

**PART 2 PROJECT PROPOSAL - Proof of Concept - IHO & IALA collaboration to Demonstrate Interoperability of S-101 and S-125 at Sea Using Wireless Updating via 4G/5G Telecoms Links**

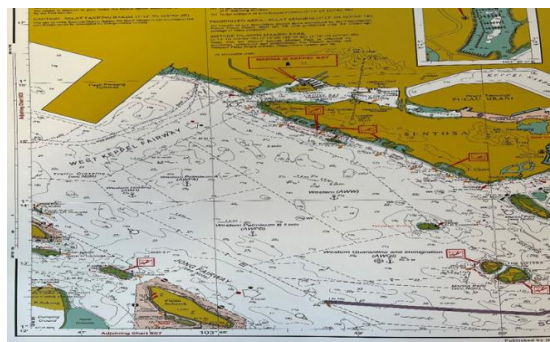
**Summary of project objectives:**

To support navigational safety by carrying out supplementing of the S-101 ENC's using varying sizes of S-124 Navigational Warnings and S-125 Marine AtoN dataset, including overlays and updating via 4/5-G telecommunications means.

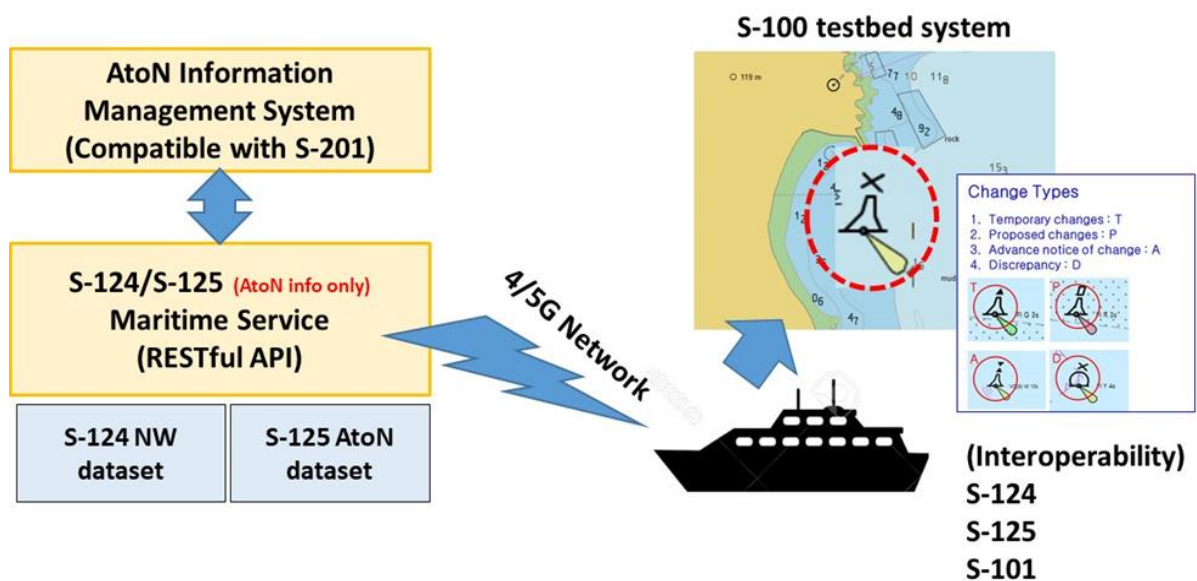
**Project Scope**, challenges identified, innovation opportunities and potential benefits.

To test the interaction of S-124 Navigational Warning services and S-125 Marine Aids to Navigation services to better understand the interaction and to validate the proposed methodology under development by various groups under the IHO and IALA umbrellas.

The testing is planned for April of 2023 and aims to test the feasibility of updating navigational information using S-124 and S-125 services, as well as the process of transferring data between these different data services as the information goes through its lifecycle.



**Propose Testbed Area – Jong Fairway, Singapore**



**AtoN Information Management System (Compatible with S-201)**

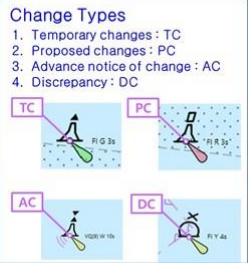
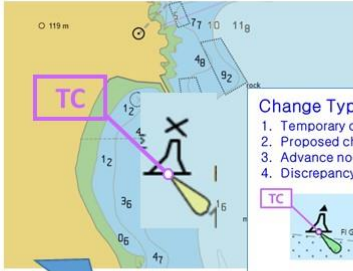


**S-124/S-125 (AtoN info only) Maritime Service (RESTful API)**

**S-124 NW dataset**

**S-125 Marine AtoN dataset**

**S-100 testbed system**



**4/5G Network**



**(Interoperability) S-124 S-125 S-101**

**Project Deliverables**

1. Test results from S-124 Navigational Warnings and an S-125 Marine AtoN Information overlap for the same AtoN on S-101 ENC. To evaluate that the S-124 NW should take priority over the S-125 AtoN Information.
2. Operate an S-124 NW and S-125 Marine AtoN in S-100 testbed system considering the S-98 interoperability.
3. Test results of interoperability between S-124, S-125 and S-101 as interleaving and overlaying which was agreed from the joint IHO/IALA workshop (September 2022).
4. Results on suitability of AtoN status symbols in S-125 marine AtoN product specification considering other symbols in ENC, and S-124 NW.
5. Test results of technical specifications for the provision of AtoN information service to end-users in terms of e-Navigation maritime service.

**Practical relevance to Hydrographic Community/Industry:**

1. Supporting navigational safety by using varying sizes of S-101, S-124 and S-125 dataset, including overlays.
2. Assessment of service S-124 and S-125 datasets via 4/5-G telecommunications means.
3. Assessment and better understanding of interoperability between S-124, S-125 and S-101 as interleaving and overlaying.

4. Identify any possible gaps in order to assist ECDIS OEMs to understand and check the suitability of AtoN status symbols in S-125 marine AtoN product specification.
5. Identify and test the technical specification for the provision of AtoN information service in e-Navigation maritime service.

**Members of Project team**

Dr. Sewoong OH, IALA ARM’s S-102 Task Group Leader and Principal Research Engineer, Korea Research Institute of Ships and Ocean (KRISO)

Mr. Eivind Mong, Chair, Nautical Information Provision Working Group (NIPWG), IHO, Adviser to Project

Mr. Lee Weng Choy, Maritime and Port Authority (MPA) of Singapore

4 Research Scientists from KRISO

- Dr. Junhyuk Jang, Principal research engineer, KRISO
- Dr. Dongwoo Kang, Researcher, KRISO
- Ms. Yunjee Kim, Researcher, KRISO
- Mr. Gyeongmin Jo, CEO, Bluemap
- Mr. Hyodong Seo, Head, Bluemap
- Ms. Taehee Kim, Senior researcher, Bluemap

3 Cartographers from MPA

**Team leader:**

Dr. Sewoong OH, Korea Research Institute of Ships and Ocean (KRISO) – Team Leader

**Collaborator information:**

MPA will provide vessel and connectivity for 4/5G Telecommunications network.

**Project schedule**

**Key milestones and deliverables for each milestone.**

Activity	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	Parties Involved
Finalisation of Implementation plan	X					KRISO and MPA
Production of S-101 ENC covering test area		X	X			MPA
Testing of 4G/5G network						MPA
Mobilisation				X		KRISO and MPA
Field Testing of S-124/ S-125 updating					X	KRISO and MPA

**Summary of project cost**

No cost to the IHO-Singapore Lab. Self-funded by participating agencies will provide following support for the Sea Demonstration.

South Korea – 5 x Researchers (3 from KRISO and 2 from BLUEMAP), including software and hardware

Singapore - Providing vessel, S-101 ENC of test bedding area, 3 x engineers and 4G/5G telecommunication links

**Other source of funding** (Have you attempted, applied for or obtained any other form of incentives/funding for this project or any similar project)

NIL

**Do you require a Workspace at IHO Lab? If so please provide:**

Work area needed at the Lab: space for the hosting server (physical or virtual)

- 2 desks space for workstations

**Declaration by applicants:**

We the Applicants hereby declare that the information provided in this Application form, including the supporting documents attached hereto, are true and correct. We have read and understood the terms set out herein, including the Terms of Funding and we agree to be bound thereby.

**Name of Applicant:**

Dr. Sewoong OH, IALA ARM's S-102 Task Group Leader and Principal Research Engineer, Korea Research Institute of Ships and Ocean (KRISO)

**Date:** 21<sup>st</sup> Nov 2022

**PROJECT TEAM LEADER AND MEMBERS**

Please provide the following details below:

- A) Name: Dr. **Sewoong Oh**  
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Please provide details of Research, Scientists and Engineers (RSEs) participating in the project, indicate the Names, whether Existing/New hire.

**Maritime & Port Authority of Singapore (Hydrographic Department)**

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