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Agenda item [[2]](#footnote-3) 8.4.2

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Operational version candidate of S-201 Aton information product specification

# Summary

IALA developed the S-201 Aton information product specification 1.0.0 as testing version in 2019. Subsequently, S-201 1.2.0 as working draft was developed at the ARM meeting addressing the S-100 5.0 version and making some content revisions. Based on the discussions at ARM19, the S-201 was improved to ensure compatibility with the S-101 ENC and to reflect the requirements of S-100 edition 5.2. As a fundamental standard for AtoN information management, S-201 enables the creation of S-124 navigational warnings and S-125 AtoN changes. Considering the S-100 ECDIS implementation roadmap (legal in 2026 and mandatory to new systems from 2029)and considering the IHO plan to commence Phase 2 product specification approval at end of 2026, approval for the operational version (2.0) of the revised S-201 is requested.

## Purpose of the document

Based on the discussions at ARM19, the revised version of the S-201 as the operational version 2.0 is proposed to ARM20, reflecting the updated data model and complying with the requirements of S-100 edition 5.2

## Related documents

S-100 IHO Universal Hydrographic Data Model (Edition 5.2.0, June 2024)

S-97 IHO Guidelines for Creating S-100 Product Specifications (Edition 1.1.0, June 2020)

S-201 Aton Information product specification

# Background

The IALA ARM Committee is updating the S-201 for the exchange of AtoN information. As discussed in the two IALA/IHO Joint Workshop, S-201 data is for use in exchange between shore-based AtoN organizations or between AtoN authorities and hydrographic offices. From S-201-based AtoN data, it is possible to generate S-124 navigational warnings and S-125 AtoN changes, as well as update the national ENC products.

# Discussion

## Major amendments of S-201

The S-201 was initially developed to be compatible with the S-57 ENC, using a data model similar to the S-57 AtoN data model. However, from the discussions at ARM19, the data model was revised to ensure compatibility with the S-101 ENC. The key revisions to the S-201 are as follows.

* The name of structure featuretype changed to be in line with S-101 ENC
* The Topmark is now associated with a floating structure, rather than a fixed structure.
* Similar to the S-101 ENC, the Light feature has been divided into four distinct features: LightAllAround, LightAirObstruction, LightFogDetector, and LightSectored.
* Bridge and Building features have been added as structures where AtoN equipment can be installed.
* The AtonStatusInformation type, which represents the status of AtoNs, has been refined to eliminate redundancy and errors in its change information enumerations.
* The Complex Attribute types included in the S-201 data model have been updated by referencing the S-101 AtoN model.
* A new abstract class, GenericLight, has been defined to include common attributes shared among different Light features.

Based on the results of the data model revision discussions, the S-201 standard has been updated through the following procedures:

* Updated the application schema
* Developed the S-201 Feature Catalogue (FC) using the S-100 Feature Conceptual Base (FCB) in accordance with UML diagram revisions
* Converted the S-201 FC to GML Schema (Default encoding)
* Compiled the S-201 FC documentation
* Updated the S-201 Portrayal Catalogue
* Revised the S-201 Data Classification and Encoding Guide (DCEG) document"

## S-201 package

The S-201, along with its main document, includes additional annexes. IALA discussed and agreed that the S-201 implementation guidance has been removed from the S-201 package and is proposed to be a separate document as a guideline. There is a need for a guideline for conversion from S-201 to S-57 / S-101 ENC that should be developed as post operational version of S-201.

The proposed S-201 package as an operational version candidate is structured as follows."

* S-201 main document: Application schema, management and maintenance of S-201 data, data quality, exchange set including metadata
* Annex A. DCEG: Data Classification and Encoding Guide
* Annex B. Default encoding (GML Schema): This package contains the S-100 Part 10b compliant GML schemas for the specification of the data product encoding for S-201 datasets.
* Annex C1. Feature Catalogue: This package is generated from the accompanying XML S-201 feature catalogue and presents the feature catalogue in a human reader-friendly form.
* Annex C2. Feature Catalogue XML: The package contains the S-201 feature catalogue in a machine-readable XML format, which complies with the IHO S-100 feature catalogue schema. This document is meant for use by systems that are intended to read/write S-201 datasets.
* Annex D. Portrayal Catalogue: The package contains the S-201 portrayal catalogue.

## Verification of S-201 Revision

IALA and Korea are collaborating on the development of the S-200 Test & Validation Tool to support the development of S-200 series and the creation of test data. This system allows for the registration of S-200 series Feature Catalogues (FC), enabling the generation of test data and the visualization of symbols on a web-based map.

IALA WWA conducted S-100/S-200 training and sea trials from March 4 to 7, 2025, in Busan, Korea. During this event, the newly revised S-201 Feature Catalogue (FC), based on the updated Aton data model, was applied to the S-200 Test & Validation Tool for hands-on S-201 data production exercises. Additionally, in the sea trial of Aton data management and service, the Korean AtoN information management system(S-AIMS) was used to validate the S-201 data production test scenarios."

## Proposal of S-201 operational version candidate

The candidate for the S-201 operational version is provided as a separate annex from this document. The proposed S-201 package has been updated to ensure compatibility with the S-101 ENC, including updates to the Feature Catalogue (FC), Data Classification and Encoding Guide (DCEG), GML Schema, and Portrayal Catalogue (PC). Additionally, it has been revised in accordance with S-100 Edition 5.2, the baseline version for S-100 implementation roadmap. Considering the S-100 ECDIS implementation, the S-201 operational version (Ed 2.0.0) candidate is proposed for approval.

# Action requested of the Committee

The Committee is requested to consider this input paper, and take actions as appropriate.

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-2)
2. Leave open if uncertain [↑](#footnote-ref-3)