

# **S-104 and S-111 CRS definition issues**

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# Coordinate reference system related issues in S-104 and S-111

Issues concerning CRS-definition in S-104 were noticed during Baltic Sea eNav – project ECDIS interoperability tests of S-101, S-102 and S-104. The same issues also applies to S-111.

The issues and proposed changes are presented in this presentation.

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# 1) Horizontal Coordinate Reference Systems in S-101, S-102 and S-104/S-111 specifications

S-104 / S-111	S-101	S-102
<i>EPSG:9057 (WGS 84) or another reference system listed above</i>  <i>[S-104 chapter 5.1 and S-111 chapter 5.1]</i>	<i>For ENC the horizontal CRS must be EPSG:4326 (WGS84).</i>	<i>CRS is EPSG:4326 (WGS 84) and listed allowed projected CRS (UTM and UPS).</i>

## 2) S-104/S-111 CRS definition conflicts with S-101 and S-102

**Issue:** S-104/S-111 CRS *EPSG:9057* (WGS 84) conflicts with S-101 definition in Chapter 5.2 "*For ENC the horizontal CRS must be EPSG:4326 (WGS 84)*"

**And conflicts also with**

S-102 Chapter 5.2 CRS is *EPSG:4326 (WGS 84)* and listed allowed projected CRS (*UTM and UPS*).

**Consequence:** S-104/S-111 can't be used in ECDIS with S-101 or S-102 because all the allowed CRS of datasets must be based on the generic WGS 84 (EPSG:4326)

### 3) S-104/S-111 Different WGS84 realisations

**Issue:** Different WGS 84 realisations are different horizontal datums.

Different datums are not allowed in ECDIS. S-101 defines that only allowed is EPSG:4326 (WGS 84).

*S-101:*

#### 5.2 Horizontal Coordinate Reference System

For ENC the horizontal CRS must be EPSG:4326 (WGS84). The full reference to EPSG:4326 can be found at [www.epsg-registry.org](http://www.epsg-registry.org).

**Horizontal Coordinate Reference System:** EPSG:4326 (WGS84)

**Consequence:** If S-104/S-111 dataset is provided in some of the listed realisations it can't be used in ECDIS with S-101 or S-102

S-104, chapter 5.1 p. 16-17

#### 5.1 Horizontal reference system

For products based on the S-100 Framework, including this Standard for S-104 products, the geodetic/geographic Coordinate Reference System must be of the form EPSG:xxxx (with WGS 84 as base datum). The generic form/code for the WGS 84 frame is EPSG:4326 while the latest and most widely adopted realisation of the WGS 84 reference frame as of 2022 was EPSG:9057. The full reference to EPSG can be found at <https://epsg.org> and other EPSG references for recent WGS 84 realisations are given below:

WGS 84 (generic)	ESPG:4326	
WGS 84(G2296)	ESPG:10606	
WGS 84(G2139)	ESPG:9755	Valid epoch 2016:0

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WGS 84(G1762)	ESPG:9057	Valid epoch 2005.0
WGS 84(G1674)	ESPG:9056	Valid epoch 2005.0
WGS 84(G1150)	ESPG:9055	Valid epoch 2001.0
WGS 84 / UTM Zone 1N to Zone 60N	ESPG:32601 – EPSG:32660	

## 4) Proposed changes

The mentioned issues could be avoided changing the CRS definition in S-104/S-111 in a way that allowed CRS are following (this is compatible with S-101 and S-102):

- ▶ WGS 84 (EPSG:4326)
- ▶ WGS 84 / UTM Zone 1N to Zone 60N EPSG:32601 - EPSG:32660
- ▶ WGS 84 / UTM Zone 1S to Zone 60S EPSG:32701 - EPSG:32760
- ▶ WGS 84 / UPS North (E,N) EPSG:5041
- ▶ WGS 84 / UPS South (E,N) EPSG:5042

**The proposal for changing Chapter 5.1** can be found in the attachments:

- ▶ Proposal-S-104\_Chapter5.1\_redline.docx (proposed changes tracked).
- ▶ Proposal-S-104\_Chapter5.1\_clean.docx (clean version).
- ▶ The proposed changes applies respectively in S-111

# 5) CRS definition in S-102 for reference

## 5 Coordinate Reference Systems (CRS)

### 5.1 Introduction

The Coordinate Reference System information contained in [Table 5-1](#) is defined in the manner specified in [S-100, Part 6](#). The vertical datum is specified separately using other root group attributes.

### 5.2 Horizontal Coordinate Reference System

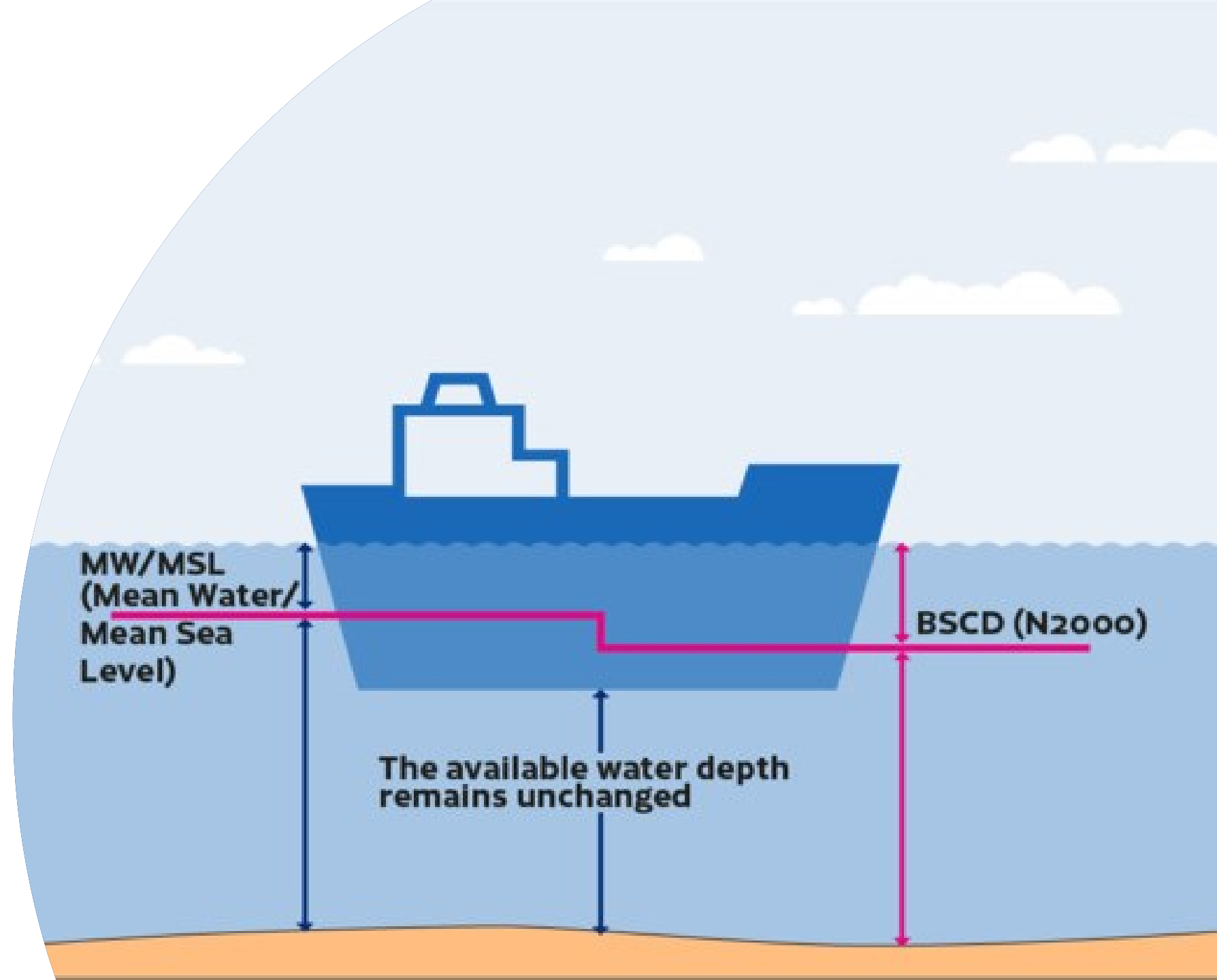
Table 5-1 — S-102 Coordinate Reference Systems (EPSG Codes)

EPSG Code	Coordinate Reference System
4326	WGS84
32601 — 32660	WGS 84 / UTM Zone 1N to Zone 60N
32701 — 32760	WGS 84 / UTM Zone 1S to Zone 60S

5041	WGS 84 / UPS North (E,N)
5042	WGS 84 / UPS South (E,N)
The full reference to EPSG can be found at <a href="https://epsg.org">https://epsg.org</a> .	

Horizontal Coordinate Reference System	EPSG (see <a href="#">Table 5-1</a> )
Projection	NONE/UTM/UPS
Temporal reference system	Gregorian Calendar
Coordinate Reference System registry	<a href="#">EPSG Geodetic Parameter Dataset</a>
Date type (according to <a href="#">ISO 19115-1:2014/Amd 1:2018</a> )	002 — publication
Responsible party	International Association of Oil & Gas Producers (IOGP)
URL	<a href="https://www.iogp.org/">https://www.iogp.org/</a>

# Thank you





**Thank you**