



NIPWG VTC 02 (2023)

S-125 Marine Aids to Navigation Update

Agenda Item 8.3.1

NIPWG VTC02 (20 June 2023) 12:00 - 15:00 (UTC)



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S-125 ED 0.0.3

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- **IALA ARM 16**
 - Held in October 2022 in at the IALA
 - S-201/S-125 Task group updated the draft of S-125 (ed 0.0.3)
 - Includes a feature catalogue, portrayal catalogue and GML schema
 - Created liaison note requesting review of the updated draft
- **NIPWG Letter 03/2023 - Updated Draft of S-125 PS**
 - Requested to review the draft and provide any comments as an input to the next IALA ARM meeting which will take place in the fall of this year
 - Review the package and provide any input using the standard form by July 31st
 - Chair group will collect this input and submit feedback to IALA ARM committee's next meeting



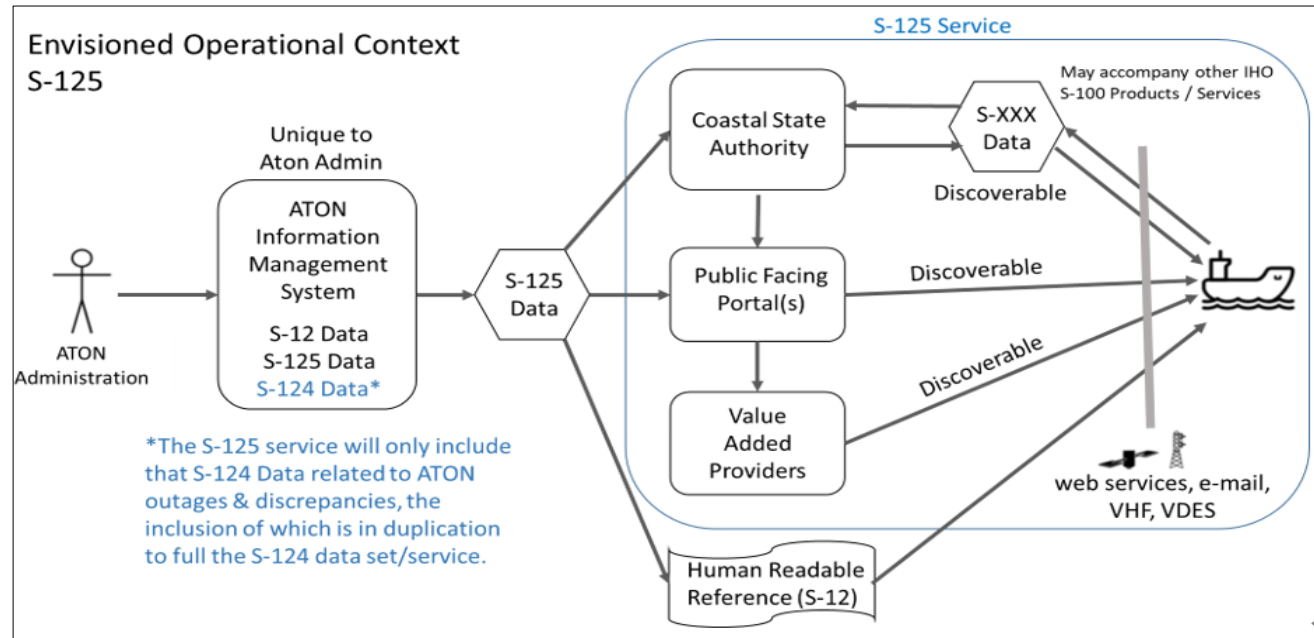
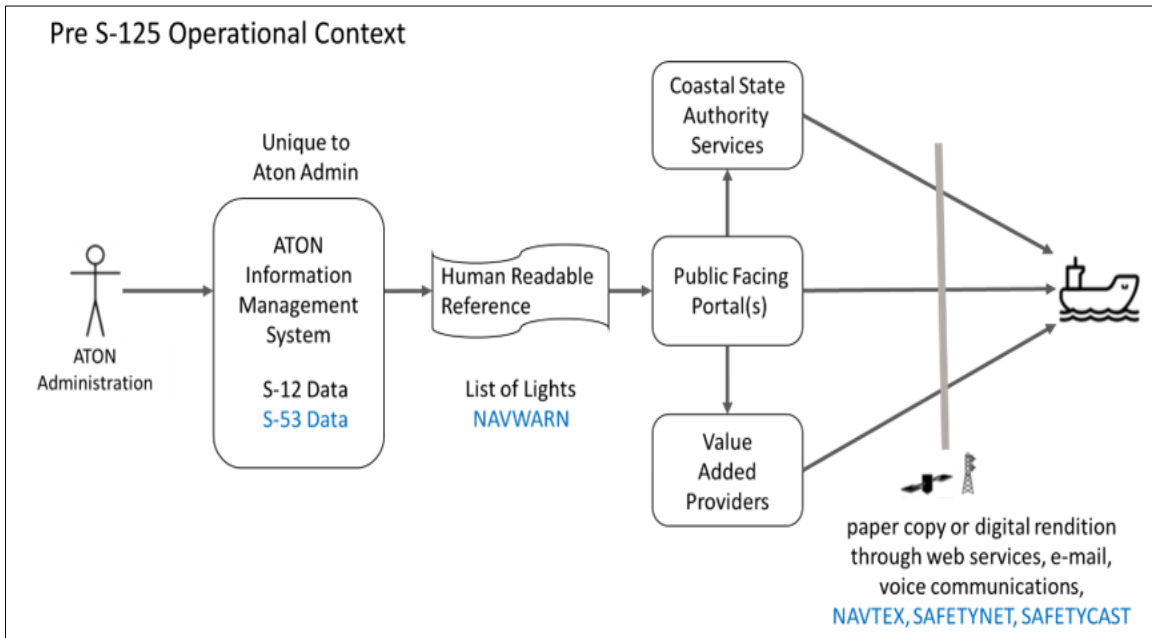
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- IALA ENAV Committee

- Developing the Technical Specification for the Provision of AtoN Information Service to End-users
- Specification for the technical service of provision of Marine Aids to Navigation (AtoN) information to end users, following the IALA guideline G1128





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- Functional requirements for S-125 service

Requirement ID	Requirement Name	Requirement Text	References
S-125R001	Transmission of dataset(s)	The service is required to transmit S-125 compliant dataset(s) with all current and valid <u>AtoN</u> Information assigned to that dataset(s).	
S-125R002	Request for dataset(s)	The service consumer can request S-125 dataset(s) by name or based on a point, line, or polygon geometry. Service providers will respond with current data relevant to request, but will not subdivide datasets to less than that defined by the authoritative source of the data.	
S-125R003	Subscribe to dataset(s)	The service may provide an optional subscription service for S-125 datasets and their respective updates.	
S-125R004	Determine Status of Subscription	If subscription is implemented, then it must be possible to provide a subscription status notification. This could indicate termination of subscription from the service provider side.	
S-125R005	Cancellation of Subscription	If subscription is implemented, then means to cancel the subscription must be provided.	



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- Operational Activities supported by the S-125 service

Operational Activity ↕	Remarks ↕
Identify S-125 Dataset(s) ↕	The service consumer is able to identify the availability of S-125 dataset(s) for a given area. This includes identification of the authoritative source for the dataset(s). ↕
Get S-125 Dataset(s) ↕	The service consumer is able to retrieve S-125 dataset(s) from the service provider ↕
Subscribe ↕	The service consumer is able to subscribe to receive S-125 dataset(s) from the service provider for a given timeframe and area. ↕
Version Designation ↕	Service provider needs to track the current version of S-125 dataset(s) and make this discoverable to service consumers. ↕
Record of Changes ↕	Service provider needs to log changes to S-125 dataset(s). ↕
Dissemination of Delta Changes ↕	The “delta” compilation of changes made to a dataset(s) since the last version was issued may be made available to service consumer before the release of a new dataset version. ↕



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- Use cases for S-125 service
 - #1a: Retrieve complete S-125 AtoN information from a service provider
 - #1b: Retrieve AtoN information for a specific area, geographically defined waterway, predefined by authoritative source as S-125 dataset(s)
 - #1c: Retrieve updates on the AtoN information through subscription service
 - #1d: Retrieve information on the status of a single AtoN based on its MRN or location

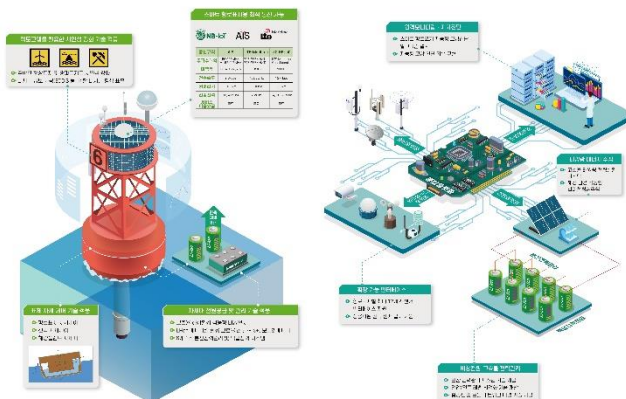
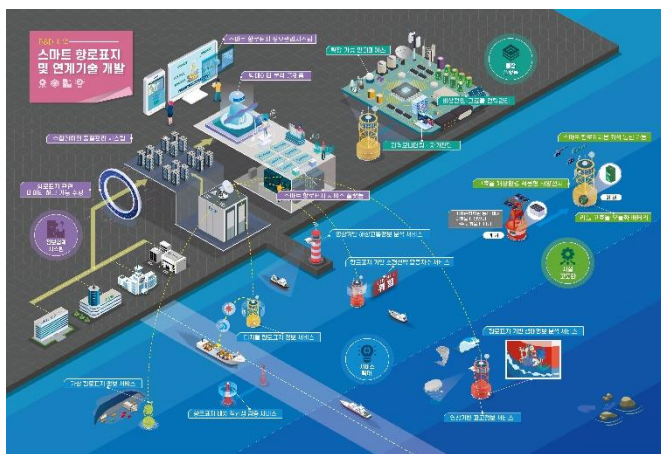


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- SMART Aton Project
 - Research project of ROK Aton Authority (2021 ~ 2025)
 - (Theme 1) Integrated platform for AtoN system, (Theme 2) Aton Service based on S-201/S-124/S-125, MRN and technical service spec.
- Joint IALA/IHO Workshop in 2022
 - Two organs discussed the Aton and Navigation warning service
 - Attendance agreed with the need of demonstration project
 - MPA proposed KRISO to have the S-124/S-125 service testbed





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- Project team

KRISO 

Overall management
Leading project

MPA 

IHO-Singapore Lab
Arrangement of all activities
4G/5G Network device
Vessel, Focused Group workshop

CCG 

Design of testing scenario
Consultation of testbed
projects

Bluemap 

Aton Info System
Development of S-124/S-125
Service, User system

Suresoft 

S-124/S-125 service test document,
Software quality assurance



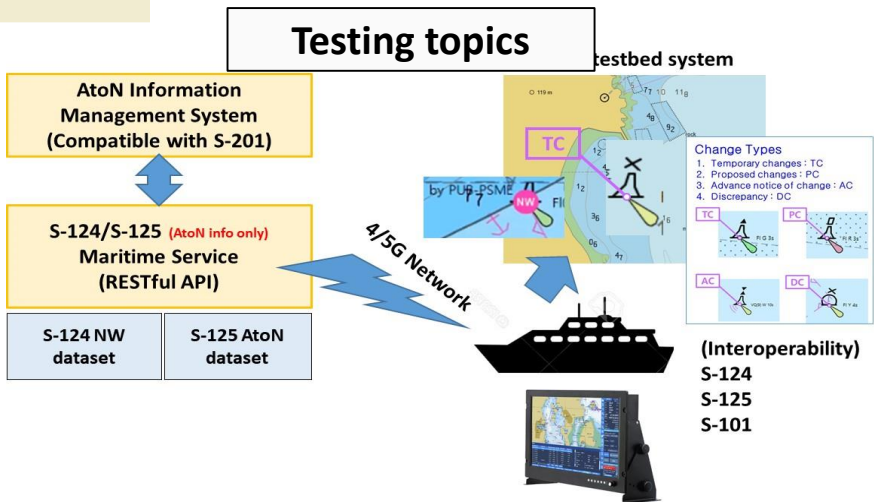
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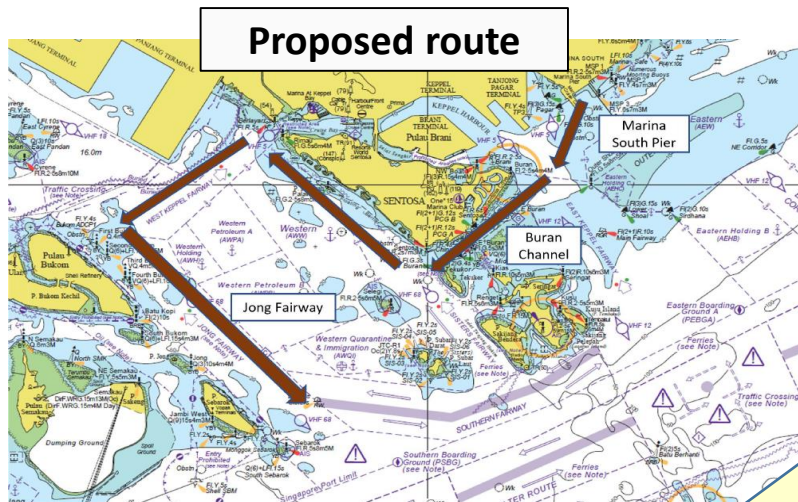
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- Preparation for testing the service

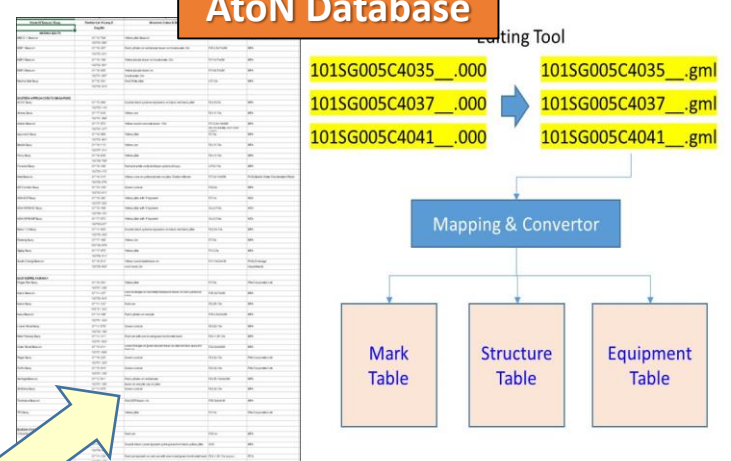
Testing topics



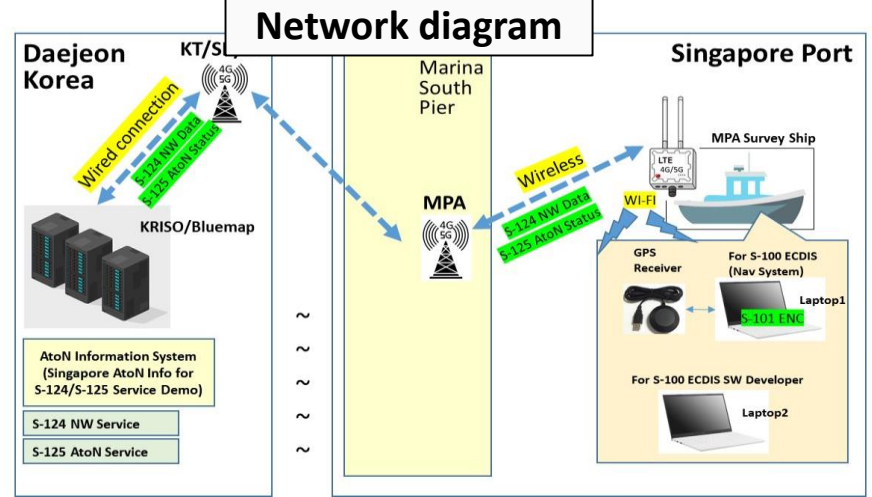
Proposed route



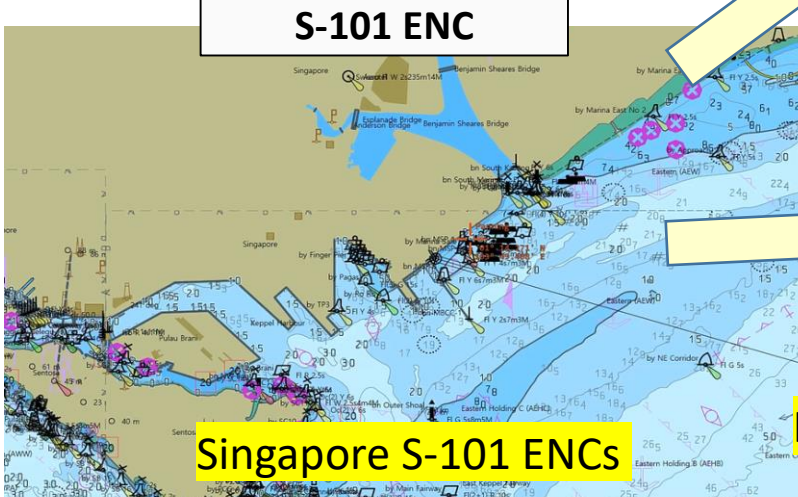
AtoN Database



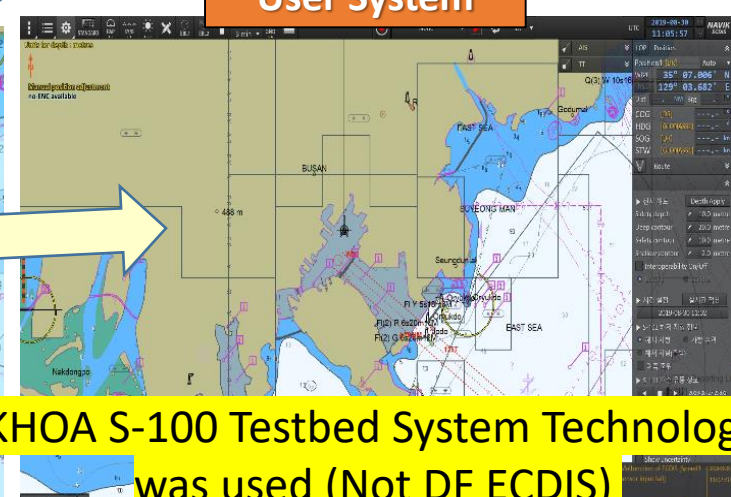
Network diagram



S-101 ENC



User System





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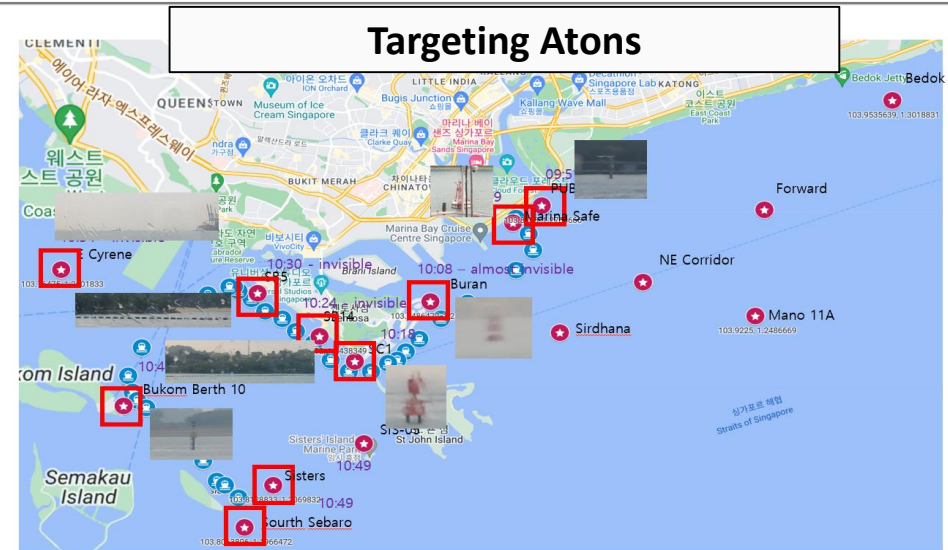
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- Planned sea route

Targeting Atons for S-124 service		Targeting Atons for S-125 service	
West Buran	POINT (103.83505 1.2341499)	Buran	POINT (103.8486472 1.25235)
Sirdhana	POINT (103.878 1.24465)	Bedok	POINT (103.9535639 1.3018831)
Mano 11A	POINT (103.9225 1.2486669)	NE Corridor	POINT (103.8968667 1.2570972)
Forward	POINT (103.9245332 1.2749333)	SB 5	POINT (103.8092389 1.2544583)
Bukom Berth 10	POINT (103.779 1.2266499)	South Sebarok	POINT (103.8063806 1.1966472)
SB 14	POINT (103.8233202 1.2438349)	Marina Safe	POINT (103.8673831 1.2717306)
Sisters	POINT (103.8128833 1.2069832)	SIS-05	POINT (103.8335497 1.2173331)
E Cyrene	POINT (103.76475 1.2601833)	SC1	POINT (103.8315167 1.2376306)
SC1	POINT (103.8315167 1.2376306)		
PUB-PSME	POINT (103.8738 1.2760666)		

S-124/S-125 Service

User-customized Service for the planned route



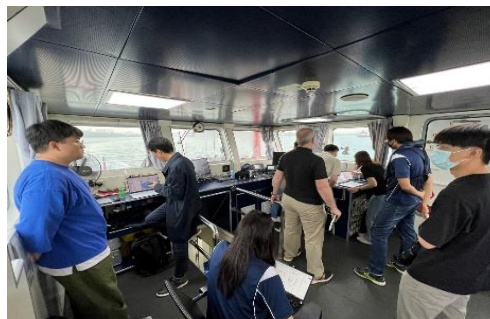
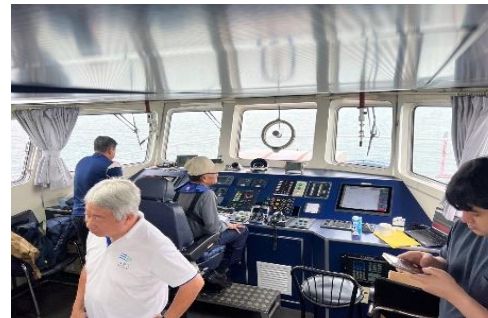


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- Sea trial activities





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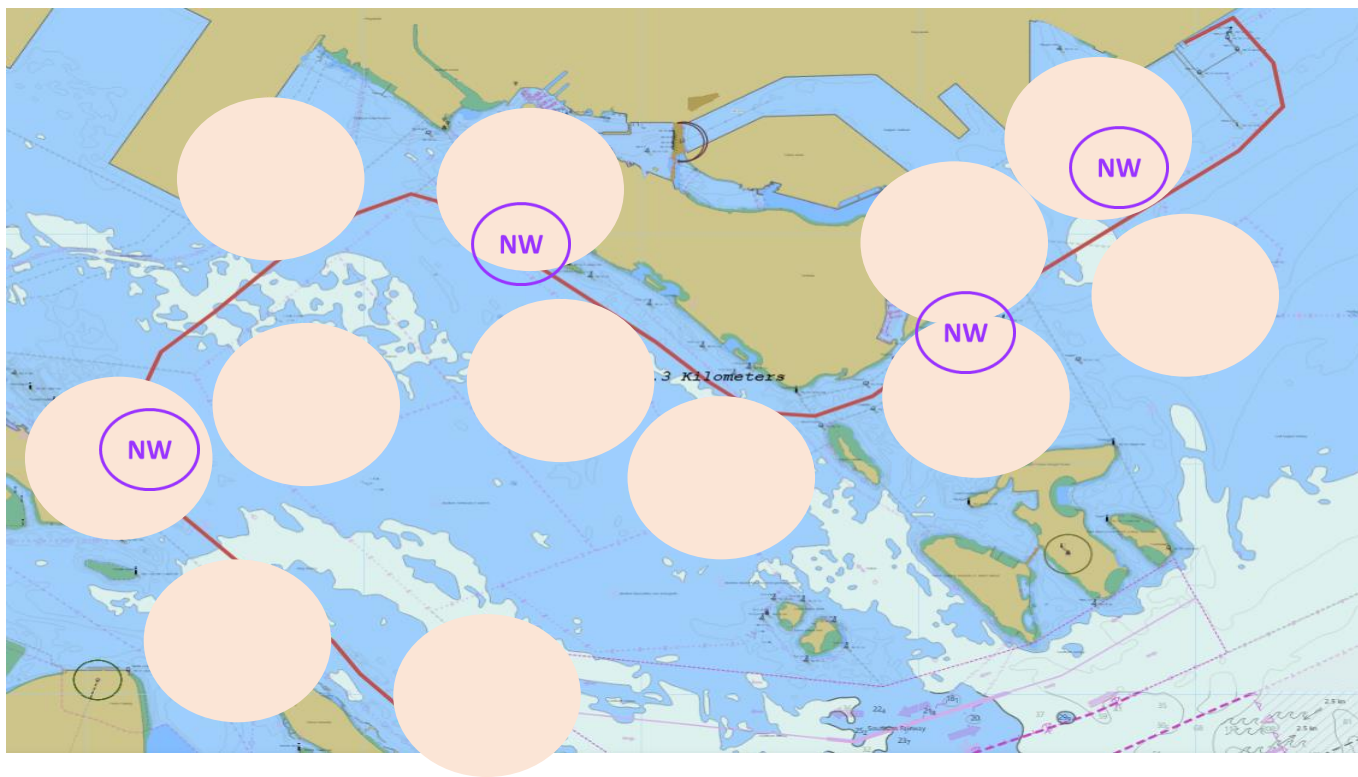
- Testing scenarios

1. Request and receive S-124 before departure

- 1-1. Receiving test of S-124 dataset in route + buffer

- 1-2. Non-receiving test of S-124 dataset unrelated to route

- 1-3. Receiving test of S-124 dataset where nominal range and route intersect



Before departure, request the S-124
NW service

Receive the S-124 NW data
for the planned route

Display the S-124 NW Symbol
in the user system



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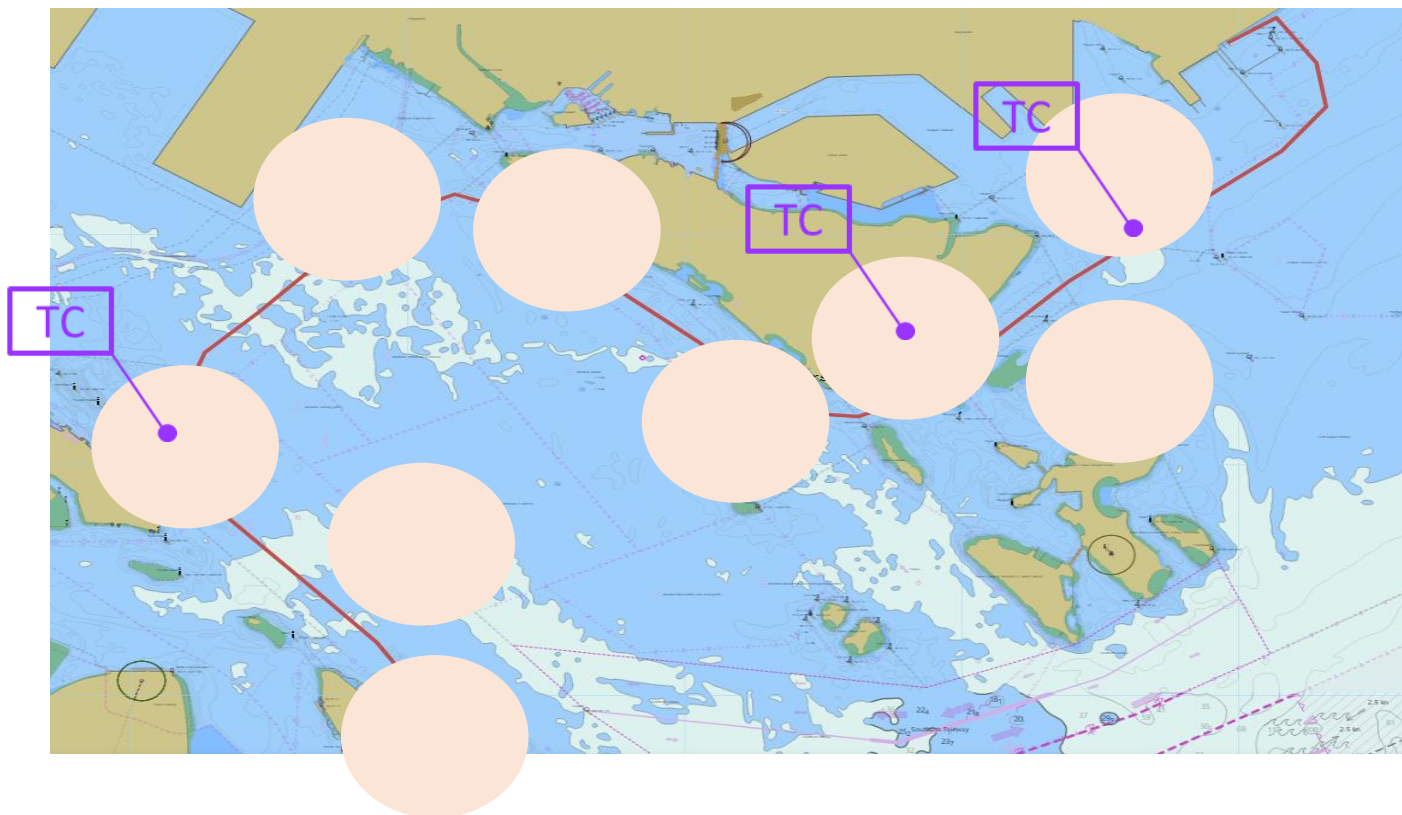
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- Testing scenarios

2. Request and receive S-125 before departure

2-1. Receiving test of S-125 dataset in route + buffer

2-2. Non-receiving test of S-125 dataset unrelated to route



Before departure, request the S-125
Marine Aton service

Receive the S-125 Aton changes
for the planned route

Display the S-125 Aton changes
Symbol in the user system



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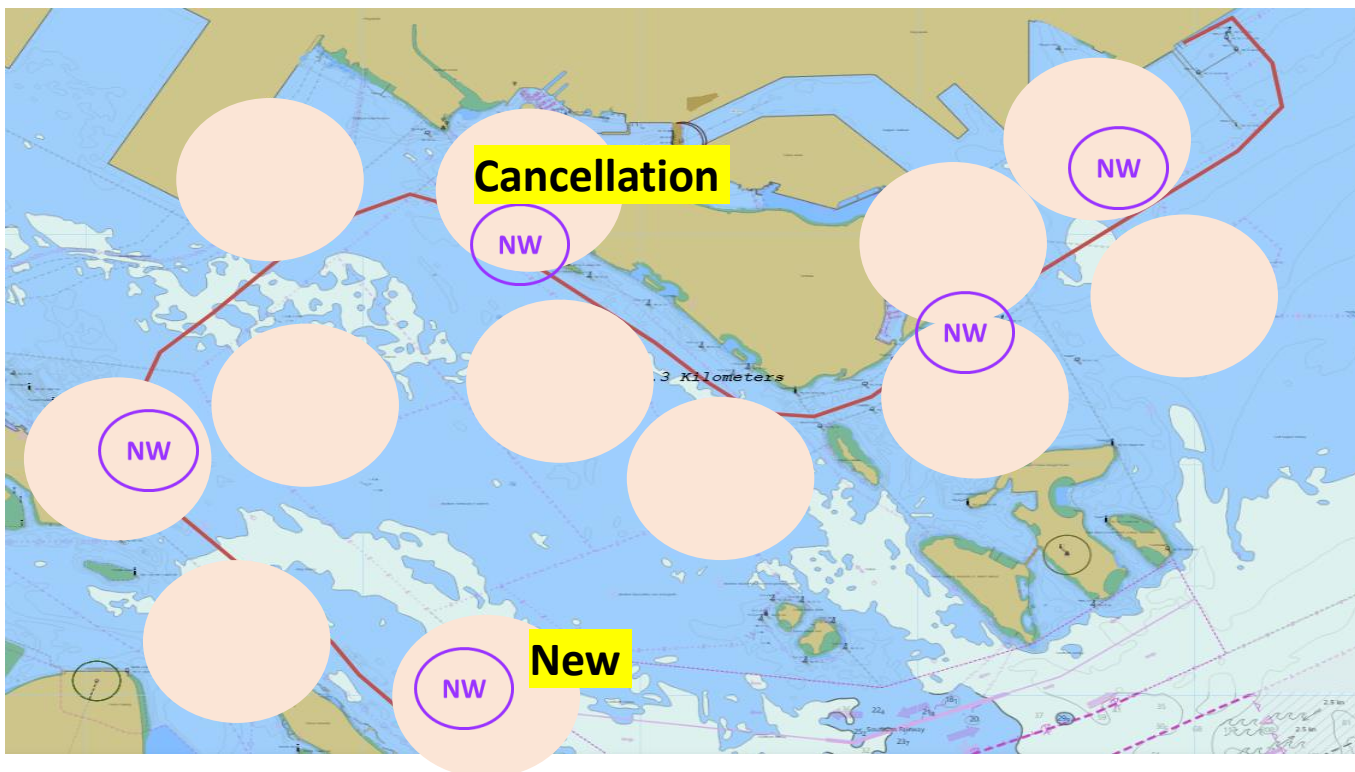
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- Testing scenarios

3. Update S-124 while sailing

3-1. Receiving test of new S-124 dataset in sailing

3-2. Receiving test of S-124 cancellation dataset in sailing



While sailing, request the S-124 NW Service

Receive the new S-124 NW and canceled S-124 NW

Display the new S-124 NW Symbol and confirms the canceled NW disappeared in the screen



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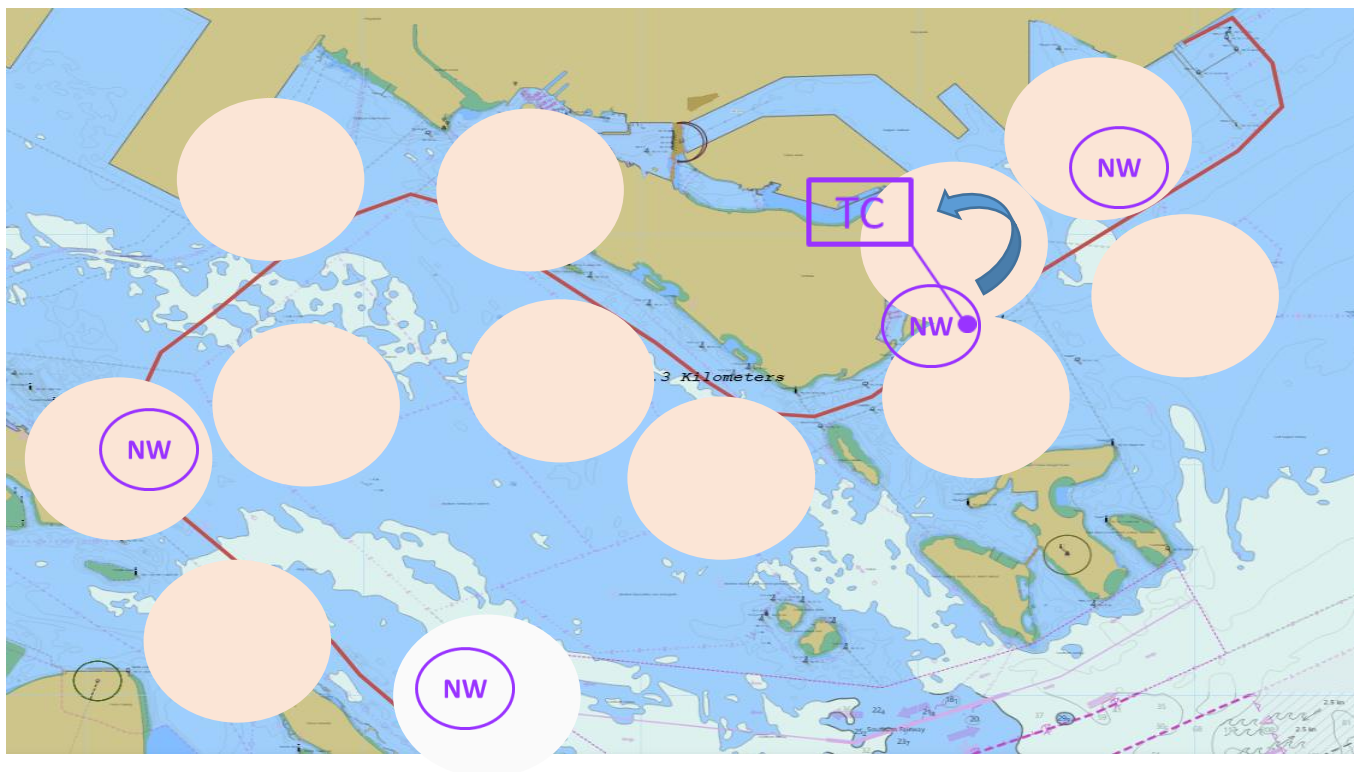
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- Testing scenarios

4. Transit from S-124 to S-125 while sailing

4-1. Transition test from S-124 dataset to S-125 dataset in sailing



While sailing, request the S-124 NW Service and S-125 Marine Aton service

Receive the S-125 Aton changes and S-124 NW for same Aton

User confirms that NW symbol changes to Aton change symbol



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• Testing results

TC-01-001

Receiving test of S-124 dataset in route + buffer



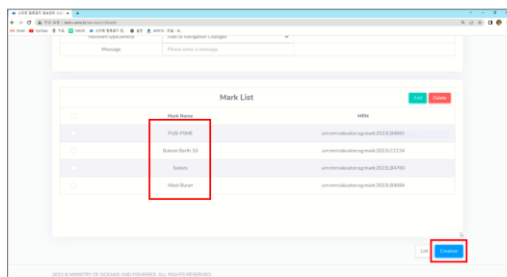
Test target AtoN
[Near route]

- PUB-PSME
- West Buran
- Bukom Berth 10
- Sisters

TC-01-001

Receiving test of S-124 dataset in route + buffer

Step 1.
Create S-124 in information system.



Test target AtoN
[Near route]

- PUB-PSME
- West Buran
- Bukom Berth 10
- Sisters

TC-01-001

Receiving test of S-124 dataset in route + buffer

Result of Step 2.
S-124 symbol is displayed on the screen.



Test target AtoN
[Near route]

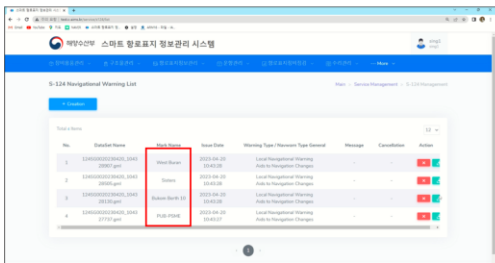
- PUB-PSME
- West Buran
- Bukom Berth 10
- Sisters



TC-01-001

Receiving test of S-124 dataset in route + buffer

Result of Step 1.
List of S-124 in the information system.



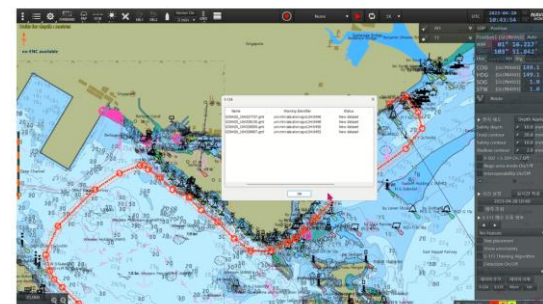
Test target AtoN
[Near route]

- PUB-PSME
- West Buran
- Bukom Berth 10
- Sisters

TC-01-001

Receiving test of S-124 dataset in route + buffer

Step 2.
Request S-124 service on ECDIS.



Test target AtoN
[Near route]

- PUB-PSME
- West Buran
- Bukom Berth 10
- Sisters

TC-01-001

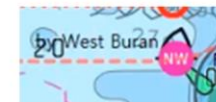
Receiving test of S-124 dataset in route + buffer

Result of Step 2.
S-124 symbol is displayed on the screen.



Test target AtoN
[Near route]

- PUB-PSME
- West Buran
- Bukom Berth 10
- Sisters





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- Discussed topics
 - Symbology of NAVWARN and AtoN status; Transparency in NAVWARN symbol, highlight in AtoN status information etc
 - Discussion for service providers; Interdependencies between a NAVWARN system and an AtoN information system
 - Discussion for mariners; how often should system check for updates
 - Discussion for mariners; user system GUI, how to present new information to user? What type of functions are needed
 - Cognitive load; The service are intended to improve the visual information presentation to end users.



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- Major lessons from the demonstration project
 - The project would provide the AtoN authorities a chance to own their datasets (i.e. S-125), rather than rely on Hydrographic Offices (HOs).
 - Authorities need to consider developing a central S-201 database to support updating service and have it operationalized before January 2026.
 - The protocols for sequencing and priority to send and display S-124 and S-125 needs to be further examined using Marine Resource Names for AtoN unique identity.
 - The project also demonstrated a low barrier to entry. System requires only a simple cellular network connection for a wide spectrum of users onboard to adopt and benefit from these services.
 - S-125 team will improve the S-125 PS and cooperate with IALA S-125 service spec. development team



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FUTURE PLAN OF S-125 TEAM

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- Updating S-125 packages
 - Comments from NIPWG members
 - Lessons from demonstration project of S-125 service
 - Requirements in terms of Aton service
 - Consolidate those and apply to the data model and packages of S-125
- Planned meeting
 - Report the S-125 update to NIPWG10 (September)
 - Discussion of S-125 update before ARM17 (VTC) (September)
 - Report and improve the S-125 package during ARM17 (October)