7. S-100 Implementation Strategy

2nd ASSEMBLY

RDML Sheppard Smith, Council Chair
Magnus Wallhagen, HSSC Chair

Update items to be reported

Agenda item 7

- Contribution to S- 100 Implementation Strategy

S-100 Services-Why Bother?

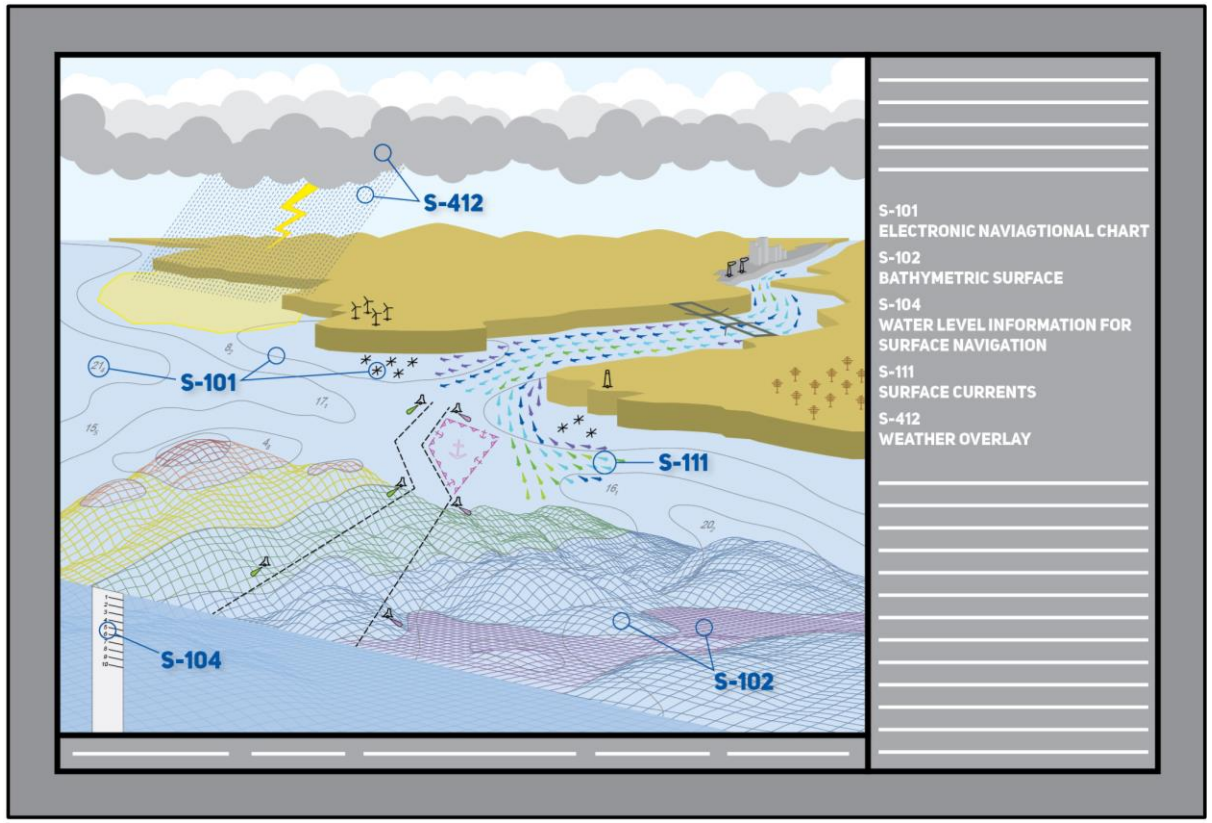
- The main drivers to develop S-100 services are:
  - increasing digitalization in the shipping industry
  - advent of autonomous navigation
  - Cyber security
  - Demand from users for more timely, higher resolution navigation services
  - Efficiency gains, particularly in ports
- The existing S-57 standard is frozen and there is pent-up demand for improvements

S-100—From Standards to Services

- Council 2, recognizing that MS have begun to develop next-generation navigation services based on newly-approved S-100 based standards, commissioned the development of the S-100 services roadmap.
- Council 3 endorsed the Roadmap and developed a showcase of S-100 services under development for the April A-1
- The Roadmap is envisioned to provide a clear path to:
  - Guide IHO activities
  - Guide MS HOs and RHCs in the development of national and regional services
  - Demonstrate seriousness of intent for coordination with IMO and national port state control authorities

Scope of Roadmap

- S-101 Electronic Navigational Chart (ENC)
- S-102 Bathymetric Surface
- S-104 Water Level Information for Surface Navigation
- S-111 Surface Currents
- S-122 Marine Protected Areas
- S-123 Radio Services
- S-124 Navigational warnings
- S-129 Under Keel Clearance Management



S-100 Roadmap Key Provisions

- Creation of a new set of coordination principles (as WEND was to S-57 ENCs), developed by the WEND WG under IRCC.
- Coordination with IMO to transition from S-57 to S-101 ENCs and to recognize additional services.
- Coordination with industry for production and use of S-100-based services
- Capacity-building for producers
- Development of global distribution capability

Special Considerations for Transition of S-57 to S-101 ENCs

- Substantial S-101 data coverage is necessary for successful adoption by customers within the shipping industry.
- To build substantial coverage rapidly, S-101 ENC could be produced by converting S-57 datasets before native production of ENCs in the cartographically enriched S-101 format.
- Transitional support for S-57 ENCs is needed for S-57-only ECDIS. S-57 ENCs could be produced by conversion from native S-101 ENCs
- The S-100 roadmap will help IHO and MS to coordinate with IMO and industry stakeholders to develop a ”dual fuel” transition plan which could include:
  - Parallel provision of S-57 and S-101 services by HOs and/or RENCs; and/or
  - Deployment of ECDIS that can use both S-57 and S-101 ENCs.

Maintenance of S-100 Roadmap

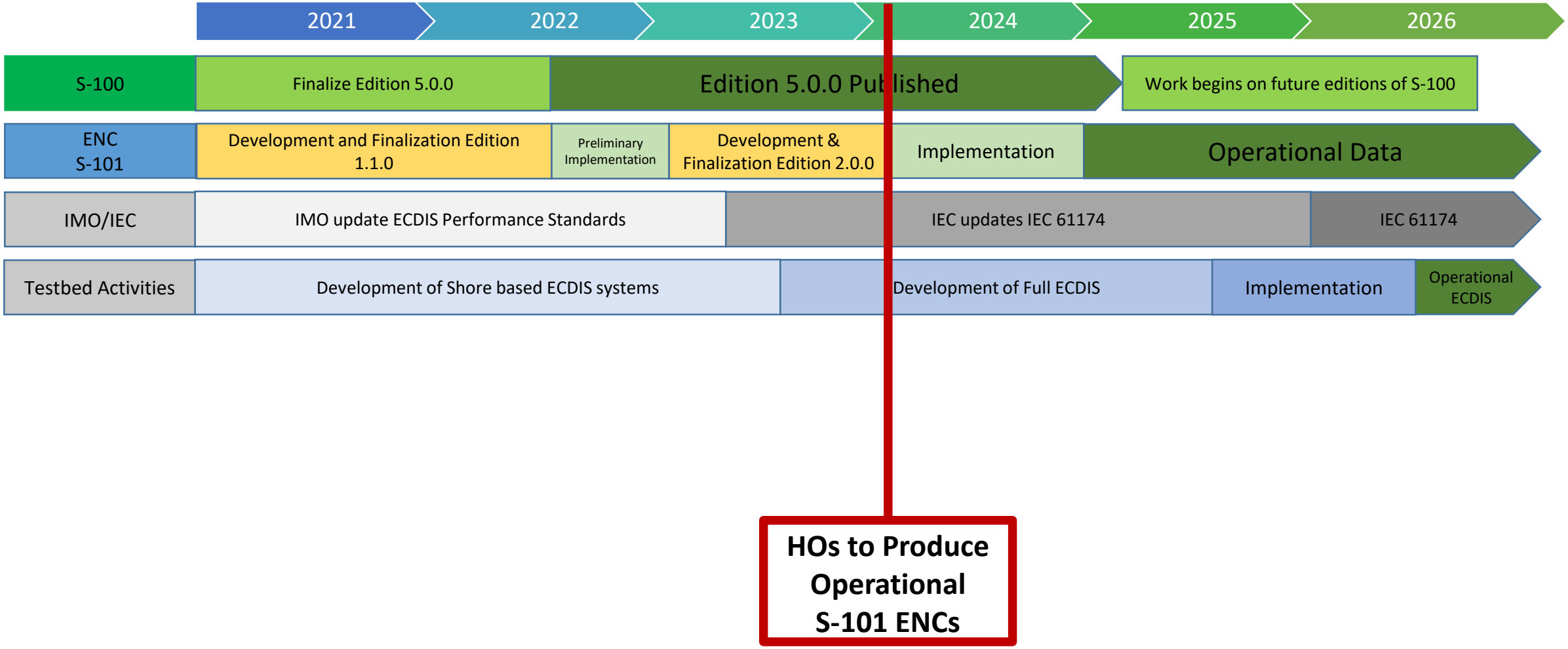
- The dynamic nature of the Roadmap requires annual update—Council is best situated to maintain the document.
- HSSC, IRCC, and the Secretariat all have important roles to play and will all work both to implement the roadmap and to propose updates.
- Council will also monitor the development of services by MS and incorporate lessons learned into the roadmap.
- While Assembly may endorse the current or future roadmaps, Council will make updates between Assemblies.

Assembly Proposal 2.1
S-100 Implementation Strategy

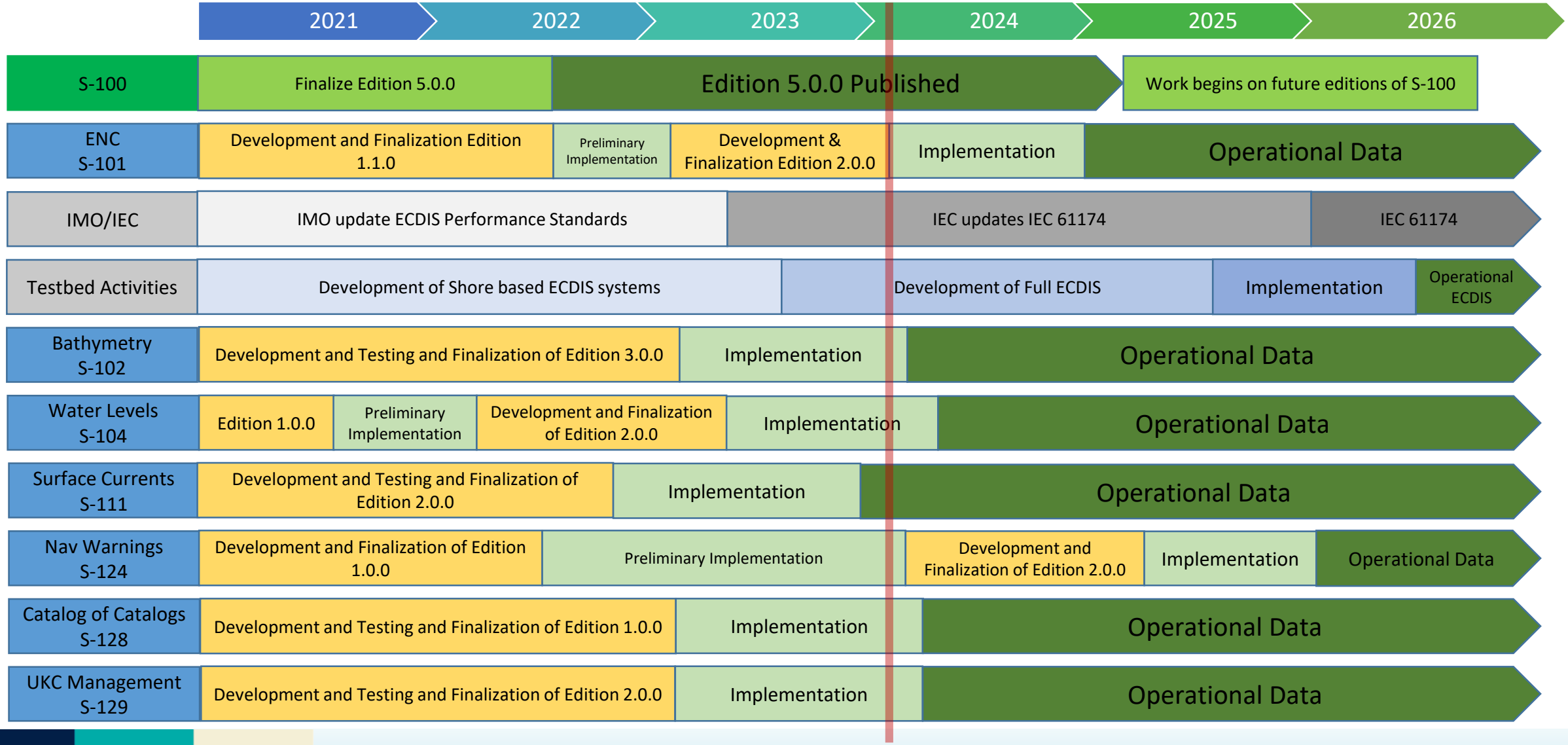
A2 PRO 2.1: The Council, having considered the progress of the technical standardization of the S-100 Framework, the interrelation to IMO´s e-navigation programme and the needs to assist Member States for readiness and capacity to commence the production and the integrated provision services of S-101 ENC and other S-100 based products, invites the Assembly:

- to approve the “S-100 roadmap for the S-100 Implementation Decade”.
- to task the Council to maintain and update the S-100 roadmap and resulting activities in liaison with external bodies on an annual basis as a key priority of the Council activities.

S-100 Product Specifications developments and Timeline



S-100 Product Specifications developments and Timeline



PRO 2.1, S-100 Implementation Strategy HSSC Proposals:

- Add 3 annexes to the S-100 Implementation Strategy;
  - one annex per Work Programme 1, 2 and 3 to be interlinked,
  - update annually and
  - report to the Council.

- Amend the S-100 Implementation Road Map for the products currently covered by S-98 (Interoperability) to guarantee their smooth integration in end user devices such as ECDIS.

PRO 2.1, S-98 Interoperability Specification
The IHO Navigational Package

First step

Navigational
Route Monitoring Mode
S-98 Edition 1.0.0

S-101 ENC
S-102 Bathymetry
S-104 Water Level
S-111 Surface Currents
S-124 Navigational Warnings
S-129 UKC Management

Next step

Navigational
Route Planning Mode
Future S-98 Editions

S-122 Marine Protected Areas
S-123 Marine Radio Services
S-125 Marine Navigational Services
S-126 Marine Physical Environment
S-127 Marine Traffic Management
S-131 Marine Harbour Infrastructure

+ S-100 Products used in Monitoring Mode

S-128 Catalogue of Catalogues

PRO 2.1 S-100 Implementation Strategy HSSC Proposals:

- Update the S-100 Implementation Timeline as a result of other Internationals Organization's capabilities and some delays in development of Product Specifications.

- Consider to participate in the future S-100 Open Online Platform (S-1OOP) operated by ROK, where data and services are shared to facilitate the application of S-100.

Dual Fuel Concept

- Dual Fuel Concept affects more aspects than ECDIS;
  - HOs production, maintenance and distribution of ENC,
  - Coordination of regional ENC schemes and collaboration of RENCs,
  - distribution and interaction with other International Bodies (IMO/IEC/CIRM).

- Suggested principles:
  - Unambiguous and standardized import and parallel use of both S-57 ENC and S-101 ENC supporting enhanced user functionality.
  - ECDIS behavior should not be any less “safe” regardless of whether S-57 or S-101 ENC is in use.
  - User experience should never be negatively impacted by amending use of any other S-100 compliant data product such as S-102 (Bathy), S-104 (Water Level), S111 (Surface Currents).

Assembly Proposal 2.2

- **A2 PRO 2.2**: Necessity of an Risk Assessment on Dual Fuel ENC arrangements

  HSSC12 outcome:

  - Prepare a synoptic summary report on the various options offered to HOs for future production of S-101 ENCs in conjunction with S-57 maintenance/production.
  - Summary report to be reported to Council 5, 2021.

Assembly Proposal 2.3

- **A2 PRO 2.3:** "A-2 is invited to task the HSSC to review the IHO Resolutions with regard to PRO 2.3".

- HSSC12 outcome:
  - Revision of some IHO Resolutions is an important driver for the effective implementation of the S-100 concept.
  - When the operational implementation of the S-100 concept becomes mature enough, proposed amendments to the Resolutions, eventually complemented by other new Resolutions (such as a result of WEND100), will be discussed and submitted to relevant IHO organs for subsequent approval by MS.

Actions Requested From A-2

- **To approve** the "S-100 roadmap for the S-100 Implementation Decade".
- **To task** to task the Council to maintain and update the S-100 roadmap and resulting activities in liaison with external bodies on an annual basis as a key priority of the Council activities.(A2 / PRO 2.1)
- **To endorse** the HSSC proposal to add 3 annexes to the S-100 Implementation Strategy, related to the IHO Work Programme 1, 2 and 3, to be updated annually and reported to the Council. (A2 / PRO 2.1)
- **To invite Council to task** the HSSC to prepare a synoptic Duel Fuel Concept summary report on the various options offered to HOs for considering the development of their production of S-101 ENCs to address the valid concerns raised by China in A2 / PRO 2.2. To be reported by HSSC to Council 5, 2021.
- Considering the ROK proposal, A2 / PRO 2.3 (Revision of IHO Resolutions following S-100), **to approve** the proposed HSSC way forward that:
  when the operational implementation of the S-100 concept becomes mature enough, proposed amendments to the Resolutions, eventually complemented by other new Resolutions (such as a result of WEND100), will be discussed and submitted to relevant IHO organs for subsequent approval by MS.