Input paper : ENG15-3.1.2.4

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM **X** ENG **□** PAP **□** Input

**□** ENAV **□** VTS **X** Information

Agenda item 9

Workplan Task Number / Technical Domain 2 1.1.2/TD#1

Working Group WG2

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Current State of Standardization of AtoN Management&Operation System in Korea

Related Guideline: IALA G1008('20.8)

The AtoN management system is installed on land, and it is a system that can monitor and control the status of each AtoN by receiving AtoN status information transmitted by terminals such as RTUs installed on the AtoN using wired/wireless communication.

Through the system, the state of the AtoN can be stored at regular intervals and used as statistical data. At the onshore station, the condition of AtoN can be continuously monitored and managed collectively without a separate inspection period. Systematic data provision of AtoN information is required in preparation for the introduction of e-Navigation and MASS. It is necessary to develop a standardized integrated management and operation system for systematic and continuous provision of AtoN information. Accordingly, Korea developed the AtoN Management and Operation System Standard S/W applying the AtoN Information International Standard (S-201) for systematic and continuous provision of AtoN information.

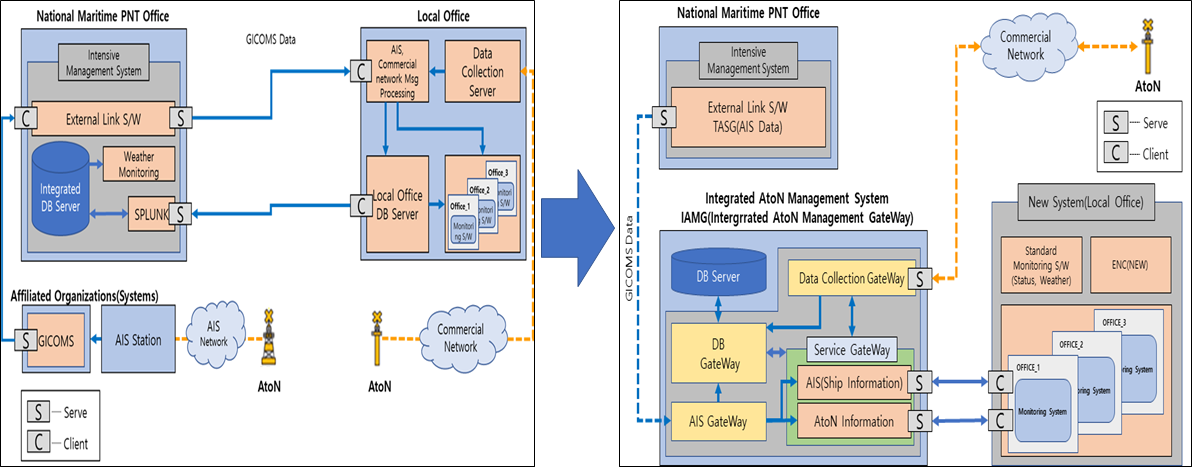


Figure 1 *Configuration diagram of standardization system change from the existing system*

The management operation system under standardization consists of AtoN status information SW, marine weather AtoN monitoring SW, and ENC monitoring SW.

The AtoN status information SW provides the ability to monitor and track the electrical, physical, and communication status of the AtoN. And the SW is expressed in a list and graph through a separate screen. In addition, the SW displays the total number and list of AtoN and provides alarm functions for communication failures and abnormal AtoN. The alarm is displayed as a list with consists of the MMSI and name, alarm occurrence time, location, and content of the AtoN in which the problem occurred. And user can add or change information on the AtoN and be controlled remotely for commercial network-based AtoN. The AtoN remotely control menu includes the marine lantern blinking and initialization, status information transmission cycle, status information call.

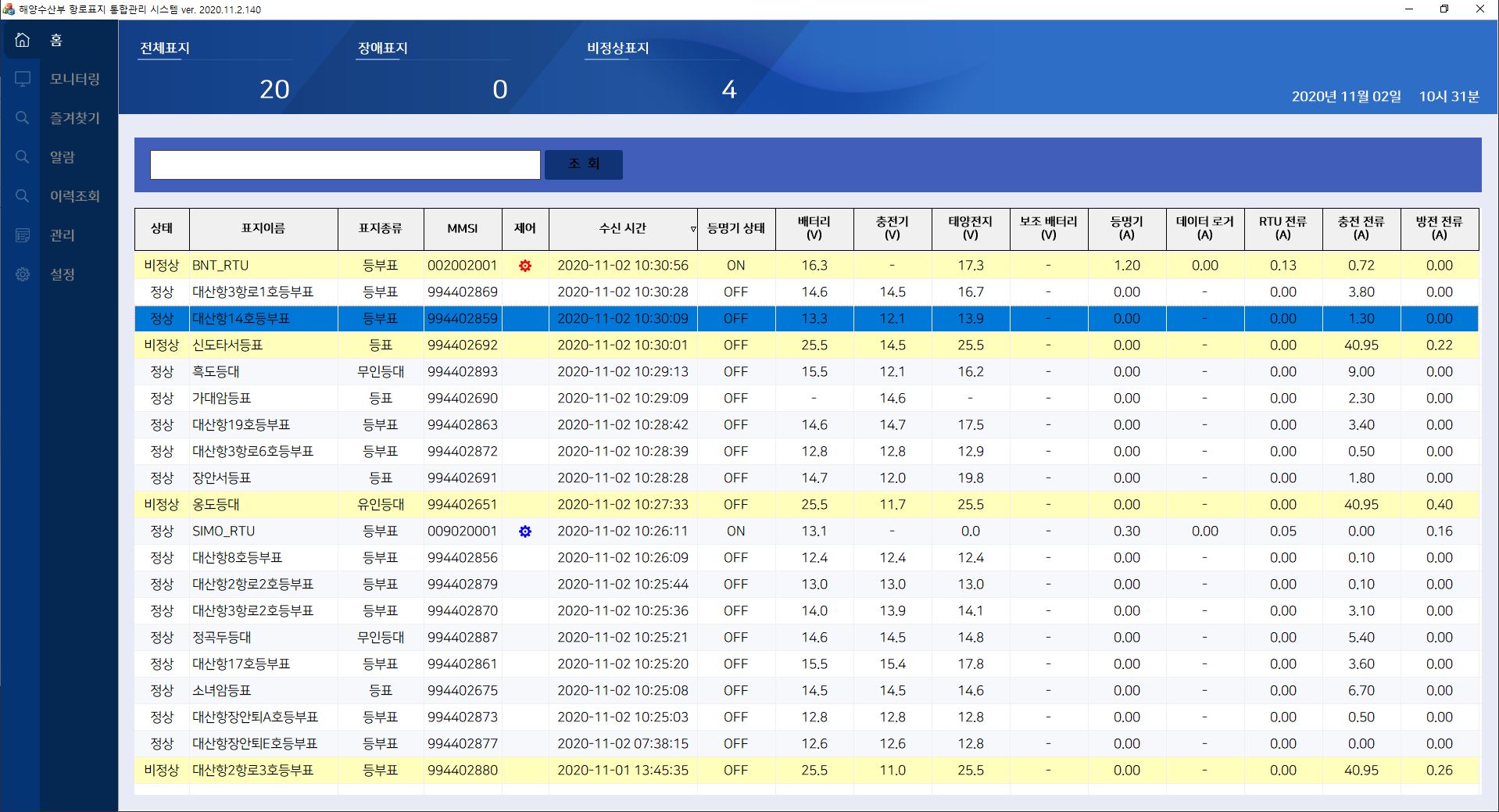


Figure 2 *Example of AtoN status information SW screen*

The marine weather AtoN monitoring SW shows weather information observed from the AtoN. When the competent marine weather AtoN transmit weather information every 10minutes using the AIS communication network, the relevant weather information is received from the SW and displayed on the screen in a list and graph. It is also possible to inquire about the history of marine weather information.



Figure 3 *Example of marine weather AtoN monitoring SW screen*

ENC monitoring SW was developed considering the flexibility and Extensibility of ENC. The user interface and the ENC engine were separated so that the ENC engine could be easily upgraded. Also, S-52(Presentation Library), S-201(Aids to Navigation Information), S-124(Navigational Warnings), S-125(Marine Navigational Services) standards were prepared for application to it. The operator can easily monitor and track the competent AtoN along with the ship information on the ENC.

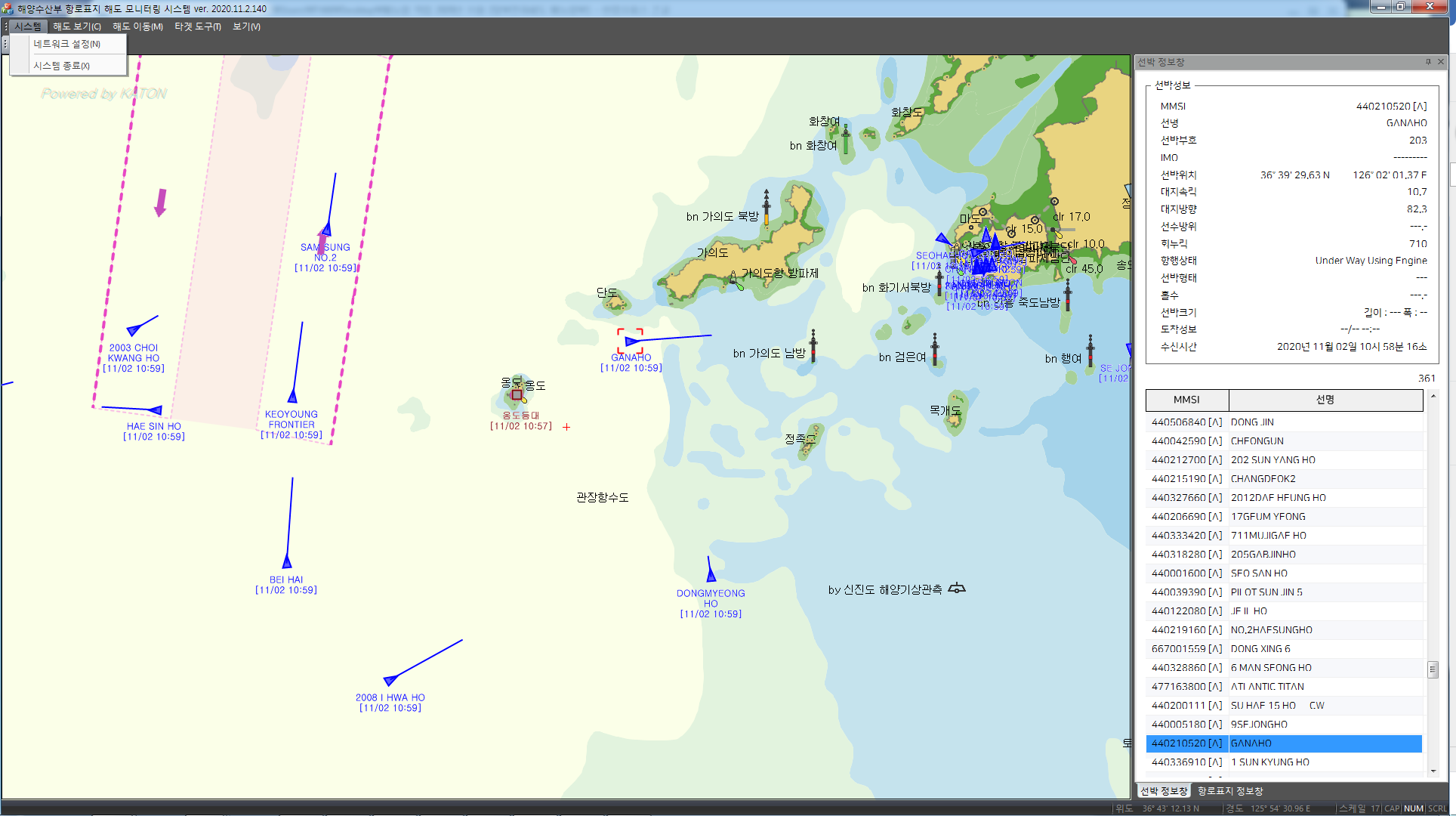


Figure 4 *Example of ENC monitoring SW screen*

A trial operation was conducted to detect errors and supplement functions. The system configuration is as follows.

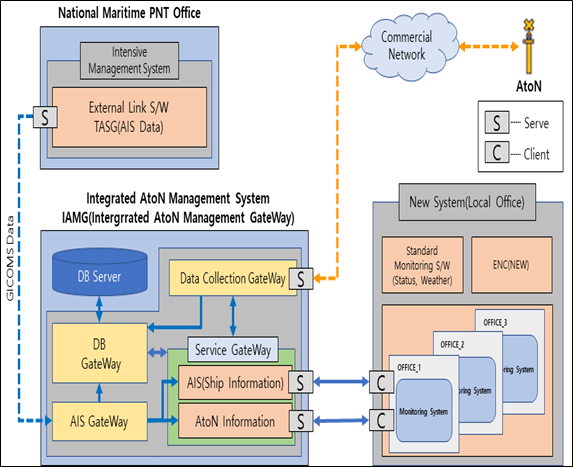


Figure 5 *Configuration diagram of the trial operating system*

In 2020, the proposal system was piloted for 7 commercial network-based AtoN under the jurisdiction of the Daesan Regional Offices of Oceans and Fisheries. In 2021, the problem was improved by expanding the pilot operation to all AtoN under the jurisdiction of the Daesan Regional Offices of Oceans and Fisheries. In 2021, additional pilot operations for two Korea Regional Offices of Oceans and Fisheries will be added to verify the safety of multi-use. Also, we are planning to replace the system of 2~3 region offices in this year.

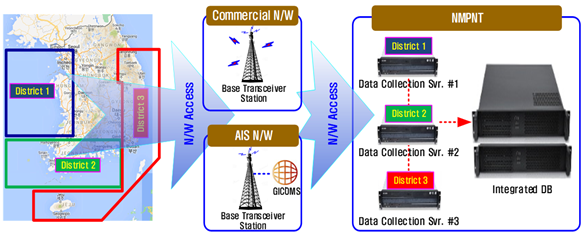
For efficient data processing and system management in the future, we plan to conduct and promote development research on S/W for portable devices so that they can be divided by region and used in the field.

Figure 6 *Concept of system wide area service*