Input paper: [[1]](#footnote-1) ARM8-10.8

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

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

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

Agenda item [[2]](#footnote-2) (from agenda) 10

Workplan Task Number / Technical Domain 2 …………………………………

Working Group WG2 Information Services and Portrayal

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Proposed way forward of S-201 AtoN Product Specification

# Summary

## Purpose of the document

The S-201 Aids to Navigation (AtoN) Information Product Specification provides a common structure for the exchange of information about AtoNs. This includes buoys, beacons, racons, lights sound signals and AIS AtoNs. Data products conforming to S-201 can contain positions, properties, operational status and general comments related to an AtoN.

The Product Specification (PS) can be used to set up a technical service for exchange of AtoN information, in a consistent form, between Lighthouse Authorities, Hydrographic Offices and other organizations, including commercial and professional agencies.

The S-201 AtoN PS has been developed by IALA ENAV WG1 – Task Group 1, and the development role has subsequently been transferred to ARM. A Web application to test the proof of concept, for data input was developed by Great Britain Lighthouse Authority and Portolan Sciences. Tools for validating the product specification have been developed by Korean Ministry of Ocean and Fisheries (MOF) and Korean Reasearch Institute for Ships and Ocean (KRISO). United States Coastguard (USCG) and Canadian Coast Guard (CCG) have started mapping their databases to S-201 in preparation for developing data exchange functions.

This paper describes the status of S-201 AtoN Product Specification development, highlighting outstanding work and proposes a way towards releasing Edition 1.0.0.

## Related documents

* IALA Guideline 1106 – Producing an IALA S-200 series product specification
* IALA Guideline 1087 - the Management of the IALA Domain

# Discussion

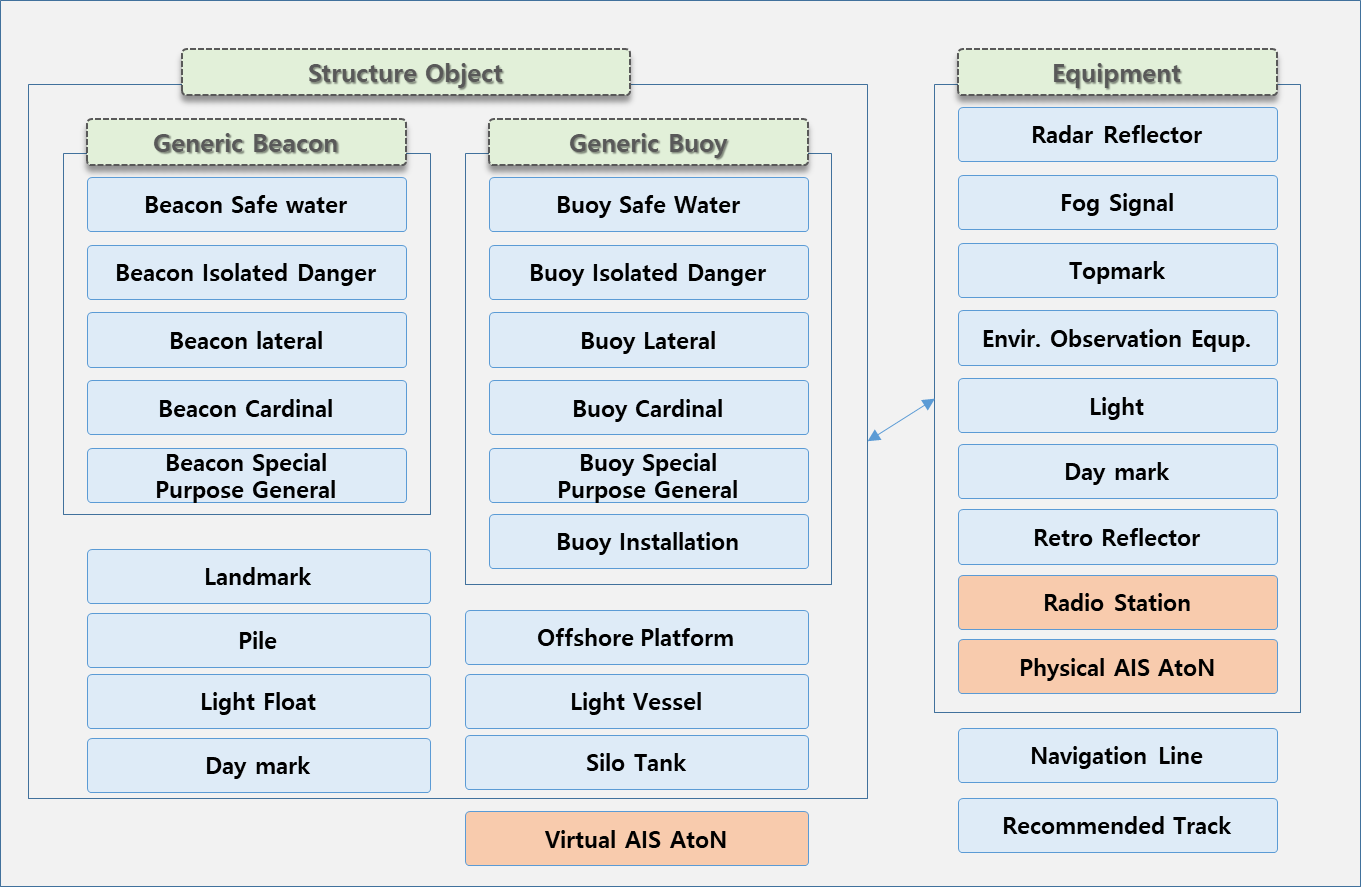
## Progress of developing S-201 AtoN product specification

Task Group1 under the IALA ENAV WG1 was responsible for the development of S-201 AtoN product specification. Relevant guidelines like G-1106 on the Development of Product Specifications and G-1087 on the Management of the IALA Domain were used for the development. It has been noted that both of these guidelines should be reviewed considering recent developments of the IHO GI Registry and S-100 Edition 4.0.0, which can be expected released at the end of 2018.

The main work of developing the S-201 PS was to draft AtoN data model and product specification documents. The latest improvement on the data model is as follows;

* Addition of AIS AtoN.
* Removing of IALA namespace in the model.
* Additional checks for the AIS feature classes.
* Colour attribute of Light feature class now has multiplicity of 1..\* to permit encoding of alternating lights.
* Improvements to metadata to align S-201 to latest version of S-100 (Ed 3.0.0).

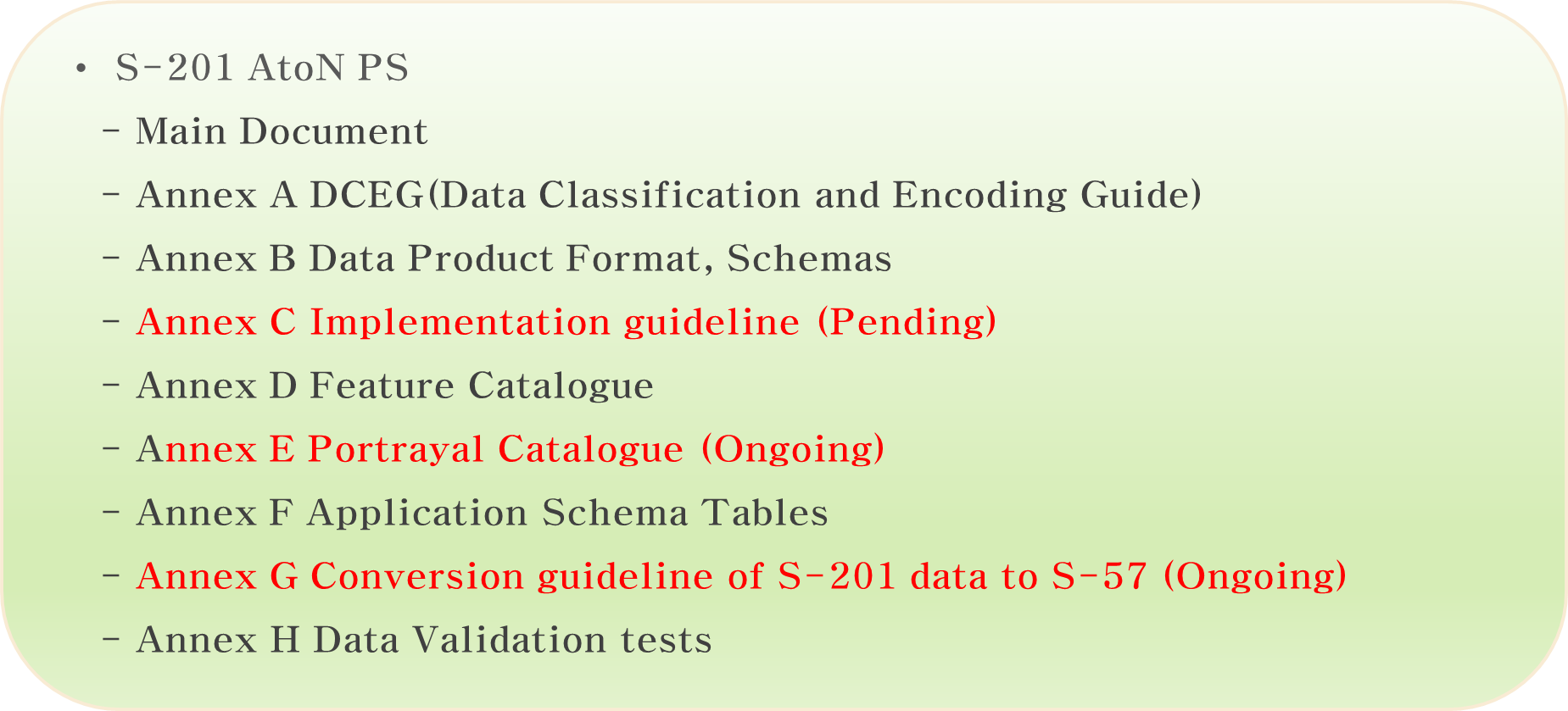
Figure 1 shows the simplified view on data model of S-201 v0.0.7 showing new additions



1. Simplified view on data model of S-201 v0.0.7 showing new additions

The S-201 AtoN product specification consists of several parts in addition to the main documents. The packages were developed by Task group of ENAV WG1. An implementation guideline is pending, and in addition to a portrayal catalogue and a conversion guideline of S-201 data to S-57 ENC.

Republic of Korea has cooperated with the Task group of ENAV WG1 team to finish the S-201 AtoN PS, and has drafted a portrayal catalogue and a guideline for conversion of S-201 data to S-57 ENC that can be supplied as starting points for further development and discussion.

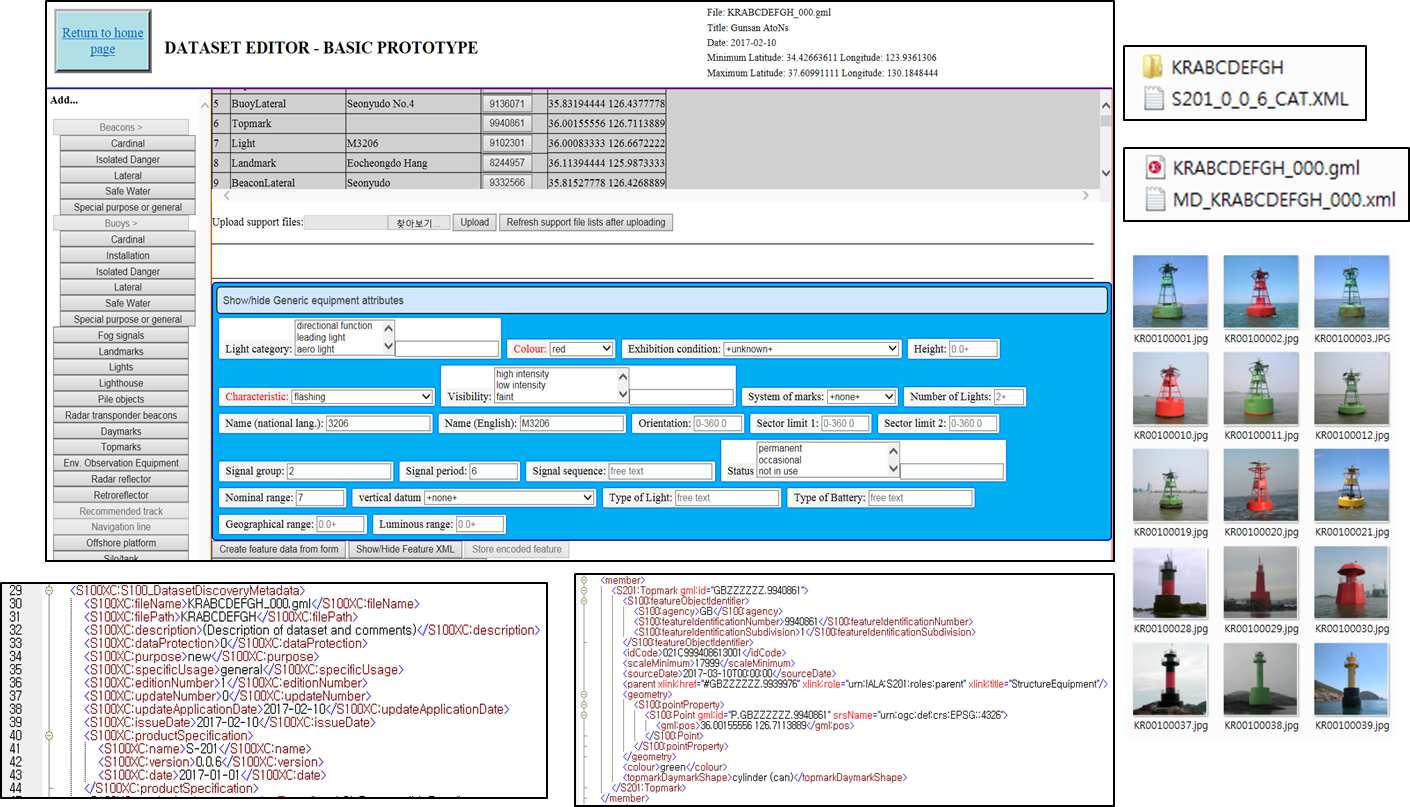


1. Status of S-201 AtoN product specification

## Tools for validating S-201 AtoN Product specification

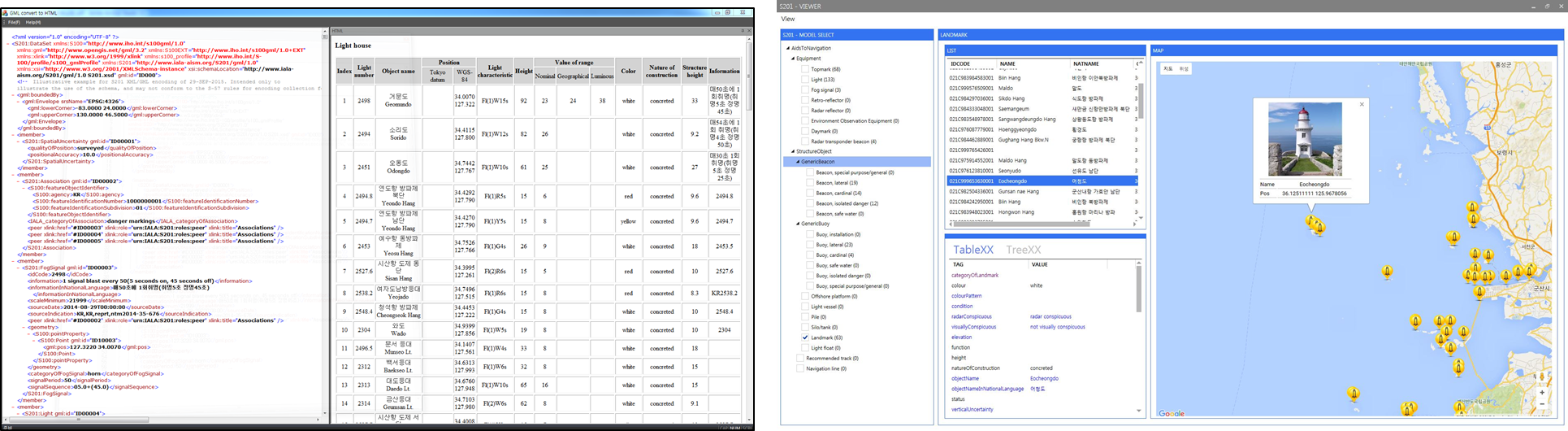
S-201 AtoN PS aims to provide a standardised method of exchanging information on Aids to Navigation, initially between lighthouse authorities and hydrographic offices, but ultimately from the AtoN authority to additional users such as other government agencies and academia.

Some organizations started to develop tools for testing the S-201 AtoN Product Specification concept. GLA/Portolan Sciences developed a Web application for data creation, and KRISO created their test datasets using this web application.



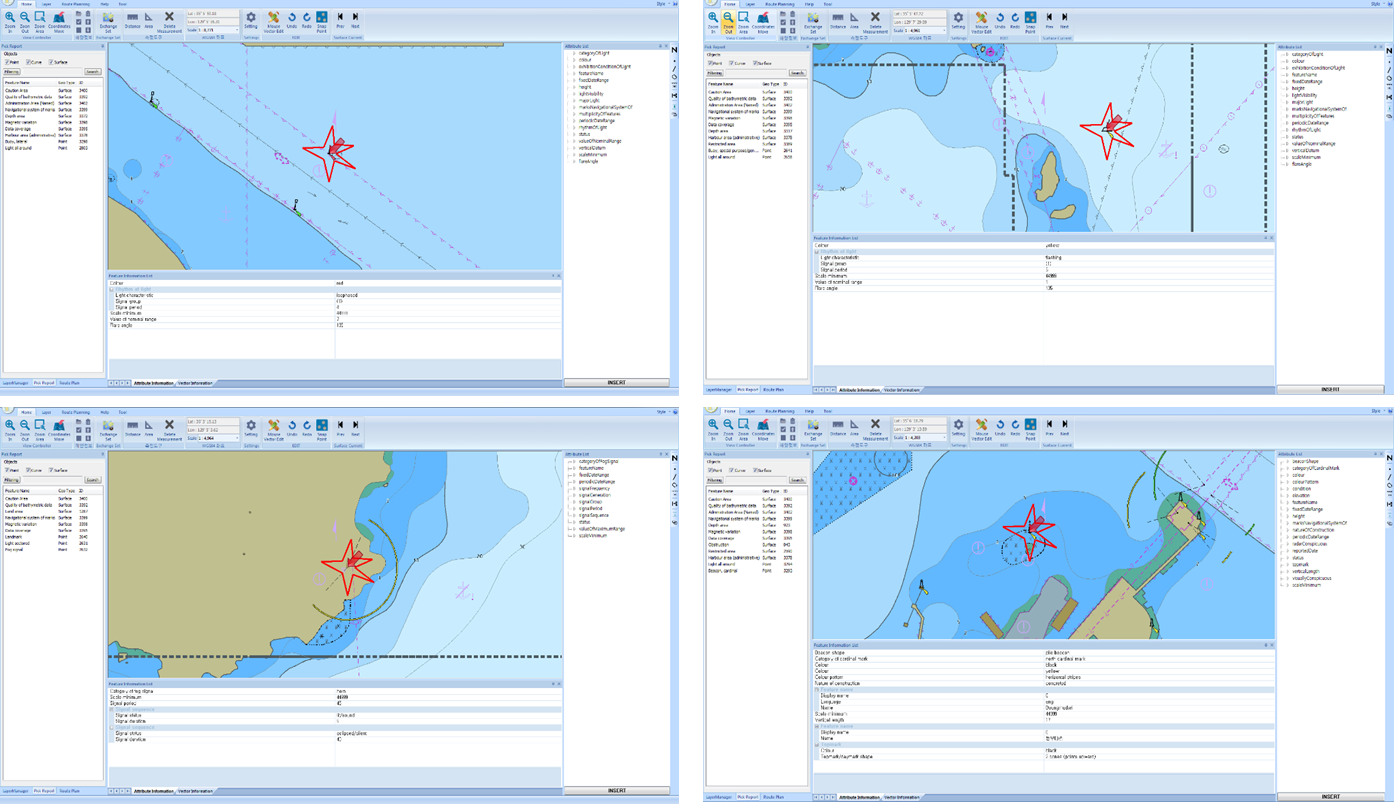
1. Web application for data input

Korea/KRISO has conducted a research project to support the development of S-200 and drafted a digital list of light as an output of that project. The list of light is a GML dataset that can be used for various portrayal outputs, including traditional list of lights, a web based list of light, or viewed in a geographical interface.



1. Digital list of light

S-201 AtoN PS has a placeholder for a portrayal catalogue, which is envisioned to be used to display AtoN information using ENC symbology. MOF/KRISO drafted a portrayal catalogue for S-201 AtoN PS and tested it with S-101 ENCs using the Korean developed S-100 Viewer.



1. Portrayal Test of S-201 AtoN data

## AtoN database to S-201 Mapping

Canadian Coast Guard (CCG) have reviewed its AtoN management database named SIPA and compared it with the S-201 data model. The investigation found that most of the content can be fairly easily mapped to the S-201 data model, but also some gaps were identified. The gaps will be considered for inputs to improvement plans as part of future SIPA upgrades.

In addition to the mapping, a conversion process was created for SIPA content into S-201, covering all the AtoN types of SIPA. Figure 6 below, shows the starting point for the conversion process.



1. Starting point for SIPA to S-201 conversion process

The mapping exercise yielded some important lessons for CCG, and highlighted to importance of consistent data entry into the AtoN database, as well as the importance of using discrete data values over strings that are often of variable structure consistency.

## Proposed way forward of S-201 AtoN Product Specification

To help facilitate the development of the S-201 AtoN product specification, this paper makes the following recommendations;

* Update the relevant guidelines considering lessons learned with development of S-201 AtoN PS (IALA Guideline 1106 - Producing an IALA S-200 series product specification, IALA Guideline 1087 - the Management of the IALA Domain), and considering improvement to IHO GI Registry and pending release of S-100 Ed. 4.
* Use the Korean drafts of Annex E (Portrayal catalogue) and Annex G (Conversion guideline of S-201 data to S-57 ENC) as a starting point to resume the development of S-201.
* Utilize the GI Registry infrastructure and development tools to create machine readable product specification components like feature catalogue and data classification and encoding guide.
* Use lessons learnt from member states to draft the Annex C Implementation guideline.
* Organize the development team to complete the development of S-201 AtoN PS Edition 1.0.0.

# Action requested of the Committee

The Committee is requested to:

1. Note this document

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Input papers should be assigned to a work task as listed in the Committee work plan which is available in input papers. Leave open if uncertain but consider how the paper is to be processed if not relevant to a work task [↑](#footnote-ref-2)