S-124 progress

Development of a S-100 Product Specification for Navigational Warnings

Submitted by:	Leader of the S-124 Correspondence Group (Mr Yves Le Franc – France)
Executive Summary:	This paper reports on the work of the S-124 CG since WWNWS8.
Related Documents:	On IHO/IRCC/WWNWS-SC/S-124 CG web pages
Related Projects:	E-navigation, Modernization of GMDSS.

Membership

China and INMARSAT joined the CG during the period.
The members are:
Australia, Brazil, Canada, China, Denmark (Danish Maritime Authority - DMA), France, Greece, Japan, New-Zealand, Norway, Republic of Korea, Sweden, Turkey, United-Kingdom, United States, CIRM, KRISO, INMARSAT, TRANSAS and Eivind Mong.

Activities since August 2016 - points to be considered

Modelling

The activity of the CG was still focused on the modelling of the navigational warnings (NWs).
Following the encoding exercise last year and the comments received, the model (dated 3 Dec 2015) has been explained in a better manner and the chair worked out proposals to amend the draft S-124 model. These proposals were submitted to S-124 CG members. The replies provided various inputs, including backgrounds from the authors (Eivind Mong) and DMA's contribution based on the NIORD implementation and tests (see below). Inputs are of great value for clarifying some aspects and for progressing in the choice of modelling options.
Thus, there are still many points to be consolidated on the way to enhanced warnings. Some of them are:

- The use of the Maritime Resource Name (MRN) concept[1] promoted by IALA for creation of globally unique identifiers for maritime features (MRN of a NW, MRN of an AtoN[2], etc),
- The attachments: they could be useful for adding a graphic for example but they would make S-124 NW not similar to S-53 NW. Moreover, the size of the NWs broadcast by radio-communication would likely both adversely affect bandwidth and increase costs of delivery,
- The use of "Subject" text attribute to be displayed as a short legend on ECDIS screen,
- The option of multi-parts NWs which carries modelling complexity but which has to be tested via implementing systems (e.g. NIORD).

Other rounds are required to stabilize the model.
DMA stressed that S-124 should not be developed only in a S-53 and ECDIS-focused direction, and that the model should target other clients (websites, apps, etc.) for anticipating combination of various data and promulgation in the very near future, including T&P NMs[3].

NIORD (Nautical Information Directory - DMA)

EfficienSea2 is testing S-124 NWs via the demonstration system NIORD of the DMA. NIORD uses a model based on the draft S-124 (the NIORD's model for warnings is close to the draft S-124, not strictly the same). Multi-parts NWs are implemented. A simple operational end-user facing web-interface is available at: https://nautiskinformation.soefartsstyrelsen.dk/#/messages/map. DMA offered that coordinators of the S-124 CG use NIORD on the test server to explore the NWs production side. NIORD gives a very good idea of what producing systems based on S-124 will be and so, the coordinators can better understand the S-124 model and its impacts on them. The human interface of NIORD is simple even if the data model is complex. NIORD

[1] Based on protocols in the well-established and proven format from the internet domain – the Uniform Resource Name (URN)
[2] AtoN: aid to navigation
[3] The S-124 model is focused on NWs but it might also be used for T&P NMs. This option is out the remit of the S-124 CG.

demonstrates also that producing solutions will be available. The coordinators are still encouraged to test NIORD.

Technical Services
An objective of the e-navigation Maritime Service Portfolios (MSPs) is to reduce the load of work of the users and the risks of errors via digitalized information and services. That implies that the delivery of data should be more machine-to-machine whereas it currently involves the users a lot. This is a domain where harmonization is also needed, in addition to the formatting of the data via product specifications.
NWs services (NWs MSPs) that coordinators will operate will be implemented by Technical Services able to deliver S-124 data from the coordinator's system (machine) to clients systems (machines).
Typically, close to the S-124 data production, we have to define how the server of a coordinator will exchange with the server of a radio-station and other clients. This Technical Services should be made available via APIs[4] of the NWs servers.

So, the S-124 CG should work on the design of standardized Technical Services for S-124 data delivery. That includes the shared mechanism for managing the NWs status (in-force or cancelled) on the client side according to the information provided by the NWs server (coordinator's server). This could imply some requirements on the data (S-124), like the need of a dated list of the In-force NWs and other management data.

The projects of implementing systems would provide valid inputs to this task, noting that IALA has issued a draft guideline on specification of e-navigation technical services that would be very helpful.

E-navigation projects support
The e-navigation projects are essential to the development of S-124. They provide the necessary experience in implementation and testing when the draft standards prepare the basis of harmonized solutions. Some experts involved in projects and in S-124 CG looked for ways to further help the S-124 development. They have come up with is a set tests that are important to verify some of the assumptions with S-124. These tests are in the annex A. The SMART project and the STM project have agreed to run the tests and to report the results to the S-124 CG. This is a great offer of assistance.

Coordination with IALA
The S-124 CG's chair attended to an IALA-IHO coordination meeting held on 18th July, in anticipation of the activation of the IMO-IHO Harmonization Group on Data Modelling (HGDM). The mandate of the HGDM is to "Develop guidance on definition and harmonization of the format and structure of MSPs" (MSC 98). Its first meeting will be held at IMO Headquarters from 16 to 20 October 2017 under the chairmanship of Mr. Sunbae Hong (Republic of Korea). The IALA-IHO Coordination meeting concluded that IHO and IALA will provide the draft IALA Guidelines on MSPs to the chairman of the HGDM before its first meeting.
The coordination meeting adopted the MSP/Operational Service – Technical Service – Product Specification concept (see Technical Services above) and the MRN concept. The meeting agreed that S-1xx and S-2xx[5] ProdSpec needed to be coordinated and that areas of cooperation have to be identified between the different product specifications and Technical Services (e.g. cooperation between different service providers).
The IHO/HSSC/NIPWG and the IHO/HSSC/S-100 WG will be the main instances of coordination.
If the WWNWS-SC agrees, the scenario for AtoNs nautical information presented in Annex B could be proposed for cooperation with IALA. It includes harmonization between S-201 (AtoN Information) and S-124 for the changes of states of AtoNs (e.g. Light unlit).
Moreover, IALA promotes e-navigation general and technical concepts (e.g. Maritime Cloud) that should be the most interesting for the future of the WWNWS.

HSSC
S-124 progress was reported at HSSC8 (HSSC8-07.1B INF2) (Nov 2016). The report stated that "the current NAVTEX, SafetyNET and AIS will not be able to convey NWs in S-124 and, therefore, S-124 NWs should be distributed by new communication systems (NAVDAT, VDES, …) identified in the modernization plan of the GMDSS under development".

[4] API: Application Programming Interface.
[5] S-2XX means S-100 ProdSpecs of the domain of IALA.

The IEC representative noted that the modernization of GMDSS is very unlikely to alter the current carriage requirements. He suggested that the S-124 data could also be used for generating messages (geo coordinates for instance) via NAVTEX and SafetyNET. These statements were supported by INTERTANKO who also raised concerns about the possible clutter of warnings on the ECDIS screen. Denmark made reference to the EfficienSea2 project, which includes S-124-type data, and to the navigational warnings and T&Ps. The HSSC made it clear that S-124 is not intended to become an interim solution for providing "equivalent" T&Ps in ENC updates.

NIPWG

The NIPWG is tasked by the HSSC to develop high level specifications for a combined Marine Service Portfolio (MSP) covering the provision of hydrographic services to mariners (MSP "Hydrographic Services") in accordance with the IMO e-navigation strategy implementation plan.
The S-124 CG's chair provided comments on the NIPWG's draft document *MSP "Hydrographic Services* "(cf. NIPWG4-43.1), including the opinion of the WWNWS-SC's chair that MSP "NWs Services" should not be merged with MSP "Hydrographic Services".

Display of NWs

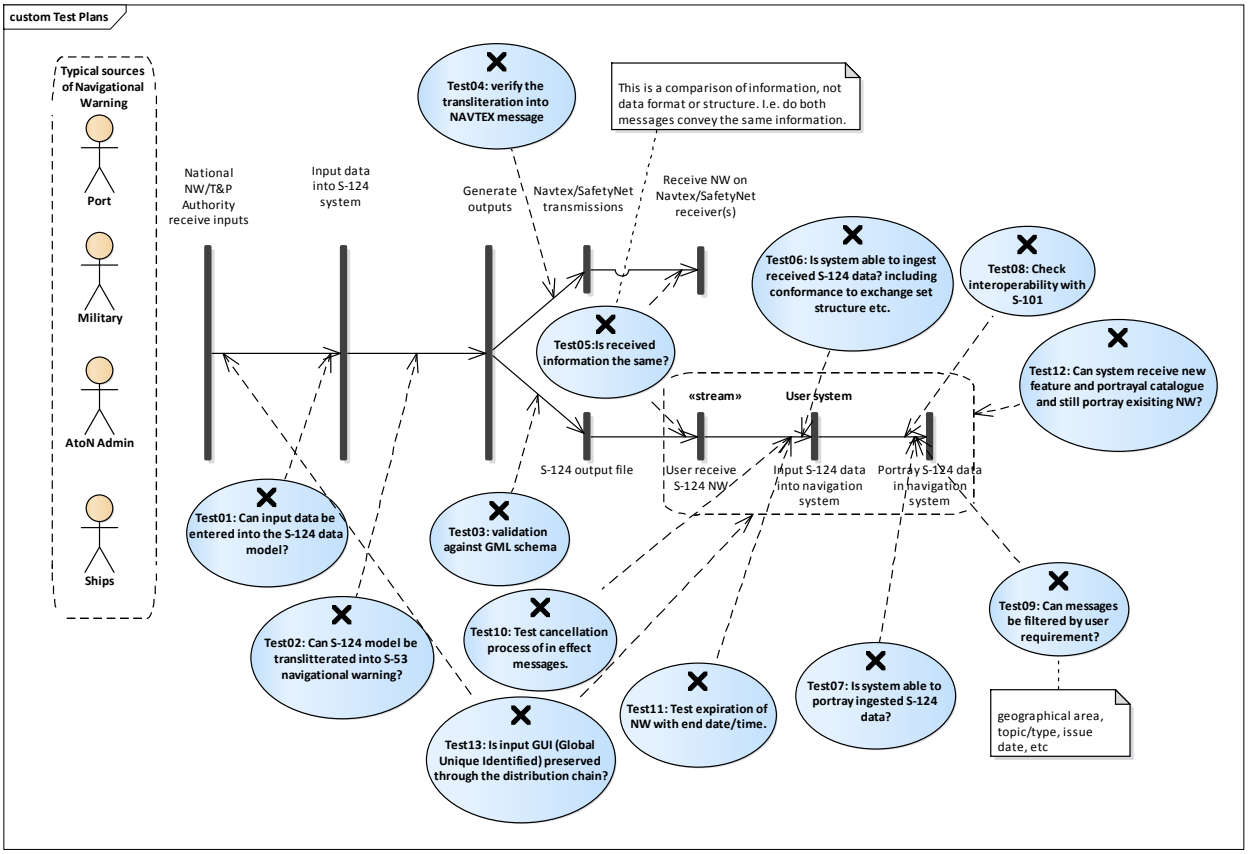
The S-124 CG's chair was involved in the IHO response to the new IMO draft Module F of the Performance Standards for INS (Display of information received via Communication Equipment – coordinated by China). MSC 98 finally postponed this task, giving the priority to the development of the "Guideline for the Harmonized display of information received via communication equipment". NIPWG coordinates the IHO contribution to the related correspondence group led by Norway. The S-124 CG will have to liaise with the NIPWG on this important subject: S-124 and the Guideline should be aligned.
The S-124 CG contributed to the Product Specification Interoperability Analysis carried out by the S-100WG. These items will contribute to define the portrayal of the NWs. This matter will be addressed when the model is stabilized.

Action Required of the WWNWS-SC

The WWNWS-SC is invited to:

a. note the report
b. advice the group as appropriate
c. renew the leader.

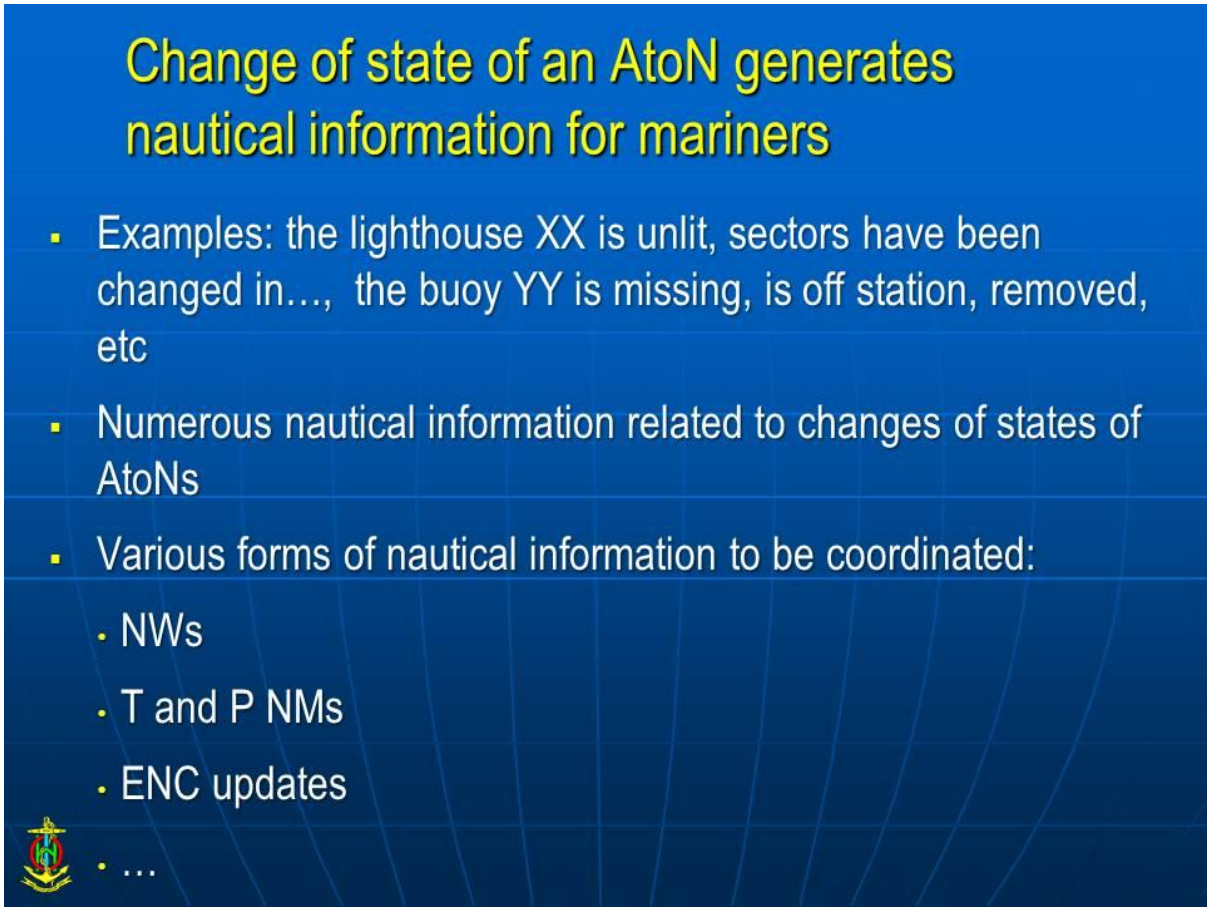
Tests to verify some of the assumptions with S-124
(email from Eivind Mong dated 27th July 2017)



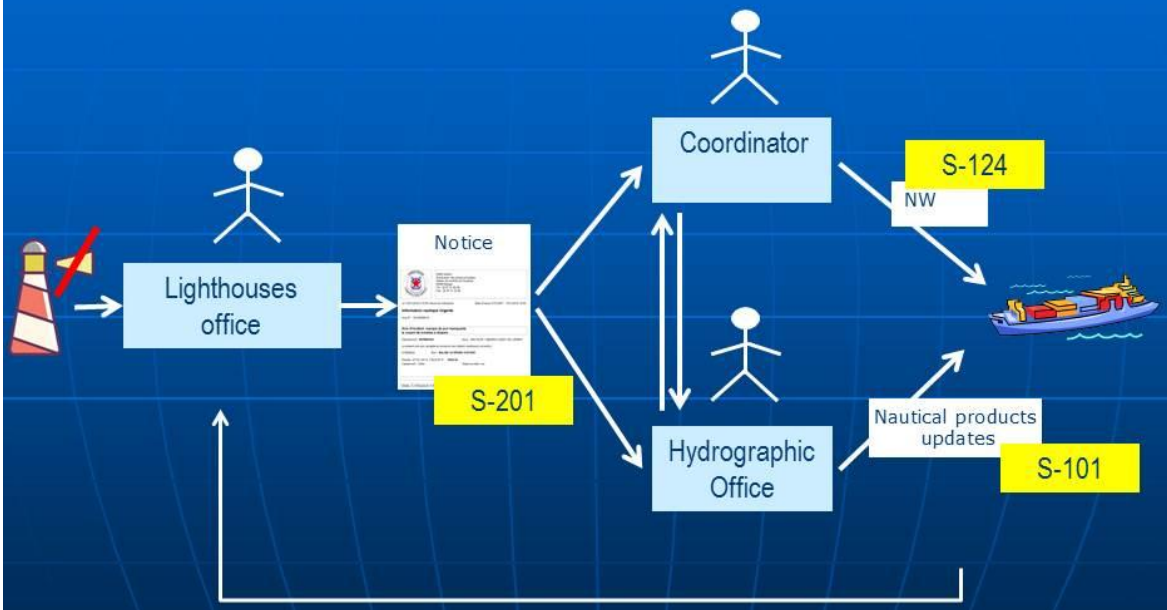
Test #	Test description
01	Test input examples from various sources and ensure these can be entered into the S-124 data model.
	Test objective: This shall test the data model versatility
02	Test that S-124 data can be transliterated into S-53 navigational warnings to ensure backward compatibility and that system can support legacy outputs.
	Test objective: This shall test that significant S-53 (legacy) items are supported in the data model so that S-124 data can be converted and broadcast in legacy issues.
03	Validate test data against the GML schema to ensure data corresponds to the GML structure and load data in COTS GML viewer.
	Test objective: This shall test how well the data matches the GML standard.
04	Test that S-124 data can be transliterated into NAVTEX to ensure backward compatibility and that system can support legacy outputs.
	Test objective: This shall test that NAVTEX output is supported by the data model so that S-124 data can be converted and broadcast in legacy issues.
05	Check that the information that follow the new S-124 path is the same as the information that goes the established S-53 (SafetyNet and NAVTEX) path.
	Test objective: This is to validate the conversion to see that no significant information is lost between the various paths. This ensures that formatting of the NW/TP does not impact the information contained in the message.
06	Test that systems can ingest received S-124 data (including exchange set structure).
	Test objective: This shall verify that the data is formatted as system expect

07	Test that S-124 data can be portrayed.
	Test objective: This is to verify that the data can be viewed and portrays as expected in a system, including pick report.
08	Test that S-124 data is interoperable with S-101 data.
	Test objective: This is to verify that the data can compliment S-101 ENC and cause no conflict.
09	Test that data can be filtered by use criteria like geographical area, topic/type, issue, date, etc.
	Test objective: This is to verify that the data can be filtered to allow users to reduce information clutter.
10	Test cancellation process for in effect messages
	Test objective: This is to verify that the cancellation process in S-124 works and that only the data that is to be cancelled is affected, leaving all other information un-affected.
11	Test expiration of NW/T/P with end date/time.
	Test objective: This is to verify that S-124 data, that has an expiration date/time, will be terminated at the specified date.
12	Test that system can receive new feature and/or portrayal catalogue and still portray existing NW/T/P.
	Test objective: This is to verify that the S-124 product specification can evolve and not negatively impact existing data.
13	Test that input GUI (Global Unique Identified) is preserved through the distribution chain.
	Test objective: This is to verify that the GUI can be preserved throughout the distribution chain for traceability.

Scenario for AtoNs nautical information



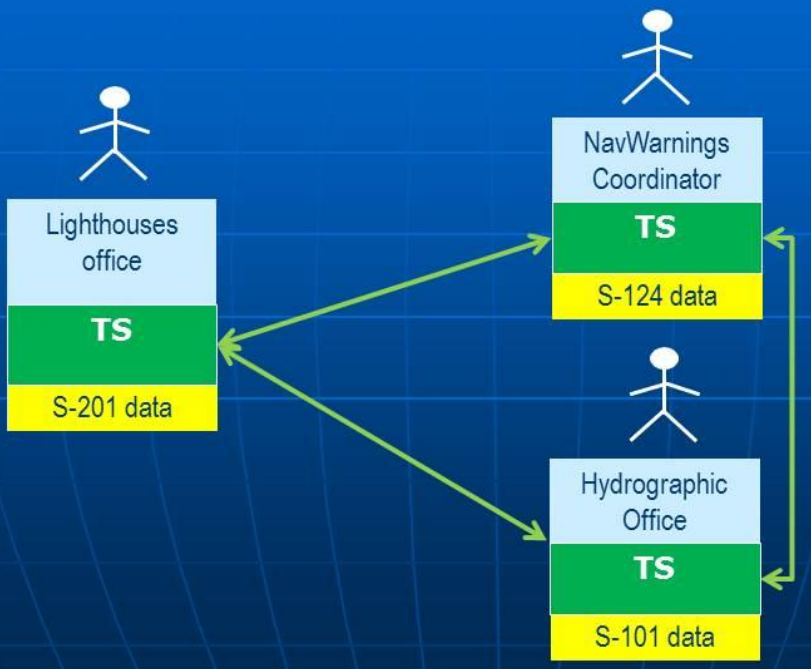
The scenario to be digitilized



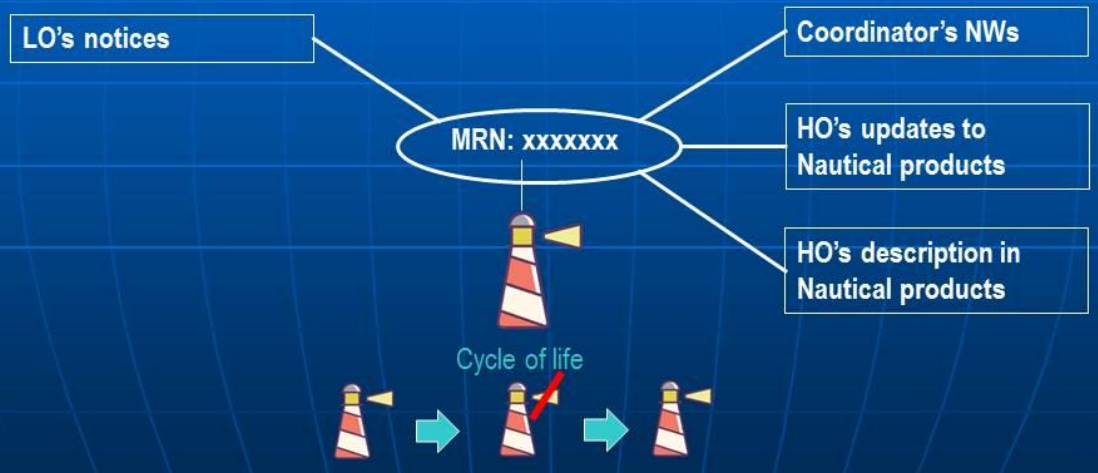
Prod Spec harmonization

- S-201, S-124, S-101 should be harmonized
- To facilitate conversion LO notice (S-201) into NW (S-124) and into subsequent production of nautical information in general (S-101 and others)
- **S-201 should cover changes of states of AtoNs (LO notices)**
- **S-124 should provide a short information of that is the problem with the AtoN (eg *Light unlit*)**
- The information can be harmonized (the cases are always the same)

Technical services to Technical services



Using Maritime Resource Name (MRN)
A universal unique ID for AtoN



LO's notices and nautical information reflect the cycle of life of the AtoN