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Technical Domain / Task Number 2 Working Group 5 (PNT)

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Progress and Plan of eLoran S-2XX Product Specification

## Purpose of the document

IALA, MOF (Ministry of Oceans and Fisheries, ROK) and KRISO agreed on the development of S-201 and exchanged a letter signed for cooperation among the three parties. In order to carry out the cooperation activities in the letter, ROK undertook to develop S-2XX product specification on eLoran. This paper outlines the progress of research activities and future plan of eLoran product specification

## Related documents

* IALA Guideline 1106 – Producing an IALA S-200 series product specification
* IALA S-240 DGNSS Station Almanac Product Specification
* ENAV17 13.13.1 Progress on the development of S-240 DGNSS Station Almanac
* RTCM SC 127 Minimum Performance Standards for Marine eLoran Receiving Equipment
* ENAV20 13.20 Progress on Development of eLoran S-20X Product Specification

# Discussion

## Progress of developing eLoran product specifications

IALA decided to develop eLoran relevant S-2XX product specification and ROK started to perform the research project to support the IALA for the followings;

* S-245 eLoran ASF Data
* S-246 eLoran Transmitter Station Almanac
* S-247 Differential eLoran Station Almanac

S-246 and S-247 is an Almanac standard for eLorean and dLoran station. The research team proposed the data model like Fig.1 and has requested the ENAV WG5 members to review those.

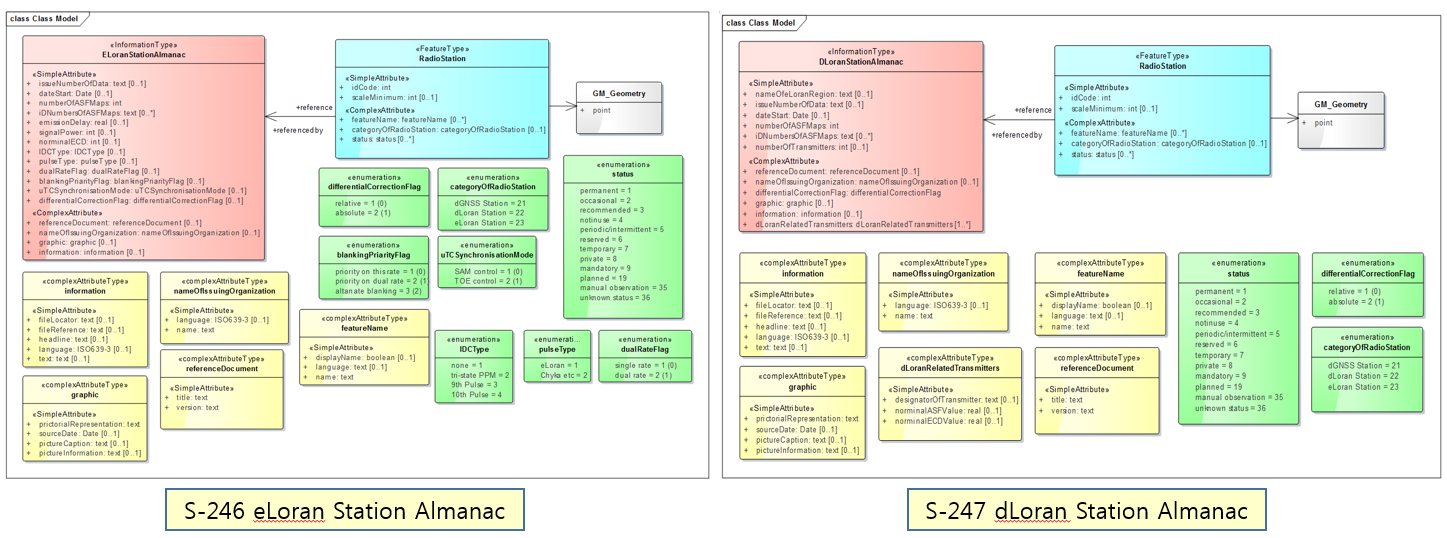


Fig 1. eLoran and dLoran Station Almanac

S-245 is a transfer standard of eLoran ASF data. The data model of ASF data was developed based on the survey result of Radio Technical Commission for Maritime Services (RTCM) Special Committee (SC) 127 and recommendations from GLA were considered to create the data model.



Fig. 2 Data Model of S-245 ASF Data

Model design has been carried referring the analysed results of eLoran S-20X product specification requirements. The metadata of ASF file, S200 Mesh information which stores the information of mesh node, mesh based feature storing the ASF value and error value are categorized. The metadata includes ASF file’s header information and the boundary information of the map area.

## Creation of S-245 ASF Sample data

The research team created the S-245 ASF sample data to verify the data model of S-245. RTCM SC 127 Minimum Performance Standards for Marine eLoran Receiving Equipment (MPS) was used to create the sample data. Regarding the characteristics of ASF data, boundaries of the ASF map area are same but, map creation information (type of map, designator of transmitter) could be different. So ASF maps are grouped by series with type of map and each series has one more blocks according to the transmitters. Block can proceed the mesh based ASF value and error value. ASF data points are located at the vertex of regular mesh girds and these data values are operated by Feature Type class. One transmitter has one block and all blocks have each one mesh typed map with ASF value and error value. Fig. 3 shows the structure for mesh based ASF data.

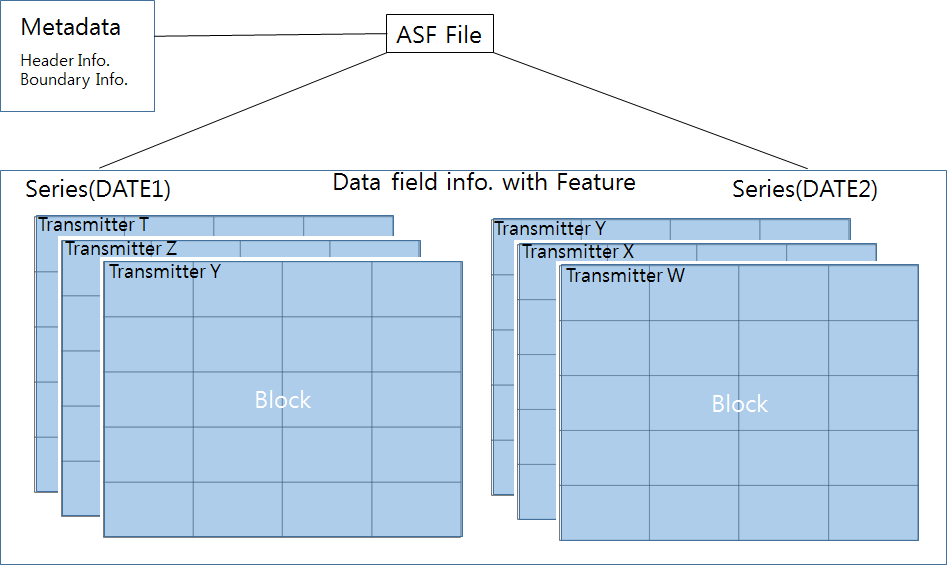


Fig. 3 Structure for Mesh based ASF data

The research team decided to create the S-245 sample data according to the ASF data structure proposed. The commonly used format for gridded data in S-200 is the HDF-5, which is a data model, library, and file format for storing and managing data. It supports an unlimited variety of datatypes, and is designed for flexible and efficient I/O and for high volume and complex data. HDF5 is portable and is extensible, allowing applications to evolve in their use of HDF5. The HDF5 Technology suite includes tools and applications for managing, manipulating, viewing, and analysing data in the HDF5 format.

Fig. 4 shows the structure of HDF-5, which consists of Group and Dataset. The group means folder and dataset means the file. The dataset can belong to the group. The group and dataset contains attribute value.

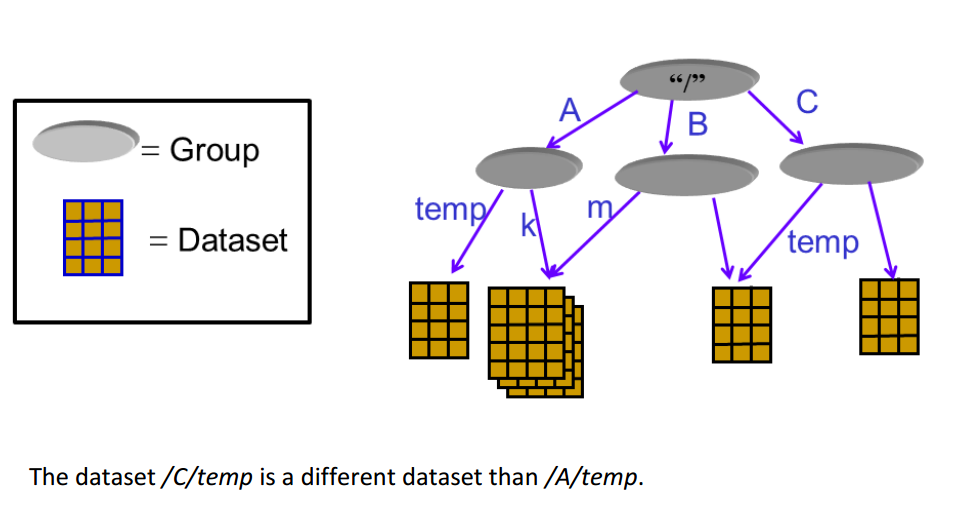


Fig 4. Structure of HDF-5 format

The research team created the S-245 sample data with the source information of ASF data. The S-245 product specification is required to define the portrayal rule, but since there is not available references for the portrayal purpose, it’s observed that it’s difficult to implement the portrayal at this point. The ASF data can be confirmed with the HDF-5 Viewer instead of the portrayal of ASF data. The result of creating the S-245 ASF sample data will be reported in the ENAV21.

## Future plan of eLoran S-200 product specification

ROK has been developing the eLoran S-200 product specification. The requirement for the development of standard was surveyed in the RTCM SC-127 Minimum Performance Standards for Marine eLoran Receiving Equipment (MPS). From the investigation, the data model of ASF, eLoran and dLoran almanac was designed and proposed. Specially, the S-245 ASF sample data was created in HDF-5 format to verify the ASF data model.

The S-245 ASF sample date was shared with the eLoran receiver industries and the research team will improve the ASF data model considering recommendations from industries. In order to advance the development of eLoran S-2XX product specification, the document will be drafted using the template of IALA S-200 guideline. The draft document will include the followings;

* Product specification maintenance
* Specification scope
* Data content and structure
* Data quality, Data capture and classification
* Data Maintenance and data product format (encoding)
* Data product delivery and metadata

The research team will carry out further review of the S-245, S-246 and S-247 data model to make sure that it can be proper for S-200 product specification. The product specification document will be drafted based on each data model.

# Action requested of the Committee

The Committee is requested to:

1. Note the progress with the eLoran S-2XX product specification
2. Provide comments for the research plan of ROK

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)