

EMSA/OP/24/2015

**Annex A - Technical Requirements for
the design and implementation of the
Central Hazmat Database Application
(CHD) & MARine Chemical
Information Sheets Application
(MAR-CIS 2)**

Table of Contents

1. Background	8
1.1 SSN Ecosystem.....	8
1.2 Scope of the document and its structure	9
1.3 Central Hazmat database (CHD)	9
1.3.1 Legal Background	9
1.3.2 Central HAZMAT Database (CHD)	10
1.4 MARine Chemical Information sheets (MAR-CIS 1)	10
2. Objective of Module 1 of the Service Contract	10
3. High-level requirements for the CHD.....	11
3.1 Legal basis	11
3.2 Users.....	11
3.3 Functional uses	12
3.4 Data flows and links	13
3.5 Content	13
3.6 Access	14
3.7 Installation, upgrade and maintenance issues	14
4. High-level requirements for MAR-CIS 2.....	14
4.1 Users.....	15
4.2 Functional uses	15
4.3 MAR-CIS 2 properties and size.....	15
4.4 Access	16
4.5 Link to the CHD	16
4.6 Installation, maintenance and upgrade	17
4.6.1 MAR-CIS 2 dataset	17
4.6.2 Web portal and application for mobile devices	17
5. CHD and MAR-CIS application datasets	18
6. Conditions for the project delivery for Module 1 services	19
7. Specific service requirements – CHD	19
7.1.1 Content of the CHD	19
7.1.2 CHD Access Rights (Web users)	19
7.1.3 Overview of services	20
7.1.4 CHD Update and maintenance.....	21
7.1.5 Receive e-mail notifications of CHD updates	22
7.1.6 Consult CHD in MAP	22

7.1.7	Consult product datasheets from MAR-CIS 2	24
7.1.8	CHD consultation by guest users	24
7.1.9	Use CHD from the System Interface	25
8.	Specific service requirements – MAR-CIS 2	26
8.1	Functional requirements	26
8.1.1	Data description	26
8.1.2	Access rights	27
8.1.3	Overview of services	28
8.1.4	Search function	29
8.1.5	Consult, print and save MAR-CIS 2 information	31
8.1.6	Glossary of the terms used	32
8.1.7	List of references	32
8.1.8	Add/delete and update information	33
8.1.9	Link MAR-CIS to CHD	33
8.1.10	Web portal	34
8.1.11	Application for mobile devices	35
8.1.12	Database migration	35
9.	Requirements concerning the technical implementation of CHD and MAR-CIS 2	39
9.1	Conceptual approach	39
9.1.1	Introduction	39
9.1.2	Implementation approach/ CHD Application	41
9.1.3	Implementation approach/ MAR-CIS 2 application	44
9.1.4	Specific requirements concerning the design of the applications	47
9.2	Data organisation	48
9.3	Access rights management	51
9.4	Data update operations	56
9.5	Management and display of references	60
9.6	Management and display of MAR-CIS 2 glossary	62
9.7	Structure/ Content of e-mail warnings sent by the CHD applications	63
9.8	Data import/ export utilities	64
9.9	Data logging	65
9.10	“Intelligent search”	66
9.11	Web consoles design	67
9.12	Management of updates of the MAR-CIS 2 mobile application	70
9.13	CHD system interfaces	70
9.14	MAR-CIS 2 “Datasheet design” templates	72

9.15	Guest users access	73
10.	Non-functional/ performance/ security requirements	75
10.1	Non-functional/ performance security requirements applicable for both CHD and MAR-CIS 2 applications	75
10.1.1	Compliance with SSN non-functional requirements.....	75
10.1.2	System Security	75
10.1.3	System Performance and Availability	75
10.2	Non-functional/ performance requirements specific for the CHD application	76
10.2.1	System capacity	76
10.3	Non-functional/ performance requirements specific to MAR-CIS 2 application	76
10.3.1	System capacity	76
10.3.2	System Performance	77
10.3.3	System availability.....	77
11.	Instructions for preparing the offer	78
12.	List of appendices	82
	Appendix A – CHD/MAR-CIS 2 – IMO Codes and Conventions elements	83
	Appendix B – MAR-CIS 1 (existing desktop application) database structure.....	89
	Appendix C – MAR-CIS 1 information fields and sub-fields properties	90
	Appendix D – Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2	100
	Appendix E – Example of MAR-CIS 1 datasheet	131
	Appendix F – Glossary of MAR-CIS 1	144
	Appendix G – EMSA mobile Access Gateway (Informative).....	154
	Appendix H – General non-functional/ security requirements for SSNv3.x application components	155
	Appendix I – IdM Guide-Access and Identity Management Guide (Abridged Version) ..	159
	Appendix J – MAP – Software design document.....	160
	Appendix K – EMSA – Visual identity guidelines.....	161
	Appendix L – Draft declaration of confidentiality	162
	Appendix M – CMC (CARD) – Implementation approach	165
	Appendix N – System Interface Guide (sample)	166

Definitions and acronyms

Abbreviation	Definition
AIS	Automatic Identification System
CARD	Central Access Rights Database
CAS No	CAS Registry Number assigned by the Chemical Abstracts Service to every chemical substance.
CCD	Central Country Database
CGD	Central Geo-reference Database
CHD	Central Hazmat Database
CLD	Central Location Database
CLP	Classification, labelling and packaging of substances and mixtures [Regulation (EC) No 1272/2008]
CMC	Common Management Console
COD	Central Organisation Database
CSD	Central Ship Database
CSN	CleanSeaNet
CSV	Comma separated value file format
CTG MPPR group	Consultative Technical group on Marine pollution Preparedness, Prevention and Response
EAG-HNS	Expert Advisory Group on Experts Advisory Group for the development of datasheets of chemical substances for marine pollution response
EBSC	European Behaviour Classification System
EC	European Commission
EIS	European Index Server
EMSA	European Maritime Safety Agency
EO DC	Earth observation Data Centre – a system in the SSN Ecosystem Architecture (an evolution of CSN)
EU	European Union
EU LRIT CDC	European Union LRIT Cooperative Data Centre – Another term identifying EU LRIT DC
FAT	Factory Acceptance Test
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection
GUI	Graphic User Interface
HAZMAT	Dangerous and polluting goods
HNS	Hazardous and Noxious Substances
HLSG	High Level Steering Group
HMI	Human Machine Interface
HTTPS	Hypertext Transfer Protocol Secure
IBC	International Code for the construction and equipment of ships carrying dangerous chemicals in bulk
ICT	Information and Communications Technology
IdM	EMSA Identity Management system

Abbreviation	Definition
IFCD	Interface and Functionalities Control Document, as mentioned in Annex III of Directive 2002/59/EC.
IGC	International Code for the construction and equipment of ships carrying liquefied gasses in bulk
IMDatE	Integrated Maritime Data Environment – It will be upgraded in the future to what is to be known as “STAR”
IMDatE WUP	The web portal of the current IMDatE system
IMDG	International Maritime Dangerous Goods Code
IMO	International Maritime Organisation
IMS	Integrated Maritime Services (framework) – a term identifying all the services supporting SSN Ecosystem functions
IMSBC	The International Maritime Solid Bulk Cargoes Code
IT	Information Technology
IUPAC	International Union of Pure and Applied Chemistry
LDAP	Lightweight Directory Access Protocol
LRIT	Long Range Identification and Tracking.
MAP	Maritime Application Portal
MAR-CIS	MARine Chemical Information sheets
MAR-ICE	Marine Intervention in Chemical Emergencies Network
MARPOL	The International Convention for the Prevention of Pollution from Ships
MS(s)	Member State(s)
MSS	Maritime Support Services (of EMSA)
MSs	Member State(s)
NCA	National Competent Authority
NSW	National Single Window
OSB	Oracle Service Bus
OWASP	Open Web Application Security Project
REST	Representational State Transfer
RFC	Request For Change
RFD	Directive 2010/65/EU of the European Parliament and of the Council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2001/6/EC
RBAC	Role-Based Access Control
SAT	Site acceptance tests
SIG	System Interface Guide
SOA	Service Oriented Architecture
SOAP	Simple Object Access Protocol
SSL	Secure Sockets Layer
SSN	SafeSeaNet
SSN (Ecosystem)	A “system of systems”, in addition to SSN EIS, includes STAR, EO DC and EU LRIT CDC

Abbreviation	Definition
SSN AccIIS	SSN Accident/Incident Information System
SSN GI	Central SSN Graphical Interface
SSN SI	SSN Streaming Interface
STAR	Ship Tracking, Awareness and Reporting data system, a system of the SSN Ecosystem
TXT	A file name extension for text files
STIRES	SSN Tracking Information Relay and Exchange System – a component system of SSN that will be deprecated as soon as STAR will go into production.
STMID	Shore-based Traffic Monitoring Information Database
STP	Software Test Plan
TLS	Transport Layer Security
VMS	Fishing Vessel Monitoring System
VTMIS	Vessel Traffic Management and Information System
VTMIS Directive	Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 establishing a Community vessel traffic information system and repealing Council Directive 93/75/EEC
WWW	World Wide Web
XML	Extensible Markup Language
XML RG	XML Reference Guide

1. Background

1.1 SSN Ecosystem

On 28 April 2014 the Executive Director of EMSA approved the "SafeSeaNet / IMDatE Integration – Way forward for 2014/2015" document. This document proposed an overarching technical framework (a "system of systems") defined as the "SSN Ecosystem". The core applications in the ecosystem are the SSN European Index server application, the STAR application (an evolution of the current STIRES and IMDatE), the Earth Observation Data Centre (ex-CSN DC) and LRIT CDC. The applications integrated within the ecosystem shall be interoperable within a SOA-based "Integrated Maritime Services" (IMS) framework which shall offer all the technical capabilities to meet service requirements stemming from European Directives or existing SLA's, in a user driven manner. In this respect, the ecosystem architecture is encompassing a number of horizontal services among them, as indicated in Figure 1 below, a number of databases storing "reference" data" concerning, ship identifiers/particulars, locations, organisations/Maritime Authorities, hazardous material and geographical shapes.

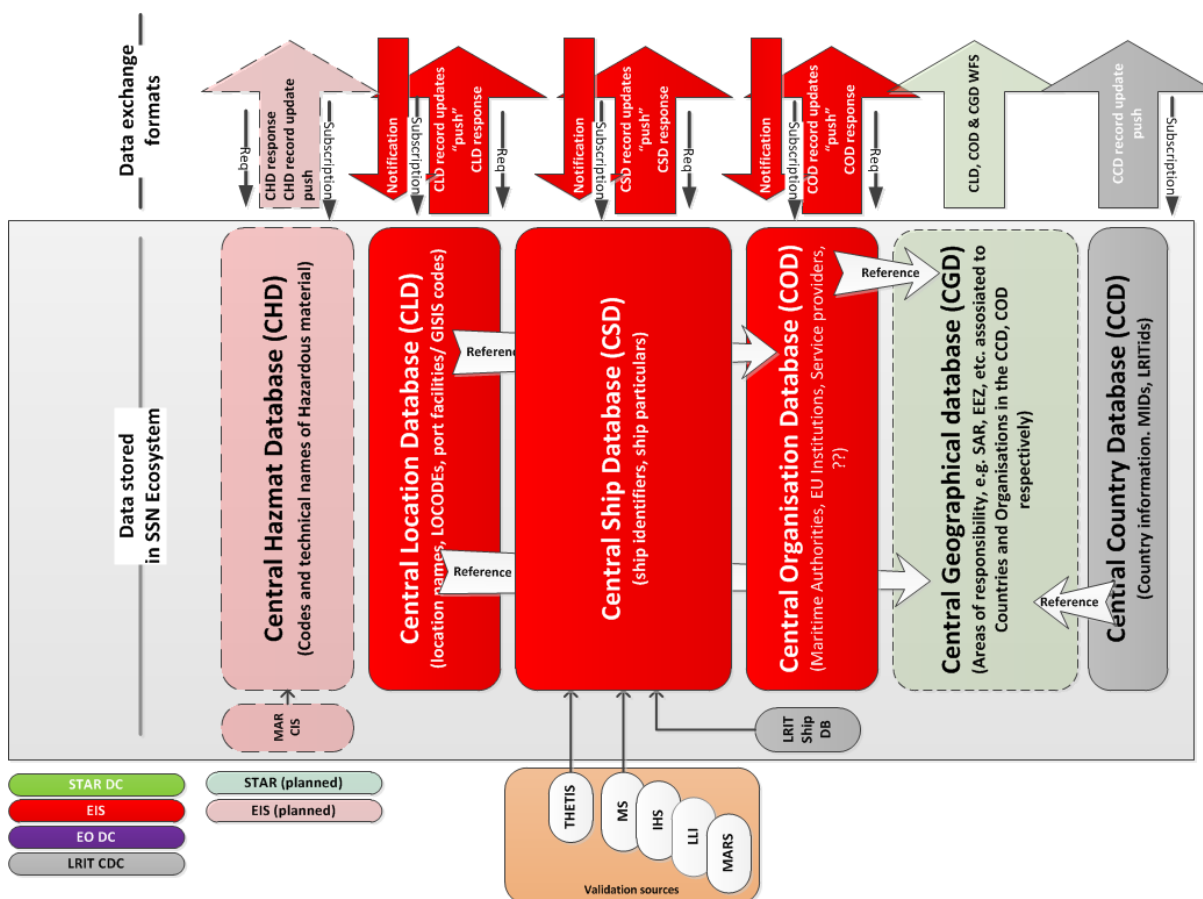


Figure 1 - SSN Ecosystem - Reference databases

This ICT Service Contract deals with the design and implementation of the applications accessing reference data for hazardous materials and chemical substances, namely the Central Hazmat database (CHD) and MARine Chemical Information sheets (MAR-CIS) application.

1.2 Scope of the document and its structure

The objective of this document is to describe the functional/non-functional/performance and technical requirements for developing dangerous and polluting goods applications, CHD and MAR-CIS 2 applications. The CHD is a new application while MAR-CIS 2 is an EMSA-server-based evolution of a pc desktop application currently available at EMSA and known as "MAR-CIS 1 database". MAR-CIS 2 (as well as the existing MAR-CIS 1) is used to store detailed information on several chemical substances whose basic information, stemming from IMO codes, is to be stored in the CHD.

CHD and MAR-CIS 2 datasets share a number of common data attributes. To avoid data replication and inconsistencies in their updates, CHD and MAR-CIS 2 data are to be maintained together in a single database and server that will be used by the two different user applications, in accordance with the specific functional requirements of each application.

This document is divided as follows:

- Chapter 1 provides information on the legal and operational background to this ICT Service Contract;
- Chapter 2 outlines the objectives of this ICT Service Contract;
- Chapters 3 and 4 describe the high-level requirements for the CHD and MAR-CIS 2 applications, respectively;
- Chapter 5 describes the MAR-CIS and CHD datasets;
- Chapter 6 refers to the applicable conditions for project delivery and the anticipated project schedule;
- Chapters 7 and 8 provide the functional, "business-oriented", requirements for the CHD application and for the MAR-CIS 2 application, respectively;
- Chapter 9 provides a set of technical requirements detailing how it is anticipated that the functional requirements listed in chapters 7 and 8 shall be addressed by the contractor;
- Chapter 10 describes the non-functional, security and performance requirements which are applicable to both the CHD and MAR-CIS 2 applications;
- Chapter 11 identifies specific requirements applied to the quotations to be submitted for this ICT Service Contract;
- The Appendices detail further the information content and provide useful references for the design of the applications.

1.3 Central Hazmat database (CHD)

1.3.1 Legal Background

Article 3 of the VTMIS Directive defines the information that all ships carrying dangerous or polluting goods (HAZMAT) have to submit to Member States' (MSs) competent authorities. In accordance with Article 13 the information on HAZMAT has to be submitted when a ship:

- a) leaves a port of a MS – at the latest at the moment of departure; and
- b) arrives from a port outside the community – at the latest upon departure from the loading port or as soon as the port/anchorage of destination is known.

The data elements to be submitted (in the form of a HAZMAT notification) are identified in Annex 1 of the VTMIS Directive, and which are included in Appendix A of this document.

Article 13 also establishes that, whenever practicable, the notifications have to be submitted to the MS electronically. This was further qualified by the Reporting Formalities Directive (RFD) which determines that after 1 June 2015, HAZMAT notifications have to be transmitted electronically by the reporting parties through a National Single Window (NSW). Both legal acts require that the HAZMAT information is made available in the national SSN systems of the MS and provided on request to other MS in electronic format via the central SSN system.

1.3.2 Central HAZMAT Database (CHD)

The SSN Group and the High Level Steering Group on SSN have agreed on the development and maintenance of a central reference database for HAZMAT information that have to be notified and exchanged in accordance with the VTMIS Directive and the RFD. This database is referred to in this document as the Central HAZMAT Database (CHD).

The overall objective of the CHD is to:

- Improve the data quality of HAZMAT notifications to SSN,
- Minimise the administrative burden for the reporting parties when submitting the HAZMAT information to the NSW, and
- Support the MS emergency response services by providing specialised information for the response to incidents involving chemical substances.

1.4 MARine Chemical Information sheets (MAR-CIS 1)

Currently, MAR-CIS 1 is implemented as a pc desktop-based application. It gathers specific information on chemical substances for emergency response to chemical spills. These are stored in a database. They contain information on the substances' maritime transport requirements (IMO codes) and their chemical and physical properties relevant for emergency response operations on board of ships. The access to the information is done via a simple menu display that allows searching, displaying and saving the datasheets in pdf files. Since March 2015, MS' experts, identified through the CTG-MPPR group, can access the "MAR-CIS tool" (PC based) directly. Previously, MAR-CIS datasheets were provided to MS via the MAR-ICE network. The overall aim is to improve MS' preparedness to respond to chemical spills at sea.

2. Objective of Module 1 of the Service Contract

The objectives of this ICT Service Contract are:

a) In terms of CHD

To design and implement a first version of the CHD application and to make it available:

- To SSN users & general public (guest users) via the single Maritime Application Portal (MAP) of EMSA;
- To SSN users via a system-to-system interface.

The implementation shall incorporate utilities enabling the manual change of specific Hazmat items in the database or the automatic uploading/modifications, from excel/word files, in conformance with changes/amendments of the relevant legislation, including IMO codes and conventions.

b) In terms of MAR-CIS 2

To replace the current MAR-CIS 1 by designing/ implementing a new version of the application (MAR-CIS 2) which shall be made available:

- To MAR-CIS 2 users via a dedicated interface integrated in the single Maritime Application Portal (MAP) of EMSA;
- To SSN users of the CHD via the single Maritime Application Portal (MAP) of EMSA;
- To MAR-CIS 2 users via an application running on mobile devices.

The aim is to broaden the current user group of MAR-CIS 1. In this respect, as aforementioned, apart from making MAR-CIS 2 available via web portal and mobile application, the MAR-CIS 2 information will be made available to CHD users via the CHD web application. CHD guest users shall not access MAR-CIS 2. The existing MAR-CIS 1 information stored in the database will be slightly modified upon integration in EMSA's maritime application environment. Once a year, the information content will be updated by EMSA. The implementation of this ICT Service Contract shall incorporate utilities enabling the manual change of the information stored in the database or by importing information from excel files. Modification to the information content of the database shall be carried out by authorised administrators.

Information included in the MAR-CIS 2 datasheets can be understood as an "extension" of the information provided in the CHD dataset for a number of chemical substances.

3. High-level requirements for the CHD

This section gives a general description of the CHD and its services.

3.1 Legal basis

The CHD shall be based on the list of HAZMAT items which are to be notified in accordance with the VTMI Directive, as amended, as follows:

(Article 3g) 'dangerous goods' means:

- goods classified in the IMDG Code,
- dangerous liquid substances listed in Chapter 17 of the IBC Code,
- liquefied gases listed in Chapter 19 of the IGC Code, and
- solids referred to in the IMSBC Code, Appendix 4, group B and A+B (previously Appendix B of the BC Code).

Also included are goods for the carriage of which appropriate preconditions have been laid down in accordance with paragraph 1.1.6 (previously 1.1.3) of the IBC Code or paragraph 1.1.6 of the IGC Code;

(Article 3h) 'polluting goods' means:

- oils as defined in Annex I to the MARPOL Convention,
- noxious liquid substances as defined in Annex II to the MARPOL Convention, and
- harmful substances as defined in Annex III to the MARPOL Convention.

3.2 Users

The CHD should serve the needs of:

- Industry stakeholders (manufacturers, shippers, freight forwarders, logistics companies) responsible for providing the Material Safety Data Sheets (MSDSs) to the ship reporting parties,
- Reporting parties (masters, ship agents, and ship operators) responsible for the completeness and accuracy of the HAZMAT information transmitted to the NSW,
- Relevant MS authorities (SSN NCAs, single window, port, maritime, security and port state control authorities) responsible for receiving, validating and processing HAZMAT information transmitted by the reporting parties,
- Emergency services of the MS responsible for providing effective response to maritime incidents to minimise loss of life, damage to property and prevention of pollution, and
- EMSA services responsible for validating the data quality of the information exchanged between MS through SSN.

3.3 Functional uses

The objectives of the CHD are achieved if it is used as a reference and verification tool during the HAZMAT reporting process both at national and central level:

a. As a reference:

- The users can search for the correct HAZMAT details. This can be done either by using specific identifiers (code or convention textual reference, UN Number, IMO class), or by inputting the product's textual reference, how it is carried (bulk or packaged) and, when applicable, type of product (liquid, gas or solid) and browse the structure of the database until the correct identification of the relative code or convention is found, as shown in Figure 2.

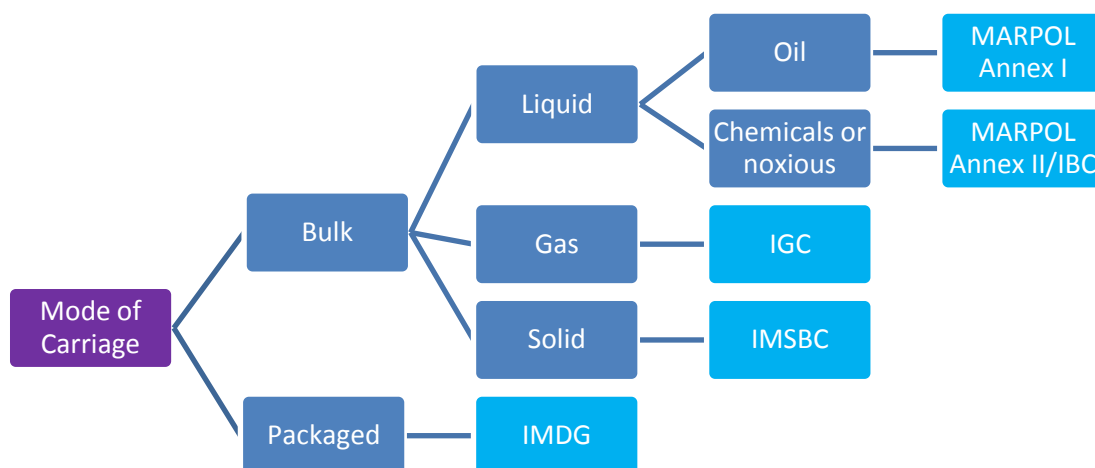


Figure 2 - Retrieving Information from the CHD application

- The administrative burden of the reporting party can be minimised if the CHD is integrated in the National Single Window (NSW). Once the reporting party inputs an identifier (e.g. textual reference or the UN number), the NSW would automatically fill in the remaining static data elements.
- Competent authorities and EMSA services can download from the CHD, information needed to respond to incidents involving ships carrying dangerous and polluting cargo.

b. For verification:

- Competent authorities and EMSA services can cross-check and validate the correctness of data on dangerous and polluting goods notified to SSN by the national SSN systems.

3.4 Data flows and links

The information flow between the users of the CHD is presented in Figure 3 below:

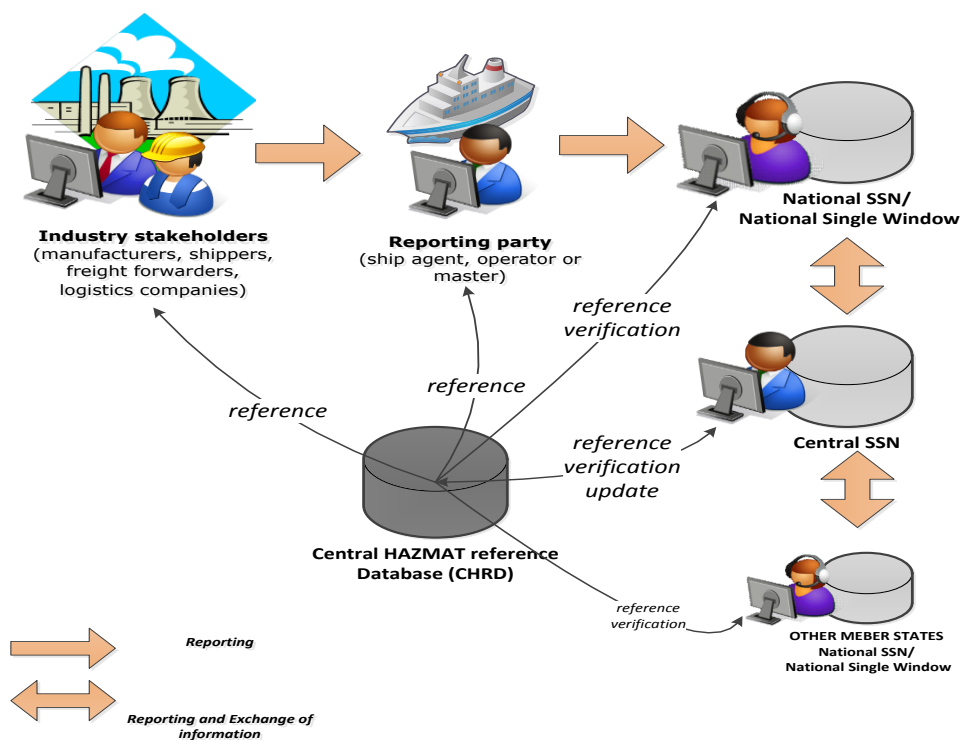


Figure 3 - Information flow

3.5 Content

The CHD will include a comprehensive list of all HAZMAT that have to be notified in accordance with the VTMIS Directive as listed in section 3.1 and Appendix A.

The CHD application will also display a button next to dangerous and polluting goods in the CHD which have MAR-CIS 2 datasheets of associated hazards and risks. Once the user presses this button the user will have access to the information in the MAR-CIS 2 application. Each datasheet in MAR-CIS 2 may be associated to more than one product in the CHD. The identification of which CHD items will be linked to MAR-CIS 2 datasheets will be made manually by the MAR-CIS 2 administrator based on the HazmatID from the CHD and the MarcisID from MAR-CIS 2. For that purpose an interface must be developed to manually link the different entries.

To-date the MAR-CIS 1 database covers primarily chemical products which are included in the IBC and the IMDG code, but in future it may be extended to cover also IMSBC products.

The access to the MAR-CIS 2 data will be unavailable to the CHD public (guest) users. Once an CHD user has accessed the MAR-CIS 2 database the user shall have access to all functionalities in this application.

The CHD and the MAR-CIS 2 information include common data elements as identified in purple in Appendix A. The CHD will also include additional MAR-CIS 2 data elements from the IMO Codes,

but which will not be visible to the CHD users unless they are authorised to access MAR-CIS 2. This will facilitate the updating of the data elements for MAR-CIS 2 which originate from the IMO Codes and will ensure strict coherence between the two datasets as indicated in Appendix A.

3.6 Access

The CHD is made available to the users via:

- EMSA maritime applications portal (MAP),
- a public site, and
- system-to-system interface.

3.7 Installation, upgrade and maintenance issues

The CHD will be hosted at central level by EMSA, allowing MSs, reporting parties and industry stakeholders easy access to harmonised and updated HAZMAT information.

MSs may host a copy of the CHD (e.g. in their NSWs) which will need to be updated every time that the CHD is updated. A dedicated mechanism between the central and national level will have to be developed for this purpose e.g. web interface and a system-to-system service.

The CHD will have to be updated as soon as there are changes to the relevant IMO Codes and Conventions. Not keeping the database updated may have safety and legal implications, particularly when it is used by authorities for verification purposes and during incident response situations.

4. High-level requirements for MAR-CIS 2

Presently the MAR-CIS 1 datasheets are available to the MS' experts, who are identified through the CTG MPPR group, upon installation of a menu display on their PC, that allows them to search and display of the datasheets in pdf (11-12 page each datasheet). The tool has information on 213 chemical substances. Following the implementation of MAR-CIS 2, the PC menu display of MAR-CIS 1 will be discontinued and the search function will be improved, but the same display of the information, print and save options developed for MAR-CIS 1 application will be implemented in MAR-CIS 2. In addition:

- a) The distribution and availability of MAR-CIS 2 datasheets shall be widened by posting the MAR-CIS application on EMSA's Maritime Application Portal (MAP) and by developing an application for mobile devices enabling the use of MAR-CIS 2 datasheets/information offline, e.g. at the incident site.
- b) MAR-CIS 2 information will be linked to the CHD dataset for:
 - i. enabling access to MAR-CIS 2 information upon display a button next to a product in the SSN CHD , and
 - ii. allowing the update of the MAR-CIS 2 specific data elements included in the CHD.
- c) MAR-CIS 2 database is to be updated (see Appendix D – Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2) and developed in a manner that serves all the user interfaces.
- d) In parallel, the MAR-CIS 2 data content will be migrated and improved (e.g. information content), eventually adding new substances, with yearly releases of MAR-CIS 2 information. Such updates should be allowed by the application, even though the information content update task itself is not included in this ICT Service Contract.

- e) The future 24/7 maintenance and operation, as well as development and update of MAR-CIS 2 by EMSA should be facilitated by the migration of MAR-CIS 1 from the desktops of EMSA's administrators to EMSA's maritime applications environment.

4.1 Users

MAR-CIS 2 should serve the needs of:

- EU (28), EFTA Member States (2) and EU candidate/acceding coastal States' (2) maritime response authorities responsible for or involved in responding to incidents involving chemical substances;
- CHD users.

4.2 Functional uses

The users will be able to search for a specific substance using one of the two interfaces (web portal and application for mobile devices). The search functionalities and the look should be common to the two interfaces. A MAR-CIS 2 web user should easily use the application for mobile devices and vice-versa.

The web portal should allow the display of MAR-CIS 2 information per substance. These files should be saved locally in pdf files and printable. The application for mobile devices should allow offline use; the information should be stored in the mobile device.

4.3 MAR-CIS 2 properties and size

Presently MAR-CIS 1 covers 213 different chemical substances with a large number of data elements and sub elements. The type of information varies: text, numbers and pictures. The length of the information fields varies from 3 to 2000 characters.

There is no mandate/obligation that identifies which chemical substances should have a MAR-CIS datasheet. The identification and selection of substances for MAR-CIS is defined by EMSA, in co-operation with the Expert Advisory Group (EAG-HNS) and with the future nominated HNS experts from the CTG-MPPR group. A number of factors are considered as selection criteria: the most transported substances in European waters, substances involved in past incidents, substances with high toxicity, substances produced in high quantities, results from national risk assessment studies in Europe and as baseline criteria, substances with GESAMP profile defined. In the future, this number is expected to increase; nevertheless it is not foreseen not exceed 300 different substances during the next four years of the project.

MAR-CIS 2 data contents will be controlled by EMSA. The MAR-CIS 2 user will not be able to input or change the information in the database. He or she will only be able to view and save copies of the information.

EMSA will be responsible for updating, maintaining or adding new information to the dataset yearly. MAR-CIS 2 database information content updates are dependent on the work of the EAG-HNS including the identification of new substances to be included in the database and new information that may be relevant for MAR-CIS 2. In addition regulatory information from GESAMP and CLP are to be kept up to date. All these modifications/interventions to the database will be performed offline by EMSA or an external contractor. The objective is to release a new version of MAR-CIS 2 information each year following the work developed during the previous year. These tasks are out of the scope of this ICT Service Contract but the resulting MAR-CIS 2 application should foresee an interface that facilitates such data management and upgrade by the MAR-CIS 2 content administrator.

Additionally the MAR-CIS 2 dataset should be exportable to excel format to facilitate the content management and reporting (e.g. overview of substances per hazard class, overview of substances per pollution category).

4.4 Access

The access to MAR-CIS 2 information will be password protected. The information shall not be accessible to CHD guest users. Most of MAR-CIS 2 users will be new users to EMSA's maritime applications. Special expertise on chemicals and emergency response operations is needed in order to interpret the information and to evaluate the hazards and risks involved in an incident involving chemical substances.

MAR-CIS 2 users will have to agree, through a disclaimer, that EMSA is not liable for any direct or indirect damages or the way in which the information is subsequently used.

The MAR-CIS 2 link in the CHD will give the CHD users' access to MAR-CIS 2 information. The CHD guests users will not have access to the MAR-CIS 2 data.

4.5 Link to the CHD

MAR-CIS 2 and CHD should be connected for the following purposes:

- i. To allow CHD users to access MAR-CIS 2 information.
- ii. To allow for updates of data elements from IMO Codes, which are incorporated in the CHD. The relevant ones should be replicated to MAR-CIS 2 database.

The connection between MAR-CIS 2 and the CHD will be based on the HazmatID from the CHD and the MarcisID to be developed for MAR-CIS 2 database upon migration in EMSA's systems. The CHD database will be substantially larger than MAR-CIS 2 in terms of number of entries; CHD will have around 5,000 entries, MAR-CIS 2 may reach 300 entries.

The connection from CHD to MAR-CIS 2 is not based on single links between entries: one CHD entry may be linked to two or more different MAR-CIS 2 entries. One MAR-CIS 2 datasheet may be linked to one or more entries in CHD. Also some UN numbers in CHD are very broad to be linked to a specific datasheet (e.g. UN 3082 Environmentally hazardous substance, liquid, n.o.s.). In order to guarantee a correct link between the two databases, the link between entries must be done manually by the MAR-CIS 2 information content administrator. For that purpose an interface must be developed to manually link the different entries.

There are some identical fields between MAR-CIS and CHD datasets: the IBC code, IMDG code and IMSBC code information¹. Up to now, the update of the fields in MAR-CIS 1 was done manually. The CHD foresees an update every time there are of the codes at least every two years. MAR-CIS 2 database shall benefit from these CHD updates. It should be noted that CHD database will have less IMO codes information fields than MAR-CIS 2. As an example, MAR-CIS 1 contains 11 information fields from the IBC Code of which only 3 are identical to the CHD (product name, pollution category, hazards class). This approach will guarantee that the information in the two applications is consistent and kept updated.

¹ MAR-CIS 1 does not contain information on the IMSBC code but MAR-CIS 2 will have, see Appendix D – Modifications to the MAR-CIS 1 database.

4.6 Installation, maintenance and upgrade

4.6.1 MAR-CIS 2 dataset

MAR-CIS 2 information is to be used during the emergency response operations to HNS incidents. The existing MAR-CIS 1 database, installed locally on PCs, needs to be migrated to EMSA's maritime applications environment in order to facilitate its hosting, upgrade and 24/7 monitoring, operation and maintenance.

Each year, following an internal testing period, the online version of MAR-CIS 2 data shall be replaced by the working version only accessible to the content administrators.

4.6.2 Web portal and application for mobile devices

The MAR-CIS 2 interfaces should be monitored to guarantee that they are available 24/7. Maintenance and technical support should be part of the contractual arrangements for the web portal and the mobile application development. These shall guarantee that any problem or bug will be fixed with the release of new versions of the interfaces.

5. CHD and MAR-CIS application datasets

Both CHD and MAR-CIS 2 applications will be connected to one database. This database will be defined and structured in accordance to the functionalities foreseen for each application and the characteristics of each dataset.

The CHD and the MAR-CIS 2 datasets will share common data attributes from the IMO codes as identified in purple in Appendix A, Section I. MAR-CIS 2 dataset will include more IMO codes data attributes than the CHD. Therefore the CHD dataset shall also include these additional MAR-CIS 2 data attributes from the IMO Codes, but which will not be used for the CHD application, see Appendix A, Section II. This will facilitate the updating of the data elements for MAR-CIS 2 which originate from the IMO Codes and will ensure strict coherence between the two datasets as indicated. See Figure 4 below that summarises the datasets organisation.

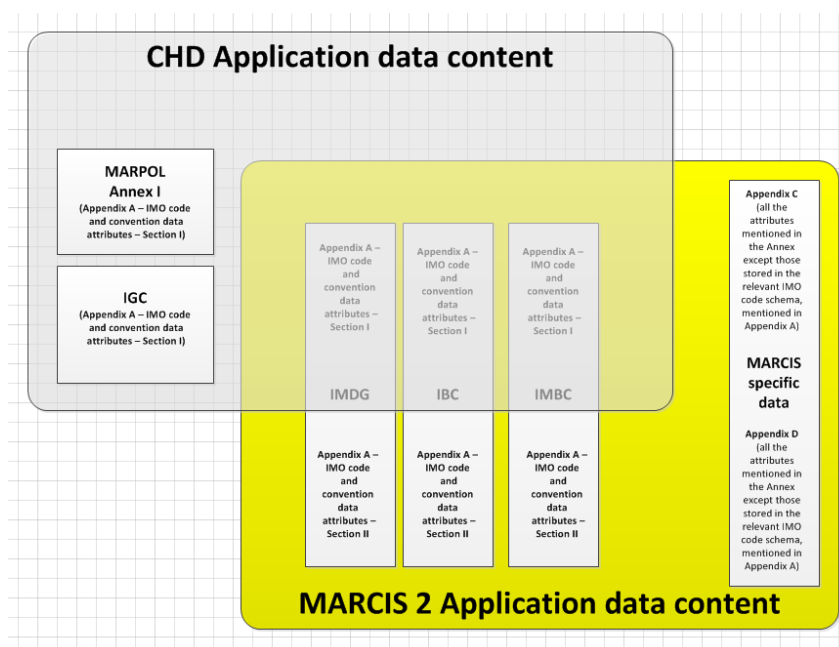


Figure 4 - CHD and MAR-CIS datasets

6. Conditions for the project delivery for Module 1 services

For the conditions governing the software deliveries under this ICT Service Contract refer to the Annex C (Work procedures for Project Delivery).

The schedule is to be provided by the contractor in the offer and agreed with EMSA at the kick-off meeting. The schedule in the offer must at least meet the maximum dates as indicated in the chapter 5 of tender specifications.

7. Specific service requirements – CHD

In this Chapter, each requirement is given a reference number and a priority: higher priority "P1", lower priority "P2". A further distinction is made "**M**" – **Mandatory requirements** on which a quotation should be definitely included in the offer made and "**D**" – **Desirable requirements** on which a quotation is desirable.

7.1.1 Content of the CHD

CHD_REQ_1	Priority: P1 Nature: M RFC ref: 13269
<p>The list of the IMO Codes and Conventions and the relevant data elements to be used to populate the dataset is provided in the Appendix A.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. The HAZMATID is the unique identifier for each product. 2. The attributes marked in purple (shaded boxes) in Appendix A, section I are common data elements with the MAR-CIS 2 data (these are also part of the MAR-CIS 2 dataset). 3. The attributes in Appendix A, section II belong to the MAR-CIS dataset and are to be accessed solely by users authorised to access the MAR-CIS 2 dataset. <p>For the implementation of database schemas related to CHD, the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_3.</p>	

7.1.2 CHD Access Rights (Web users)

CHD_REQ_2	Priority: P1 Nature: M RFC ref: 13269
<p>Three types of access rights to the CHD are foreseen for human users:</p> <ol style="list-style-type: none"> 1. <u>CHD Content administrators</u> (profile CHD CONTENT ADMIMISTRATOR, refer to SSN_CHD_MARCIS_INT_REQ_4), who shall be granted with the rights to create, update or delete (i.e. deactivate) entries in the CHD and to approve user accounts. The administrators for managing the CHD content may be different from administrators managing the CHD accounts. Therefore, different tasks have to be created. 2. <u>CHD users</u> (profile CHD SSN USER, refer to SSN_CHD_MARCIS_INT_REQ_4), who will have access to search, display and filter the CHD content (including access to MAR-CIS 2 content) or to download the whole CHD (but not including the MAR-CIS 2 specific data elements) using the 	

CHD web console accessible via the single Maritime Application Portal (MAP) and system-to-system interfaces. CHD users may also receive e-mail notifications of changes in the CHD.

3. CHD guest users (profile CHD GUEST, refer to **SSN_CHD_MARCIS_INT_REQ_4**), who will have access to search, display and filter the CHD content through MAP, but will not have access to MAR-CIS 2.

For implementation specific details refer to **SSN_CHD_MARCIS_INT_REQ_4** and **SSN_CHD_MARCIS_INT_REQ_19**.

7.1.3 Overview of services

The use case diagram below presents the services offered by the CHD with the associated user roles. Requirements regarding each service are described in the sections below.

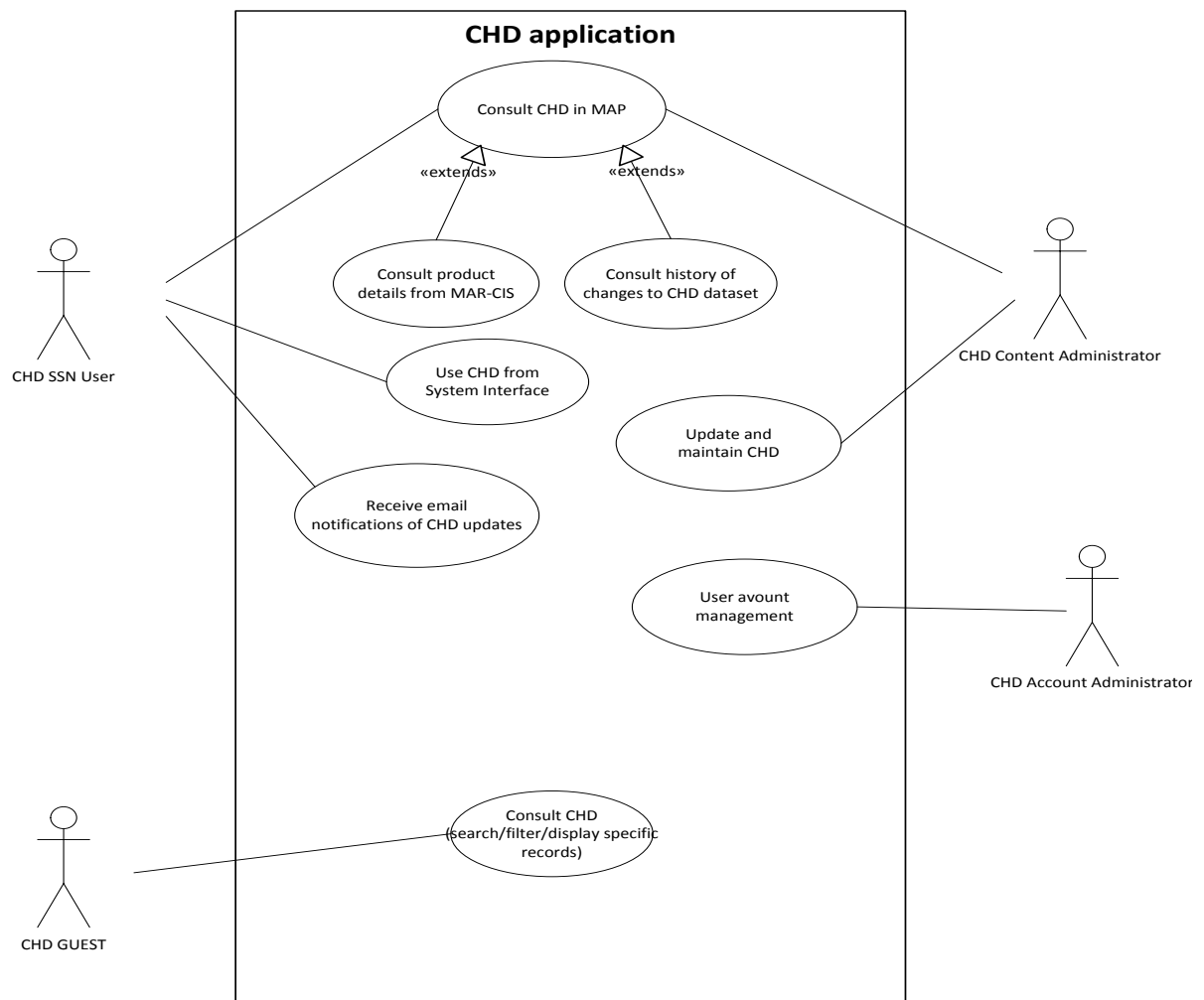


Figure 5 - CHD services and associated user profiles

7.1.4 CHD Update and maintenance

CHD_REQ_3	Priority: P1 Nature: M RFC ref: 13269
<p>The CHD shall be populated and maintained up-to-date by CHD Content Administrator following updates to the IMO Codes and Conventions. For this purpose the CHD should include a facility to allow the upload of excel or word files which will be defined at the design stage (for the implementation of the data import utility refer to SSN_CHD_MARCIS_INT_REQ_16).</p> <p>The CHD application is to have at least two different versions of CHD datasets, as follows:</p> <ol style="list-style-type: none"> <u>'Online version'</u>: this version is the one which is accessible by the CHD users. <u>'Working version'</u>: this will be an offline version which is only accessible to CHD Content Administrators. This 'working version' will be used for updating the content of the dataset. CHD Content Administrators shall update the CHD dataset and set a cut-off date/time (for example the date of entry into force of an amendment to an IMO Code) when the new version of the CHD will be applicable. As soon as the coming into force date is reached the new version will replace the existing 'online version'. Changes to the CHD and their date of entry into force shall be carried out within specific time frames. <p>Records which are no longer applicable will be deactivated.</p> <p><u>Note:</u> Usually, a new version of a code is issued once every two years. However, in between HAZMAT items may need to be updated following changes, updates or corrections notified by IMO.</p> <p>For the implementation approach concerning version scheduling and data updates the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_5 and SSN_CHD_MARCIS_INT_REQ_7.</p> <p>For the implementation of the data import utility the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_16.</p>	
CHD_REQ_4	Priority: P1 Nature: M RFC ref: 13269
<p>The CHD web console shall include a user interface allowing the CHD Content administrators to create, update or deactivate individual HAZMAT items manually or whole sections (bulk changes) of the CHD through the upload of excel or word files.</p> <p>For the implementation approach concerning the manual content management operations refer to SSN_CHD_MARCIS_INT_REQ_19 and for implementing the data import utility refer to SSN_CHD_MARCIS_INT_REQ_16.</p>	
CHD_REQ_5	Priority: P1 Nature: M RFC ref: 13269
<p>A version control system shall be created in order to track all updates made to the CHD 'online version'. The system will keep a record of the data elements changed, its value, and timestamp of the changes and who made the changes (User ID). A 'comment' information field in the CHD 'working version' shall allow the CHD Content Administrators and the contractor to provide the reason why specific records have been changed (for example, by quoting the IMO document number which promulgated the changes).</p> <p>Any change in the content of the CHD shall result in the creation of the new version of the data base at a specific cut-off date/time.</p>	

The version control shall allow an easy and user-friendly presentation on the Web interface of:

- The changes made per HAZMAT product, as well as,
- For the CHD Content administrators, all changes made to the content of the CHD during a specific period of time.

This version control should support the automatic numbering and control of the versions of the CHD on all interfaces.

For the implementation approach concerning version scheduling the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_5** and **SSN_CHD_MARCIS_INT_REQ_7** (point 3). For data logging refer to **SSN_CHD_MARCIS_INT_REQ_17**.

7.1.5 Receive e-mail notifications of CHD updates

CHD_REQ_6	Priority: P1 Nature: M RFC ref: 13269
<p>An automatic e-mail notification service shall be created to inform the CHD users of any update of the CHD content, which means that an automatic e-mail will be generated at a defined time (configurable by EMSA) prior to the cut-off date/time (entry in to force) of the new dataset version. The e-mail address of the user account will be used for that purpose. It should be possible to enable or disable the email notification for each individual user account. By default the e-mail functionality is disabled and it is the user who has to enable the receipt of e-mails.</p> <p>For the structure of the e-mail warnings, the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_13. For the configuration of e-mail warning by the users, refer to SSN_CHD_MARCIS_INT_REQ_19 (points 5.b and 9).</p>	

7.1.6 Consult CHD in MAP

CHD_REQ_7	Priority: P1 Nature: M RFC ref: 13269
<p>The CHD shall be made available to CHD users and to CHD administrators via the CHD web console.</p> <p>There shall be a welcome page explaining the background and content of the CHD as well as providing links to reference documentation, legal instruments and user manuals. EMSA will provide the relevant content of the welcome page during the development phase. The welcome page will inform of any upcoming update to the CHD content. The date and version number of the last CHD update should also remain displayed on this welcome page.</p> <p>The display and presentation shall follow the EMSA design guidelines and MAP design approach.</p> <p>The authorised user will be given the possibility to:</p> <ol style="list-style-type: none"> a) Basic search: search by one data attribute - DG classification, UN number or textual reference. b) Step by step search: the user will start selecting the mode of carriage, then the type of product carried in bulk (if relevant), and then the textual reference. The mechanism for this type of search is illustrated in the Figure 2, in section 3.3. 	

- c) Advanced search: search for the details of HAZMAT items, using more than one data attributes from the table in **CHD_REQ_1** (for example, DG classification, UN Number, mode of carriage and type of product).

In all free-text search fields, the system will give the possibility to search by part of the content of an entry. For example, if a user is searching by UN Number, when the user enters 3 digits the user will immediately see the UN Numbers containing that group of digits, irrespective whether the numbers are in the beginning, middle or end of the UN Numbers.

The system will provide the results of the search in a list which will show items 1 to 6 and 13 of table in Appendix A – CHD/MAR-CIS 2 – IMO Codes and Conventions elements).

- When clicking on one of the items in the list, the user will get a detailed view of the HAZMAT product with all data elements of table in **CHD_REQ_1**. The user will also have the possibility to consult the history of changes to the HAZMAT product, and to see a button which allows access to MAR-CIS 2 data.
- The user will have the possibility to export the results of a search or the whole CHD content in Excel, txt, docx, pdf file formats. The specific content and format of the electronic file will be defined during the design phase.

In addition to the above, CHD Content administrators will have the possibility to consult the list of changes made to the whole CHD dataset during a specific period of time.

The User Scenarios describe below provides an illustration of the requirement.

For the implementation approach of the web console, the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_19**. In particular for the “history download” function shall refer to **SSN_CHD_MARCIS_INT_REQ_17** (point 3).

User Scenarios	Priority: P1 Nature: M RFC ref: 13269
<p>Scenario 1: A CHD user wants to check the correctness of a report received from a reporting party for a product transported in bulk. The CHD user logs into MAP, accesses the CHD and searches for the product details using the textual reference of the product and the mode of transport indicated (in bulk). The system will display the details found and which can then be exported to an Excel file. The user should have the option to export to a single excel file the result of several search results.</p> <p>Scenario 2: An MSS Officer (MSSO) wants to verify the quality of a HAZMAT report received from a MS regarding a substance carried in packaged form on a RO/RO ship. The officer logs to the MAP, accesses the CHD and searches for the details of the specific product using the UN number reported.</p> <p>Scenario 3: A SSN NCA administrator wants to upload a new version of the CHD in the National Single Window (NSW) application, following a notification on the new version availability. The administrator logs in to the CHD and downloads the latest version of the whole database into a txt file which can subsequently be uploaded to the NSW application.</p>	

7.1.7 Consult product datasheets from MAR-CIS 2

CHD_REQ_8	Priority: P1 Nature: M RFC ref: 13269
<p>A CHD user will be able, via the CHD web interface and a button in the CHD, to access MAR-CIS 2 dataset, if available, for the product(s) that the CHD user has searched for. When accessing MAR-CIS 2, the user shall obtain access to the product information sheet in MAR-CIS 2 and other MAR-CIS 2 functionalities.</p> <p>The product page in MAR-CIS 2 shall open in a separate window. There is neither the need to log in to the MAR-CIS 2 nor to search again for the product via the MAR-CIS 2 web interface.</p> <p>However, when the CHD dataset is downloaded to a MS system there shall only be an indication whether specific HAZMAT items have datasheets in the MAR-CIS 2 dataset. In addition CHD guest users will not have access to the MAR-CIS 2 datasheets.</p> <p>The user scenario described below provides an illustration of this requirement.</p> <p>For the implementation approach, the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_19.</p>	

User Scenario	Ref: CHD_REQ_8
<p>A user responding to an emergency obtains information regarding a specific product carried on board. The user would like to have more data related to the properties of the product as well as the associated hazards and risks. The user logs in to CHD Web console, accesses the CHD module and searches for the product. The details of the product will include a button which will allow access to MAR-CIS 2 information sheets. The user clicks on the button and is redirected to the MAR-CIS 2 page containing the relevant datasheet of the product.</p>	

7.1.8 CHD consultation by guest users

CHD_REQ_9	Priority: P1 Nature: M RFC ref: 13269
<p>The CHD dataset shall be made available to the public (guests) via EMSA MAP. The web interface shall be compliant with EMSA visual identity guidelines, and follow the corporate image and colour code of the Agency.</p> <p>There shall be a welcome page which is the same as in CHD_REQ_7.</p> <p>Guest users will need to log-in as "CHD guest" users to have access to the CHD public site.</p> <p>First time users have to subscribe² to access the CHD by filling in a registration form providing the following details:</p> <ul style="list-style-type: none"> Name and surname, (mandatory); Profession, (mandatory); 	

² "Registration of users" is to be provided by the IdM and in this sense is out of the scope of this contract.

- Workplace details, Company/Organization (optional);
- Contact details: e-mail (mandatory).

The system will generate an authorization and a password which will be sent by e-mail to the registered person.

Guest users will be given the same search functions as introduced in **CHD_REQ_7** above, with the limitation that guest users will not have access to MAR-CIS 2 nor to the history of changes, and that the export of search results will only be in pdf format.

The CHD public site should provide basic administrator functions to EMSA, allowing generation of the statistics on the use of the CHD, for example, on the number of registered users, visits on the site, and downloads.

For the implementation approach, the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_19**. For additional desirable functionality refer to **section 9.15**.

7.1.9 Use CHD from the System Interface

CHD_REQ_10	Priority: P2 Nature: M RFC ref: 13269
<p>The CHD shall be made available via system-to-system interface to the MSs National SSN systems, NSW or other systems (e.g. via web services).</p> <p>These system-to-system services shall include:</p> <ol style="list-style-type: none"> Push automatically updates and changes in the CHD at cut-off date/time; Transmission of a list of HAZMAT items defined in a request from the Member State system, for example the list of UN Numbers and mode of carriage for the IMDG code; <p>The history of updates and access to MAR-CIS 2 shall not be made available via the request/response messages.</p> <p>The CHD should provide basic administrator functions to EMSA, allowing generation of usage statistics of the system interface.</p> <p>A System Interface Guide (SIG) shall be provided. The SIG will give all necessary indications to the MS to set up and operate the interface of their national system to the CHD. For the design of the system2system interface, the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_21.</p>	

8. Specific service requirements – MAR-CIS 2

In this Chapter, each requirement is given a reference number and a priority: higher priority "P1", lower priority "P2". A further distinction is made **"M" – Mandatory requirements** on which a quotation should be definitely included in the offer made and **"D" – Desirable requirements** on which a quotation is desirable.

8.1 Functional requirements

8.1.1 Data description

MARCIS_REQ_1	Priority: P1 Nature: M RFC ref:13269
<p>The information stored in MAR-CIS 1 database is organised in categories and subcategories (tables) per chemical substance. See 'Appendix B – MAR-CIS 1 (existing desktop application) database structure', 'Appendix C – MAR-CIS 1 information fields and sub-fields properties' and 'Appendix D – Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2'.</p> <p>The information provided in these Appendixes describe MAR-CIS 1 database and should be seen as indicative⁴. The contractor <u>is expected to analyse MAR-CIS 1 structure</u>, tables and information fields. Modifications to the database MAR-CIS 1 will have to be integrated upon migration to EMSA's maritime application systems (see MARCIS_REQ_13).</p> <p>Types of information stored in the database: text, numbers, and pictures. Almost each information category has a reference associated that provides information on the source used (see MARCIS_REQ_7 for more details).</p> <p>For the implementation approach, the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_3.</p>	

8.1.2 Access rights

MARCIS_REQ_2	Priority: P1 Nature: M RFC ref: 13269
<p><u>MAR-CIS 2 user (profile MARCIS USER, refer to SSN_CHD_MARCIS_INT_REQ_4):</u> The access to MAR-CIS 2 information will be password protected. The user will not be able to modify the content of the dataset. Most of MAR-CIS 2 users will be new users to EMSA's information systems; therefore the creation of logins is expected. Depending on the interface two types of users will exist. A MAR-CIS 2 web portal user will also have access to the MAR-CIS 2 App and vice versa:</p> <ul style="list-style-type: none"> ○ MAR-CIS 2 web portal user; ○ MAR-CIS 2 App user (for smartphones and tablets). <p><u>MAR-CIS 2 content administrator (profile MARCIS CONTENT ADMINISTRATOR, refer to SSN_CHD_MARCIS_INT_REQ_4):</u> He or she will manage MAR-CIS dataset content, a task that is out of the scope of this ICT Service Contract and will be carried by EMSA or a contractor. The administrator should be able to;</p> <ul style="list-style-type: none"> - add/delete substances to the MAR-CIS 2 dataset; - modify the information content of each substance and inputting text a new information field (to be developed) 'Comments' only accessible to the MAR-CIS 2 content administrator; - add/delete references or modify existing entries in the reference list; - add/delete or modify the glossary of terms used in MAR-CIS 2; <p><u>MAR-CIS 2 accounts administrator (profile MARCIS ACCOUNT ADMINISTRATOR, refer to SSN_CHD_MARCIS_INT_REQ_4):</u> He or she will manage the users' account of MAR-CIS 2: add, delete and modify. This task shall be carried out by Unit C.1.</p> <p><u>CHD SSN user (profile CHD SSN USER, refer to SSN_CHD_MARCIS_INT_REQ_4):</u> The CHD user (not the CHD guest user) will have access to the MAR-CIS 2 information via the CHD. For entries in CHD that have MAR-CIS 2 information a button will be displayed in the CHD interface directing the user to the MAR-CIS 2 information. The CHD user should have access to the same functionalities as the MAR-CIS 2 web portal user.</p> <p><u>CHD/MAR-CIS 2 administrator (profile MARCIS PRIME ADMINISTRATOR, refer to SSN_CHD_MARCIS_INT_REQ_4):</u> He or she will have access to the CHD/MAR-CIS 2 joint interface to manually link MAR-CIS 2 entries to the CHD entries, i.e. to include or delete a link to the details of a product in the CHD.</p> <p>For the implementation approach, the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_4.</p>	

8.1.3 Overview of services

MARCIS_REQ_3	(Web) – Web Interface (user)	Priority: P1 Nature: M RFC ref: 13269
	(Cont) – Web Interface (content manager)	Priority: P1 Nature: M RFC ref: 13269
	(Mob) – Mobile (user)	Priority: P2 Nature: M RFC ref: 13269
	(Acc) – Web interface (account manager)	Priority: P1 Nature: M RFC ref: 13269

The MAR-CIS 2 should have the following functionalities see Figure 6:

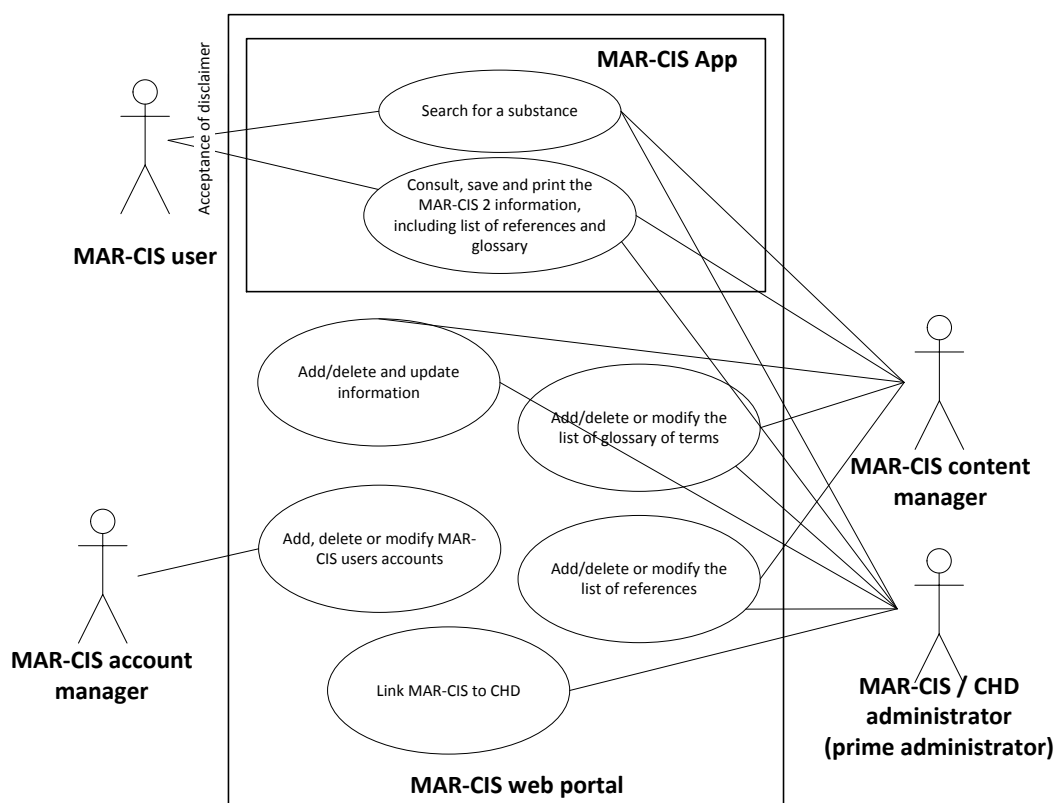


Figure 6 – MAR-CIS 2 overview of services and user profiles

For all users authorised to access MAR-CIS 2:

Search for a substance: All users (web portal and App users) should be able to search for a substance in the database. See business requirements **MARCIS_REQ_4** with more details on this function.

Consult, save and print the MAR-CIS 2 information: All users should be able to view and display the MAR-CIS 2 information. See business requirements **MARCIS_REQ_5** with more details on

this function.

Accept and display the disclaimer with the conditions of use: The user should accept the disclaimer when accessing and logging to the MAR-CIS 2 web portal. For the MAR-CIS 2 App the disclaimer should be accepted before installing the App. The user should be able to retrieve the disclaimer for reference in both interfaces.

Display the glossary of the terms: The glossary of the terms used in the project should be available to the users. See more details **MARCIS_REQ_6**.

Display the list of references: The list of reference used should be available to the users. See more details **MARCIS_REQ_7**.

For MAR-CIS 2 content administrator (access via the web portal):

Add/delete a substance to the dataset and modify the information: This function should be available for the 'MAR-CIS 2 information content administrator' only. This should be done via a dedicated interface for managing the information contents. The interface for the 'MAR-CIS 2 information content administrator' should include an new information field 'Comments' for adding justifications to modifications made to the information content of the substances in the database.

Add/delete or modify the list of glossary of terms: see point **MARCIS_REQ_6**.

Add/delete or modify the list of references: see point **MARCIS_REQ_7**.

For MAR-CIS 2/CHD administrator (access via the web portal):

Link MAR-CIS 2 entries to the CHD: This function should be available for the MAR-CIS 2/CHD administrator only. This should be done via an interface that allows linking manually MAR-CIS 2 entries to the CHD entries. See business requirement **MARCIS_REQ_9** for more details.

For the implementation approach, the contractor shall refer to:

- Web console: **SSN_CHD_MARCIS_INT_REQ_19, SSN_CHD_MARCIS_INT_REQ_20**.
- Amending references: **SSN_CHD_MARCIS_INT_REQ_11** and **SSN_CHD_MARCIS_INT_REQ_22**.
- Linking glossary terms to attribute labels: **SSN_CHD_MARCIS_INT_REQ_12** and **SSN_CHD_MARCIS_INT_REQ_22**

8.1.4 Search function

MARCIS_REQ_4	(Web) – Web Interface (user)	Priority: P1 Nature: M RFC ref: 13269
	(Cont) – Web Interface (content manager)	Priority: P1 Nature: M RFC ref: 13269
	(Mob) – Mobile (user)	Priority: P2 Nature: M RFC ref: 13269

The search function should be the same for the web portal and the application for mobile devices. It should cover four different search types (see mock-up Figure 7):

- a. By word: the search function should look at the beginning, at the end and within the word. The search function should look into the following information fields:
 - Name (in MAR-CIS 2);
 - IUPAC name (in MAR-CIS 2);
 - Proper shipping name (from the IMDG code);
 - Product name (from the IBC code);
 - Bulk cargo Shipping Name (from the IMSBC);
 - Other names (in MAR-CIS 2).

The search results should show the hits by each information field.

- b. By UN number: A four digit information field.
- c. CAS number³: up to 10 digits.
- d. By physical behaviour (EBCS): a drop down menu which lists the physical behaviour.
- e. Search by HazmatID and MarcisID via the administrator interface. This functionality should be available only for the MAR-CIS 2 content administrator through the interface for managing the information content and the link to the CHD.

The search function should not be case sensitive. Names of chemical substances incorporate very often hyphens, numbers at the beginning and middle of the chemical substance's name, and prefixes. All these variables should be considered in the definition of the search function.

As the user starts to type, the search function should start displaying the search results, listing vertically the name of the substances that match the search criteria. As the user continues to type, the number of search results should decrease.

The result of a search should display immediately all results without restriction to the number of substances matching the criteria for the search.

Within the search results list of substances, the user should click on the name of one of the substances and be linked to the display of MAR-CIS 2 information.

For the implementation approach, the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_19** and **SSN_CHD_MARCIS_INT_REQ_20**.

³ CAS Registry Number includes up to 10 digits which are separated into 3 groups by hyphens. The first part of the number, starting from the left, has up to 7 digits; the second part has 2 digits. The final part consists of a single check digit. The general format is xxxxxx-yy-z (see <http://www.commonchemistry.org/help.aspx>). It has a check digit control to ensure a valid CAS number (see algorithm <http://www.cas.org/content/chemical-substances/checkdig>)

8.1.5 Consult, print and save MAR-CIS 2 information

MARCIS_REQ_5	(Web) – Web Interface (user)	Priority: P1 Nature: M RFC ref: 13269
	(Cont) – Web Interface (content manager)	Priority: P1 Nature: M RFC ref: 13269
	(Mob) – Mobile (user)	Priority: P2 Nature: M RFC ref: 13269

The grouping and display of MAR-CIS 2 information should follow existing layout in MAR-CIS 1, see Appendix E – Example of MAR-CIS 1 datasheet. Some entries in MAR-CIS 1 have explanatory information (from a value list) associated to a certain value (e.g. IBC code, ship type “3”, means a “Chemical tanker for products with sufficiently severe environmental and safety hazards (moderate degree of containment)”). This explanatory information from values lists should be maintained in MAR-CIS 2.

A new information category group ‘key properties’ should be created in the MAR-CIS 2 information template. This new group should be displayed at the first page and at the top of the web browser. This new group of information fields will gather key parameters needed for doing a first evaluation of the substances’ properties (e.g. flash point, vapour pressure). This new group will use information fields that already exist in the database. The display or not of this new group should be dependent on the substances properties and will be defined by the MAR-CIS 2 information content administrator. Therefore the interface for managing the MAR-CIS 2 information contents should include the option to display or not this new group of information fields.

The reference number of the information source used to complete the MAR-CIS 2 information should be displayed next to the corresponding information category. This is a modification to MAR-CIS 1 datasheet layout. Existing layout displays the reference numbers per information group category making difficult the tracking of reference number per information field. The reference text should be easy visualised by the user. This functionality will be further described in point **MARCIS_REQ_7**.

For the terms in the datasheet template that have a definition in the glossary, the corresponding explanatory text from the glossary should be easily visualised by the user. This functionality will be further described in point **MARCIS_REQ_6**.

The user should scroll down and see all the information related to a chemical substance. To export/print the information the user will have to click on a button that transforms the information from the web browser in pdf to be saved locally or printed. A list of references used for completing the information on a certain datasheet/substance, should be included at the end of the pdf, see last page of Appendix E – Example of MAR-CIS 1 datasheet.

The display of the information in the web browser and in the pdf file should be optimised. If there is no information on a certain information category and sub-category, then the information category should collapse or be greyed out in case of a sub-information field. The space should then be redistributed.

This requirement is applicable for the web portal and the application for mobile devices.

For the implementation approach for the web console, allocation of references, definition of glossary terms associated to data attributes displayed for a datasheet, uploading references and glossary to mobile application, the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_19**, **SSN_CHD_MARCIS_INT_REQ_11**, **SSN_CHD_MARCIS_INT_REQ_12**,

SSN_CHD_MARCIS_INT_REQ_20 and SSN_CHD_MARCIS_INT_REQ_22**8.1.6 Glossary of the terms used**

MARCIS_REQ_6	(Web) – Web Interface (user)	Priority: P1 Nature: M RFC ref: 13269
	(Cont) – Web Interface (content manager)	Priority: P1 Nature: M RFC ref: 13269
	(Mob) – Mobile (user)	Priority: P2 Nature: M RFC ref: 13269

MAR-CIS 1 includes a pdf file that lists statically (with no automatic links) all the terms used in the MAR-CIS 1 project. This list of terms used is not part of the MAR-CIS 1 database. The list should be incorporated in the database at the time of the migration MAR-CIS 1 database in EMSA's maritime application systems. It will be provided in excel format. See **Appendix F – Glossary of MAR-CIS 1**.

Information fields belonging to datasheet template (e.g. PACs, EBCS, Flash point) that have a definition in the glossary, their text should be easily visualised (e.g. tool tip) in the web browser and in the MAR-CIS 2 App. This visualisation option should exist only for the terms that are "fixed", meaning the terms those that belong to the datasheet template.

The MAR-CIS 2 content administrator shall be able to add/delete or modify the glossary of terms and definitions used. This shall include the terms to be included in the "tool tip".

The glossary should be downloaded to the mobile application for reference.

For the implementation approach, the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_12, SSN_CHD_MARCIS_INT_REQ_22**.

8.1.7 List of references

Ref: MARCIS_REQ_7	(Web) – Web Interface (user)	Priority: P1 Nature: M RFC ref: 13269
	(Cont) – Web Interface (content manager)	Priority: P1 Nature: M RFC ref: 13269
	(Mob) – Mobile (user)	Priority: P2 Nature: M RFC ref: 13269

MAR-CIS 1 has a list of references (~750) used as information sources for completing the information stored in the dataset. These are numbered and contain text explaining the information source. Some references include also urls. Almost each information field in the database has an associated reference, see 'Appendix D – Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2', 'column reference'. A reference could be unique for a substance or could be used by

several substances.

The text included in the reference information field, should be easily visualised in the web browser and in the MAR-CIS 2 App. A small window or text box should open if the user clicks on the reference number. The urls should be displayed and work and point to the corresponding web address.

The MAR-CIS 2 content administrator shall be able to add/delete or modify the reference list.

The reference list should be downloaded to the mobile application.

For the implementation approach, the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_11 and SSN_CHD_MARCIS_INT_REQ_22**. For web console design guidelines for the content management portlet the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_19**.

8.1.8 Add/delete and update information

MARCIS_REQ_8	(Cont) – Web Interface (content manager)	Priority: P1 Nature: M RFC ref: 13269
<p>The task of keeping the MAR-CIS 2 information content up-to-date is out of the scope of this ICT Service Contract. However the MAR-CIS 2 application should enable the modification of the MAR-CIS data content by the 'MAR-CIS 2 content administrator'. He or she should also be able to add new substances to the dataset and eventually delete substances if needed.</p> <p>Modifications to the database should be recorded in the log system, see business requirement MARCIS_REQ_15.</p> <p>For web console design guidelines, the contractor shall refer to:</p> <ul style="list-style-type: none"> Content management portlet: SSN_CHD_MARCIS_INT_REQ_19. Logging: SSN_CHD_MARCIS_INT_REQ_17 		

8.1.9 Link MAR-CIS to CHD

MARCIS_REQ_9	(Web) – Web Interface (user)	Priority: P1 Nature: M RFC ref: 13269
<p>The CHD SSN user will access MAR-CIS 2 information via the CHD application without the need to login again. For entries in CHD that have MAR-CIS 2 information, a button will be displayed in the CHD interface which will connect to the MAR-CIS 2 website. A disclaimer will have to be accepted by the CHD SSN user upon login to the CHD in order to visualise the corresponding MAR-CIS 2 information. The CHD SSN user should have access to all functionalities available to the MAR-CIS 2 web portal users: search, glossary references, and pdf file creation, print and save.</p> <p>An interface should be developed to enable the 'CHD/MAR-CIS 2 administrator (profile MARCIS Prime administrator, refer to SSN_CHD_MARCIS_INT_REQ_4) to manually create/ review and update the link between a Hazmat item listed in the IMO codes with a MARCIS dataset. The interface should make use of the HazmatID and the MarcisID..</p>		

In order to benefit from the CHD updates, MAR-CIS 2 IMO codes information fields (IMDG code, IBC code, IMSBC code¹) should also be updated in MAR-CIS 2 database (see Appendix A – CHD/MAR-CIS 2 – IMO Codes and Conventions elements). As MAR-CIS 2 database uses more information fields from the IMO codes than the ones in CHD, there is a risk that part of the IMO codes information on a certain substance is updated and the remaining information on the IMO code is outdated. This should be prevented. All substances in MAR-CIS 2 database and their IMO codes information should be updated at the same time as the CHD is updated.

For the implementation approach of the CHD web console for users authorised to access MAR-CIS 2, the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_19**.

8.1.10 Web portal


MARCIS_REQ_10	(Web) – Web Interface (user)	Priority: P1 Nature: M RFC ref: 13269
----------------------	-------------------------------------	--

The web portal shall include the search function described before, see **MARCIS_REQ_4**. The design and layout of the web portal shall include EMSA's visual identity and follow the corporate and colour code of the Agency. The EMSA communication team will provide some guidance and will develop a logo for the project. The two interfaces should have the same MAR-CIS look.

A disclaimer already in MAR-CIS 1 for 'Copyright Clause', 'Liability Clause' and 'General Terms (of use)' should appear and be accepted by the user before accessing the information. This should happen each time the MAR-CIS 2 user logs in the web portal. In addition it should be available for reference. It will be provided at a later stage.

The information displayed in the web portal should be exportable in pdf file, printable and saved locally. The pdf should also optimise the display of the information considering if there is or not information to be displayed, see **MARCIS_REQ_5**.

For the implementation approach concerning the web console, the contractor shall refer **SSN_CHD_MARCIS_INT_REQ_19**. The updating of text for disclaimers will conform with **SSN_CHD_MARCIS_INT_REQ_6**.



MARine Chemical Information Sheets

Search for chemical substances

By word	<input type="text" value="alcohol"/>	<input type="button" value="Search"/>
By UN number	<input type="text"/>	<input type="button" value="Search"/>
By CAS Number	<input type="text"/>	<input type="button" value="Search"/>
By behaviour	<input type="text"/>	<input type="button" value="Search"/>

Search results

- 1 – Tetradecanol
- Octanol
- Carbon disulphide
- Dodecyl alcohol
- Ethyl alcohol

Figure 7 - MAR-CIS 2 Web portal and application for mobile devices mock-up

8.1.11 Application for mobile devices

MARCIS_REQ_11	(Mob) – Mobile (user)	Priority: P2 Nature: M RFC ref: 13269
<p>The application for mobile devices (smartphones and tablet PCs) should work on android, window phone and IOS operating system (see mock-up in Figure 7).</p> <p>It shall include the entire search and display functionalities described before (see MARCIS_REQ_4 and MARCIS_REQ_5). The design and layout of the web portal shall include EMSA's visual identity and follow the corporate and colour code of the agency. The two interfaces should have the same MAR-CIS 2 look.</p> <p>The display of the information should be optimised according to the size of the display of the mobile devices. All information fields should appear in the Application for mobile devices.</p> <p>The MAR-CIS mobile application should be available for download via all major distribution channels (e.g. GooglePlay, AppleStore). However only authorised users of MAR-CIS 2 should be able to use the application (by quoting their credentials). A disclaimer already developed for MAR-CIS 1 for 'Copyright Clause', 'Liability Clause' and 'General Terms (of use)' should appear and be accepted upon using the App.</p> <p>For the implementation approach, the contractor shall refer to section 9.1.3.4 and SSN_CHD_MARCIS_INT_REQ_20.</p>		

8.1.12 Database migration

MARCIS_REQ_12	Priority: P1 Nature: M RFC ref: 13269
<p>Data migration:</p> <p>Important note: The MAR-CIS 1 database file "mar-cis.tdbd" can be provided to the tenderer upon request (by sending an email to the email address mentioned in the Invitation to Tender, see Appendix L).</p> <p>The existing MAR-CIS 1 database (TurboDB Managed product from the manufacturer dataweb⁴), see 'Appendix B – MAR-CIS 1 (existing desktop application) database structure' and 'Appendix C – MAR-CIS 1 information fields and sub-fields properties' should be migrated and used as basis for the MAR-CIS 2 database. The MAR-CIS 2 database shall incorporate the amendments described in 'Appendix D – Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2'.</p> <p>The database migration should include a testing phase during FAT (Factory Acceptance Test) and repeated during site acceptance testing (SAT) to guarantee that the migration of MAR-CIS 1 was successful. In this respect:</p> <p>The contractor shall prepare and provide to EMSA scripts allowing the migration of existing MAR-</p>	

⁴ http://www.dataweb.de/en/products/dotnet_database.html.

CIS 1 with all its content to the database to be implemented under the contract. The migration scripts shall be tested during the FAT to ensure that they can be executed without errors by EMSA during the SAT and during the GO LIVE of the new implementation.

MARCIS_REQ_13	Priority: P1 Nature: M RFC ref: 13269
<p>Database modifications:</p> <p>MAR-CIS 1 database needs to be modified in order to incorporate stakeholders' comments from the 2013 consultation and other improvements identified in the past during the MAR-CIS 1 development. These modifications are not expected to be substantial. Appendix D – Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2 describes in detail the modifications needed to be integrated in MAR-CIS 2.</p> <p>New information field 'Comments' will be added to each substance. This shall not be visible to the MAR-CIS 2 and the CHD user.</p> <p>For the implementation approach, the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_3.</p>	

MARCIS_REQ_14	(Web) – Web Interface (user)	Priority: P1 Nature: M RFC ref: 13269
	(Cont) – Web Interface (content manager)	Priority: P1 Nature: M RFC ref: 13269
	(Mob) – Mobile (user)	Priority: P2 Nature: M RFC ref: 13269
<p>Versions of MAR-CIS 2 data:</p> <p>The objective is to have at least two different versions of MAR-CIS 2 data with different cut-off dates per entry.</p> <p><u>'Online version'</u>: online version of the MAR-CIS 2 accessible to 'MAR-CIS 2 users'. The web portal, application for mobile devices and CHD should be linked to this dataset.</p> <p><u>'Working version'</u>: offline version only accessible to MAR-CIS 2 content administrators. This 'working version' will be used for updating the information contents of the dataset. This task of content updates will be carried out regularly during the year. Once per year, this offline version, shall replace the online version. This yearly release should cover information updates to all substances (e.g. response actions, GESAMP information, CLP classification). Intermediate releases for single substances should be avoided. All modifications to the information contents of MAR-CIS database shall require the filling in the new information field 'Comments'.</p> <p>For the implementation approach, the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_8</p>		

MARCIS_REQ_15	(Cont) – Web Interface (content manager)	Priority: P1 Nature: M RFC ref: 13269						
<p>Log information to control the information content modifications</p> <p>A log system shall be created in order to track modifications to the information content of each MAR-CIS 2 substance, per attribute. As described before (see MARCIS_REQ_2 and MARCIS_REQ_13) a new information field named 'Comments' will be added to each substance. This information field will be used by the 'MAR-CIS 2 content administrator' to describe and record all modifications made to the information content of each substance, IMO codes information updates, add or delete entries from the database. MAR-CIS 2 users shall not see this information field. The information stored in the 'Comments' information field together with other database properties information should be gathered in tabular exportable excel file. See example below. Modifications to the data contents will be accepted only if there is text in the information field 'Comments'. The addition and/or removal (deactivation) shall also require text input in the 'Comments' information field.</p>								
Numb er	Datasheet MarcisID	Recorded createdON	Date and time of updatedON	Expected cut-off	Mode (E-Edit or D- Definite)	Us er	Substan ce	New field 'Comments'
No1	MarcisIDx	10/10/2015 18:00	14/10/2015 17:00	31/12/2 015	E	An a	XXX1	Comment1
No2	MarcisID	10/10/2015 18:00	15/10/2015 17:10	31/12/2 015	E	An a	XXX1	Comment2
<p>For the implementation approach, the contractor shall refer to SSN_CHD_MARCIS_INT_REQ_17.</p>								

MARCIS_REQ_16	Priority: P1 Nature: M RFC ref: 13269
<p>Development of a MAR-CIS 2 dataset ID:</p> <p>A unique identifier associated to each entry (datasheet/substance) of MAR-CIS 2 dataset. These shall be used to link MAR-CIS 2 entries to the CHD items.</p> <p>In relation to the implementation approach for the database schemas contractor shall refer to SSN_CHD_MARCIS_INT_REQ_3.</p>	

MARCIS_REQ_17	(Cont) – Web Interface (content manager)	Priority: P1 Nature: M RFC ref: 13269
<p>Export MAR-CIS 2 dataset to Excel (only to MAR-CIS 2 content administrator):</p> <p>In order to facilitate the dataset contents management and reporting (e.g. overview of substances</p>		

per hazards class, overview of substances per pollution category) it should be exportable to excel in tabular form. The MAR-CIS 2 content administrator should have the option to select the information fields to be included in the excel file in order to facilitate the download process. Nevertheless all information fields should be exportable (including pictures). See template below.

	HazMat/MarcisID	UN number	Proper shipping name	solubility	PPE	...
Subs 1						
Subs 2						
Subs 3						
Subs 4						

Import information to the dataset (only to MAR-CIS 2 content administrator):

For the information fields that are text type, the option to import information from an excel file should exist. This will facilitate the dataset information contents update.

For the implementation approach, the contractor shall refer to **SSN_CHD_MARCIS_INT_REQ_16**.

9. Requirements concerning the technical implementation of CHD and MAR-CIS 2

In this Chapter, each requirement is given a reference number and a priority: higher priority "P1", lower priority "P2". A further distinction is made: **"M" – Mandatory requirements** on which a quotation should be definitely included in the offer made and **"D" – Desirable requirements** on which a quotation is desirable.

9.1 Conceptual approach

9.1.1 Introduction

In line with the business requirements, there is a need to design two distinct applications (the CHD application and MAR-CIS 2 application) that will share the same physical database (refer for more details **SSN_CHD_MARCIS_INT_REQ_3**), Oracle instance, database server and access rights policies configuration (using the Common Management Console). For more details refer to Figure 8:

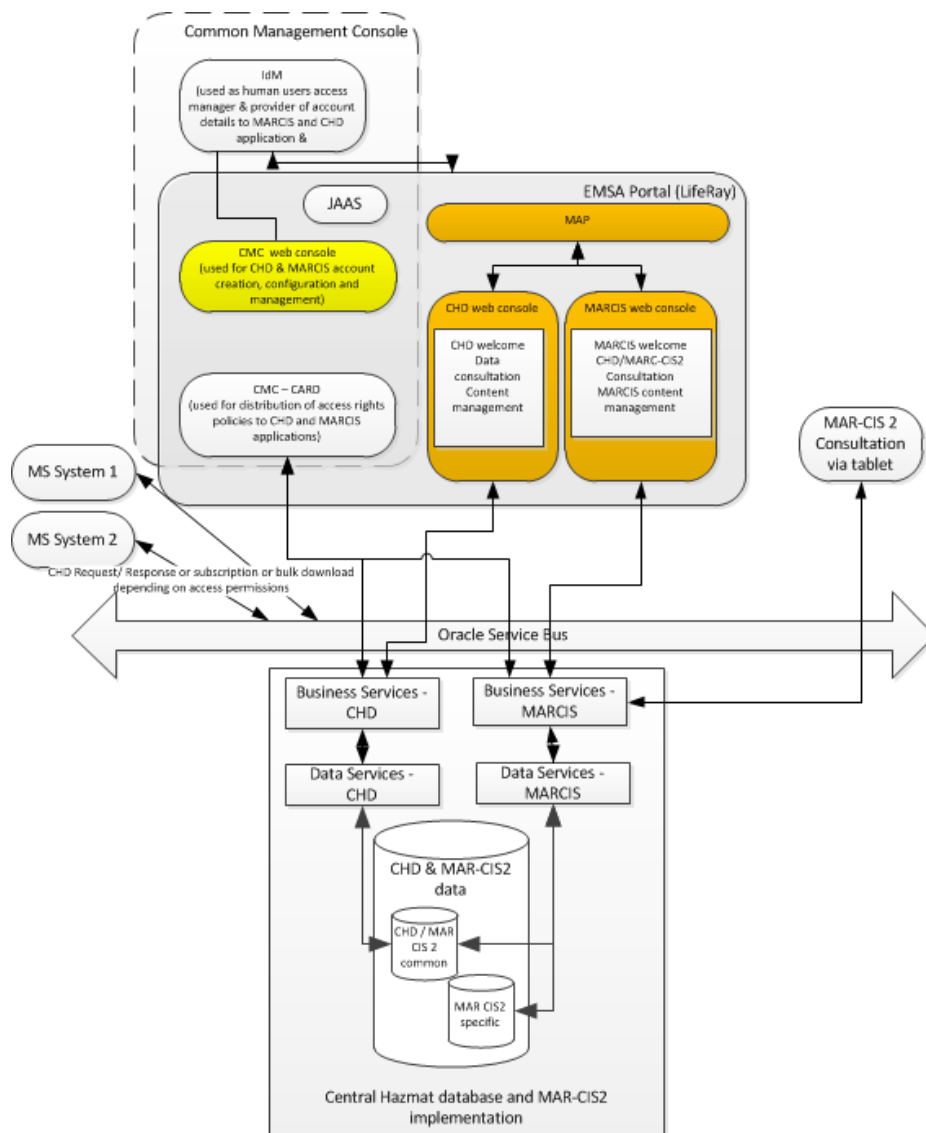


Figure 8 - MAR-CIS 2 and CHD applications

Given the differences in workflows for data management and visualisation, each application shall implement its own set of data and business services (refer to sections **9.1.2, 9.1.3**). One however could expect that in software implementation level some of the components to be developed shall be utilised by both applications.

User account and access policies configuration shall utilise the Central Management Console to be implemented as a horizontal service in EMSA.

The access control for the CHD and MAR-CIS applications shall be implemented based on the following approach:

- a. User account and access policies configuration (for both type of accounts, concerning human users and systems) shall be performed at EMSA Common Management Console (CMC) level by means of one or more profiles assigned to users. Each profile may be associated with one or more roles.
- b. Access policies enforcement (a "policy" shall be associated to the definition of a "role") shall be performed at MAR-CIS and CHD application level.
- c. The MAR-CIS and CHD applications shall interact with the applications integrated into the CMC (IdM and CARD) using the services exposed by IdM and CARD. In this respect:
 - i. IdM will act as a human users access manager & furthermore as a provider of account details (roles) to MARCIS and CHD application;
 - a. The interfaces to CMC (IdM) shall be based on the IdM guide (refer to Appendix I). The authentication of human users shall be based on JAAS (Java Authentication and Authorization Service).
 - b. The CMC (IdM) will be utilised for the configuration of extremal systems interacting with the CHD application (called below "system" users). IdM will not be involved in the authentication / authorisation process of "system" users (However, IdM shall make available the relevant provisioning information using a mechanism compatible with the IdM guide). The application will be responsible for implementing an authentication/authorisation service. As an alternative could be examined, during the design phase of the project and following proposals from the contractor, the usage of the new API Gateway (currently being tested by the Agency for the IMDatE Mobile application (refer to Appendix G) .
 - ii. CARD shall expose a service enabling MAR-CIS and CHD applications to consult the access rights policies associated to human and system users.
 - a. The interfaces to CMC (CARD) shall be implemented, if so to be decided by the Agency, under evolutive maintenance – Module 2 (informative information is provided in Appendix M).

In terms of roles/access policies the following are noted:

- i. The CHD web-user could be granted one or more of the following roles: CHD_ACCOUNT_MANAGER, CHD_CONTENT_MANAGER, CHD_CONSULT_HISTORY, CHD_DATA_IMPORT, CHD_GUEST_READER (giving access to all the CHD data as per appendix A section I), CHD_MARCIS_READER (giving access to data stored in the CHD in Appendix I and II, only for Hazmat items linked to MAR-CIS 2 datasheets), CHD_DATA_DOWNLOAD (enabling download of the CHD content), MARCIS_WEB_READER (giving access to MAR-CIS 2 specific data), CHD_EMAIL_RECIPIENT (enabling a user to receive an e-mail warning associated to the change of the content of the CHD, refer to the

- CHD_REQ_6**, CHD_WORKVERSION_WARNING_EMAIL_RECIPIENT (assigned to users with MAR-CIS content administrators rights, in order to enable them receiving an e-mail warning following a change in a Hazmat item linked to a MAR-CIS 2 datasheet).
- ii. The MS applications accessing the CHD via a system2system interface could be granted one or more of the following roles: CHD_SUBSCRIBER, CHD_REQUESTOR (right to request for the data store in the CHD except the MAR-CIS 2 specific data).
 - iii. The MAR-CIS 2 web-user could be granted one or more of the following roles: MARCIS_ACCOUNT_MANAGER, MARCIS_CONTENT_MANAGER, MARCIS_WEB_READER (giving access to MARC-CIS 2 specific data via the web interface), CHD_MARCIS_READER (giving access to data stored in the CHD in Appendix A section I and II, only for Hazmat items linked to MAR-CIS 2 datasheets), MARCIS_MOBILE_USER (giving access to MARC-CIS 2 specific data via tablet/smartphone application), MARCIS_CHD_LINK_MANAGER (granted to those content administrators having the additional access right to link MAR-CIS 2 datasheets to CHD items).
 - iv. The "Create", "Update" and "Delete (Deactivate)" actions, those associated with content management of CHD should be available only to EMSA / CHD Administrators (who in this respect shall be granted the task CHD_CONTENT_MANAGER) while those concerning MAR-CIS schema should be available only MAR-CIS 2 content Administrators who in this respect shall be granted the role MARCIS_CONTENT_MANAGER.

9.1.2 Implementation approach/ CHD Application

9.1.2.1 Data services

The CHD should provide a minimal set of services ("Data Services") that give the possibility to access and manage the stored information for the application in the database ("HAZMAT items").

Each HAZMAT item shall be identified by a unique alphanumeric key ("primary key") in the database. It is proposed to use, as unique key, the HazmatID specified in the **CHD_REQ_1**.

For each HAZMAT item three timestamps attributes (DateTime in UTC) should be stored in the database. These shall indicate:

1. The item "Creation" date-time timestamp;
2. The item "Last update" date-time timestamp;
3. The "cut-off" (refer to CHD_REQ_3 and **CHD_REQ_5**) timestamp.

A "multi-layer"-based approach should be followed for the CHD architecture (refer to the figure 8 above).

The "data Services" should be implemented following a CRUD approach, providing the following operations:

- a. **C**reate – Create a new item;
- b. **R**ead – Retrieve the item details;
- c. **U**ppdate – Update an existing item;
- d. **D**elete – Deactivate an existing item.

Deleting an item should not remove its entry from the database but it will disable the entry and keep it for historical and audit purposes.

A Journal should be kept to record all changes to the CHD ("who did what and when"). The Journal should be accessible in a read-only mode for historical analysis and audit purposes.

To facilitate the access to the CHD information, including the Journal records, a "Query-by-Example" search function should be implemented ("examples" being the search criteria combinations identified in the **CHD_REQ_7**). The requesting application provides a pattern (regular expression) for one or more of the attributes of an item. The Search action will return a list of matching items that can be selected and further processed by the user or the external system.

9.1.2.2 Business layer services

This layer shall make use of the Data Services to execute business functions over the data to be stored in the CHD in accordance with the business requirements.

The following business services shall be provided:

- a. Bulk Update: the service updates for all items in the CHD in a single batch process. Based on an input source (e.g. file), new entries shall be added, modified file entries shall be updated, and specifically marked entries shall be deleted.
- b. Create/ Update Item: the service creates/ updates for specific items (identified by its Primary Key). This service is intended to support operations executed by human users.
- c. Get Item Details (asynchronous request/ response): based on a Query-by-Example search, the service shall return a list of one or more items matching the query parameters. This service can be used by an application to synchronize its data with the CHD enabling a partial or full download of CHD contents.
- d. Get e-mail notification (CHD users): enable users receiving an e-mail notification announcing changes to the CHD at cut-off date/time (this e-mail is to be sent upon the CHD content administrator at a configurable datetime) prior to the cut-off date/time on the assumption that the CHD administrator already "saved" the "target" version for an item.
- e. Get e-mail notification (MAR-CIS 2 content administrator): enable MAR-CIS 2 content administrators to receive an e-mail notification announcing the creation of a new working version of a Hazmat item in the CHD.
- f. Push data changes to subscribers: the service connects a new application (external system) in order to enable the "push" of an "announcement" message whenever the "cut-off" date/time is to be reached for a subscribed item (which was updated/de-activated). An announcement message will be also pushed to the external application whenever a new item is created in the CHD.
- g. Subscribe to CHD and Subscribe/Unsubscribe items. This is to be used by an external application:
 - a. to subscribe to CHD for receiving updates of CHD HAZMAT items belonging to one or more IMO codes and subscribe for item changes, and
 - b. to subscribe additional items (from different IMO codes) and/or unsubscribe existing ones.
- h. Get Journal: the service retrieves the Journal records based on temporal criteria and Query-by-Example search.
- i. Get Item History: the service returns the full list of changes undergone by the specific item based on temporal criteria and Query-by-Example search.

Only authenticated and authorized users (human or system users) should have access to these services.

Business Services can be consumed or used in two different ways:

- I. System-to-System interface: The business Services shall be made available to other systems/applications via web services. The implementation requires:
 1. The definition of the external application exchanging data with the CHD as a system user accessing CHD application;
 2. The identification of end-points for the data exchange (request/ response, data announcement, notification);
- II. Human Interface: CHD business services in the bullet points a, b, c, d, e, g, h above shall be exposed for human usage. This point is addressed by the Presentation Layer described in the next section.

As a general rule any create, update, or delete action should be manually validated by CHD administrator before being registered in the CHD for publication following the cut-off date/time.

9.1.2.3 Presentation layer

The Business Services described above should be accessible through a web interface inside the single Maritime Application Portal (MAP) of EMSA, based on Liferay. One or several *portlets* should be implemented to provide presentation services to the human users and according to the Portlet standard defined in "JSR 286 - Portlet Specification 2.0"⁵.

Portlet implementation shall take into consideration that:

- Allowed functionalities are different depending of the role of the user logged in;
- Portlets can be used inside different user communities;
- Portlet must always call Business Services exposed by the Business Layer;
- A Query-by-example search functionality shall be implemented in line with the requirements in **CHD_REQ_7**.

Items matching the search criteria should be displayed in a results data grid. Results Data Grid should allow:

- Configurable paging, i.e. number of visible rows;
- Sorting by all columns;
- Filtering by all columns;
- Export items details to different formats to be agreed with the contractor at design stage;
- Selection of one or more rows; it shall be possible to execute functions over the selected rows. Implementation must take into consideration that some business functions that cannot be executed over a set of rows.

Business Services can be used by an authenticated Human user according to his profile and access rights.

Note:

The account administration/ configuration module shall use the utilities to be created by the CMC project.

⁵ <http://jcp.org/en/jsr/detail?id=286>

9.1.3 Implementation approach/ MAR-CIS 2 application

9.1.3.1 Data services

The MAR-CIS 2 application shall provide a minimal set of services ("Data Services") that give the possibility to access and manage the stored information in it ("MAR-CIS 2 datasheets"). Each datasheet in MAR-CIS 2 shall be identified by a unique alphanumeric key ("primary key") in the database (MarcisID).

For each MAR-CIS 2 datasheet three timestamps attributes (DateTime in UTC) should be stored, at minimum (subject to a decision on the implementation of the desirable requirement

SSN_CHD_MARCIS_INT_REQ_9 could be more) in the database. These shall indicate:

1. The datasheet "Creation" date-time timestamp;
2. The datasheet "Last update" date-time timestamp;
3. The "cut-off" date-time timestamp.

A "multi-layer"-based approach should be followed for the MAR-CIS 2 architecture (refer to the Figure 8).

As indicated in the Figure 8, the "data Services" should be implemented following a CRUD approach, providing the following operations:

- a. "Create" – Create a new datasheet;
- b. "Read" – Retrieve the datasheet details;
- c. "Update" – Update an existing datasheet;
- d. "Delete" – Deactivate an existing datasheet.

Deleting a datasheet should not remove its entry from the database but it will disable the entry and keep it for historical and audit purposes.

A Journal should be kept to record all changes to the MAR-CIS 2 ("who did what and when per datasheet"). The Journal should be accessible in a read-only mode for historical analysis and audit purposes.

To facilitate the access to the MAR-CIS 2 information, including the Journal records, a "Query-by-Example" search function should be implemented ("examples" being the search criteria combinations identified in the **MARCIS_REQ_4**). The requesting application provides a pattern (regular expression) for one or more of the attributes of a datasheet. The Search action will return a list of matching datasheets that can be selected and further processed by the user or the external system.

9.1.3.2 Business layer services

This layer shall make use of the Data Services to execute business functions over the data to be stored in the MAR-CIS 2.

The following business services shall be provided:

- a. Bulk Update – the service updates several or all the datasheets in the MAR-CIS 2 in a single batch process. Based on an input source (e.g. file), new entries shall be added, modified file entries shall be updated, and specifically marked entries shall be deleted.
- b. Create/ Update Item – the service creates/ updates specific datasheets (identified by its Primary Key). This service is intended to support operations executed by human users.

- c. Get Item Details (asynchronous request/ response) – based on a Query-by-Example search, the service shall return a list of one or more datasheets matching the query parameters. This service can be used by e.g. CHD for retrieving a single datasheet in the MAR-CIS or a set-of datasheets. Possibility for retrieving the whole content of MAR-CIS 2 database in xml should be also envisaged.
- d. Get Journal – the service retrieves the Journal records based on temporal criteria and Query-by-Example search.
- e. Get Item History – the service returns the full list of changes undergone by the specific datasheet (per substances/MarcisID) based on temporal criteria and Query-by-Example search

Only authenticated and authorized users (human persons for the moment) should have access to these services.

As a general rule any create, update, or delete action should be manually validated by MAR-CIS 2 content administrator before being registered in the MAR-CIS 2 for publication following the cut-off date/time.

9.1.3.3 Presentation layer - Web console accessible via MAP

The Business Services described above should be accessible through a web interface inside the single Maritime Application Portal (MAP) of EMSA, based on Liferay. The design and constraints are similar to those outlined in the section 9.1.2.3 for CHD. Query-by-example search functionality shall be implemented in line with the requirements in **MARCIS_REQ_4**.

Datasheets matching the search criteria should be displayed in a results data grid. Results Data Grid should allow:

- Configurable paging, i.e. number of visible rows;
- Sorting by all columns;
- Filtering by all columns;
- Export datasheets details to, Excel;
- Export a datasheet to pdf;
- Import information from Excel to the database;
- Selection of one row; it shall be possible to execute functions over the selected rows. Implementation must take into consideration that some business functions that cannot be executed over a set of rows.

Business Services can be used by an authenticated Human user according to his profile and access rights.

Note:

The account administration/ configuration module shall use the utilities to be created by the CMC project.

9.1.3.4 MAR-CIS 2 application for tablets

The Business Services described above should be accessible and the data should be downloaded to the tablet devices (Android, iOS compliant, Windows compliance shall be assessed under Module 2 of the contract). The search functionality shall be implemented in line with the requirements in **MAR-CIS_REQ_4** and mock-up in **MAR-CIS_REQ_10**.

Datasheets matching the search criteria should be displayed in a user friendly manner in a results data grid. The implementation should be optimized for tablets and smartphones.

The application should enable tablet users to print MAR-CIS 2 datasheets.

The application should use the (currently under implementation) Mobile Access Gateway of EMSA. A potential architecture is outlined in the schema below:

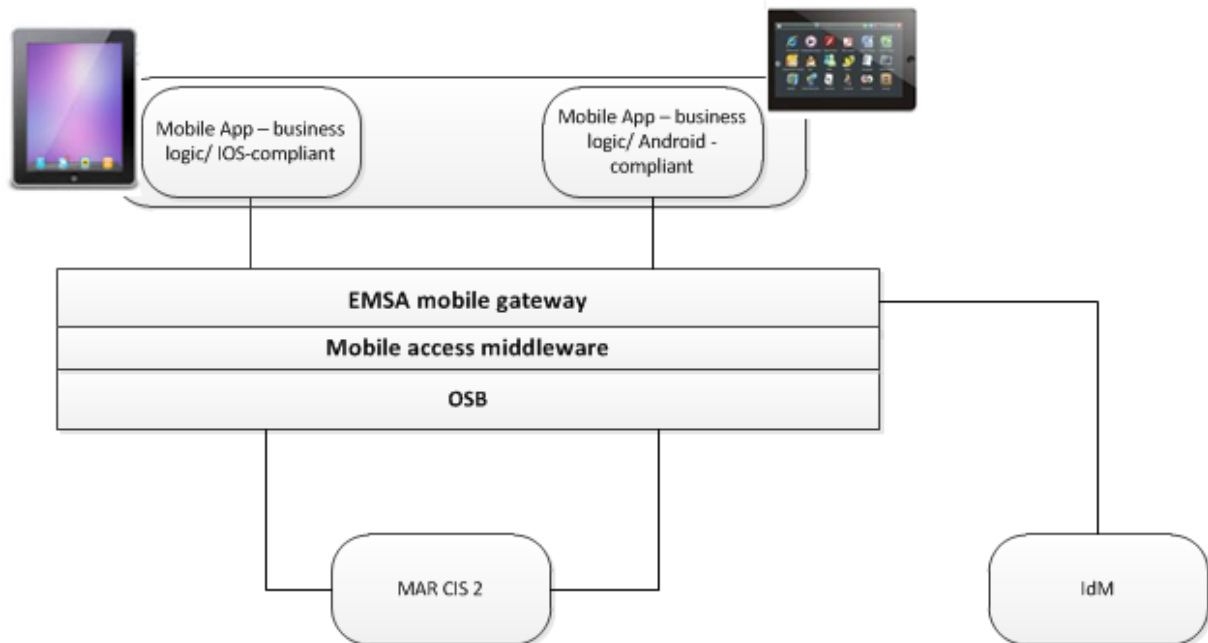


Figure 9 - MAR-CIS 2 Mobile application architecture

The mobile applications middleware would provide a REST facade for the mobile applications. The middleware consumes the services exposed by MAR-CIS 2 through the EMSA Oracle Enterprise Service Bus (OSB).

To ensure that only authorized users are able to access EMSA resources, the mobile applications depend on the EMSA mobile access gateway to the EMSA single sign on platform (IdM) to authenticate a user and check the user access rights.

9.1.4 Specific requirements concerning the design of the applications

In line with the above described concept:

Ref: SSN_CHD_MARCIS_INT_REQ_1	Priority: P1 Nature: M RFC ref: 13269
--------------------------------------	--

From an implementation perspective:

1. CHD and MAR-CIS 2 are two distinct applications within the SSN Ecosystem. In this sense CHD/MAR-CIS 2 implementation software shall be fully segregated from the rest of SSN central components.
2. The design of CHD and MAR-CIS 2 applications shall be SOA-driven aligned with the implementation concept described in section 9.1.
3. Due to strong interdependencies (sharing of IMO codes information), CHD and MAR-CIS 2 schemas should be co-hosted in the same physical database and share same oracle instance and database server. Business and presentation layer services could share application servers or not, subject to contractor proposal and a final agreement with EMSA during the design phase.

Note:

The technical proposal in the offer should already outline the proposed implementation and deployment approach.

Ref: SSN_CHD_MARCIS_INT_REQ_2	Priority: P1 Nature: M RFC ref: 13269
--------------------------------------	--

1. The presentation layer (web interfaces) design will be Liferay v6.2 compliant (refer for more details in **SSN_CHD_MARCIS_INT_REQ_19**) and shall be based on Liferay 6.2 compliant portlets providing the "look and feel" of the MAP portlets. MAP design specification is provided in Appendix J. EMSA visual identity guidelines (refer to Appendix K) should be followed. In the event of conflicts (e.g. fonts, stylesheets) among MAP design specifications and EMSA visual identity guidelines, a question should be submitted to EMSA during the design phase, asking for a decisions on the way conflict is to be resolved. The implementation will be based on the guidance to be provided by EMSA on the conflict resolution.
2. As it is the case for any other user of EMSA maritime applications, users will access the MAR-CIS and CHD applications via the EMSA MAP application. There, the user will be redirected to his/her user private home page where he/she will be provided with a url for either accessing CHD application or MAR-CIS application depending on his/her access rights (for more details on the MAP see Appendix J).

9.2 Data organisation

Ref: SSN_CHD_MARCIS_INT_REQ_3	Priority: P1 Nature: M RFC ref: 13269
<p>As indicated in the Figure 10 here-after, in compliance with the functional requirements for CHD and MAR-CIS 2 in the previous chapters, the data should be stored in the database as follows:</p> <ol style="list-style-type: none"> Distinct schemas, each one associated with one of the IMO codes mentioned in Appendix A, that is the codes: IGC, IMSBC, IMDG, IBC and MARPOL Annex I. Within each IMO code schema there shall be recorded the data associated with distinct Hazmat items, each item linked to a Unique HazmatID. The main reasons to segregate the data into different schemas are: <ol style="list-style-type: none"> The set of data attributes to be stored for Hazmat attributes differs per code (refer to Appendix A). Furthermore certain data attributes appearing in more than one code (e.g. see "IMO hazard class" in Appendix A) use different classifications. The scheduled date for updating the Hazmat items associated to a code in the CHD may differ from the update date of other Hazmat items in the CHD associated to another code. <p>For each Hazmat item there shall be stored in the CHD:</p> <ol style="list-style-type: none"> The values of data attributes that are of interest to the SSN user community (refer to Appendix A, section I); plus The additional data attributes from IMO codes that are of interest to the MAR-CIS 2 user community (refer to Appendix A, section II) A distinct schema for MAR-CIS 2. Within this schema there shall be recorded, for each MAR-CIS 2 datasheet, the data listed in Appendices C and D. Each datasheet will be uniquely referenced using as identifier a MarcisID. IMO code information relevant to MAR CIS datasheets should not be stored/ replicated within the MAR CIS schema. Such data will be stored within the CHD schema. This would avoid inconsistencies in IMO code data updates⁶. <p>Notes:</p> <ol style="list-style-type: none"> A Hazmat item in the CHD is identified uniquely by its HazmatID and can be listed in only one code (MARPOL Annex I, IGC, IMSBC, IMDG, IBC codes). The HazmatID will be a text string, automatically generated by the application based on a concatenation of data stored for an item. The structure of the HazmatID is proposed in Appendix A, section I. A datasheet in MAR-CIS 2 is identified by a unique MarcisID. The MarcisID will be a text 	

⁶ The risk of creating inconsistencies during updates of MAR CIS datasheets is associated to the following:

- The MAR CIS data not stemming from IMO codes are to be updated normally once per year, following the work carried out by the Expert Advisory Group (EAG-HNS).
- The MAR CIS data stemming from IMO codes are to be updated at dates decided at IMO level, not necessarily at same date as the rest of information in a MAR CIS datasheet.

By maintaining the MAR-CIS 2 relevant data in the CHD schema is warranted that an update action in CHD concerning an IMO code will include all the data attributes (CHD or MAR CIS relevant). This will eliminate the risk of inconsistencies in IMO code information due to a split of the update into two parts executed at different dates by different administrators.

string, automatically generated by the application based on a concatenation of data stored for an MAR-CIS 2 datasheet. The structure of the MarcisID will be agreed with EMSA during the design phase.

- c. Within the CHD, a single MAR-CIS 2 datasheet identified by its unique MarcisID could be linked to zero, one or more Hazmat items identified by their HazmatID. As noted in the Figure 10 here after the Hazmat items linked to MAR-CIS 2 are among those to be registered within the IMDG or IBC or IMSBC codes.
- d. Within the MAR-CIS 2 schema a single MAR-CIS 2 datasheet could be linked to zero, one or more Hazmat items identified by their HazmatID.
- e. Although not explicitly included in Appendices A, C, D, in both the schemas - CHD and MAR-CIS 2 – there should be:

- i. A proper structure where to log the specific comments that an administrator does when he/ she decides to update one or more attributes in a “working version” of a Hazmat item in CHD or a datasheet in MAR-CIS 2 (for the definition of the “working version” refer to the requirements **SSN_CHD_MARCIS_INT_REQ_7** and **SSN_CHD_MARCIS_INT_REQ_8**).

It is required to envisage the storage of data attributes in the database for each Hazmat item (CHD) or datasheet (MAR-CIS 2). This data attribute, in free text format, is to record the “reason for update” of one or more specific fields in a CHD Hazmat item or a MAR-CIS 2 datasheet during an update action. The filling of the “comments” field, during update actions, is optional for CHD but mandatory for MAR-CIS 2.

These comments are to be visible in the web interface only to the users who are assigned with a “content administration” permission.

The information to be logged is further detailed in **SSN_CHD_MARCIS_INT_REQ_17**.

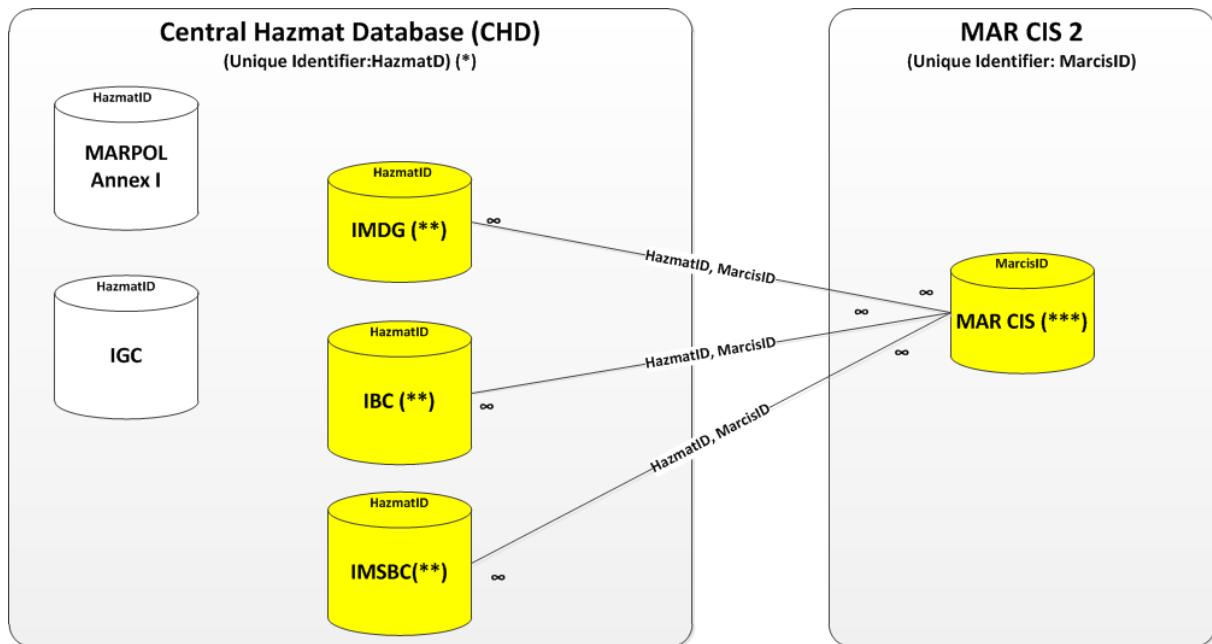
- ii. A “Reason for record update” data attribute associated to a unique Hazmat item in CHD and a unique datasheet in MAR-CIS 2. The attribute is optional for both CHD and MAR-CIS 2 (null value permitted – 512 characters text string). This field shall be visualised by all the users accessing the “on-line” version of the database in any of the interfaces (web portal based or, for MAR-CIS, the mobile application) used by the user. If is foreseen in order to enable a content administrator announcing to the users the “formal” reason for updating a Hazmat item in the CHD or a datasheet in MAR-CIS 2. A definition of the “on-line” version is given in the requirements **SSN_CHD_MARCIS_INT_REQ_7** and **SSN_CHD_MARCIS_INT_REQ_8**).

One may also note that this field, if consistently maintained, would allow the execution of queries by database administrators (for collection of statistics) or data ware-house or monitoring applications which would retrieve only those items in CHD/ datasheets in MAR-CIS 2 that were indeed updated at a certain release date of a new version of the “on-line” database.

- f. As highlighted in Appendix A, section II, a MAR-CIS 2 datasheet is going to include certain information from the IMO codes that are not part of the information included in the CHD dataset which has been derived from the needs of SSN community. In order to avoid inconsistencies in the updating of the MAR-CIS 2 specific data stemming from the IMO codes, to the extent that is possible, the following approach should be followed (alternative proposals could be accepted by EMSA during the project design phase if they are justified

and acceptable to EMSA):

- i. The MAR-CIS specific data stemming from IMO codes shall be kept within the CHD overarching schema and included in the database schema associated with each code. To ensure proper visibility of these fields by only the authorised MAR-CIS users, the visibility of these fields will be associated with a specific access permission (role CHD_MARCIS_READER, refer to the requirement **SSN_CHD_MARCIS_INT_REQ_4**).
- ii. The CHD cut-off dates/times concerning each specific code shall also be applicable for the MAR-CIS 2 specific data stored in the CHD as above indicated.
- iii. The excel files used to import data to the CHD for each code will also include the MAR-CIS 2 specific information. The uploading of these attributes to CHD could be only performed by authorised administrators that have access rights for content administration of both CHD and MAR-CIS 2 (rprofiles MARCIS CONTENT ADMINISTRATOR, MARCIS PRIME ADMINISTRATOR refer to **SSN_CHD_MARCIS_INT_REQ_4**).
- iv. MAR-CIS 2 users will obtain access, via the web portal/ mobile application to MAR-CIS 2 dataset stored in MAR-CIS 2 schema and the MAR-CIS 2 -relevant data stored in the CHD schema (MAR-CIS 2 specific data or data identical to CHD Hazmat items linked to MAR-CIS 2 datasheets).



Database within CHD linked to MAR CIS

(*) A Hazmat item in the CHD is identified uniquely by its HazmatID and can be listed in only one code (MARPOL Annex I, IGC, IMSBC, IMDG, IBC)

(**) Within the CHD a single MAR CIS data sheet identified by its unique MarcisID could be linked to zero, one or more Hazmat items identified by their HazmatID. Hazmat items could be registered under IMDG or IBC code.

(***) Within the MAR CIS 2 schema a single MAR CIS data sheet could be linked to zero, one or more Hazmat items identified by their HazmatID

Figure 10 - Organisation of data within CHD/ MAR-CIS 2

9.3 Access rights management

Ref: SSN_CHD_MARCIS_INT_REQ_4	Priority: P1 Nature: M RFC ref: 13269
<ol style="list-style-type: none"> 1. Authentication of users accessing CHD and MAR-CIS databases will be implemented using the Oracle's IdM system implemented as a horizontal service, within CMC, for all EMSA application. 2. Access to protected resources of the two applications shall be based on a Role-Based Access Control (RBAC) model. 3. The CMC (IdM) will provide utilities for creating / configuring/ deleting users (human users and systems) and register user profiles and roles in a LDAP-compatible directory. <p><u>Important Note.</u></p> <p>The CMC utilities for creating/ configuring/ deleting user accounts are out of scope of this ICT Service contract.</p> <ol style="list-style-type: none"> 4. The interface of the two applications with IdM shall be implemented on the basis of instructions in the IdM guide (refer to the Appendix I which includes the version of the IdM guide applicable at the launch of the tender). The MAR-CIS / CHD contractor will be provided with the IdM guide that shall be the basis for the implementation at the initiation of the design phase of the project. A web service will be implemented as an interface between IdM and the applications (for the provisioning of the users created/ updated at CMC level in the application). The design details for the provisioning service shall be agreed between the CHD/ MAR-CIS contractor and EMSA during the design phase of the project. 5. The CMC (IdM) will be utilised for the configuration of external systems interacting with the CHD application (called below "system" users). The information concerning the roles granted to system users shall be registered, by CMC (IdM) in a directory accessible via LDAP protocol. The structure of the directory will be provided to the CHD/ MAR-CIS contractor during the design phase of the project. 6. The application will be responsible for implementing an authentication/ authorisation service (refer also to the requirement SSN_CHD_MARCIS_INT_REQ_21) As an alternative could be examined, during the design phase of the project and following proposals from the contractor, the usage of the new API Gateway currently being tested by the Agency for other applications of the Agency (refer to Appendix G). The details shall be agreed between the CHD/ MAR-CIS contractor and EMSA during the design phase of the project. 7. Liferay/ MAP options provisioning shall be based on the roles assigned to users by the account administrators (refer to the Table 1 and Table 2 below). The provisioning of Liferay will be done by IdM using Liferay web services. The implementation of the web services is out of scope of Module 1 of this ICT service contract but its details shall be agreed between the CHD/ MAR-CIS contractor and EMSA IdM team during the design phase of the project. 8. Table 2 and Table 3 below outline the roles and profiles that are to be used for configuring in the CMC. The access rights policies enforcement shall be performed by the CHD/ MAR-CIS 2 application software on the basis of user roles. 9. MAR-CIS 2 mobile application users should be first registered (in CMC (IdM)) as users of MAR-CIS 2 (a MAR-CIS 2 administrator will create their account and provide to the user with the credentials via e-mail). Upon downloading the mobile application e.g. from Google play or Apple Store, during the first run of the mobile application, the user shall be 	

requested to store the credentials in the mobile application. Then he/she may start using the mobile application. Access to MAR-CIS 2 resources is achieved following authentication of the user account utilising IdM and the EMSA mobile Gateway (refer to Appendix G).

Table 1 - Roles for CHD & MAR-CIS 2

Role	Expected behaviour
CHD_ACCOUNT_MANAGER	<p>Users assigned to this role can create/ configure/delete other users of lower security level (as per the IdM Guide-Access and Identity Management Guide, Appendix I) accessing the CHD on-line version.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> for the CHD application.</p>
CHD_GUEST_ACCOUNT_WARNING	<p>Users assigned to this role shall receive a warning e-mail, with the intended userID and password identified by a guest user (users that are only assigned the CHD_GUEST_READER role and no other role) wishing to get access to the CHD.</p> <p>In terms of IdM this role can be assigned to users belonging to the <i>Application Administration Level</i> for the CHD application.</p>
CHD_CONTENT_MANAGER	<p>Users assigned to this role can manage the content update of Hazmat items in the CHD (updates are to be inserted in the "working" version of an item).</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA web user level</i> for the CHD application.</p>
CHD_GUEST_READER	<p>Users assigned to this role will have access to search, display and filter the CHD content in the CHD web interface (the data attributes listed in Appendix A – section I only for all the 5 IMO codes listed in the CHD). They will be able to export the results of the search in pdf format only and will not have access to the MAR-CIS 2 specific data stored within CHD schema nor the MAR-CIS 2 data stored in MAR-CIS 2 schema.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA Web User Level</i> for the CHD application.</p>
CHD_CONSULT_HISTORY	<p>Users assigned to this role will have access to consult the history of changes in the Hazmat items in the CHD.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA Web User Level</i> for the CHD application.</p>

Role	Expected behaviour
CHD_DATA_DOWNLOAD	<p>Users assigned to this role will have access to search, display and filter the CHD content in the CHD web interface or to download the whole or part (IMO code specific download) of CHD via the CHD web interface.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA Web User Level</i> for the CHD application.</p>
CHD_DATA_IMPORT	<p>Users assigned to this role will have the right to import content to the CHD from properly formatted templates or manually.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA web user level</i> for the CHD application.</p>
CHD_MARCIS_READER	<p>Users assigned to this role will have access to search, display and filter the MAR-CIS 2 specific content stored in the CHD schemas for the three IMO codes with MAR-CIS relevance (Appendix A, section II) along with the rest of CHD attributes (as per Appendix A, section I) concerning Hazmat items linked to one or more MAR-CIS datasheets.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA Web User Level</i> for the CHD application.</p>
CHD_EMAIL_RECIPIENT	<p>Users assigned to this role may receive automatically generated e-mails at a defined time (configurable by EMSA) prior to the cut-off date/time (entry in to force) of changes to any of the five codes listed in the CHD.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA Web User Level</i> for the CHD application.</p>
CHD_WORKVERSION_WARNING_EMAIL_RECIPIENT	<p>Users assigned this role will receive an e-mail warning each time a working version for a Hazmat item stored in one of IMDG, IBC, IMSBC is first updated.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> (for MAR-CIS 2 application) or the <i>EMSA web user level</i>.</p>
CHD_SUBSCRIBER	<p>External systems (listed in the CMC (IdM) as system users of the CHD application) assigned to this role can subscribe and receive in XML via a web service, the Hazmat items changed in the CHD on line version upon their cut-off date/time. Only the data attributes listed in Appendix A, section I will be pushed per Hazmat item (the additional fields stored per IMO code, as per appendix A-section II, with MAR-CIS 2 relevance, shall not be pushed).</p>

Role	Expected behaviour
CHD_REQUESTOR	<p>External systems (listed in the CMC (IdM) as system users of the CHD application) assigned to this role can request and receive in XML, via a web service, one or more Hazmat items listed in the on-line version of the CHD. Only the data attributes listed in Appendix A, section I will be provided per Hazmat item in the response message (shall not be included the additional fields stored per IMO code, as per appendix A-section II, with MAR-CIS 2 relevance).</p>
MARCIS_WEB_READER	<p>Users assigned to this role will have access to search, display and filter the MAR-CIS 2 content using the MAR-CIS 2 web interface. Users will obtain access to all the data attributes with MAR-CIS 2 relevance (Appendices A, C, D), those stored in the 3 IMO codes in the CHD schemas or the MAR-CIS 2 data schema. The users will not have access to CHD Hazmat items (related to MARPOL Annex I, ICG code) that are not linked to MAR-CIS 2 (except if the users are also granted the role CHD_GUEST_READER but who will have to access the CHD application separately).</p> <p>In addition, the users assigned to this role will have the right to download a pdf version of MAR-CIS 2 datasheets.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA Web User Level</i> for the MAR-CIS 2 application.</p>
MARCIS ACCOUNT_MANAGER	<p>Users assigned to this role can create/ configure/delete other users of lower security level (as per the IdM Guide-Access and Identity Management Guide, Appendix I) accessing the MAR-CIS 2 application.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> for the MAR-CIS 2 application.</p>
MARCIS_CONTENT_MANAGER	<p>Users assigned to this role can manage/ update/ deactivate the content of MAR-CIS 2 datasheets that are not originated from IMO codes (that is they manage the data attributes for a datasheet stored in the MAR-CIS 2 schema). The updates are to be inserted in the "working" version of an item.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA web user level</i> for the CHD application.</p>

Role	Expected behaviour
MARCIS_MOBILE_USER	<p>Users assigned to this role will have access to search, display and filter the MAR-CIS 2 content using the MAR-CIS 2 mobile application. Users will obtain access to all the data attributes with MAR-CIS relevance (Appendices A, C, D), those stored in the 3 IMO codes in the CHD schemas or the MAR-CIS 2 data schema. The users will not have access to CHD Hazmat items not linked to MAR-CIS 2.</p> <p>The users granted the role in addition will have the right to download a pdf version of MAR-CIS 2 datasheets.</p> <p>In terms of IdM, this role can be assigned to users belonging to the <i>Application Administration Level</i> or the <i>EMSA Web User</i> level for the MAR-CIS 2 application.</p>
MARCIS_CHD_LINK_MANAGE R	<p>Users assigned to this role can use the web interface of MAR-CIS 2 for content management and the underline business services for linking CHD to MAR-CIS 2 database to associate one or more Hazmat items in the CHD to a MAR-CIS 2 datasheet.</p>

The informative table below indicate the profiles to be created in the CMC for CHD and MARCIS 2 users. The configuration of profiles is out of scope of MARCIS/CHD applications. This will be done by CMC.

Table 2 CMC Profiles/ Role matrix for CHD & MAR-CIS 2 (informative)

CMC profile	Roles associated with the profile
CHD GUEST	CHD_GUEST_READER
CHD SSN USER	CHD_GUEST_READER CHD_CONSULT_HISTORY CHD_DATA_DOWNLOAD CHD_EMAIL_RECIPIENT CHD_MARCIS_READER MARCIS_WEB_READER
CHD ACCOUNT ADMINISTRATOR	CHD_ACCOUNT_MANAGER
CHD GUEST ACCOUNTS ADMINISTRATOR	CHD_ACCOUNT_MANAGER CHD_GUEST_ACCOUNT_WARNING

CMC profile	Roles associated with the profile
CHD CONTENT ADMINISTRATOR	CHD_CONTENT_MANAGER CHD_DATA_IMPORT CHD_GUEST_READER CHD_DATA_DOWNLOAD CHD_EMAIL_RECIPIENT CHD_MARCIS_READER MARCIS_WEB_READER
MARCIS USER	CHD_MARCIS_READER MARCIS_WEB_READER
MARCIS CONTENT ADMINISTRATOR	CHD_CONTENT_MANAGER CHD_DATA_IMPORT MARCIS_CONTENT_MANAGER
MARCIS PRIME ADMINISTRATOR	MARCIS_ACCOUNT_MANAGER MARCIS_CHD_LINK_MANAGER CHD_CONTENT_MANAGER CHD_DATA_IMPORT CHD_WORKVERSION_WARNING_EMAIL_RECIPIENT MARCIS_CONTENT_MANAGER CHD_GUEST_READER CHD_DATA_DOWNLOAD CHD_EMAIL_RECIPIENT CHD_MARCIS_READER MARCIS_WEB_READER
MARCIS ACCOUNT ADMINISTRATOR	MARCIS_ACCOUNT_MANAGER
MARCIS MOBILE APP USER	MARCIS_MOBILE_USER
DATA SUBSCRIBER TO CHD	CHD_SUBSCRIBER
DATA REQUESTOR TO CHD	CHD_REQUESTOR

9.4 Data update operations

Ref: SSN_CHD_MARCIS_INT_REQ_5	Priority: P1 Nature: M
-------------------------------	---------------------------

	RFC ref: 13269
<p>"Scheduled" cut-off Date/Times for expected new versions of each of the IMO codes included in the CHD will be set via the CHD content management portlet by authorised CHD content administrators. Furthermore a "version identifier" of the "CHD" version will be set via the CHD content management portlet. The CHD "version" code will be generated automatically and have the value:</p> <p>"CHD_[to-be-updated IMO code at the scheduled date e.g. IMDG, IBC]_[Scheduled cut-off Date]"_[incremental version number]</p> <p>Examples: CHD_IMDG_15062016_v1, CHD_IBC_ISMBC_20032017_v2</p> <p>Along with the configuration of a "scheduled" data, CHD content administrators shall be able to update:</p> <ol style="list-style-type: none"> 1. The "welcome" text that the users will view upon accessing the CHD web console portlet. 2. A "Scheduled warning" threshold (e.g. -2, -3 etc.). The "Scheduled warning" threshold shall be used by the application (in line with the requirement CHD_REQ_6) to automatically generate e-mail warnings for changes in the CHD. For the content/ structure of the e-mail warning refer to SSN_CHD_MARCIS_INT_REQ_13. 3. The text of the banner to be displayed in the welcome page, warning for changes in the CHD, from the date indicated by the "Scheduled warning" threshold (e.g. 2 days before the scheduled date) until an equivalent time after the scheduled date of update in the CHD (e.g. 2 days after). 4. The list of "Legal/ Operational" references that should be displayed in the CHD "welcome" section of the CHD web console portlet (refer to SSN_CHD_MARCIS_INT_REQ_10 for the management of references and the SSN_CHD_MARCIS_INT_REQ_19 point 5 for the "welcome" section structure) 5. The text of the MAR-CIS disclaimer that, based on MARCIS_REQ_9, users authorised to access MAR-CIS, should visualise/ accept in order to access the MAR-CIS datasheet information. 	

Ref: SSN_CHD_MARCIS_INT_REQ_6	Priority: P1 Nature: M RFC ref: 15055
<p>"Scheduled" cut-off Date/Times for expected new versions of MAR-CIS 2 will be set via the MAR-CIS 2 content management portlet by authorised MAR-CIS 2 content administrators. Furthermore a "version identifier" ("Scheduled Release") of the "MAR-CIS 2" version will be set via the MAR-CIS 2 management console. The MAR-CIS 2 "version" identifier will be generated automatically and have the value:</p> <p>"MARCIS_[Scheduled cut-off Date]"</p> <p>Example: MARCIS_20122016</p> <p>Along with the configuration of a "scheduled" date administrators shall be able to update:</p> <ol style="list-style-type: none"> 1. The "welcome" text that the users will view upon accessing the MAR-CIS 2 web console portlet (e.g. conditions of use). 2. The text of the MAR-CIS disclaimer envisaged in MARCIS_REQ_10 which MAR-CIS users 	

should visualise and accept any time the login into MAR-CIS 2 in order to access the MAR-CIS datasheet information.

3. The default "datasheet design" template (refer to **SSN_CHD_MARCIS_INT_REQ_22**) enabling the linking of document references to specific categories/ subcategories or and/ or specific attributes of a datasheet as well as linking glossary terms as tooltips to the labels of specific attributes.

Ref: SSN_CHD_MARCIS_INT_REQ_7	Priority: P1 Nature: M RFC ref: 13269
<ol style="list-style-type: none"> 1. In the CHD application shall be possible to maintain, at any time, at least three versions of a CHD Hazmat item. <ol style="list-style-type: none"> a. The "on-line" version – Is the version that standard users (users with roles CHD GUEST, CHD SSN USER) access via system or web interface. b. The "working version" – Is a version that is accessible by the CHD content administrator as long he/ she performs changes to a Hazmat item that shall become applicable on or after a certain cut-off date/time. When a working version for the record is created initially the content of the "on-line" version of the item shall be "cloned" to it. The system shall propose as cut-off date/time the date included as value of the "schedule" cut-off data/time parameter for the relevant code (see SSN_CHD_MARCIS_INT_REQ_5 above). However the CHD administrator will have the option to alter the cut-off date/time and use another date time than the "scheduled" one (e.g. because he/she is forced to align a specific item release with a change announced by the IMO). c. The "target" version – This is the definite "future" version of an item created after the CHD content administrator finishes with all the changes of the CHD in the "working" version of it and decides that the item could be released (at the date planned for it). No further changes will be allowed to the "target" version of the CHD hazmat item after the creation of the target version (with the exemption of a potential deletion of it). 2. As soon as a "target version" for an item is created (for e.g. datetime T1), the CHD content administrator may, if he/ she wishes, create another working version of the item corresponding to a different cut-off date/time (e.g. T2). <u>The timestamp T2 could be set at a date after T1. The target version for T2 could be only generated after the version of the Hazmat item is released in T1.</u> <p>The CHD content administrator may search and retrieve at any time, via the CHD content management console, any version of those that are mentioned above. However he/she may introduce updates only in the "working" version of an item.</p> 3. The version of the CHD shown to standard users will not strictly follow the dates of updates of specific items in the CHD. It shall correspond to the version number set via the "Scheduled Release" parameter via the management console. At any date between two scheduled updates the version number indicated to all the users shall be the one that the Scheduled release date is "in the past" with respect to system date/time. That is if one update occurred in 2014 (e.g. CHD_IMDG_15062014) and another is to take place in 2016 (e.g. CHD_IMSBC_02102016) in the event that a user is to query the CHD on 11/11/2015, he/she will see as a version number the CHD_IMDG_15062014. 	

Ref: SSN_CHD_MARCIS_INT_REQ_8	Priority: P1 Nature: M RFC ref: 15055
<p>1. In the MAR-CIS 2 application it shall be possible to maintain, at any time, at least three versions of a MAR-CIS 2 dataset.</p> <p>a. The "on-line version" – Is the version that users with role MAR-CIS USER, CHD USER access via web interface or the version that user with role MAR-CIS USER access via the mobile application.</p> <p>b. The "working version" – Is a version that is accessible to the MAR-CIS 2 content administrator as long he/ she performs changes to a datasheet that shall become applicable on or after a certain cut-off date/time. When a working version for the record is created initially the content of the "on-line" version of the item shall be "cloned" to it. The system shall propose as cut-off date/time the date and time included as value of the "schedule" cut-off parameter (see SSN_CHD_MARCIS_INT_REQ_6 above). However the MAR-CIS 2 administrator will have the option to alter the cut-off date/time and use another date/time than the "scheduled" one.</p> <p>c. The "target" version – This is the definite "future" version of an item created after the MAR-CIS content administrator finishes with all the changes of the CHD in the "working" version of it and decides that the item could be released (at the date planned for it). No further changes will be allowed to the "target" version of the datasheet after the creation of the target version (with the exemption of a potential deletion of it).</p> <p>2. As soon as a "target version" for an item is created (for e.g. date/time T1), the MAR-CIS 2 content administrator may, if he/ she wishes, create another working version of the item corresponding to a different cut-off date/time (e.g. T2). <u>The timestamp T2 will be set at a date after T1. The target version for T2 could be only generated after the version of the Hazmat item is released in T1.</u></p> <p>The MAR-CIS 2 administrator may search and retrieve at any time, via the CHD content management console, any version of those that are mentioned above. However he/she may introduce updates only in the "working" version of an item.</p> <p>3. The version of the MAR-CIS 2 shown to standard users will not strictly follow the dates of updates of specific datasheets in the MAR-CIS 2. It shall correspond to the version number set via the "Scheduled Release" parameter via the management console. At any date between two scheduled updates the version number indicated to all the users shall be the one that the Scheduled release date is "in the past" with respect to system date/time. That is if one update occurred in 2014 (e.g. MARCIS_20122014) and another is to take place in 2015 (e.g. MARCIS_20122015) in the event that a user is to query the MAR-CIS 2 on 11/11/2015, he/she will see as a version number the MARCIS_20122014.</p>	

Ref: SSN_CHD_MARCIS_INT_REQ_9	Priority: P1 Nature: D RFC ref: 13269
<p>The following more flexible approach for managing updates is desirable. <u>If EMSA will choose to implement this desirable requirement, the bullet point 2 in the requirements SSN CHD MARCIS INT REQ 7 and SSN CHD MARCIS INT REQ 8 shall be ignored and the creation of working versions will conform with the requirement below.</u></p> <p>In order to cover all possible scenarios of data updates the system implementation should allow the co-existence of:</p> <p>1. a working and/ or the target version of an item in CHD or datasheet in MAR-CIS 2 corresponding to a cut-off date/time at e.g. T1; and</p>	

2. an additional working version of the item or datasheet at T2 (T2 timestamp can be **before T1 or further** in the future than T1).

This second version shall be created by cloning the content of the on-line version of CHD or MAR-CIS 2 or the one available from the:

- working with cut-off date/time T1; or
- target version with cut-off date/time in T1

Depending if, at the moment of the creation of the second working version, there is, available in the system, the "working" or "target" version of the item to be released in T1.

As a consequence of the above more flexible update process, the System implementation would allow the creation of the target date at T1 effectively allowing to maintain in the system:

- The "on-line" version;
- Up to **two sets of future releases** of an item/ datasheet in "working" or "target" version mode.

9.5 Management and display of references

Ref : SSN_CHD_MARCIS_INT_REQ_10	(CHDcont) – Web Interface (CHD content manager)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISCont) – Web Interface (MARCIS content manager)	Priority: P1 Nature: M RFC ref: 13269
	(CHDweb) – Web Interface (CHD web user)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISweb) – Web Interface (MARCIS web user)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISmob) – Web Interface (MARCIS mobile user)	Priority: P2 Nature: M RFC ref: 13269

- The following information will be maintained, in a table (used by both CHD and MAR-CIS applications) within the CHD schema, for each reference document in the CHD:
 - A textual description (mandatory field);
 - A non-mandatory field which stores the complete reference (hyperlink) to a location in the web or a document server maintained at EMSA where a version of the document in any of the formats supported by SSN (e.g. pdf, Excel, Word, XML, etc.) could be stored;
 - A comments/ note field (non-mandatory);
 - CreateOn and Last Update datetime fields (Last Update field could be null);
 - Using the CHD content management portlet, the administrator could associate one or more "reference" documents to a CHD release at CHD "welcome" page level (in line with **CHD_REQ_7**).
- The list of "Legal/ Operational" references that should be displayed in the CHD "welcome"

section will be configured in the way defined in **SSN_CHD_MARCIS_INT_REQ_5**.

3. Using the MAR-CIS 2 content management portlet with the aid of MAR-CIS design templates (refer to **SSN_CHD_MARCIS_INT_REQ_22**), the administrator could associate one or more "reference" document to a given HAZMAT item. The association of a reference document could be possible:
 - a. At specific HAZMAT item level;
 - b. At specific attribute level within a HAZMAT item.

Note:

The potential association or references at HAZMAT item level or attribute within specific item level stems from MAR-CIS 2 functional requirements **MARCIS_REQ_7**. That is the association of references at these levels will be made using the MAR-CIS datasheet design templates and the references shall be visible only to users authorised to access the MAR-CIS datasheets. For the requirement concerning design datasheets refer to **SSN_CHD_MARCIS_INT_REQ_22**.

1. In all the cases above, upon user accessing the relevant page he/she may visualise:
 - a. The textual reference of the reference;
 - b. The hyperlink to the reference.
2. In case the reference(s) is (are) displayed in the CHD welcome page, the textual description shall be always visible while the actual document could be directly accessed by clicking to a "magnifier" button with tooltip "Access to document".
3. In case the reference(s) is (are) displayed in Hazmat item or attribute level, both textual description and hyperlink to the actual document shall be accessed by clicking a "magnifier" button which shall open a pop-up window or portlet which displays:
 - a. The textual description of the reference;
 - b. A magnifier button with tooltip "Access to document".

Ref: SSN_CHD_MARCIS_INT_REQ_11	(MARCISCont) – Web Interface (MARCIS content manager)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISweb) – Web Interface (MARCIS web user)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISmob) – Web Interface (MARCIS mobile user)	Priority: P2 Nature: M RFC ref: 13269
<ol style="list-style-type: none"> 1. The following information, for each reference in MAR-CIS 2, will be maintained in the table within the MAR-CIS 2 schema: <ol style="list-style-type: none"> a. A textual description (mandatory field); b. A non-mandatory field which stores the complete reference (hyperlink) to a location in the web or a document server maintained at EMSA where a version of the document in any of the formats supported by SSN (e.g. pdf, Excel, Word, XML, etc) 		

- could be stored;
- c. A "notes" field (non-mandatory);
 - d. CreateOn and Last Update datetime fields (Last Update field could be null).
2. Using the MAR-CIS 2 content management portlet and a datasheet "design" template (refer also to requirement **SSN_CHD_MARCIS_INT_REQ_22**), the administrator could associate one or more "reference" documents to a datasheet. The association of a reference document could be possible:
 - a. At Datasheet level;
 - b. At specific category / subcategory level;
 - c. At specific attribute level within a datasheet (refer to **MARCIS_REQ_5** and **MARCIS_REQ_7**).
 3. In all three cases above, upon user accessing the relevant page he/she may visualise:
 - a. The textual reference of the reference;
 - b. The hyperlink to the reference.
 4. Both textual description and hyperlink to the actual document shall be accessed by clicking a "magnifier" which shall open a reference pop-up window which displays:
 - a. The textual description of the reference;
 - b. A magnifier button with tooltip "Access to document".

Note:

For better performance of the mobile applications, the references table shall be stored in the mobile device. When a user access a MAR-CIS 2 datasheet via a mobile device, along with the data to be downloaded to the device for a given datasheet the "relations" to the references will also be downloaded, enabling a presentation of the references to the mobile users upon "browsing" the datasheet description.

9.6 Management and display of MAR-CIS 2 glossary

Ref: SSN_CHD_MARCIS_INT_REQ_12	(MARCISCont) – Web Interface (MARCIS content manager)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISweb) – Web Interface (MARCIS web user)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISmob) – Web Interface (MARCIS mobile user)	Priority: P2 Nature: M RFC ref: 13269
<ol style="list-style-type: none"> 1. The following information will be maintained in table within the MAR-CIS 2 schema for each term included in the MAR-CIS 2 glossary (refer to the appendix F) : <ol style="list-style-type: none"> a. A textual description (mandatory field); b. CreateOn and Last Update datetime fields (Last Update field could be null). 2. Using a MAR-CIS 2 datasheet "design" utility, the MAR-CIS 2 content administrator could associate one or more glossary terms to specific datasheet attributes. 		

3. The glossary term shall be displayed as a "tooltip" when a user "hovers" over the attribute label of a datasheet.
4. For better performance of the mobile application, the glossary terms and their relationship to datasheet attributes shall be stored in the mobile device. Glossary terms will be presented as tooltips, upon hovering, also for mobile users.

9.7 Structure/ Content of e-mail warnings sent by the CHD applications

Ref: SSN_CHD_MARCIS_INT_REQ_13	Priority: P1 Nature: M RFC ref: 13269
<p>CHD e-mail warning shall be provided to authorised users (those having the role CHD_EMAIL_RECIPIENT enabled) at a defined time prior to the "Scheduled Date" (entry in to force) of the new on-line version due to a change to a specific code.</p> <p>The e-mail will be sent at the date/time set via the content management portlet (with reference to SSN_CHD_MARCIS_INT_REQ_5) the date/time that the e-mail should be scheduled for despatch is ["Schedule Date" datetime minus the threshold defined in the "scheduled warning"].</p> <p>The e-mail warning shall provide details:</p> <ul style="list-style-type: none"> <u>In the e-mail subject:</u> IMO code (s) to be updated and expected cut-off date/time of the new on-line version. <u>In the body of the e-mail:</u> A standard text (to be agreed with EMSA during the design phase). 	

Ref: SSN_CHD_MARCIS_INT_REQ_14	Priority: P2 Nature: D RFC ref: 13269
<p>CHD e-mail warning to users could be sent exceptionally for warning users on <u>the update of specific Hazmat item (s)</u>. The warning will be sent few days before the actual "target release date" of a hazmat item (based on the value of the "scheduled warning" value and the actual target date set by the administrator for the item). It will be sent only if the administrator will specifically indicate his/ her wish to despatch a warning by setting the value of a specific attribute (named "Despatch e-mail warning "YES" to "true" upon editing the working version of an item.</p> <p>This e-mail shall provide details:</p> <ul style="list-style-type: none"> <u>In the e-mail subject:</u> Hazmat item to be updated and expected date/time for the target release. <u>In the body of the e-mail:</u> A standard text (to be agreed with EMSA during the design phase). <p>This e-mail could be sent only to users that are authorised to receive e-mail warnings (those having the role CHD_EMAIL_RECIPIENT enabled).</p>	

Ref: SSN_CHD_MARCIS_INT_REQ_15	Priority: P1 Nature: M RFC ref: 13269
---------------------------------------	--

As stated previously in **SSN_CHD_MARCIS_INT_REQ_4** an e-mail warning will be sent from the CHD application to the MAR-CIS 2 content administrators (those users with the role CHD_WORKVERSION_WARNING_EMAIL_RECIPIENT enabled) upon the first update action that a CHD administrator will execute on the working version of a CHD item that belongs to one of the three IMO codes with MAR-CIS relevance.

This e-mail shall provide details:

- In the e-mail subject: Hazmat item under update and the expected date for the target release of the item.
- In the body of the e-mail: A standard text (to be agreed with EMSA during the design phase).

9.8 Data import/ export utilities

Ref: SSN_CHD_MARCIS_INT_REQ_16	(CHDcont) – Web Interface (CHD content manager)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISCont) – Web Interface (MARCIS content manager)	Priority: P1 Nature: M RFC ref: 13269
	(CHDweb) – Web Interface (CHD web user)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISweb) – Web Interface (MARCIS web user)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISmob) – Web Interface (MARCIS mobile user)	Priority: P2 Nature: M RFC ref: 13269
<ol style="list-style-type: none"> 1. The templates to be utilised for data import (refer to requirements CHD_REQ_3, CHD_REQ_4, MARCIS_REQ_17) or export (refer to CHD_REQ_7, MARCIS_REQ_17) shall be agreed between EMSA and the contractor during the design phase. 2. The application shall include properly designed utilities for uploading data to the CHD, enabling the execution of the following: <ol style="list-style-type: none"> a. Importing Hazmat items to CHD (into a temporary cache); b. Detecting structural rules / business rules violation in data to be imported and presenting these data in a list to enable administrators to correct inconsistencies manually. Data presenting no inconsistencies will not be visualised (otherwise the utility shall not be practically usable); c. Creating working versions of item(s) that will be modified from data imported (if a working version is not already available in the system); d. Storing the imported data to the working version of the Hazmat item(s). 3. The application shall include properly designed utilities for importing data to MAR-CIS 2: <ol style="list-style-type: none"> a. Importing datasheet data to MAR-CIS 2 (into a temporary cache). b. Detecting structural rules / business rules violation in data to be imported and 		

presenting these data in a list to enable administrators to correct inconsistencies manually. Data presenting no inconsistencies will not be visualised (otherwise the utility shall not be practically usable).

- c. Creating working versions of datasheet (s) that will be modified from data uploaded (if a working version is not already available in the system).
- d. Storing the uploaded data to the working version of the datasheet(s).

The design approach for the utilities and method to perform structural/ business validation of data to be imported shall be agreed between EMSA and the contractor during the design phase.

9.9 Data logging

Ref: SSN_CHD_MARCIS_INT_REQ_17	(CHDcont) – Web Interface (CHD content manager)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISCont) – Web Interface (MARCIS content manager)	Priority: P1 Nature: M RFC ref: 13269
	(CHDweb) – Web Interface (CHD web user)	Priority: P1 Nature: M RFC ref: 13269

1. Both CHD and MAR-CIS 2 schemas shall include properly designed tables for logging information concerning modifications made by the content administrators. In terms of MAR-CIS 2 the information to be logged is that mentioned in **MARCIS_REQ_15**. In terms of CHD the information to be logged are similar to that logged for MAR-CIS 2, that is:

- A reference number for the update action;
- The Hazmatid of the item amended and its name;
- The datetime the item was first created;
- The datetime of the update action;
- The expected target release date/time for the item;
- An indication of the (status quote) nature of update action:
 - The indication "E" (edit) shall be used, if the action was concerning a partial update of some fields in the working version and after saving it, it will still remain in "working mode".
 - The indication "D" (definite) will be used upon completion of all the updates and commitment of the "target" release of the item in the database.
- An indication of the userID of the user undertaking the update action;
- A "comment" field.

2. The logging information shall be presented to administrators in an appropriate format, an example is the tabular format in **MARCIS_REQ_15**. Administrators should be in a position to hide/ unhide specific logging attributes and/ or limit the logging results in one of the following ways:

- a. "Show" logging information executed in MAR-CIS or CHD schema (for Code X) between datetime A and datetime B (Period between A and B could be maximum one month –

default period (pre-chosen) one day).

- b. "Show" all logging information in the working version of specific Hazmat item or MAR-CIS 2 datasheet (selected on the basis of its HazmatID or MarcisID or item/ substance name) between the [A chosen datetime (default, pre-chosen value=System DateTime) – Last online release of the item/ datasheet]
3. In relation to the requirement **CHD_REQ_7** and in particular the function enabling a CHD SSN user to consult the history of changes in the CHD, it is noted that when a CHD SSN user requests for such history, the system would retrieve from the CHD logs those changes only that are registered with status code "D".

9.10 "Intelligent search"

Ref: SSN_CHD_MARCIS_INT_REQ_18	Priority: P2 Nature: D RFC ref: 13269
<p>Apart and beyond the search facilities foreseen in:</p> <ol style="list-style-type: none"> a. MARCIS_REQ_4, MARCIS_REQ_10 (see also Figure 7) for MAR-CIS 2; and b. section 3.3 and CHD_REQ_7 for CHD. <p>The application should provide (highly desirable) "contextual" search facilities to users of MAR-CIS or CHD. In this respect in a single search field the user may start entering part of the text string or the whole text string associated with any of the distinct search criteria mentioned in the requirements above and the application should be intelligent enough to instantly display all the corresponding items or datasheets.</p> <p>The contextual search shall be added (in the case that EMSA will decide to include in the contract the implementation of this requirement) as a "contextual search" frame in the data search/consultation portlet that is to be implemented in line with the requirement SSN_CHD_MARCIS_INT_REQ_19 below.</p> <p>Note:</p> <p>The cost / effort of including the contextual search frame in the data consultation portlet (refer to the next requirement) should be included in the cost of the implementation of the requirement SSN_CHD_MARCIS_INT_REQ_18.</p>	

9.11 Web consoles design

Ref: SSN_CHD_MARCIS_INT_REQ_19	(CHDcont) – Web Interface (CHD content manager)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISCont) – Web Interface (MARCIS content manager)	Priority: P1 Nature: M RFC ref: 13269
	(CHDweb) – Web Interface (CHD web user)	Priority: P1 Nature: M RFC ref: 13269
	(MARCISweb) – Web Interface (MARCIS web user)	Priority: P1 Nature: M RFC ref: 13269

Having regard that:

- The HAZMAT item “search” work-flow for CHD is clarified in section 3.3 and **CHD_REQ_(7 and 9)**.
- The MAR-CIS 2 datasheet “search” work-flow is in line with **MARCIS_REQ_4, MARCIS_REQ_10**.
- The CHD users will only access MAR-CIS 2 specific data for specific Hazmat items only if they are authorised to access MAR-CIS 2 and only if they specifically wish to do so.

The following additional clarifications to requirements **CHD_REQ_(7,9) MARCIS_REQ_(3,4,5,6,7,10)** apply:

1. The design specification for MAP are included in Appendix J.
2. Portlets utilised by CHD users and MAR-CIS 2 users will conform with the functional requirements mentioned above.
3. Portlets utilised by CHD content administrators and MAR-CIS content administrators will conform with the functional requirements mentioned above and the additional clarifications on the implementation approach provided in chapter 9.
4. Via the MAP, and utilising distinct URLs, a user, based on his/her access rights configuration in CMC (IdM)⁷ will access a “CHD web console” portlet or a “MARCIS web console” portlet, as follows:
 - a. CHD web console portlet. This portlet is accessed by users that are assigned one or more of the following profiles
 - CHD GUEST

⁷ The provision of liferay portal MAP application will be performed by CMC based on a profile/role information stored in IdM. CMC and the contractor of CHD/MAR-CIS application however will need to agree on the urls pointing to the web consoles.

- CHD SSN USER
 - CHD CONTENT ADMINISTRATOR
- b. MAR-CIS 2 web console portlet. This portlet is accessed by users that are assigned one or more of following profiles
- MARCIS USER
 - MARCIS CONTENT ADMINISTRATOR
 - MARCIS PRIME ADMINISTRATOR
5. Upon accessing the web console corresponding to his/ her access rights, the user will visualise a "welcome" frame ("expanded" by default) and one or more MAP-like icons pointing to:
- a. *(All type of users)* A "Data consultation" url (through which the user is granted access to either a "CHD/ MAR-CIS data consultation" portlet (users with access permissions like in b.i above) or a MAR-CIS data consultation portlet (users with access permissions like in b.ii above).
 - b. *(only the users granted the role "CHD_EMAIL_RECIPIENT")* An "eMail warning" url (used for accessing an "e-mail warning configuration" portlet where the user could enable / disable the receipt of e-mail notifications for scheduled releases – refer to **CHD_REQ_6**).
 - c. *(Application content and / or account administrators only)* URLs pointing to:
 - i. Content management portlets.
 - ii. Account administration portlets.
6. The structure of the welcome frame within the web console shall present:
- a. In the case of MAR-CIS 2, the disclaimer foreseen in the **MARCIS_REQ_3** and **MARCIS_REQ_10** plus, eventually, a text explaining the scope/ content/ conditions of use of MAR-CIS. The users should accept the disclaimer in order to browse MAR-CIS datasheet information during the on-going session.
 - b. In the case of CHD, in line with the requirement **CHD_REQ_7** and for meeting requirement **MARCIS_9**:
 - 1. a welcome text (to be agreed with EMSA during the design phase);
 - 2. List of legal/ operational references (refer also to the requirement **SSN_CHD_MARCIS_INT_REQ_10**);
 - 3. *(only for users enabled to access MAR-CIS detailed information)* A MAR-CIS disclaimer which the users have to accept for browsing MAR-CIS datasheet information during the on-going session.
7. The structure of the "CHD/ MAR-CIS data consultation" portlet or the "MARCIS data consultation" portlets caters for the following:
- a. A "contextual search" frame (subject to the implementation of the desirable requirement **SSN_CHD_MARCIS_INT_REQ_18** above).
 - b. A "Criteria-based" search frame ("expanded" in default) which shall enable the

execution of searches:

- i. In line with requirements **MARCIS_REQ_4**, **MARCIS_REQ_10** for the "MARCIS data consultation" portlet.
- ii. In line with section 3.3 **CHD_REQ_7** and **CHD_REQ_9** for the "CHD/ MAR-CIS data consultation" portlet.
- c. A "Display search results" frame which is collapsed before the execution of a search and expanded when the search results are available.

The results shall be presented in appropriate (in terms of ergonomics) format and shall include:

1. In the case of "CHD/ MAR-CIS data consultation" the attributes 1 to 6, and 13 of table mentioned in **CHD_REQ_1**.

Note that the button to the MAR-CIS datasheet (attribute 13 as per table mentioned in **CHD_REQ_1**) is (are) only presented if the value of attribute 14 is TRUE and the reference key(s) MarcisID(s) has been recorded in the CHD schema.

Further note that when the user will click on the button for a MAR-CIS 2 datasheet, the user will be re-directed to the portlet displaying the corresponding MAR-CIS 2 datasheet.

2. In the case of MAR-CIS 2 consultation, the following attributes: The MAR-CIS 2 datasheet's name shall be presented as search result. In addition the CAS number and the UN number if available shall be displayed.
3. By double clicking on any of the attributes in a line presenting a datasheet in the results, the user will be re-directed to the portlet displaying the corresponding MAR-CIS 2 information.
8. The design of the portlets for content administration shall be proposed by the contractor and agreed with EMSA during the design phase. For 'MAR-CIS content management' portlet, attention is also drawn to the fact that it should provide access to a datasheet design utility to allow the configurations associated with the linking of references and glossary terms in line with the requirement **SSN_CHD_MARCIS_INT_REQ_11** and **SSN_CHD_MARCIS_INT_REQ_12**. The functionality associated with design templates is clarified in **SSN_CHD_MARCIS_INT_REQ_22**. Furthermore should include utilities allowing the content administrators to include or modify the data in the values lists used by the applications (e.g. refer to the value lists included in the Appendix D).
9. The portlet enabling authorised CHD users to configure e-mail alerts for CHD scheduled releases will include a "radio" button for enabling/ disabling the reception of e-mail warnings for changes in the CHD. The default setting is "disable".

9.12 Management of updates of the MAR-CIS 2 mobile application

Ref: SSN_CHD_MARCIS_INT_REQ_20	Priority: P1 Nature: M RFC ref: 13269
<p>EMSA shall appoint a third party trusted service provider for management of the uploading and maintenance of the proper version of the MAR-CIS 2 mobile application in the GooglePlay, AppleStore, etc.</p> <p>The CHD / MAR-CIS contractor shall include, in to the installation configuration manuals of MAR-CIS 2, all the necessary information for EMSA code administrators and the third party trusted service provider for generating the executable files for the mobile application. In this respect the following should be defined/ agreed with EMSA:</p> <ol style="list-style-type: none"> 1. Method of importing the new version of the disclaimer foreseen in MARCIS_REQ_11 to the code of mobile application updates; 2. Method of exporting the glossary from the MAR-CIS 2 and its associations with the labels of specific attributes and importing them into the code; 3. Method for exporting references from the web application and their associations with specific attributes and importing them into the mobile application code. 	

9.13 CHD system interfaces

Ref: SSN_CHD_MARCIS_INT_REQ_21	Priority: P1 Nature: M RFC ref: 13269
<p>On the basis of the information in Appendix A, section I , the contractor shall present to EMSA during the design phase, an appropriate XSD schema for the CHD system interface and a System Interface guide (SIG) covering:</p> <ol style="list-style-type: none"> a. CHD request/ response services b. CHD subscription/ Announcement service <p>The System Interface Guide shall be delivered to EMSA during the design phase of the project and agreed with EMSA. The document will follow in terms of content organisation the template of other SIGs for services integrated into the SSN central system portfolio (refer to the sample document in the Appendix N which could provide an indication of the organisation of the content and a paradigm for other services exposed by the SSN central system).</p> <p>The implementation of the services is within the scope of the contract and will be executed on the basis of the to-be-agreed SIG.</p> <p>For the design of the services and in particular, the authentication/ authorisation method which shall be implemented (refer also to section 9.1.1 and the SSN_CHD_MARCIS_INT_REQ_4 point 5) in accordance with the following requirements:</p> <ol style="list-style-type: none"> 1. The following are the practices adopted by EMSA: <ol style="list-style-type: none"> a. The configuration of the system interface shall allow: <ol style="list-style-type: none"> i. SOAP-based exchange; ii. REST full-based exchange. b. Authentication approach (e.g. WSA for SOAP-based web services) shall be agreed 	

with EMSA at the beginning of the design phase.

- c. External systems accessing CHD application may connect over a secured SSL connection (HTTPS – e.g. systems external to EMSA) or a standard http-based connection (e.g. system internal to EMSA). As a standard practice in EMSA the connections to systems external to EMSA are protected using 2Way SSL.
2. To facilitate the easier adaptation of internal EMSA resources for the CHD application, the connection of the external systems to CHD shall benefit from the proxy services offered by an enterprise service bus (EMSA has implemented Oracle Service bus – refer to the Figure 8 and the EMSA technical landscape documentation attached as Appendix 1, to Annex II of the draft Service Contract.
3. The authorization of the system user accessing CHD will be based on the role information registered in the LDAP of EMSA.
4. The request/ response service will adopt the asynchronous model of all similar SSN-compatible services.

9.14 MAR-CIS 2 "Datasheet design" templates

Ref: SSN_CHD_MARCIS_INT_REQ_22	Priority: P1 Nature: M RFC ref: 15055
<p>For compliance with MAR-CIS 2 functional requirements associated with the management of updates of reference documents and glossary terms within the datasheets, there is a need to implement "datasheet design" template, accessed only by the MAR-CIS 2 content administrators via the content management portlet of MAR-CIS 2. The following implementation workflow and rules are applicable:</p> <ol style="list-style-type: none"> 1. The design of the MAR-CIS 2 datasheet shall be customisable to enable MAR-CIS 2 content administrators to adjust the attributes and categories that are to be visible/ exported in pdf / printed for a specific MAR-CIS 2 datasheet. 2. At the time of introduction in the system of a new scheduled release of MAR-CIS 2 (refer to the requirement SSN_CHD_MARCIS_INT_REQ_6) the MAR-CIS 2 content administrator will be warned to review and update a "default" design template for MAR-CIS 2 datasheets. This template apart from linking, database information contents, references and glossary terms (as previously explained in SSN_CHD_MARCIS_INT_REQ_11 and SSN_CHD_MARCIS_INT_REQ_12) shall be also used for applying "default" visibility /print/export rules for the data attributes and/ or for globally for categories/ subcategories of attributes in a datasheet. 3. At the time of creating/ updating the working version (refer to SSN_CHD_MARCIS_INT_REQ_8) of a specific datasheet in MAR-CIS 2, the content administrator shall be given the option to create, through customisation of the "default" design template, the specific template to be used for the datasheet (by e.g. adding/ amending references, removing/updating/adding tooltips linked to attributes and amending attribute visibility/ export/print rules). 4. The MAR-CIS 2 content administrator may update the customised design of a specific datasheet at any time as long the datasheet remains in "editing" mode in the working version. As soon as the "target" version of the datasheet is created, shall not be possible to introduce further changes in the specific datasheet's design. 5. Given the requirement MARCIS_REQ_5, attributes in a datasheet which have a "null" value in the database, shall not be displayed/ exported/ printed. The administrator should have the option to show or not the null information. 6. To ensure that the presentation of the content of a datasheet in the web browser or mobile device is not substantially distorted (due to design customisations and/ or non-visibility of certain attributes due to null values), the design of the application will warranty at minimum: <ol style="list-style-type: none"> a. The "bounding box" for images displayed within a category/ subcategory will be assessed by the ergonomic expert participating in the contractor team and agreed with EMSA during the design phase. b. The visible space on a browser or pdf print-out for a category/ subcategory will be fixed within a max/minimum value (to be proposed by the ergonomics expert of the contractor following an assessment of the "example" datasheet in Appendix E) and the maximum size of a text strings, images. The limits for the "bounding box" for each category/ subcategory shall be agreed with EMSA during the design phase. 	

Different sizing limits could be applicable for the web application, a tablet application, mobile phone application and print-outs.

- c. The bounding box size shall be adjusted within the agreed limits for each category, and application (web browser on desktop or mobile device) taking into consideration the size of content to be displayed.
- d. If, despite the sizing of the bounding box e.g. to the smallest possible size for the category, will leave "empty" space, this space will be concentrated to the "bottom" of the bounding box for the category/ subcategory.

9.15 Guest users access

The current version of IdM does not support the self-registration of a user name and password for the users to be assigned the CHD GUEST role. Self-registration, as described in chapter 7.1.8, will be made possible after the upgrade of IdM (at a still unknown date). The following alternative solutions are envisaged for mitigating the issue:

- For a transitional period (until the new version of the IdM becomes available) CHD account administrator will create a single GUEST account whose access credentials details will be disclosed to the general public (guest users) via a portlet (a web page) reached via the "public" home page of MAP. All the guest users will access the application using the GUEST account credentials. This solution is compatible with MAP functionalities, IdM functionalities and the mandatory requirements in chapters 7 and 9.
- For a transitional period users accessing CHD via a "public" CHD application which shall be accessible via the MAP public home page (refer to the desirable requirement **SSN_CHD_MARCIS_INT_REQ_23**) below.

The choice of the option to be followed will be defined by EMSA at the design stage.

Ref: SSN_CHD_MARCIS_INT_REQ_23	Priority: P2 Nature: D RFC ref: 13269
<p>A distinct public front-end application shall be designed and implemented. It shall comply with the following requirements:</p> <ol style="list-style-type: none"> 1. There shall be a welcome message/display explaining the background and content of the CHD as well as providing links to reference documentation, legal instruments and user manual. EMSA will provide the relevant content of the welcome page during the development. The welcome page will inform of the CHD updates by a banner which will be displayed few days before (configurable based on "scheduled warning threshold" ref: SSN_CHD_MARCIS_INT_REQ_5) and few days after (configurable based on "scheduled warning threshold") each update of the CHD. The date and version number of the last CHD update of the content should remain displayed on this welcome page. 2. Users of the public application will be given the same search functions as introduced in chapter 7.1.6, with the limitation that guest users will not have access to MAR-CIS 2 nor to the history of changes, and that the export of search results will be allowed only in pdf format and will not include the indication of MAR-CIS 2 data. 3. The public front-end shall be defined as a system user accessing CHD resources with CHD_GUEST role access rights. It will communicate with CHD application utilising (subject to contractor evaluation and cost/ benefits) either a request/ response mechanism to be established based on CHD_REQ_10 or a lightweight REST full services based mechanism 	

specifically designed to be used by the public front-end..

4. The front-end will have the look and feel of the CHD web console.

10. Non-functional/ performance/ security requirements

In this Chapter, each requirement is given a reference number and a priority: higher priority "P1", lower priority "P2". A further distinction is made: **"M" – Mandatory requirements** on which a quotation should be definitely included in the offer made and **"D" – Desirable requirements** on which a quotation is desirable.

10.1 Non-functional/ performance security requirements applicable for both CHD and MAR-CIS 2 applications

10.1.1 Compliance with SSN non-functional requirements

Ref: SSN_CHD_MARCIS_INT_REQ_24	Priority: P1 Nature: M RFC ref: 13269
<p>If no specific reference is made in this chapter, the implementation of MAR-CIS/ CHD is bound by the general non-functional/ security requirements of all the applications included in SSN (refer to the Appendix H).</p> <p>All the application components shall be compliant to the EMSA BCF strategy to ensure Business Continuity (refer to "EMSA System and Application Technical Landscape" attached as Appendix 1, to Annex II of the draft Service Contract for details).</p>	

10.1.2 System Security

CHD_REQ_13 MARCIS_REQ_22	Priority: P1 Nature: M RFC ref: 13269
<p>All the components of CHD and MAR-CIS 2 applications (including the system-to-system interfaces) shall be aligned with SafeSeaNet IFCD chapter 7 and follow the security standards as applied in SSN (refer to Appendix H).</p>	

10.1.3 System Performance and Availability

CHD_REQ_12 MARCIS_REQ_21	Priority: P1 Nature: M RFC ref: 13269
<p>The CHD/ MAR-CIS modules, web consoles and system-to-system interface, shall be available as per SafeSeaNet IFCD standards (paragraph 4.3):</p> <ul style="list-style-type: none"> • twenty-four hours a day, seven days a week, • at a minimum of 99% over a period of one year, with the maximum permissible period of interruption of 12 hours. <p>The response time for requests should also be in accordance with the parameters established in the SafeSeaNet IFCD: data users should receive the desired information within an average of 30 seconds.</p>	

10.2 Non-functional/ performance requirements specific for the CHD application

10.2.1 System capacity

CHD_REQ_11	Priority: P1 Nature: M RFC ref: 13269
<p>The total number of HAZMAT items in the CHD would be around 5,000. The number of items per code varies from around 3,500 in the IMDG code to 50 in the list of oils in MARPOL Annex 1. The CHD will handle the following number of requests:</p> <ul style="list-style-type: none"> • 1,000 requests per day for HAZMAT product lists and 2,000 CHD downloads per year from users with the CHD SSN USER role (refer to Table 2), • 10,000 requests per day for individual HAZMAT items and 2,000 downloads per year from users with the CHD GUEST role (refer to Table 2), • 10,000 requests per day for HAZMAT items lists or 2,000 downloads per year through the system-to-system interfaces. 	

10.3 Non-functional/ performance requirements specific to MAR-CIS 2 application

10.3.1 System capacity

Ref: MARCIS_REQ_18	Priority: P1 Nature: M RFC ref:15055
<p>It is very difficult to estimate the number of requests that the web portal will receive and the number of downloads requests for the mobile application. Both interfaces are new therefore there is no experience on how the user will behave. In addition the MAR-CIS 2 information is to be used in emergency situations that are rare.</p> <p>It is expected that the number of MAR-CIS 2 web users to be around <u>96⁸</u>. Assuming that half of users will access the web portal each day and will request information on three different substances, the MAR-CIS 2 web portal may be accessed <u>144 times</u> per day.</p> <p>For the MAR-CIS 2 users via the CHD dataset <u>600 requests</u> per day are expected. This number is based on the ratio of MAR-CIS 2 entries (300) and CHD entries (5,000), times the expected number of request per day on individual data items from CHD (1,000 per day).</p> <p>For downloading the MAR-CIS 2 application for mobile devices, three users per State are expected, therefore <u>96 MAR-CIS App downloads</u> are expected.</p> <p>The number of MAR-CIS 2 entries should not exceed <u>300 entries</u> during the next 4 years of the project.</p>	

⁸ Assuming 3 users per each stakeholder: EU Member States (28) + EFTA coastal Member States (2) + EU candidate/acceding coastal States (2).

10.3.2 System Performance

Ref: MARCIS_REQ_19	Priority: P1 Nature: M RFC ref:15055
<p>The search function on both interfaces should be fast: the search result lists should appear before a maximum of two seconds.</p> <p>The MAR-CIS 2 information display and its pdf creation upon user request should be fast: the information should be displayed before a maximum of two seconds. The same quantitative criteria should be used for the pdf creation.</p>	

10.3.3 System availability

Ref: MARCIS_REQ_20	Priority: P1 Nature: M RFC ref:15055
<p>The MAR-CIS 2 web portal, system to download the mobile application and MAR-CIS 2 information that will be linked to the CHD database shall be available:</p> <ul style="list-style-type: none">– twenty-four hours a day, seven days a week,– at a minimum of 99% over a period of one year, with the maximum permissible period of interruption of 12 hours.	

11. Instructions for preparing the offer

In line with what is foreseen in the Point 15 (Award criteria) of the tender specifications, the offer for the module 1 of the Service Contract shall include:

- a. The information required as per Article 15.3 (a,b,c,d) of the tender specifications;
- b. The assigned team (names of team members, basic tasks assigned to each member for the provision of Module 1 services;
- c. The detailed breakdown, in terms of effort (person-days) and price, per expert profile for the execution of module 1. In this respect shall be followed the instructions here-after and the financial quotation shall respect the template included in the 'Enclosure 2 - Price grid for evaluating the offers'. In this respect the tenderers should take into account the fact that the objective of detailing the technical requirements in chapter 9 is not to "add" additional functionalities to those listed in chapters 7 or 8 but simply to clarify the anticipated implementation approach. Therefore the basis for effort/ price calculations shall be the requirements listed in chapters 7, 8 and 10.

With reference to the requests for wireframes/ mock-ups to support tender evaluation (refer to tender specifications article 15.3.f), the bidders should include in their offers:

- i. Wireframes or mock-ups of the web console portlet for CHD and MAR-CIS and mock-ups of the data consultation portlets taking into consideration the MAP design approach (refer to the requirements **SSN_CHD_MARCIS_INT_REQ_19 points 2,3,4,5**).
- ii. Wireframes or mock-ups of the "data search" and "results of the search" presentation in screens of iPad size and iPhone size (refer to **MARCIS_REQ_11**).

The mock-ups will be considered during the evaluation of the technical adequacy of the offer and evaluation of the bidders understanding of the requirements. Furthermore will be used for evaluating the capability of the contractor to design and implement an ergonomic and user friendly application.

Instructions for filling the bid template ('Enclosure 2 - Price grid for evaluating the offers'):

- A. The effort/ costs for testing during the FAT in line with the requirements in 'Annex C - Work Procedures for Project Delivery' shall be reflected to the effort/ cost to be quoted for the Quality Assurance / tester profile.
- B. Distinct quotations shall be provided for each of the requirements **CHD_REQ_1, CHD_REQ_2, CHD_REQ_6 and CHD_REQ_10 and MARCIS_REQ_12..**
- C. The rest of the requirements are grouped in the way indicated in the price grid. For each group effort/ price shall be provided taking into account the instructions in the table below.

Table 3 - Instructions FOR FILLING THE PRICE GRID

Requirements as they are grouped in the price grid in Enclosure 2	Instructions for effort/ costs calculations
CHD_REQ_1 [Content of the CHD]	Distinct quotation including the effort/costs concerning data organisation and data services implementation for the CHD application (refer to section 9.2, 9.1.2.1. and SSN_CHD_MARCIS_INT_REQ_3).
CHD_REQ_2 [CHD access rights]	Quotation of effort/costs concerning implementation of the business logic for access control enforcement for the CHD application and the implementation of interfaces with the CMC (IdM) for user authentication/ user provisioning as per SSN_CHD_MARCIS_INT_REQ_4 .
CHD_REQ_[3,4,5] [CHD Update and maintenance]	<p>Quotation including:</p> <ol style="list-style-type: none"> 1. The effort and cost for the functions listed in chapter 7 concerning content management. 2. The effort/costs concerning data organisation and data services implementation for the CHD application (refer to section 9.1.2.1 and SSN_CHD_MARCIS_INT_REQ_3). 3. The effort/costs concerning the parametrisation / scheduling of CHD application versions and associated welcome text, disclaimers and banners (SSN_CHD_MARCIS_INT_REQ_5) data update workflow (SSN_CHD_MARCIS_INT_REQ_7). 4. The effort/costs concerning the management of references as per SSN_CHD_MARCIS_INT_REQ_10 point 1 and 2. 5. The effort/costs concerning the provision of e-mail warnings structured as per SSN_CHD_MARCIS_INT_REQ_13 and SSN_CHD_MARCIS_INT_REQ_14. 6. The effort/costs concerning the CHD data import utilities as per SSN_CHD_MARCIS_INT_REQ_16. 7. The effort/costs for enabling CHD content administrators to access the data logging functionality as per SSN_CHD_MARCIS_INT_REQ_17. 8. Web console design effort/costs as per the additional clarifications given in SSN_CHD_MARCIS_INT_REQ_19 for functionalities accessed by CHD content administrators.
CHD_REQ_[7,9] [Consult CHD]	<p>Quotation including:</p> <ol style="list-style-type: none"> 1. The effort and cost for the functions listed in chapter 7 concerning the users access (CHD or CHD Guest users). 2. The effort/costs concerning the display of references as per SSN_CHD_MARCIS_INT_REQ_10. 3. The effort/costs concerning the display of glossary as per SSN_CHD_MARCIS_INT_REQ_12. 4. The effort/costs concerning the CHD data export utility. 5. The effort/costs for enabling CHD users to access the "history of changes" functionality as per SSN_CHD_MARCIS_INT_REQ_17. 6. Effort/ costs associated with business services design (those used by the web-based presentation layer of CHD (as per sections 9.1.2.2.) and the Web console design effort/costs as per the additional clarifications given in SSN_CHD_MARCIS_INT_REQ_19 for functionalities accessed by CSD web users.
CHD_REQ_6 [e-mail notifications]	The effort/costs to be quoted shall include the provision of e-mail warnings structured as per SSN_CHD_MARCIS_INT_REQ_13 and SSN_CHD_MARCIS_INT_REQ_14 .
CHD_REQ_8 and MARCIS_REQ_9 [Consult MAR-CIS via CHD]	Quotation including: he effort and cost for the functions listed in chapter 7 concerning the access of MAR-CIS by SSN CHD users (MARCIS_REQ_9) shall be grouped and quoted together with CHD_REQ_8.

Requirements as they are grouped in the price grid in Enclosure 2	Instructions for effort/ costs calculations
MARCIS_REQ_[1,13,16] [MAR-CIS database]	Quotation including: <ol style="list-style-type: none"> 1. The effort and cost for the functions listed in chapter 8 concerning the data storage and data services. 2. The effort/costs concerning data organisation and data services implementation for the MAR-CIS application (refer to section 9.1.3.1. and SSN_CHD_MARCIS_INT_REQ_3).
MARCIS_REQ_[2, 3(acc)] [MAR-CIS access rights and acc. manager]	Quotation of effort/costs concerning implementation of the business logic for access control enforcement for the MARCIS application and the implementation of interfaces with the CMC (IdM) for user authentication/ user provisioning as per SSN_CHD_MARCIS_INT_REQ_4 .
MARCIS_REQ_[3,4,5,6,7,10,14](web) [MAR-CIS web]	Quotation including: <ol style="list-style-type: none"> 1. The effort and cost for the functions listed in chapter 8 concerning the web interface for MAR-CIS users. 2. The effort/costs concerning the display of references as per SSN_CHD_MARCIS_INT_REQ_10. 3. The effort/costs concerning the display of references as per SSN_CHD_MARCIS_INT_REQ_11. 4. The effort/costs concerning the display of glossary as per SSN_CHD_MARCIS_INT_REQ_12. 5. The effort/costs concerning the MAR-CIS data export utilities for web and mobile applications. 6. Effort/ costs associated with business services design (those used by the web-based presentation layer of MAR-CIS and Web console design costs as per the additional clarifications given in SSN_CHD_MARCIS_INT_REQ_19 for functionalities accessed by MAR-CIS web users.
MARCIS_REQ_[3,4,5,6,7,8,14,15,17](cont) [MAR-CIS content manager]	Quotation including: <ol style="list-style-type: none"> 1. The effort and cost for the functions listed in chapter 8 concerning the content management. 2. The effort/costs concerning the parametrisation / scheduling of MAR-CIS application versions and associated welcome text, disclaimers and banners (SSN_CHD_MARCIS_INT_REQ_6) data update workflow (SSN_CHD_MARCIS_INT_REQ_8). 3. The effort/costs concerning the management of references as per SSN_CHD_MARCIS_INT_REQ_10 (points1, 3) and SSN_CHD_MARCIS_INT_REQ_11. 4. The effort/costs concerning the management of glossary and linking of glossary terms to labels of attributes as per SSN_CHD_MARCIS_INT_REQ_12. 5. The effort/costs concerning the MAR-CIS data import utility as per SSN_CHD_MARCIS_INT_REQ_16. 6. The effort/costs for enabling MAR-CIS content administrators to access the data logging functionality as per SSN_CHD_MARCIS_INT_REQ_17. 7. Web console design effort/ costs as per the additional clarifications given in SSN_CHD_MARCIS_INT_REQ_19 for functionalities accessed by MAR-CIS content administrators. 8. Effort/ costs associated with MAR-CIS design templates in SSN_CHD_MARCIS_INT_REQ_22.

Requirements as they are grouped in the price grid in Enclosure 2	Instructions for effort/ costs calculations
MARCIS_REQ_[3,4,5,6,7,11,14](mob) [MAR-CIS App]	Quotation including: <ol style="list-style-type: none"> 1. The effort and cost for the functions listed in chapter 8 concerning the mobile application for MAR-CIS users. 2. The effort/costs concerning the display of references as per SSN_CHD_MARCIS_INT_REQ_10. 3. The effort/costs concerning the display of references as per SSN_CHD_MARCIS_INT_REQ_11. 4. The effort/costs concerning the display of glossary as per SSN_CHD_MARCIS_INT_REQ_12. 5. The effort/costs concerning the MAR-CIS data export utilities for web and mobile applications. 6. The costs of designing the mobile application façade and the mobile application versions for iOS and Android for mobiles and tablets as per section 9.1.3.4 taking into account the additional clarifications given in SSN_CHD_MARCIS_INT_REQ_20 for the management of updates of the mobile applications.
MARCIS_REQ_12 [MAR-CIS database migration]	A distinct quotation shall be provided for the MARCIS_REQ_12 concerning existing MAR-CIS data migration to MAR-CIS 2 application.
SSN_CHD_MARCIS_INT_REQ_24 [CHD/MAR-CIS compliance with SSN non-functional requirements]	A distinct quotation shall be provided. It should include the effort of testing during the FAT.
CHD_REQ_13 & MARCIS_REQ_22 [CHD/MAR-CIS System security]	
CHD_REQ_12 & MARCIS_REQ_21 [CHD/MAR-CIS System performance and security]	
CHD_REQ_10 [CHD System Interface]	Effort/ costs associated with business services design (those used by the system interface of the CHD (as per sections 9.1.2.2) effort/costs for the additional clarifications given in SSN_CHD_MARCIS_INT_REQ_21 .
MARCIS_REQ_18 [MAR-CIS System capacity]	A distinct quotation shall be provided. It should include the effort of testing during the FAT.
MARCIS_REQ_19 [MAR-CIS System performance]	A distinct quotation shall be provided. It should include the effort of testing during the FAT.
MARCIS_REQ_20 [MAR-CIS System availability]	A distinct quotation shall be provided. It should include the effort of testing during the FAT.
SSN_CHD_MARCIS_INT_REQ_9 [Database additional working version]	A distinct quotation shall be provided for the requirement marked as "Desired" requirements to be used as evaluation scenario of the bids, see point 14.4 b (P_{SCENARIO}).
SSN_CHD_MARCIS_INT_REQ_14 [Email warning for specific items]	
SSN_CHD_MARCIS_INT_REQ_18 ["Intelligent search"]	
SSN_CHD_MARCIS_INT_REQ_23 [CHD public application]	

12. List of appendices

The table below summarises the applicable appendices that shall be considered an integral part of this specifications

Appendix	Title
A	CHD – IMO Codes and Conventions elements
B	MAR-CIS 1 (existing desktop application) database structure
C	MAR-CIS 1 information fields and sub-fields properties
D	Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2
E	Example of MAR-CIS 1 datasheet
F	Glossary of MAR-CIS 1
G	EMSA mobile Access Gateway (<i>draft version - Informative</i>)
H	General non-functional/ security requirements for SSNv3.x application components
I	IdM Guide -Access and Identity Management Guide (Abridged Version)
J	MAP – Software design document
K	EMSA – Visual identity guidelines
L	Draft declaration of confidentiality
M	CMC (CARD) – Implementation approach <i>Informative</i>
N	System Interface Guide (sample) <i>Informative</i>

Appendix A – CHD/MAR-CIS 2 – IMO Codes and Conventions elements

I. CHD – IMO codes and conventions data attributes

For MAR-CIS 2 dataset, the values marked with (*) shall be linked to “fixed” explanatory text (from values lists). This text shall be included in the datasheet as it is displayed in MAR-CIS 1. See ‘Appendix E – Example of MAR-CIS 1 datasheet’, page 2 and ‘Appendix D – Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2’ that gathers the value lists in MAR-CIS 1.

No.	Data element to be stored in the database	Type	Length	Mandatory or Optional	Description	IMO Codes and Conventions, including possible values				
						IMDG	IBC	IMSBC	IGC	Marpol Annex 1
1	DG classification	Fixed values		1	Attribute contains the information in which IMO Code(s) <i>DG must be declared</i>	“IMDG”	“IBC”	“IMSBC”	“IGC”	“MARPOL _ANNEX1 ”
2	Textual reference	Text	1-350	1	The textual reference is a mandatory field but its content is derived from the appropriate IMO Code and Conventions	Proper Shipping Name ⁹	Product name ⁹	Bulk cargo Shipping Name ⁹	Product Name	Name of Oil
3	Mode of Carriage	Fixed values		1	Depending on the relevant IMO code or convention.	Packaged	Bulk	Bulk	Bulk	Bulk
4	Type of Product carried in bulk	Fixed values		0-1	Depending on the relevant IMO code or convention.		Liquid - Chemicals or noxious	Solid	Gas	Liquid - Oil
5	IMO hazard class(*)	Text	1-7	0-1	In accordance with IMDG, IBC, and IMSBC codes	“1” to “9” and relevant sub-classes	“S”, “P”,	“B”, “A and B” ⁹		

⁹ Fields in purple, are IMO codes data attributes which are used by both MAR-CIS 2 and CHD applications.

No.	Data element to be stored in the database	Type	Length	Mandatory or Optional	Description	IMO Codes and Conventions, including possible values				
						IMDG	IBC	IMSBC	IGC	Marpol Annex 1
						and divisions (e.g. 1.1F) ⁹	"S/P"			
6	UN number	Text	4	0-1	UN number of HAZMAT product in accordance with the IMO Codes	4 digits ⁹				
7	Packing group(*)	Enum		1	Values as appropriate and as defined in IMDG	"I", "II", "III", "-" ⁹				
8	Subsidiary risks(*)	Text	1-17	0-5 list	Any risks in addition to the class to which dangerous goods are assigned; and which is determined by a requirement to have a subsidiary risk. A dangerous good may have up to 5 subsidiary risks.	Y (e.g. "See SP204", "6.1/8 etc") ⁹		Y		
9	Flashpoint	Decimal	5	0-5 List or range	The temperature in degrees Celsius at which a liquid will give off enough flammable vapour to be ignited. (Note: In the IMDG list this is contained within the Properties and Observations column).	Y				
10	Marine Pollutant(*)	Fixed value	1	0-1	The code value defined in MARPOL Annex III and IMDG. (Note: In the IMDG list this is contained within the Subsidiary Risks column).	"p", "-" ⁹				
11	Pollution category(*)	Fixed values	2	0-1	The code values defined in MARPOL Annex II and IBC.		"X", "Y", "Z", "OS" ⁹			
12	EmS(*)	Fixed values		0-2 list	Emergency response procedures for ships carrying dangerous goods. Two values are possible: Fire (F) and Spillage (S).	"F-A" to "F-J" "S-A" to "S-Z" ⁹				

No.	Data element to be stored in the database	Type	Length	Mandatory or Optional	Description	IMO Codes and Conventions, including possible values				
						IMDG	IBC	IMSBC	IGC	Marpol Annex 1
13	Additional Information	Text	1-256		Any additional information regarding dangerous and polluting goods on-board (Properties and Observations in the IMDG list)	Y ⁹				
14	MAR-CIS reference	Access button		0-1	Access to MAR-CIS 2 product datasheet.	Y	Y	Y		
15	MAR-CIS datasheet availability	Binary		1	Code: TRUE or FALSE	Y	Y	Y		
16	HazmatID			1	Composed as follows: a. the first part will indicate the relevant IMO Convention or Code of the product by using the abbreviation of the code (IMDG, IMSBC, IBC, etc). b. The following digits will indicate the UN number, if available. If a UN number is unavailable, as in the case of IBC products, '0000' is used. c. The last digits will refer to the sequence number of the product.	Y	Y	Y	Y	Y

Table 4 – CHD database – IMO codes and conventions elements

II. MAR-CIS 2 database – IMO Codes and Conventions elements

MAR-CIS data elements from the IMO codes that are not common to the CHD database. For MAR-CIS 2 database, the values marked with (*) shall be linked to "fixed" explanatory text (from values lists). This text shall be included in the datasheet as it is displayed in MAR-CIS 1, see 'Appendix E – Example of MAR-CIS 1 datasheet', page 2 and 'Appendix D – Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2' that gathers the value lists in MAR-CIS 1.

No.	Data element to be stored in the database	Type	Length	Mandatory or Optional	Description	IMO Codes and Conventions, including possible values		
						IMDG	IBC	IMSBC
	Stowage and Handling (*)	Fixed values	tbd	0-6	Attribute contains the information associated with stowage and handling requirements from the IMDG code. ¹⁰	- "Category 01" to "Category 5" and "Category A" to "Category C"; - "SW1" to "SW 28"; - "H1" to "H3"; - "-"		
	Segregation (*)	Fixed values	tbd	0-11	Attribute contains the information associated with segregation requirements from the IMDG code	"SG1" to "SG75"		
	Ship type(*)	Fixed values	1	0-2	Attribute contains the information associated with the ship type from the IBC code.		"1", "2", "3", "-", "(k)"	
	Tank type(*)	Fixed values	1	0-2	Attribute contains the information associated with the tank type from the IBC code.		"1", "2", "P", "G", "-"	
	Tank vents(*)	Fixed values	tbd	0-1 (list)	Attribute contains the information associated with the tank type from the IBC code.		"Contr.", "Open"	
	Gauging(*)	Fixed	tbd	0-1 (list)	Attribute contains the information		"O", "R",	

¹⁰ Note that MAR-CIS 1 has different values associated to this information field due to the fact that is based on an older version of IMDG code. The IMO code 2014 version gathers up to three sub-information fields in this column: stowage categories ("Category 1" to -"Category 5" and "Category A" to "Category C"), stowage codes, handling codes. Each category has a corresponding explanatory text that must be included in MAR-CIS 2 datasheet.

No.	Data element to be stored in the database	Type	Length	Mandatory or Optional	Description	IMO Codes and Conventions, including possible values		
						IMDG	IBC	IMSBC
		values			associated with the Gauging from the IBC code.		"C", "-"	
	Tank environmental control(*)	Fixed values		0-3 (list)	Attribute contains the information associated with the Tank environmental control from the IBC code.		"Inert", "Pad", "Dry", "Vent", "No", "-"	
	Vapour detection(*)	Fixed values	2	0-3 (list)	Attribute contains the information associated with the Vapour detection from the IBC code.		"F", "T", "No", "-", "(g)" "(a)"	
	Fire protection(*)	Fixed values	2	0-6 (list)	Attribute contains the information associated with the Fire protection from the IBC code.		"A", "B", "D", "C", "No", "-", "(b)", "(f)", "(j)",	
	Emergency equipment(*)	Fixed values	3	0-1(list)	Attribute contains the information associated with the Emergency equipment from the IBC code.		"No", "Yes", "-"	
	Angle of repose	tbd [String or decimal]		0-1	Information from the IMSBC code.			Y
	Bulk density	tbd [String or decimal]		0-1	Information from the IMSBC code.			Y
	Stowage factor	String or		0-1	Information from the IMSBC code.			Y

No.	Data element to be stored in the database	Type	Length	Mandatory or Optional	Description	IMO Codes and Conventions, including possible values		
						IMDG	IBC	IMSBC
		decimal						
	Size	String or decimal		0-1	Information from the IMSBC code.			Y
	Class	String or decimal		0-1	Information from the IMSBC code.			Y
	Stowage and segregation	String or decimal		0-1	Information from the IMSBC code.			Y
	Hold cleanliness	String		0-1	Information from the IMSBC code.			Y
	Weather precautions	String		0-1	Information from the IMSBC code.			Y
	Loading	String		0-1	Information from the IMSBC code.			Y
	Precautions	String		0-1	Information from the IMSBC code.			Y
	Ventilation	String		0-1	Information from the IMSBC code.			Y
	Carriage	String		0-1	Information from the IMSBC code.			Y
	Discharge	String		0-1	Information from the IMSBC code.			Y
	Clean-up	String		0-1	Information from the IMSBC code.			Y
	Special emergency equipment to be carried	String		0-1	Information from the IMSBC code.			Y
	Emergency procedures	String		0-1	Information from the IMSBC code.			Y
	Emergency action in the event of fire	String		0-1	Information from the IMSBC code.			Y
	Medical first aid	String		0-1	Information from the IMSBC code.			Y

Table 5 - MAR-CIS 2 database – IMO Codes and Conventions elements

Note:

Bidders should note that the labels of some attributes in MAR-CIS 2 might be altered in the beginning of the design phase of the project to avoid misunderstanding, by the MAR-CIS 2 and CHD users, concerning the value stored in these attributes. Reference is made e.g. to the flashpoint. Upon initiation of the design phase, EMSA shall provide contractor with a complete list of attributes associated with this requirement.

Appendix B – MAR-CIS 1 (existing desktop application) database structure

The MAR-CIS database was developed using the TurboDB Managed product from the manufacturer dataweb: http://www.dataweb.de/en/products/dotnet_database.html. The MAR-CIS 1 database file "mar-cis.tdbd" can be provided to the tenderer upon request, see Appendix L. See the contact details in the invitation to tender. The data model for the current version is shown below:

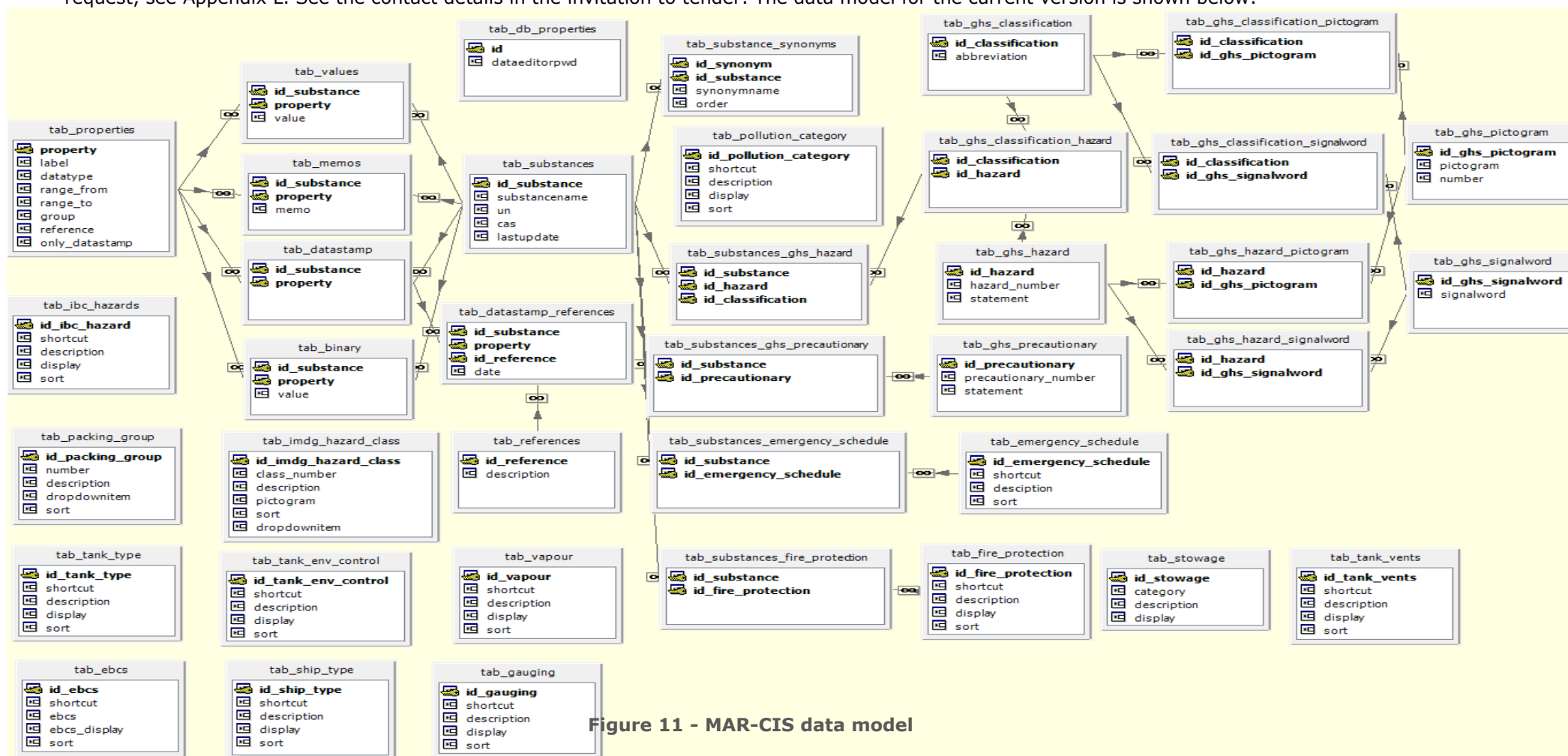


Figure 11 - MAR-CIS data model

Appendix C – MAR-CIS 1 information fields and sub-fields properties

MAR-CIS 1 database has 38 tables. See below the description of each table.

BaseTable Name	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Logging	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
tab_properties	property	1	20	System.String	String	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	property					Lists the information fields (attributes): "property", "label", "datatype", "range_from", "range_to", "group", "reference", "only_datastamp".
	label	2	50	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	datatype	3	10	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	range_from	4	0	System.Double	Float	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE							
	range_to	5	0	System.Double	Float	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE							
	group	6	20	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	reference	7	20	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	only_datastamp	8	0	System.Boolean	Boolean	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_values	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_substance	fk_id_substance	tab_substances	id_substance	id_substance	Lists the values of the each information fields per substance (using GUID ¹¹ as ID): "id_substance", "property", "value".
	property	2	20	System.String	String	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		property	fk_property	tab_properties			

¹¹ GUID, A 16 byte globally unique identifier.

Annex A - Technical Requirements for the design and implementation of the Central Hazmat Database Application (CHD) & MARine Chemical Information Sheets Application (MAR-CIS 2)

BaseTable Name	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Long	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
	value	3	150	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							.
tab_memos	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_substance	fk_id_substance	tab_substances	id_substance	id_substance	Lists the values of the information fields as text based per substance (using GUID as ID): "id_substance", "property", "memo".
	property	2	20	System.String	String	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		property	fk_property	tab_properties			
	memo	3	2000	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_datastamp	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_substance	fk_id_substance	tab_substances	id_substance	id_substance	Lists per substance (using GUID as ID) the information fields not empty: "id_substance", "property".
	property	2	20	System.String	String	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		property	fk_property	tab_properties			
tab_binary	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_substance	fk_id_substance	tab_substances	id_substance	id_substance	Lists all pictures (e.g. chemical structure, pictograms) per substance (using GUID as ID): "id_substance", "property", "value".
	property	2	20	System.String	String	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		property	fk_property	tab_properties			
	value	3	2147483647	System.Byte[]	Blob	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_datastamp_references	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_substance	fk_datastamp	tab_datastamp	id_substance	id_substance	Lists per substance (using GUID as ID) the information field and its reference number: "id_substance", "property", "id_reference", "date".
	property	2	20	System.String	String	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		property	fk_id_reference	tab_references	property	property	
	id_reference	3	0	System.Int32	Integer	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_reference					
	date	4	0	System.DateTime	Date	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							

Annex A - Technical Requirements for the design and implementation of the Central
 Hazmat Database Application (CHD) & MARine Chemical Information Sheets
 Application (MAR-CIS 2)

BaseTable Name	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Logging	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
tab_db_properties	id	1	0	System.Int32	AutoInc	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	sys_Primary	id					Lists the password for editing the database contents.
	dataedit_orpwd	2	10	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_ebcs	id_ebcs	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_ebcs					Lists all drop down menu list from the 'EBCS' sub-information: "id_ebcs", "ebcs", "shortcut", "sort".
	ebcs	2	50	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	shortcut	3	5	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_emergency_schedule	id_emergency_schedule	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_emergency_schedule					Lists the drop down menu list from the 'Emergency Schedule' from the IMDG code: "id_emergency_schedule", "shortcut", "description", "sort".
	shortcut	2	5	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	50	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_fire_protection	id_fire_protection	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_fire_protection					Lists the drop down menu list of the 'Fire protection' information field from the IBC code: "id_fire_protection", "shortcut", "description", "sort".
	shortcut	2	3	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	110	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							

Annex A - Technical Requirements for the design and implementation of the Central Hazmat Database Application (CHD) & MARine Chemical Information Sheets Application (MAR-CIS 2)

BaseTableName	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Logging	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
tab_gauging	id_gauging	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_gauging					Lists the drop down menu list of the 'Gauging' information field from the IBC code: "id_gauging", "shortcut", "description", "sort".
	shortcut	2	3	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	20	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_ghs_classification	id_classification	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_classification					Lists all sub- information fields associated with the information field 'Hazard classification' from the CLP/GHS Classification: "id_classification", "abbreviation".
	abbreviation	2	30	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_ghs_classification_hazard	id_classification	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_classification	fk_id_classification	tab_ghs_classification	id_classification	id_classification	Associates/links the hazard class to the hazard statement number: "id_classification", "id_hazard".
	id_hazard	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_hazard	fk_id_hazard	tab_ghs_hazard			
tab_ghs_classification_pictogram	id_classification	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_classification	fk_id_classification	tab_ghs_classification	id_classification	id_classification	Associates the 'Hazard classification' with the pictogram: "id_classification", "id_ghs_pictogram".
	id_ghs_pictogram	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_ghs_pictogram	fk_id_ghs_pictogram	tab_ghs_pictogram			
tab_ghs_classification_signalword	id_classification	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_classification	fk_id_classification	tab_ghs_classification	id_classification	id_classification	Associates the 'Hazard classification' to the 'signal word': "id_classification", "id_ghs_signalword".
	id_ghs_signalword	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_ghs_signalword	fk_id_ghs_signalword	tab_ghs_signalword			
tab_ghs_hazard	id_hazard	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_hazard					Lists the menu list of 'Hazards Statements'; "id_hazard",

Annex A - Technical Requirements for the design and implementation of the Central Hazmat Database Application (CHD) & MARine Chemical Information Sheets Application (MAR-CIS 2)

BaseTable Name	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Long	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
	hazard_number	2	12	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							"hazard_number", "statement".
	statement	3	255	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_ghs_hazard_pictogram	id_hazard	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_hazard	fk_id_hazard	tab_ghs_hazard	id_hazard	id_hazard	Associates the 'hazard' to the 'pictogram': "id_hazard", "id_ghs_pictogram".
	id_ghs_pictogram	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_ghs_pictogram	fk_id_ghs_pictogram	tab_ghs_pictogram			
tab_ghs_hazard_signalword	id_hazard	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_hazard	fk_id_hazard	tab_ghs_hazard	id_hazard	id_hazard	Associates the 'Hazards' to 'Signal word': "id_hazard", "id_ghs_signalword".
	id_ghs_signalword	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_ghs_signalword	fk_id_ghs_signalword	tab_ghs_signalword			
tab_ghs_pictogram	id_ghs_pictogram	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_ghs_pictogram					Lists all 'CLP/GHS pictograms': "id_ghs_pictogram", "pictogram", "number".
	pictogram	2	2147483647	System.Byte[]	Blob	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE							
	number	3	5	System.String	String	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE							
tab_ghs_precautionary	id_precautionary	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_precautionary					Lists all 'Precautionary statements' from the CLP/GHS classification: "id_precautionary", "precautionary_number", "statement".
	precautionary_number	2	18	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	statement	3	255	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_ghs_signalword	id_ghs_signalword	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_ghs_signalword					Lists all 'signal words' to the CLP classification: "id_ghs_signalword", "signalword".

Annex A - Technical Requirements for the design and implementation of the Central
 Hazmat Database Application (CHD) & MARine Chemical Information Sheets
 Application (MAR-CIS 2)

BaseTableName	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Logging	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
	signalword	2	20	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_ibc_hazards	id_ibc_hazard	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_ibc_hazard					Lists the drop down menu list of 'Marine pollution category' from the IBC code: "id_ibc_hazard", "shortcut", "description", "sort".
	shortcut	2	5	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	30	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_imdg_hazard_class	id_imdg_hazard_class	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_imdg_hazard_class					Lists the drop down menu list of 'Hazard class' from the IMDG code: "id_imdg_hazards_class", "class_number", "description", "pictogram", "sort".
	class_number	2	5	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	150	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	pictogram	4	2147483647	System.Byte[]	Blob	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE							
	sort	5	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_packing_group	id_packing_group	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_packing_group					Lists the drop down menu list of 'Packing Group' from the IMDG code information: "id_packing_group", "number", "description", "sort".
	number	2	3	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	20	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							

Annex A - Technical Requirements for the design and implementation of the Central
 Hazmat Database Application (CHD) & MARine Chemical Information Sheets
 Application (MAR-CIS 2)

BaseTable Name	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Long	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
tab_pollution_category	id_pollution_category	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_pollution_category					Lists the drop down menu list of 'Pollution category' from the IBC code: "id_pollution_category", "shortcut", "description", "sort".
	shortcut	2	3	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	45	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_references	id_reference	1	0	System.Int32	Integer	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_reference					Lists all references used as information sources: "id_reference", "description".
	description	2	1000	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_ship_type	id_ship_type	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_ship_type					Lists the drop down menu list of 'Ship type' from the IBC code: "id_ship_type".
	shortcut	2	3	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	120	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_stowage	id_stowage	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_stowage					Lists the drop down menu list for 'Stowage' from the IMDG code: "id_stowage", "category", "description".
	category	2	10	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	200	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_substance_synonyms	id_synonym	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_synonyms	fk_id_substance	tab_substances	id_substance	id_substance	Lists for each substance the 'synonyms': "id_synonyms", "id_substance", "synonymname",
	id_substance	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_subst					

Annex A - Technical Requirements for the design and implementation of the Central
 Hazmat Database Application (CHD) & MARine Chemical Information Sheets
 Application (MAR-CIS 2)

BaseTable Name	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Logging	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
										E			ance					"order".
	synonym name	3	100	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	order	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_substances	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_substance					Lists for each substances the 'Name', 'UN number', 'CAS Number' and the 'last update' date: "id_substances", "substancesname", "un", "cas", "lastupdate".
	substancesname	2	150	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	un	3	20	System.String	String	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE							
	cas	4	20	System.String	String	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE							
	lastupdate	5	0	System.DateTime	DateTime	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE							
tab_substances_emergency_schedule	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_substance	fk_id_substance	tab_substances	id_substance	id_substance	Lists to each substance the corresponding 'Emergency schedule' from the IBC code: "id_substance", "id_emergency schedule"
	id_emergency_schedule	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_emergency_schedule	fk_id_emergency_schedule	tab_substances_emergency_schedule			
tab_substances_fire_protection	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_substance	fk_id_substance	tab_substances	id_substance	id_substance	Lists to each substance the corresponding 'Fire protection' from the IBC code: "id_substance", "id_fire_protection".
	id_fire_protection	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_fire_protection	fk_id_fire_protection	tab_fire_protection			
tab_substances_ghs_haz	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_substance	fk_id_substance	tab_substances	id_classification	id_classification	Lists to each substance I 'hazard classification' and 'hazard statements'

Annex A - Technical Requirements for the design and implementation of the Central Hazmat Database Application (CHD) & MARine Chemical Information Sheets Application (MAR-CIS 2)

BaseTableName	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Logging	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
zard	id_hazard	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_hazard	fk_id_class_hazard	tab_ghs_classification_hazard	id_hazard	id_hazard	associated: "id_substance", "id_hazard", "id_classification".
	id_classification	3	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_classification					
tab_substances_ghs_precautionary	id_substance	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	sys_Primary	id_substance	fk_id_substance	tab_substances	id_substance	id_substance	Lists to each substances all 'Precautionary statements': "id_substance", "id_precautionary".
	id_precautionary	2	0	System.Guid	Guid	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE		id_precautionary	fk_id_precautionary	tab_ghs_precautionary			
tab_tank_env_control	id_tank_env_control	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_tank_env_control					Lists all values in the drop down list of IBC code 'Tank environmental control': "id_tank_env_control".
	shortcut	2	5	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	60	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_tank_type	id_tank_type	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_tank_type					Lists all values in the drop down list of IBC code 'Tank type': "id_tank_type", "shortcut", "description", "sort".
	shortcut	2	3	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	25	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_tank_vents	id_tank_vents	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_tank_vents					Lists all values in the drop down list of IBC code 'Tank vents': "id_tank_vents", "shortcut", "description",
	shortcut	2	5	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							

Annex A - Technical Requirements for the design and implementation of the Central
 Hazmat Database Application (CHD) & MARine Chemical Information Sheets
 Application (MAR-CIS 2)

BaseTable Name	Column Name	Column Ordinal	Column Size	Data Type	Provider Type	Is Long	Allow DB Null	Is Read Only	Is Unique	Is Key	Is Auto Increment	Unique keys / Constraint Name	Key columns	Foreign keys / constraint Name	Foreign keys / Referenced table	Columns of this table	Columns of the referenced table	Author's notes
										E								"sort".
	description	3	20	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
tab_vapour	id_vapour	1	0	System.Guid	Guid	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	sys_Primary	id_vapour					Lists all values in the drop down list of IBC code 'Vapour detection': "id_vapour", "shortcut", "description", "sort".
	shortcut	2	3	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	description	3	40	System.String	String	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							
	sort	4	0	System.Int16	SmallInt	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE							

Appendix D – Modifications to the MAR-CIS 1 database applicable for MAR-CIS 2

The column MAR-CIS 2 aims at explaining the modifications to be included in MAR-CIS 2 upon migration to EMSA's systems. Information fields (attributes) in shadow grey are new fields to be included in MAR-CIS 2.

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
			substance name		Name		Name of the datasheet. See in MAR-CIS 1 schema <i>tab_substances</i> with the substance name.	
			un		UN number		See in MAR-CIS 1 schema <i>tab_substances</i> UN number associated to each substance. Null value is possible.	
			CAS		CAS number		See in MAR-CIS 1 schema <i>tab_substances</i> with the CAS-number associated to each substance.	Presently each substance has one CAS number only. The new MAR-CIS 2 database should allow more than one CAS Number depending if there are other substances that have similar properties and could be included in the same datasheet e.g. isomers.
identification	identification	iupac	IUPAC name	String	IUPAC name	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the IUPAC name per substance.	
identification	identification	trade	Trade name	String	Proper shipping name	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the trade name per id_substance.	
identification	identification	product_name	Product name	String	Product name	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the <i>product_name</i> per id_substance.	
identification	identification	einecs	EINECS	String	EINECS	yes	See in MAR-CIS 1 schema <i>tab_values</i> for EINECS per substance.	
identification	identification	index_number	Index number	String	Index number	yes	See in MAR-CIS 1 schema <i>tab_values</i> for index number per substance.	
synonyms	synonyms	synonyms	Synonyms	String	Other	yes	See in MAR-CIS 1 schema	

¹² See *tab_datastamp_reference* and *tab_references* in MAR-CIS 1 schema.

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
					names		<i>tab_substances_synonyms</i> . This table associates <i>id_substances</i> per <i>id_substance</i> per synonymname.	
identification	substance_properties	substance_properties	Substance properties	Memo	Substance properties	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per <i>id_substance</i> .	
identification	substance_properties	class	Class	String	Class	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the class per <i>id_substance</i> .	
identification	substance_properties	main_uses	Main uses	String	Main uses	yes	See in MAR-CIS 1 schema <i>tab_values</i> .	
identification	substance_properties	appearance	Appearance	String	Appearance	yes	See in MAR-CIS 1 schema <i>tab_values</i> .	
identification	substance_properties	odour	Odour	String	Odour	yes	See in MAR-CIS 1 schema <i>tab_values</i> .	
identification	substance_properties	behaviour_ebcs	Behaviour (EBCS)	Guid	Behaviour (EBCS)	yes	Drop down list with 15 possible values (see point 1 below and in MAR-CIS 1 schema <i>tab_ebcs</i>).	
identification	fire_codes	fc_health	Fire Code Health (Blue)	Int16	Fire Code Health (Blue)	yes	6 possible values: ;0 ;1 ;2 ;3 ;4.	This information field should be hidden in case there is no information to be displayed.
identification	fire_codes	fc_flammability	Fire Code Flammability (Red)	Int16	Fire Code Flammability (Red)	yes	6 possible values: ;0 ;1 ;2 ;3 ;4.	
identification	fire_codes	fc_reactivity	Fire Code Reactivity (Yellow)	Int16	Fire Code Reactivity (Yellow)	yes	6 possible values: ;0 ;1 ;2 ;3 ;4.	
identification	fire_codes	fc_specific_hazards	Fire Code Specific Hazards (White)	String	Fire Code Specific Hazards (White)	yes	Drop down list with 3 possible values (see below point 2).	
identification	warning	warning	Warning	String	Warning	yes		
maritime_transport	maritime_transport	hazard_class	hazard class	Guid	hazard class	yes	Drop down list with 26 possible values (see point 3 below and see MAR-CIS 1 schema <i>tab_imdg_hazard_class</i>). Each class has a	Note: there is a reference field for each IMDG code information field in MAR-CIS 1. However this is not

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
							placard associated.	needed. One reference field for all information related with the IMDG code is enough. The stowage and segregation information field will have to be modified in accordance with the new IMDG code version. See Appendix A section II with more information on the new format
maritime_transport	maritime_transport	subsidiary_risks	subsidiary risks	Guid	subsidiary risks	yes	Drop down list with 26 possible values (see point 3 below and see MAR-CIS 1 schema <i>tab_imdg_hazard_class</i>).	
maritime_transport	maritime_transport	packing_group	packing group	Guid	packing group	yes	Drop down list with 4 possible values (see point 4 below and in MAR-CIS 1 schema <i>tab_packing_group</i>)	
maritime_transport	maritime_transport	emergency_schedule	emergency schedule EMS	Guid	emergency schedule EMS	yes	Menu list with 38 possible values see point 5 below. In MAR-CIS 1 schema the <i>tab_substances_emergency_schedule</i> links the <i>id_substance</i> to the <i>id_emergency_schedule</i> . The <i>tab_emergency_schedule</i> lists all fields including shortcut and text description.	
maritime_transport	maritime_transport	stowage	stowage and segregation	Guid	stowage and segregation	yes	Drop down list with 7 possible values (see point 6 below and in MAR-CIS 1 schema <i>tab_stowage</i>).	
maritime_transport	maritime_transport	stowage_description	stowage description	Memo	stowage description	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per <i>id_substance</i> .	In MAR-CIS 1 the options are "Yes", "No" and empty. These should be modified and aligned with the options mentioned in Appendix A Section I. The "yes" should be modified to "P" In case of "P" a "Marine pollutant" pictogram (from the IMDG code) should be included in the datasheet.
maritime_transport	maritime_transport	marine_pollutant	marine pollutant	String	marine pollutant	yes	Drop down list with 3 possible values (see point 7 below).	
maritime_transport	maritime_transport	pollution_category	marine pollution categorie	Guid	marine pollution categorie	yes	Drop down list with 8 possible values (see point 8 below and MAR-CIS 1 schema <i>tab_pollution_category</i>).	The drop down list (list of values) in MAR-CIS 1 needs to be cleaned up. There are two duplications.
maritime_transport	maritime_transport	ibc_hazards	hazards	Guid	hazards		Drop down list with 5 possible values (see point 9 below and MAR-CIS 1 schema <i>tab_ibc_hazards</i>).	Note: there is a reference for each IBC code information field in MAR-CIS 1. However this is not needed. One reference field for all

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
								information fields in the IBC code is enough.
maritime_transport	maritime_transport	ship_type	ship type	Guid	ship type		Drop down list with 5 possible values (see point 10 below and MAR-CIS 1 schema <i>tab_ship_type</i>).	Add additional value to the value list.
maritime_transport	maritime_transport	tank_type	tank type	Guid	tank type		Drop down list with 8 possible values (see point 11 below and MAR-CIS 1 schema <i>tab_tank_type</i>).	
maritime_transport	maritime_transport	tank_vents	tank vents	Guid	tank vents		Drop down list with 5 possible values (see point 12 below and MAR-CIS 1 schema <i>tab_tank_vents</i>).	
maritime_transport	maritime_transport	gauging	gauging	Guid	gauging		Drop down list with 6 possible values (see point 13 below and MAR-CIS 1 schema <i>tab_gauging</i>).	
maritime_transport	maritime_transport	tank_env_control	tank environmental control	Guid	tank environmental control		Drop down list with 9 possible values (see point 14 below and MAR-CIS 1 schema <i>tab_tank_env_control</i>).	
maritime_transport	maritime_transport	vapour_detection	vapour detection	Guid	vapour detection		Drop down list with 6 possible values (see point 15 below and MAR-CIS 1 schema <i>tab_vapour</i>).	Add additional values to the value list.
maritime_transport	maritime_transport	fire_protection	fire protection	Guid	fire protection		Menu list with 7 possible values, see point 16 below. In MAR-CIS 1 schema the <i>tab_substances_fire_protection</i> links the <i>id_substance</i> to the <i>id_fire_protection</i> . The <i>tab_fire_protection</i> lists all fields including shortcut and text description.	Add additional values to the value list.
maritime_transport	maritime_transport	emergency_escape	emergency escape	String	emergency escape		Drop down list with 3 possible values (see point 17 below).	
maritime_transport	maritime_transport				Note		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2: to be displayed only if there is text inside. This field should be text type.
maritime_transport	maritime_transport				Name		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2, information from the IMSBC code. To add a reference information field.
maritime_transport	maritime_transport				Category		Does not exist in MAR-CIS 1.	

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
nsport	sport							
maritime_transport	maritime_transport				Angle of repose		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Bulk density		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Stowage factor		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Size		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Class		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Stowage and segregation		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Hold cleanliness		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Weather precautions		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Loading		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Precautions		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Ventilation		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Carriage		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Discharge		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Clean-up		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Special emergency equipment		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
					nt to be carried			
maritime_transport	maritime_transport				Emergency procedures		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Emergency action in the event of fire		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
maritime_transport	maritime_transport				Medical first aid		Does not exist in MAR-CIS 1.	New field in MAR-CIS 2
gesamp_profile	gesamp_profile	a1	A1 Bioaccumulation	String	A1 Bioaccumulation	yes	Drop down list with 15 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	The GESAMP picture present in the MAR-CIS 1 datasheets is built on the rating values of each hazard category. The point 18 below, describe all possible values.
gesamp_profile	gesamp_profile	a2	A2 Biodegradation	String	A2 Biodegradation		Drop down list with 9 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	b1	B1 Acute aquatic toxicity	String	B1 Acute aquatic toxicity		Drop down list with 17 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	b2	B2 Chronic aquatic toxicity	String	B2 Chronic aquatic toxicity		Drop down list with 13 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	c1	C1 Mammalian acute oral toxicity	String	C1 Mammalian acute oral toxicity		Drop down list with 13 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	c2	C2 Mammalian acute dermal toxicity	String	C2 Mammalian acute dermal toxicity		Drop down list with 13 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	c3	C3 Mammalian	String	C3 Mammalian		Drop down list with 13 possible values (see point 18). See in MAR-CIS 1 schema tab_values with	

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
			n acute inhalation toxicity		an acute inhalation toxicity		the values per id_substance.	
gesamp_profile	gesamp_profile	d1	D1 Skin irritation and corrosion	String	D1 Skin irritation and corrosion		Drop down list with 14 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	d2	D2 Eye irritation and corrosion	String	D2 Eye irritation and corrosion		Drop down list with 11 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	d3	D3 Long-term health effects	String	D3 Long-term health effects		Drop down list with 12 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	e1	E1 Tainting	String	E1 Tainting		Drop down list with 7 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	e2	E2 Physical effects on Wildlife & benthic habitats	String	E2 Physical effects on Wildlife & benthic habitats		Drop down list with 9 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
gesamp_profile	gesamp_profile	e3	E3 Interference with Coastal Amenities	String	E3 Interference with Coastal Amenities		Drop down list with 7 possible values (see point 18). See in MAR-CIS 1 schema tab_values with the values per id_substance.	
hazards_risks	overview	overview	Overview	Memo	Overview	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
hazards_risks	ghs_classification	ghs_classification	CLP/GHS classification	String	CLP/GHS classification	yes	See point 19 for more information on how the information is organised in MAR-CIS 1.	This information field should be hidden in case there is no information to be displayed. The list of 'classification', 'hazard statements' and 'precautionary

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
								statements', 'pictograms' will be revised and updated. The links between the tables need also to be revised. Information contained in the field: classification hazard number hazard statement Pictogram Signal word Precautionary number Precautionary statement
					Note:		Does not exist in MAR-CIS 1.	Add new field to MAR-CIS 2. Text basis
hazards_risks	health_hazards	if_swallowed	if swallowed	Memo	if swallowed	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
hazards_risks	health_hazards	if_inhaled	if inhaled	Memo	if inhaled	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
hazards_risks	health_hazards	skin_eye_contact	skin/eye contact	Memo	skin/eye contact	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
hazards_risks	health_hazards	odour_threshold_concentration	odour threshold concentration	String	odour threshold concentration	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
hazards_risks	health_hazards	toxicity	Toxicity	Memo	Toxicity	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
hazards_risks	substance_intrinsic	fire_explosion	fire/explosion	Memo	fire/explosion	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
hazards_risks	substance_intrinsic	fume_hazards	fume hazards	Memo	fume hazards	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
hazards_risks	substance_intrinsic	acids	acids	Bool	acids	yes	Information field type tick box.	
hazards_risks	substance_intrinsic	shock	acids	Bool	acids	yes	Information field type tick box.	
hazards_risks	substance_intrinsic	ox_agents	oxidising_a	Bool	oxidising	yes	Information field type tick box.	

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
s	insic		gents		_agents			
hazards_risks	substance_intrinsic	air	air	Bool	air	yes	Information field type tick box.	
hazards_risks	substance_intrinsic	water	fresh/sea-water	Bool	fresh/sea-water	yes	Information field type tick box.	
hazards_risks	substance_intrinsic	alkalis	alkalis	Bool	alkalis	yes	Information field type tick box.	
hazards_risks	substance_intrinsic	w_reducing_agents	with reducing agents	Bool	with reducing agents	yes	Information field type tick box.	
hazards_risks	substance_intrinsic	w_other_substances	with other substances	Memo	with other substances	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
hazards_risks	substance_intrinsic	combustion_products	combustion by products	Memo	combustion by products	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
hazards_risks	env_hazards	behaviour	behaviour	String	behaviour	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
hazards_risks	env_hazards	viscosity	viscosity	String	viscosity	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
hazards_risks	env_hazards	eco_toxicity	eco-toxicity	Memo	eco-toxicity	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_health_measures	symptoms	Symptoms	Memo	Symptoms	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_health_measures	inhalation	inhalation	Memo	inhalation	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_health_measures	ingestion	ingestion	Memo	ingestion	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_health_measures	skin_contact	skin contact	Memo	skin contact	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_health_measures	eye_contact	eye contact	Memo	eye contact	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_response_measures	response_actions	response actions	Memo	response actions	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_response_measures	open_area	in open	Memo	in open	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text	

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
measures	measures		area		area		content per id_substance.	
emergency_measures	em_response_measures	confined_space	in confined space	Memo	in confined space	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_response_measures	to_water	to water	Memo	to water	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_response_measures	ext_media	extinguishing media	Memo	extinguishing media	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_response_measures	fire_fighting	fire fighting	Memo	fire fighting	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_response_measures	pp_equipment	personal protective equipment	Memo	personal protective equipment	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_response_measures	decontamination	decontamination of personal at site	Memo	decontamination of personal at site	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	em_response_measures	esl_unit	exposure safety limit unit	String	exposure safety limit unit	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
emergency_measures	em_response_measures	esl_pac_1	PAC 1	Double	PAC 1			
emergency_measures	em_response_measures	esl_pac_2	PAC 2	Double	PAC 2			
emergency_measures	em_response_measures	esl_pac_3	PAC 3	Double	PAC 3			
emergency_measures	em_response_measures	monitoring	Monitoring/detection	Memo	Monitoring/detection	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
emergency_measures	env_prot_measures	inter_storage	intermediate storage	Memo	intermediate storage	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
emergency_measures	env_prot_measures	sub_disposal	substance disposal	Memo	substance disposal	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
danger_zones	danger_zones	dz_02_1	Danger zone 0,2 m ³ 1 m/s	Binary	Danger zone 0,2 m ³ 1 m/s	yes	It is a picture, uploaded or pated by the MAR-CIS 1 administrator.	This information field should be hidden in case there is no information to be displayed. Presently the heading of the danger zones are fixed, built in the datasheet template. In MAR-CIS 2 these shall revised and integrated in the database as the scenario conditions may change per substance. The reference fields should be merged.
danger_zones	danger_zones	dz_02_5	Danger zone 0,2 m ³ 5 m/s	Binary	Danger zone 0,2 m ³ 5 m/s	yes	It is a picture, uploaded or pated by the MAR-CIS 1 administrator.	
danger_zones	danger_zones	dz_100_1	Danger zone 100 m ³ 1 m/s	Binary	Danger zone 100 m ³ 1 m/s	yes	It is a picture, uploaded or pated by the MAR-CIS 1 administrator.	
danger_zones	danger_zones	dz_100_5	Danger zone 100 m ³ 5 m/s	Binary	Danger zone 100 m ³ 5 m/s	yes	It is a picture, uploaded or pated by the MAR-CIS 1 administrator.	
danger_zones	danger_zones	dz_10000_1	Danger zone 10000 m ³ 1 m/s	Binary	Danger zone 10000 m ³ 1 m/s	yes	It is a picture, uploaded or pated by the MAR-CIS 1 administrator.	
danger_zones	danger_zones	dz_10000_5	Danger zone 10000 m ³ 5 m/s	Binary	Danger zone 10000 m ³ 5 m/s	yes	It is a picture, uploaded or pated by the MAR-CIS 1 administrator.	
danger_zones	danger_zones				Note:		Does not exist in MAR-CIS 1.	
case_histories	first_case	cause_1	Cause of the incident	Memo	Cause of the incident	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	This information field should be hidden in case there is no information to be displayed.
case_histories	first_case	type_1	Type of cargo	Memo	Type of cargo	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per substance.	
case_histories	first_case	year_1	Year	String	Year	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the	

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
s							values per id_substance.	
case_historys	first_case	location_1	Location	String	Location	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
case_historys	first_case	incident_descr_1	Incident description	Memo	Incident description	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
case_historys	first_case	response_descr_1	Response description	Memo	Response description	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
case_historys	first_case	authority_1	Authority in charge for dealing with the incident	Memo	Authority in charge for dealing with the incident	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
case_historys	second_case	cause_2	Cause of the incident	Memo	Cause of the incident	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	This information field should be hidden in case there is no information to be displayed.
case_historys	second_case	type_2	Type of cargo	Memo	Type of cargo	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
case_historys	second_case	year_2	Year	String	Year	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
case_historys	second_case	location_2	Location	String	Location	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
case_historys	second_case	incident_descr_2	Incident description	Memo	Incident description	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
case_historys	second_case	response_descr_2	Response description	Memo	Response description	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	
case_historys	second_case	authority_2	Authority in charge for dealing with the incident	Memo	Authority in charge for dealing with the incident	yes	See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
physical_chemical	physical_chemical	structure	structure	Binary	structure	yes	It is a picture, uploaded or pasted by the MAR-CIS 1 administrator.	Add an additional sentence to the "Physical and chemical properties" datasheet template e.g. "Physical and chemical properties parameters of the substances may vary depending on the content of impurities. The values given here are only an indication and may vary in certain ranges. " (sentence to be confirmed).
physical_chemical	physical_chemical	formula	formula	String	formula	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	molar_mass	molar mass	String	molar mass	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	melting_point	melting point	String	melting point	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	boiling_point	boiling point	String	boiling point	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	ph_viscosity	viscosity (at 20 °C)	String	viscosity (at 20 °C)	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	density	density (at 20 °C)	String	density (at 20 °C)	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	physical_state	physical state at 20 °C	String	physical state at 20 °C	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	auto_fl	auto-flammability	String	auto-flammability	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	flash_point_tag	flash point (TAG closed vessel)	String	flash point (TAG closed vessel)	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	coefficient	partition coefficient of n-octanol/water	String	partition coefficient of n-octanol/water	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	vapour_pressure	vapour pressure (at 20 °C)	String	vapour pressure (at 20 °C)	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	vapour_density	vapour density	String	vapour density	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
			(air=1)		(air=1)			
physical_chemical	physical_chemical	lst	liquid surface tension (at 20 °C)	String	liquid surface tension (at 20 °C)	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	cod	COD	String	COD	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	bod	BOD	String	BOD	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	fl_limits	flammability limits in air	String	flammability limits in air	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	flash_point_abel	flash point (ABEL closed vessel)	String	flash point (ABEL closed vessel)	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	decom_temp	decomposition temperature	String	decomposition temperature	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	physical_chemical	s_fresh_water	solubility in fresh water at 20 °C	String	solubility in fresh water at 20 °C	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_0_5	Solubility in sea water	String	Solubility in sea water	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	These information fields should be hidden in case there is no information to be displayed.
physical_chemical	sea_water	swater_5_5	sea water	String	sea water	yes	See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_20_5	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_34_5	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_0_10	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	

MAR-CIS 1								MAR-CIS 2
group	reference	property	label	datatype	label	Reference in MAR-CIS 1 ¹²	Description in MAR-CIS 1 database	Modifications to be included in MAR-CIS 2
physical_chemical	sea_water	swater_5_10	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_20_10	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_34_10	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_0_20	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_5_20	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_20_20	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_34_20	sea water	String	sea water		See in MAR-CIS 1 schema <i>tab_values</i> with the values per id_substance.	
physical_chemical	sea_water	swater_note	Note:	Memo	Note:		See MAR-CIS 1 schema <i>tab_memos</i> with text content per id_substance.	

The tables below describe the value lists stored in MAR-CIS 1 database. These value lists will be revised upon migration and integration in MAR-CIS 2. The MAR-CIS 2 Administrator should have the means to revise (add/delete and modify) the lists below.

1. **Behaviour (EBCS):** drop down list with 15 possible values (see in MAR-CIS 1 schema *tab_ebcs*):

ebcs	shortcut
gas	G
floater	F
gas / dissolver	GD
floater / dissolver	FD
evaporator	E
dissolver / evaporator	DE
evaporator / dissolver	ED

dissolver	D
floater / evaporator	FE
sinker / dissolver	SD
floater / evaporator / dissolver	FED
sinker	S
floater / sinker	FS
	-

2. **Fire codes specific hazards:** drop down list with 3 possible values:

none	
oxidizer	OX
use no water	W

3. **IMDG code**, hazard class: drop down list with 26 possible values (see below and in MAR-CIS 1 schema *tab_imdg_hazard_class*)

class_number	description	pictogram
1	Explosive Dangerous Goods: Explosive substances and articles used to produce explosions or pyrotechnic effect	
1.1	Explosives with a mass explosion hazard	
1.2	Explosives with a severe projection hazard	
1.3	Explosives with a fire, blast or projection hazard but not a mass explosion hazard	
1.4	Explosives with a minor fire or projection hazard	
1.5	An insensitive substance with a mass explosion hazard	
1.6	Extremely insensitive articles	
2.1	Flammable gas	
2.2	Non-flammable, compressed gas	
2.3	Toxic gas	

3	Flammable liquids	
4.1	Flammable solids	
4.2	Spontaneously combustible solids	
4.3	Combustible solids when in contact with water	
5.1	Oxidizer	
5.2	Organic peroxide	
6.1	Toxic substances	
6.2	Infectious substances	
7 I	Category I-WHITE (Symbol 7A)	
7 II	Category II-YELLOW (Symbol 7B)	
7 III	Category III-YELLOW (Symbol 7C)	
7	Criticality safety index label (Symbol 7E)	
8	Corrosive materials	
9	Miscellaneous dangerous compounds	
-		

4. **IMDG code, packing group:** drop down list with 5 possible values (see below and in MAR-CIS 1 schema *tab_packing_group*)

number	description
I	Great hazard
II	Moderate hazard
III	Slight hazard
-	

5. **IMDG code, emergency schedule:** drop down list with 38 possible values (see below and in MAR-CIS 1 schema *tab_emergency_schedule*)

shortcut	description
F-A	General fire schedule
F-B	Explosive substances and articles
F-C	Non-flammable gases
F-D	Flammable gases
F-E	Non-water-reactive flammable liquids
F-F	Temperature-controlled self-reactives and organic
F-G	Water-reactive substances
F-H	Oxidizing substances with explosive potential
F-I	Radioactive material
F-J	Non temperature-controlled self-reactives and organic
S-A	Toxic substances
S-B	Corrosive substances
S-C	Flammable, corrosive liquids
S-D	Flammable liquids
S-E	Flammable liquids, floating on water
S-F	Water-soluble marine pollutants
S-G	Flammable solids and self-reacting substances
S-H	Flammable solids (molten material)
S-I	Flammable solids (repacking possible)
S-J	Wetted explosives and certain self-heating substances
S-K	Temperature-controlled self-reactive substances
S-L	Spontaneously combustible, water-reactive substance
S-M	Hazard of spontaneous ignition
S-N	Substances reacting vigorously with water
S-O	Substances dangerous when wet (non-collectable article)
S-P	Substances dangerous when wet (collectable article)
S-Q	Oxidising substances

shortcut	description
S-R	Organic peroxides
S-S	Radioactive material
S-T	Dangerous goods with biohazard
S-U	Gases (flammable, toxic or corrosive)
S-V	Gases (non-flammable, non-toxic)
S-W	Oxidising gases
S-X	Explosive items and articles
S-Y	Explosive chemicals
S-Z	Toxic explosives
-	

6. **IMDG code, stowage and segregation:** drop down list with 7 possible values (see below and in MAR-CIS 1 schema *tab_stowage*)

category	description
Cat.A	Cargo or passenger ships with < 25 passengers or 1 passenger/3 m length - stowage on or under deck; other passenger ships with more passengers - stowage on or under deck
Cat.B	Cargo or passenger ships with < 25 passengers or 1 passenger/3 m length - stowage on or under deck; other passenger ships with more passengers - stowage on deck only
Cat.C	Cargo or passenger ships with < 25 passengers or 1 passenger/3 m length - stowage on deck only; other passenger ships with more passengers - stowage on deck only
Cat.D	Cargo or passenger ships with < 25 passengers or 1 passenger/3 m length - stowage on deck only; other passenger ships with more passengers - stowage prohibited
Cat.E	Cargo or passenger ships with < 25 passengers or 1 passenger/3 m length - stowage on or under deck; other passenger ships with more passengers - stowage prohibited
-	

7. **IMDG code, marine pollutant:** drop down list with 3 possible values (see below).

No
Yes

8. **IBC code, pollution category:** drop down list with 8 possible values (see below and MAR-CIS 1 schema *tab_pollution category*).

X	Category X-Substances under MARPOL Annex II
Y	Category Y-Substances under MARPOL Annex II
Z	Category Z-Substances under MARPOL Annex II
OS	Other substances under MARPOL Annex II
-	
Z	Chapt. 18 - IBC does not apply
OS	Chapt. 18 - IBC does not apply

9. **IBC code hazards:** drop down list with 5 possible values (see below and MAR-CIS 1 schema *tab_ibc_hazards*).

shortcut	description
S	Safety hazards
P	Pollution hazards
S/P	Safety and pollution hazards
-	

10. **IBC code ship type:** drop down list with 5 possible values (see below and MAR-CIS 1 schema *tab_ship_type*).

shortcut	description
1	Chemical tanker for products with very severe environmental and safety hazards (maximum preventive measures)
2	Chemical tanker for products with appreciably severe environmental and safety hazards (significant preventive measures)

3	Chemical tanker for products with sufficiently severe environmental and safety hazards (moderate degree of containment)
-	

11. **IBC code tank type:** drop down list with 8 possible values (see below and MAR-CIS 1 schema *tab_tank_type*).

shortcut	description
1	Independent tank
2	Integral tank
G	Gravity tank
P	Pressure tank
2G	Integral gravity tank
-	
1G	Independent gravity tank

12. **IBC code tank vents:** drop down list with 5 possible values (see below and MAR-CIS 1 schema *tab_tank_vents*).

shortcut	description
Open	Open venting
Cont.	Controlled venting
SR	Safety relief valve
-	

13. **IBC code gauging:** drop down list with 6 possible values (see below and MAR-CIS 1 schema *tab_gauging*).

shortcut	description
----------	-------------

O	Open gauging
R	Restricted gauging
C	Closed gauging
I	Indirect gauging
-	

14. **IBC code tank. env. control:** drop down list with 9 possible values (see below and MAR-CIS 1 schema *tab_tank_env_control*).

shortcut	description
Inert	Inerting
Pad	Liquid or gas padding
Dry	Drying
Vent	Natural or forced ventilation
No	No special requirements
-	
P + i	Liquid or gas padding and inerting
V/pg	Naturel or forced ventilation or gas padding

15. **IBC code tab vapour detection:** drop down list with 6 possible values (see below and MAR-CIS 1 schema *tab_vapour*).

shortcut	description
F	Flammable vapours
T	Toxic vapours
No	Indicates no special requirements
F-T	Flammable toxic vapours

-	

16. **IBC code fire protection:** drop down list with 7 possible values (see point 15 below and MAR-CIS 1 schema *tab_fire_protection*).

shortcut	description
A	Alcohol-resistant foam or multi-purpose foam
B	Regular foam; (not of an alcohol-resistant type, including fluoro-protein and aqueous-film-forming foam)
C	Water-spray
D	Dry chemical
No	No special requirements
-	

17. **IBC code emergency equipment:** drop down list with 3 possible values (see below).

No
Yes

18. **GESAMP diagram:** drop down list of GESAMP values. The GESAMP picture in the datasheet is defined based on the ratings defined for each GESAMP sub-category.

	Possible values for all GESAMP subcategories														
A1 Bioaccumulation	0	(0)	1	(1)	2	(2)	3	(3)	4	(4)	5	(5)	NI	-	
A2 Biodegradation	R	(R)	NR	(NR)	Inorg.	(Inorg.)	NI	-							
B1 Acute aquatic toxicity	0	(0)	1	(1)	2	(2)	3	(3)	4	(4)	5	(5)	6	(6)	NI
B2 Chronic aquatic toxicity	0	(0)	1	(1)	2	(2)	3	(3)	4	(4)	NI	-			
C1 Mammalian acute oral	0	(0)	1	(1)	2	(2)	3	(3)	4	(4)	NI	-			

toxicity																	
C2 Mammalian acute demal toxicity	0	(0)	1	(1)	2	(2)	3	(3)	4	(4)	NI	-					
C3 Mammalian acute inhalation toxicity	0	(0)	1	(1)	2	(2)	3	(3)	4	(4)	NI	-					
D1 Skin irritation and corrosion	0: Not Irritating	(0) : Not Irritating	1:Mildly irritating	(1):Mildly irritating	2: Irritating	(2): Irritating	3: severely irritating	(3): severely irritating	3A:C orrosive (≤ 4 hr)	(3A):C orrosive (≤ 4 hr)	3B: Corrosive (≤ 1 hr)	(3B): Corrosive (≤ 1 hr)	3C: Corrosive (≤ 3 min)	(3C): Corrosive (≤ 3 min)			
D2 Eye irritation and corrosion	0: Not Irritating	(0) : Not Irritating	1:Mildly irritating	(1):Mildly irritating	2: Irritating	(2): Irritating	3: severely irritating	(3): severely irritating	NI	-							
D3 Long-term health effects	C: Carcinogen	M: Mutagenic	R: Reprotoxic	S: Sensitising	A: Aspiration haz.	T: Target organ systemic toxicity	L: Lung injury	N: Neurotoxic	I: Immunotoxic	NI: No Information	-						
E1 Tainting	NT: Not tainting (tested)	(NT): Not tainting (tested)	T: Tainting	(T): Tainting	NI: No Information	-											
E2 Physical effects on Wildlife & benthic habitats	Fp: Persistent floater	F: Floater	S: Sinking substances	G: Gas	E: Evaporates	D: Dissolves	NI: No Information	-									
E3 Interference with Coastal Amenities	0	1	2	3	NI: No Information	-											

19. CLP/GHS classification: the tables below summarises the CLP/GHS classification and hazard communication. There is a list with all 'classifications' (see point 19.1). Based on that a certain hazard statement (see point 19.2), pictogram and signal word is selected.

The precautionary statements (see point 19.3) are not linked to the classification table.

These tables need to be revised and the links between them need also to be revised.

19.1. There are 77 different entries for "classification".

	abbreviation
--	--------------

1	Unst. Expl.
---	-------------

2	Expl. 1.1
---	-----------

3	Expl. 1.2
---	-----------

4	Expl. 1.3
5	Expl. 1.4
6	Expl. 1.5
7	Expl. 1.6
8	Flam. Gas 1
9	Flam. Gas 2
10	Flam. Aerosol 1
11	Flam. Aerosol 2
12	Ox. Gas 1
13	Press. Gas
14	Flam. Liq. 1
15	Flam. Liq. 2
16	Flam. Liq. 3
17	Flam. Sol. 1
18	Flam. Sol. 2
19	Self-react. A
20	Org. Perox. A
21	Self-react. B
22	Org. Perox. B

23	Self-react. C&D
24	Org. Perox. C&D
25	Self-react. E&F
26	Org. Perox. E&F
27	Self-react. G
28	Org. Perox. G
29	Pyr. Liq. 1
30	Pyr. Sol. 1
31	Self-heat. 1
32	Self-heat. 2
33	Water-react. 1
34	Water-react. 2
35	Water-react. 3
36	Ox. Liq. 1
37	Ox. Sol. 1
38	Ox. Liq. 2
39	Ox. Sol. 2
40	Ox. Liq. 3
41	Ox. Sol. 3

42	Met. Corr. 1
43	Acute Tox. 1
44	Acute Tox. 2
45	Acute Tox. 3
46	Acute Tox. 4
47	Skin Corr. 1A
48	Skin Corr. 1B
49	Skin Corr. 1C
50	Skin Irr. 2
51	Eye Dam. 1
52	Eye Irr. 2
53	Resp. Sens. 1
54	Skin. Sens. 1
55	Muta. 1A
56	Muta. 1B
57	Muta. 2
58	Carc. 1A
59	Carc. 1B
60	Carc. 2

61	Repr. 1A
62	Repr. 1B
63	Repr. 2
64	Lact.
65	STOT SE 1
66	STOT SE 2
67	STOT SE 3
68	STOT RE 1
69	STOT RE 2
70	Asp. Tox. 1
71	Aquatic Acute 1
72	Aquatic Chronic 1
73	Aquatic Chronic 2
74	Aquatic Chronic 3
75	Aquatic Chronic 4
76	Ozone
77	

19.2. There are 113 different entries for hazard statements. However the MAR-CIS 1 structure allows the addition of hazard number and its corresponding statement without a classification selected. This needs to be revised upon integration in MAR-CIS 2.

hazard_number	statement
H200	Unstable explosives.
H201	Explosive; mass explosion hazard.
H202	Explosive, severe projection hazard.
H203	Explosive; fire, blast or projection hazard.
H204	Fire or projection hazard.
H205	May mass explode in fire.
H220	Extremely flammable gas.
H221	Flammable gas.
H222	Extremely flammable aerosol.
H223	Flammable aerosol.
H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H228	Flammable solid.
H240	Heating may cause an explosion.
H241	Heating may cause a fire or explosion.
H242	Heating may cause a fire.
H250	Catches fire spontaneously if exposed to air.
H251	Self-heating: may catch fire.
H252	Self-heating in large quantities; may catch fire.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H261	In contact with water releases flammable gases.
H270	May cause or intensify fire; oxidiser.
H271	May cause fire or explosion; strong oxidiser.
H272	May intensify fire; oxidiser.
H280	Contains gas under pressure; may explode if heated.
H281	Contains refrigerated gas; may cause cryogenic burns or injury.
H290	May be corrosive to metals.
H300	Fatal if swallowed.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H310	Fatal in contact with skin.
H311	Toxic in contact with skin.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.

hazard_number	statement
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H341	Suspected of causing genetic defects <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H350	May cause cancer <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H351	Suspected of causing cancer <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H360	May damage fertility or the unborn child <state specific effect if known> <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H361	Suspected of damaging fertility or the unborn child <state specific effect if known> <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H362	May cause harm to breast-fed children.
H370	Causes damage to organs <or state all organs affected, if known> <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H371	May cause damage to organs <or state all organs affected, if known> <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H372	Causes damage to organs <or state all organs affected, if known> through prolonged or repeated exposure <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H373	May cause damage to organs <or state all organs affected, if known> through prolonged or repeated exposure <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.
EUH001	Explosive when dry.
EUH006	Explosive with or without contact with air.
EUH014	Reacts violently with water.
EUH018	In use may form flammable/explosive vapour-air mixture.
EUH019	May form explosive peroxides.
EUH044	Risk of explosion if heated under confinement.
EUH029	Contact with water liberates toxic gas.
EUH031	Contact with acids liberates toxic gas.
EUH032	Contact with acids liberates very toxic gas.
EUH066	Repeated exposure may cause skin dryness or cracking.
EUH070	Toxic by eye contact.
EUH071	Corrosive to the respiratory tract.
EUH059	Hazardous to the ozone layer.
EUH201/201A	Contains lead. Should not be used on surfaces liable to be chewed or sucked by children.\r\nWarning! Contains lead.
EUH202	Cyanoacrylate. Danger. Bonds skin and eyes in seconds. Keep out of the reach of children.
EUH203	Contains chromium (VI). May produce an allergic reaction.
EUH204	Contains isocyanates. May produce an allergic reaction.
EUH205	Contains epoxy constituents. May produce an allergic reaction.
EUH206	Warning! Do not use together with other products. May release dangerous gases (chlorine).
EUH207	Warning! Contains cadmium. Dangerous fumes are formed during use. See information supplied by the manufacturer. Comply with the safety instructions.
EUH208	Contains <name of sensitising substance>. May produce an allergic reaction.

hazard_number	statement
EUH209/209A	Can become highly flammable in use.\r\nCan become flammable in use.
EUH210	Safety datasheet available on request.
EUH401	To avoid risks to human health and the environment, comply with the instructions for use.
-	
H313	May be harmful in contact with skin.
H316	Causes mild skin irritation.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H350i	May cause cancer when inhaled.
H360F	May damage fertility.
H360D	May damage the unborn child.
H360FD	May damage fertility. May damage the unborn child.
H360Fd	May damage fertility. Suspected of damaging the unborn child.
H361f	Suspected of damaging fertility.
H361d	Suspected of damaging the unborn child.
H227	Combustible liquid.
H303	May be harmful if swallowed.
H305	May be harmful if swallowed and enters airways.
H320	Causes eye irritation.
H333	May be harmful if inhaled.
H401	Toxic to aquatic life.
H402	Harmful to aquatic life.
H420	Harms public health and the environment by destroying ozon in the upper atmosphere.
H227	Combustible liquid.
H303	May be harmful if swallowed.
H305	May be harmful if swallowed and enters airways.
H320	Causes eye irritation.
H333	May be harmful if inhaled.
H420	Harms public health and the environment by destroying ozon in the upper atmosphere.

19.3. Precautionary statements: below a list of precaution numbers and their corresponding text in MAR-CIS 1. The list will be updated.

precautionary_number	statement
P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P103	Read label before use.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P211	Do not spray on an open flame or other ignition source.
P220	Keep/ store away from clothing/ .../ combustible materials.
P221	Take any precaution to avoid mixing with combustibles/ ...

precautionary_number	statement
P222	Do not allow contact with air.
P223	Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P230	Keep wetted with ...
P231	Handle under inert gas.
P232	Protect from moisture.
P233	Keep container tightly closed.
P234	Keep only in original container.
P235	Keep cool.
P240	Ground/ bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ .../ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P244	Keep reduction valves free from grease and oil.
P250	Do not subject to grinding/ shock/ friction.
P251	Pressurized container: Do not pierce or burn, even after use.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P262	Do not get in eyes, on skin, or on clothing.
P263	Avoid contact during pregnancy/while nursing.
P264	Wash ... thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P281	Use personal protective equipment as required.
P282	Wear cold insulating gloves/ face shield/ eye protection.
P283	Wear fire/ flame resistant/ retardant clothing.
P284	Wear respiratory protection.
P285	In case of inadequate ventilation wear respiratory protection.
P231 + P232	Handle under inert gas. Protect from moisture.
P235 + P410	Keep cool. Protect from sunlight.
P301	IF SWALLOWED:
P302	IF ON SKIN:
P303	IF ON SKIN (or hair):
P304	IF INHALED:
P305	IF IN EYES:
P306	IF ON CLOTHING:
P307	If exposed:
P308	If exposed or concerned:
P309	If exposed or if you feel unwell:
P310	Immediately call a POISON CENTER or doctor/ physician.
P311	Call a POISON CENTER or doctor/ physician.
P312	Call a POISON CENTER or doctor/ physician if you feel unwell.

precautionary_number	statement
P313	Get medical advice/ attention.
P314	Get medical advice/attention if you feel unwell.
P315	Get immediate medical advice/ attention.
P320	Specific treatment is urgent (see ... on this label).
P321	Specific treatment (see ... on this label).
P322	Specific measures (see ... on this label).
P330	Rinse mouth.
P331	Do NOT induce vomiting.
P332	If skin irritation occurs:
P333	If skin irritation or rash occurs:
P334	Immerse in cool water/ wrap in wet bandages.
P335	Brush off loose particles from skin.
P336	Thaw frosted parts with lukewarm water. Do not rub affected area.
P337	If eye irritation persists:
P338	Remove contact lenses, if present and easy to do. Continue rinsing.
P340	Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P341	If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
P342	If experiencing respiratory symptoms:
P350	Gently wash with plenty of soap and water.
P351	Rinse cautiously with water for several minutes.
P352	Wash with plenty of soap and water.
P353	Rinse skin with water/ shower.
P360	Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P361	Remove/ take off immediately all contaminated clothing.
P362	Take off contaminated clothing and wash before reuse.
P363	Wash contaminated clothing before reuse.
P370	In case of fire:
P371	In case of major fire and large quantities:
P372	Explosion risk in case of fire.
P373	DO NOT fight fire when fire reaches explosives.
P374	Fight fire with normal precautions from a reasonable distance.
P375	Fight fire remotely due to the risk of explosion.
P376	Stop leak if safe to do so.
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P378	Use ... for extinction.
P380	Evacuate area.
P381	Eliminate all ignition sources if safe to do so.
P390	Absorb spillage to prevent material damage.
P391	Collect spillage.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302 + P334	IF ON SKIN: Immerse in cool water/ wrap in wet bandages.
P302 + P350	IF ON SKIN: Gently wash with plenty of soap and water.

precautionary_number	statement
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P304 + P341	IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P306 + P360	IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P307 + P311	If exposed: Call a POISON CENTER or doctor/ physician.
P308 + P313	If exposed or concerned: Get medical advice/ attention.
P309 + P311	If exposed or if you feel unwell: Call a POISON CENTER or doctor/ physician.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P342 + P311	If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P370 + P376	In case of fire: Stop leak if safe to do so.
P370 + P378	In case of fire: Use ... for extinction.
P370 + P380	In case of fire: Evacuate area.
P370 + P380 + P375	In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.
P371 + P380 + P375	In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
P401	Store ...
P402	Store in a dry place.
P403	Store in a well-ventilated place.
P404	Store in a closed container.
P405	Store locked up.
P406	Store in corrosive resistant/ ... container with a resistant inner liner.
P407	Maintain air gap between stacks/ pallets.
P410	Protect from sunlight.
P411	Store at temperatures not exceeding °C/ °F.
P412	Do not expose to temperatures exceeding 50 °C/ 122 °F.
P413	Store bulk masses greater than kg/ lbs at temperatures not exceeding °C/ °F.
P420	Store away from other materials.
P422	Store contents under ...
P402 + P404	Store in a dry place. Store in a closed container.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P410 + P403	Protect from sunlight. Store in a well-ventilated place.
P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F.
P411 + P235	Store at temperatures not exceeding °C/ °F. Keep cool.
P501	Dispose of contents/ container to ...
P309 + P310	If exposed or you feel unwell: immediately call a POISON CENTRE or doctor/ physician
-	

Appendix E – Example of MAR-CIS 1 datasheet

Identification

Name	Methyl acetate	Reference numbers	
IUPAC name	methyl acetate	UN number	1231
Proper shipping name	METHYL ACETATE	CAS number	79-20-9
Product name	METHYL ACETATE	EINECS	201-185-2
		Index number	607-021-00-X
Other names (more on page 11)	Acetic acid, methyl ester Acétate de méthyle Aethansaeuremethylester Devoton Essigsaeuremethylester		

Reference: 2, 10, 44, 631


Substance Properties

Extremely flammable colourless liquid with fruity odour, may form explosive mixtures. Flash point -13 °C. Dissolver, evaporator.

Class	Flammable liquids
Main uses	Solvent (nitrocellulose), by-product of PVC industry.
Appearance	Colourless liquid
Odour	Fruity
Behaviour (EBCS)	DE - dissolver / evaporator

Reference: 1, 2, 10, 516, 631



Fire Codes

Legend	no risk  severe risk		
Health	Blue (Left)	0 to 4	
Flammability	Red (Top)	0 to 4	
Reactivity	Yellow (Right)	0 to 4	
Special Hazards	White (Bottom)	OX means "oxidizer" W means "use no water"	

Reference: 128

Warning: Very dangerous. Presence in danger zone only with full protective clothing and breathing apparatus.

Reference: 128

Maritime transport codes					
IMDG			IBC		
UN number		1231	Marine pollution category	Z	Category Z-Substances under MARPOL Annex II
Hazard class	3	Flammable liquids			
Subsidiary risks	-			P	Pollution hazards
Packing group	II	Moderate hazard	Ship type	3	Chemical tanker for products with sufficiently severe environmental and safety hazards (moderate degree of containment)
Emergency schedule EmS	F-E	Non-water-reactive flammable liquids	Tank type	2G	Integral gravity tank
Placard / label	S-D	Flammable liquids	Tank vents	Cont.	Controlled venting
			Gauging	R	Restricted gauging
			Tank environmental control	No	No special requirements
			Vapour detection	F	Flammable vapours
			Fire protection	A	Alcohol-resistant foam or multi-purpose foam
Stowage and segregation	Cat.B	Cargo or passenger ships with < 25 passengers or 1 passenger/3 m length - stowage on or under deck; other passenger ships with more passengers - stowage on deck only	Emergency equipment	No	No special requirements
Marine pollutant	No				

Reference: 2, 44

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

GESAMP profile		1	2	3	4	5	6
Bioaccumulation & biodegradation	A1 Bioaccumulation	0					
	A2 Biodegradation	R: Readily biodegradable					
Aquatic toxicity	B1 Acute aquatic toxicity	1					
	B2 Chronic aquatic toxicity	NI: No information					
Acute mammalian toxicity	C1 Mammalian acute oral toxicity	0					
	C2 Mammalian acute dermal toxicity	0					
	C3 Mammalian acute inhalation toxicity	0					
Irritation, corrosion and long term health effects	D1 Skin irritation and corrosion	1: Mildly irritating					
	D2 Eye irritation and corrosion	2: Irritating					
	D3 Long-term health effects						
Interference with other uses of the sea	E1 Tainting						
	E2 Physical effects on wildlife & benthic habitats	D: Dissolves E: Evaporates					
	E3 Interference with coastal amenities	2					
Legend		<div> <div></div> maximum value </div> <div> <div></div> maximum value reached </div> <div> <div></div> () indicative or provisional classification </div>					

Reference: 1

Overview

High concentrations can produce central nervous system depression and optic nerve damage. Irritation of respiratory tract, skin. Causes serious eye irritation.

Reference: 10, 631

CLP/GHS classification and hazard communication

GHS pictogram



Signal word

danger / warning

Hazard statements

Flam. Liq. 2	H225	Highly flammable liquid and vapour.
Eye Irr. 2	H319	Causes serious eye irritation.
STOT SE 3	H336	May cause drowsiness or dizziness.

Precautionary statements

P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P243	Take precautionary measures against static discharge.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTER or doctor/ physician if you feel unwell.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use ... for extinction.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.

Reference: 631

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Health hazards

If swallowed	Irritation
If inhaled	Narcotic effect on prolonged/ concentrated exposure.
Skin/eye contact	Skin: Mildly irritating; eye: serious irritating.
Odour threshold concentration	4.6 ppm
Toxicity	Workers, inhalation, systemic, long term: DNEL - 610 mg/m ³ , local, long term: DNEL - 305 mg/m ³ , dermal, systemic, long term: DNEL - 88 mg/kg bw/day; general population, inhalation, systemic, long term: DNEL - 131 mg/m ³ , local, long term: DNEL - 152 mg/m ³ , dermal, systemic, long term: DNEL - 44 mg/kg bw/day, oral, systemic, long term: DNEL - 44 mg/kg bw/day.

Reference: 1, 10, 631

Substance intrinsic hazards

Fire explosion	Extremely flammable liquid, may form explosive mixtures.				
Fume hazards	Flammable. Vapour is heavier than air and may travel a considerable distance to a source of ignition and flash back.				
Reaction with other substances					
Acids	Yes	Shock	No	Oxidising agents	Yes
Air	Yes	Fresh/sea water	No	Alkalis	Yes
With reducing agents	Yes				
With other substances	The substance can react dangerously with alkali metals.				
Combustion by-products					

Reference: 10, 44, 368, 516

Environmental hazards

Behaviour	
Viscosity	Extremely thin
Eco toxicity	PNEC aqua (freshwater) - 0.12 mg/L, PNEC aqua (marine water) - 0.012 mg/L, PNEC aqua (intermittent releases) - 1.2 mg/L, PNEC STP - 600 mg/L, PNEC sediment (freshwater) - 0.128 mg/kg sediment dw, PNEC sediment (marine water) - 0.0128 mg/kg sediment dw, PNEC soil - 0.0416 mg/kg soil dw, PNEC oral - 20.4 mg/kg food.

Reference: 10, 631

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Emergency health measures

Always consult a doctor!

Symptoms	May be followed by damage to optic nerve. Narcotic effect on prolonged/ concentrated exposure. Contact can irritate and burn the eyes with possible permanent damage. Irritation of skin causing itching, redness, rash, drying and cracking. Irritation of lungs causing coughing and/ or shortness of breath. Higher exposures can cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath. Exposure can cause dizziness, lightheadedness, headache, nausea and passing out.
First aid response	
Inhalation	Move to fresh air, keep the victim laying down and restful. If breathing has stopped, give artificial respiration.
Ingestion	Do not induce vomiting. Danger of aspiration. Seek medical advice and clearly identify substance.
Skin contact	Wash with plenty of water or water and soap. Remove contaminated or soaked clothing. Seek medical advice in case of continuous irritation.
Eye contact	Rinse immediately with plenty of water. Follow up check by oculist.

Reference: 10, 631, 705

Emergency response measures on board of vessels

Response actions	KEEP UNAUTHORISED PERSONNEL AWAY. STAY UPWIND. KEEP OUT OF LOW AREAS. VENTILATE CLOSED SPACE BEFORE ENTERING. ALOHA Danger zones: Initial safety zone (0.2 m ³ release, wind speed 1 m/s): downwind >800 meters, 90 degrees 350 meters.
In case of leakage	
In open area	Contain, pump off with explosion-proof pump. If possible, close leak. Cover residual quantities with a liquid binding material such as diatomaceous earth, place ready in closed containers. Seal off low-lying rooms. Remove ignition sources.
In confined space	Contain, pump off with explosion-proof pump. If possible, close leak. Cover residual quantities with a liquid binding material such as diatomaceous earth, place ready in closed containers. Seal off low-lying rooms. Remove ignition sources.
To water	

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Fire fighting			
Extinguishing media	Large: Alcohol-resistant foam, water spray. Small: CO2, powder, foam, water spray.		
Fire fighting methods			
Personal protective equipment	<p>Special protective equipment for fire fighting: Use respiratory protection independent of recirculated air. Body protection: The protection clothing should be solvent resistant. Wear flameproof, antistatic protective clothing. Respiratory protection: In an emergency respiratory protection must be worn. Respiratory protection: Gas filter AX, colour code brown. Max. concentration for use: 1000 mL/m³ for max. 60 min. 5000 mL/m³ for max. 20 min. Eye protection: Wear glasses with side protection. Hand protection: Use protective gloves. Textile or leather gloves are completely unsuitable. Protective gloves of the following materials should not be worn longer than 1 hour continually (permeation time >= 1 hour): Butyl rubber - butyl (0.5 mm).</p>		
Decontamination of personnel on-site	Chemical / physical treatment, special waste incineration.		
Exposure safety limit	PAC 1	PAC 2	PAC 3
	250 ppm	250 ppm	10000 ppm
Monitoring/detection	Sample-tubes: Dräger Ethylacetat 200/a or equivalent.		
Emergency contacts	MAR-ICE		
	Phone: +33 2 98 33 10 10 +33 8 00 62 77 65	Fax: +33 2 98 44 91 38 E-Mail: MAR-ICE@cedre.fr	

Reference: 10, 112, 228, 455, 516, 590, 631

Environmental protection measures	
Intermediate storage	<p>Maximum temperature allowed during storage and transportation: 100 °C. Suitable materials: Teflon, polyethylene, polypropylene, PVDF, buna-N, carbon steel, stainless steel 316/304, tantalum, titanium, plain carbon steel, CrNi steel, CrNiMo steel, aluminium, monel 400, hastelloy C276.</p>
Substance disposal	Special waste incineration plant.

Reference: 10, 631

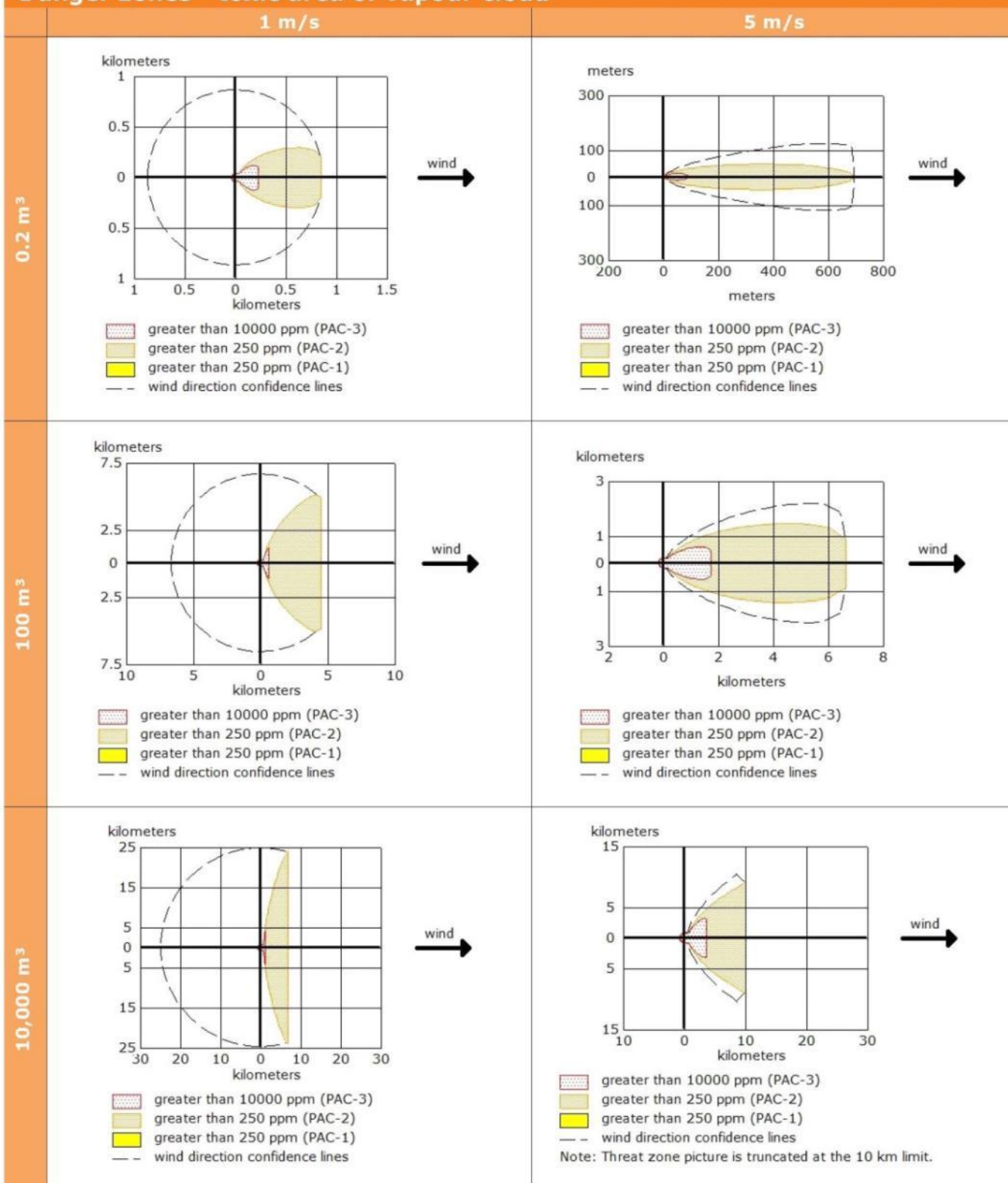
Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Danger zones - toxic area of vapour cloud



Source for the calculation is the ALOHA model developed by the US EPA and NOAA. Maximum predicted impacted area is 10 km. The calculations are based on:

Location: ATLANTIC, OCEAN Building: unsheltered single storied Time: using computer's clock SOURCE STRENGTH: Direct source: 0.2 or 100 or 10,000 m ³ Source height: 10 meters with spontaneous release	ATMOSPHERIC DATA: Wind: 1 or 5 meters/second from 180° true at 10 meters Ground roughness: open water Air temperature: 20 °C Inversion height: No inversion height Cloud: no cloud Stability class: D Relative humidity: 50 %
--	--

Reference: 455

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

First case history	
Cause of the incident	
Type of cargo	
Year	
Location	
Incident description	
Response description	
Authority in charge for dealing with the incident	

Reference:

Copyright Clause

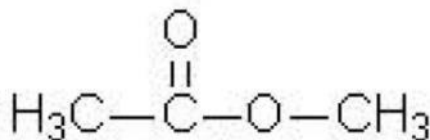
The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Physical and chemical properties

Structure



Formula	C3H6O2		
Molar mass	74.1 g/mol	Vapour pressure (at 20 °C)	220 hPa
Melting point	-98,3 °C	Vapour density (air=1)	2.560
Boiling point	57.2 °C	Liquid surface tension (at 20 °C)	24.6 mN/m
Viscosity (at 20 °C)	0.386 mPa*s	COD	
Density (at 20 °C)	0.93 g/cm ³	BOD	
Physical state (at 20 °C)	Liquid	Flammability limits in air	3.1 / 16 %
Auto flammability	455 °C	Flash point (ABEL closed vessel)	-13 °C
Flash point (TAG closed vessel)		Decomposition temperature	
Partition coefficient log (octanol/water)	0.37 at 25 °C	Solubility in fresh water (at 20 °C)	300 g/L

Reference: 10, 516, 631

Solubility in sea water	Temp. (°C)	5	10	20
	Salinity (g/kg)			
	0			
	5			
	20			
	34			
Note				

Reference:

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Other names

Acetic acid, methyl ester	
Acétate de méthyle	
Aethansaeuremethylester	
Devoton	
Essigsaeuremethylester	
Essigsäuremethylester	
Ethansaeuremethylester	
Ethansäuremethylester	
Ethyl ester of monoacetic acid	
METÜÜLETANOAT	
Methyl ethanoate	
Methylethanat	
Äthansäuremethylester	
Methyl acetic ester	

Reference: 10, 516

Reference Annex

- 1 INTERNATIONAL MARITIME ORGANIZATION (Editor); IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP); The Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships; London, 19.4.2013 - EHS50/8;
<http://www.gesamp.org/publications/publicationsdisplaypages/rs64>
<http://www.imo.org/OurWork/Environment/PollutionPrevention/ChemicalPollution/Documents/GESAMP-EHSCompositelistofhazardeprofiles.pdf> (14.4.2014)
- 2 Recommendations on the Transport of Dangerous Goods, United Nations, New York and Geneva, 2007 [with IMDG Code], revised by RESOLUTION MSC.328(90) (AMENDMENT 36-12) January 2013
- 10 RESY, Gefahrstoffdatenbank der Behörde für Stadtentwicklung und Umwelt Hamburg, 2012 [Computer aided emergency response unit system]
- 44 IBC Code 2007 Edition, International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk, IMO, London, 2007; ISBN 978-92-801-4226-6
- 112 Protective Action Criteria (PAC) database by Advanced Technologies and Laboratories International Incorporated;
<http://www.atlintl.com/DOE/teels/teel/search.html> (Rev. 27 - 7.5.2012)
- 128 Fire Protection Guide to Hazardous Materials, 14th edition, National Fire Protection Association, Quincy, Mass., 2010, ISBN 978-1-616-65041-4
- 228 U. S. Department of Transportation Pipeline and Hazardous Materials Safety Administration, CANUTEC Transport Dangerous Goods
 Transport Canada, Secretariat for Communications and Transport Land Transport Directorate Hazardous Materials and Wastes Directorate; <http://www.tc.gc.ca/media/documents/canutec-eng/ERG2012.pdf>
- 368 United States National Oceanic and Atmospheric Administration Office of Response and Restoration, CAMEO (Computer-aided management of emergency operations); <http://cameochemicals.noaa.gov/search/results> (4.4.2013)
- 455 United States Environmental Protection Agency, Emergency Management;
<http://www.epa.gov/emergencies/content/cameo/aloha.htm>, version 5.4.4 (1.1.2014)
- 516 GESTIS - database on hazardous substances, IFA Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung; [http://gestis-en.itrust.de/nxt/gateway.dll?f=templates\\$fn=default.htm\\$vid=gestiseng:sdbeng](http://gestis-en.itrust.de/nxt/gateway.dll?f=templates$fn=default.htm$vid=gestiseng:sdbeng) (14.2.2014)
- 590 Dräger; <http://www.draeger.net/voice/searchStart.do> (23.4.2014)
- 631 European Chemicals Agency; http://apps.echa.europa.eu/registered/data/dossiers/DISS-9d8b82e2-bb2b-1dc8-e044-00144f67d249/DISS-9d8b82e2-bb2b-1dc8-e044-00144f67d249_DISS-9d8b82e2-bb2b-1dc8-e044-00144f67d249.html (21.6.2014)
- 705 New Jersey Department of Health and Senior Services, Hazardous Substance Fact Sheet METHYL ACETATE; December 1996, rev. June 2003; <http://nj.gov/health/eoh/rtkweb/documents/fs/1217.pdf> (15.10.2014)

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Appendix F – Glossary of MAR-CIS 1

Glossary

Acute	Severe but short duration.
Acute health effects	Occur immediately after exposure to hazardous chemicals.
Acute toxicity	Adverse effects produced by single exposure to substance.
Acute (aquatic) toxicity	Adverse effects that occur rapidly as a result of short-term exposure to a chemical or physical agent. In fish and other aquatic organisms, effects that occur within a few hours, days or weeks are considered acute. A chemical is considered acutely toxic if by its direct action it kills 50 % or more of the exposed population of test organisms in a relatively short period of time, such as 24-96 h.
AEGL	<p>Acute Emergency Guideline Levels (AEGLs) represent threshold exposure limits for the general public and are applicable to emergency exposures ranging from 10 minutes to 8 hours. Three levels—AEGL-1, AEGL-2, AEGL-3—are developed for each of five exposure periods (10 minutes, 30 minutes, 1 hour, 4 hours, and 8 hours) and are distinguished by varying degrees of severity of toxic effects. The three AEGLs are defined as follows:</p> <p>AEGL-1 is the airborne concentration (expressed as ppm [parts per million] or mg/m³ [milligrams per cubic meter]) of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic, nonsensory effects. However, these effects are not disabling and are transient and reversible upon cessation of exposure.</p> <p>AEGL-2 is the airborne concentration (expressed as ppm or mg/m³) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting, adverse health effects or an impaired ability to escape.</p> <p>AEGL-3 is the airborne concentration (expressed as ppm or mg/m³) of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening adverse health effects or death.</p>
ALOHA model	See NOAA website http://response.restoration.noaa.gov/aloha . See also "Danger zone".
Aspiration hazard	Any substance which, if inhaled into the respiratory tract during swallowing or vomiting of the substance, will cause respiratory tract (usually lung) injury because of its severe irritancy or corrosivity, or cause a granulomatous reaction because of its insolubility and persistence in the respiratory tract.
Auto-flammability	or auto-ignition temperature, which indicates the temperature at which spontaneous combustion may occur in the absence of any flame or spark.
Baseline aquatic toxicity	Baseline toxicity is the (theoretical) aquatic toxicity exerted by a substance due to the most simple mode of toxic action, i.e. nonpolar narcosis, a process whereby the phospholipid bi-layers of cell membranes become saturated with the substance, causing the cell to die.
Bioaccumulation	General term describing a process by which chemicals are taken up by aquatic organisms directly from water as well as from exposure through other routes, such as consumption of food and sediment containing the chemicals.
Biological oxygen demand (BOD)	A measure of the rate at which molecular oxygen is consumed by micro-organisms during oxidation of organic matter. The standard test is the 5-day BOD test, in which the amount of dissolved oxygen required for oxidation over a 5-day period is measured. The results are measured in mg of oxygen/l (mg/l).
Bioconcentration factor (BCF)	A term describing the degree to which a substance can be concentrated in the tissues of an organism in the aquatic environment as a result of exposure through the water phase. At steady state during the uptake phase of a bioconcentration test, the BCF is a value equal to the concentration of a substance in one or more tissues of the exposed aquatic organisms divided by the average exposure water concentration of the chemical in the test.
Biodegradation	The transformation of a substance resulting from the complex enzymatic action of microorganisms (e.g., bacteria, fungi). It usually leads to disappearance of the parent structure and to the formation of smaller chemical species, some of which are used for cell anabolism.
BCSN	Bulk Cargo Shipping Name
BOD	See >Biological oxygen demand<.

Copyright Notice

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Notice

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Boiling point	The temperature of a liquid at which its vapour pressure reaches 1 atmosphere at ambient pressure.
bw	Body weight.
CAMEO	CAMEO Chemicals is a tool designed for people who are involved in hazardous material. CAMEO Chemicals was developed by the National Oceanic and Atmospheric Administration's Office of Response and Restoration in partnership with the Environmental Protection Agency's Office of Emergency Management and the U.S. Coast Guard's Research and Development Center.
Carcinogen	The term carcinogen denotes a chemical substance or mixture which induces cancer or increases its incidence. Substances which are known to induce benign or malignant tumours in well-performed experimental studies on animals are also considered to be presumed or suspected human carcinogens, unless there is strong evidence that the mechanism of tumour formation is not relevant for humans.
CAS number	Chemical Abstract System: standardized reference number for all regulated materials.
Chemical oxygen demand (COD)	A measure of the oxygen equivalent of the organic matter in wastewater susceptible to oxidation by a strong chemical oxidising agent (e.g., potassium permanganate; see also BOD).
Chronic toxicity	Effects resulting from repeated exposure to a substance for the lifespan of the species, or the greater part thereof.
Chronic (aquatic) toxicity	Adverse effects on aquatic organisms that occur largely from continuous long-term exposure to a chemical or other potentially toxic substance or agent, alone or in combination, but where the exposure time covers only a portion of the life cycle (lifespan) of the aquatic species tested or exposed naturally. The effects may be the result of a single exposure (e.g., to a strong acid) but more often they are the consequence of repeated or continuous longterm exposures. Subchronic toxic effects may be lethal or sublethal.
CLP classification	Regulation for Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation, January 2009). This Regulation incorporates the classification criteria and labelling rules agreed at UN level, the so-called Globally Harmonised System of Classification and Labelling of Chemicals (GHS). It is based on the principle that the same hazards should be described and labelled in the same way all around the world. Abbreviation of classification see table at end of this glossary "CLP Regulation (EC) No. 1272 / 2008"
Coastal amenity	Beach, mudflat, wharf, boardwalk or any other feature of the coastline considered of public value.
COD	See >Chemical oxygen demand<.
Combustability	The ability of a material to burn under ambient conditions.
Confidence line	On ALOHA's (see danger zone) threat zone plot for all dispersion scenarios, the dashed lines along both sides of the threat zone represent uncertainty in the wind direction. The wind rarely blows constantly from any one direction. As it shifts direction, it blows the released chemical in a new direction. The "uncertainty lines" around the threat zone enclose the region within which, about 19 out of 20 times, the chemical cloud is expected to remain. The lower the wind speed, the more the wind changes direction, so as wind speed decreases, the uncertainty lines become farther apart. They form a circle when wind speed is very low.
Corrosive	Capable of causing erosive destruction of tissues.
CPR	Cardiopulmonary Resuscitation
cPs	A centipoise is one millipascal-second (mPa*s) in SI units. (1 cP = 10 ⁻² P = 10 ⁻³ Pa*s) Centipoise is properly abbreviated cP, but the alternate abbreviations cps and cPs are also commonly seen.
CSM	Chlorosulfonated polyethylene, DuPont synthetic rubber marketed as Hypalon.
cSt	centi Stoke - unit for viscosity (the resistance of a fluid to flow).

Danger zone	<p>Source for the calculation is the ALOHA model developed by the US EPA and NOAA. The calculations are based on:</p> <p>Location: ATLANTIC, OCEAN (Lat 30 deg. N / Long 70 deg. W)</p> <p>Building: unsheltered single storied</p> <p>Time: using computer's clock</p> <p>ATMOSPHERIC DATA:</p> <p>Wind: 1 or 5 meters/second from 180° true at 10 meters</p> <p>Ground roughness: open water Cloud: no cloud</p> <p>Air temperature: 20 °C Stability class: D</p> <p>No inversion height Relative humidity: 50 %</p> <p>SOURCE STRENGTH:</p> <p>Direct source: 0.2 or 100 or 10,000 tons</p> <p>Source height: 10 meters with spontaneous release.</p>
Decomposition temperature	The amount of heat liberated when the specified weight decomposes to more stable substances. The value is given for very few chemicals, because most are stable and do not compose under the conditions of temperature and pressure encountered during shipment.
Density	Definition of mass per unit volume in relation to pure water at 4 °C = density 1.0.
Dermal toxicity	Systemic toxic effects produced as a result of a substance being absorbed across the skin.
Dissolved Organic Carbon (DOC)	That part of the organic carbon in the water which cannot be removed by specified phase separation, for example by centrifugation at 40,000 m/s ² for 15 min or by membrane filtration using membranes with pores of 0.2 - 0.45 µm diameter.
DNEL	Derived no effect level.
EBCS	European Behaviour Classification System; Classification of hazardous substances in behaviour groups by their vapour pressure, density and solubility in water.
EC10	Effective concentration 10 % (the concentration that induces half of the maximal effect).
EC50	Effective concentration 50 %: The concentration of a substance which produces a 50 % response in the defined end-point. The EC50 should be cited for a specific exposure period.
EINECS	The European Inventory of Existing Commercial chemical Substances (EINECS) lists and defines those chemical substances, which were deemed to be on the European Community market between 1 January 1971 and 18 September 1981.
EL50	The effective loading rate in excess of the aqueous solubility of a substance or mixture at which a 50 % effect is caused in tests with aquatic organisms following exposure to water accommodated fractions of the substance.
Emergency Response	The response to any occurrence which results, or is likely to result, in a release of hazardous substance due to an unforeseen event.
Emergency schedule EmS	The emergency schedules (introduced with amendment 31 to the IMDG Code) are intended for fire and/or spillage emergencies on board a ship involving packaged dangerous goods. They are not for dealing with bulk cargoes, which have their own emergency information. They are intended for shipboard use when response is needed without external assistance.
Environment	Water, air, and land, and the interrelationship which exists among and between them and all livings.

ERPG	<p>The Emergency Response Planning Guidelines (ERPGs) are Toxic Levels of Concern (LOCs) that are used in ALOHA (see danger zone) to predict the area where a toxic gas concentration might be high enough to harm people. The ERPGs are three-tiered guidelines with one common denominator: a 1-hour contact duration</p> <p>ERPG 1: The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odor.</p> <p>ERPG 2: The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.</p> <p>ERPG 3: The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.</p>																																									
est.	estimated																																									
Evacuation	A population protection strategy involving orderly movement of people away from an actual or potential hazard, and providing reception centres for those without their own resources for temporary relocation.																																									
Explosive	A chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.																																									
Exposure safety limits	See PAC.																																									
Flammability	The ease with which a material will ignite, either spontaneously from exposure to a high temperature, or from exposure to a spark or open flame.																																									
Flammability limits in air	or Explosive Limits, which are the minimum and maximum concentrations of vapours of a substance in the air forming a mixture that are flammable or explosive in the presence of ignition sources.																																									
Flash point	Refers to the lowest temperature at which a liquid still gives off enough vapour to be capable of ignition.																																									
Fire codes	<p>Or "fire diamond" is a US Standard maintained by the National Fire Protection Association (NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response). The standard provides a readily recognised, easily understood system for identifying specific hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative hazards of a material.</p> <p>Interpreting NFPA 704 Codes according to CAMEO:</p> <table border="1"> <tbody> <tr> <td rowspan="6">Health Hazard</td><td>4</td><td>Too dangerous to enter - vapour or liquid.</td></tr> <tr> <td>3</td><td>Extremely hazardous - use full protection.</td></tr> <tr> <td>2</td><td>Hazardous - use breathing apparatus.</td></tr> <tr> <td>1</td><td>Slightly hazardous.</td></tr> <tr> <td>0</td><td>Like ordinary material.</td></tr> <tr> <td></td><td></td></tr> <tr> <td rowspan="5">Flammability Hazard</td><td>4</td><td>Extremely flammable.</td></tr> <tr> <td>3</td><td>Ignites at normal temperatures.</td></tr> <tr> <td>2</td><td>Ignites when moderately heated.</td></tr> <tr> <td>1</td><td>Must be preheated to burn.</td></tr> <tr> <td>0</td><td>Will not burn.</td></tr> <tr> <td rowspan="5">Reactivity Hazard</td><td>4</td><td>May detonate - evacuate area if materials are exposed.</td></tr> <tr> <td>3</td><td>Strong shock or heat may detonate - use monitors.</td></tr> <tr> <td>2</td><td>Violent chemical change possible.</td></tr> <tr> <td>1</td><td>Unstable if heated - use normal precautions.</td></tr> <tr> <td>0</td><td>Normally stable.</td></tr> <tr> <td rowspan="2">Specific Hazard</td><td>W or "Use NO WATER"</td><td>Indicates an unusually water-reactive material (such as sodium).</td></tr> <tr> <td>OX or "Oxidizer"</td><td>Indicates a material that is an oxidizer (such as ammonium nitrate).</td></tr> </tbody> </table>		Health Hazard	4	Too dangerous to enter - vapour or liquid.	3	Extremely hazardous - use full protection.	2	Hazardous - use breathing apparatus.	1	Slightly hazardous.	0	Like ordinary material.			Flammability Hazard	4	Extremely flammable.	3	Ignites at normal temperatures.	2	Ignites when moderately heated.	1	Must be preheated to burn.	0	Will not burn.	Reactivity Hazard	4	May detonate - evacuate area if materials are exposed.	3	Strong shock or heat may detonate - use monitors.	2	Violent chemical change possible.	1	Unstable if heated - use normal precautions.	0	Normally stable.	Specific Hazard	W or "Use NO WATER"	Indicates an unusually water-reactive material (such as sodium).	OX or "Oxidizer"	Indicates a material that is an oxidizer (such as ammonium nitrate).
Health Hazard	4	Too dangerous to enter - vapour or liquid.																																								
	3	Extremely hazardous - use full protection.																																								
	2	Hazardous - use breathing apparatus.																																								
	1	Slightly hazardous.																																								
	0	Like ordinary material.																																								
Flammability Hazard	4	Extremely flammable.																																								
	3	Ignites at normal temperatures.																																								
	2	Ignites when moderately heated.																																								
	1	Must be preheated to burn.																																								
	0	Will not burn.																																								
Reactivity Hazard	4	May detonate - evacuate area if materials are exposed.																																								
	3	Strong shock or heat may detonate - use monitors.																																								
	2	Violent chemical change possible.																																								
	1	Unstable if heated - use normal precautions.																																								
	0	Normally stable.																																								
Specific Hazard	W or "Use NO WATER"	Indicates an unusually water-reactive material (such as sodium).																																								
	OX or "Oxidizer"	Indicates a material that is an oxidizer (such as ammonium nitrate).																																								
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Pollution.																																									
GHS classification	See >Precautionary statements< and >Hazard statements<.																																									

Disclaimer

The Intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorizes you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Hazard	1. A substance is considered to be hazardous when it possesses one or more intrinsic properties which may cause significant harm to human health or the aquatic environment. 2. Any situation that has the potential for causing damage to life, property, and /or the environment.
Hazard class	A group of materials that share a common major hazardous property, i.e. flammability.
Hazard evaluation	A process whereby hazard is assessed on the basis of a series of end-points relating to its intrinsic properties, e.g. toxicity.
Hazard statements (CLP classification)	"Hazard statement" means a phrase assigned to a hazard class and category that describes the nature of the hazards of a hazardous substance or mixture, including, where appropriate, the degree of hazard.
Hot Zone	The total exclusion area around the hazardous material incident; size of the "hot zone" will vary depending on the material involved. No entry is allowed except by personnel wearing >special protective< clothing.
IBC Code	International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk and Index of Dangerous Chemicals Carried in Bulk, IMO
IMDG CODE	The International Maritime Dangerous Goods Code, IMO.
IMO	International Maritime Organization, London.
IMSBC	International Maritime Solid Bulk Cargoes Code. The code categorises cargo into three groups: Group A, cargoes which may liquefy if shipped at a moisture content in excess of their transportable moisture limit. Group B, cargoes which possess a chemical hazard which could give rise to a dangerous situation on a ship. Group C, cargoes which are neither liable to liquefy (Group A) nor to possess chemical hazards (Group B).
Inflammation	Tissue reaction to injury caused by chemical, bacterial or mechanical irritation.
IC50	Inhibition concentration 50 %: a point estimate of the chemical concentration that would cause a given percent reduction (e.g., IC50) in a non-lethal biological measurement of the test organisms, such as reproduction or growth. The IC should be cited for the specific exposure period.
IDLH	The Immediately Dangerous to Life or Health (IDLH) level is a limit originally established for selecting respirators for use in workplaces by the National Institute for Occupational Safety and Health (NIOSH). A chemical's IDLH is an estimate of the maximum concentration in the air to which a healthy worker could be exposed without suffering permanent or escape-impairing health effects. Once you choose a chemical in ALOHA, its IDLH (if one has been established) is displayed in the Text Summary window as a possible Toxic Level of Concern. A Toxic Level of Concern (LOC) is a threshold concentration of an airborne pollutant, usually the concentration above which a hazard may exist. For each LOC you choose, ALOHA estimates a threat zone where the ground-level pollutant concentration is predicted to exceed that LOC at some time after a release begins. These zones are displayed on a single Threat Zone plot ("Danger Zones" in MAR-CIS). If three LOCs are chosen, ALOHA will display the threat zones in red, orange, and yellow. When you use ALOHA's default LOCs, the red zone represents the worst hazard.
IL50	The loading rate in excess of the aqueous solubility of a substance or mixture at which a 50% inhibition of population growth is measured in tests with microalgae following exposure to water accommodated fractions of the substance.
Intermediate storage	Emergency short-term treatment and storage of dangerous goods involved in accidents.
IMDG Code	International Maritime Organisation Dangerous Goods Code, published by IMO, is a reference book, listing relevant properties for a large number of industrial chemicals transported by sea.
IMO Class	The International Maritime Organisation (IMO) approved a system of classifying chemical substances on the basis of physical hazards involved.
Index number	Formerly: EC number from the EC Directive 79/831/EEC [...] on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances for the identification and systematisation of chemical compounds in Community legislation on dangerous substances.
Irritant	Capable of causing a local inflammatory response.
IUPAC name	Nomenclature of the International Union of Pure and Applied Chemistry.

Disclaimer

The intellectual property rights connected to the Databases of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorizes you to access and use these Databases and the data and information contained within these Databases for non-profit use only. Where any information from these Databases is used in any context, these EMSA Databases must be acknowledged as the source.

Liability

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Databases, or the use or inability to use these Databases.

K _{ow}	See >n-Octanol-water partition coefficient<.
LCL ₅₀	Lowest lethal concentration.
LC ₀	Lethal concentration 0 % (the concentration that does not kill any component of a tested population).
LC ₅₀	Lethal concentration 50 %: The concentration, in air or in a solution, which causes 50 % mortality of the test species. It is calculated from the incidence of mortality at various concentrations to which different groups of the test species are exposed. Since mortality will depend on the time of exposure, the LC ₅₀ should be cited for the specific exposure period.
LD ₅₀	Lethal dose 50 %: the amount (dose) of test substance that causes 50 % mortality of the test species. It is calculated from the incidences of mortality at various doses given to different groups of the test species. It is usually expressed as mg (or g) of test substance per g or kg of body weight of the test species. Also referred to as the median lethal dose.
Lethal	Causing or capable of causing death.
Liquid surface tension	The measure of the tensile force at the surface of a liquid that tends to shape liquid fragments into spherical drops.
LL ₅₀	The loading rate in excess of the aqueous solubility of a substance or mixture at which 50 % mortality is caused in tests with aquatic organisms following exposure to water accommodated fractions of the substance.
LOEC	Lowest observed effect concentration.
LOEL	Lowest observed effect level.
Log P _{ow}	The ratio of a chemical's solubility in a mixture of n-octanol and water at steady state; also expressed as P. The logarithm of P or K _{ow} (i.e., log P or log K _{ow}) is used as an indication of a chemical's propensity for bioconcentration by aquatic organisms.
Lower explosion limit (LEL)	The minimum percentage of vapour (gas) at which vapour or gas mixture can be made to explode.
Marine pollutant	Identification of packaged dangerous goods which could be a threat to the marine environment (IMDG Code).
MARPOL	International Convention for the Prevention of Pollution from Ships 1973/78.
MATC	Maximum acceptable threshold concentration (see NOEC).
Material Safety Data Sheet (MSDS)	Compilation of the health, flammability, and reactivity hazards of a chemical. It is a legal document. It contains information about safe handling of a hazardous chemical, and will contain recommended exposure limits.
Melting point	The temperature at which the phase change from solid to liquid occurs.
mg/kg	Quantity of material, by weight, administered to a test subject, based on their body weight in kg.
mg/m ³	Concentration expressed in weight of substance per volume of air.
Molar mass	Describes the relative mass of the molecules of a substance in relation to the carbon isotope with a molar mass of 12.0; permits conclusions about the chemical identity of the substance.
Mutagen	A substance capable of causing molecular injury to the genetic substance (DNA: deoxyribonucleic acid).
N/A	Not applicable.
na	Not available.
nd	Not determined.
Neurotoxic	Capable of causing injury to the central nervous system (brain and spinal cord) and/or peripheral nervous system (nerves arising from the brain and spinal cord). Delayed neurotoxicity refers injury to the nervous system following a single exposure, but for which there is a significant latent period between exposure and the appearance of signs of a neurotoxic effect.
NOAEL	No observed adverse effect level (see NOEC).
NOELR	No observed effect loading rate.
No Observed Effect Concentration (NOEC)	The highest concentration of a substance in a toxicity test that has no statistically significant adverse effect on the exposed population of test organisms compared with the controls. When derived from a life cycle or partial life cycle test, it is numerically the same as the lower limit of the Maximum Acceptable Threshold Concentration (MATC); also called no observed adverse effect level (NOAEL).
n-Octanol-water partition coefficient (K _{ow})	The ratio of a chemical's solubility in a mixture of n-octanol and water at steady state; also expressed as P. The logarithm of P or K _{ow} (i.e., log P or log K _{ow}) is used as an indication of a chemical's propensity for bioconcentration by aquatic organisms.

Disclaimer

The Intellectual property rights contained in the Databases of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorizes you to access and use these Databases and the data and information contained within these Databases for non-profit use only. Where any information from these Databases is used in any context, these EMSA Databases must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Databases, or the use or inability to use these Databases.

Odour threshold	Lowest concentration in ppm at which human beings sense the odour emitted from that substance.														
PAC	<p>Protective Action Criteria (PAC)¹ are essential components for planning and response to uncontrolled releases of hazardous chemicals. These criteria, combined with estimates of exposure, provide the information necessary to evaluate chemical release events for the purpose of taking appropriate protective actions. PAC values for emergency planning for chemical release events are based on the following exposure limit values:</p> <ul style="list-style-type: none">• Acute Exposure Guideline Level (AEGL) values published by the U.S. Environmental Protection Agency (EPA). <i>[For threshold explanation, see AEGL].</i>• Emergency Response Planning Guideline (ERPG) values produced by the American Industrial Hygiene Association (AIHA). <i>[For threshold explanation, see ERPG]</i>• Temporary Emergency Exposure Limit (TEEL) values developed by SCAPA. <i>[For threshold explanation, see TEEL]</i> <table><tr><td></td><td>Effects</td><td>Criteria used</td></tr><tr><td>PAC-1</td><td>Mild, transient health effects.</td><td><ul style="list-style-type: none">• 1st AEGL-1;• If AEGL-1 is not available use ERPG-1;• If neither AEGL-1 nor ERPG-1 is available, use TEEL-1 value.</td></tr><tr><td>PAC-2</td><td>Irreversible or other serious health effects that could impair the ability to take protective action.</td><td><ul style="list-style-type: none">• 1st AEGL-2;• If AEGL-2 is not available use ERPG-2;• If neither AEGL-2 nor ERPG-2 is available, use TEEL-2 value.</td></tr><tr><td>PAC-3</td><td>Life-threatening health effects.</td><td><ul style="list-style-type: none">• 1st AEGL-3;• If AEGL-3 is not available use ERPG-3• If neither AEGL-3 nor ERPG-3 is available, use TEEL-3 value.</td></tr></table>				Effects	Criteria used	PAC-1	Mild, transient health effects.	<ul style="list-style-type: none">• 1st AEGL-1;• If AEGL-1 is not available use ERPG-1;• If neither AEGL-1 nor ERPG-1 is available, use TEEL-1 value.	PAC-2	Irreversible or other serious health effects that could impair the ability to take protective action.	<ul style="list-style-type: none">• 1st AEGL-2;• If AEGL-2 is not available use ERPG-2;• If neither AEGL-2 nor ERPG-2 is available, use TEEL-2 value.	PAC-3	Life-threatening health effects.	<ul style="list-style-type: none">• 1st AEGL-3;• If AEGL-3 is not available use ERPG-3• If neither AEGL-3 nor ERPG-3 is available, use TEEL-3 value.
	Effects	Criteria used													
PAC-1	Mild, transient health effects.	<ul style="list-style-type: none">• 1st AEGL-1;• If AEGL-1 is not available use ERPG-1;• If neither AEGL-1 nor ERPG-1 is available, use TEEL-1 value.													
PAC-2	Irreversible or other serious health effects that could impair the ability to take protective action.	<ul style="list-style-type: none">• 1st AEGL-2;• If AEGL-2 is not available use ERPG-2;• If neither AEGL-2 nor ERPG-2 is available, use TEEL-2 value.													
PAC-3	Life-threatening health effects.	<ul style="list-style-type: none">• 1st AEGL-3;• If AEGL-3 is not available use ERPG-3• If neither AEGL-3 nor ERPG-3 is available, use TEEL-3 value.													
Packing group	Packing and stowage based on hazard by IMDG Code.														
Partition coefficient of n-octanol/water	See > Log P _{ow} <.														
PE	Polyethylene														
Personal protective equipment	ABS	acrylonitrile butadiene styrene copolymer													
	CR	chloroprene chlorobutadiene natural rubber (Neoprene)													
	ECTFE/ETFE	ethylene chlorotrifluoroethylene / ethylene tetrafluoroethylene													
	EPDM	ethylene propylene diene monomer													
	FEP/PFA	tetrafluoroethylene perfluoropropylene													
	FPM	fluoropolymer, Viton													
	HDPE	polyethylene of high density													
	LDPE	polyethylene of low density													
	NBR	nitrile natural rubber													
	NR	natural rubber													
	PA	polyamide, Nylon													
	PC	polycarbonate													
	PETG	polyethylene terephthalate with glycols													
	PMP	polymethylpentene													
	POM	polyoxymethylene													
	PP	polypropylene													
	PS	polystyrene													
	PSU	polysulfone													
	PTFE	polytetrafluoroethylene													
	PVC	polyvinyl chloride													
PVDF	polyvinylidene fluoride														
SAN	styrene acrylonitrile														
SI	silicone natural rubber														
Physical state	It indicates whether the chemical is a solid, liquid, or gas after it has reached equilibrium with its surroundings at ambient conditions of temperature and pressure.														
PNEC	Predicted no effect concentration.														

¹ Emergency Management Issues Special Interest Group (2012), <http://orise.orau.gov/em/scapa/chem-pacs-lets/default.htm>

Disclaimer

The intellectual property rights concerned in the Databases of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorizes you to access and use these Databases and the data and information contained within these Databases for non-profit use only. Where any information from these Databases is used in any context, these EMSA Databases must be acknowledged as the source.

Liability

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Databases, or the use or inability to use these Databases.

Pollution Category	<p>Under the IBC Code it is assigned to each product under Annex II of MARPOL 73/78.</p> <p>The Annex II Regulations for the control of pollution by noxious liquid substances in bulk define a four-category categorization system for noxious and liquid substances.</p> <p>The categories are:</p> <ul style="list-style-type: none"> • Category X: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a major hazard to either marine resources or human health and, therefore, justify the prohibition of the discharge into the marine environment; • Category Y: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and therefore justify a limitation on the quality and quantity of the discharge into the marine environment; • Category Z: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a minor hazard to either marine resources or human health and therefore justify less stringent restrictions on the quality and quantity of the discharge into the marine environment; and • Other Substances: substances which have been evaluated and found to fall outside Category X, Y or Z because they are considered to present no harm to marine resources, human health, amenities or other legitimate uses of the sea when discharged into the sea from tank cleaning or deballasting operations. <p>The discharge of bilge or ballast water or other residues or mixtures containing these substances are not subject to any requirements of MARPOL Annex II.</p>
--------------------	--

ppm	Parts per million.
Precautionary statements (CLP classification)	"Precautionary statement" means a phrase that describes recommended measure(s) to minimise or prevent adverse effects resulting from exposure to a hazardous substance or mixture due to its use or disposal.
Product name	The product name is taken from the IBC code.
Proper shipping name	The proper shipping name is listed in the IMDG Code; if the substance is not listed there the name of the IBC code will be taken.
Ready biodegradability	70 % removal of DOC and 60 % removal of ThOD (Theoretical oxygen demand) or ThCO ₂ (Theoretical carbon dioxide) production (for respirometric methods), reached within a 10 days window in 28 days using non-adapted bacterial inocula.
Response	The efforts to minimize the risks created in an emergency by protecting the people, the environment, and property, and the efforts to return the scene to normal pre-emergency conditions.
Risk	The likelihood of harm occurring, e.g. when exposure of an organism to a substance is considered in conjunction with hazard data (Hazard × Exposure = Risk). If either hazard or exposure can be minimised, the risk or likelihood of harm will be reduced.
Reproductive toxicity	Injury to the male or female reproductive system, interfering with the propagation of the species.
Reprotoxic	A substance causing adverse effects on reproductive ability or capacity, or on the development of offspring.
Sensitisation	Exposure to the substance results in stimulation of the immune system, resulting in a state of hypersensitivity to the substance. Sensitisation by skin contact results in local allergic responses. Sensitisation by inhalation (respiratory sensitisation) causes asthma.
Solubility	Maximum soluble mass of substance per volume of water, generally at 20 °C.
STCC	Standard Transportation Commodity Code.
STEL	Short Term Exposure Limit, see >TLV<.
STP	Sewage treatment plant.
Structure	Based on >chemindustry.com< following symbols are used: red square O dark blue square N light blue square Na grey square H yellow square P green square Cl.

General Note

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorizes you to browse and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or liability to use these Datasheets.

Systemic toxicity	Adverse effects produced by a substance (or conversion products) after absorption into, and circulation by, the blood stream. Systemic effects occur in tissues remote from the site where the substance comes into contact with the body, and from where it is absorbed.
Tainting	Taint is defined as a foreign flavour or odour in marine organisms, induced by conditions in the water to which the organisms are exposed.
TEEL	Temporary Emergency Exposure Limits (TEELs) are intended for use until AEGLs (see >definition<) or ERPGs (see >definition<) are adopted for chemicals. <ul style="list-style-type: none"> TEEL-0 is the threshold concentration below which most people will experience no adverse health effects. TEEL-1 is the airborne concentration (expressed as ppm [parts per million] or mg/m³ [milligrams per cubic meter]) of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic, nonsensory effects. However, these effects are not disabling and are transient and reversible upon cessation of exposure. TEEL-2 is the airborne concentration (expressed as ppm or mg/m³) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting, adverse health effects or an impaired ability to escape. TEEL-3 is the airborne concentration (expressed as ppm or mg/m³) of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening adverse health effects or death.
TLV	Threshold limit value suggest the concentration of a substance to which a normal worker could be exposed without harmful effects for the 8 hour work day and 40 hour work week and as a Short Term Exposure Limit (STEL) for 15 minute excursion above the TLV value.
Toxic	Capable of causing adverse effects, detrimental to the survival or normal functioning of the individual.
UN number	Dangerous goods that are transported by sea must be clearly marked with the appropriate United Nations (UN) number.
Upper explosion limit (UEL)	The maximum percentage of vapour (gas) at which vapour or gas mixture can still explode.
UVCB	Undefined or variable composition, complex reaction products or biological material.
Vapour density	Indicates the number of times that the vapours of a substance are heavier or lighter than air.
Vapour pressure	The pressure exerted when a solid or liquid is in equilibrium with its own vapour.
Viscosity	The resistance of a substance to flow.
Water reactive	A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

References: 1,5,8,9,10,11,12,13,14,18,45,46,51,71,81,893,932

Copyright Notice

The intellectual property rights concerned in the Databases of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorizes you to browse and use these Databases and the data and information contained within these Databases for non-profit use only. Where any information from these Databases is used in any context, these EMSA Databases must be acknowledged as the source.

Liability Notice

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Databases, or the use or inability to use these Databases.

Appendix G – EMSA mobile Access Gateway (Informative)

[Document attached]

Appendix H – General non-functional/ security requirements for SSNv3.x application components

The non-functional requirements of the current version of SSN will apply to the new version to be delivered with this contract. These requirements are provided in this chapter for reference.

The requirements listed in this chapter are applicable to SSN as an integrated system comprising all the modules and services that will be interoperable when the new version will be integrated and deployed.

1. EMSA ICT & Security Standards and Guidelines

SSN will comply with the following requirements from the EMSA ICT system and application landscape (provided in Appendix 1, to Annex II of the draft Service Contract):

- Redundancy and failover,
- Communications (incl. Firewalls and proxies),
- Security (incl. SSL termination),
- Development frameworks,
- Middleware and DBMS.

2. Availability/ Integrity

Ref: SSNV3_49

<p>The SSN system including its databases, associated services and networked communications shall collect and provide data in accordance with the SLA standards specified in the SSN Interface and Functionalities Control Document (IFCD) chapter 4. The following (requirements extracted from the IFCD) shall be applicable:</p>

- | |
|---|
| <ul style="list-style-type: none">• SSN shall be maintained in operation twenty-four hours a day, seven days a week, to satisfy the mandatory functionalities of the system.• The availability of the SSN system shall be maintained at a minimum of 99% over a period of one year, with the maximum permissible period of interruption being 12 hours.• Application design shall propose the implementation of redundancy, failover and load balancing techniques whenever considered appropriate. Suggestions on how to improve EMSA System Landscape could be provided if necessary and with proper justification.• In the event of a failure or a scheduled interruption, SSN central shall ensure that SSN messages are stored and then transmitted to the external systems connected to SSN when communications and/or systems have recovered. The central SSN systems should be able to received and treat 2 weeks of messages from the MS systems (ship position information may be down-sampled for this purpose).• Missing messages should be less than 0.1% per message type. A VDM sentence included in the incoming-outgoing streams of SSN SI is also considered, for the purposes of this requirement, a "message".• SSN data users should receive the desired information from SSN within an average of 30 seconds (central SSN system will not process responses received after 4 minutes) of making a request. |
|---|

Ref: SSNV3_50	
<p>The system architecture of the SSN system shall not impede MS from complying with their obligations under the IFCD as introduced in the requirement above. Accordingly:</p> <ul style="list-style-type: none"> a) The configuration of the application and data communication links and networks shall allow MS to transfer the notification messages foreseen in the applicable XMLRG within 1 minute. This timeframe should be respected for 95% of the information exchange over a 24h period, and for 99% of the cases over a one year period. The ratio of messages lost or corrupted messages in message transfer between the Member States and the central SSN shall be less than 0.1%. b) The system shall also be capable of receiving, handling and redistributing at least the total number of ships anticipated within coverage of future EU AIS networks as well as all of those LRIT messages within the combined access rights of all of the Member States. <p>The system must also be designed and developed to ensure that the architecture supports the reliability and availability of individual services and composite applications. For example, those supporting SSN central core services as well as those supporting ancillary functions, interfaces to EMSA applications (LRITCDC, THETIS, IMDATE, CSN) and pilot projects (e.g. BB, VMS synergies pilot)</p> <p>Those application components supporting ancillary functions or pilot projects integrated into the SSN system shall not impede MS from complying with the requirement above.</p>	

3. Redundancy/ Reliability/ Resilience

Ref: SSNV3_1	
To avoid delays in addressing incidents causing interruption of services to MS, it is highly desirable a system design that allows the automatic recovery / restart of system services, in the proper order, without human intervention.	
Ref: SSNV3_2	
In order to ensure maximum availability and load balancing between nodes, support for active-active clustering techniques must be provided for all the applications included in SSN including those to be designed/ upgraded under this procurement	
Ref: SSNV3_3	
To ensure that whenever human intervention would be required to address an incident, it is anticipated that the Configurations and installation manual will include instructions sufficiently detailing the procedure for restarting SSN services.	

4. Scalability/ Dimensioning/ Performance

Ref: SSNV3_4	
<u>Part relevant to this procurement</u>	
<p>The contractor is invited to clearly identify and describe the applicable constraints in each case mentioned above.</p> <p>Computer Software Limitations:</p> <p>The throughout capability of the real-time data processing pipeline of the system will be configured</p>	

and tuned for maximum performance taking into account the scalability requirements in the ICT Service Contract.

The contractor shall provide precise indication on how to configure and tune the various infrastructure elements (e.g. web-logic server, clusters, load balancers, etc.).

Ref: SSNV3_5

The system must be designed and developed so as to ensure that it can accommodate rapid and unexpected increases in transaction volume through the automatic installation of new and increasing numbers of services and end users.

SSN (all components) shall be designed in order to be scalable both:

- Vertically (taking benefit from multiprocessor computing); and
- Horizontally (as a distributed application allowing for deployment on multiple nodes of a cluster).

Ref: SSNV3_6

The application itself, as well as its components, shall be accessible to Member States through Internet and/or sTESTA.

Ref: SSNV3_7

The time for execution of an action by a user using the web-interfaces made available by the system that does not require exchange of information with an external system but only relies on data stored in SSN (e.g. a zoom-in or zoom-out operation, a search by area, retrieval of the past positions of a vessel from the database) shall be less than 3 seconds, at average.

Ref: SSNV3_8

The system shall perform correctly (in accordance with the specifications defined in this document), while all MS are active as users for other applications integrated into SSN Ecosystem. This includes the total numbers of anticipated AIS/LRIT messages, web users, AIS data providers, AIS data subscribers, etc.

The contractor must indicate in the STP the tools methods recommended for conducting load and stress tests specific to the procurement launched with this ICT Service Contract.

5. Security

Ref: SSNV3_9

SSN applications shall comply with OWASP Application Security Verification Standards (minimum level '2A') (<http://www.owasp.org/index.php/ASVS>)

Each external system interacting with the application must use Transport Layer Security protocol (TLS version 1.0 or later). SSL (preferably v3) is exceptionally allowed for compatibility reasons with external peers not TLS v1.0 compliant. In all cases renegotiation support should be disabled in order to prevent the 'SSL/TLS renegotiation bug'.

It shall be possible to configure the protocol between an external to SSN application but hosted at EMSA to be http instead of https.

Ref SSNV3_10

Only secure cypher suites of 128 bit or more shall be supported.

6. Other application specific requirements

Ref: SSNV3_11	
The system shall manage issues such as queuing, congestion and quality of service (QoS) to guarantee performance and management of the network traffic generated.	
Ref: SSNV3_12	
Development should be oriented aiming distinct application modules for the human interface and system-to-system interfaces. Each interface must be implemented in a separate deployable allowing for listening in separate ports. This principle shall not compromise the compliance with the best practices of code reuse through modularity and loose coupling.	

Appendix I – IdM Guide-Access and Identity Management Guide (Abridged Version)

[Document attached]

Appendix J – MAP – Software design document

[Document attached]

Appendix K – EMSA – Visual identity guidelines

[Document attached]

Appendix L – Draft declaration of confidentiality

The tenderers requesting the MAR-CIS 1 database file “mar-cis.tdbd”, will have to sign a declaration of confidentiality. See Draft Declaration of confidentiality below.

Draft

(Attached to Annex A - Technical Requirements for the design and implementation of the Central Hazmat Database Application (CHD) & MARine Chemical Information Sheets Application (MAR-CIS 2))

Declaration of Absence of Conflict of Interests and Confidentiality in Regard to the Provision of MAR-CIS 1 database file ¹³

Reference: EMSA/OP/24/2015 Central Hazmat Database Application (CHD) & MARine Chemical Information Sheets Application (MAR-CIS 2)

I, [insert name and title of signatory of this declaration], the undersigned,

☐ in my own name (for a natural person)

or

☐ representative of (for a request made on behalf of a legal person)

[insert name in full of the legal person, official address in full]

requesting, within the aforementioned tender, the provision of MAR-CIS 1 database file "mar-cis.tdbd", hereby confirm:

- that on the date of the request for the provision of the MAR-CIS 1 database file, the entity that I represent and the staff proposed are not subject to a conflict of interest in the context of the procurement EMSA/OP/24/2015 Central Hazmat Database Application (CHD) & MARine Chemical Information Sheets Application (MAR-CIS 2); a conflict of interest could arise in particular as a result of economic interests, political or national affinities, family or emotional ties, or any other relevant connection or shared interest;
- that I will inform EMSA, without delay, of any situation constituting a conflict of interest or which could give rise to a conflict of interest;

13 To be provided by tenderers who requested an example of MAR-CIS 1 Database.

- that I will not communicate any confidential information that is revealed to me or that I have discovered. I will not make any adverse use of information given to me.
- that I will keep the database file entrusted to me confidential. I will not disclose the MAR-CIS 1 database nor the information contained in the database to any party. I will use the MAR-CIS 1 database only for the purposes of this invitation to tender.
- that I [the organisation that I represent and its staff] have not sought and will not seek, have not attempted and will not attempt to obtain, and have not accepted and will not accept, any advantage, financial or in kind, from any party whatsoever, where such advantage constitutes an illegal practice or involves corruption, either directly or indirectly, inasmuch as it is an incentive or reward relating to receipt of the MAR-CIS 1 Database.
- that I am aware that EMSA reserves the right to check this information, and I realise the possible consequences that may arise from any false declaration.

Full name and signature:

Date:

Appendix M – CMC (CARD) – Implementation approach

[Document attached]

Appendix N – System Interface Guide (sample)

The existing interface guide for the Central Ship database is provided as a “sample” template of the method of organising the content of the SIG for the web services to be exposed by the CHD. The sample document is attached.