

37th North Sea Hydrographic Commission Conference

9–10 April 2024, Malmö Sweden

DRAFT MINUTES

A. Opening formalities

A.1. Opening of the Conference

CHAIR

Documents:

- [NSHC37 Outline Programme](#)
- [NSHC37 List of Documents](#)
- [NSHC37 List of Participants](#)

The Chair of the NSHC, *Mr. Magnus Wallhagen (SE)*, opened the 37th North Sea Hydrographic Commission Conference and welcomed the delegates and IHO Secretariat representatives to Malmö.

The Chair informed the meeting that we at the last meeting tasked three of the NSHC WG to take the S-100 implementation forward. This will be shown in the presentations during the meeting on adaption and implementation of the new standards in the North Sea region.

In total, the Conference had 23 participants, including NSHC vice chair RAdm Angus Essenhigh (UK). The IHO Secretariat was represented by Dr. John Nyberg. Not counted as delegates of the meeting Hans Öiås (SE) acts as secretary, and Klara Lindström (SE) as assistant for the meeting.

A.2. Adoption of the Agenda

CHAIR

Document:

- *This document*

The delegates approved the draft agenda.

DECISION 1: The Commission adopted the agenda.

A.3. Minutes of the 36th NSHC Conference

CHAIR

Document:

- [NSHC36_Minutes](#)
- The minutes from 36th NSHC Conference (VTC) has been approved earlier by correspondence which was confirmed at this meeting.

DECISION 2: The 37th Conference confirmed the approval of the NSHC36 Minutes.

A.4. Actions of the 36th NSHC Conference

CHAIR

Document:

- Original [NSHC36_List_of_Actions](#)
- Updated version of [NSHC36_List_of_Actions](#)

The Commission reviewed and updated the status of the Actions of the 36th Conference.

DECISION 3: The Conference decided to close Actions: 16/2023 E1, 6/2023 C.4, 10/2023 C.5, 12/2023 D.4.1.

B. IHO work program 1 – Corporate Affairs

B.1. Information about the activities of the IHO

IHO SECRETARIAT

Document:

- [NSHC37_B1_2024_EN_IHO_Secretariat_Report](#)

IHO Director, *Dr. John Nyberg*, presented the Secretariat's work, Council matters and informed the Commission about status of the IHO Work Programme 1 and the IHO's Strategic Plan.

Currently, the IHO consists of 99 Members.

He reminded of the IHO's Strategic Plan as the core of the Work Programme 2020-2026. Regarding Goal 1, the focus of the current work lies on implementing the S-100 framework in ECDIS and S-100 based products, while maintaining S-57 and building a future for the provision of paper charts. IHO will report S-100 implementation progress to IMO on a yearly basis.

All MS are encouraged to handle all IHO CL as soon as possible, as approvals and further work is depending on that those documents and standards are approved as soon as possible. To manage the phase 1 implementation of S-100 it is crucial that all MS respect the time schedule.

The Director also encourage the regions to work more on EWH for the coming period.

IHO will arrange some sessions for Hydrography and its economic impact at the Geospatial Forum held in Rotterdam 15-16 May 2024.

He thanked for all efforts put in by the NSHC member states, in various IHO WG and PT, and noted that it is not even a need to push for updates of P-5 and C-55.

Work has started within the WEND-WG on “S-11 Part C” for maintenance of S-100 Navigational Data Services. This is a big addition to their work plan.

IHO reports to IMO regarding the development plans for production and expected availability of S-100 data coverage. It is also important for HOs to cooperate with their respective national IMO representatives as both relates to each other and especially now during the S-100 implementation. A need to match the SOLAS requirements for Maritime Services (MS) to the related S-100 products has been identified. NIPWG has been working on this task and the ENDS Tree diagram will be presented at HSSC-16 for this purpose.

Norway suggest an IHO Bulletin showing the relations found between S-100 and IMO/SOLAS. The director noted this as a task.

Action 1: Conduct a survey within NSHC on hosting and attending meetings in the four different modalities (in-person, in-person with live streaming, hybrid, or full VTC). *Reference IHO Report recommendation e).*

The survey will be made when the questionnaire has been presented by the Council Sub WG.

B.2. Information about IHO Council

NSHC REPRESENTATIVE
(GERMANY)

- NSHC37_B2-Report Council 7

DE, Thomas Dehling, having the NSHC seat in the Council held a presentation summarizing the Council 7th meeting held in Monaco 7 October 2023. The Council has put together a “*Project Team on Fund Generation of IHO’ Project Initiatives under the IRCC*”.

National Hydrographers, or their Deputies, are strongly encouraged to participate and attend to the CSBWG meetings and the next one is 23-26th April2024 VTC/Hybrid format.

One important action is to contribute with suggestions for the revision of the Strategic Plan for the period 2027 to 2032.

Action 2 Member States to provide input to the E-learning centre and provide feedback on existing content.

C. IHO work program 2 – Hydrographic Services and Standards

C.1. HSSC: Items relevant to NSHC, incl. S-100 implementation

HSSC CHAIR

Document:

- [HSSC Report](#)

Magnus Wallhagen, now as the HSSC Chair, specifically pointed out the importance for the MS to reply to the CL regarding approval of the new standards as soon as possible in order to be able to keep the timetable set up for the S-100 implementation.

He also focused on the importance of the future maintenance scheme for the S-100 Infrastructure, such as the GI Registry, and also the need to get the security scheme to become fully operational. It is important that the maintenance of the S-100 Infrastructure becomes sustainable and not dependant on short term initiatives from MS.

IMO has indicated that they want to be involved in the roll-out of S-100 to secure that the transition phase is not too long. Some stakeholders are advocating for S-57 sunset which might lead to increased investments in S-100 ECDIS.

Next HSSC Meeting is planned to be held in Tokyo 27- 31 May 2024.

C.2. Status and continuation of the Resurvey Working Group (RWG)

NSHC CHAIR

Document:

- [NSHC37 C.2 Resurvey WG](#)

No nomination for Chair of the RWG were presented during the meeting and none had been received before the meeting. DK commented that it may be important WG with many different relating activities that are going on in the North Sea area today with windfarms and other activities. Several other MS agrees, but no nominee for Chair for such a group exists, and the work cannot be restarted at this time.

Decision 4: The Commission decided to keep the RWG dormant for the time being, and focus the work on the IHO-HSWG. The Commission also decided to cancel Action 2/2023 C.3 and update the due date of Action 9/2023 to NSHC38.

Action 3: The Commission decided to form a correspondence group that will look into ToR and Workplan for possible restart of the RWG at the NSHC38 meeting. Participating in the correspondence team are DE (lead), NO, IR, DK, UK, NL.

C.2.1 Advancements in Satellite-Aided Mapping

DENMARK

- [NSHC37 C2.1 DK Satellite Briefing](#)

Hendrik Justus Stang (DK) presented the ongoing work of the Danish HO with satellite-aided mapping in Greenland and at Lake Volta in Ghana. The meeting discussed the use of, and possibilities from satellite technology in the field of bathymetry. It was also brought up that the European Space Agency (ESA) has procured the creation of a global SDB coverage in 100m resolution that will be available within a few years.

C.2.2 Digital survey specifications

NORWAY

- [NSHC37 C2.2 Digitalization of Survey Specifications](#)

Evert Flier (NO) presented the work performed on automatizing a number of quality controls for use in procured and internal bathymetric results. The tool is amongst other controls used to check data density, finding gaps in the survey coverage over a specified allowed size, and can be used with different cell sizes for different depths. The tools (*created for use with Kongsberg MBES data format*) will, during 2024, be made available for other users.

C.3. Report of Tidal Working Group (TWG)

TWG CHAIR

Document:

- [NSHC37-C3_TWG_Report-SE](#)

Thomas Hammarklint (Chair TWG) will step down as Chair and Andreas Boesch (DE) has volunteered for the position as Chair. The WG suggests that the NSHC will appoint Mr Boesch as new TWG Chair.

The Chair presented his report, including an example from the work in the Baltic Sea WGs on the infrastructure needed for the provision of S-104 and S-111 data.

NSHC noted the report and the following decisions were agreed upon:

- Decision 5:** Andreas Boesch (DE) was elected as permanent Chair of the TWG and Action 15/2022 D.4.2 was closed.
- Decision 6:** The adjusted (gender neutral) TWG ToR and the suggested Workplan and List of Actions were accepted.
- Action 4:** The Commission tasked the TWG to report to NSICCWG on the progress of S-104 and S-111 implementation coordination. *Reference: Decision 6/2023 C.2*

C.4. Update on the ECS Project Team

UK

- [NSHC37 C4 ECS Project Team update](#)

The report was presented by Nick Rodwell (UK) and stated that UKHO will for the foreseeable future continue to produce paper charts, contrary to their earlier position to sunset the paper chart production 2026. However, UKHO foresee that the cost per chart will increase over time as the sold numbers decrease and the cost will fall on the customers.

The Project team is formed under the HSSC umbrella and had their first meeting in July 2023. They have no intention to develop new standards, but to see what can be done using the ones already existing. The presentation was followed by some discussion regarding possible future changes of ECDIS or ECS carriage requirements for vessels today not covered by SOLAS. It was consensus that this is a question for IMO and that IHO has no possibilities to set rules for carriage requirement.

The report was noted.

C.5. Sample Production of S-127 dataset by BSH

GERMANY

- [NSHC37 C5 S-127 BSH](#)
- [NSHC37 C5 S-127 Annex 1 VTS Guide Germany extract](#)
- [NSHC37 C5 Annex 2 VTS-Guide from S-127](#)

The report was presented by Thomas Dehling (GE), showing examples of how digital information for VTS services can be developed using the relevant S-100 standard, S-127. Today the information is created using information in QGIS and compiled using Python scripts, but a higher degree of automation will be needed for the future and at the same time the nautical information still needs to be manually analysed. BSH encourage MS to present their national developments if scheduled, and/or liaise with BSH regarding S-127 production.

D. IHO work program 3 – Inter Regional Coordination and Support

D.1. Actions requested by IRCC

CHAIR / IRCC CHAIR

Reference document:

- [IRCC15 List of Actions, Decisions and Recommendations to RHCs](#)

During this agenda Item there were some discussions especially regarding the Recommendation 4: “to consider to open the debate on future engagement in climate change related activities in reference to strategic goal 3”. Several points were mentioned where the hydrographic community already supports with data for flooding prevention and similar tasks, but we can all be more alert and participating in such activities.

DK mentioned that a broader cooperation addressing offshore wind and green energy potential in the North Sea has been formed by DK, NL, BE and DE on a government level last year (Esbjerg Declaration of Intent)..

There were also discussions regarding recommendation 13 “*encourage Member States to support the CSB initiative with positive actions, such as requiring all research vessels to collect bathymetric data for late uploading, when on passage or when it does not interfere with other research activities.*”. It was pointed out that in several national waters, the use of multibeam echosounders are not considered to perform CSB collection (considered as scientific research), and that such passage soundings then only is allowed using single beam echosounders.

Decision 7: The Commission decided to consider all remaining open IRCC Actions and Recommendations done and close them.

D.1.1 NSHC Input to the IHO Strategic Plan

CHAIR / UK (INCOMING
NSHC CHAIR)

Document:

- [NSHC37 D1.1 NSHC Inputs to the IHO SP.](#)

The Chair presented the main goals and invited all delegations, during 10 minutes, to write down suggestions for inputs to the future Strategic Plan. After the meeting the meeting secretariat made a summary of the suggestions and forwarded them to UK as the next Chair of NSHC. The summary will also be added as an annex to these minutes and in addition as an annex in the NSHC report to IRCC-16.

A short round where the MS could present their input was also made and it was a substantial amount of suggestions brought up. For further details, please see the annex 1 to these minutes.

Action 5: NSHC Chair to include input on the IHO Strategic Plan as an annex to the IRCC Report

D.2. IHO-EU Network Report

NSHC REPRESENTATIVE
(GERMANY)

Document:

- *NSHC37-D2-Report IENWG*

Thomas Dehling (DE) presented the report and the main topics that has been discussed during the last meeting and one of the main topics is to connect also with other EU-DG than DG-Mare.

The next IENWG meeting will be held in Svendborg, Denmark on 29 May back-to-back with the European Maritime Days, also held in Svendborg 30-31 May 2024 and it is still open for registration.

Some discussion was also opened on the “High-Value Dataset” and that IENWG will send out a questionnaire regarding what information each HO’s plan to provide under this EU Directive.

D.3. Status of the Baltic Sea North Sea Marine Spatial Data Infrastructure Working Group (BS-NSMSDIWG).

DENMARK

Document:

- [NSHC37_D3_BSNSMSDIWG](#)

BSHC has decided to withdraw their participation in this WG. Some discussions followed regarding the importance of this WG and the outcome was that interested parties can take part in the IHO-MSDIWG where DK, UK and DE already participate, as well as other global initiatives.

The IRCC15 recommendation 11 to appoint MSDI Ambassadors was discussed and DE nominated Kimberley Mason (DE) for this post.

The Commission decided to permanently close this WG.

Decision 8: The Commission decided to terminate the BS-NSMSDIWG permanently, to close Action 11/2023 D.3, and focus on global MSDI initiatives, IHO-MSDIWG, and S-100 coordination.

Decision 9: In accordance with IRCC15, recommendation 11: The Commission appointed Kimberley Mason (DE) as NSHC-MSDI ambassador.

Action 6: The NSHC Chair to inform the MSDIWG with contact details of the NSHC-MSDI ambassador.

D.4. Report of the North Sea MSI Working Group (NSMSIWG)

NSMSIWG CHAIR
(UK)

Documents:

- [NSHC37-D4_NSMSIWG_Report](#)
- [NSHC37-D4_ToR's_North_Sea_Maritime_Safety_Information_Working_Group_V3](#)

UK held the presentation and the Commission noted the report and approved the updated ToR. The Commission also discussed the presented work plan and directed the WG to also include implementation of other S-100 standards related to MSI. DK emphasized that the Danish Maritime Regulator, represented in the NSMSIWG, perceives a risk of increased workload if additional S-100 standards are included in the group's work, as these standards are already being addressed by other IALA and IHO working groups.

Decision 10: NSHC37 approved the suggested amendments to the NSMSIWG ToR, and decided to close action 7/2023 and 8/2023

Decision 11: NSHC37 decided to task the NSMSIWG to include, in addition to S-124, implementation of other S-100 standards related to MSI (such as S-201, S-125 & S-41x) in their workplan.

Action 7: The Commission tasked the NSMSIWG to report to NSICCWG on the progress of S-124 implementation, as well as implementation of other relevant S-100 standards relating to MSI. Reference: Decision 8/2023 C.2

D.5. Report of the NSHC representative to WENDWG

NSHC REPRESENTATIVE
(UK)

Document:

- [NSHC37 D5 WENDWG Report](#)

The report was presented and duly noted.

Some discussions were held about the S-100 standard and allowing SENC delivery or not for S-100. The problem is that the data producer signature, agreed upon in the S-100 standard, will be broken if SENC delivery is allowed. PRIMAR advisory committee (PAC) has decided not to allow SENC delivery. The UK means that there are user/customer demands for a continuation of SENC deliveries.

It was also discussed around how and when production of S-100 based datasets will begin in the MS and that IHO, as well as other MS, are interested in the progress within the region and an action about this was formed. The upcoming WENDWG15 will be held 18 - 20 February 2025, in Wollongong, Australia

Action 8: Member states to share S100 coverage with ICCWG /NSHC WENDWG Rep. prior to the yearly WENDWG.

D.6. Report of the North Sea INT Chart Coordination Working Group (NSICCWG)

NSICCWG CHAIR
(UK)

Document:

- [NSHC37-D6 NSICCWG Report](#)

The report focused on the result from the NSICCWG questionnaire regarding the timetable for planned implementation of the prioritized S-100 based standards. All MS except IR and IS have replied to the questionnaire and the Chair asked also them to provide updates to the next questionnaire. All responding MS anticipate start of production of S-101 and S-102 early 2026.

FR and UK are jointly working to re-scheme ENC coverage of the Channel and the Channel Islands.

Many of the MS needs to cooperate with other national agencies in order to be able to produce S-104 and S-111.

Decision 12: NSHC37 approved the suggested amendments to the NSICCWG ToR, and decided to close action 3/2023 C.2, 4/2023 C.2, and 5/2023 C.2

D.7. Report of the IHO Capacity Building Sub-Committee, including report of EWH (CBSC)

NSHC REPRESENTATIVE
(GERMANY)

Germany presented the ongoing activities in CBSC.

There is no specific CBSC related activity within this Commission, but several MS are participating with support to others. There is a high need within other regions for funding.

Denmark has been involved in a project in Ghana and also supports EWH. UK informed that they have set aside 100 000£ in a fund that partly can be used for EWH and other items that needs financing. Denmark, Belgium and Norway have all committed to give 10 000€/year to the IHO for use in EWH activities.

D.8. Status CSB/GEBCO/Seabed 2030

NORWAY

Document:

- [NSHC37-D8 status GEBCO-SB2030-CSB](#)

Norway presented the status of GEBCO and the SEABED 2030 initiative. The coverage of the seas has increased from 6% in 2017 to nearly 25% today. Much of this is thanks to release of already existing datasets, and just a minor part from new surveys.

This region is rather well represented in participating in the work to fulfil the goals of SEABED 2030 if not directly so via their inputs to EMODNET Bathymetry that is used as regional input to GEBCO.

IHO-DCDB continues to grow and more and more data is flowing in from public sources.

The Chair informed that NHC plans to sign a MoU with SEABED 2030 and would like all MS to consider if NSHC also should sign such MoU.

Action 9: All MS to consider if NSHC can follow the NHC to sign a MoU with SEABED 2030.

D.8.1 EMODNet Bathymetry Report

FRANCE

Document:

- [NSHC37_D.8.1_emodnetbathy](#)

The report was presented by FR and showed the time schedule for the ongoing contract period. The amount of data contributed as well as the amount of CDI Metadata continues to grow. The number of High Resolution (*with resolution better than 1/16 Min*) DTMs have also increased and there is today more than 200 available. The regional coordinators shall deliver their DTM in July and the goal is to make the 2024 DTM public in the very beginning of 2025.

D.9. NSHC Website

CHAIR

No MS volunteered to host a website and the commission decided not to pursue this question any longer.

The WG that needs some place for common storage of document and other work material will have to sort that out by themselves using commercial or other suitable services.

Decision 13: NSHC conference decided to cancel action 14/2023 and 15/2023 and for the time being not provide any NSHC-website.

D.10. Report of Baltic Sea e-Nav project

SWEDEN

Document:

- [NSHC37 D10 Baltic Sea E-nav SE](#)

The report was presented by SE. From the NSHC region SE, DK, and DE participate in the project that is funded by Interreg Baltic Sea Region.

One of the goals is to produce S-101 and S-102 data and to discuss harmonisation rules for the products. S-101 activities are led by Sweden (SMA) and S-102 by Germany (BSH) and S-104 and S-111 activities are led by Finland (Finish Meteorological Services).

Action 10: Sweden to report to the NSICCWG on harmonization rules developed for S-101 and S-102 in the Baltic Sea e-Nav project during the project period 2024-2026.

D.11. NSHC IHR Report

NETHERLANDS

NL confirmed that Leendert Dorst remains as the NSHC representative for the IHR. There is always a request for contributions in form of scientific articles, but also shorter articles, project reports and news are welcome.

E. Any other business

E.1. NSHC Statutes

CHAIR

Document:

- [NSHC Statutes](#)
- [Annex A NSHC Statutes ver 1.0 endorsed by MS 2023 clean version](#)
- [Annex B NSHC Statutes ver 1.0 endorsed by MS 2023 redline version](#) (Word format)

The Statutes had previously been circulated between the MS and approved before the meeting. At this meeting they were formally approved by signing of all member states representatives.

Decision 14: The Commission approved the amended statutes by a formal signing procedure at the NSHC37 conference.

F. Election of new Chair and Vice Chair

The meeting elected: Angus Essenhigh, United Kingdom as Chair
Thomas Dehling, Germany as Vice Chair

G. Place and date of next Conference

The meeting decided that NSHC38 is to be held on the 8-9 April 2025 as a Virtual meeting.

H. Review of NSHC37 List of Actions

The draft list of decision and actions was presented and minor adjustments and rephrasing was performed.

I. Closing ceremony

The NSHC Chair Magnus Wallhagen thanked all meeting participants for their contribution to a fruitful meeting and declared the meeting as closed.

Annex 1 reference to D.1.1

NSHC Input to the IHO Strategic Plan

1. General comments:

- Maintain the three main goals in its general understanding but update and refine targets to better align with strategic objectives.
- Review and update targets under each goal to ensure they are specific, measurable, and aligned with broader strategic aims and specific goals.
- SPI's should be objectively reviewable, applicable across all member states, and ideally - based on data collected by the IHO Secretariat. Principles should allow for the use of data to assess SPI's, possibly through tools like IntoGIS. Draw inspiration from previous successful frameworks and adapt to national or regional needs.
- Clearly identify targets and assign review responsibilities, ensuring the strategy's objectives and progress are transparent and measurable.
- At Assembly 2023 it was decided to prioritize SP1 over SP2 and SP3. The priorities should be revised to ensure equal priority for each over time.
- Consider lunchtime presentations at IMO MSC/NCSR and MEPC (MPA's etc).
- The IHO structure should be representative of the MS, when considering diversity and inclusivity, gender balance etc.
- Respond to the requirement to create better metrics to measure, understand and define success or failures toward the SPIs.

2. Goal 1:

- Be clear that hydrography is more than bathymetry.
- Better interdependency between e-navigation and S-100 implementation. Make the SP more specific in context of the IMO implementation dates for S-100 ECDIS (2026/2029).
- Focus and priority for S-100 products that are needed on ECDIS mandated vessels for route monitoring (Phase 1) and planning (Phase 2).
- S-100 is evolving, there is no clear end point.
- Emphasis safety of navigation.
- Recognize the importance of robust IHO S-100 Infrastructure suggesting its inclusion as specific target under goal 1.
- IHO contributing to cyber security for shipping. Management of the Security Scheme.
- It is obvious that we need to add a new object for the next Strategic Plan "To ensure operability and sustainability of the S-100 framework".
- Integrate capacity-building targets related to charting, digitization, satellite processing, and digital twins within each goal to foster global hydrographic competency.



- Competency and Learning Exchange: facilitate mutual learning and skill development among member states.
- Concentrate activity on S100 development capacity building.
- A regional approach is adequate with the S-100 transition.
- Ratio of Large harbors (based on the WPI index) covered by at least two S—100 layers. Include a target about adaptation of S-1xx and strive to achieve global coverage.
- Harmonization of carriage requirements regulations for the market currently outside the SOLAS carriage requirements for ECDIS. Taking into account the development of the product offering in connection with e-navigation.
- Increased engagement with Maritime Safety Administrations/Educational establishments in relation to S100.

3. Goal 2:

- Delete or rephrase the MSDI related target. IHO will not build a MSDI portal but improve IHO GIS tools.
- Expand the scope of depth data collection and use beyond traditional methods, promoting societal benefits and climate change mitigation.
- IHO is the reference provider for the bathymetric twin of the ocean to be used in climate change related projects. Proposed indicator: Number of International Projects using DCDB as the reference for the bathymetry.
- Promote innovative depth data collection (including satellite mapping) and modeling to support both navigation safety and broader societal needs
- Consider focusing Goal 2 primarily on depth data, leveraging advancements in new technology for charting. Making depth data available for society in the best way possible.
- Using hydrographic data, and the IHOs data competencies to play a role in mitigating and modelling climate change-related changes.
- Holistic approach and include the nature of the seabed and not only focus on bathymetry for initiatives such as DCDB, GEBCO. Inclusion of hydrographic data such as backscatter for seabed classification and habitat mapping. Proposed indicator: Percentage of total seabed nature described in the DCBD dedicated layer.
- Apply UN shared guiding principles for geospatial information management in order to ensure interoperability and extended use of hydrographic data in combination with other marine-related data.
- Include something about avoiding duplication in survey efforts.



4. Goal 3

- More clear connection to eco-system based Marine Spatial Planning and support of blue economy.
- Link to UN SDG's 2030 Agenda and UN Decade Ocean Research for Sustainable Development.
- Strengthen IHO's role as a global player by integrating navigational safety, depth data, and other marine data, emphasizing collaboration, data alignment, and a broader narrative on the benefit of hydrography.
- Enhance partnerships with IMO, IALA, IOC, WMO and other relevant organizations to bolster IHO's global presence and effectiveness.
- Enhancing IHO's Visibility and International Positioning: Implement strategies to make IHO more known and better positioned within the international governmental landscape.
- Maritime data at large: hydrography as support for initiatives such as the Digital Twin and general knowledge on our oceans: this may also include initiatives such as promoting Marine Protected Areas.
- Using the IHO competencies to both serve the broader society, but also as a tool to position the IHO and hydrography more broadly in the world.
- Target 3.2 on Improve knowledge of the seafloor should include critical infrastructure on seabed (cables, pipelines) to cover seabed warfare.
- Improved communication and advertisement regarding the developing S-100 world including all socio-economic benefits e.g., Decarbonisation, Voyage Optimisation, Green Corridors and other Green/sustainable initiatives, as these support each of the 3 principal strategic goals.