

Central Ship Database

Progress Report

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Document History

Version	Date	Changes	Prepared	Approved
1.0	10/04/2017	Initial version	JMM & YLM	
1.1	05/05/2017	Comments from LAI	JMM & YLM	LAI & IKU

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List of Abbreviations

AIS	Automatic Identification System
CSD	Central Ship Database
EFCA	European Fisheries Control Agency
EFTA	European Free Trade Association
EMSA	European Maritime Safety Agency
IMO	International Maritime Organization
LRIT	Long Range Identification Tracking System
MMSI	Maritime Mobile Service Identity
PSC	Port State Control
RVD	Reference Vessel Database
SEG	SafeSeaNet Ecosystem Graphical interface
SIG	System Interface Guide
SSN	SafeSeaNet
UNCTAD-STAT	United Nations Conference on Trade and Development.
UVI	Unique Vessel Identifier
V&V	Verification and Validation
VMS	Vessel Monitoring System

1. Introduction

1.1 Background

In 2012, SafeSeaNet High Level Steering Group 7 decided to create a working group to design and develop a database of ship attributes called the Reference Vessel Database (RVD). In 2016, EMSA resumed the project, and it was re-named the Central Ship Database (CSD).

The objective of the CSD is to become a reliable and cooperative source of ship attributes to serve Member States, EU bodies and EMSA services users.

1.2 Concept

In order to build a complete and up-to-date database, it is necessary to receive and cross check information from several sources. The Central Ship Database has been designed as a cooperative database where Member States and EU bodies can contribute, and in return, benefit from the available information.

The CSD main process is to compare the information it receives with the existing CSD records and, based on pre-defined rules, to decide whether an update can be performed or not. Besides this general process, the CSD also ensures that data access rights are respected relative to the data sources.

SafeSeaNet, THETIS, LRIT and MARINFO (i.e. the EMSA database fed by information from commercial providers) contribute to the Central Ship Database. The ship identifier-related information contained in VMS and AIS messages, as well as in additional external databases (e.g. fishing vessels), should also further enrich the CSD sources portfolio in the near future. To benefit from the Central Ship Database, a set of web services has been designed in order to allow system-to-system information sharing in an efficient way. In addition, a web interface is accessible via the EMSA portal.

Figure 1 illustrates the CSD main sources:

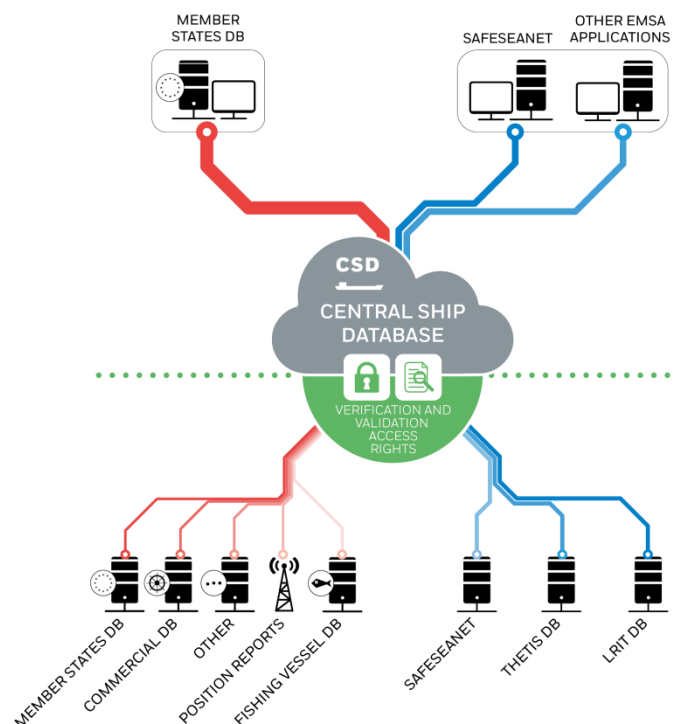


Figure 1: CSD main sources

1.3 Current Status

In 2016, CSD improvements were developed along with SafeSeaNet versions 3.3 and 3.4.

Version 3.3 (deployed in December 2016) includes the following additional developments:

- **Additional database elements:** The existing database was modified to include more attributes per ship. An overview of the new structure is contained in the "*Data Mapping v1.0*", which is downloadable from the SafeSeaNet technical documentation Repository¹ on the EMSA website.
- **Upgraded Web services:** Request-Response, Notification push updates from MSs to the CSD and Announcement push updates from the CSD to MSs were implemented. In addition, a dedicated web service was developed for the CSD to provide relevant ship particulars to the SSN Ecosystem Graphical interface (SEG). An overview of the new web services is contained in the "*SSN-SIG-Part B ShipParticularsExchange-v1.28*", which is downloadable from the SafeSeaNet technical documentation Repository¹ on the EMSA website.

Figure 2 illustrates the CSD interfaces:

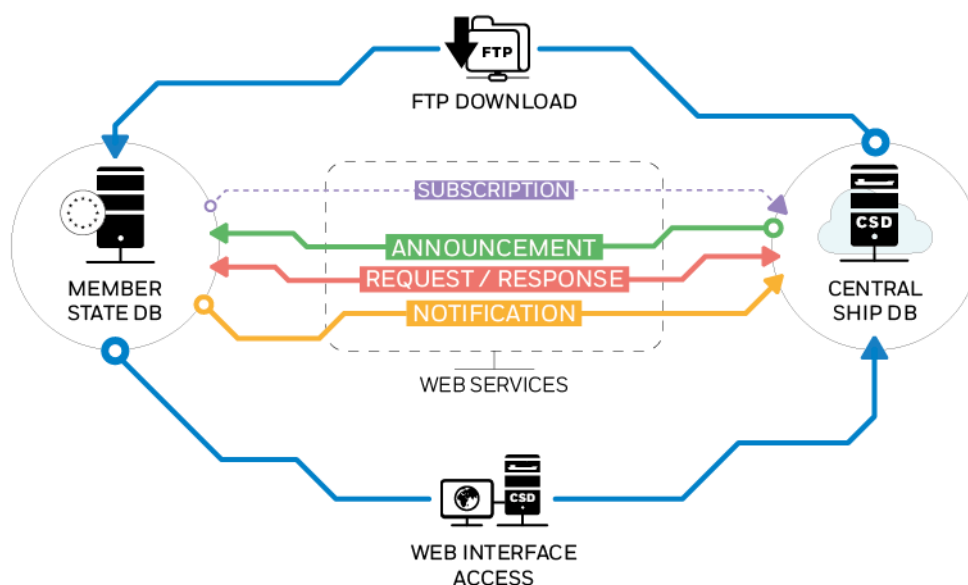


Figure 2: CSD interfaces

Version 3.4 (planned to be deployed in Production June 2017) will include the following improvements:

- **New web interface:** This will be developed so that it is more user friendly and better aligned with the database changes in SSN v3.3.
- **Enhanced Verification & Validation (V&V):** The V&V algorithm will be enhanced (i.e. the process whereby the CSD compares information received with already existing records and decides whether the information is going to be part of the Central Ship Database).
- **Uniqueness of the MMSI:** The MMSI shall be unique for each ship in the CSD, and in cases of conflict, manual intervention is foreseen.
- **CSD Source Configuration tool:** This feature shall be accessible only for EMSA, and allows for the configuring of the level of confidence and the exchange model of all CSD sources. This gives the flexibility to add new sources of information at any time without changing the software.

¹ <http://www.emsa.europa.eu/ssn-main/documents.html>

2. CSD content assessment

EMSA used external commercial databases to assess the information in the CSD. This analysis gives a rough indication of the CSD implementation, and should not be considered as a qualitative assessment, but rather as a comparative exercise with existing and recognised actors.

2.1 Quantity analysis

A ship is created in the CSD when a Unique Vessel identifier (UVI) and an MMSI number are available for the vessel and this information has been confirmed by 2 sources.

The following ship attributes can be used as UVIs:

- IMO number (mainly for commercial vessels above a certain tonnage).
- IR number (used for fishing vessels without an IMO number).
- EMSA-R (an EMSA Reference number that is solely created by the CSD for ships without an IMO number or IR number).

There are **79,102 ships** in the CSD, all of which have been created by the combination of IMO and MMSI numbers. For these ships, the CSD holds mainly the flag, call sign and ship name, although the CSD is capable of storing much more information for each ship, such as technical details, dimensions, company information, status of the ship, PSC related data, etc. A significant improvement is foreseen in mid-2017 (following SSN v3.4 implementation), when a substantial amount of additional information will be provided by MARINFO and THETIS (see the CSD data mapping file at: <http://www.emsa.europa.eu/ssn-main/documents.html>).

Figure 3 shows the numbers of the available ship attributes in the CSD.

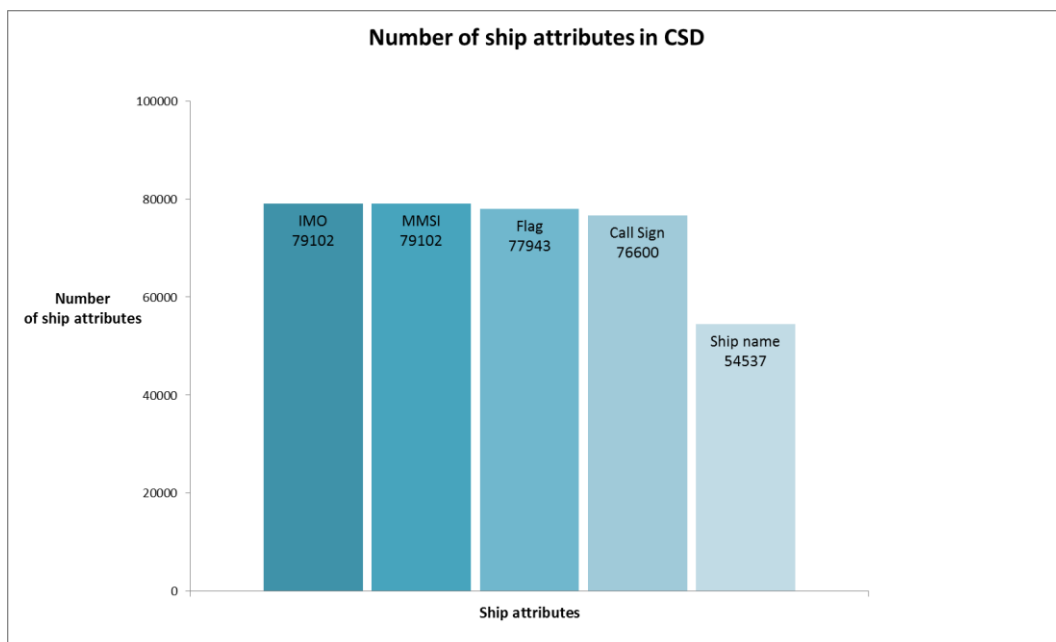


Figure 3: Ship attributes in the CSD

The number of ships in the CSD is quite significant. For the EU/EFTA fleet, the CSD holds more ships than any other source consulted (with the exception of Italian and Spanish flagged ships, this may be because of the high number of fishing vessels from these 2 Member States that are not yet available in the CSD).

Figure 4 shows the number of ships by MS (NB not all MSs are represented).

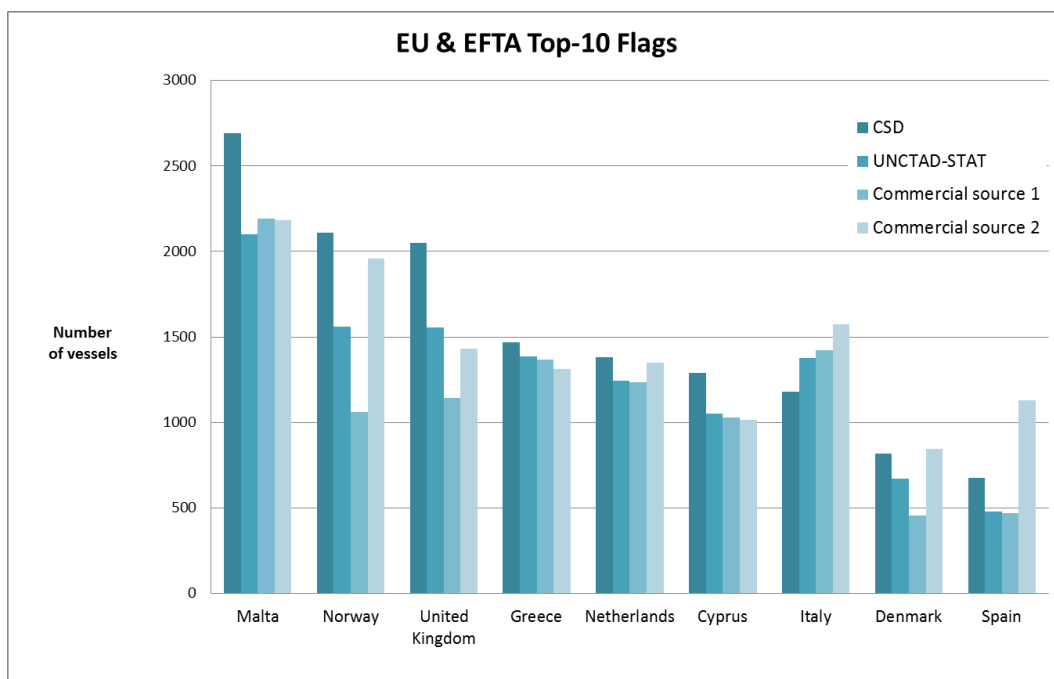


Figure 4: Top-10 ranking of EU & EFTA countries

With respect to non-EU/EFTA flags, the CSD has fewer ships than the sources consulted (particularly for the flags of Indonesia, Japan, India, Malaysia and China). This difference may be due to the fact that these ships navigate mainly outside EU, and are therefore less frequently reported by the main CSD sources (e.g. SSN). Figure 5 shows the number of ships with non-EU/EFTA flags.

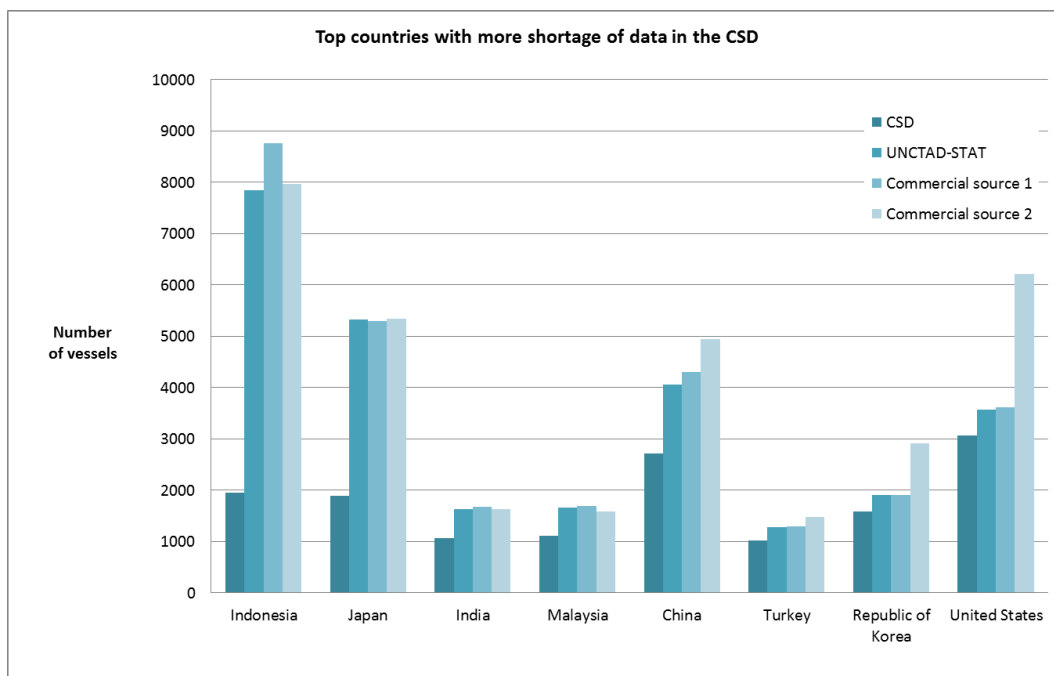


Figure 5: Top-10 countries (above 1000 ships flagged) with less data in the CSD

2.2 CSD attributes analysis

To further assess the information in the CSD, a comparison has been performed between the CSD and other databases. For the assessment of the IMO number, IHS-Fairplay information was used as a reference, as it manages the IMO Ship Numbers on behalf of the IMO.

The objective of the assessment was to check whether the IMO numbers recorded in the CSD were also identified in IHS. Of the 79,102 ships contained in the CSD, 63,259 vessels have an IMO number available in IHS (nearly 80%), which means that 15,843 of the IMO numbers in the CSD are not in IHS. The reason for this may be that scrapped ships have been deleted from the IHS database, but retained by the CSD).

Figure 6 shows ships with IMO numbers that are in both IHS and the CSD:

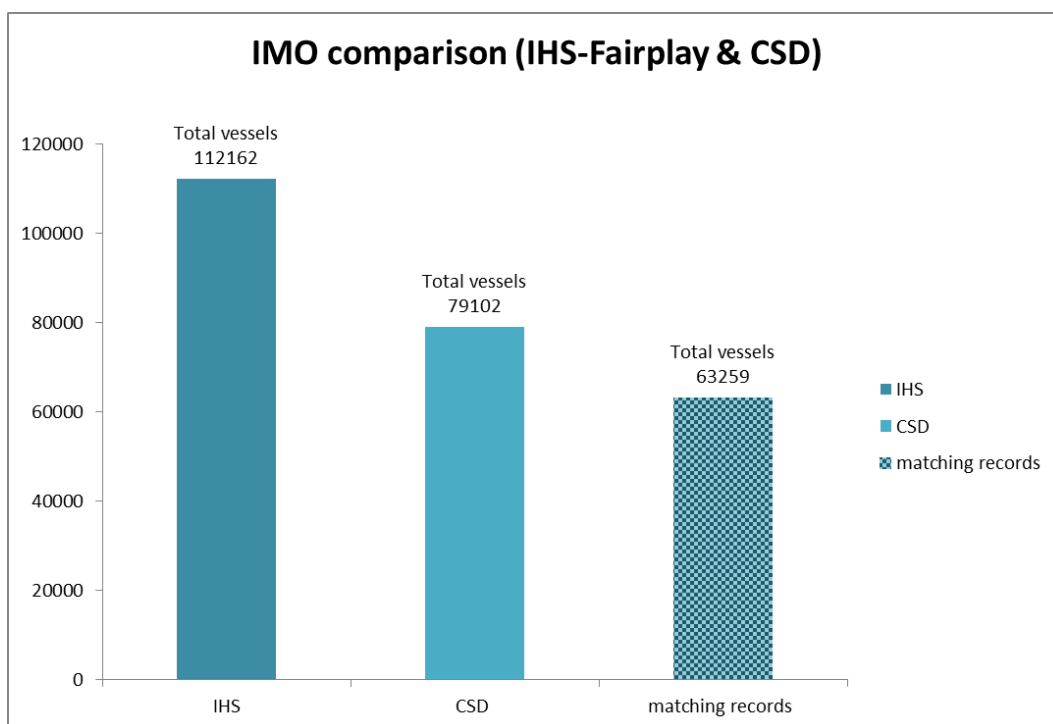


Figure 6: Comparison of IMO numbers between IHS-Fairplay and CSD

3. Main outcomes and proposals

3.1 What is performant

The performance of the CSD, in terms of the number of ships navigating in and around EU waters, seems to be quite high. This might be due to the connection of the CSD with the reliable EU databases described below:

- **SafeSeaNet:** SSN is the most important contributor of ship attributes.
- **LRIT:** The EU LRIT CDC holds a database for all EU vessels to which the LRIT regulation applies. This database is fully shared with the CSD, and is certainly one of the reasons for the good performance in terms of the number of EU/EFTA flagged ships in the CSD.
- **THETIS:** This information system sends information on verified ships particulars to the CSD (following inspection). In addition, in 2017, it will provide additional information such as ship type, keel laying date and company information.

3.2 Proposals for improvements

The following areas for improvement have been identified:

- a. **Increasing the number of ships (especially for non EU EFTA flags) by using additional sources such as:**
 - Position Reports: e.g. AIS and VMS position reports should be considered in the CSD validation process, especially for identifying ships that are not navigating in and around EU waters.
 - MS ship databases: EMSA plans to contact several MSs in order to assess the potential for cooperation in sharing ship related information with the CSD and vice versa.
 - Other databases (e.g. for fishing vessels) .
- b. **Enriching the CSD content** with additional information than the ship identifiers using Marinfo and THETIS (already planned for 2017) as well as National databases.
- c. **Improving the availability of ship identifiers by:**
 - reducing the number of IMO numbers that do not match IHS-Fairplay.
 - improving ship name availability .

4. Next steps

The next steps planned for the CSD are as follows:

- a. The enhanced version of the CSED will enter into production in June 2017 (along with SSN 3.4 developments).
- b. A work plan will be defined for the implementation of the further developments identified in 3.2 above.

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