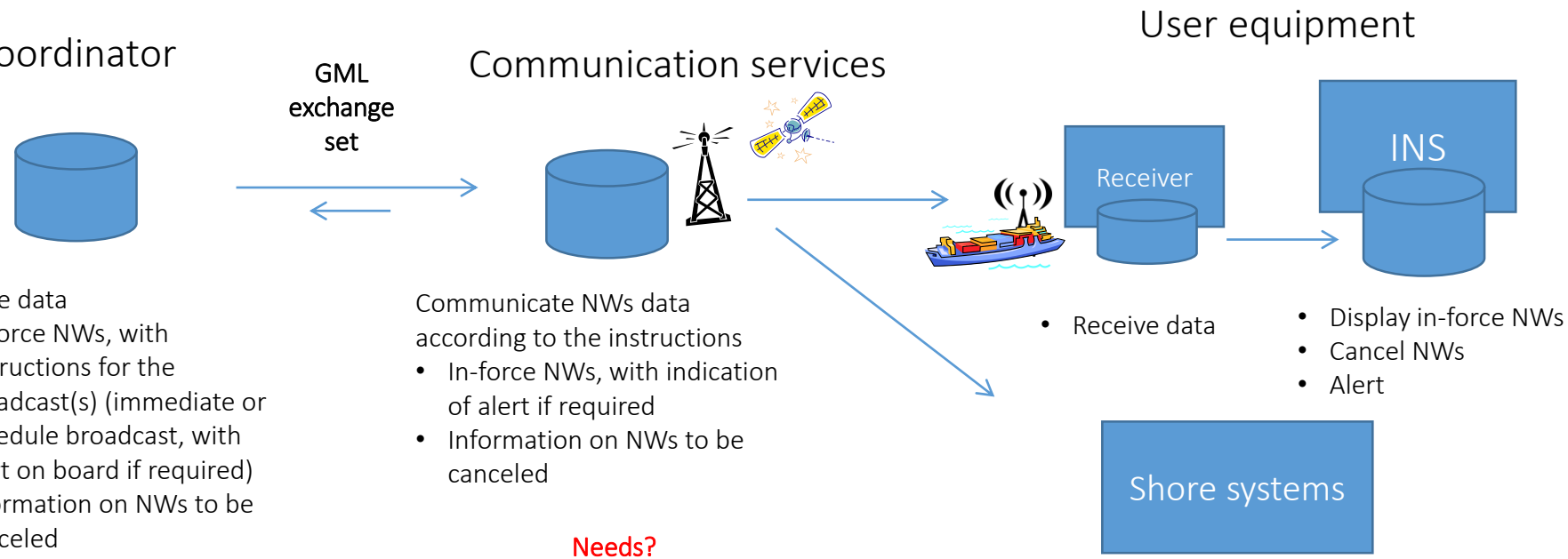
For S-100WG5

Report of the S-124 Correspondence Group

S-124 Navigational Warning - background

- S-100 based product specification for capturing and distributing Navigational Warnings component of MSI.
- S-124 can support local, coastal and NAVAREA warnings.
- Developed for use in ECDIS, but any system that support S-100 can make use of S-124.
- S-124 is being developed by the S-124WG Project Team under World Wider Navigational Warning Service Sub-committee (WWNWS-Sc).

S-124 Development scope



Provide data
- In-force NWs, with instructions for the broadcast(s) (immediate or schedule broadcast, with alert on board if required)
- Information on NWs to be canceled

S-124 data + G1128 technical services

May provide data to different communication services and to other clients

Communicate NWs data according to the instructions
- In-force NWs, with indication of alert if required
- Information on NWs to be canceled

Needs?

May transmit NWs data from different coordinators and from other services

- Receive data

- Display in-force NWs
- Cancel NWs
- Alert

Needs?

May receive data from different communication services or from other applications (including the same NWs data)

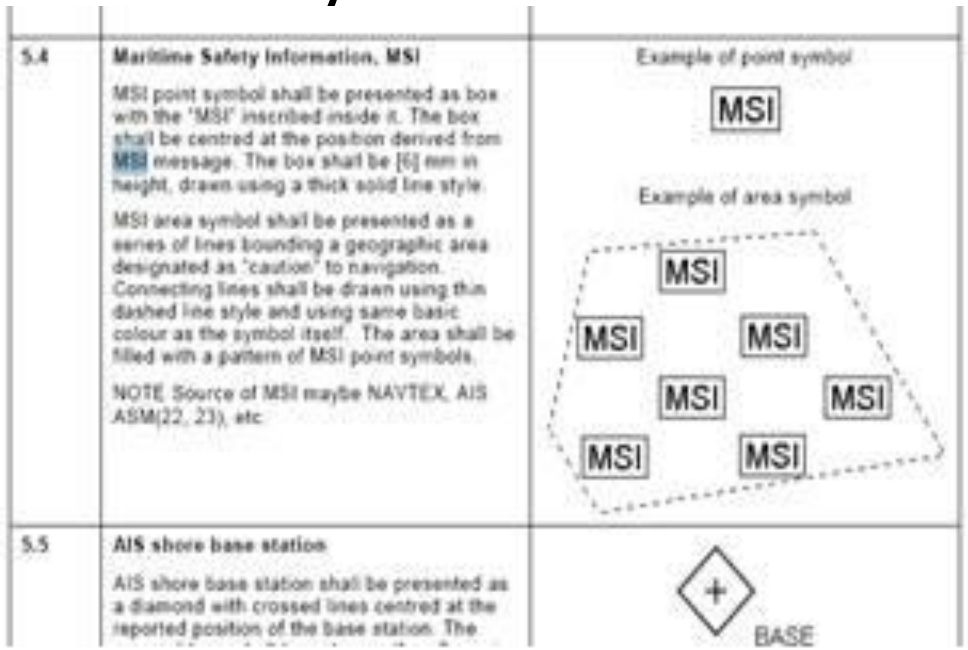
Ongoing Activities

- Data Modelling
  - The warning type code list is very long (growing).
    - List is under review by WWNWS-Sc
    - Benefit of list is enabling increased standardized messages that can become numerical outputs when supporting legacy EGC transmissions.
  - Model has remained stable for about 12 months
- Product Specification
  - First draft released for review in October 2018.
  - Second draft released for review in June 2019.
  - Review comments being discussed.
    - Major ongoing discussion items center around distribution methodology that can support a great variety of planned communication channels.

S-124 Developments

- S-124 workshop held in parallel with WWNWS11 in Halifax.
- WWNWS11 agreed that S-124 should align with S-100/S-52 where S-53 differ. E.g. Format of time, adding metres as UoM.
- WWNWS11 agreed that S-124 will only have one MRN ID that maintains alignment with current NAVWARN paradigm.
- Portrayal discussion and input from NAVAREA Managers, many of whom are mariners.

Portrayal limitations imposed by IMO and IEC



5.4	**Maritime Safety Information, MSI** MSI point symbol shall be presented as box with the 'MSI' inscribed inside it. The box shall be centred at the position derived from MSI message. The box shall be [6] mm in height, drawn using a thick solid line style. MSI area symbol shall be presented as a series of lines bounding a geographic area designated as "caution" to navigation. Connecting lines shall be drawn using thin dashed line style and using same basic colour as the symbol itself. The area shall be filled with a pattern of MSI point symbols. NOTE Source of MSI maybe NAVTEX, AIS ASM(22, 23), etc.	Example of point symbol MSI Example of area symbol MSI MSI MSI MSI MSI MSI MSI
5.5	**AIS shore base station** AIS shore base station shall be presented as a diamond with crossed lines centred at the reported position of the base station. The	BASE

Screen shot from IEC 62288

Topic	Symbol	Description
MSI	Example of point symbol MSI Example of area symbol MSI MSI MSI	MSI point symbol should be presented as a box with the "MSI" inscribed inside it. The box should be centred at the position derived from the MSI message. The box should be drawn using a thick solid line style. The MSI area symbol should be presented as a series of lines bounding a geographic area designated as "caution" to navigation. Connecting lines should be drawn using thin dashed line style and using the same basic colour as the symbol itself. The area should be filled with a sparse pattern of MSI point symbols. Note that the source of MSI may be NAVTEX, AIS ASM function identifier 22 or 23 (SN.1/Circ.289), etc.

Screen shot from NCSR6 WP 4 report [GUIDELINES FOR THE PRESENTATION OF NAVIGATIONAL-RELATED SYMBOLS, TERMS AND ABBREVIATIONS]

Limitations imposed by IMO and IEC

From NCSR 6 WP4 Report

5.9 As there was **no time for developing new symbols at this stage**, and recognizing a need to avoid conflicts with the presentation and display of information received on board for use in navigation equipment, the Group noted that several international organizations were developing information **product specifications that would make available revised or new information in the coming years**. The Group also noted that the IHO's S-100 Working Group was dealing with harmonization issues between developing information product specifications within their remit, and in this respect, encouraged participation in the IHO's S-100 Working Group. The Group was of the view that after completing its work on e-navigation maritime services, the Organization should continue its work on the harmonized display of information received by communications equipment by revisiting the *Interim guidelines for the harmonized display of navigation information received via communication equipment* (MSC.1/Circ.1593).

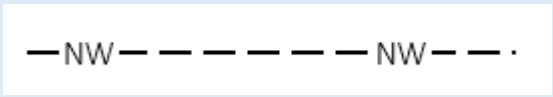
Canadian IMO-NCSR7 submission (NCSR7-22-2)

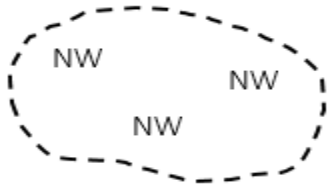
- The Canadian submission to IMO-NCSR7 (NCSR7-22-2) requested clarifications on the role of the SN.Circ.243.Rev2 guideline in order to resolve the issues related to MSI symbol in navigation equipment imposed by the guideline. It was recommended by NCSR7 that IMO Maritime Safety Committee approve a corrigendum to SN.Circ.243.Rev2 that removes the symbol causing issues.
- This development opens the way for the outcomes from WWNWS11 to be drafted into portrayal catalogue for S-124.

Decisions regarding Portrayal of NW messages from WWNWS11

- Navigational Warning and Weather Warning (S-412) should have different symbols.
  - These are both MSI, but have different packaging.
- One symbol for all types of navigational warnings. (“NW” in some format).
  - No colour differentiation between types of hazards.
- Navigational Warning layer should not be turned off during route monitoring mode.
- Filtering: no filtering of which types of warnings (e.g. local vs coastal), no spatial, topic, or route. Temporal filtering is still important.
  - Navigational Warnings will be filtered by the extend of the chart pane (i.e. show all NW within chart pane, except those temporally out of range).

Point, line and area representation is needed for NW

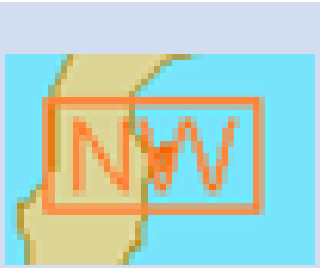
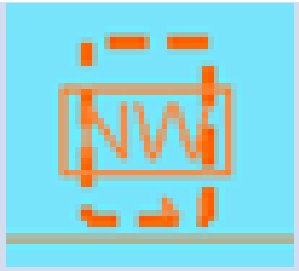
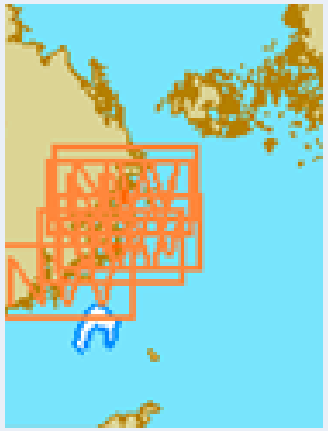
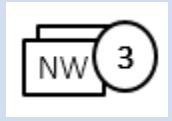


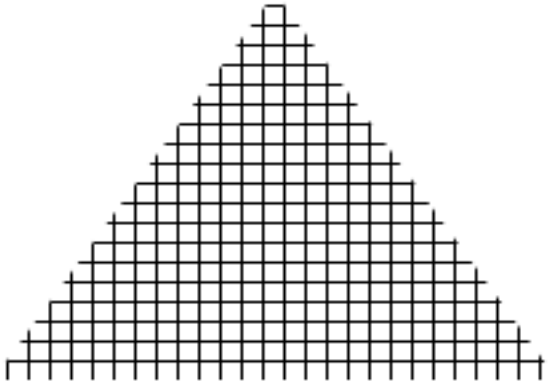


Day, night and dusk colour palettes.

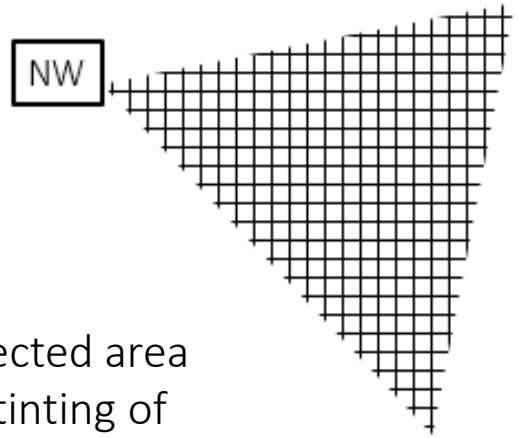
Symbology should have two version, one for not acknowledged information and one for acknowledged information. (e.g. bold and non-bold, or highlighted and non-highlighted)

Portrayal should also include a function to reset the new navigational warnings received for when a new officer comes in to see what they are.

 	Common problem for all products. S-124 should follow align with ENCs portrayal logic to resolve this (S-52 PresLib Ed.4 Part I, 8.5?).
 	Proposal to reduce clutter into a symbol indicating NW symbol both individual and to indicate a group of NW. NCWG will be requested to support this. *Unsure this can be done within a portrayal catalogue given the functionality currently available in S-100. May have to be a machine function.
  	Grouping of NWs that are close and causing clutter at screen resolution. Alternatively the number of grouped NW could be shown. No fill background to reduce blocking underlying objects.



NW point with affected area highlight. For example a light outage with the light arc. Location of light is the NW and the light arc is the affected area.

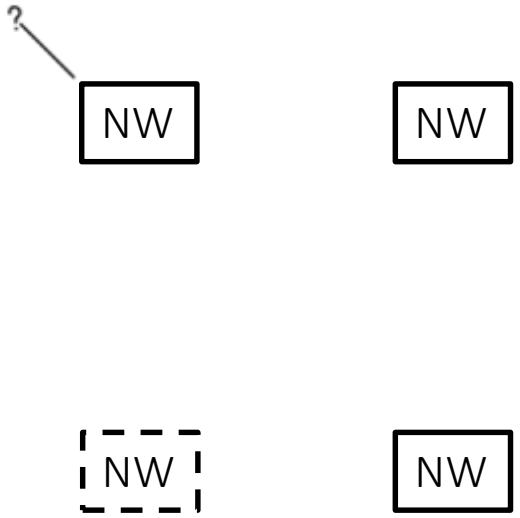


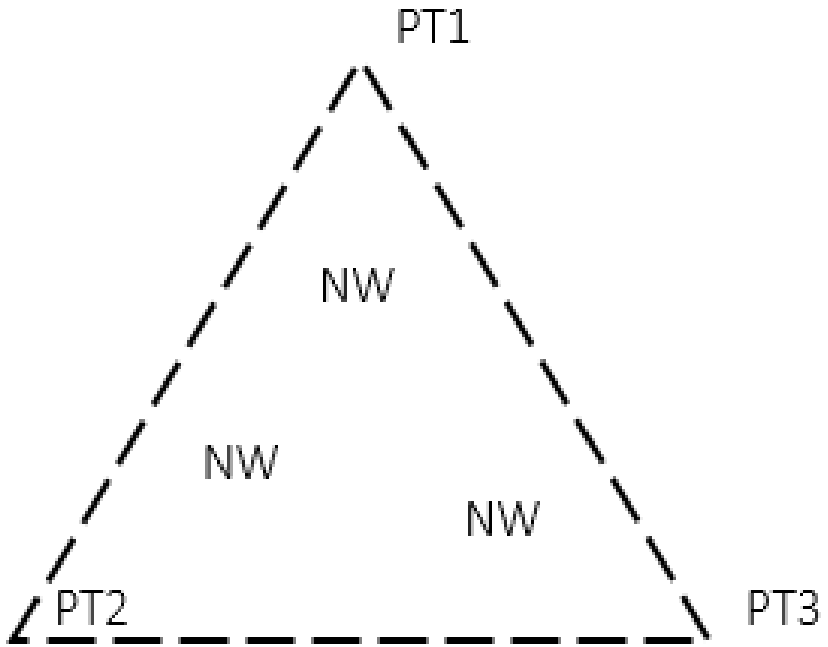
There needs to be a visualization of the affected area that is not intrusive (e.g. a temporary light tinting of the selected area). E.g. outage of a light has an affected area related to its nominal range.

Affected area pattern style. Only to display when the NW is selected by pick report or other user action.
Also recommended to be used for whole NAVAREA messages and other very large areas.

Question to consider; should users be allowed to turn it on if they so choose?

WWNWS agreed that NW information is by default approximate positions. It should be possible to flag a position as accurate. Portrayal of this is an open question. E.g. should all NW by default have the '?' or should accurately known NW have a slightly different symbol.





Area NW with text placements to simplify visual reference between NW text and NW area.

Is it possible that NW symbols reduce masking the chart details by for example using transparency or symbol with on offset?

Example of use case; when a NW is related to a charted AtoN, then the AtoN on the chart must remain visible.

Ongoing Activities

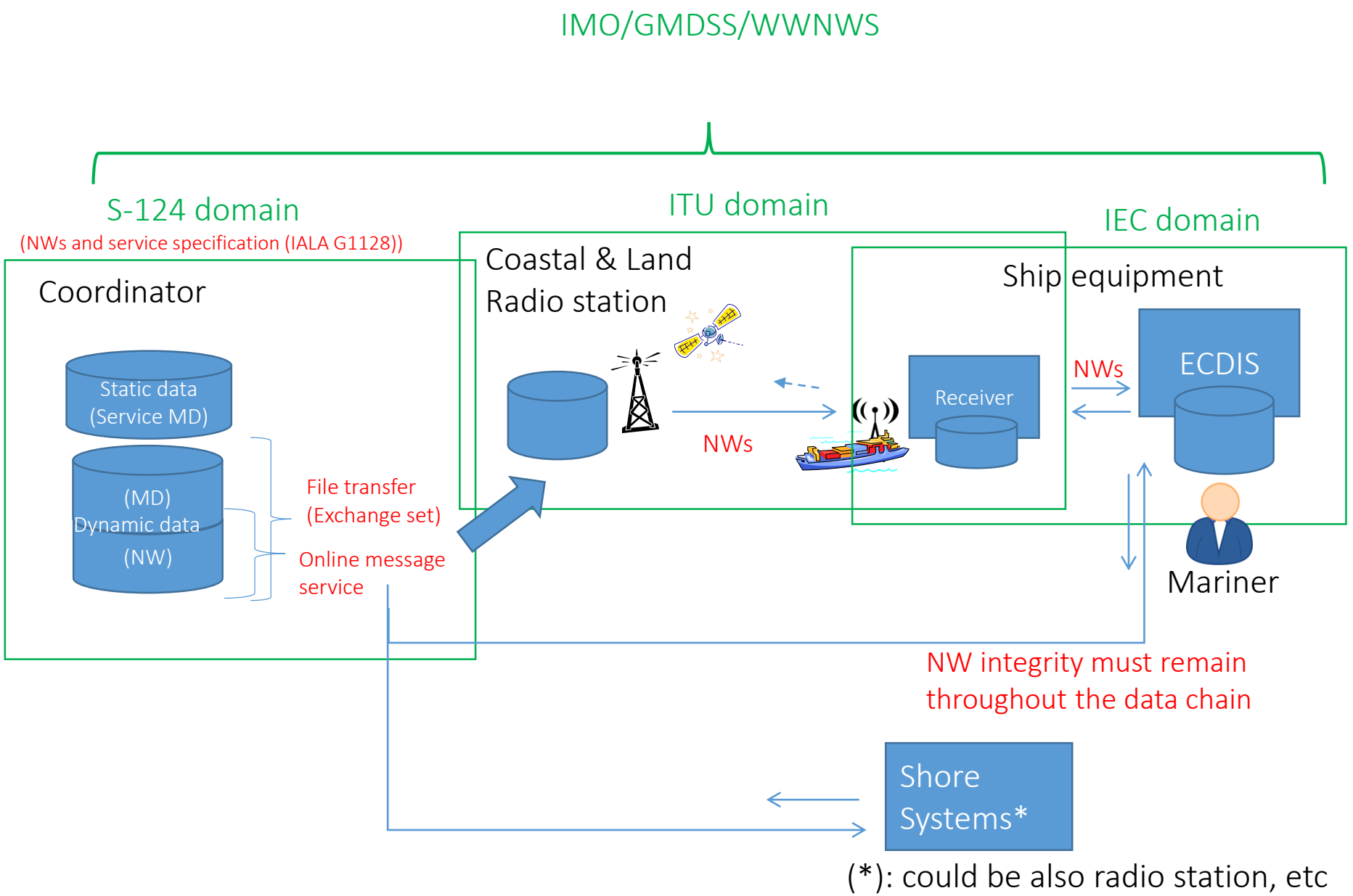
- Data Classification and Encoding Guide (DCEG) will be using the S-53 example NWs, mapped to S-124 format, as a comprehensive discussion on how to use the data model for various types of NW.
  - Annex of S-124 Training Manual.

- Important to keep alignment with current paradigm for backwards compatibility.

Ongoing Activities – open questions

- Data volume
- The S-100 defined exchange set structure imposes a discovery metadata file on each S-124 dataset of approximate 10KB, while preliminary tests indicate an average NW dataset to be about 3-5KB. This means that for the total exchange set, metadata will account for 66-75% of total data amount. This issue can, to some extent, be mitigated by compression. S-100 Ed 4.0.0 permits ZIP compression (see S-100 part 15).
- Use a different encoding (e.g. 8211 or HDF5)? **However**, metadata is external to the dataset, the improvements offered are limited and likely offset by increased complexity in the production systems
- Another option to reduce data volume is to use the Online Communication Exchange (OCE) (see S-100 Part 14) which would not use the exchange set methodology, but rather send metadata at the beginning of a session and then send only the NW datasets. A drawback is that this specification is still new and largely untested. The IALA ENAV committee is working on testbeds and improved documentation (see WWNWS11_S124WS_4.2 and S-100WG5_2019_4.1B).
- Current GMDSS Enhanced Group Calling (EGC) methodology unlikely to work for S-124, therefore IP communication seems like the most feasible option. This may require some changes to GMDSS.

Interim S-124 promulgation architecture



WWNWS11 recommended to change the correspondence group into a project team to speed up the development with the aim of a version 1.0.0 at the end of 2020 and an operational version 2.0.0 at tend of 2024.