- BELGIUM: States that the new updated matrix has been recalculated by the Netherlands
- NORWAY: Offers compliments on quality of presentation delivery. Notes that the graphic on display to NSHC members only shows border with UK and notes that Norway also has borders with other countries highlighting that Norwegian data has been omitted from graphic.
- CHAIR: Asks the floor for thoughts on the goal of 1% difference
- FRANCE: Responds with a question of intent of action. Notes that in relation to the link between other reference surfaces (EMODnet etc) questions whether the reference surface is wanted for surface navigation or for other purposes? States that H.O.s should not make use of reference surfaces for other purposes or for use on authoritative charts.
- BELGIUM: Agrees with FRANCE's point that the TWG agrees that the issue raised by FRANCE may have consequences and impact on charting. States that in terms of modern navigation there exists a desire for seamless harmonised reference surfaces for the representation of relevant datum – noting that the state of the art is not yet at that point (for the purposes of navigation)
- GERMANY: Supports FRANCE's statement, also noting that in the context of future sea-level rise – the development of seamless reference surfaces. Notes that meaningful tracking of sea-level rise will depend on the availability of these products and offers support to the TWG's proposal to continue further investigation of the subject.
- **CHAIR: Produces a change to the wording of Work Plan Item 06/2016. "To continue to investigate and to reduce differences" in relation to reference surfaces. Notes that this is a subtle change and asks BELGIUM to update and resubmit.**
- NETHERLANDS: Asks whether BELGIUM has enough guidance to continue.
- BELGIUM: Responds in the affirmative.

****Ends****

B.8 IRCC 9 – CHAIR

- **Implements action item to review and provide comment on action item list**

- Refers action items to the floor
- A review of action item list is conducted
- N2: Requirement to identify new people who can support and deliver MMSI training
- N3: Feedback from CB working group to IRCC
- N4: Not relevant
- N10: Capacity Building (Chair invites NSHC members to engage with CB WG Chair on this matter. (GERMANY: Comments that Many states doing this already e.g. Norway and the UK), States that it is good if national agencies can be used to get involved and progress CB matters.
- N18: Satellite Bathymetry Workshop is noted to have been deferred until September 2018, members encouraged to engage with workshop.
- N36: Netherlands states that this is going nicely
- On conclusion of review the CHAIR asks the floor whether there are any other issues which need consideration and receives confirmation from the floor - that there are none.

****Ends****

B.9 NSHC Structure Operation – CHAIR

- Raises issue of timing of annual meetings, inter-sessional meetings – notes that statutes don't need change in order to make changes with regard to the timing of meetings.
- Asks whether Iceland is happy to host the next NSHC meeting (NSHC34)
- **ICELAND confirms that it is happy to host NSHC 34**
- NORWAY: raised issue of Bi-annual meetings in the context of the increasing speed of development of issues and challenges relevant to the NSHC. Notes that the IHO meets annually and asks NSHC members to consider how NSHC would like to influence IHO, asks whether there is a specific reason for biannual meetings and whether NSHC members are happy with current levels of progress stating that it would be surprising if NSHC members felt if current way was sufficient.
- GERMANY: Suggests that NSHC members may reconsider our task at NSHC meetings and use the meetings as an opportunity to bring forward strategic initiatives, notes that the IRCC report raises several issues, comments that regarding the frequency of meetings that the NSHC could liaise with IHO
- UK: Comments that it is open to the NSHC meeting on a more regular basis in the case that the agenda is worth meeting over annually. Notes that the frequency of meetings depends on what the role of the NSHC is as a commission. Notes that the statutes are currently being met and that the NSHC represents country and not commission – therefore there is need for clarity on what the commission is trying to achieve.
- NORWAY: Questions whether as a body the NSHC wishes to be proactive or reactive – noting that bi-annual meetings are reactive in the context of other bodies such as the IHO meeting annually. Also offers agreement with the UK that the agenda should warrant an annual meeting noting that it is a common responsibility as a party to ensure that this is so. Reminds colleagues that the NSHC is a strategic commission, whereas other RHCs have other priorities e.g. Arctic is exploration focused. Asks NSHC members not to lose sight of the fact that the strategic nature of the NSHC means that its activities are high value and should be made use of.
- NETHERLANDS: Comments that the TOR are within scope, notes that IRCC is the primary venue for NSHC members to exert influence. Asks NSHC colleagues whether as a group there is a desire to regain initiative from working groups.
- FRANCE: Comments that the NSHC is a regional commission and that the primary focus should be on a regional basis – notes that the NSHC region is very important for navigation and has resulted in many historic initiatives. The region therefore represents an important area for the

development of IHO's role in developing the Blue Economy. Notes that no item has been included on e-navigation wondering should this not be a subject for the NSHC to consider? Also, developments in relation to autonomous shipping? States that in the event the NSHC decide to take on more work – there must be an identified objective and that this idea is important for the NSHC in a regional perspective. Asks whether the mechanisms of the Working Groups are receiving sufficient guidance from NSHC. Concurr with the UK on the need for clear objectives and agenda.

- CHAIR: Thanks group members for input states that subjects of e-navigation, autonomy and the issues raised by UK and Norway can be addressed at the end of the meeting.
- GERMANY: States that it is flexible on meeting frequency but notes the difficulties associated with setting the agenda on short notice. (CHAIR comments – at a minimum, one year for preparation)
- **CHAIR: States that it will be decided at the end of the meeting whether more frequent meetings are required**

****Ends****

C. Survey

C.1 Re-survey Working Group Report – UK

- Notes error in relation to submitted date of last meeting
- Notes that at 6th meeting Netherlands were chair and 7th meeting the UKHO were chair (onboard HMS Belfast)
- During the RWG meeting – discussion of group's risk assessment, agreed to concentrate on the Dover Strait area.
- WG 8 developed a harmonised display of risk and survey status, incorporating identifiers for technology used, including LiDAR and Satellite Bathymetry
- WG considered the status of autonomous vehicles as survey platforms noting that so far there have been few trials and that these have not been overly successful
- In consideration of Crowd Sourced Bathymetry, the WG notes that if controlled it could represent a useful monitoring tool, there exists a need for better targeting of companies for deployment of CSB techniques. Further agreement is to be reached on this matter however the RWG proposes that it be considered the ideal forum for this discussion
- Asks that the NSHC notes the RWG Chairman's report
- Asks that NSHC endorses the RWG proposal to develop a harmonised plan focused on the Dover Strait and investigation into matters relating to CSB.
- Extends invitation for other IHO members to attend RWG future meetings

Comment

- **CHAIR: Endorses report, endorses development of harmonised risk map and tasks the RWG with the production of a paper on CSB.**
- FRANCE: Asks whether NSHC/RWG currently view CSB as a way of detecting change. Asks the question of whether NSHC needs an intermediary session of the subject of CSB – Is this something that the IHO seeks to endorse or provide guidance on? Should NSHC look into this subject more?
- UK: States that more clarification in effort is required before guidance on CSB can be provided (or more time is required in order to provide feedback).
- IHO: There are various ways to look into this report – suggests getting the WG to develop ideas on CSB and to feed these back to NSHC in the context of a regional area.

- GERMANY: Supports UK's position that CSB in well surveyed areas has a role in planning resurvey activity. Suggests that this can be reported at next meeting.
- IHO: Offers some criticism that the current document as it stands is too general. A meeting is to be held in June to finalise- if there are comments on current draft they should be provided now. Notes that more precise guidance from CSB WG is needed by NSHC.
- NORWAY: CSB has been discussed in the context of a lack of data. Notes that there is a need for a specific use case and that these outputs should not place a burden on IHO level discussions.
- **CHAIR: Phrases the tasking of a paper on CSB to Resurvey WG thus: "To investigate how CSB can be used to support survey / resurvey activity in the North Sea region".**
- FRANCE: For CSB the Dover Strait should be the test-bed. As a suggestion; the CSBWG should consider how CSB could be utilised and also pushed in the North Sea region.
- NORWAY: Suggests that in the context of the CSBWG TOR - guidance should also be provided on how attractive the concept is for participants, the potential for good user experience in adopting the technology can make another good argument for it. Especially amongst entities operating across national boundaries such as ferries etc.
- CHAIR: Asks the floor whether the development of CSB in the context of CATZOCs holds any potential?
- NORWAY: Suggests in response that this matter may be addressed through the Data Quality Working Group – States that differing levels of data quality have different uses.
- IHO: Raises the possibility of implementing a technical demonstration as part of a small project (suggests Dover Strait). Notes that the ability to demonstrate and attract participants to CSB activity will lead into CATZOC considerations. Also notes that the possibility currently exists to engage with INMARSAT who could potentially provide free data connectivity for a time during such a trial.
- **CHAIR: Notes that an invitation to set up a technical demonstration is on the table**

****Ends****

C.1a TOR and ROP adoption – UK

The new TOR and ROP were adopted.

C.2 GEBCO activities and Nippon Seabed 2030 – GEBCO

- IHO and IOC of UNESCO
- Issue of how to make a better grid

Comment:

- NETHERLANDS: Is tooling being developed for the extraction of data from ENCs? If not, is it possible to develop this type of tooling through the GEBCO initiative?
- IHO: Notes that the project director for Seabed 2030 has a strong profile and background in sales. Notes that the project director is being supported by a team of hydrographers noting that IHO members (and NSHC members?) should support the efforts of this initiative. Suggests that GEBCO could possibly fund a comprehensive crowd sourcing technical demo as well as possibly funding projects related to emerging technology. GEBCO could also potentially help to discover and unlock new data sources, by asking project participants to "take a look back home" for available data streams (e.g. wind, oil and gas exploration etc.) Suggests that the project could help to drive data access in the context of a global project.
- UK: Acknowledges that GEBCO are undertaking a mammoth task and recommends efforts to harness datasets already held – in support of this effort. Addresses a question to GEBCO- is

there a plan to coordinate on areas of interest and if so how are coordinating centres going to work?

- GEBCO: The plan is to make a map of maps in order to see where data is available and using this as a resource; countries will get involved in order to task surveys in areas where data gaps exist.

****Ends****

E. Marine Spatial Data Infrastructure (MDSI)

E.1 BSNSMSDI-WG – DENMARK

- Notes that the complementary worldwide MSDI working group reports to the IRCC
- Addressed new tasks, 6 guidance areas addressed from both a regional and national perspective
- MSP is the main driver especially in the Baltic States
- Reported on the VASAB/HELCOM MSP Data Expert Subgroup which has organised input data according to 52 themes. The data is authoritative and kept up to date.
- Asks the NSHC to note the report
- Asks for comment from present assembly on the implications of MSDI from a H.O. perspective and comment on the benefits which can be drawn from taking a regional approach.

Comment

- CHAIR opens this to the floor.
- NORWAY: Comments that Baltic sea is leading the way for MDSI
- NETHERLANDS: Raises considerations on how to approach the INSPIRE Directive – notes that the Working Group could be used to exchange national implementation experiences.
- GERMANY: Notes that INSPIRE is only one aspect – and MSP is beyond INSPIRE. Looking at data from the perspective of a HO, how can we make information available? Notes importance of good spatial data infrastructure.
- CHAIR: Agrees MSP will be a useful tool once implemented. States that an effort will be made to build a list for MSDI contacts for circulation of NSHC members

****Ends****

E.2 Bathymetry in Support of the Blue Economy – NETHERLANDS

- Notes that bathymetric data are the most important datasets possessed by H.O.s.
- Notes that the sea is the “workplace” of the Blue Economy
- Raises issues of data centricity highlighting that typically the data custodians are the data product producers – this means that a fraction of the available data are passed to potential end users, noting that high resolution datasets inherently carry sensitivities for some areas.
- Recommends that MSDI stays as generic as possible facilitating access for multi-sector users.
- Suggests that it is the responsibility of the users to decide on data adequacy.
- Mentions Sendai framework for disaster risk reduction 2015
- Draws comparison between INSPIRE and EMODnet as means of managing data access, highlighting the fact that INSPIRE is enshrined within the law while EMODnet is a project with a set amount of funding surrounded by corresponding future uncertainty.
- Describes how databases are transferred from the CARIS Spatial fusion infrastructure to Geo-Server an open source solution in widespread use.

- Asks are users happy with current web services. Notes that web-services are complex. Highlights the fact the current approach incurs a significant lack of interaction with the end user.
- Adequate use of associated metadata (accuracy/old/new/shoal bias etc) is the responsibility of both the end user and the data provider
- Presents a common environmental picture at both a source level and at a product level.

Comment

- FRANCE: Raises issue of the provision of shoal biased bathymetry from HOs.
- NETHERLANDS: Observes that gridded bathymetry should be provided at as high a resolution as possible
- NORWAY: Suggests that shoal biased bathymetry should be provided as a derived product from accurate bathymetry data, adds that the potential uses/applications of these datasets should not be limited by HO navigational considerations
- GERMANY: Agrees with NORWAY. Notes that as data producers and managers, there are several products possible in the future. Notes the oncoming s-100 standards and that it only covers navigation. Asks NSHC are other standards required? States that new standard and product specifications are needed.
- FRANCE: Mentions the issue of data processing, especially onboard vessels. Questions the solution of just increasing resolution as a driver for improved source/base data. Notes that S-44 was written to just look at data in a certain way – this may need to be revisited.
- GERMANY: Highlights S-44 and S102 as examples – suggests taking a closer look at both as a means of how we harmonise our data and metadata resources. Suggests that standards should have a profile to cover use cases.

****Ends****

E.3 MSPs in Norway – NORWAY

- Notes that 2004 was the start of MSP in Norway directing attention to the four quadrants of MSDI modified with inner circle mechanism. States MSPs should serve a purpose.
- MSPs should be used as a tool for resolving and visualizing conflicts of interest, highlights the link between MSDI and MSP.
- States that Norway has developed a tool for Marine Management focused on the underlying aim of sustainability. The Ministry for Climate and the Environment is the responsible body in Norway for MSP.
- States that the key to MSP is extensive collaboration, providing a list of players, data contributors and policy users. Defines the meaning of activity load and provides a concrete list of activities.
- The tool aims to provide a service based approach based on long stakeholder engagement and facilitates the integration of statistics and geospatial information.

Comment

- CHAIR: Notes that it is good to see a mature system in operation.
- GERMANY: Asks how does the Norwegian methodology facilitate harmonisation of MSP activity with neighbours?
- NORWAY: The tool is only designed to operate with regional seas and the main problem regarding coordination is the fact that it functions using the Norwegian language (11 government agencies feed into data into it). Comments that future development of the tool should definitely aim for harmonisation.

- GERMANY: Asks NSHC whether there is a role for a HO or the IHO in this space
- IHO: Answers that an HO should facilitate infrastructure for combination of datasets noting that a HO will be positioned to take a coordination role, however it is difficult to answer this query as the issue of a particular nation's representative in this space (e.g. A Geological Survey) and the role they assume will affect the answer. Puts forth the idea of a S-100 toolbox with flexibility to create any desired standard – essentially machine produced standards. States that hopefully this work will be done by those who adopt the S-100 standard.

****Ends****

E. 4 New Routes in the North Sea – DENMARK

- An interesting description of a collaborative project between Denmark and Sweden proposing a new vessel routing system was provided to the assembled NSHC members.

Comment:

- No comments were received
- CHAIR: Notes that a change has been made to the agenda for Session 2 (the following day) – The talk scheduled to be presented by CARIS has been replaced by Seven Cs.
- **CHAIR: Concludes the first day of proceedings of NSHC 33.**

****Ends****

Session 2: Wednesday 28th March

F. General Developments

F.1 – Automated Contour Algorithm – UK/CARIS

- Provides an introduction to the automated contour algorithm developed by Teledyne-CARIS.
- Noted that there exists increasing demand for more contours in order to avoid ECDIS alarms
- Benefits of the tool are in the ability to integrate new data, using multi-resolution, master surface layers. Effective tool for tackling edge-matching issues.
- Provides a comparison of automated verses human generated contours – noting that outputs from the new algorithm closely resemble human interpretations
- Conclusion of the review is that the automated contour algorithm reduces workloads in terms of editing and provides an effective means of addressing areas of complex seafloor morphology and addressing edge-matching issues.
- Using the Bristol Channel as an example shows how ECDIS can more easily create safety contours – notes ability to utilise extra contour information without corresponding screen clutter

Comment

- NORWAY: States that the results displayed appear impressive – asks UK about level of cooperation with CARIS.
- UK: Replies that some research has been undertaken in-house with CARIS. States that the algorithm is available in CARIS Bathymetry Database 4.4 and that the UK has already published ENCs using it (reflecting a two week turnaround from date of acquisition to ENC production)

- NORWAY: Asks whether any documentation on the subject is available for sharing
- UK: Will revert to group noting absence of CARIS
- Refers to research on this subject carried out by Denmark – states that the two week turnaround from acquisition to ENC production is a positive development.
- NETHERLANDS: Wishes to amplify NORWAY's comments, wonders whether there has been any comparison between CARIS automated algorithm and the one available from Seven Cs?
- UK: Notes that CARIS is not available to answer query.
- NETHERLANDS: Queries the reason for such a distinction between ENCs and Charts?
- UK: responds that the distinction due to the way in which tiny areas may become hidden on a chart.
- GERMANY: Notes that there has been no coordination on these new developments – proposing the creation of a forum at a technical level which can report to a regional NSHC level forum
- NETHERLANDS, SWEDEN and BELGIUM indicate agreement with GERMANY
- **CHAIR: Notes this as an action item with BELGIUM to coordinate amongst interested parties**
- IHO: Notes this as a significant development – moving towards a paradigm shift (no identical image of ENC and paper), wonders how best to communicate this change?
- NORWAY: Might turn around to the point where there will be an attempt to have paper charts that look like ENCs
- NETHERLANDS: Mentions the relevance of the Nautical Chart Working Group – specifically their activities concerning the simplification of paper charts.
- IHO: comments that there have been delays with publication of a paper on paper charting- notes that in the near future there is a significant decision to be made on the future of paper charts providing the hypothetical example of 10 years from now when someone prints a paper chart from ECDIS. Notes that this also indicates a substantial change to INT charts, asks NSHC what do we want to achieve and how best to instruct WG members. Puts forward the idea of holding a workshop prior to the creation of a forum – ask for comment from NSHC members.
- GERMANY: Invites a workshop on this topic
- **CHAIR: Thanks GERMANY**
- NORWAY requests clarification – a workshop on automated contouring algorithms or changing paper charts to look like ENCs – notes that this is a topic that needs work too.
- GERMANY: States that it will look for input from members on topics and subject matter

****Ends****

F.2 Seven Cs ENC and Bathymetry Plotter – SEVEN Cs

- Company activity and background introduced to the NSHC. Seven Cs is an ECDIS manufacturer and digital chart provider.
- Addresses shift in thinking currently underway regarding ENCs and paper charts, majority of clients are transitioning from paperless with paper chart back-up to completely paperless notes that some crews are not even seeing paper charts, citing the use of ENC “get me home chart data” stored on tablets. Asks is this approved?
- Addresses the regulations for primary and secondary navigation techniques noting that the theme of the higher density ENC is important stating that not many high density (contours) ENCs are available
- Describes how safe areas are set in ECDIS – noting that companies set their own safety margins reminding the NSHC that the ECDIS scheme is not the same as safety contours
- Illustrates how this can lead to “lost areas” of navigable water – using the example of how a safety channel of 11 meters means that the vessel in question will stay within the 20 meter colour scheme losing areas within the 10-20m scheme of potentially navigable water.

- States that this concept has financial and efficiency implications for shipping.
- Notes that denser contours means more manual work – a long process
- Questions the future of ENC usage as movement grows towards the use of HD ENCs
- Invites the commission to try the bathymetry plotter tool and to investigate its ability to create HD ENCs as a potential rival to CARIS

Comments

- CHAIR: Questions Seven Cs on proposed training tools
- Seven Cs replies that they are CBT based
- NORWAY: Addresses a question to IHO regarding the several initiatives presently underway in relation to the development of automated HD ENCs citing the examples of Denmark, Seven Cs and CARIS – asks how best to ensure that the ENC of tomorrow will be a satisfactory product – what is the best way to incorporate the knowledge currently being generated
- IHO: replies to NORWAY, that the incorporation of these developments is a slow process with the anticipation that there are at least 5 more years until its arrival – Notes that the ECDIS currently deployed in the field from the current generation must be maintained, asks whether ECDIS in its current shape absorb the new technological progress. The answer is yes to a point but there is the understanding that the size of the ENC is limited to 5MB (asks for clarification) – is this tendency inherent to ENCs or is it a limitation of software – asks whether ENC software developers have the ability to move beyond the 5MB limit. Asks whether with regards to the bathymetric ENC it is possible to standardize the bathy overlay and what are the pros and cons
- Seven Cs: Bathymetry and HD ENC are not mutually exclusive noting that PPU pilots report that they are finding the bathymetry ENC the most useful – Since both types can run on Seven Cs ECDIS system – technically either is plausible
- FRANCE: asks why the 5MB limit in the first place? Is it related to the inclusion of a nautical elevation model?
- Seven Cs: Replies – no, the issue is more to do with the communications ability onboard vessels to receive files greater than 5MB but notes that improvements in this area mean that this is changing.

****Ends****

F.3 Fugro Developments -FUGRO

- Introduces company background and activity, notes that Fugro have become a proud participant in the Seabed 2030 project through data sharing activities.
- Provides an overview of the challenges currently being tackled through the use of emerging technical solutions.
- These include: The use of multi-detect with Kongsberg Multibeam Echo sounders (MBES) which allow for better performance on and around seafloor infrastructure such as jacket foundations etc.
- Describes progress in using ASV where this equipment is now fully functional for geophysical survey activity
- Describes an innovative use of fibre optic technology for maintaining real time control of AUV technology.
- Raises the possibility of a potential change in the state of the art for field surveys where vessel size and manoeuvrability is restricted: From larger DP equipped vessels to smaller launches equipped with force multiplying autonomous technology.

Comment:

- IHO: Notes that Seabed 2030 appreciates the efforts of Fugro, citing their initiative to deliver data to GEBCO from route to mission survey activity (logging data while vessel is underway to mission) – asks Fugro whether there is any scope to approach their clients regarding the opportunity for them to submit degraded but useful variants of their data to GEBCO in support of the Seabed 2030 project.
- FUGRO: responds that they are making their clients aware but that there are also national territorial considerations and factors which influence the decision process, highlights gridding option for making data available to Seabed 2030 and states that they will support this in the future.

****Ends****

F.4 Crowd Sourced Bathymetry – SEA ID

- Crowd Sourced Bathymetry Working Group Guidelines referred to
- Company background and concept introduced, standard logger and SBES input
- Question of how to make CSB a viable topic for consideration, need to assure the mariner (IHO) and to tackle the question of uncertainty in relation to placing depth measurements relative to the ellipsoid
- This is what was achieved – together with Brian Calder who is scheduled to present a paper on the technology in Canada shortly, provides technical description and illustration of the concept, which mainly uses software solutions to tackle issues such as determining correct vertical offsets so that the technology can autonomously determine the depth of the seabed relative to the ellipsoid – thereby enabling reduction of soundings to a known datum relative to the ellipsoid.
- Discussed examples of GPS spoofing highlighting test carried out in Corfu
- Provided results from pilot study carried out in Canada, which demonstrate the stated positional accuracy of the technology.
- Further development of the concept intends to incorporate the technology with SSS data
- Applications in terms of CSB data acquiring units were discussed and the utility of placing the device on vessels transiting across territorial borders was highlighted.

Comment

- NORWAY, finds the technology and concept described to be very interesting - poses technical question: with regard to the proposed methodology, observes that it appears that the technology requires to be calibrated off known depths (offset). Also notes that in the context of the Resurvey WG that the technology holds potential for detecting significant change in areas like the Dover Strait.
- IRELAND: Comments that the technology looks good and that it is bound to be useful in the event that its reliability in operation is established, comments that a series of bar checks at varying depth would help calibrate the system when operating in waters of unknown depth.
- SEA-ID agrees and also notes that the current presentation did not have the scope to go into more detail relating to automated calibration solutions already implemented along with other system features such as a functioning MRU.
- DENMARK: Asks whether the technology has experienced any geographical limitations
- SEA ID: responds that the system should work at the poles, also states that the planned standard post-processing lead time of 2 weeks should be sufficient to support the CSB concept.
- NETHERLANDS: Comments that there is a large inherent interest in determining whether the technology functions especially in the Dover Strait region – suggests that members/observers with ideas for running trials reach out to the Resurvey Working Group.

- IHO: Suggests that a demonstration of this technology would be more effective if it were put on a survey vessel.
- NORWAY: enquires as to cost of technology
- SEA ID: responds that the unit cost is very low with the majority of the costs associated with licensing. Notes that to develop this technology 11 million dollars has been spend on software development with a further 8 million spend on hardware development. Offers to make a unit available to carry out a technical demonstration at no cost noting that NOAA have already signed off on Brian Calder's paper on the technology.

****Ends****

F.5 Seabed 2030 and the NSHC – NORWAY

- Highlights the lack of data and knowledge of our oceans, noting that the project while having great merit cannot achieve its aims using current methods and practices
- Notes that the programme has the potential to develop significant gains in knowledge.
- Notes that 98% of ENC data can come from RENC – highlighting the potential for feeding data from this source into the Seabed 2030 product, noting that this approach is not relevant in the well surveyed North Sea region.
- Comments that the WEND WG is moving towards presenting a paper to the IRCC and would ask other nations attending the IRCC if they could support this approach

Comment

- DENMARK: Notes that shoal bias present in ENC data is significant but accepts that a little data is indeed better than none.
- NORWAY: Comments that the actual difference arising from the use of Shoal Biased data in the context of the scale of the Seabed 2030 output product would be insignificant.
- FRANCE: Disagrees, highlighting an occasion where charts were digitised producing very bad results, commenting that critical areas were inaccurate and the results were potentially dangerous – raising this anecdote in order to highlight that shoal bias has a major significance.
- NORWAY: Takes the point from FRANCE, however Seabed 2030 data is in no circumstances to be used for navigation and notes that there are many areas in the world where data is available and would be of use to the Seabed 2030 project using this approach.
- NETHERLANDS: In the context of WEND, NORWAY and US to resubmit paper to IRCC, this may describe a potential way forward for Seabed 2030 however the question remains as to who would carry out the data extraction. Notes that RENCs need tooling to implement process, suggests that funding may be available through the Seabed 2030 project to facilitate the development of these tools.

****Ends****

G. National Developments

G. 2 Production of Nautical Publications – NORWAY

- Two main resources – Norwegian pilot guide (not captured properly)
- Process is resource intensive
- New Norwegian pilot guide – harvest data from nation Geo Portal – a centralised database
- Presents comprehensive visual on dataflow – NB vector-tiles inputs
- Portal to new Norwegian Pilot DB

Comment

- Seven Cs: Asks whether these are mandatory publications
- NORWAY: They are the responsibility of the Maritime Safety Administration, once finalised – they are official publications
- Seven Cs: Asks how updates are scheduled
- NORWAY: Replies that updates are scheduled in real-time
- NETHERLANDS: Asks what is the project time-frame
- NORWAY: Describes how the project is scheduled over several phases moving from port to port noting that the schedule is planned to be scaled up over time
- NETHERLANDS: Notes that the methodology described incorporates a new architecture which includes a content management system with associated database and applications – asks when this new capacity is expected to come on line
- NORWAY: The plan is for the system to come online by the end of the year noting that significant activity will focus on getting data from the ports
- Seven Cs: Asks how much data needs to be accessed online in order to utilise
- NORWAY: Confirms that associated data can be accessed/stored/made available offline
- NETHERLANDS: Poses question to NSHC; asks whether it is still mandatory to have paper as well as digital publications for pilots?
- FRANCE: Answers no – so long as there is sufficient electronic backup
- GERMANY: Echoes French answer

****Ends****

G.3 New Survey Ship – DENMARK

- Denmark presents exciting outline of plans to bring new vessels with hydrographic capability online bolstering their present capabilities – announces intentions to operate the following MBES systems: RESON T-50 and RESON 7160 and R2Sonic 2024

Comment

- No questions or comment from assembled NSHC members

Ends*

G.4 INFOMAR Programme Developments – IRELAND

- Provides NSHC members with general overview of Ireland's national seabed mapping programme: Integrated Mapping for the Sustainable Development of Ireland's Marine Resource (INFOMAR), including key developments and current challenges.
- Highlights importance of carrying out a Cost Benefit Analysis (CBA) Notes 4:1 value from Ireland CBA process and contrasts with much higher figure from USA (which factors accidents and pollution mitigation into results)
- Emphasises the potential value of CBA for new potential IHO members and those seeking CB assistance, in that by establishing these metrics from mature services – it is easier for national bodies seeking CB assistance to justify the establishment of hydrographic and seabed mapping activities as the value can be easily demonstrated.

Comment

- NORWAY: States that it has been an ambassador for the INFOMAR programme abroad and was impressed how IRELAND was able to maintain its seabed mapping programme throughout an unprecedented economic crisis – noting the role that the CBA figures would have played in this outcome. Notes that CBA however is a tricky business (Tug-boat anecdote)

and requires careful consideration but agrees that CBA can be beneficial at a national and regional basis – cites that an ongoing review of Norwegian aquaculture is yielding a CBA result of between 3 : 1 and 3.5 : 1.

****Ends****

H. Closing Activities – CHAIR

H.1 AOB

- CHAIR: Notes a question from NETHERLANDS on Offshore Wind Energy activity
- NETHERLANDS: Notes that offshore wind installations are large “space eaters” – notes that these areas are becoming open to shipping less than 24m in length, noting that this raises questions in relation to surveying requirements and responsibilities – divides the issue into two areas 1) Survey and 2) Charting (electronic and paper), asks NSHC if they have comments on these issues.
- GERMANY: States that the issues raised by the NETHERLANDS are also issues for GERMANY, Notes that GERMANY considers its HO to still have responsibility for safety of navigation in these areas and highlights the need to check for information from wind-farm operators, notes that large scale nautical charts should show wind farm locations and notes that government operations (survey) have exemption in these areas from the 24m limit
- UK: States that currently the UKHO do not have responsibility for ensuring safe navigation in these areas and that this lies with the wind-farm operators stating that these operators are obliged to provide up to date information to UKHO at the construction, post-construction and decommissioning phases of offshore wind projects. Acknowledges the issue of how to ensure that adequate resurveying activity is undertaken by operators and notes an upcoming conversation on the matter scheduled for April, agrees that not enough guidance can currently be given to cover re-survey activity in relation to these areas
- FRANCE: Has the same questions as already raised on the subject. Notes that the restriction on vessel length is significant, echoes UK’s synopsis of the issue - in that at present, responsibility is placed on the operator but what is required from operators is not yet clear. Expresses concern that wind farm development will continue to have an increasing effect on vessel routing (noting that this is more for local routing), states that new routes will need to be surveyed for local navigation – asks who will incur the associated costs – describes these costs as “hidden costs” to offshore wind energy developments
- UK: States that upcoming Marine Management Organisation (the UK body for marine planning) meeting will look at the cumulative impact of numerous developments in this space – including the issue of who pays and impacts of developments close to national borders and the associated impacts on neighbouring territory.
- FRANCE: Asks whether the UK would be willing to share the results of these discussions stating that they would provide a good example of how the process is evolving
- UK: States that it would be happy to share the results and draws attention to relevant documentation already available on the web
- NETHERLANDS: Offers thanks for comments received on the subject – notes the importance of consideration of all costs including the potentially “hidden costs” at project level for offshore wind developments

H.2 Review Conclusions

- CHAIR: Implements a review of actions

H.3 Lessons Identified

- NORWAY: Comments that the session today was positive and more effective than the previous day's session – asks question as to the cause of this.
- CHAIR: Responds that this may be due to the administrative nature of the first sessions subject matter – suggests that some consideration can be given to the structure of future meetings e.g. half day/full day/ half day
- IHO: Wonders whether industry felt bored during first session raises the idea of having day one closed and day two open.
- CHAIR: Asks for final comments from the floor in relation to statutes and action items which have been closed.
- NORWAY: raises a query in relation to actioning items directly to member states –giving the example of UK's excellent presentation on automated contouring/ENCs which raised issues and subject matter which requires action – asks whether it is appropriate to direct this action to a single country.
- CHAIR: States that this is fine so long as the country in question accepts the designated action item.
- UK: Notes that in regard to the example given the result/action item has been that GERMANY is to host a workshop on the subject matter raised during the UK's presentation.

H.4 Introduction New Chair

- **CHAIR: Introduces BELGIUM as the incoming chair of the NSHC**

H.5 Next Meeting

- CHAIR: Notes as an example inter-sessional workshop to be hosted by GERMANY, the ongoing activities of the working groups reporting to the NSHC and the openness amongst members to facilitate online/skype meetings as required and states that **in this case there is not a need for an annual meeting** - Comments that NSHC 34 is provisionally to be held in March 2020 and is to be hosted by Iceland

H.6 Closing Remarks

- CHAIR: Offers thanks to all participants for their co-operation, contributions and for the papers submitted. Notes that it was a pleasure to chair the event and wishes all concerned a safe journey home. **Closes proceedings of NSHC 33**