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**GLOSS GE XVIII 11-14 March 2025, Panama**

## **Agenda Item 9**

### **Linkages between GLOSS and Other Programmes & Bodies**

#### **9.1 IHO TWCWG**

**International Hydrographic Organization**

**Tides, Water Levels & Surface Currents Working Group**

Chris Jones, UKHO Tides Technical Lead & TWCWG Chair  
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#### Visiting the IHO Secretariat

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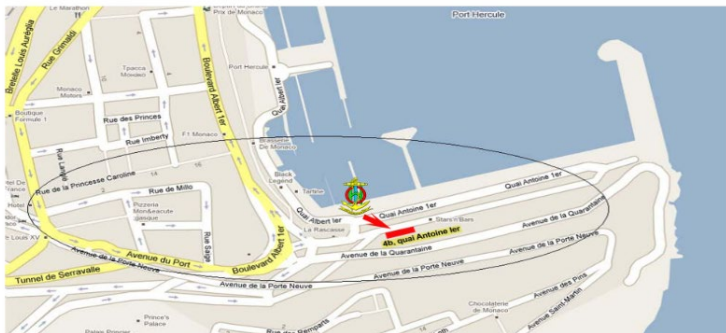
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Email: please use info@iho.int

The International Hydrographic Organization and Secretariat are situated in Monaco.. It is headed by a Secretary-General assisted by two Directors and supported by technical and administrative personnel.

# International Hydrographic Organization (IHO)



## STREET PLAN OF THE NEIGHBORHOOD



“The International Hydrographic Organization is an intergovernmental organization that works to ensure all the world's seas, oceans and navigable waters are surveyed and charted. Established in 1921, it coordinates the activities of national hydrographic offices and promotes uniformity in nautical charts and documents. It issues survey best practices, provides guidelines to maximize the use of hydrographic survey data and develops hydrographic capabilities in Member States.”

<https://iho.int/en/importance-of-hydrography>



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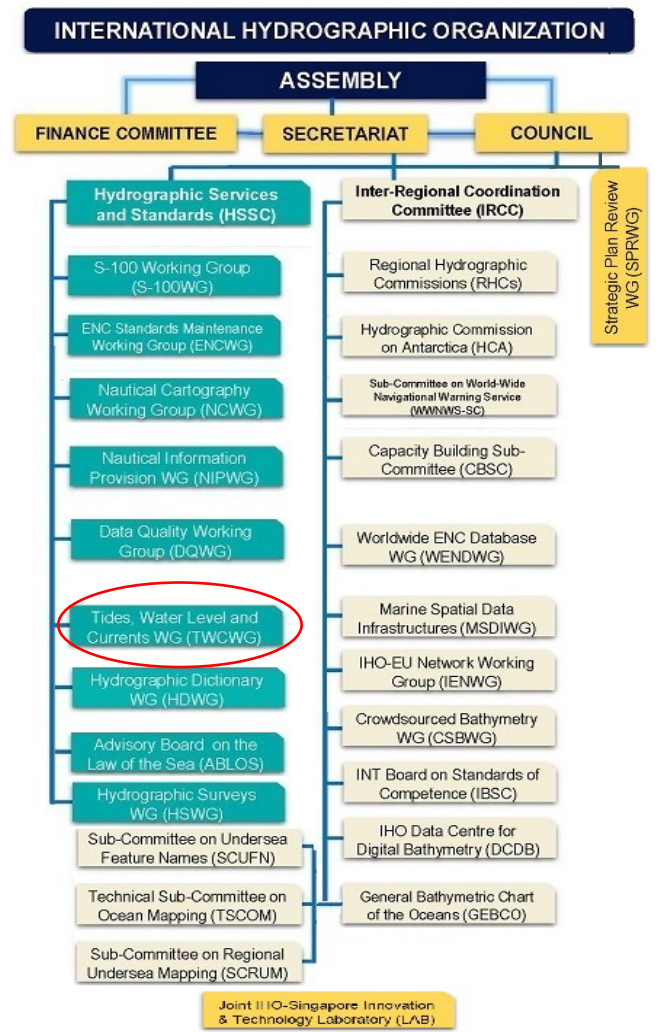


## Structure of the IHO:

## Committees and Working Groups

Website

<https://iho.int/>





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# Hydrographic Services & Standards Committee (HSSC)



## Objective:

*“To promote and coordinate the development of standards, specifications and guidelines for official products and services to meet the requirements of mariners and other users of hydrographic information.”*

<https://iho.int/en/hssc>

## Main Elements:

- Programme Coordination
- Foundational Nautical Cartography Framework
- S-100 Framework
- S-57 Framework
- Support the implementation of e-navigation & Marine Spatial Data Infrastructures (MSDI)
- Hydrographic Surveying
- Hydrographic aspects of UNCLOS
- Other technical standards, specifications, guidelines and tools



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# Tides, Water Levels and Surface Currents Working Group (TWCWG)



## Objectives:

- To **provide technical advice** and **coordination** on matters related to tides, water levels, currents and vertical datum, including integrated water level/current data models.
- To support the **development** and **maintenance** of related **specifications** in liaison with the relevant IHO bodies and non-IHO entities.
- To develop and maintain the **IHO publications** for which the WG is responsible.



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# Tides, Water Levels and Surface Currents Working Group (TWCWG)



## **Authority:**

- TWCWG is a subsidiary of the HSSC and its Work Plan is subject to HSSC approval.

## **Composition & Chair / Vice Chair:**

- Representatives of IHO Member States (MS), Expert Contributors (EC), Observers from accredited Non-Governmental Organizations (NGIO), and a representative of the IHO Secretariat.
- Chair / Vice Chair from a MS only.



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# TWCWG9

## Hybrid Meeting: 19 – 22 Nov 2024



**65 Registered Delegates** representing **57 Member States**;

- 29 in person attendees at the IHO, Monaco.
- **Member states represented:** Argentina, Australia, Brazil, Chile, China, Colombia, Denmark, Finland, France, Germany, Indonesia, Italy, Japan, Netherlands, New Zealand, Norway, Peru, Portugal, Republic of Korea, South Africa, Sweden, UK, USA
- 4 from **Industry** (all VTC) [Portolan Sciences, PRIMAR, WR Systems, HARTIS Integrated Nautical Services]
- 4 from **Other Organisations** (2 face to face) [Japan Hydrographic Association (JHA) and the National Oceanography Centre (UK)]

Also representation from the **Global Sea Level Observing System (GLOSS)**.

Plus reps from other Project Teams working on related “**S-1xx**” **Product Specifications**







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# TWCWG9

## Agenda Items



- [Standard Constituent List](#).
- The study of long-term data sets for the determination of global sea level rise and changes in tidal range.
- [Compare Tidal Predictions](#) generated as a [result](#) of [analysis of a common data set](#) by different analysis software (including the **International Association for the Physical Sciences of the Oceans (IAPSO)** [Best Practice Study group on Tidal Analysis](#)).
- Historical data recovery/data archaeology.
- Establishment and Maintenance of Vertical Reference Frames / Systems [VRF / VRS] for High Resolution Bathymetric Surfaces.



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# TWCWG9

## Agenda Items



- Determining ellipsoidal height of MSL at the coast.
- [Inventory of Tide gauges](#) used by IHO Member States.
- [Actual Tides On-line Link](#) [ATOLL] status.
- [List of vertical datums](#) in use to describe Chart Datum.
- Review of relevant IHO [Resolutions](#) and [Charting Specifications](#).
- Capacity Building: Tides Training Course.
- Minimum metadata requirements for water level gauges and current monitors.
- Working with the Hydrographic Surveys Working Group (HSWG) [Chair David Parker] on defining uncertainty standards for water level and currents in S-44 (Standards for Hydrographic Surveys)

# What is S-100?

The International Hydrographic Organisation (IHO) S-100 Standard is a framework document that is intended for the development of digital products and services for hydrographic, maritime and GIS communities.

It comprises multiple parts that are based on the geospatial standards developed by the International Organization for Standardization, Technical Committee 211 (ISO/TC211).



[What is the IHO S-100 Standard?](#)

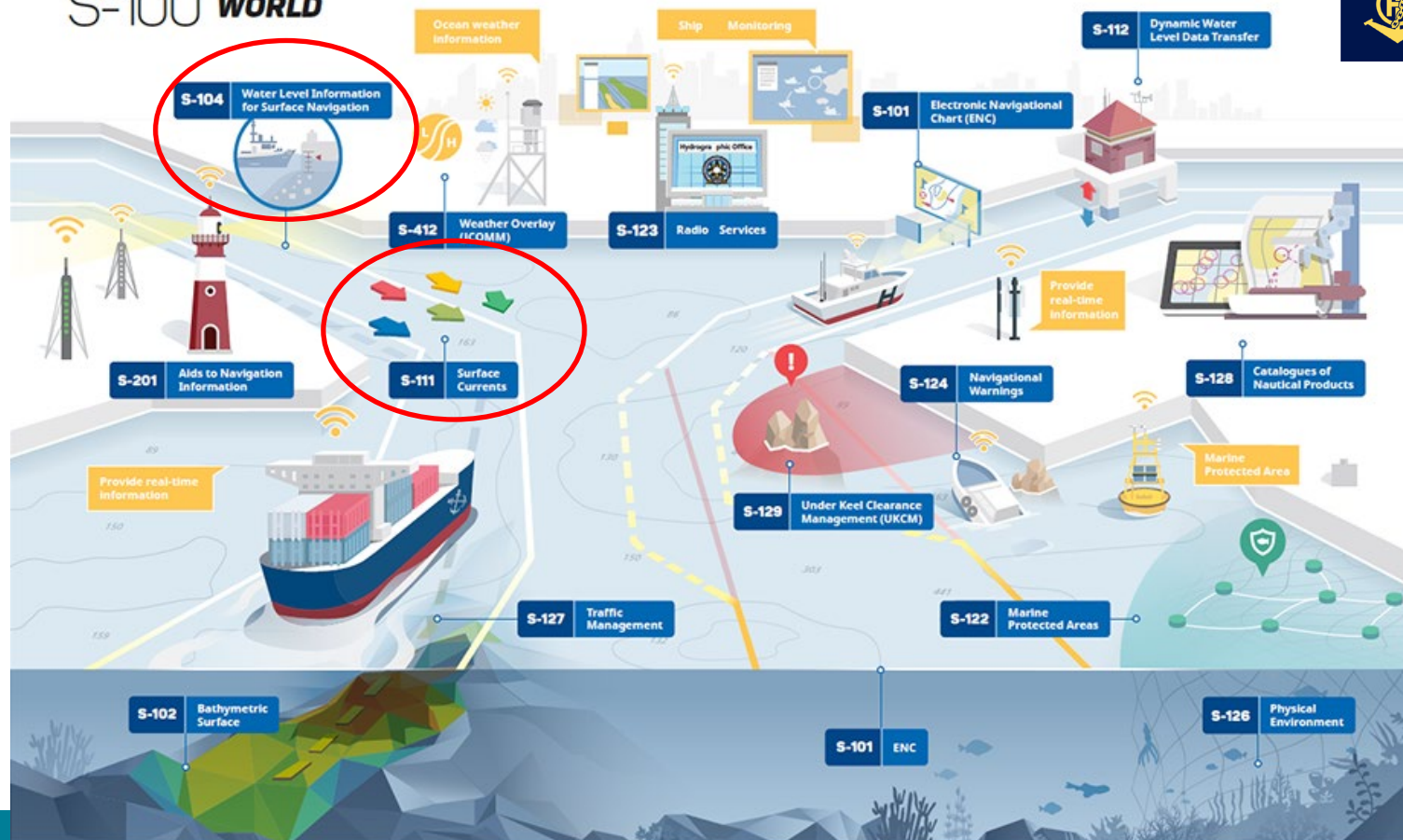
[YouTube Video](#)

# S-100 WORLD



IHO

International  
Hydrographic  
Organization

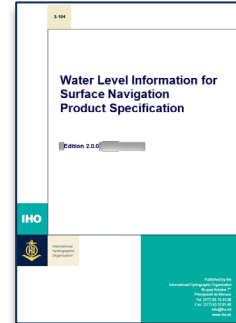




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# TWCWG Project Teams (PT)

## S-104: Water Level Information for Surface Navigation



*Why?*

The development of electronic navigation with high resolution bathymetric data, and the drive to increase mariners' safety are now demanding temporal data such as tidal heights to be available.

*What?*

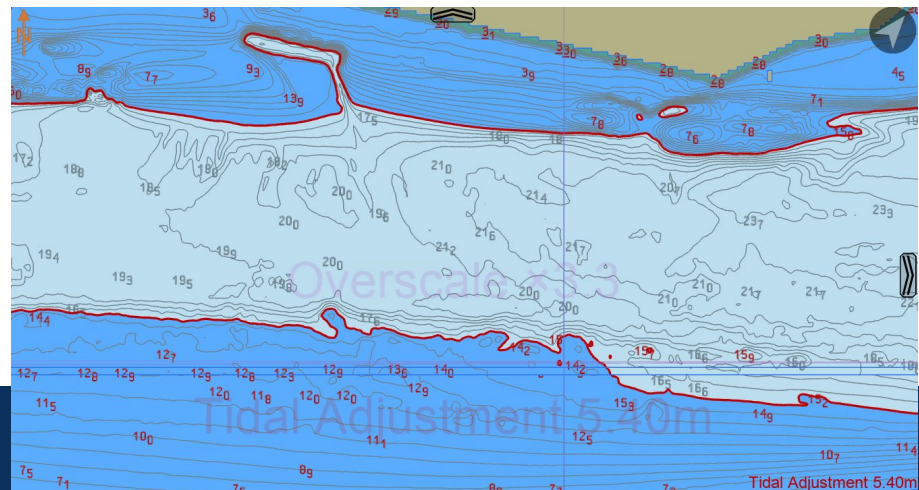
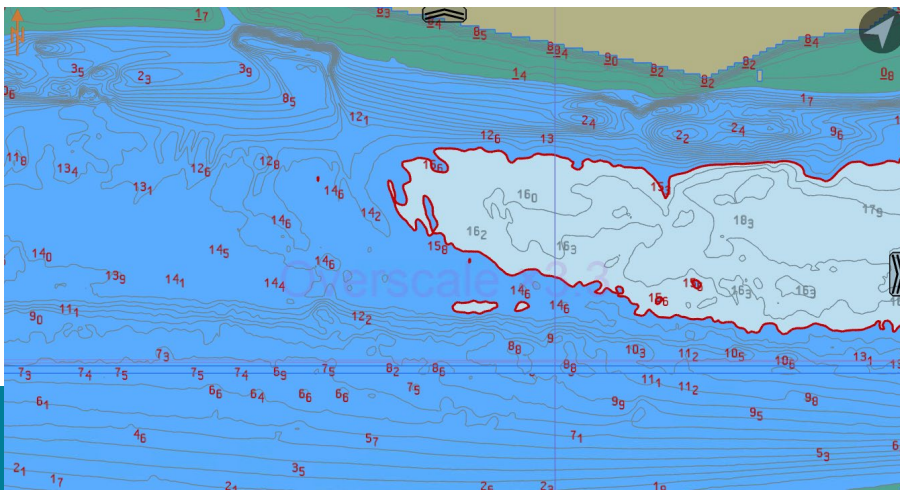
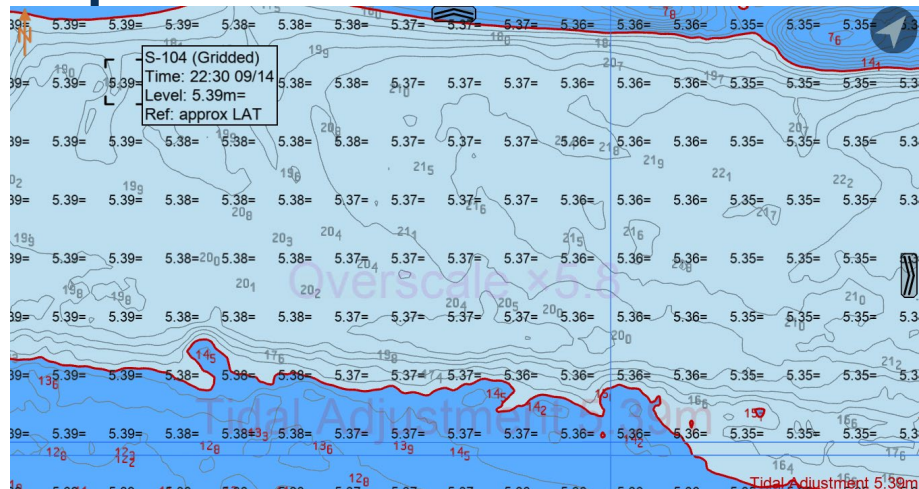
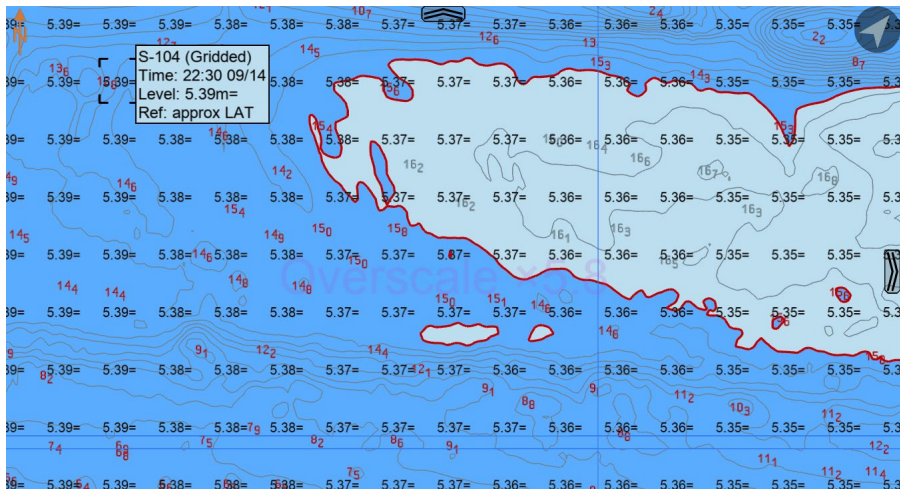
S-104 describes the **provision of tidal height data** as single entity irrespective of whether they are observations, or model derived predictions.

S-104 may be used **alone** or it may be **combined** with ENC or other S-100 compatible data.

S-104 describes **one of a number of additional information** that could be integrated with other 'S-100' products for use with ENC.

S-104 defines a **content model** and an **exchange file format** for the exchange of tidal height entity data. There currently are no recognized standards on the exchange of tidal height single point data.

# S-104 examples





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# TWCWG Project Teams (PT)

## S-111: Surface Currents



*Why?*

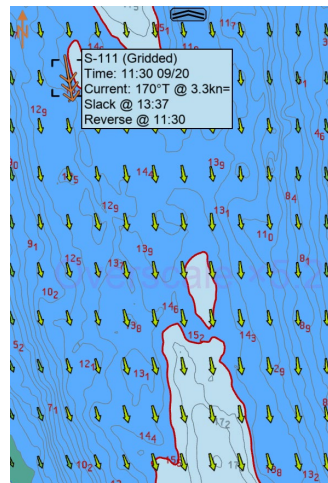
With the advent of electronic navigation, surface current data and updates are more accessible and easier to integrate into navigation displays. This integration of the chart with other supplemental data improves decision making and results in more efficient navigation.

*What?*

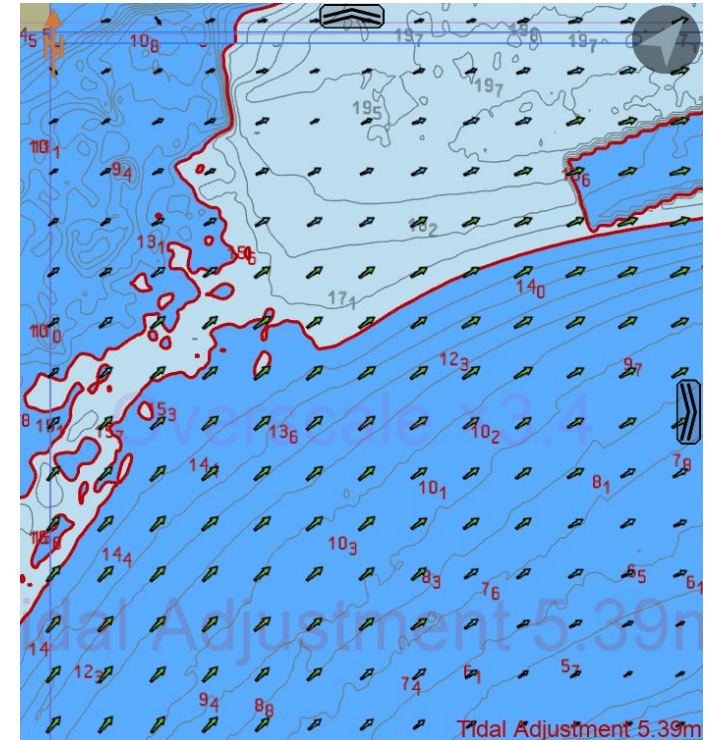
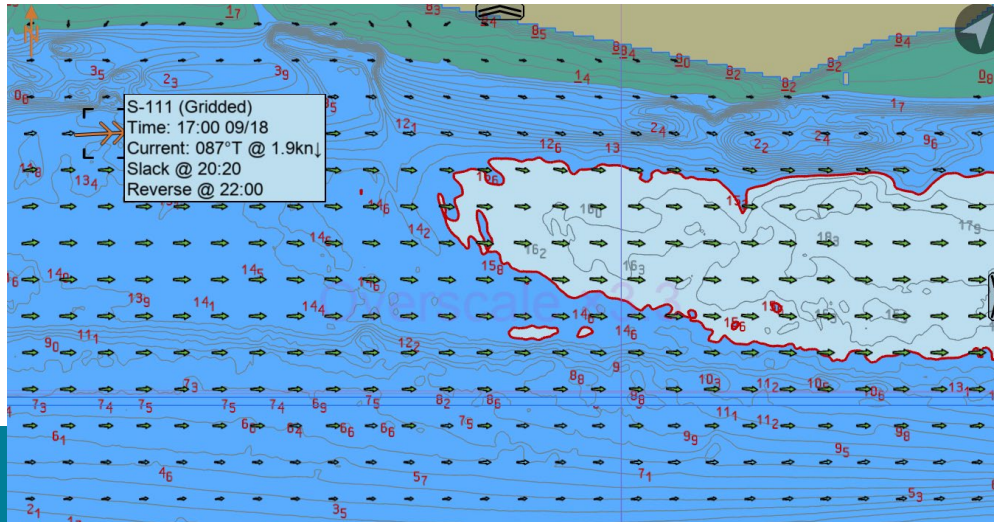
S-111 describes all the **features**, **attributes** and **relationships** of surface currents and their **mapping** to a dataset.

S-111 includes general information for data **identification** as well as for data **content** and **structure**, **reference system**, data **quality** aspects, data **capture**, **maintenance**, **encoding**, **delivery**, **metadata** and **portrayal**.

S-111 defines the 'data coverage'; most commonly a regular grid, or also a point set.



## S-111 examples





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## TWCWG9: S-104 & S-111

- Extensive development (by correspondence of the TWCWG Project Teams) of both the S-104 & S-111 Product Specifications (PS).
- **S-104 Ed. 2.0.0** & **S-111 Ed 2.0.0** are both finalised and subsequently now out for a final round of Member State Voting by Circular Letter (CL); the latest drafts are published on the IHO [GI Registry](#) (Geospatial Information Registry).
- Both PS are fully aligned to **S-100 Ed 5.2.0** (S-100 Part 17).



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Thank you

**Questions?**

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