

**NIPWG report and recommendations**

<b>Submitted by:</b>	NIPWG
<b>Related Documents:</b>	Minutes of the various VTC meetings
<b>Related Projects:</b>	S-100 product specifications

<b>Chair:</b>	Eivind Mong, CANADIAN COAST GUARD, CA
<b>Vice-Chair:</b>	Stefan Engström, TRAFICOM, FI
<b>Secretary (acting):</b>	James Weston, UKHO, U.K.
<b>Member States:</b>	Argentina, Brazil, Canada, Denmark, Estonia, Finland, France, Germany, Japan, India, Italy, Republic of Korea, Netherlands, Norway, Poland, Russian Federation, South Africa, Spain, UK, USA, (and IHB).
<b>Expert Contributor Organisations:</b>	Anthropocene Institute, CARIS, Bergmann Marine, CIRM, EEC, Fleetmon, Furuno Finland, Geomod, IHMA; IIC Technologies, KRISO, NV Chats Germany, NOVACO, NTOU, Portolan Sciences, University of New Hampshire.

**Meetings Held During Reporting Period** (Work Plan section K)

NIPWG VTC, multi-sessional virtual meetings in June and December 2022, and March 2023.

NIPWG9 in Niteroi, Brazil in September 2022.

**Next Planned Meetings**

NIPWG10 in Monaco, September 2023

NIPWG VTC, multi-sessional virtual meetings in June and December 2023, and March 2024

**Work Programme according to the HSSC Work Plan 2022-2023 for NIPWG and associated HSSC action items**

Current work is being conducted in accordance with the HSSC Work Plan. Work progress is starting to recover after COVID.

Action Item HSSC14/44 (formerly HSSC13/35) continues to be worked on under section F of the workplan. Canadian Coast Guard surveying navigators within its fleet and holding public consultation for views on how NPUBs should work in an ECDIS. Other national agencies are considering how to also contribute to these efforts. This work is ongoing and there are testbeds being conducted or planned to help further inform the views of how S-100 based products should work together in ECDIS. Work has therefore not progressed as far as anticipated and additional time is needed to complete the action item with the anticipation of an update of progress being reported at future HSSC meetings.

Action Item HSSC14/45 No input has been received in the reporting period and a reminder for will be issued in the next reporting period.

Action Item HSSC14/46 NIPWG has engaged with Expert Group on Data Harmonization (EGDH) and has confirmed Stefan Engstrom as the permanent liaison from NIPWG to EGDH. More updates are provided later in the report.

Action Item HSSC14/47 Work on the input is ongoing. The Joint IALA/IHO S-100/S-200 workshop in Norway in September 2022 recommended a data flow diagram that has recently been tested in parts in a testbed under the IHO-Singapore Lab. See section on S-125 for more details.

Action Item HSSC14/48 is completed and IALA has been informed.

Action Item HSSC14/49 development of the S100 picture is ongoing with parts of the picture being developed within the other ongoing discussions.

Actions HSSC14/50 All of the S-100 based product specifications under NIPWG responsibility are in the process of being upgraded to S-100 Edition 5, with the exception of S-131 which was developed using S-100 Edition 5.0.0.

Action Item HSSC14/51 is complete.

Action Item HSSC14/52 Discussions have been had regarding responsibilities of production of S-128, including an ad-hoc discussion forum in conjunction with TSM9, conclusions include that the concept and specification can handle the needs of the main stakeholders. See S-128 section for more details.

Action Item HSSC14/87 NIPWG have been working on a framework for classifying S-100 products according to the SOLAS V terms for the development of S-128. This work connects with the efforts to elaborate the ENDS term in the Revised ECDIS Performance Standard (MSC.530(106)) and action HSSC14/49.

## **Product Specifications development progress**

### **S-122 (Marine Protected Area) (Work Plan section F)**

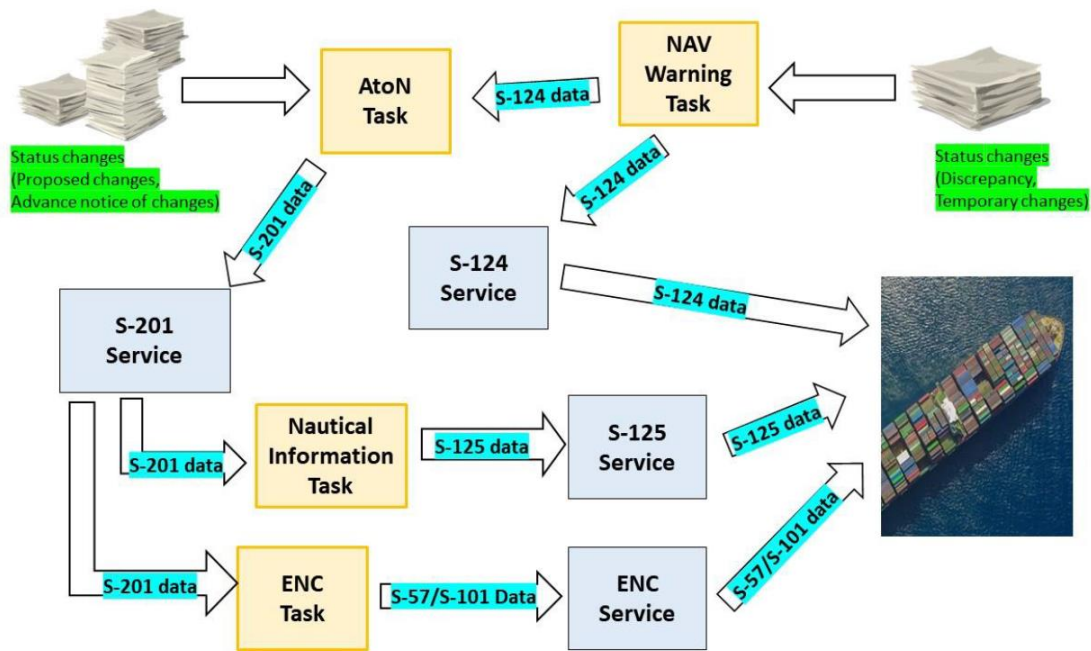
Task group to review and update the product specification has been stood up with Jonathan Pritchard (IIC Technologies) as task group lead. Main goal is to bring S-122 into alignment with Edition 5 of S-100 and review lessons learned during a recent OGC project. Work is on track according to timeline in the S-100 Implementation plan.

### **S-123 (Radio Services) (Work Plan section F)**

Task group to update S-123 based on lessons learned during implementation of the first edition of the product specification is well under way and meeting monthly to progress the work. The task group is led by Bridget Gagné (Canadian Coast Guard). The TG is collecting proposed solutions for the next version of S-123 product specification. Canadian Coast Guard is collecting user feedback on the visualization and user interface for digital nautical publications in ECDIS and is expected to provide proposals for visualization of S-123 to aid in the development of a portrayal catalogue. Work is on track according to timeline in the S-100 Implementation plan and it is expected that a request for funding to update the product specification will be filed in this current calendar year, in line with expectations reported in previous HSSC reports from NIPWG.

### **S-125 (Navigational Services) (Work Plan section F, J)**

IALA cooperation is working well with IALA ARM Committee drafting a version 0.0.3 of the product specification. The joint IALA-IHO workshop held in Norway, in September of 2022 made some recommendations for how S-125 development should be carried out. NIPWG chair and vice-chair attended the workshop and collected the recommendations made, presented these to the 9th meeting of NIPWG, which concurred with the recommendations and submitted an input to the 16th meeting of IALA ARM committee where the recommendations were followed in the creation of the latest draft version. The figure showing how a typical national data flow could work for S-101, S-124, S-124, and S-201 was developed at the workshop and supported by NIPWG and IALA.



Interoperability of S-201, 124 and 125 with S-101

Figure 1 - AtoN information data streams

NIPWG chair group is preparing to conduct a working group review of this draft and report findings to IALA. Testbed held at the IHO-Singapore Lab testing the progressing of AtoN data from S-124 to S-125 and how the visualization of said data is observed in the user equipment yielded very positive results and valuable lessons learned in how to visualise the updated information and give users a complete understanding of what has changed. Work is on track according to timeline in the S-100 Implementation plan.

**S-126 (Physical Environment) (Work Plan section F)**

It was attempted to form a task group to work on the S-126 product specification, however, among the interested stakeholders it was not possible to identify a lead for the work, and it was therefore concluded that the work item does not have sufficient priority among the membership to dedicate the limited resources available at this time. It is therefore recommended that the development of S-126 is put back on hold till such a time as the necessary resources become available.

**S-127 (Traffic Management) (Work Plan section F)**

Task group started with Ed Kuwalec (IIC) as task group lead. Several meetings have been held and the group is working on assessing the S-127 Ed. 1.0.0 and what changes are needed for moving to S-100 Edition 5 compatibility as well as the collection of comments received since the release of Edition 1.0.0. Work is on track according to timeline in the S-100 Implementation plan

**S-128 (Catalogue of Nautical Products) (Work Plan section F)**

Ad hoc discussion group held during the S-100WG Test Strategy Meeting 9 in Seoul, ROK. Discussions revealed that the concept seems to work well, although the product specification need some modifications to include some additional functionalities to support real time data service description.

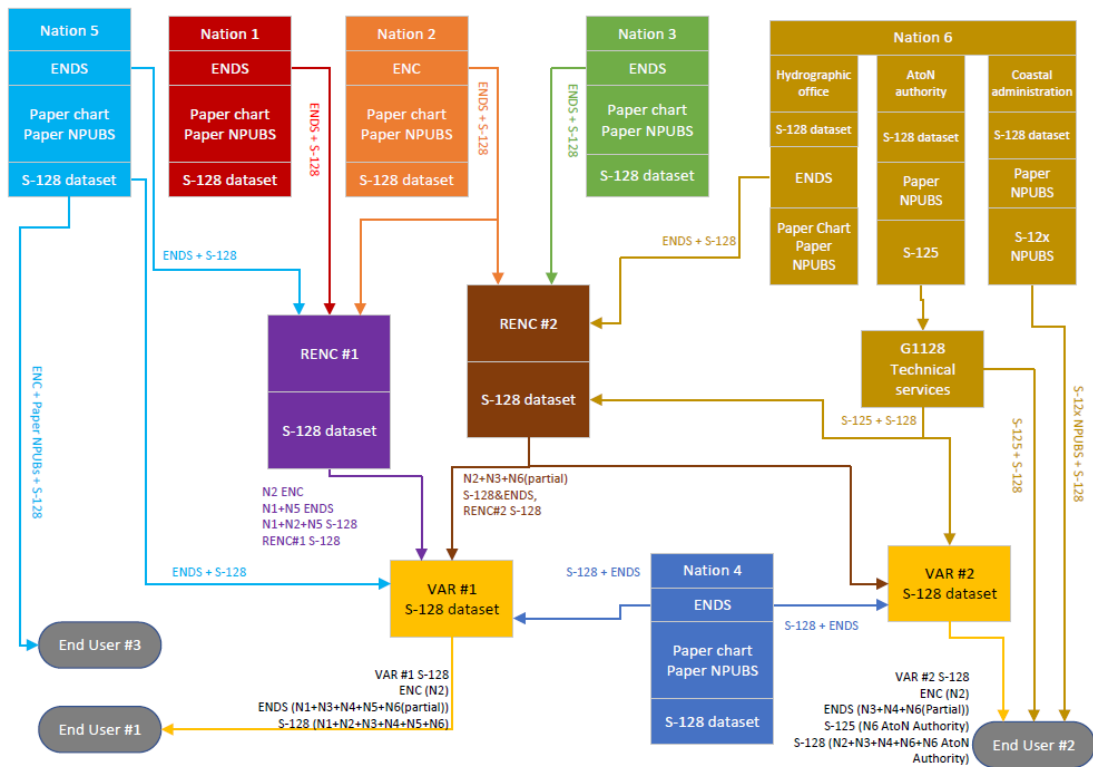


Figure 2 - Sample of possible S-128 scenarios

This diagram represent a set of potential scenarios that may be encountered in the future and how S-128 can be utilized in these scenarios. The scenarios are formulated using input from NIPWG members based on the current situation. The core thought is that S-128 will be used by each service provider to describe the service. This means that for example like in the case of Nation 1 there may be several government entities that have agreed to offer the S-100 services as a national service, and S-128 is used to describe the status of that national S-100 products service, meaning there is one national S-128 service describing all navigational products and services, including electronic and paper products. Another example is Nation 6, where each government entity have decided to do individual services and use S-128 to describe their services, meaning that there are three S-128 services that are used to describe the whole national navigational product offerings. RENCs could collect the member nationals S-128 products as a service offering, and create their own S-128 service that describe the service offered by the RENC. This same principle flows down the supply chain where distributors do the same and use S-128 to describe their service. The user system then utilize all S-128 products available to create a statement of up-to-dateness and to describe what products are available to user.

The S-128 task group are working on the details of how to validate S-128 products from all relevant producers, and currently consider producer codes as the leading candidate to do so.

**S-131 (Marine Harbour Infrastructure) (Work Plan section F)**

The S-131 Product Specification has been through final review and comment assessment. Over 200 comments were received and adjudicated. Comments that proposed significant data model changes or scope adjustments are put on hold for consideration during the testing phase of the S-131 development. Conclusion was that it is ready for Ed 1.0.0 and it has been submitted for approval from HSSC. See HSSC15-05.3B.

**S-131 database testbed**

The S-131 2-year project is at the halfway mark. API development continues apace: the feature catalogue was stabilised in December 2022 and has been implemented. In practical terms, upload of single features/feature collections is now possible, and next up will be expressive datasets featuring all S-131 features. A GML export is available but it's not supporting exchange sets yet. The API integration with the

GUI is almost complete. Current challenges include attribute display & prioritization, as the GUI must support all possible data input & output. The data model is sophisticated enough to handle the inherent complexities of multiple levels of attribution & sub-attribution, but need to simplify the interface so as not to overwhelm the user. Another current challenge is the access control scheme, and the need to define who should be able to upload/download data. Integrity checks against digital signatures, source providers, and inter-operability with Maritime Connectivity Platform all must be incorporated. The project team is soliciting test datasets from select harbours. Towards the end of 2023, those select harbours will be invited to test the DB's capacity to connect to users' existing GIS to import, customize and export of their data, in support of the end goal of an operational system by April 2024.

#### **Maintaining IHO Standards under NIPWG responsibility (Work Plan section D, I,)**

##### ***Maintain Publication S-12 “Standardization of List of Lights and Fog Signals”***

No requests to amend S-12 were raised in 2022. The content provided in S-12 is considered as appropriate and fit for purpose.

##### ***Amendments to M-3***

The NIPWG did not receive requests on M-3 amendments in 2022.

#### **Any Other Items of Note**

##### ***IMO related work (Work Plan section G) (HSSC14/46)***

IMO Expert Group on Data Harmonization ( EGDH ) is a subgroup of the IMO FAL committee and Stefan Engstrom will act as the permanent IHO liaison to this group. The EGDH maintains the IMO Compendium on Facilitation and Electronic Business. The IMO Compendium is a data dictionary consisting of elements related to electronic ship reporting. It should be noted that the expansion of the IMO Compendium beyond the FAL convention reports has introduced some overlap with IHO GI-Registry concepts requiring harmonization of definitions. Collaboration between NIPWG and EGDH has been sporadic over the years, but has increased since 2022 with NIPWG participation at EGDH since EGDH 7 in 2022. To ensure the continuation of a good start, standing agenda items for collaboration have been added to both NIPWG and EGDH agenda.

##### ***Classification of S-100 based products and services (Work Plan section F, H)***

NIPWG has drafted a diagram to link S-100 products to the e-navigation maritime services as a way to describe what ENDS is, and to classify S-100 products and services. The classification is an important part of S-128 product catalogue creation and NIPWG is therefore working on a way to do so. The figure below is a work in progress and is included in this report to seek guidance on the merit of proceeding on this path. For example the product and service mapping to maritime services will need to be confirmed and/or corrected.

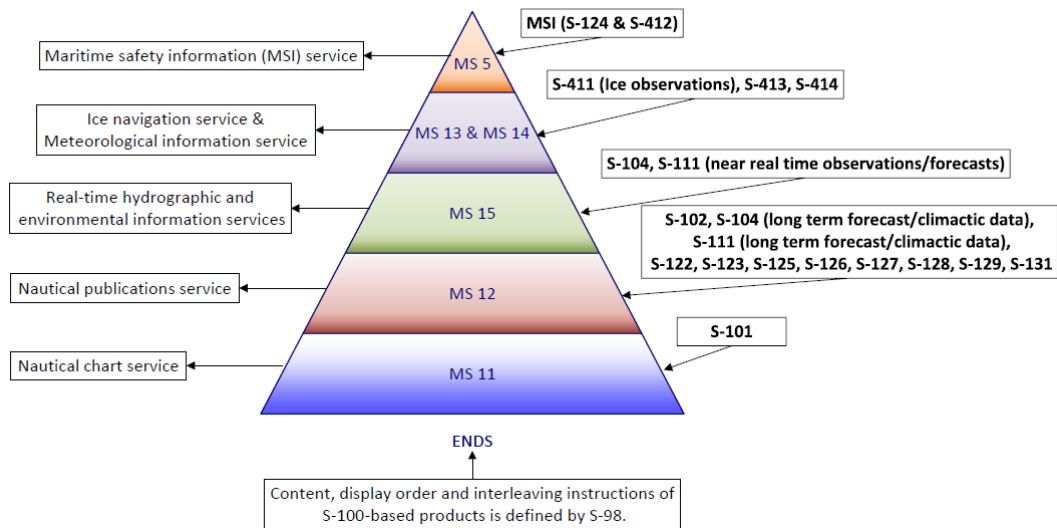


Figure 3 - Description of ENDS in relation to Maritime Services and S-1xx

### Conclusions and Recommended Actions

NIPWG continue to focus on making progress with the S-100 compliant NPUB Product Specifications development including updating those already released to Edition 5.0.0 of S-100. The speed of work is governed by the available resources and is mostly on track according with the plan, however S-126 is recommended to be placed on hold at this time pending resource availability. The IHO Standards that NIPWG is responsible for maintaining are regularly assessed for their continued appropriateness with no required changes in the work period. NIPWG manages the coordination of the IHO contributions to the IMO e-nav strategy and the assessment of proportionate S-100 based products management.

### Action required of HSSC

HSSC13 is invited to note this report and to endorse:

1. the activity of NIPWG;
2. the continuance of the revised 2022-23 Work Plan as annexed;
3. approve that S-126 development be put on hold till sufficient resources are identified.

**Annex A**

**Members List see**

[https://iho.int/uploads/user/Services%20and%20Standards/NIPWG/MISC/NIPWG\\_Members.pdf](https://iho.int/uploads/user/Services%20and%20Standards/NIPWG/MISC/NIPWG_Members.pdf)

## NIPWG WORK PLAN 2023-24

### Tasks

D	Maintain Publication S-12 “Standardization of List of Lights and Fog Signals” (IHO Task 2.8.1)
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F	Establish and monitor, in liaison with the S-100WG, the project teams required to specify and develop nautical information layers for use in ECDIS
G	Develop high level specifications for a maritime services as defined by IMO in the context of e-navigation covering the provision of hydrographic services to mariners in accordance with the IMO e-navigation strategy implementation plan (IHO Task 2.5.2)
H	Develop a test and implementation plan for the development of the maritime services as defined by IMO (IHO Task 2.5.2)
I	Maintain IHO Resolutions in M-3 relating to Nautical Publications as required (IHO Task 2.1)
J	Liaise with other HSSC WGs and other IHO and international bodies (IHO Task 2.1.8)
K	Conduct the 2023 and 2024 meetings of the NIPWG and its sub-group(s) and project team(s) (IHO Task 2.1)

### Work items

Work item	Title	Priority H-high M-medium L-low	Next Milestone	Start Date	End Date	Status P – Planned O – Ongoing C – Completed S – Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
D.1	Monitor and assess proposals for amending S- 12	M	Next meeting	2014	Permanent	O	Chair Team	S-12	In close liaison with IALA; see J.5.1



Work item	Title	Priority H-high M-medium L-low	Next Milestone	Start Date	End Date	Status P – Planned O – Ongoing C – Completed S – Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
F.1	Assess the progress and perspectives of developing S-100 product specifications for NP data and propose the way forward for consideration by HSSC	H	Next meeting	2015	Permanent	O	Chair Team		To be considered in the context of the IMO e-navigation strategy implementation.  NIPWG to consider establishing one or more project team(s) in liaison with S-100WG as required (see J.3), in particular to continue the development of Product Specifications currently assigned to the NIPWG.
F.2	Investigate the interaction between S-100 based Nautical Publication products and ENC in ECDIS	H	Next meeting	2015	Permanent	O	Chair Team		In close liaison with the S-100 WG Encourage national testbeds.
F.3	Model the NP data where required.	H	Next meeting	2004	Permanent	O	Chair Team		S-100 related. To be included in Hydro domain of the FCD Register.

Work item	Title	Priority H-high M-medium L-low	Next Milestone	Start Date	End Date	Status P – Planned O – Ongoing C – Completed S – Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
F.4	Review of objects and attributes. Propose	H	Next meeting	2004	Permanent	O	Raphael Malyankar / Chair Team		S-100 related. Incorporate in GI Registry if appropriate.
F.8.1	Develop S-1xx Nautical Information Product Specification								
F.8.1.3	For Marine Aids to Navigation (AtoN)	L	Next meeting	2013	2023	O	Sewoong Oh	S-125	In progress. IALA developing draft, see J.5.1
F.8.1.4	For Marine Physical Environment	L				S	Chair Team	S-126	No task group lead identified
F.8.1.6	For Catalogue of nautical products	H	Next meeting	2016	2024	O	Izzy Kim	S-128	In progress. Development continued by KHOA.
F.8.1.7	For Marine Harbour Infrastructure	H	Next meeting	2020	2023	O	Sarah Rahr	S-131	Seeking approval to release edition 1.0.0 at HSSC 15. Ongoing development in relation to S-131 database project.
F.8.2	Draft Data Classification and Encoding Guides								Document for NPs similar to: Use of the Object Catalogue.
F.8.2.3	For Marine Aids to Navigation (AtoN)	L	Next meeting	2013	2023	O	Sewoong Oh	S-125	In progress. IALA developing draft, see J.5.1
F.8.2.4	For Marine Physical Environment	L				S	Chair Team	S-126	No task group lead identified

Work item	Title	Priority H-high M-medium L-low	Next Milestone	Start Date	End Date	Status P – Planned O – Ongoing C – Completed S – Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
F.8.2.6	For Catalogue of nautical products	H	Next meeting	2016	2024	O	Izzy Kim	S-128	In progress. Development continued by KHOA.
F.8.2.7	For Marine Harbour Infrastructure	H	Next meeting	2020	2023	O	Sarah Rahr	S-131	Seeking approval to release edition 1.0.0 at HSSC 15. Ongoing development in relation to S-131 database project.
F.8.3	Monitor and Maintain NIPWG Product Specifications								
F.8.3.1	For Marine Protected Areas	M	Next meeting	2023	2024	O	Jonathan Pritchard	S-122	In progress. Edition 2.0 in development.
F.8.3.2	For Marine Radio Services	M	Next meeting	2022	2024	O	Bridget Gagné	S-123	In progress. Edition 2.0 in development.
F.8.3.5	For Marine Traffic Management	M	Next Meeting	2022	2024	O	Ed Kuwalek	S-127	In progress. Edition 2.0 in development.
G.1	Monitor the requirements for, and provision of, nautical information in e-navigation testbeds. Produce NP1 sample data sets.	M				O	Mike Kushla		According to the tasks assigned by HSSC4. Collection of information to be modelled.

Work item	Title	Priority H-high M-medium L-low	Next Milestone	Start Date	End Date	Status P – Planned O – Ongoing C – Completed S – Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
G.3	Rules and guidelines for displaying nautical information in ECDIS and in maritime services as defined by IMO								
G.3.1	Develop basic display principles for NP data intended for use in ECDIS (NP3)	M		2008		O	Chair Team		Close co-operation with NCWG and S-100WG required. Interoperability Spec to be considered.
G.3.2	Monitor and contribute to the development of IMO guidelines showing how navigation information received by communications equipment can be displayed in a harmonized way and what equipment functionality is necessary.	M		2015	Permanent	O	Stefan Engström		NIPWG has a permanent rep with the EGDH. e-nav IMO Strategy Implementation Plan, Task T13 (HSSC6-07.1A refers) Interim guidelines released by IMO. Continue to monitor development.
I.1	Maintain and extend resolutions in M-3 relating to Nautical Publications.	M	Next meeting	2012	Permanent	O	Chair Team	M-3	A review is required due for the harmonization of M-3 information and potential Prod Specs content.
J.3	Liaise with other HSSC WG	M		2004	Permanent	O	Chair Team		
J.3.1	Liaise with the NCWG	M			Permanent	O	Chair Team		Establish joint project teams as required and endorsed by HSSC.

Work item	Title	Priority H-high M-medium L-low	Next Milestone	Start Date	End Date	Status P – Planned O – Ongoing C – Completed S – Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
J.3.2	Liaise with the ENCWG	L			Permanent	O	Chair Team		
J.3.3	Liaise with the S-100WG	H			Permanent	O	Chair Team		Establish joint project teams as required and endorsed by HSSC.
J.4	Liaise with IRCC								
J.4.1	Liaise with WWNWS Sub-Committee							S-124	Monitor developments of S-124 Project Team.
J.5	Liaise with other international bodies which contribute to nautical information	H		2015	Permanent	O	Chair Team		
J.5.1	Liaise with IALA	H		2013	Permanent	O	Chair Team		IALA ARM and ENAV Committees.
J.5.2	Liaise with International Harbor Masters' Association (IHMA)	M		2015	Permanent	O	Chair Team		
J.5.3	Liaise with International Cable Protection Committee (ICPC)	L		2016	Permanent	O	Chair/Sec NIPWG		

### Meetings (Task K)

Date	Location	Activity
Sept 2023	Monaco	NIPWG10
Sept 2024	Poland (tbc)	NIPWG11
Sept 2025		NIPWG12

Chair: Eivind Mong, Canadian Coast Guard, CA      Email: Eivind.Mong@dfo-mpo.gc.ca  
Vice Chair: Stefan Engström, Traficom, FI      Email: Stefan.englstrom@traficom.fi  
Secretary: James Weston, UKHO, UK      Email: james.weston@ukho.gov.uk

#### Top three work items:

- Develop S-128 (Catalogue of Nautical Products) product specification
- Continue to develop all S-1xx nautical information product specifications
- Coordinate the IHO contributions to the definition and harmonisation of maritime services as defined by IMO within the remit of IHO

