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eIWT 2017 – 2018

ECDB - European Crew Database in the perspective of the electronic tools

Electronic tool for Inland Waterways Transport
AA eIWT 2017–2018 Mid-Term Report

Fivos Andritsos

June 2018



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Introduction

1.1 Background

The new EU directive on the recognition of professional qualifications in inland navigation¹ foresees harmonized procedure and models for Union certificates of qualifications, service record books (SRB) and logbooks (LBK) and facilitates the electronic exchange of information through the setting up of a central database. In doing so, it paves the way for the introduction of electronic tools, for which the European Parliament and the Council ask the Commission to submit an assessment².

The Commission has already recognized the need for measures fostering the use of electronic documents, including transport documents, in a number of policy-setting documents as the [White Paper on Transport](#)³; the Digital Single Market Strategy⁴ and the [EU e-Government Action Plan 2016-2020](#)⁵. Digitalisation as a mean to facilitate the flow of information or its recognition has also been the subject of (cross sectoral) legislative initiatives at EU level: the [2015 eIDAS Regulation](#)⁶ and the recent proposal on [Digital Single Gateway](#)⁷. In the [Tallinn Ministerial Declaration on e-Government](#), the Member States commit themselves to give priorities towards ensuring high quality, user-centric digital public services for citizens and seamless cross-border public services for businesses. [The Council in its conclusions on the digitalization of transport](#), adopted on 5 December 2017, emphasizes the potential of digitalization and calls on the Commission to take further actions.

In the inland waterway transport (IWT) sector, measures to develop digitalization are required to exploit the full potential of IWT sector as an integral part of the value chain. Today digitalization mainly relates to River information services (RIS) which focuses on traffic management. SRBs and LBKs as well as other official documents related to crew members or the vessels exist mainly in paper format.

In a joint statement sent to the Commission in 2016, the social partners at EU level and AQUAPOL expressed their common interest in the development of a coherent and enforceable legislative framework for the sector at EU level. After the Council Directive on working time for IWT adopted in 2014⁸ and the Directive on the recognition of professional qualifications in inland navigation, an EU

¹ [Directive 2017/2397/EU of 12 December 2017]

² Article 22(5) of the Directive on the recognition of professional qualifications and recital 35 refer to an assessment on the possibility of replacing the paper version of Union certificates of qualification, SRBs and LBKs, by electronic tools, such as electronic professional cards and electronic vessel units, with a view to further modernising the IWT sector and to reducing the administrative burden while rendering the documents less prone to being tampered with.

³ COM/2011/0144, pp. 13, 19.

⁴ COM(2015) 192, pp. 82-84.

⁵ COM(2016) 179, p. 8.

⁶ Regulation 910/2014/EU, OJ L 257, 28.8.2014, p. 73–114

⁷ COM(2017)256

⁸ Directive 2014/112/EU.

initiative on digital tools is considered by the sector as the next building block of such a framework⁹.

With the perspective of a forthcoming possible EU initiative on the introduction of electronic tools related to work in inland navigation, the Commission relies on its Joint Research Centre (JRC) to obtain the necessary technical and research expertise for the characterization of various options for a system architecture covering such digital tools (eIWT). A first report was published, [3]. The electronic system that JRC should work on should cover, as a minimum, the functions of the SRB and the LKB but also the recording of the resting and working time as foreseen under Council Directive 2014/112/EU. Such system should also rely on the existence and seamless operation of the relevant existing central databases and be open to additional optional functionalities aimed at further integrating and rationalizing the digital services related to IWT as outlined in the DINA¹⁰ report, [6].

With the objective to ensure, to the extent possible, coherence with the possible future digital tools, JRC is also asked to work on determining the characteristics and conditions of use of the database that should be adopted through a delegated act under the Directive 2017/2397/EU (the Crew Database – ECDB).

1.2 Scope

This working document focuses on the *European Crew Database (ECDB)*, the definition of which will be the object of a dedicated report, to be finalized during the first 6 months of 2018. It serves as a basis for discussion members of the Commission expert group on social issues in inland navigation and other IWT stakeholders, in order to build at a future-proof ECDB that meets the requirements of Directive 2017/2397/EU and, at the same time, accommodates eIWT operational requirements, such as suggested in [3]. It is very important that such design is well understood and shared by the main IWT stakeholders, in first place the MS administrations. Such an in-depth consultation and collaboration is achieved by means of dedicated workshops and bilateral working meetings.

1.3 Methodology

The methodology followed for the definition of draft standards for the ECDB includes the following steps:

1. Definition of High-level objectives
2. Definition of functional objectives
3. Definition of main actors
4. Selection and definition of the most relevant use-cases
5. Definition of the operational requirements at short term (no eIWT) and long term (eIWT), based on the in analysis of the use-cases
6. Technical requirements, characteristics and conditions of use

It should be noted that even if ECDB, along with the EHDB, will have a central role in an initiative on electronic tools, eIWT is not, for the time being, a prerequisite for setting up ECDB. Thus, the standards for the ECDB, even if projected towards

⁹ In this context, the sector also needs the establishment of a modern and flexible system for crewing requirements at EU level. A 2 years research study TASCs (2017-18) is being carried out by the social partners with this objective.

¹⁰ Digital Inland Navigation Area

a 'digital' future, will be elaborated also taking into account the current procedures and the existing paper documents.

1.4 Structure

After the list of abbreviations and the present introductory section, the rest of the document will comprise the following:

- A section on the terms and acronyms (section 2)
- A section on the context in which the European Crew Database (ECDB) is being defined, mainly focused on the new European Directive on Professional Qualifications and other international or national policy requirements (section 3)
- A section on the ECDB objectives related to the new Directive and the upcoming electronic tools for the IWT sector (section 4)
- A section on the proposed ECDB architecture and dataset requirements, taking into account the new directive, the national registries and the future electronic tools (eIWT) requirements (section 5)
- A section on the ECDB dataset definition, taking into account the new directive, the national registries and the future electronic tools (eIWT) requirements (section 6)
- A section on the ECDB users and their access rights (section 7)
- A section on the definition of a number of operational use cases (UC), in particular during the most complex phase, when eIWT will be fully operational (section 8)
- A section on the definition of a number of operational use cases (UC), in particular during the initial phase (no eIWT), when the ECDB will be operational but all certificates and SRBs will still be on paper (section 9)

Note that, at this stage, sections 7 and 8 are far from complete. They will be completed for the final ECDB report scheduled for June 2018.

In summary, the present report, in its final version, aims at drafting ECDB standards as required by the Directive, making them also future-proof and receiving the maximum support among the IWT stakeholders.

2 Definitions & acronyms

2.1 General

Access control: a system of technical means, personnel and procedures, which enables an organisation to control access to areas and resources in a given physical facility or computer-based information system. It has 3 essential functions: entitlement check, identification and documentation of the persons entering a certain controlled access area.

Actor: any person or group of persons who interacts with a system or a procedure.

Assisted GPS (aGPS): a system that, under certain conditions, improves the start-up performance of a GPS satellite-based positioning system and used extensively with GPS - capable cellular phones.

Cyber security: protection of ICT systems, information or infrastructure against damage, unauthorized use, exploitation or destruction, especially against cyber-threats such as viruses, worms, Trojan horses, phishing, denial of service (DoS) attacks, unauthorized access etc.

Digital-by-default: digital means as the preferred option providing for public services

Digital ID: information used by a computer/digital system to represent a physical entity (person, organisation, application, or device); here used for physical persons unless explicitly mentioned otherwise

Digital twins: physical entities (persons, organisations etc.) having the same the digital ID data (i.e. name, surname, date of birth, ...)

eIDAS: EU regulation (Nº 910/2014 of 23 July 2014 on electronic identification, repealing Dir 1999/93/EC) on standards for electronic identification and trust services for electronic transactions in the European Single Market.

Entitlement: evidence of the right to benefit a service or access an area, typically a ticket, a travel or access card or an entrance permit.

Functional requirements: a set of functionalities needed and / or expected from a product or a service under development or procurement. Alternatively referred to as 'user requirements'

Functional specification: the breakdown, quantification and association of the system's functional requirements to the main system's functional components.

Functionality: the ability to perform a certain function; function is an action or use for which something is suited or designed.

Geographic Information System (GIS): a system designed to capture, manage, analyse, store, manipulate and display all types of geographically referenced information.

Global Positioning System (GPS): a satellite navigation system based on a large number of designated satellites (US DoD, Galileo, Glonass, Beidou), which transmit time signals that are received by a receiver on the ground. Transmissions received from four or more satellites calculate the position through triangulation.

Identification: evidence of identity

Identifier: a name that identifies (i.e. labels) a unique object or class of objects. An identifier following an encoding system is often referred to as: code or ID code. Identifiers that do not follow any encoding scheme are often said to be arbitrary

IDs. A unique identifier (UID) is an identifier that refers to only one instance, i.e. only one particular object

Identity: whatever makes an entity definable and recognizable

Identity theft: to pretend to be someone else, typically in order to access resources or obtain credit and other benefits in that person's name

Interoperability: the capability to communicate, execute programs or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units (ISO/IEC 2382-1:1993). The property of a product or a system enabling it to work with other products or systems, present or future, without any particular restrictions or additional implementation.

Location Based Services (LBS): information or entertainment services, accessible with mobile devices through the mobile network and utilizing the ability to make use of the geographical position of the mobile device.

Minimum standard: a formal document that establishes uniform engineering or technical criteria, methods, processes and practices that set the lowest acceptable level of quality or attainment¹¹. Standards can be technical¹², functional¹³ or goal-based.

Once-only (principle in public administration): avoiding that citizens or companies submit the same information to public authorities repeatedly.

Personal data: any information relating to an identified or identifiable natural person ("data subject"); an identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his physical, physiological, mental, economic, cultural or social identity (EC Directive 95/46 article 2.a).

Personal data protection: all regulations, technical systems and procedures that aim at the protection of such personal data throughout the acquisition / transmission / use / storage and disposal cycle.

Privacy: the quality or state of being secluded from company or observation.

Risk: the potential that a chosen action or activity (including the choice of inaction) will lead to a loss (an undesirable outcome); the effect of uncertainty on objectives (ISO 31000).

Risk management: the identification, assessment, and prioritization of risks followed by coordinated and efficient application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities.

Safety: the state of being free of risk or danger (natural or accidental); being in control of recognised hazards and reducing risk of harm or damage as low as reasonably practicable. The term 'safety', when used as an attribute, encompasses all measures, actions or systems aiming at ensuring the state of safety.

Safety incident: an accidental event, of internal or external causes, that is likely to lead to some negative consequences and compromise safety.

¹¹ Although standards can be voluntary, they usually are understood as mandatory, especially if adopted by a government, business contract, etc.

¹² Usually imply measurable quantities

¹³ Also referred to as functional specifications

Security: the set of means / actions through which safety is ensured, in particular against intentional threats. Thus, the term 'security' encompasses all measures, actions or systems aiming at preventing intentional threats from compromising safety.

Security incident: deliberate act intended to harm and injure, damage equipment and infrastructure, disrupt operations and compromise safety.

User requirements: a set of needs and / or expectations of the user(s) from the product, system or service under development. The term 'users' encompasses any citizens, businesses or public authorities that might use the final product, system or service.

2.2 IWT specific

Barge: a vessel, intended for the carriage of goods and built to be towed, either having no motive power of its own or having only sufficient motive power to perform restricted manoeuvres. Barges can only navigate in convoy with one or more push-boats (see vessel).

Boatmaster: a *deck crewmember* who is qualified to sail a craft on the Member States' inland waterways and is qualified to have overall responsibility on board, including for the crew, for the passengers and for the cargo. The term 'skipper', where used, has exactly the same meaning as the term 'boatmaster'.

Certificate of qualification: a certificate issued by a *competent authority* attesting that a person fulfils the requirements of Directive 2017/2397/EU.

Competent authority: any authority or body designated by a Member State with the responsibility for issuing, renewing, suspending or withdrawing *Union certificates of qualification*, validating the navigation time in Service Record Books, keeping the registers and combating related unlawful practices.

Crew: persons collectively involved in the operation of a vessel, being deck crewmembers or machine personnel.

Crewmember: any individual, member of the *crew* of a certain vessel or fleet of vessels.

Dataset (ECDB or EHDB): the set of data fields recorded (or available for recording) for each crewmember (ECDB) or vessel (EHDB) and which is present, as a minimum, at the MS registries.

Deck crew members: persons involved in the general operation of a craft on Union inland waterways and who carry out various tasks, such as tasks related to navigation, controlling the operations of the craft, cargo handling, stowage, passenger transport, marine engineering, maintenance & repair, communication, health & safety, and environmental protection, other than persons who are solely assigned to the operation of the engines, cranes, or electrical and electronic equipment.

Inspection body: the national authority, i.e. ministry or other national administration or other duly delegated body, which is responsible for issuing the *inland navigation vessel certificate*.

Logbook (LBK): official record of all craft activities (journeys, modifications, crewing etc.) as required by the applicable model to be adopted following Directive 2017/2397/EU, in paper or electronic (eLBK) form. Active LBK is an LBK open for recording data.

Navigation time (crewmembers): the time, measured in days, that *deck crewmembers* spent aboard during a journey performed by a vessel on inland waterways, including loading and unloading activities that require active navigational operations, which is validated by the *competent authority*.

Rest time: the time outside working time; this term covers rest periods on a moving or stationary craft and on land. It does not include short breaks (of up to 15 minutes). On a day to day basis, *working time* plus *rest time* should be equal to 24 hours.

Sailing time: the time during which a vessel is navigating, usually with the main propulsion running.

Service Record Book (SRB): personal register recording details of a *crewmember's* work history, in particular navigation time and journeys carried out. In paper (SRB) or in electronic (eSRB) form.

Shipboard personnel: employees on board of a (usually) passenger vessel other than the crewmembers.

Skipper: same as *boatmaster*

Vessel: craft intended solely (or mainly) for navigation on inland waterways, designed for the carriage of goods or passengers. For the purpose of this report, unless otherwise stated, the term *vessel* denotes a craft that is intended to carry goods and has autonomous navigation capability (propulsion & steering).

Vessel certificate: certificate that a vessel is capable to navigate and operate. It is issued by a national inspection body, following the Union and/or national legislation. Also referred as Vessel, Community, Rhine or Union certificate according to the circumstances [ES-TRIN Article 1.01 (11.4)].

Voyage: the trip of a vessel from the harbour of departure to the harbour of its destination. Usually, such movement is performed for a specific operational purpose (commercial or other) and can include calls to intermediate ports.

Voyage file: file (database) that resides in the *vessel unit* (eIVU), on which are registered all data concerning, as a minimum, the vessel and the crew during a particular *voyage*.

Working time: The time during which a worker (*crewmember* or *shipboard personnel*) is scheduled to work or must be available to work (on-call time) on and for the *vessel* on the instructions of the employer or the employer's representative.

2.3 Acronyms

AIS	Automatic Identification System (maritime and inland navigation)
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
CCNR	Central Commission for the Navigation of the Rhine
CESNI	Comité Européen pour l'élaboration de Standards dans le domaine de la Navigation Intérieure (European committee for drawing up standards in the field of inland navigation)
DINA	Digital Inland Navigation Area
EBU	European Barge Union
ECDB	European Crew Database (of IWT crews)
ECDIS	Electronic Chart Display Information System
EHDB	European Hull Database (of IWT vessels)

eIDAS	Electronic Identification, Authentication & trust Services
ERDMS	European Reference Data Management System (RIS context)
ESO	European Skippers Organisation
eIVU	Electronic Inland Vessel Unit, also referred to as <i>vessel unit</i>
eIWC	Electronic Inland Worker’s Card, also referred to as <i>crew card</i>
eIWT	Electronic IWT – system/tool implementing eSRB and eLBK
eLBK	Electronic Logbook
eSRB	Electronic SRB (Service Record Book)
GIS	Geographical Information System
GPS	Global Positioning System
ISO	International Standards Organisation
IT	Information Technologies
IWT	Inland Waterways Transport
KSS	Knowledge of Specific Sectors (of inland navigation)
LBK	Logbook, vessel activities log
LNG	Liquefied Natural Gas
MS	Member States (EU)
NTS	Notices to Skippers
PIN	Personal Identification Number
PKI	Public Key Infrastructure
RIS	River Information Services
SME	Small or Medium Enterprise
SRB	Service Record Book, boatmen’s service log
UNECE	United Nations Economic Commission for Europe
VIV	Virtual Inland Vessel (concept)

3 Context

3.1 Directive 2017/2397/EU

Article 25 of Directive 2017/2397/EU foresees that each Member State (MS) shall keep registers of the Union certificates of qualification, service record books and logbooks issued under their authority and of documents recognised pursuant to Article 10(2) which have been issued, renewed, suspended or withdrawn, which have been reported lost, stolen or destroyed, or which have expired. MS shall reliably record without delay data related to the certificates of qualifications, service record books and logbooks in a database kept by the Commission.

Registers shall include, as a minimum¹⁴:

- All data appearing on the Union certificates of qualification and the issuing authority;
- For SRBs, the SRB identification number, the name and the identification number of the holder, the date of issuance and the issuing authority;
- For LBKs, the European Vessel Identification Number (ENI number), the name of the craft, the LBK identification number, the date of issuance and the issuing authority.

The Commission is empowered to adopt delegated acts to provide the standards laying down the characteristics of such database and the conditions for its use, specifying in particular the instructions for encoding data and for operating the database, the access rights and the maximum duration that data is retained.

The *database* is set for the following purposes:

- Implementation, enforcement and evaluation of the Directive,
- Maintain safety,
- Ease of navigation,
- Statistics and
- Facilitate the exchange of information between the MS authorities.

All provisions of the directive related to the database can be found in Annex II.

3.2 DSM strategy & DINA

The European Crew Database (ECDB), along with the future EHDB (European Hull Database), should be considered right from the beginning in the context of the Digital Single Market (DSM) strategy and its sectoral approach, as suggested in the DINA report [6].

DSM foresees for the transport sector *that the shift towards cooperative, connected and automated mobility can reduce accidents, pollution and congestion, and enhances traffic and capacity management as well as energy efficiency. It also strengthens the competitiveness of transport and digital industries and helps integrate different modes of transport into one mobility system tailored to the needs of its users, be it freight logistics or people*, [5].

What is even more interesting is that, in the section regarding the modernisation of the public services and administration, it is stated that:

¹⁴ The Commission is empowered to complement, through delegated acts, the information in the SRB and LBK registers with other information eventually required by the SRB and LBK models adopted

Digital technologies allow public authorities to deliver services more quickly, more precisely, and more efficiently. At the EU level, the eGovernment Action Plan 2016-2020 seeks to accelerate and broaden the scope of digitisation, thereby increasing the efficiency of public administrations and facilitating the free movement of businesses and citizens. Savings can flow from simpler administrative procedures for individuals and companies, such as the 'digital-by-default' and the 'once-only' principles. As an example, companies participating in eProcurement procedures would only need to provide one document.

The 'once-only' principle at EU level could generate total net savings of around EUR 5 billion/year.

The proposal for a single digital gateway, adopted on 2 May 2017, will help people and businesses to face fewer administrative burdens when moving and/or doing business across borders in the Single Market. It will offer easy access to relevant information and assistance services, it will enable users to complete certain key administrative procedures, online and guarantee non-discriminatory access to national online procedures for users from other countries. It will also set the first step towards implementing the once-only principle in cross-border scenarios.

The planned initiative on Digital solutions throughout a company's lifecycle will allow companies to fulfil administrative requirements (register, file and update company documents) online and across borders, bringing the benefits of digitisation to the process of setting up and maintaining a business. [5].

For IWT, the concept of DINA, as outlined in [6], intends to interconnect information on infrastructure, people, operations, fleet and cargo and to connect this information with other transport modes. More concretely, the objectives would be to:

- Create a digital space for IWT, supporting new digital-driven innovations; establish the basis for more efficient fleet management and navigation for barge operators;
- Improve the management and use of waterway infrastructure (traffic, lock operations);
- Improve the visibility for users of IWT and intermodal hubs, allowing for more efficient processes;
- Reduce the administrative burden for compliance with IWT legislations and provide tools for making compliance checks more effective (e.g. dangerous goods, statistics, certification of vessels, working time, manning and crew qualifications);
- Link and further develop existing tools and applications into an interlinked digital system for inland waterways.

DINA should provide an overall framework for several IWT related initiatives that will improve the functioning of the IWT market through digitalization and through the integration of IWT in the multimodal supply network.

The work of JRC on the IWT electronic tools [3] moves exactly along the DSM strategy guidelines. Its guiding principles have been exactly those mentioned as cornerstones of the DSM eGovernment:

- 'Digital-by-default' and
- 'Once-only'

Likewise, the ECDB and the EHDB databases would serve as 'single digital gateways' for the crew and the vessels respectively.

3.3 Electronic tools - eIWT

The initiative on *electronic/digital tools for the IWT sector* hereafter referred as *eIWT* aims at developing digital tools to facilitate compliance and enforcement of IWT legislation, resulting in improved cost-efficiency and reliability of IWT operations that will contribute to a better functioning of the IWT market and to its better integration in the value chain.

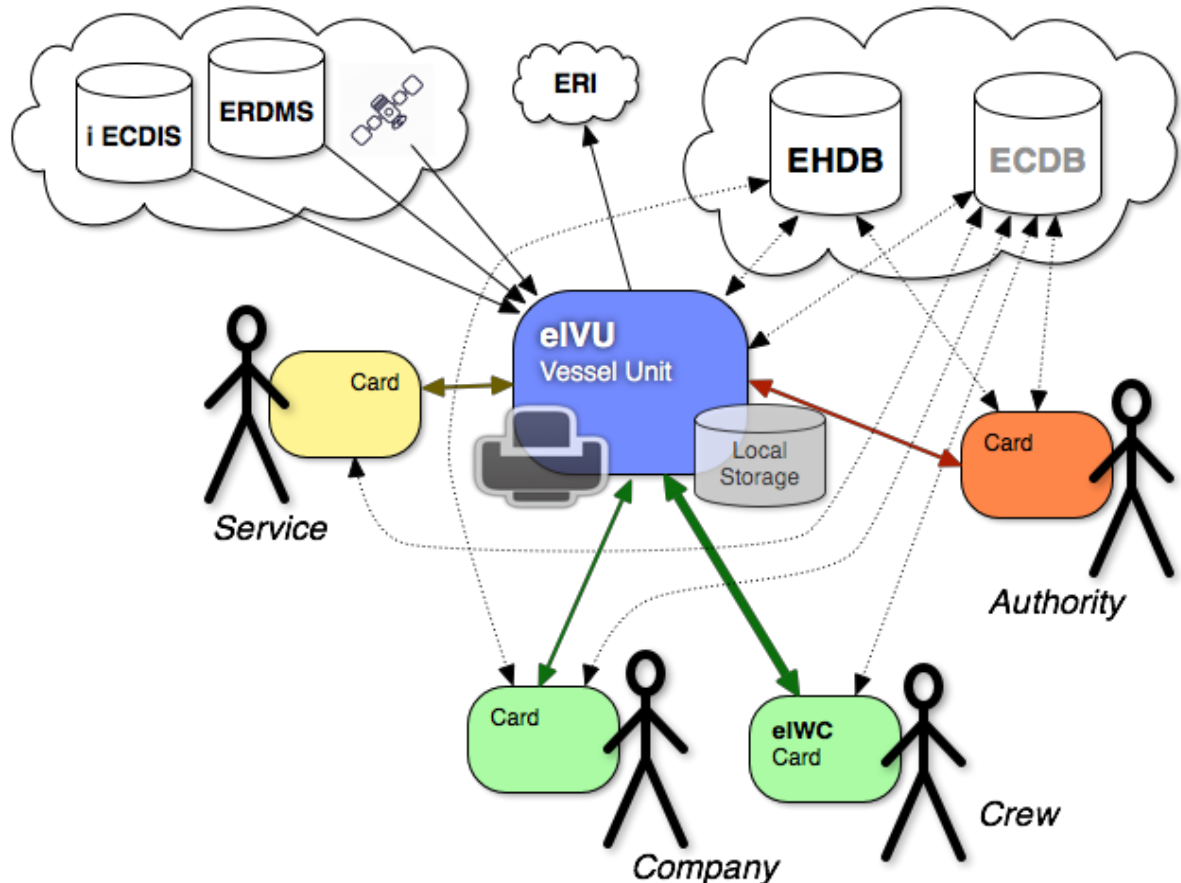


Figure 1: Main elements of the eIWT architecture, reprinted from [3]

The eIWT architecture, as in Figure 1 above, and its operational requirements have been described in detail in [3] both in the context of a basic (only eSRB, eLBK and working time registration) and of an extended (basic + voyage planning) functionality. Note that the extended eIWT functionality will also be discussed on the occasion of the ongoing RIS Directive evaluation as well as in the context of work on DINA.

The eIWT initiative, in particular, with its extended eIWT functionality, could be the cornerstone of digitalization strategy for the sector. Even at its minimum functionality (eSRB and eLBK), it will link digitally the vessel crew (in terms of identity, professional qualifications, navigation time and working time) and to the vessel (in terms of identity, voyage -including specific stretches of inland waterway-, particularities of the vessel e.g. LNG fueled or pusher of large convoy, etc.).

As shown in Figure 2 below, an extended eIWT could be considered as the vessel's operator point of view of an approach as suggest in DINA report, where the positioning of eIWT in respect to the major DINA components is depicted. In addition to the basic data exchange with the EHDB and the *Professional Qualification Register(s)* (i.e. ECDB in Figure 1 above), shown in thick green

arrows, connection should be established with RIS, navigation aids and corporate cargo management tools.

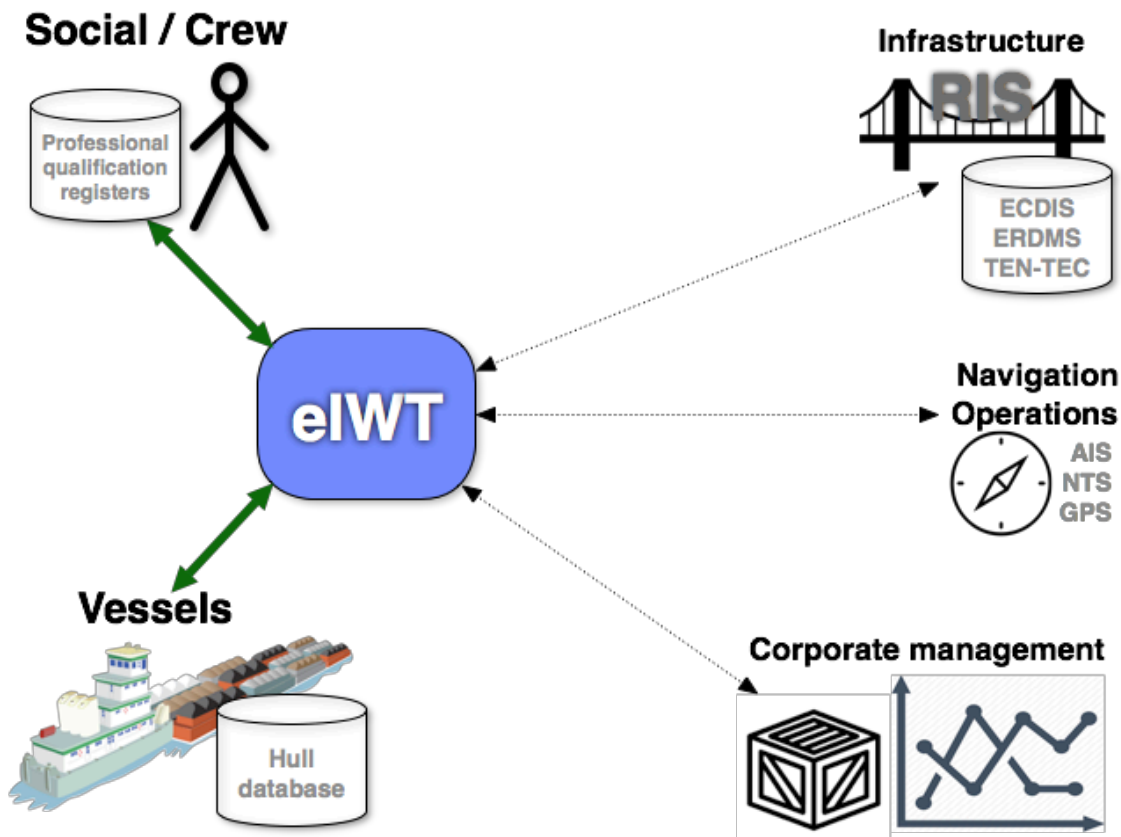


Figure 2: eIWT concept positioning within DINA, reprinted from [3]

There have already been many discussions, brainstorming and proposals on how to best interconnect people, vessels, infrastructure, commercial/market activities, each with different characteristics, aims and needs. Of course, this problem can be seen from many angles, according to one's position in the value chain.

In the real world, the fundamental IWT unit/block is the vessel. We therefore believe that, from a perspective of extended digitalization, as suggested by the DINA report [6], the fundamental digital block/unit should likewise be a virtual/digital vessel. The virtual inland vessel (VIV) concept is highlighted in Figure 3 below. The basic idea is very simple: a cyber representation / model of the physical vessel including its crew and cargo. Apart from static information like ENI number, certificates, technical information etc., the model contains dynamic information such as logs and plans, crew qualifications and activity, cargo management etc.

Although the information contained in or transiting through the VIV can belong to many owners¹⁵, the boatmaster, representing the company and having the authority, is responsible, within the limits of the law, for the VIV management as much as he/she is for the real vessel. The boatmaster would have a 'single' digital placeholder for all information regarding the vessel, the crew and the cargo, related to a particular voyage. From this set of data, he could choose what, when

¹⁵ For example: vessel and crew certificates are owned by the competent national authorities, other crew related data are owned by individual crewmembers, cargo related and voyage planning data are owned by the company, etc.

and where to send data according to the various regulation requirements but also according his corporate interests.

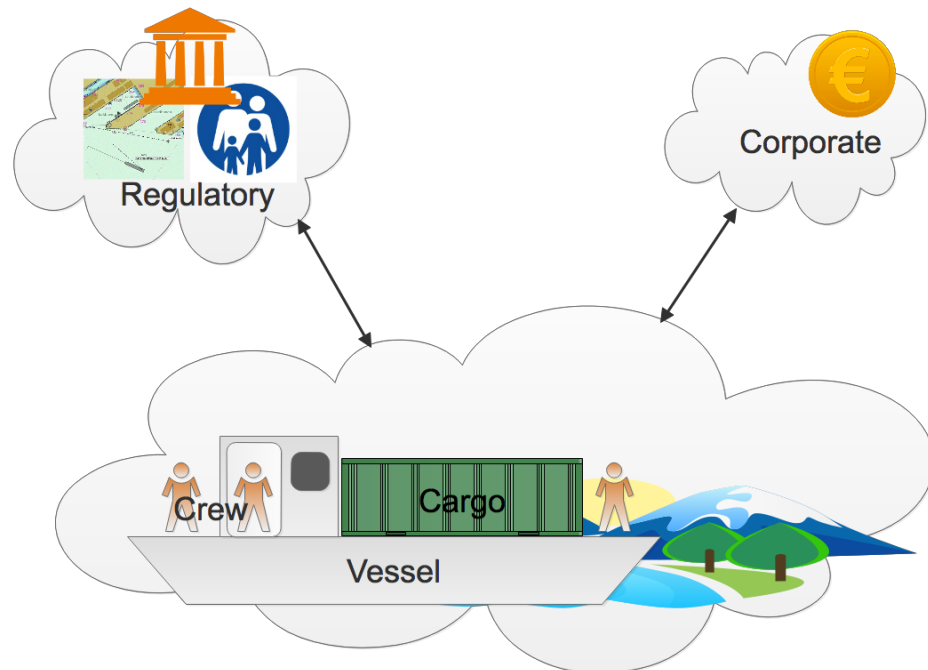


Figure 3: Virtual inland vessel (VIV) concept.

VIV could be the concept used to refer to the extended eIWT which includes functionalities for corporate needs.

3.4 The European Hull Database (EHDB)

Currently the legal basis for EHDB is Directive 2008/87/EC. The data, procedures, access rights, etc. are covered by a Service Agreement [4].

Directive 2016/1629/EU, laying down the technical requirements for IWT vessels, amending Directive 2009/100 and repealing Directive 2006/87/EC, provides the legal basis (article 19, paragraph 7) for the delegated act that will set the requirements for the new EHDB that should be in place by October 2018. Such delegated act should, in principle, provide for the following:

- the data to be entered in the database;
- the types of access permitted;
- the instructions regarding the use and operation of the database.

If EHDB, along with ECDB, is to be a key component of the future eIWT system, then its main scope will need to be further adapted. Instead of just providing IWT vessel information to the RIS authorities, EHDB should become the single access point of information regarding the European IWT vessels for all stakeholders (authorities, operators, law enforcers, etc.).

It is our opinion that: (a) ECDB should be set up right away as a single digital gateway for the EU IWT crew transactions with the administration and (b) the EHDB should also be revised to provide a single digital gateway for everything regarding the EU IWT vessels, along the above mentioned eGovernment principles.

4 ECDB objectives

4.1 High-level objectives

Taking into account the context described in the previous sections, the ECDB should be seen as one important component for the eGovernance of the IWT sector, contributing towards the implementation of a *single digital gateway* and the *once-only* principle in everything that regards data on IWT crew. That means that it should provide IWT crewmembers and all other actors having legitimate interests in accessing the ECDB data with a unique access point, ensuring that all data are entered only once and are kept up-to-date as securely and as efficiently as possible.

The high-level objective for ECDB could be described as follows:

1. The efficient administration¹⁶ of Union Certificates of Qualifications as per the Directive 2017/2397/EU.
2. The effective and efficient digitalisation of the IWT sector in order to improve its efficiency, safety & security while ensuring fair competition and good working standards, in compliance with the Digital Single Market and e-Governance principles.

4.2 Functional objectives

The above high-level objectives can be further mapped into a set of functional (i.e. operational) objectives as follows:

1. Facilitate the exchange of information between Member States and with the Commission for the purpose of implementation, enforcement and evaluation of the Directive on Professional Qualifications or for statistical purposes.
2. Provide, in the frame of eIWT, a single digital gateway (i.e. point of access) to data pertinent to crew (i.e. qualifications, navigation days) as per the regulations on IWT crewing and in compliance with the DSM and e-Governance principles.
3. Apply, in the frame of eIWT, the digital-by-default principle in the IWT sector; in other words: provide public services by digital means as the preferred option.
4. Contribute, in the frame of eIWT, towards the realization of the once-only principle in the IWT sector; in other words: avoid having to submit the same information to public authorities repeatedly either while entering or while updating the data.
5. Ensure the maximum reliability, availability security.

4.3 Main actors

As “actors” are meant the persons or entities that would be required to interact with the ECDB in order to best achieve the above stated functional objectives.

A first list of the ECDB actors is as follows:

1. European Commission: policy services (DG MOVE.D.3) and technical services (DG MOVE.SRD.4, JRC)
2. Member State competent authorities: authorities issuing, replacing and/or renewing IWT professional qualification certificates

¹⁶ Issuing, renewing, suspending and withdrawing Certificates of Qualification by the Member States

3. Member State enforcing authorities such as: police, water police etc.
4. Boatmasters
5. Crewmembers and shipboard personnel
6. Third countries' competent authorities
7. International organisations including River Commissions
8. Ship-owners and/or operators
9. Possible service providers

5 Proposed architecture

5.1 ECDB / EHDB

In order to comply with the above stated objectives, ECDB and EHDB should be tightly coupled¹⁷. Figure 4 below depicts, at high level, the architecture of the combined ECDB / EHDB databases. These are unique access points both for the crew (ECDB) and the vessels (EHDB). For each of these databases, 2 kinds of data are foreseen:

- A set of quasi static data, i.e. data introduced at the issuance stage and changed only rarely (i.e. revocation or qualification change): the vessel characteristics/certificates and the crew qualifications are such data sets.
- A set of dynamic data, i.e. data that are changed/updated on a regular basis: the vessel LBK and the crew SRB are such data sets.

All static data on both databases are pushed (copied) from the national registries, where the original data are stored. Dynamic data (eSRB and eLBK) are updated / uploaded to the ECDB / EHDB from the vessel or the crewmembers and are stored in draft form for control and validation by the relevant MS authority. After their validation, the updated eSRBs and eLBKs are pushed again from the MS registries to the ECDB / EHDB.

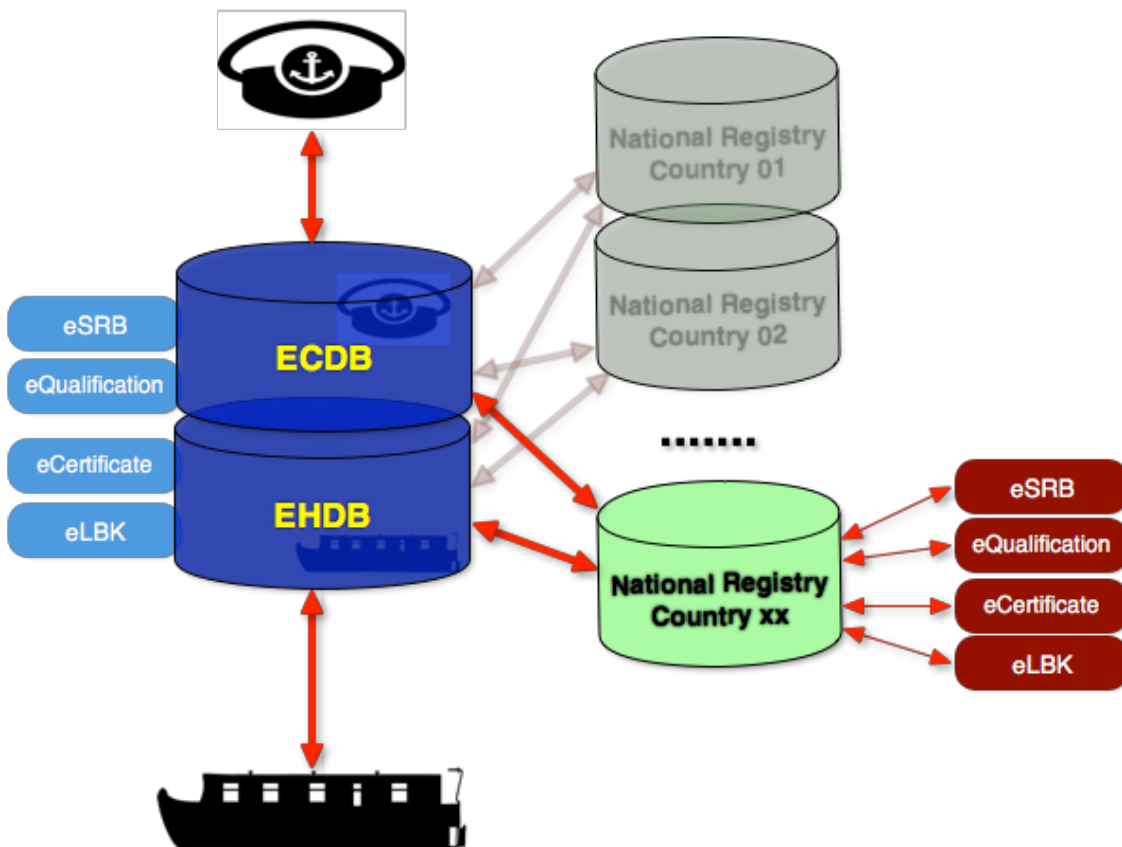


Figure 4: ECDB / EHDB architecture, assuming fully implemented eIWT

Thus, at any given moment, the official up-to-date documents are stored in the MS registries and are replicated to the EU databases. On the other hand, all electronic communication / interaction with the IWT crew, vessel, enforcing bodies

¹⁷ That means that there should be some common reference so that data among the two databases can be cross-checked

etc. happen exclusively via the EU unique access point. This presents considerable advantages from the point of reliability, availability and cybersecurity.

The architecture depicted in Figure 4 above assumes full implementation of the eIWT electronic tools. Until the implementation of eIWT, the above architecture defaults to that depicted in Figure 5 below. The main function of ECDB is to facilitate the exchange of information between Member States and with the Commission for the purpose of implementation, enforcement and evaluation of the Directive on Professional Qualifications. For that purpose, ECDB is linked only to the Member State registries and, of course, stores SRB and crewmembers' certificates of qualification data rather than original electronic documents. The vessels' LBK data, as foreseen by the Directive 2017/2397/EU, are stored in EHDB¹⁸.

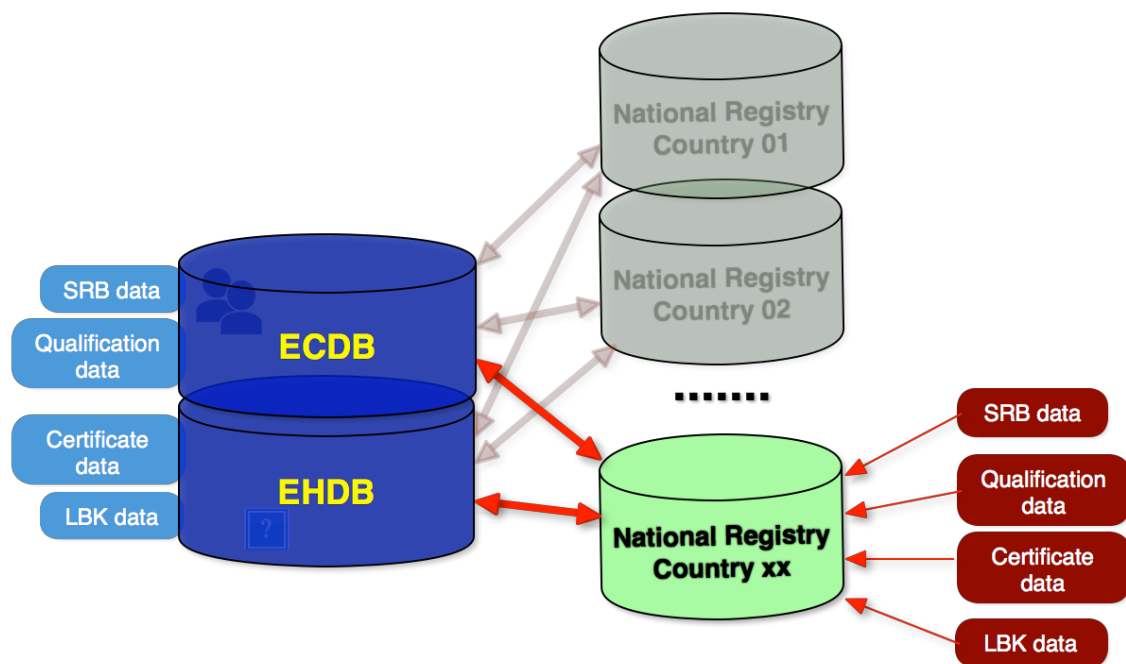


Figure 5: ECDB / EHDB architecture, initial phase, eIWT not yet implemented

Given that the digitalisation of the IWT sector is a priority, both for the Commission and the major stakeholders, the main criterion for definition of ECDB will be its future role in the contest of eIWT. This will be the case also for the definition of requirements for the national registries.

5.2 National registries

Although MS administrations can be organized as per their own particular requirements, the national registries should be organized in such a manner that they can match exactly the ECDB / EHDB data structure specifications, in order to:

- Push automatically to the ECDB and EHDB all the data related to the (electronic) documents that they issue/renew
- Control the central databases for any updates or proposed changes (i.e. eLBK and eSRB updates, upgrade proposals, suspension or withdrawal proposals)

¹⁸ To verify the feasibility from legal and technical point of view

- Cross-check data (i.e. navigation time) registered by the boatmasters on their crewmembers' (e)SRB and on the vessels' (e)LBK¹⁹

Essentially, each national registry should include, at least, all data fields foreseen for ECDB (and EHDB). Each MS issuing authority can, of course, opt to store more data on the crew and/or the vessel. However, it is clear that these data are under the MS responsibility and that they will not interfere with the ECDB. Hereafter, the *MS registry data* or, simply, *dataset*, will refer to the dataset²⁰ in the ECDB and/or EHDB databases, which will correspond exactly to the MS registries as per Figure 6 below.

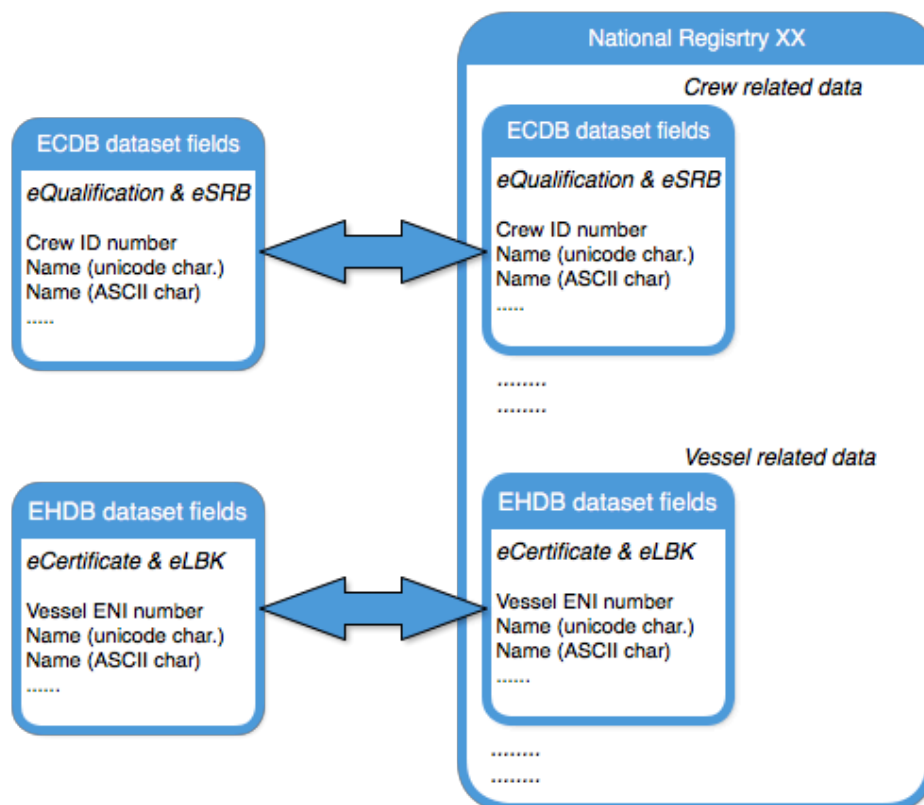


Figure 6: Correspondence of MS registries' data fields with the ECDB and EHDB

Obviously, since the ECDB and EHDB databases will function as a unique digital gateway for the IWT crews and vessels, the national registries' data outside the ECDB or EHDB datasets will not be accessible through the ECDB / EHDB gateway and, consequently, it will not be readily available to other national authorities, vessel owners or crewmembers²¹. Concerned MS should develop their own procedures and IT tools for maintaining and sharing such data.

¹⁹ Automatic cross-checking software could be implemented centrally in the ECDB/EHDB, thus avoiding the development of a multitude of national SW and cross-checking methodologies and rules (see Figure 12).

²⁰ The data fields available for recording data per each crewmember (ECDB) or per each vessel (EHDB); data fields can contain numbers, alphanumeric strings in ASCII and/or Unicode character sets, pictures (JPG, PNG or other format), documents (preferably PDF format) or pointers

²¹ For example: a country may decide to keep the record of a crewmember's or a vessel's infractions / suspensions / prohibitions for a number of years. Another country could decide to keep in its archive the medical records justifying a decision on the physical fitness of a crewmember.

5.3 Dataset requirements

The exact definition of the ECDB *dataset* (implicitly also of the MS registries' minimum datasets) can only take place but after the detailed definition and common acceptance of the ECDB *use cases*. At the present stage, we can only set the high-level requirements as follows:

- Cover fully the minimum requirements of the Directive, that is:
 - For each crewmember: the name of the holder, the issuing authority and all data appearing on the crewmember's qualification (Union) certificate, his/hers (active) SRB identification number, date of SRB issuance and issuing authority
 - For each vessel: the European Vessel Identification Number (ENI number), the name of the craft, the (active) LBK identification number, date of issuance and issuing authority
- Cover fully the eIWT requirements, as documented in [3]
- Streamline, as much as possible, to DSM strategy and DINA

This approach may now be somewhat more complex and costly, for the Commission and the MS authorities but it will prevent much costlier interventions when the electronic tools will be implemented. Furthermore, the ECDB / EHDB databases implemented within a well-studied eIWT system pave the way to DINA, effectively integrating the IWT sector in the transport network and, thus, having a very important impact.

A first proposal on the MS registry data structure can be seen in Figure 7 below.

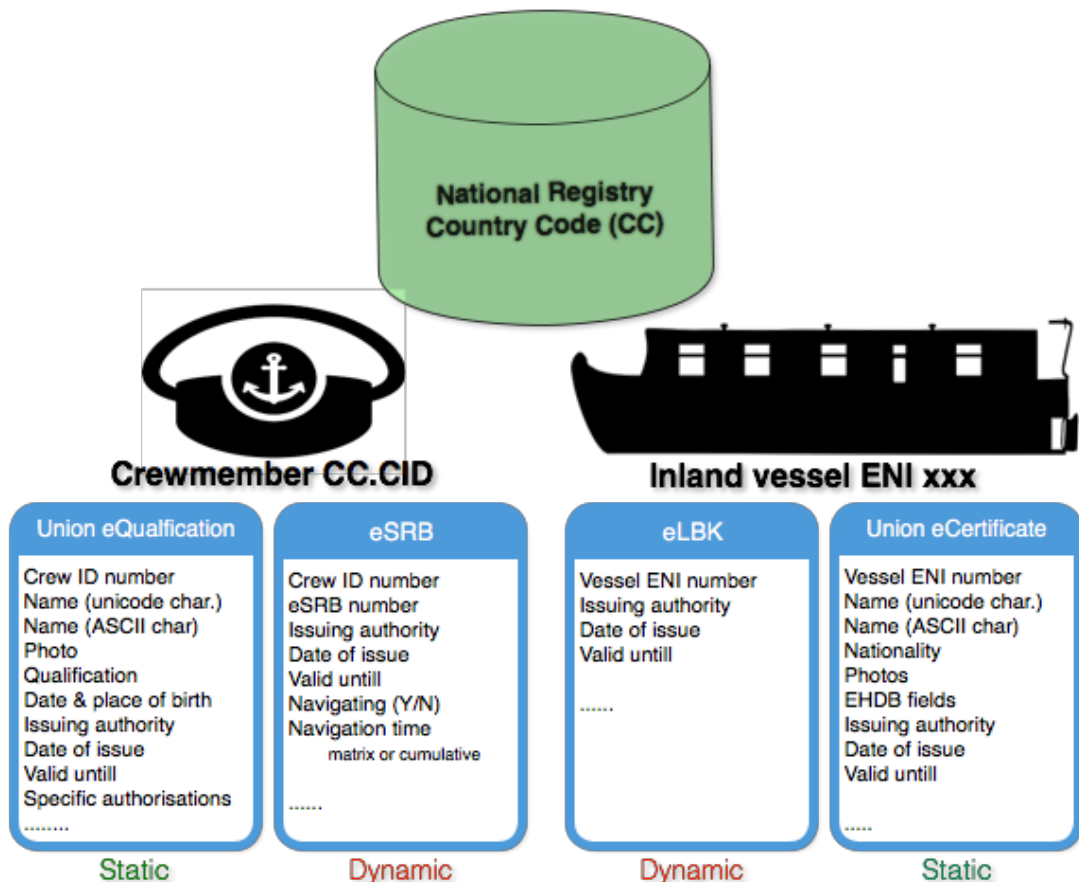


Figure 7: National registries indicative data structure

Although the exact data specification of ECDB and the corresponding part of the national registries will not be defined but after the completion of the ECDB *Use Cases*, a proposal on the eSRB dataset definition is given in the section 6 below.

5.4 Implementation architecture

The above ECDB requirements can be met by two implementation architectures:

- Federative architecture
- Centralised architecture

The main difference between these two solution lies in the role of the ECDB in relation to the MS registries. In the first one

Each of these architectures is described in the subsections below:

5.4.1 Federated solution

In the federative solution, the prime role of ECDB will be that of a gateway, initially for the MS competent authorities and other administrations and later also for the IWT crews, vessel operators and other stakeholders. It would be a gateway to services and information regarding the IWT crews.

At any time, the original data regarding each crew is hosted within the archives of a single MS competent authority, which, at any time, maintains a complete file/dossier for that crewmember. This means that each and every crewmember, upon entering the 'system', is automatically linked to a single competent authority, which becomes his/her competent authority.

Whatever modification of the data regarding the particular crewmember is forwarded to his/her competent authority, which, at any time, has his/her complete picture/file. Depending on his/her history and transactions, a crewmember might have data also on other competent authorities (i.e. data on certificates that were issued or past SRBs that were validated elsewhere) but it is only his/her own competent authority that has his complete file.

Whatever operations/actions by a competent authority other the crewmember's or by other authorities (i.e. enforcing, validating etc.) are forwarded to his/her own competent authority, through ECDB, to update his/her personal file.

ECDB will thus store only the data explicitly prescribed by Directive 2017/2397/EU, essentially for statistics, plus some minimum additional data necessary to perform its *gateway* and *unique access point* functions, as per the *Use Cases* described in sections 8 and 9. Furthermore, these data, synchronised with the national registries (and, during the 'electronic' phase with the eIVU and eIWC) can be considered as a buffer of part of the original data stored in the archives of the MS competent authorities.

It is slightly more complex from the centralised architecture and, in terms of legal framework, goes somewhat beyond²² the minimum requirements of the Directive 2017/2397/EU but it is inherently more secure and is closer to the current MS practices in other sectors (i.e. drivers' licenses) and EU trends in IT systems.

The federative solution can be seen schematically in Figure 8 below.

²² The Directive obliges MS to keep registries of all the certificates they emit but not a complete file for each crewmember, including certificates emitted by other authorities

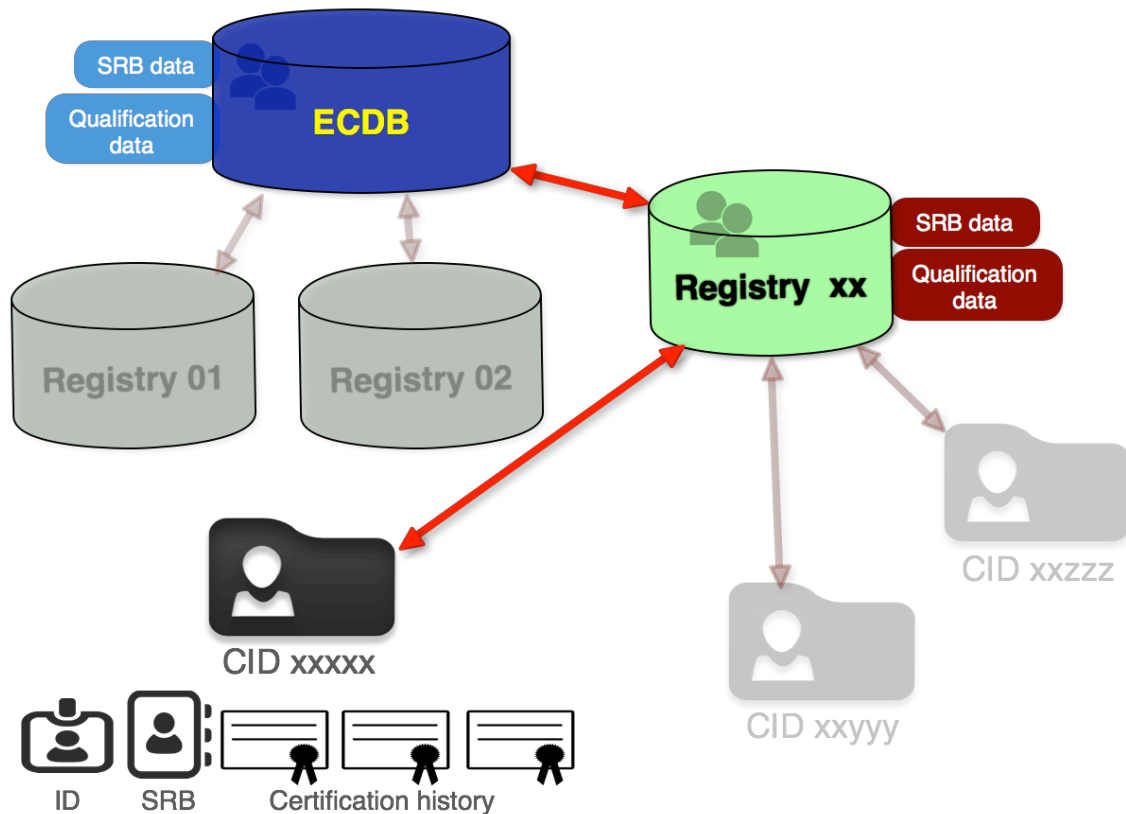


Figure 8: Federative architecture: the complete archive of crewmember xxxxx resides at the archives/registry of competent authority xx; it includes complete ID and SRB data (as per the national regulations) as well as all his/her qualification certificate data independently from where they were emitted; a subset of this data is pushed/mirrored to ECDB.

The federative solution was retained as reference for the definition of the ECDB dataset (section 6 below) as well as for the Use Cases outlined in sections 8 and 9, for the 'electronic' and the initial phases respectively.

5.4.2 Centralised solution

In the centralised solution ECDB becomes the main depository of the EU IWT crewmembers. Each competent authority keeps any data it retains necessary; however, it registers and forwards to ECDB only the data on the certificate it emits (incl. SRBs and LBKs). In the electronic phase, the *eQualifications* emitted and stored in its archives are the original, legally binding documents. However, a crewmember can have different *eQualifications* in many competent authorities, its complete and updated file being available only at ECDB, where all competent authorities will promptly push the data for the certificates they emit.

Crewmembers will not have their own (national) competent authority as in the federated solution. They will be European crewmembers certificated by one or more competent authorities.

MS competent authorities can get the complete picture of a crewmember only through ECDB. ECDB thus becomes much more than a unique access point or gateway to the data stored at the MS competent authorities' archives. It becomes a central data hub for IWT EU crewmembers.

The centralised solution can be seen schematically in Figure 9 below.

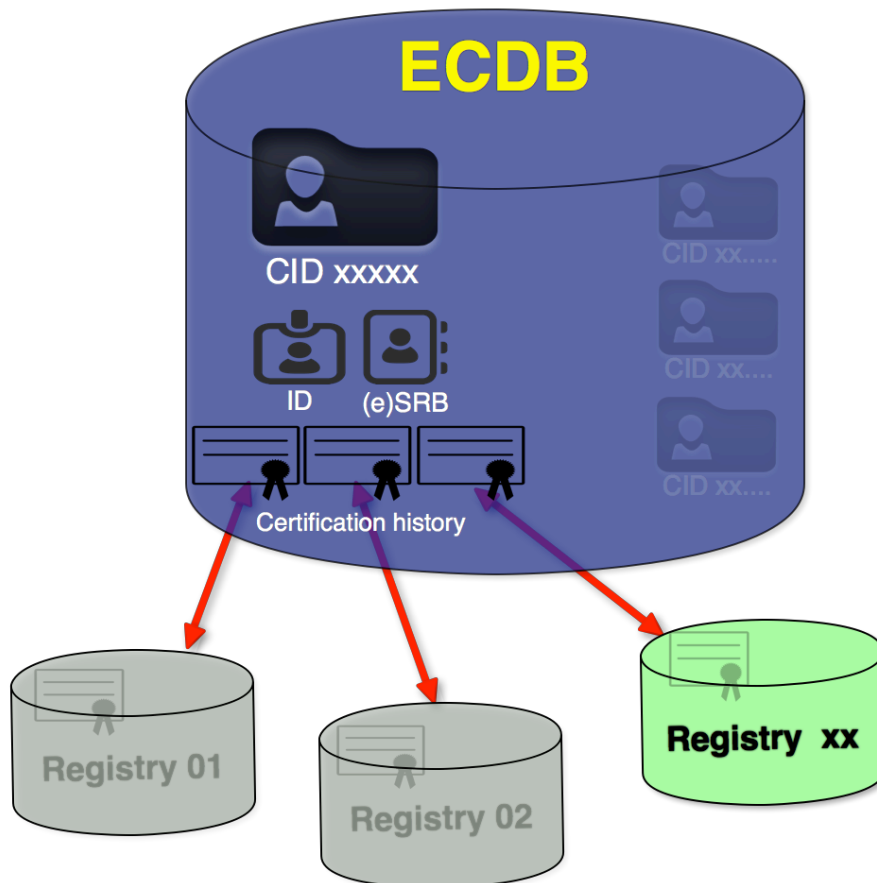


Figure 9: Centralised architecture: the complete archive of crewmember xxxxx resides in ECDB assembled by the certificate data pushed to ECDB by the MS competent authorities as per their obligation by the Professional Qualifications Directive; MS competent authorities only store the original (e)certificates they emit but the complete (e)qualification picture of the crewmember is available only in ECDB.

It presents some notable advantages in respect to the federated solution:

- It fulfils the requirements of the Directive and nothing more
- It is simpler than the federative solution, requiring less interaction with the MS registries
- It would be simpler to integrate crew data for non-EU states.

However, it also has some notable disadvantages:

- During the second (electronic) phase, the crewmember data are much more exposed; such a solution would thus require better and more expensive security measures and procedures. It would certainly require a central management of cryptographic keys and, possibly, of eIWC card issuing.
- Although the data stored in ECDB will also exist elsewhere (i.e. MS registries, eIVU and/or eIWC), in case ECDB data get lost or corrupted it is much more difficult to re-assemble the data again as there will be no complete crewmember files elsewhere than ECDB itself. This is true for both the initial and the 'eIWT' phases.
- There could be some issues on data ownership.

6 Dataset definition

6.1 Methodology

The basic requirement for the eSRB is to include all data of the current paper SRB as per the requirements of the *Directive 2017/2397/EU* [2] and to fulfil the future eIWT requirements as documented in [3] and outlined in section 3.3. At this stage, the CESNI draft as per [8] was taken as a reference (reprinted in ... of the present report). However, based on the model that will be adopted under Directive 2017/2397/EU, these data might need to be adjusted.

The methodology for the definition of the ECDB and EHDB datasets is as follows:

We proceed by categorising the parameter space of both databases by identifying classes and sub-classes of data. Starting from the top, the first categorisation is about data regarding the crewmembers (i.e. their certificates of qualification, SRBs, service, navigation time, voyages etc.) and or about data regarding the vessels (i.e. their certificates, voyages, type, crewing etc.). In general, all crew related data shall be in the ECDB database while all vessel related data shall reside in EHDB.

Consequently, we can distinguish two main classes of data, as follows:

- Crew related data → part of ECDB → variables have the prefix 'Crew'
- Vessel related data → part of EHDB → variables have the prefix 'Vessel'

For example, the variable *Crew.Voyage* would refer to a voyage of a certain crewmember while the variable *Vessel.Voyage* would refer to a voyage of a vessel. The variable *Crew.Voyage.StartDate* would refer to the voyage starting date of a crewmember which could have the same value as the *Vessel.Voyage.StartDate* or as the *Crew.Service.StartDate*.

Following this methodology, we can distinguish the following seven classes of crew related data, as in Table 1 below. The first three classes regard rather static data that are introduced once and are not updated but on a few specific cases. They are part of the *eQualification* set as per Figure 4 and Figure 7 above. The next three classes are part of the *eSRB* set. Classes 5 and 6 in particular regard dynamic data that, under the eIWT scheme, should be updated on a regular basis (i.e. at each new service or each voyage completion). Finally, the last class regards all crew related paper documents that, for whatever reason²³, are not valid anymore.

On top of these two databases, efficient and reliable compilation of the eLBKs and eSRBs require access to the ERDMS database, from where, in principle, all infrastructure related data²⁴ should be retrieved. More specifically, it is required that certain data fields take values selected among ERDMS-provided lists (arrays). This class of data, used in drop-down menus for assigning values to specific ECDB or EHDB variables, is as follows:

- ERDMS lists → part of ERDMS → arrays with prefix 'ERDMS'

The specific requirements from ERDMS are outlined in a separate section (6.8).

²³ They have been withdrawn, declared lost/stolen or have reached their validity limit

²⁴ Like the voyage start and end location

Table 1: Crew related data classes

	#	Data class	Class variable names
eQualification	1	ID related	Crew.Identity
	2	Fitness related	Crew.Fitness
	3	Qualification history	Crew.Qualification
eSRB	4	Competent authority related	Crew.Authority
	5	Voyage history	Crew.Voyage
Requests	6	Requests to authorities	Crew.Request
Inactive docs	7	Non-active documents	Crew.Inactive
Status	8	Current crewmember status	Crew.Status

The data description for each of these classes is given on

Table 3 to Table 9 below, in sections 6.2, 6.3, 6.5 and 6.6 for the *eQualifications*, the *eSRB*, the *inactive documents* and the *status* datasets respectively.

It should be noted that the crewmembers' service history, although presently recorded on the draft CESNI paper SRB model, is not part of the eSRB data. The main reason for this choice is that this data is, to a great extent, redundant with the crewmembers' voyage history. Even more so if the vessels' crewing history is implemented as part of the future eLBK (see Table 2 and Table 11).

Although the definition of the new EHDB is not part of the present report, some preliminary EHDB data definition are included here for the sake of clarity and for the congruence of the ECDB operational procedures when the digital will be adopted. Table 2 below indicates the vessel related data classes, part of the new EHDB database.

Table 2: Vessel related data classes

	#	Data class	Class variable names
eCertificate	1	ID related	Vessel.Identity
	2	Certification history	Vessel.Certification
	3	Inspection body related	Vessel.Authority
eLBK	4	Crewing history	Vessel.Crew
	5	Ownership history	Vessel.Owner
	6	Voyage history	Vessel.Voyage
Inactive docs	7	Non-active documents	Vessel.Inactive

It must be noted that the all ECDB variables listed on Table 3 to Table 10 below are arrays indexed to each *crewmember's unique crew ID N°* (Crew.Identity.CID), except, of course from the Crew.Identity.CID variable, which is a ASCII string that serves as an index for all *Crew* class variables. For readability purposes this is omitted. The same holds true for the EHDB variables, for example those on the vessel's crewing history (Table 11), that are arrays indexed with the vessel's ENI number.

6.2 eQualification dataset

This dataset comprises all data pertinent to the Union certificate of qualifications of the IWT crewmembers. These data are rather static i.e. are introduced once and are not updated but on a few specific cases like the fitness status or in case of a new certificate of qualification.

Table 3: Data fields related to the crewmember's ID

Crew.Identity			
Description	Variable	Type	Notes
Unique Crew ID N°	CID	ASCII string	
Name (Unicode)	NameUni	Unicode string	
Surnames (Unicode)	SurUni	Unicode string	
Name (ASCII)	NameASCII	ASCII string	To be inserted by the issuing Competent Authority according to national transliteration rules or transliterated automatically in ECDB according to EU standards
Surnames (ASCII)	SurASCII	ASCII string	
Date of birth	BirthDate	DD-MM-YYYY	
Place of birth	BirthPlace	Unicode string	Locality, region, country
Picture	Picture	JPG file	Passport specifications
Signature	Signature	JPG file	
Last ID data update	IDUpdate	DD-MM-YYYY	

The *Crew.Identity* class includes all identification data currently foreseen on the paper *Union Certificate of Qualification*. The main requirements are for a comprehensive digital twin search by the competent authorities upon the introduction of a crewmember to the electronic system and the issuance of the unique crew number (CID), see sections 8.2 and 9.2 below.

Table 4: Data fields related to the crewmember's fitness

Crew.Fitness			
Description	Variable	Type	Notes
Restrictions	Restriction	ASCII string	Choice among standard restrictions; see section 6.8 list 4
Mitigation measures	Mitigation	ASCII string	Choice among standard restrictions; see section 6.8 list 4
Issuing authority	Authority	ASCII string	Qualification issuing authority, not to be confused with medical service; choice among standard authorities; see section 6.8 list 2
Date of Issue	IssueDate	DD-MM-YYYY	Date of validation of the medical certificate by the issuing competent authority.
Valid until	EndDate	DD-MM-YYYY	Fitness certificate validity

The above table on crewmembers' fitness is based on the following assumptions:

- A crewmember can be fit for his/her job or not. If fit, he/she can have some standard restrictions.
- Any crewmember with void *Crew.Fitness* variables or when past the *Crew.Fitness.EndDate* date, is considered as non-fit and his/her active qualifications are automatically suspended and, if not updated after a pre-established period of time, withdrawn.

Table 5: Data fields related to the crewmember's qualification history

Crew.Qualification			
Description	Variable	Type	Notes
Qualification (i)	Qualification (i)	ASCII string	Choice among standard qualifications ²⁵ (section 6.8 list 5)
Active or not	Active (i)	yes / no	Calculated automatically
Start date	StartDate (i)	DD-MM-YYYY	
End date	EndDate (i)	DD-MM-YYYY	
Issuing auth.	Authority (i)	ASCII string	Choice among standard competent authorities (see section 6.8 list 2)
Total N° of qualifications	TotQualif	Integer	Incrementally updated by 1 at every new qualification
Last update date	LastUpdate	DD-MM-YYYY	Date of the last qualification issuance
Suspension start	SuspStart	DD-MM-YYYY	
Suspension end	SuspEnd	DD-MM-YYYY	
Withdrawal date	WithdrawDate	DD-MM-YYYY	
Withdrawal notes ²⁶	WithdrawNote	ASCII string	Choice among standard reasons / notes (see section 6.8 list 7)
Note: i is an integer variable ranging from 1 to <i>TotQualif</i> , where <i>TotQualif</i> is the total number of qualification levels accessed by the crewmember concerned			

The above-mentioned methodology is based on the following assumptions / conventions:

- As qualification is understood any certified competence of a crewmember. It includes the standard qualifications, including for specific authorizations (i.e. LNG, large convoys, stretches with specific risk), as foreseen by the Directive.
- Initially and until the harmonisation of the qualification levels, qualifications foreseen by national or regional regulations, should be included among standard qualifications (section 6.8 list 5).
- A renewed qualification is considered as a new qualification independently if this happens automatically or after exams, including after a withdrawal.
- A crewmember is likely to have many qualifications, one or more of which will be active.

²⁵ Including qualifications not necessarily foreseen by the *Qualifications Directive*. For example: ADN certificate etc.

²⁶ It allows to keep track of any serious / criminal offences connected with the prohibition (i.e. by national penal law) to navigate in certain countries, so that other competent authorities do not re-emit withdrawn certificates.

- Any qualification not suspended or withdrawn or not having reached its expiry date (*Crew.Qualification.EndDate* (i)) is considered as active.
- The non-active qualifications are only kept in ECDB for a limited time (could be 1 year), after which they are automatically deleted. ECDB only keeps the incremental (i.e. total) number of the qualifications.
- The *withdrawal notes* field allows the competent authorities to check if an applicant for a qualification certificate had in the past a similar certificate withdrawn elsewhere and the reasons for such a withdrawal and decide accordingly.

Regarding the *identity* class of data, we must note the following:

- The MS administrations and the Commission should decide on a method of issuing a Unique Crew ID (CID). The *Crew.Identity.CID* field, as proposed in allows for various solutions: from the simple numerical method followed in the current EHDB (not advised for a number of reasons) till a more sophisticated method that embeds personal information (like sex, age, nationality, issuing MS etc.) in the unique CID.
- The MS administrations and the Commission should define the criteria for the identification of duplicate / twin entries: which combination(s) of similar *identity* fields would trigger a 'twin' alert.
- The MS administrations and the Commission should define the procedures to follow for the verification of a 'twin' alert. These steps should be taken primarily at the issuance of the first electronic certificate, when the crewmember is given his/hers Unique Crew ID (CID).

6.3 eSRB dataset

This dataset, primarily pertinent to the eIWT phase, comprises all data related to the crewmembers' eSRB. Data on Table 6 are rather static, introduced once and rarely updated. On the contrary, data on Table 11 and Table 7 are dynamic, i.e. they are normally updated on a regular basis, like at each new crewmember's service or each voyage completion.

eSRB dataset refers to the architecture as per Figure 4, implying a fully operational eIWT and, consequently, the existence of eSRBs. However, the same data fields can serve for the *SRB data* as per Figure 5, i.e. when no eIWT or eSRB exist. In this case, no *service* or *voyage* data are recorded, the only data required being that of the number, the date and the issuing authority of the active paper SRB. This entry can be recorded on the *Last paper SRB fields* in under the *Crew.Authority* class of variables as in Table 6 below.

Rows highlighted in light green color indicate ECDB data fields that are required for the also in the initial ECDB phase, prior to the introduction of the electronic tools, as per the requirements of the *Professional Qualifications Directive*.

More specifically, regarding the SRB, during the period prior to the introduction of the eSRB²⁷ and during the transitory phase prior to the full application of eIWT²⁸, the three data-fields *LastSRBNo*, *LastSRBAuth* and *LastSRBDate* of Table 6 below

²⁷ No eIWT, consequently paper only SRBs; however, ECDB is operational (limited to the scope as per the Professional Qualifications Directive), requiring MS to push via their registries the "name of the holder and his identification number, the SRB identification number, the date of issuance and the issuing authority" of paper SRBs

²⁸ When some crewmembers will have an eSRB but some others will still be using a paper version

can be used to record the active paper SRB number, issuing authority and issuing date.

Table 6: Data fields related to the (e)SRB issuing authority

Crew.Authority			
Description	Variable	Type	Notes
eSRB issuing authority	Authority	ASCII string	Choice among standard competent authorities (see section 6.8 list 2)
Issuing date	IssueDate	DD-MM-YYYY	
Last eSRB update	LastUpdate	DD-MM-YYYY	
Last paper SRB N°	LastSRBNo	Integer	
Last SRB issuing authority	LastSRBAuth	ASCII string	Choice among standard competent authorities (see section 6.8 list 2)
Last paper SRB issuing date	LastSRBDate	DD-MM-YYYY	
Net navigation days in paper SRBs	SRBNav	Integer	Accumulated net navigation days as per paper SRBs; filled by the eSRB issuing authority
Stretches with specific risk as in paper SRBs	SRBSSR (i)	ASCII string	Stretches with specific risk as per paper SRBs; filled by the eSRB issuing authority; choice among a list of stretches (see section 6.8 list 10).
No RIS areas from paper SRBs	SRBNoRIS (i)	ASCII string	Free text definition of locations on areas not covered by RIS; filled by the eSRB issuing authority
Note: During the no-eIWT period the variable <i>Authority</i> refers to the competent authority currently issuing the new SRB while the <i>LastSRBAuth</i> refers to the one that has issued the last SRB, which is now de-activated			

The variables in Table 6 above serve primarily for the transition from the paper to electronic documents. However, they also serve later, during the eIWT phase, for the manual introduction of data like the net navigation days in non-connected waterways following the procedures described at the last paragraphs of section 8.1.

Table 7: Data fields related to the crewmember's voyage history

Crew.Voyage			
Description	Symbol	Type	Notes
Crew voyage #i	Number	Integer	Incremental crew voyage count
Vessel ENI	VesselENI (i)	Number	If it exists
Vessel national N°	VesselNumber (i)	Unicode string	Country code plus national vessel number - Not necessary if ENI exists
Vessel name	VesselName (i)	Unicode string	Not necessary if vessel in EHDB and ENI exists
Vessel type	VesselType (i)	ASCII string	Choice between standard types - Not necessary if vessel in EHDB
Large convoy	LargeConvoy (i)	yes / no	Entry by the skipper
Vessel voyage N°	VesselVoyage (i)	Integer	Same as on vessel's eLBK
Function(j) during the voyage(i)	Function (i, j)	ASCII string	Choice between standard functions (see section 6.8 list 6)
Skipper CID	SkipperCID (i)	ASCII string	Skipper at end of voyage or crew disembarkation
Skipper name	SkipperName (i)	Unicode string	Not necessary in case CID exists
Starting location	StartLoc (i)	Unicode string	Choice among standard ports (see section 6.8 list 1)
Start date	StartDate (i)	DD-MM-YYYY	Date of crewmember embarkation or voyage beginning – whichever comes later
Via	ViaLoc (i)	Unicode string	Choice among standard ports (see section 6.8 list 1)
End location	EndLoc (i)	Unicode string	Choice among standard ports (see section 6.8 list 1)
End date	EndDate (i)	DD-MM-YYYY	Date of crewmember disembarkation or voyage termination; whichever comes first
Interruption	Interruption (i)	Integer	N° of non-navigating days
Net navigation days	Navigation (i)	Integer	Calculated automatically: (EndDate(i) – StartDate(i)) – Interruption(i) + 1
Stretches with specific risks	SSR (i, j)	ASCII string	Stretch(j) part of Voyage(i); choice among a list of stretches (see section 6.8 list 10)
No RIS areas	NoRIS (i)	ASCII string	Free text definition of locations on areas not covered by RIS; otherwise empty
Validating authority	ValAuthority (i)	ASCII string	Choice among authorities (see section 6.8 list 3)
Validation date	ValDate (i)	DD-MM-YYYY	
N° of Voyages	TotVoyages	Integer	Incrementally updated by 1 at every new Voyage
Note: i (= Number) is an integer variable ranging from 1 to <i>TotVoyages</i> , where <i>TotVoyages</i> is the total number of voyages accumulated by the crewmember concerned to date.			

Regarding the navigation through *stretches with specific risks*, these are logged in the *voyage file* either automatically by the *vessel unit* based on the vessel's geolocation compared with the ECDIS information or manually by the boatmaster,

as a choice among a list of stretches of inland waterways with specific risks, provided in an ERDMS list (see section 6.8 list 10).

Vessels navigating on waterways which are not covered by RIS and, consequently, their geo-located infrastructure cannot be in an ERDMS list, will chose the 'No RIS' entry for the *start location*, *via* and *end location* fields and would indicate, in free text, the *start*, the *via* and the *end* locations in the *No RIS areas* field (Crew.Voyage.NoRIS(i)).

It should also be noted that the term 'voyage' encompasses also the brief repetitive movements of vessels like those of the feeder vessels or the ferries. In such case the *start*, *via* and *end* locations would coincide.

6.4 Requests to competent authorities

This class regards the data fields necessary for the transmission of requests regarding the crew eQualification or eSRB towards the proper competent authorities. Requests can come either from a *crewmember* or from another *authority*. Typical requests are:

- Request of a crewmember to update his/her qualification
- Request to issue a new qualification or special ability
- Request by enforcing authorities for qualification certificate suspension or withdrawal

The variables listed on Table 8 are transitory: they are re-initialised (set to NULL) once the request has been processed.

Table 8: Data fields related to requests to competent authorities

Crew.Request			
Description	Variable	Type	Notes
Crew request type	CRequest	ASCII string	Crewmember's request for a new document or a renewal; choice among a list of standard requests;
Crew Request Date	CDate	DD-MM-YYYY	
Crew Request Note	CNote	ASCII string	Free text supporting the request
Recipient Authority	Recipient	ASCII string	Choice among standard competent authorities (see section 6.8 list 2)
Authority Request type	ARequest	ASCII string	Request from an (enforcing) authority for suspension or withdrawal; choice among a list of standard requests
Auth. Request Date	ADate	DD-MM-YYYY	
Auth. Request Note	ANote	ASCII string	Free text supporting the request
Requesting Authority	RAuthority	ASCII string	Requesting (enforcing) body/authority; choice among a list of enforcing bodies

Apart from the cases cited above or the use-cases in sections 8.3, 8.4, 9.3 and 9.4, this table can be used also for other crew-to-authority and authority-to-authority requests.

6.5 Inactive crew documents

This class of data regards all crew-related documents that, for whatever reason, are no more active / valid. Typical reasons include:

- Certificate of qualification withdrawal
- Paper SRBs that are filled-up and, consequently, replaced
- Certificates of qualification or SRB declared lost or stolen.
- Certificates of qualification reaching the end of their validity period.

This class of data regards primarily the period before the introduction of eIWT or during the eIWT transition period when paper documents co-exist with the electronic ones. When eIWT will be fully implemented there will be just one eSRB, while non-active *eQualifications* will appear in the *Crew.Qualification* class of data as per Table 5 above.

Table 9: Data fields related to inactive documents

Crew.Inactive			
Description	Variable	Type	Notes
Inactive document #i	Number	Integer	Incremental inactive doc N°
Document type	DocType (i)	ASCII string	Choice among standard docs (see section 6.8 list 9)
Inactive since	Since (i)	DD-MM-YYYY	
Next document	Next (i)	Integer	N° of next document issued
Issuing authority	Authority (i)	ASCII string	Choice among standard authorities (see section 6.8 list 2)
Notes	Notes (i)	ASCII string	Choice among standard notes / reasons (see section 6.8 list 8)
Note: i (=Number) is an integer variable incrementing by 1 for each new inactive document.			

Inactive documents are only kept in ECDB for a limited time (could be 1 year), after which they are automatically deleted. ECDB only keeps the incremental (i.e. total) number of the documents.

6.6 Status

This class of data regards the current status of each crewmember. The second variable (*Crew.Status.Voyage*) serves as the *navigation flag* (see Figure 11 and Figure 12) that indicates that a crewmember is already in voyage and prohibits duplicate embarkations.

Table 10: Data fields related to the crewmember status

Crew.Status			
Description	Variable	Type	Notes
Currently embarked?	Voyage	YES / NO	YES if embarked, otherwise NO
Current embarkation vessel number	VesselENI	ASCII string	Vessel ENI; if no ENI then national number
Current embarkation vessel name	VesselName	ASCII string	Vessel name; not necessary if ENI exists
Last update	Update	DD/MM/YYYY	Date of last status update
Qualification(s) currently suspended?	Suspended	DD/MM/YYYY NO	Suspension end date; otherwise NO; automatically reverts to NO after suspension end date
Qualification(s) withdrawn?	Withdrawn	YES / NO	

When crewmembers have contracts with owners/operators of more vessels and are required to change vessels very frequently (i.e. feeder barges in a large port), performing navigational operations on vessels involving *short movements* rather than *voyages*, then the variable *Crew.Status.VesselENI* is left void while the variable *Crew.Status.VesselName* is used to describe in free text (max 200 ASCII characters) their embarkation situation²⁹.

6.7 EHDB crewing fields

For the sake of completeness and clarity, the data fields related to the crewing history of each vessel, part of the vessel's eLBK (Vessel.Crew class, see Table 2), is given on Table 11 below. These fields are not part of ECDB; they should be part of the new EHDB, adapted for the requirements under the eIWT scheme.

It is supposed that the vessel is registered in the EHDB and, consequently, has an ENI number. Crewmembers, at least during an initial transitory period, may not necessarily have a unique CID.

²⁹ Examples: YYYY enterprise, convoy assembly, terminal ZZZZ, port XXXX
 YYYY enterprise, feeder vessels, terminal ZZZZ, port XXXX
 ENI XXXX or ENI YYYY or ENI ZZZZ, port PPPP

Table 11: Data fields related to the vessels' crewing history

Vessel.Crew			
Description	Variable	Type	Notes
Vessel crew #i	Number	Integer	Incremental vessel crew count
Unique Crew ID N°	UniqueCID (i)	ASCII string	Not necessary if CID exists
Name (Unicode)	NameUni (i)	Unicode string	Not necessary if CID exists
Surnames (Unicode)	SurUni (i)	Unicode string	Not necessary if CID exists
Name (ASCII)	NameASCII (i)	ASCII string	Not necessary if CID exists
Surnames (ASCII)	SurASCII (i)	ASCII string	Not necessary if CID exists
Function (j) during crewing service (i)	Function (i, j)	ASCII string	Choice between standard functions (section 6.8 list 6)
Service start date	StartDate (i)	DD-MM-YYY	
Service end date	EndDate (i)	DD-MM-YYY	
Total N° of crews	TotCrew	Integer	Incrementally updated by 1 at every new crewmember
Note: i (=Number) is an integer variable ranging from 1 to <i>TotCrew</i> , where <i>TotCrew</i> is the total number of crewmembers having served on a given vessel to date.			

6.8 ERDMS list requirements

A number of data fields of the above tables will be filled-in through the eIWT system, manually or automatically, as choices among lists of accepted options. These lists should be provided to eIVU (eIWT vessel unit) and updated regularly, preferably through the European Reference Data Management System (ERDMS). They concern the following classes of data:

1. RIS objects: the boatmaster, on planning the voyage should pick out from the RIS index (or the ERI locations outside EU) the right RIS objects as per his reporting, registration or other requirements. When crewmembers disembark along a voyage, either the boatmaster manually assigns the RIS objects as above or, in alternative, the RIS objects are picked out automatically, based on the vessel's geolocation at the time of embarkation / disembarkation. These values should be passed automatically to the vessel's eLBK and the crew's eSRB as required. ECDB data fields concerned are:
 - a. Crew.Voyage.StartLoc(i)
 - b. Crew.Voyage.EndLoc(i)
 - c. Crew.Voyage.ViaLoc(i)
2. Competent authorities: list of the competent authorities that are entitled to issue / update / revoke qualification certificates. ECDB data fields concerned are:
 - a. Crew.Fitness.Authority
 - b. Crew.Qualification.Authority(i)
 - c. Crew.Authority.Authority
 - d. Crew.Authority.LastSRBAuth
 - e. Crew.Inactive.Authority(i)
3. Validating authorities: list of the authorities that are entitled to validate crewmembers' SRBs. To date, no such list exists in ERDMS. ECDB data fields concerned are:
 - a. Crew.Service.ValAuthority(i)

- b. Crew.Voyage.ValAuthority(i)
- 4. Standard fitness restrictions: list of standard fitness restrictions, such as those established by CESNI and referred to in EU delegated act. To date, this list does not exist in ERDMS. The ECDB data field concerned is:
 - a. Crew.Fitness.Restriction
- 5. Standard qualifications and specific authorisations: list of standard Union qualifications and specific authorisations, as established by Directive 2017/2397/EU. During the transitory period when the national certificates of qualifications are mutually recognised as per Directive 2005/36/EC, the list should comprise also the qualifications established across all EU MS. The ECDB data fields concerned are:
 - a. Crew.Qualification.Qualification(i)
- 6. Standard functions: list of standard deck crew functions. To date, deck functions are not harmonised at international or EU level. Until such harmonisation takes place, the list should comprise all possible crew functions across all EU MS. The ECDB data fields concerned are:
 - a. Crew.Voyage.Function(i)
 - b. Crew.Service.Function(i)
- 7. Standard qualification withdrawal reasons: list of standard reasons/notes for withdrawing a qualification. The ECDB data fields concerned are:
 - a. Crew.Qualification.WithdrawNote(i)
 - b. Crew.Inactive.Notes(i)
- 8. Standard inactive document notes: list of standard reasons/notes for each inactive document. The list concerns the pre-eIWT and the transition phases, when paper documents exist. The ECDB data fields concerned are:
 - a. Crew.Inactive.Notes(i)
- 9. Standard document types: list of standard crew document (i.e. SRB). The list concerns the pre-eIWT and the transitory phases, when paper documents exist. The ECDB data fields concerned are:
 - a. Crew.Inactive.DocType(i)
- 10. Standard stretches with specific risk: list of standard stretches with specific risks provided as an ERDMS list or as geo-located objects in ECDIS. The ECDB data fields concerned are:
 - a. Crew.Voyage.SSR(i,j)

7 Access rights

As per the Directive 2017/2397/EU, Article 24(1) and 24(2):

- MS shall carry out all processing of personal data according the Union law on the protection of personal data, in particular Regulation (EU) 2016/679.
- The Commission shall carry out all processing of personal data in accordance with Regulation (EC) No 45/2001.

The following subsections refer to the access rights and data retention policy to be implemented in ECDB during the first non-electronic phase, when ECDB serves primarily for data exchange and control between authorities and for statistical purposes.

In what regards their access rights, considering the main ECDB actors foreseen in in section 4.3 and the eIWT architecture as in Figure 1, the main classes of access foreseen for ECDB during the first (non-eIWT phase) are as follows:

7.1 Competent authorities

Competent authorities, in addition to the interactions defined in sections 9 below, can access the full ECDB for control / verification purposes. This is a READ-ONLY access of all the data concerning all crewmembers, irrespective of their status or of the competent authority at which they are registered.

7.2 Enforcing authorities

In principle, enforcing authorities, can only access ECDB in the frame of their inspection/enforcing duties. In addition to the interactions described in section 9.4 below, when on board of a vessel to be inspected, they should be granted a READ-ONLY access to the ECDB data concerning the current crewmembers of a vessel under inspection or those who have been part of the vessel's crew during its current voyage. They should also be granted READ-ONLY access to the EHDB data of the vessel under inspection.

During the 'electronic' phase, granting of such access will be done automatically, just by inserting their card in the vessel unit (eIVU) of the inspected vessel. However, in the initial, non-eIWT when there is no eIVU and the ECDB/EHDB system does not have any information on the vessel voyages, the proper implementation of such functionality can be prohibitively complicated. It is therefore proposed that, during this initial non-eIWT phase, enforcing authorities are granted a READ-ONLY ECDB access following one of the following modalities:

1. Enforcing authorities are granted permanent READ-ONLY access to ECDB or
2. Enforcing authorities are granted by the corresponding competent authorities a temporary READ-ONLY ECDB access, valid only for a specific inspection campaign, or
3. Enforcing authorities access the ECDB through a competent authority

Enforcing authorities that need to perform a query for purpose other than an inspection must access ECDB through their respective national competent authorities.

7.3 River Commissions and other stakeholders

International organizations and other bodies (i.e. recognised professional organisations, IWT social partners, authorised private bodies etc.) can access only anonymised³⁰ information in READ-ONLY mode.

ECDB should provide the possibility, through a web-based interface, to build complex queries on the number of ECDB entries that respect certain conditions. Typical such queries are:

- Number of crewmembers registered in ECDB
- Number of crewmembers with a particular active qualification or special ability
- Number of crewmembers currently embarked
- Number of crewmembers in navigation per vessel type
- Number of crewmembers having navigated through a specific risk stretch during a certain period of time
- Number of Qualifications emitted per competent authority over a certain period of time
- Number of SRBs validated per validating authority over a certain period of time
-

7.4 Crew access

This class includes the access by all IWT crewmembers (including the boatmasters) targeted under the recent qualifications Directive. More in particular all *deck crewmembers*, *LNG* and *passenger navigation experts*, sailing on crafts³¹ in Union inland waterways³². Each such crewmember must be assigned with a unique Crew ID number (Crew.ID.CID) and, upon the eIWT implementation, be issued with an eIWT *Crew Card*.

As per the Directive 2017/2397/EU, Article 24(4), crewmembers are entitled to be informed on their personal data stored in the MS registries or the ECDB. During the 'electronic' phase, crewmembers will have a direct READ-ONLY access to their own³³ data in ECDB directly, through their eIWC or through delegated third parties (i.e. service providers). During the initial non-eIWT phase, crewmembers will be informed by the respective competent authorities on their registered personal data. Additionally, crewmembers can request at any time, any competent authority to furnish details about their personal data stored in ECDB according the protocols and modalities in place at each MS.

In addition to that, during the eIWT phase, crewmembers will be able to access ECDB following the scheme outlined in UC3 (see section 8.3)

7.5 Company access

This class includes the access by vessel owners, operators or delegated third parties (i.e. service providers or boatmasters acting on behalf of their company or operator).

³⁰ Anonymized data in respect to both the crewmembers' and the vessels' identities.

³¹ As defined in Articles 2 and 3 of the EC Directive

³² Excluding local, non-interconnected waterways as per Article 2 par 3 of the EC Directive

³³ All data indexed with their personal unique CID

During the 'electronic' phase, companies will have a direct READ-ONLY access to the data regarding their vessel(s)³⁴ in EHDB and ECDB, directly through their *Company Card* or through delegated third parties (i.e. service providers). During the initial non-eIWT phase, companies have to interact with the respective inspection or competent authorities on the registered vessel and crew data according the protocols and modalities in place at each MS.

³⁴ Including some data on the crews of their vessel(s)

8 Use case definition

We can distinguish to distinct ECDB operational phases:

- a) Initial phase → No eIWT system in place, ECDB fulfils just the requirements of Directive 2017/2397/EU
- b) Electronic phase → eIWT system is fully operational

Since it has been opted to design in ECDB in view of its use at long term, the Use Cases should reflect the ECDB operational requirements during the *electronic phase* ((b) above) i.e. assuming the full implementation of *Directive 2017/2397/EU* and of the eIWT system, as defined in [3].

When the eIWT will be fully operational, the ECDB and EHDB databases will serve as unique gateways for the electronic interaction of the IWT non-institutional stakeholders (crewmembers and vessels) with the IWT institutions (national competent authorities or inspection bodies) as depicted schematically in Figure 10 below.

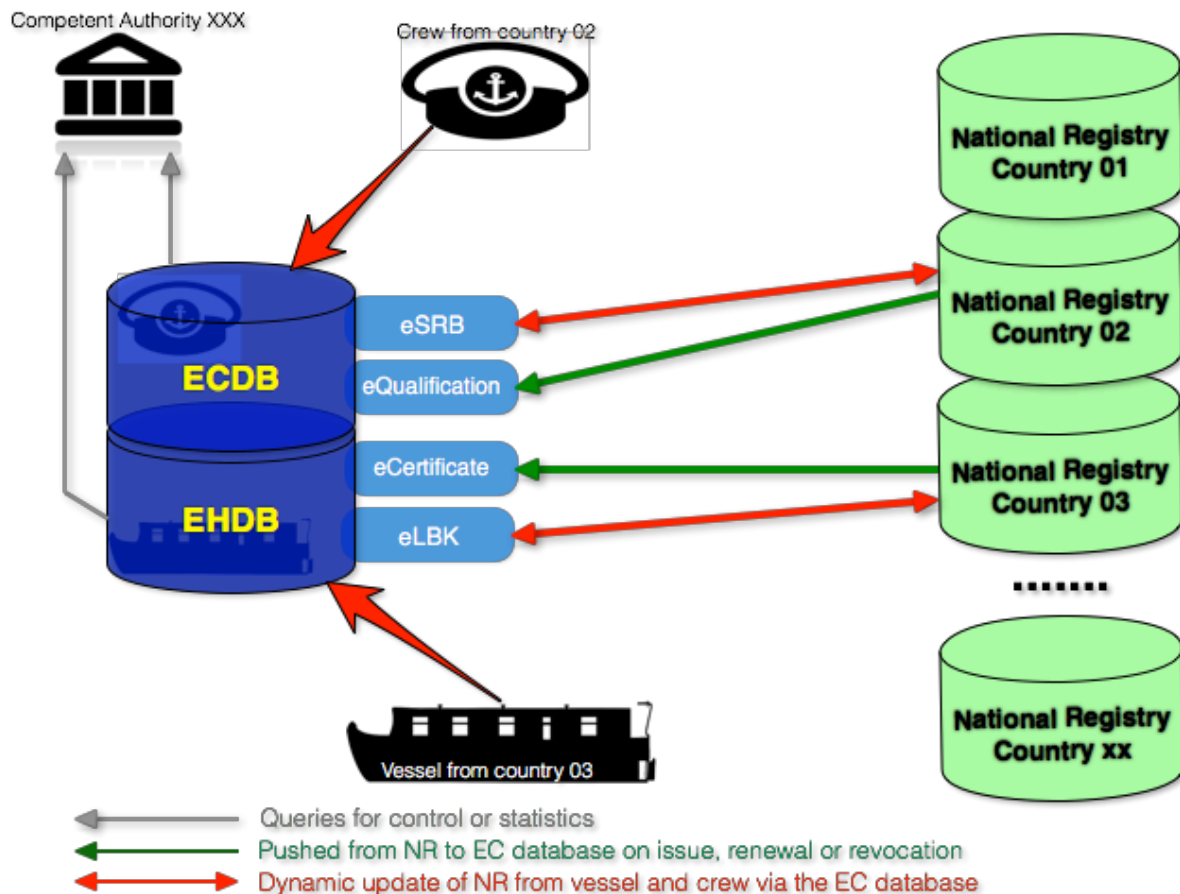


Figure 10: Vessel / crew interaction with national authorities through the ECDB / EHDB single gateway during day-to-day IWT operations

A number of *Use Cases (UC)* that cover the widest possible spectrum of the anticipated ECDB operations were selected:

1. eSRB & eLBK update
2. eIWC issuance
3. eQualification update or renewal
4. eQualification suspension or withdrawal
5. Queries by authorities

6. Queries for statistics
7. Queries by crewmembers

Evidently, during the first phase ECDB will be operated at a small fraction of its capacity and many of the above UCs are not applicable. Also, the update EHDB will not be available. The simplified Used Cases related to the initial ECDB phase are examined separately in Section 9.

8.1 UC1: eSRB & eLBK update

This use-case describes how the crew eSRBs and vessel eLBKs are updated with the voyage data. The eSRB is updated with the navigation time accumulated on board of a vessel either when the crewmember disembarks from a vessel or when the voyage ends³⁵. The eLBK is updated at the end of the voyage, when the vessel's *voyage file* is electronically signed by the boatmaster and closed.

By the terms *embarkation* and *disembarkation*, we understand the acts of taking and leaving service³⁶ on-board of a vessel. This is not necessarily linked with a particular voyage and does not necessarily coincide with the start or the end of the vessel's voyage.

The eLBK is not directly related to the ECDB. It should be directly related to the upgraded EHDB, where information on the vessel certification, voyages, ownership and crewing will be stored. However, as seen in Figure 11 and Figure 12 below, eLBK registrations are used for cross-checking the eSRB voyage entries. That is why the eLBK update was included in this report and incorporated in UC1. The eLBK should be updated on many occasions, like: new or updated vessel certificates, transfer of ownership, crew taking or leaving service, voyage completion etc. This use-case only concerns the dynamic update of the vessel's voyage history that takes place at the beginning, during and at the end of a vessel voyage.

The eSRB update maps what happens when a *crewmember* embarks and disembarks to/from a vessel; it involves the following procedures:

On *crew* embarking:

1. The *boatmaster* requests the *crew card (eIWC)* of the embarking *crew* and checks his/her identity. He then inserts it (or sweeps it through) the vessel's eIVU card reader(s). The system reads the eIWC data and checks on-line the validity³⁷ of the eIWC through the ECDB, if connection is available³⁸.
2. On successful completion of the 1st step above, the crewmember's embarkation is registered in the eIVU's voyage file. The eIVU uploads³⁹ a minimum set of data (like crew card number, vessel number, location and time stamp) to the ECDB so as to avoid duplicate or parallel use of the same credentials. This is done by raising a navigation flag in ECDB indicating that

³⁵ Whatever happens first

³⁶ In most cases, embarkation / disembarkation dates should coincide with the start / end dates of the crewmembers' service as recorded in the vessels eLBK under the *Vessel.Crew* class of data.

³⁷ In particular check that it has not been suspended or that the crewmember is not already recorded as active on-board another vessel

³⁸ If connection is not available, the operation is queued for later. The last eIWC – ECDB synchronization time-stamp is a good indication for the eIWC validity. Failure to synchronize over a long time can raise suspicions.

³⁹ If connection is not available, the operation is queued for later.

the particular crewmember is part of a crew. As long as this flag is raised, the crewmember cannot register as crew on any other vessel.

On crew disembarking or at the end of a *voyage*:

3. The eIVU, based on the registered actual route, specific conditions etc. acquired through ECDIS and RIS services, automatically updates the eSRB relevant data of the disembarking crew by registering all necessary data (navigation time, stretches with specific risks etc.).
4. The boatmaster controls the voyage data of the disembarking crew. In case of a discrepancies, failure of the automatic registration, non-availability of RIS etc., he has the possibility to correct / overwrite the automatic registration. However, this action is recorded on a log file both at the crew card (eIWC) and the vessel unit (eIVU).
5. The boatmaster digitally signs, on the eIVU, the crewmember's eSRB related data, thus finalizing the disembarking crew eSRB update and signalling the disembarkation of the crew member.
6. The disembarkation is logged also at the crewmember's eIWC, including the time stamp of the disembarkation and any eSRB relevant information.
7. The disembarkation is registered at the vessel's voyage file and the variation in the vessel crew composition is written in the vessel's eLBK.
8. The eIVU signals the disembarkation to the ECDB removing the navigation flag from the disembarked crewmember's records and uploads the disembarking crew eSRB updates on ECDB.
9. Upon the boatmaster's signature⁴⁰, the eSRB data related to the particular voyage is pushed by the eIVU to the crewmember's file in ECDB, where they remain at a non-validated status until the completion of step 10 below.
10. Periodically or on ECDB's notification, each competent authority controls⁴¹ and validates the eSRB updates and, where relevant, issue a new certificate of qualifications to the concerned crewmember, in accordance with the applicable rules.

After their validation, the eSRB updates are registered on the national original eSRB files, which are then pushed to the ECDB and to the crewmember's eIWC. The information flow in and out of the ECDB during such an eSRB update is depicted schematically in Figure 11 below.

Alternatively, the control of the eSRB update proposal with the relevant eLBK entries could be done automatically at ECDB / EHDB level, the result of this congruence check being pushed to the eSRB issuing authority, which proceeds (or not) to the formal eSRB update, as depicted schematically in Figure 12 below. This alternative could save MS authorities the software necessary for such congruency control but, on the other hand, would delegate part of their present mandate / authority.

Failure of the eIVU to update the ECDB data of the disembarking crew (due to a communication failure or any other reason) will generate an alarm at the first synchronization attempt of the eIWC with the ECDB and will trigger corrective actions as required.

⁴⁰ Or as soon as a connection is available

⁴¹ It is up to each competent authority to set-up its proper control procedures. One way of controlling the eSRB entries is to check with the correspondent eLBK entries in EHDB

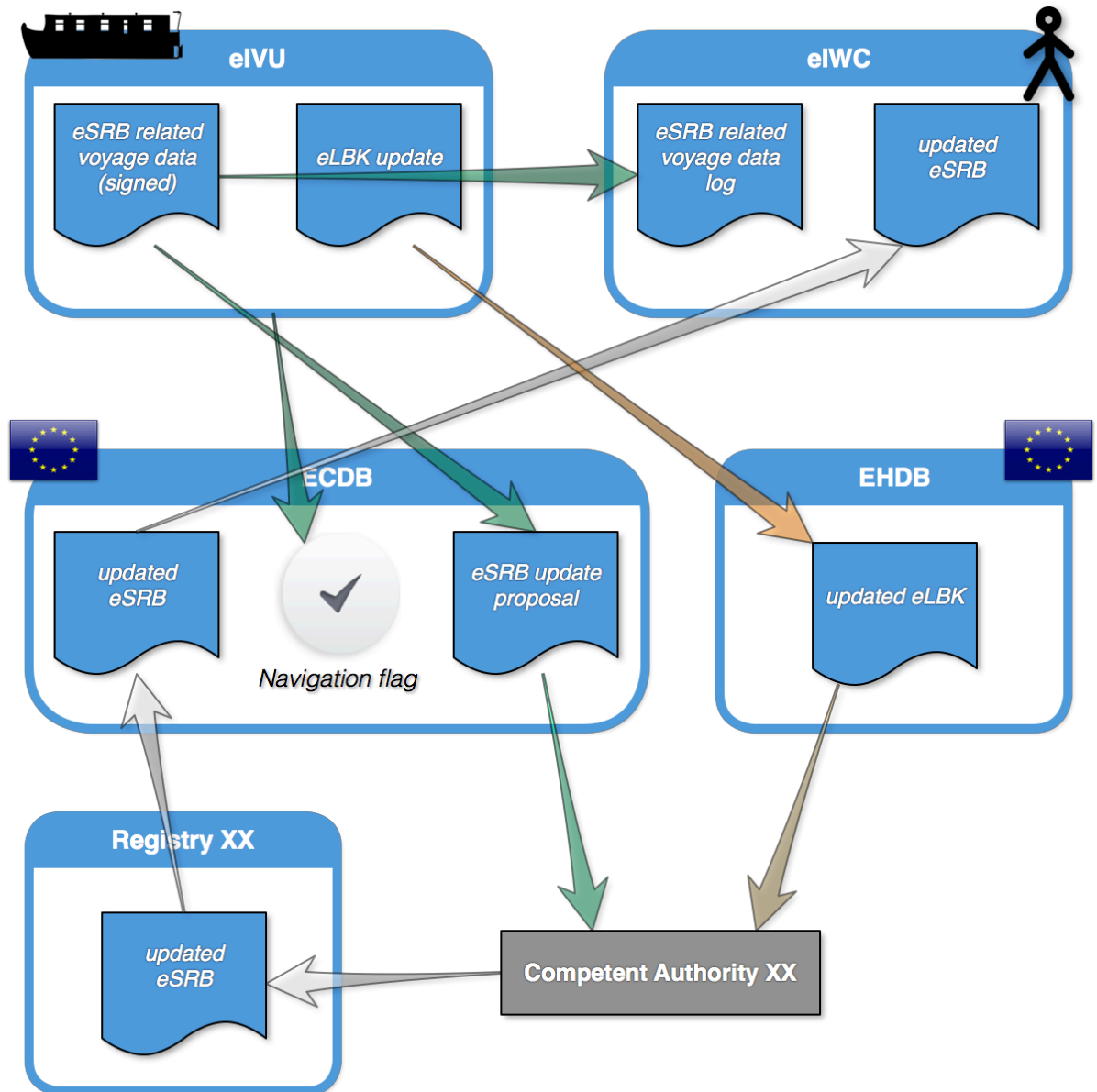


Figure 11: Information flow into and from the ECDB in UC1: eSRB validating authority checks congruence of eSRB update proposal and eLBK entries prior to proceeding with the formal eSRB update; green arrows are related to the eSRB updates, triggered at the crewmember’s disembarkation or the voyage end (whatever happens first); brown arrows are related to the eLBK update, triggered at the voyage end.

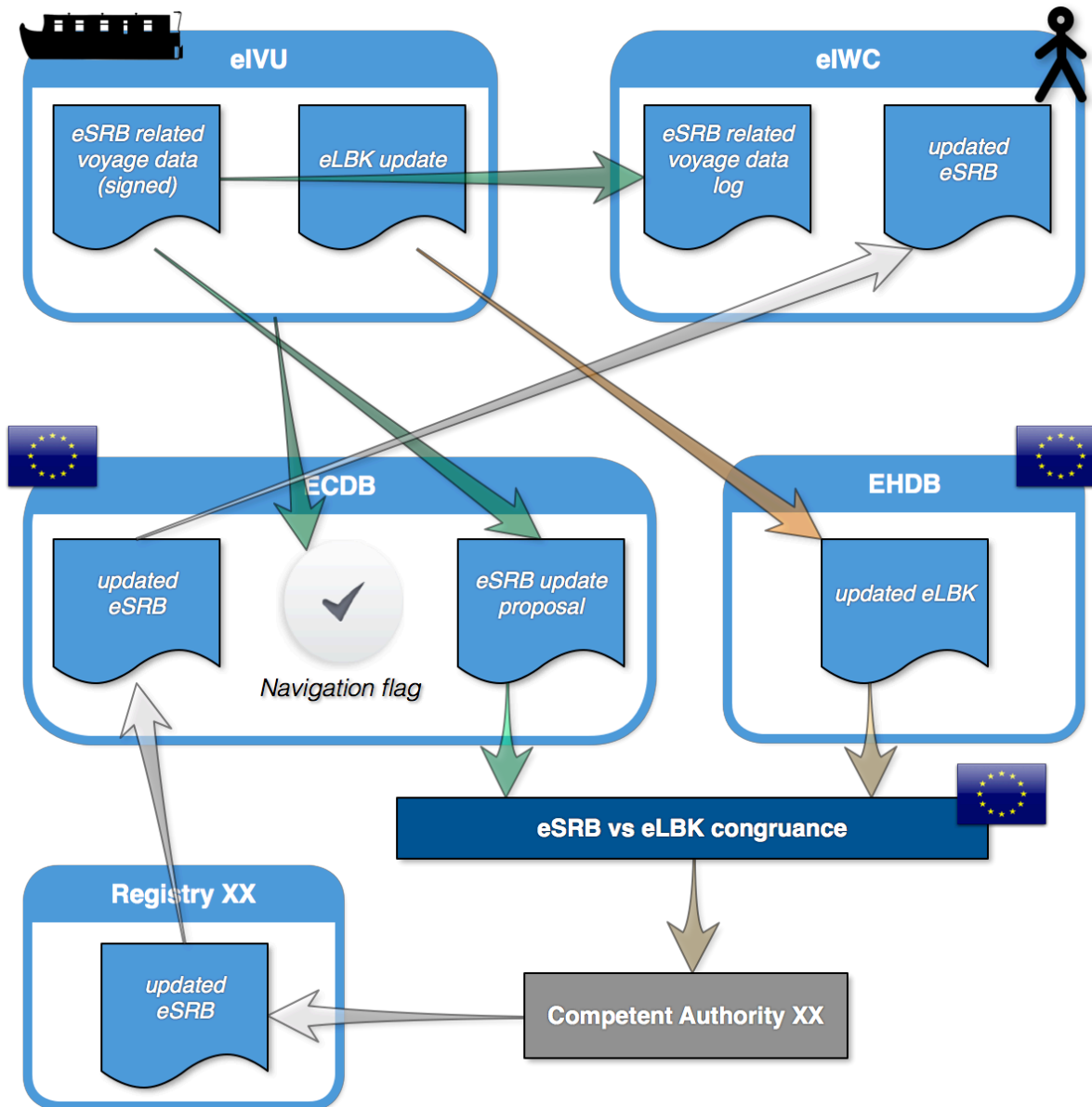


Figure 12: Alternative information flow into and from the ECDB in UC1: Congruence of eSRB update proposal and eLBK entries is done automatically at ECDB/EHDB level; the result (positive or negative) is forwarded to the eSRB issuing authority that proceeds (or not) with the formal eSRB update; green arrows are related to the eSRB updates, triggered at the crewmember’s disembarkation or the voyage end (whatever happens first); brown arrows are related to the eLBK update, triggered at the voyage end.

The procedures / steps for the eLBK dynamic update are described in the following paragraphs. For clarity purposes, the procedures that are not directly related to the ECDB or EHDB databases are included. In fact, the eIVU interacts with EHDB only at the last stage (3rd bullet in paragraph 7 below, underlined), after the boatmaster closes the voyage file.

At voyage start, the boatmaster:

1. Initializes the *voyage* within the vessel unit (eIVU). A *voyage file* is opened within the eIVU file system, where all subsequent information concerning the voyage (vessel and crew related) are stored until the completion of the voyage.

2. Sets-up the crewing planning according to the relevant manning requirements. The system acquires and associates to the voyage automatically the crew card (eIWC) data⁴² of any crew already present on-board.
3. The vessel's eLBK relevant data (i.e. planned voyage, crewing etc.) are automatically updated in the *voyage file* in the eIVU.

During the voyage:

4. The boatmaster indicates the intermediate stops or other events to be logged to the *voyage file* in the eIVU according the current regulations. Location information, based on GPS positional data and inland ECDIS information, is logged automatically by the eIVU to the *voyage file*.

At voyage end:

5. The eIVU, finalises the eLBK voyage data (i.e. the entries related to the concluded voyage that should be logged to the vessel's eLBK.
6. The *boatmaster* checks that the eLBK entries, as compiled automatically by the eIVU, are correct. In case of discrepancies, the boatmaster is able to correct by manually editing and/or overwriting some fields. However, each and every manual intervention is logged at the eIVU.
7. The *boatmaster* electronically signs the voyage file and closes the voyage, triggering the following actions:
 - The eLBK part concerning the particular voyage is finalised: the relative data are permanently stored in the eLBK (within the eIVU) and are no more available for editing.
 - The eIVU *voyage file* is closed and can no more be edited, deleted or changed, apart from specific parts concerning a-posteriori notes or memos.
 - The finalized eLBK data concerning the particular voyage is pushed to the EHDB, updating the EHDB vessel eLBK file.

Finally, the relevant vessel eLBK entries of the MS national registries are updated periodically or after notification from the EHDB.

The eLBK entries in the EHDB can serve for cross checking automatically the crews' eSRB⁴³ as depicted schematically in Figure 11 and, in alternative, Figure 12 above.

Note that the electronic updates of the eSRB regard the voyages performed in European connected waterways. Due to the possibilities of exemptions under the current regulatory framework, the (e)SRB of a crewmember on service on a vessel navigating in a non-connected waterway or on a vessel not yet equipped with an eIVU will have to be updated by the issuing or other validating authority manually, on demand of the interested crewmember. In such cases, crewmembers will have to proceed as follows:

- Maintain, in parallel to their eSRB, a paper SRB, on which the skipper manually records their voyages; this SRB is periodically brought to a competent authority which proceeds to the update of the eSRB.
- Get signed printouts of their voyage records; introduce a request in the *Crew.Request.CRequest* in Table 8, as per the UC3, and send the signed printouts, along with any other document required, to the

⁴² The data related to the crew on-board (including navigation, working or resting time) exists independently of the voyage. Crew navigation time does not necessarily coincide with the voyage time.

⁴³ Note that eSRB and eLBK updates are not necessarily synchronous; eSRB can be updated during a crewmember's disembarkation while the eLBK is updated only at the end of a voyage.

competent/validating authority by mail. Competent authority personnel control the documents and update the eSRB as required.

In order to minimize the competent authorities workload in introducing in the electronic system the above data, competent authorities could use Table 6 to update just the *Crew.Authority.SRBNav* field, adding the additional *net navigation days* in the non-connected waterways and noting any passages from specific risk stretches on the *Crew.Authority.(SRBSSR(i) or SRBNoRIS(i))* data fields.

8.2 UC2: eIWC issuance

This use-case includes all necessary steps/procedures that a competent authority must take to register a crewmember not already registered in ECDB. This will imply the assignment of a unique crew identification number (CID), the issuance of an electronic Union Certificate of Qualifications (hereon referred as *eQualification*), an electronic SRB (eSRB) and an *eIWT crew card*, hereon referred as *electronic Inland Worker's Card (eIWC)*. The steps followed during this UC are described in the following paragraphs while the information flow between the *competent authority*, the *national registry* and the *ECDB* is depicted schematically in Figure 13 below.

1. The *crewmember* submits a request to a national *competent authority* for the issuance, update or renewal of a qualification certificate, furnishing all the necessary documents (or other proof) for his/her identity and requested qualification, including the SRB, where applicable.
2. The *competent authority*, checks at the *European Crew Database (ECDB)* for a possible previous entry according a *digital twins* search procedure.
3. Only if no such entry exists and on positive verification of the *request*, the *competent authority* initiates the procedure for the *eQualification* issuance (including the eSRB and eIWC) according its own rules and procedures. The competent authority:
 - a. Assigns to the crewmember a unique CID.
 - b. Opens an electronic crewmember's dossier, on which all eQualification data are registered. As a minimum, the electronic dossier should initially comprise the data-fields listed in Table 3, Table 4 and Table 5.
 - c. Issues, if relevant, the crewmember's eSRB and fills-in all data-fields from the paper SRB(s) as per Table 6.
 - d. Initiates the procedures for the issuance of the crewmember's electronic worker's card (eIWC).
 - e. Initializes the crewmember's Crew.Voyage and Crew,Inactive classes of data-fields, as per Table 7 and, so that these are available for dynamic updates and synchronisation as foreseen by the eIWT operational scenario.
4. The *competent authority* uploads the eQualification and eSRB data (i.e. the values of all data-fields in Table 3 to Table 7) to the European Crew Qualification Database (ECDB), maintained by the EC.
5. The *competent authority* deactivates⁴⁴ the original paper Qualification Certificate(s) and SRB and provides the *crew* with certified printouts of his/hers eQualification and eSRB that serve as provisory documents until the completion of step 6 below. It provides the crew with a token through which he/she can access electronically all his/her personal information at the *European Crew Database (ECDB)*. From that point on, the official, legally

⁴⁴ Stamps, perforates or uses any other method to clearly and unambiguously mark the non-validity of the paper documents because crew might be reluctant to handle/destroy them as they represent a piece of their personal history.

binding documents are those in digital form (eQualification and eSRB) in the archives of the issuing *competent authority*.

6. The *competent authority* initiates the necessary procedures for the issuance of the electronic Inland Worker's Card (eIWC), directly or through a duly delegated issuing company. Once issued and handed to the requesting crewmember, eIWC will serve as a personal certified electronic copy of the crewmember's *eQualification* and *eSRB*.

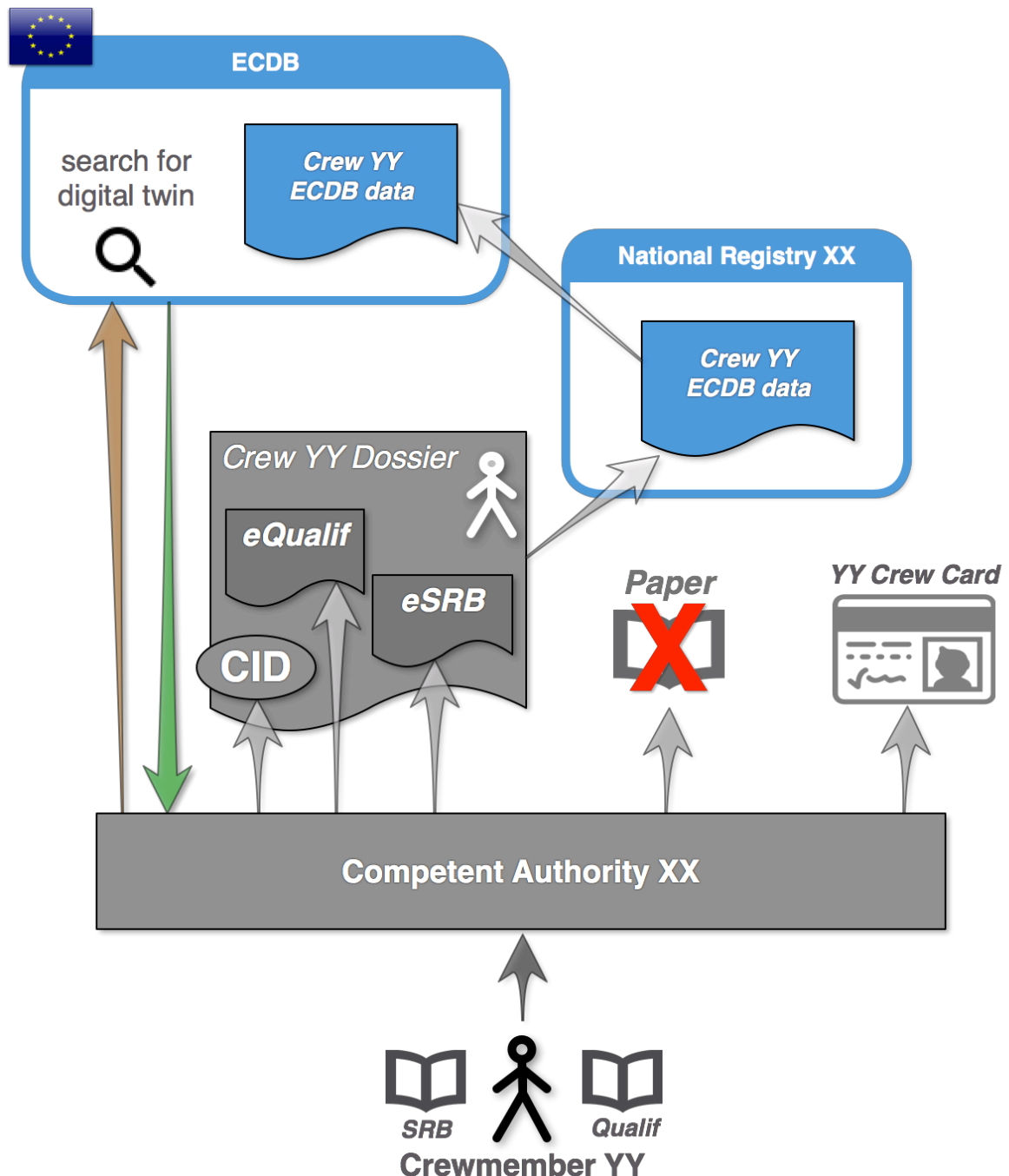


Figure 13: Information flow into and from the ECDB in UC2: competent authority XX checks (orange arrow) if applicant crewmember YY is already in ECDB; After mandatory clearance from ECDB (green arrow), it proceeds to assign a *unique crew number* (CID) and establishes his/hers dossier in their own digital archives and forwards the ECDB relevant data to its *national registry* and the ECDB; it deactivates the paper documents (union certificate and SRB) and proceeds to the issuing of the *crewmember's electronic card* (eIWC)

The importance of the ID check and the 'digital twin' search during UC2 is fundamental since the whole system is based on a strict one-to-one correspondence between each crewmember and his/her CID. This one-to-one correspondence is ensured in UC2 by:

- The proper ID checks by the *issuing competent authority* and
- A mandatory digital twin search in ECDB.

In fact, it is only after the acknowledgement of a negative search for digital twin (green arrow on Figure 13 above) that the issuing competent authority can proceed with the attribution of a CID and the consequent introduction of a new crewmember in the system.

The digital twin search (DTS) initiates by sending a request to ERDB including all crewmember's data required in the *Crew.Identity* class, as per Table 3. In the *Crew.Identity.CID* field, a special ASCII string is sent, comprised by the prefix 'DTS' followed by the identifier of the issuing authority (as per the variable *Crew.Qualification.Authority(i)* in Table 5). ECDB automatically performs a query, the exact modalities which will be defined at the ECDB design phase.

If the query is negative, the green light is given from ECDB to the issuing competent authority by returning the crewmember's *Crew.Identity* data with a 'GREEN' instead of the 'DTS' prefix in the *Crew.Identity.CID* field.

If the query is positive, ECDB returns the crewmember's *Crew.Identity* data with a 'RED' instead of the 'DTS' prefix in the *Crew.Identity.CID* field, appending the CID(s) of the identified digital twin(s). The issuing *competent authority* can thus proceed to more elaborate controls, eventually contacting directly the issuing authority of the identified digital twin(s). The modalities and procedures for these controls, the eventual corrective actions and the formalities required to turn the RED light into GREEN will be defined during the ECDB design phase.

8.3 UC3: eQualification update

This use-case includes all necessary steps/procedures that a competent authority must take to register in ECDB the update of an *eQualification* of a crewmember already registered⁴⁵ in ECDB. By *eQualification update* we understand any change or addition to data in Table 5. According the rationale of the eQualification section of ECDB, any renewal, upgrade or addition of a specific authorization is treated as a new qualification, which may be active in parallel to other qualifications⁴⁶. It includes the following steps:

1. The crewmember checks his dossier in ECDB, if he has the necessary requisites (i.e. navigation time or journeys on stretches with specific risk) for an *eQualification* upgrade or add a *specific authorisation*.
2. If the *crewmember* thinks that he/she fulfils the necessary requirements, including any training and/or exams, then he/she submits a request for the upgrade or renewal of his/hers eQualification, through the ECDB, using the *Crew.Authority.(Request, CReqDate* and *CReqNote)* variables, Table 6. The

⁴⁵ Hence having a unique European crew number (CID)

⁴⁶ For example, the renewal of a certain qualification due to expire is considered as a new qualification even if the only difference can be the new expiration date; the new qualification will become active right away while the old one will become inactive at its natural expiration date. Similarly, a qualification level upgrade will imply a new active qualification (i.e. boatmaster), the old one (i.e. helmsman) becoming inactive at its natural expiration date. It goes without saying that a boatmaster can function also as a helmsman even after the expiration of his/her old qualification.

- crewmember's request is passed automatically to his/her competent authority⁴⁷.
3. In alternative to step 2 above, a crewmember, if he/she has a valid reason⁴⁸, can submit the request for his/her eQualification update to any other *competent authority*⁴⁹, using the *Crew.Authority.(Request, CReqDate, CReqNote and CReqAuth)* variables, Table 6, the value of the last variable (*CReqAuth*) indicating the *competent authority* to which the request is addressed to. The motivation for the choice is written to the *CReqNote* field. The crewmember's national *competent authority* is automatically notified on the request.
 4. The recipient *competent authority* initiates the procedure for the *eQualification* update, as per the crewmember's request. As applicable and according its own rules and procedures, the competent authority:
 - a. Checks the consistency of the crewmember's request with his/her electronic file (eQualification, eSRB) in its own archives or, in case of a request under step 3 above, in ECDB.
 - b. Performs eventual cross checks with vessel eLBK data.
 - c. Asks the crewmember to furnish eventual training or medical fitness certificates. The *Crew.Authority.CReqNote* field, in Table 6, can be used for exchanging messages with the crewmember.
 - d. Upon positive completion of steps a-c above, the recipient *competent authority* proceeds by updating the electronic crewmember's dossier, in particular his/her *eQualification* and, if applicable, his/her eSRB. In case of a request under step 3 above, the *competent authority* can, according its own rules and procedures, open a dossier for the particular crewmember at its own archives or proceed with step 5 below.
 - e. Having accepted the crewmember's request, the recipient *competent authority* resets the ECDB variables *Crew.Authority.(Request, CReqDate, CReqNote and CReqAuth)* to NULL.
 5. The updated *eQualification* is pushed by the *competent authority* to the national registry and, consequently, the ECDB. In the case of a request under step 3 above, the recipient *competent authority*, updates directly the crewmember's ECDB files. The crewmember's *competent authority*⁵⁰, having being automatically notified about the request procedure, updates from ECDB its national registry and its own archives.
 6. The *eQualification* is updated also in the crewmember's *crew card* upon its first synchronisation with ECDB.

⁴⁷ Usually, the competent authority at which the crewmember was initially registered to the electronic system and, consequently, the electronic dossier with his/her eQualification and eSRB resides.

⁴⁸ If, for example, he/she has to submit paper documents or interact physically with the authority or he/she have passed exams at a certain country.

⁴⁹ That is part of the ERDMS list of competent authorities as per section 6.8, paragraph 2.

⁵⁰ The competent authority that has introduced the crewmember in ECDB and, consequently, issued the crewmember's CID.

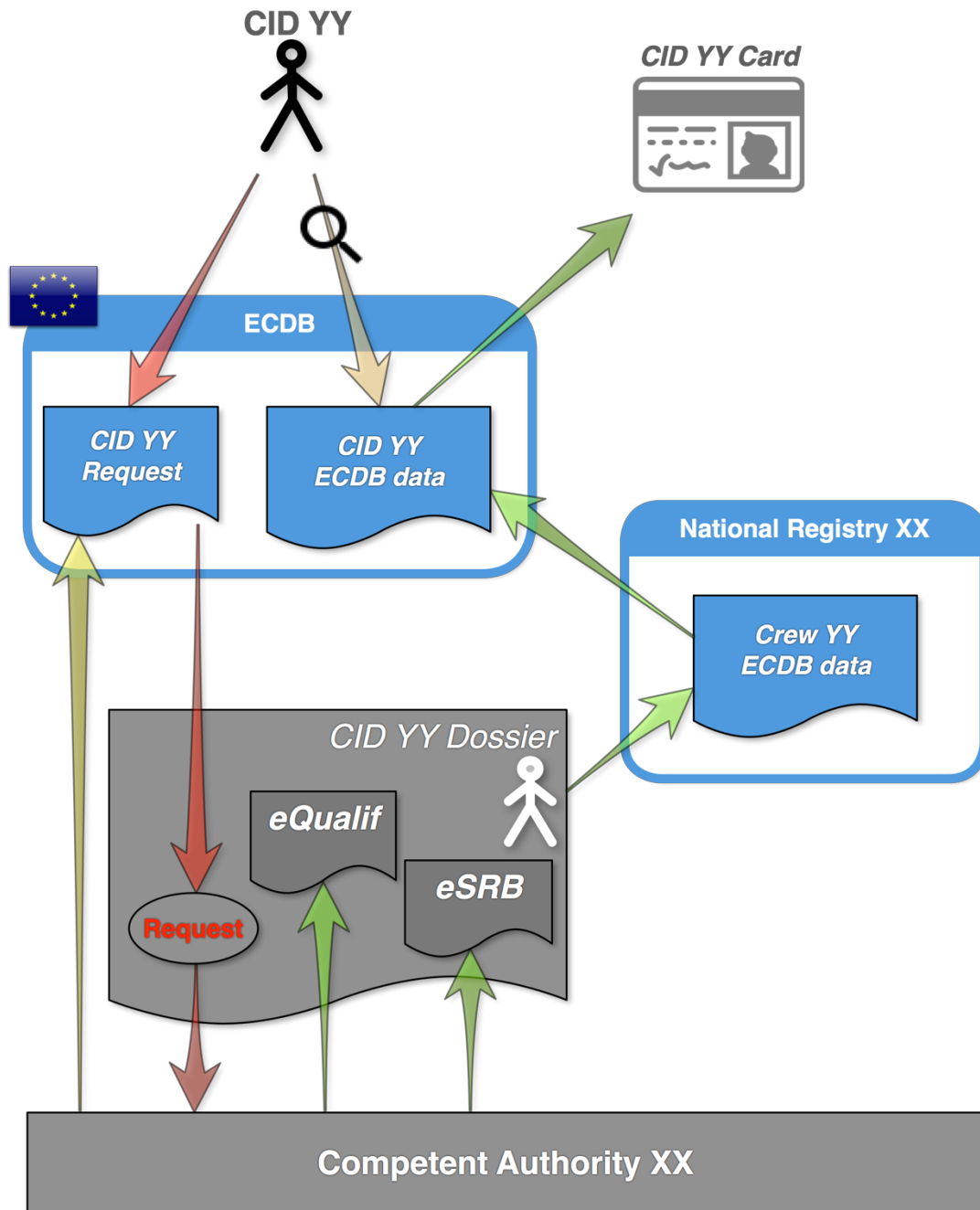


Figure 14: Information flow into and from the ECDB in UC3: crewmember with CID YY requests, through ECDB, the update of his qualification certificate (red arrows); competent authority XX controls the crew request and, if OK, proceeds with the update of his/hers eQualification and/or eSRB in the crewmember’s dossier (green arrows); it then forwards the ECDB relevant data to its *national registry* and the ECDB (green arrows) and resets the *request* fields in ECDB (yellow arrow); updated eQualification and/or eSRB are pushed in the crewmember’s card automatically upon the first synchronisation (green arrows)

The information flow to and from the ECDB during UC3 is outlined schematically in Figure 14 above. In case of a request to a *competent authority* other than his/her own (request under step 3 above), Figure 15 applies.

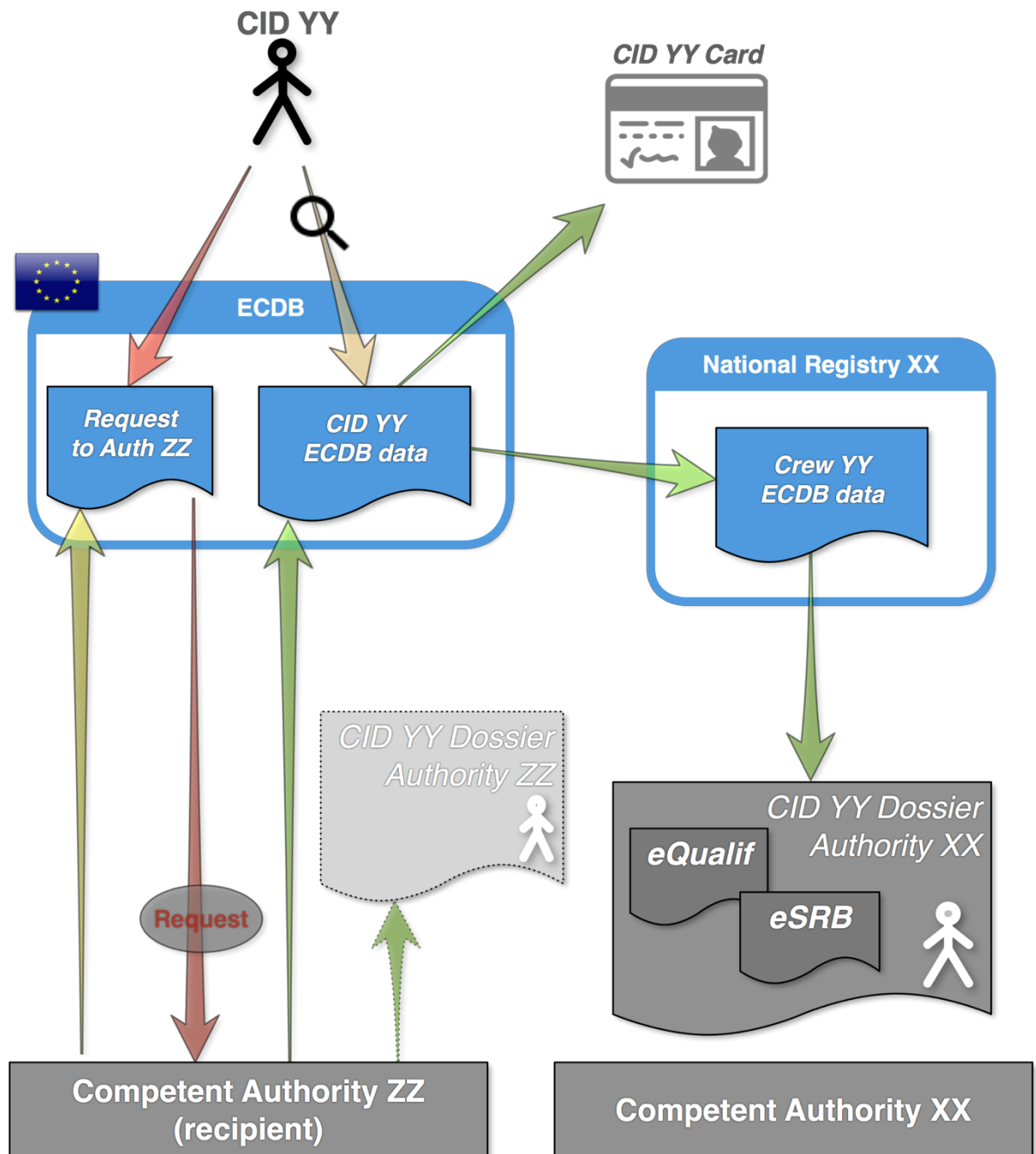


Figure 15: Information flow into and from the ECDB in UC3: crewmember with CID YY, registered in authority XX, requests, through ECDB, the update of his qualification certificate (red arrows) by competent authority ZZ; the later controls the request and, if OK, proceeds with the update of his/hers eQualification and/or eSRB in ECDB, optionally opening a dossier at its own archives (dotted green arrow); it resets the *request* fields in ECDB (yellow arrow); the updated crewmember's YY ECDB data is then pushed to the *national registry* XX and the authority XX archives (green arrows); updated eQualification and/or eSRB are also pushed in the crewmember's card automatically upon the first synchronisation (green arrows)

8.4 UC4: eQualification suspension or withdrawal

This use-case includes all necessary steps/procedures that a competent authority must take to register in ECDB the suspension or withdrawal of the *eQualification*

of a crewmember registered⁵¹ in ECDB. As a consequence of an *eQualification suspension* or *withdrawal* the crewmember can temporarily (suspension) or permanently (withdrawal) be prohibited to exercise his function aboard. The initiator of an eQualification suspension/withdrawal procedure is, usually, an enforcing authority (police, water police etc.). It includes the following steps:

1. The enforcing body/authority submits an enforcing request to the crewmember's *competent authority* for the suspension or withdrawal of the relevant crewmember certificate(s). This is done through the ECDB, by filling as appropriate the *Crew.Authority.(ERequest, EReqDate, EgReqNote and EReqBody)* fields in Table 6. The *Crew.Authority.EReqNote* field is used for inserting a free text on any additional information regarding the infraction, the enforcing officer's contact details etc.
2. The enforcing body/authority changes the ECDB status of the concerned crewmember by introducing in the field *Crew.Status.Suspended* the appropriate suspension end date⁵².
3. The request of the enforcing authority is passed automatically to the crewmember's *competent authority*.
4. The *competent authority* initiates the procedure for checking the *enforcing request* as applicable and according to its own rules and procedures, eventually contacting directly the requesting enforcing authority and/or the concerned crewmember.
 - a. Upon acceptance of the *enforcing request*, the competent authority proceeds to the update of the electronic crewmember's dossier. Otherwise the procedure jumps to step d.
 - b. It updates, through its national registry, the relevant ECDB fields, i.e. the *Crew.Qualification.(SuspStart, SuspEnd, WithdrawDate and WithdrawNote)* fields in Table 5.
 - c. It updates the crewmember status in ECDB by filling-in the *Crew.Status.(Suspended or Withdrawn)* fields in Table 10 as appropriate. In case of suspension, the suspension end date is introduced in the *Crew.Status.Suspended* field. This field is automatically switched to 'NO' after the suspension end date.
 - d. Having accepted the enforcing authority's request, the competent authority proceeds to resetting the relevant ECDB variables: *Crew.Authority.(ERequest, EReqDate, EReqNote and EReqBody)* to NULL.
5. The *Crew.Qualification.(SuspStart, SuspEnd and WithdrawDate)* data fields are updated also in the crewmember's *crew card* upon its first synchronisation with ECDB.

The information flow to and from the ECDB during UC4 is outlined schematically in Figure 16 below.

⁵¹ Hence having a unique European crew number (CID)

⁵² Maximum allowable suspension days, after which the variable *Crew.Status.Suspended* is automatically reset to NO if, in the meantime, it has not been re-set to another date by the concerned *competent authority*.

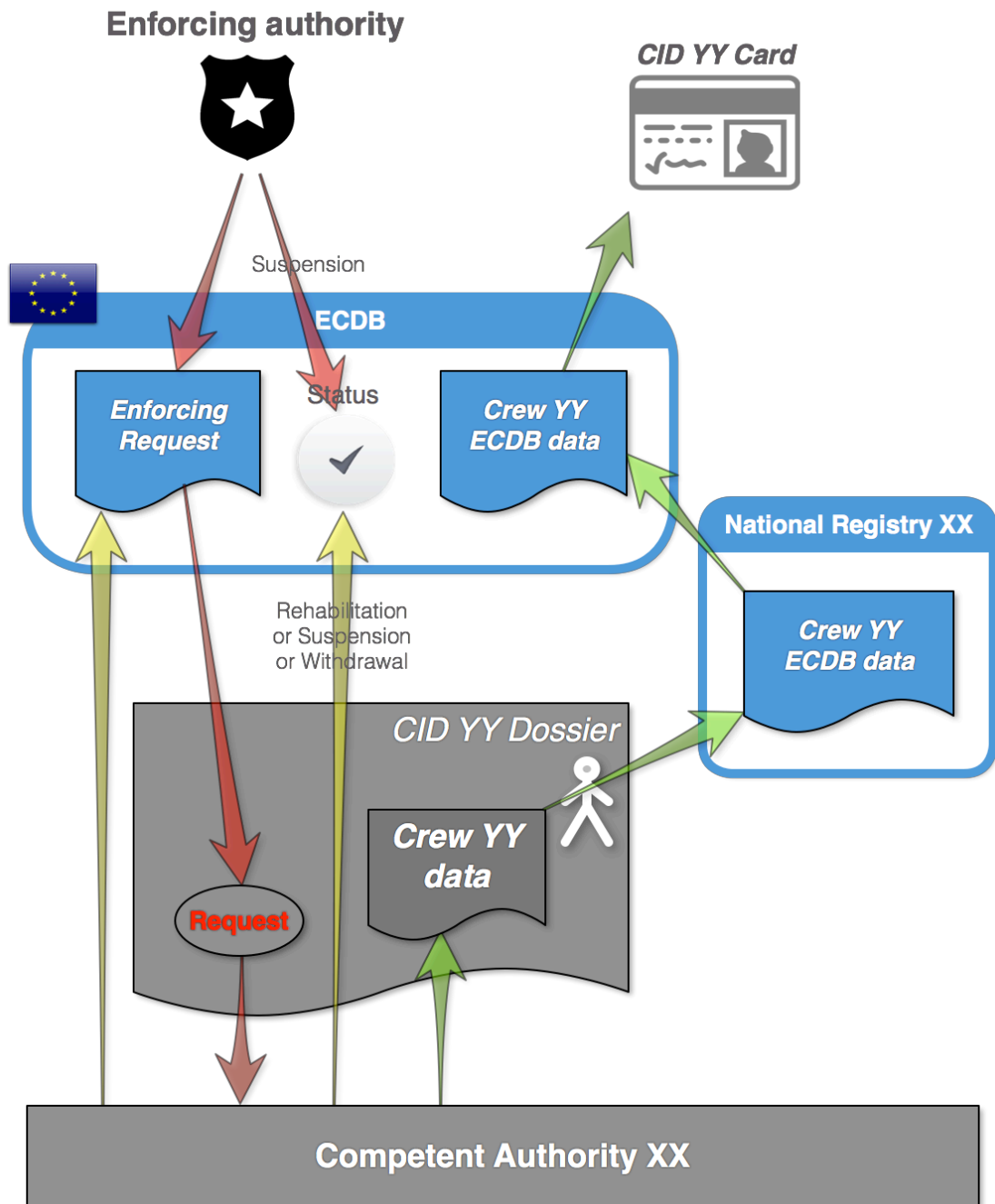


Figure 16: Information flow into and from the ECDB in UC4: an enforcing authority makes, through ECDB, a suspension or withdrawal request and changes the crewmember YY status by introducing a suspension *end date* (red arrows); competent authority XX controls the crew request and, if OK, proceeds with the update of the crewmember’s dossier and forwards the ECDB relevant data to its *national registry* and the ECDB (green arrows); it sets the relevant *status* fields in ECDB as appropriate and resets the enforcing request fields (yellow arrows); updated crew data are pushed in the crewmember’s card automatically upon the first synchronisation (green arrows)

8.5 UC5: Queries by authorities

Competent authorities, in addition to the interactions defined in sections 8.1 to 8.4 above, can access the full ECDB for control / verification purposes. This is a READ-

ONLY access of all the data concerning all crewmembers, irrespective of their status or of the competent authority at which they are registered.

Enforcing authorities, can only access ECDB in the frame of their inspection/enforcing duties. In addition to the interactions described in 8.4 above, when on board of a vessel to be inspected, they are granted, by inserting their card in the eIVU, a READ-ONLY access to:

- All data concerning the crew and the vessel stored locally in the eIVU, like the voyage file, the eLBK, the eSRB and eQualification of each crewmember, the vessel's certificates etc.
- All ECDB data concerning the current crewmembers of a vessel under inspection or those who have been part of the vessel's crew during its current voyage.
- They are also granted READ-ONLY access to the EHDB data of the vessel under inspection.

Enforcing authorities that need to perform a query for purpose other than an inspection must access ECDB through their respective national authorities.

8.6 UC6: Queries for statistics

Competent authorities can, anyhow, access all data in ECDB in READ-ONLY mode.

International organizations and other bodies (i.e. recognised professional organisations, IWT social partners, authorised private bodies etc.) can access only anonymised⁵³ information in READ-ONLY mode.

ECDB should provide the possibility, through a web-based interface, to build complex queries on the number of ECDB entries that respect certain conditions. Typical such queries are:

- Number of crewmembers registered in ECDB
- Number of crewmembers with a particular active qualification or special ability
- Number of crewmembers actually in navigation
- Number of crewmembers in navigation per vessel type
- Number of crewmembers having navigated through a specific risk stretch during a certain period of time
- Number of eQualifications emitted per competent authority over a certain period of time
- Number of eSRBs validated per validating authority over a certain period of time
-

8.7 UC7: Queries by crewmembers

Crewmembers have a READ-ONLY access exclusively to their *own data* i.e. all data classes (as per Table 1) indexed at their CID.

⁵³ Anonymized data in respect to both the crewmembers' and the vessels' identities.

9 Use cases during the initial phase

During the initial phase of ECDB operation i.e. when no eIWT system and no upgraded EHDB are in place ECDB will have to fulfil just the requirements of Directive 2017/2397/EU. The EC databases no longer serve as unique access points for crew or vessels. In fact, the ECDB will not be accessible but only to the *Competent Authorities*, only in READ-ONLY, all other interaction (qualification data and SRB and LBK updates) being done exclusively through the *National Registries*. Figure 10 thus reduces to Figure 17 below.

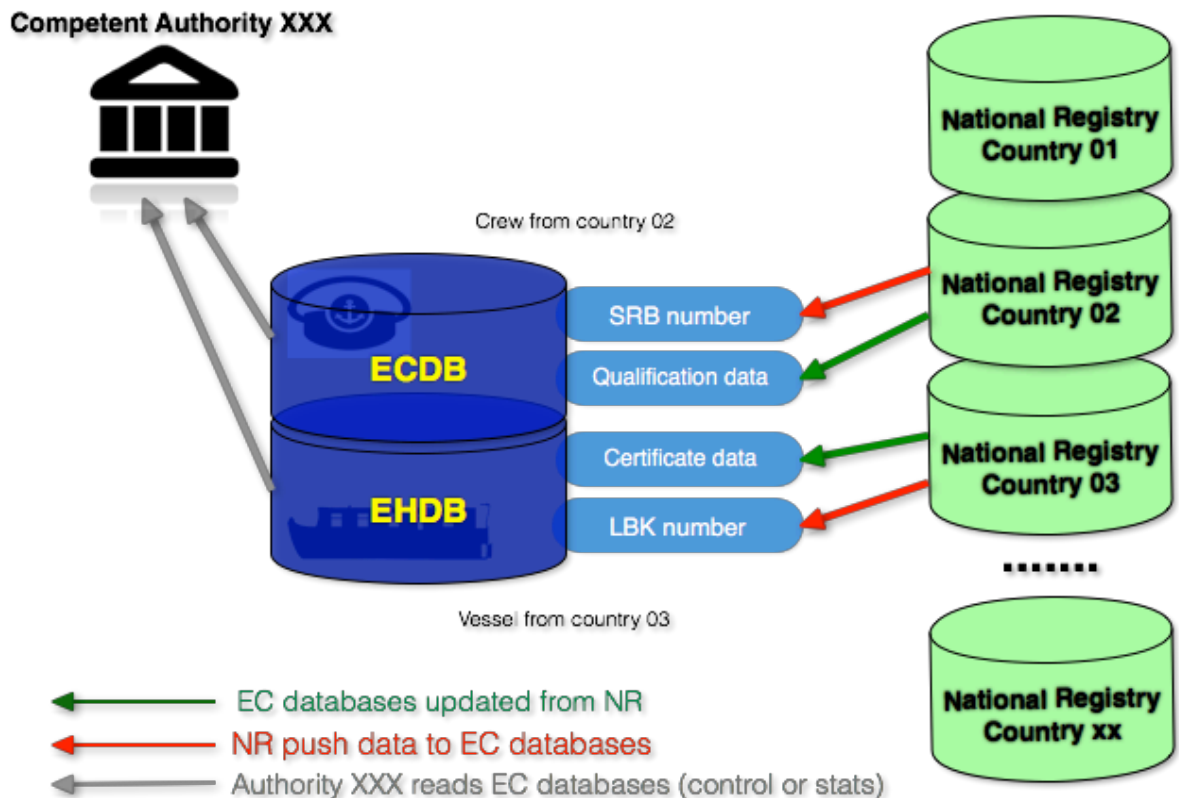


Figure 17: Interaction between EC databases, National Registries and Competent Authorities during the initial ECDB implementation

The *Use Cases (UC)* that cover this reduced spectrum of operations are:

1. SRB & LBK update
2. Initial crew registration
3. Certificate issuance, renewal or upgrade
4. Certificate suspension or withdrawal
5. Queries by competent and enforcing authorities
6. Queries for statistics
7. Queries by crewmembers

They are examined in detail in the subsections that follow.

9.1 IUC1: SRB & LBK update

During the initial phase according Directive 2017/2397/EU requirements, individual crewmembers⁵⁴ or vessel owners (or operators or skippers), upon filling-up or losing their paper SRB or LBK should ask a competent authority (or inspection

⁵⁴ Already registered in ECDB with a proper CID number; otherwise section 9.2 applies

body) for a new SRB or LBK booklet. The recipient authority (XX) assigns a new incremental SRB or LBK number and handles the booklet to the crewmember or vessel owner.

It then pushes the SRB (or LBK) serial number to the ECDB and through which the registry and the archives of the issuing competent authority (YY) are updated. The flow is illustrated schematically with the green arrows in Figure 18 below. In case the recipient and the issuing authorities coincide, then the flow is further simplified as per the red arrows in Figure 18.

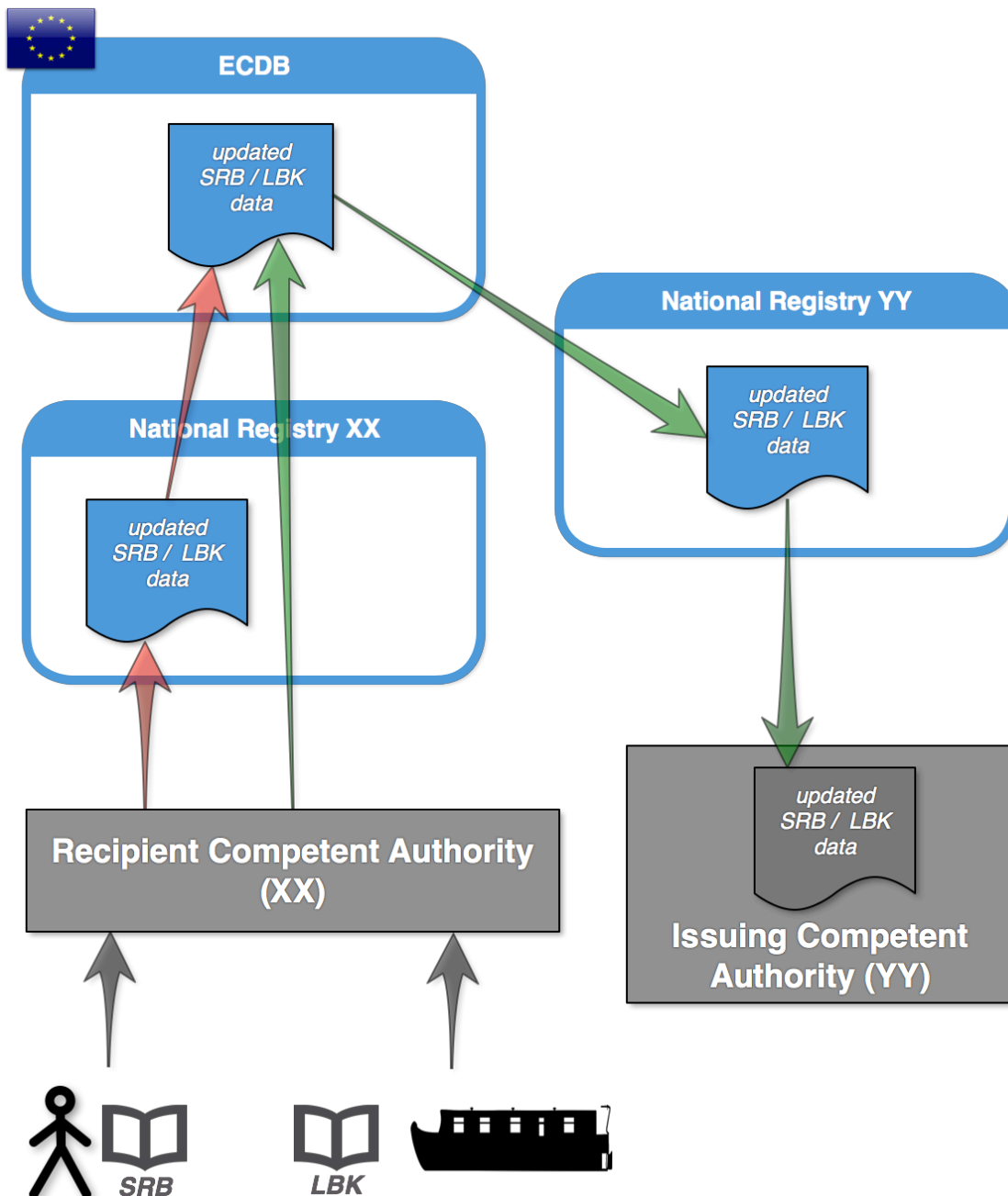


Figure 18: Information flow into and from the ECDB in IUC1 during the initial phase, when eIWT not yet implemented: crewmembers and barge operators bring their paper SRBs and LBKs to a recipient competent authority (XX) that, successively, updates the ECDB and EHDB fields and the issuing authority archives; red arrows are applicable in case the recipient authority is the issuing one (XX=YY); otherwise the green arrows apply.

For the SRB, the concerned variables are the last 3 fields of Table 6, that is:

1. Crew.Authority.LastSRBNo: active SRB incremental number
2. Crew.Authority.LastSRBAuth: active SRB issuing authority
3. Crew.Authority.LastSRBDate: active SRB date of issuance

Idem, for the LBK number registration uses similar fields in the *Vessel.Authority* class of data of the EHDB database (see Table 2).

9.2 IUC2: Initial crew registration

This use-case includes all necessary steps/procedures that a competent authority must take to register in ECDB a crewmember applying for the issuance, update or renewal of his/her *professional/union certificate* of qualifications but is not registered in ECDB. This will imply the assignment of a unique crew identification number (CID) and the registration of the Union Certificate of Qualifications (hereon referred as *Qualification*) data and the incremental crewmember's SRB number to the national registry and the ECDB. The steps followed during this UC are described in the following paragraphs while the information flow between the *competent authority*, the *national registry* and the *ECDB* is depicted schematically in Figure 19 below.

1. The *crewmember* submits a request to his/her national *competent authority* for the issuance, upgrade or renewal of a union qualification certificate, furnishing all the necessary documents (or other proof) for his/her identity and requested qualification, including the SRB, where applicable.
2. The *competent authority*, checks at the *European Crew Database (ECDB)* for an eventual previous entry according a *digital twins* search procedure.
3. If no such entry exists and on positive verification of the *request*, the *competent authority* initiates the procedure for the *Qualification* issuance, renewal or update, according its own rules and procedures. The competent authority:
 - a. Assigns to the crewmember a unique CID.
 - b. Opens an electronic crewmember's dossier, on which all *union qualification certificate* data are registered. However, in order to be ready for an eventual introduction the eIWT digital tools, the electronic dossier should comprise the data-fields listed in Table 3, Table 4, Table 5, Table 6 and Table 7, even if these fields will remain void until the introduction of such tools.
 - c. Issues the new/updated crewmember's union certificate of qualifications as requested.
4. The *competent authority* deactivates⁵⁵ the old qualification certificate(s) and SRB; it provides the *crew* with his/her new/updated Union Qualification Certificates and SRB.
5. The *competent authority* uploads the Qualification data (i.e. the values of the data-fields in Table 3, Table 4 and Table 5) as well as the active paper SRB incremental number, issuing authority and issuing date to the data-fields *LastSRBNo*, *LastSRBAuth* and *LastSRBDate* (see Table 6) of the European Crew Qualification Database (ECDB), maintained by the EC.

⁵⁵ Stamps, perforates or use other method to clearly and unambiguously mark the non-validity of the old documents because crew might be reluctant to handle/destroy them as they represent a piece of their personal history.

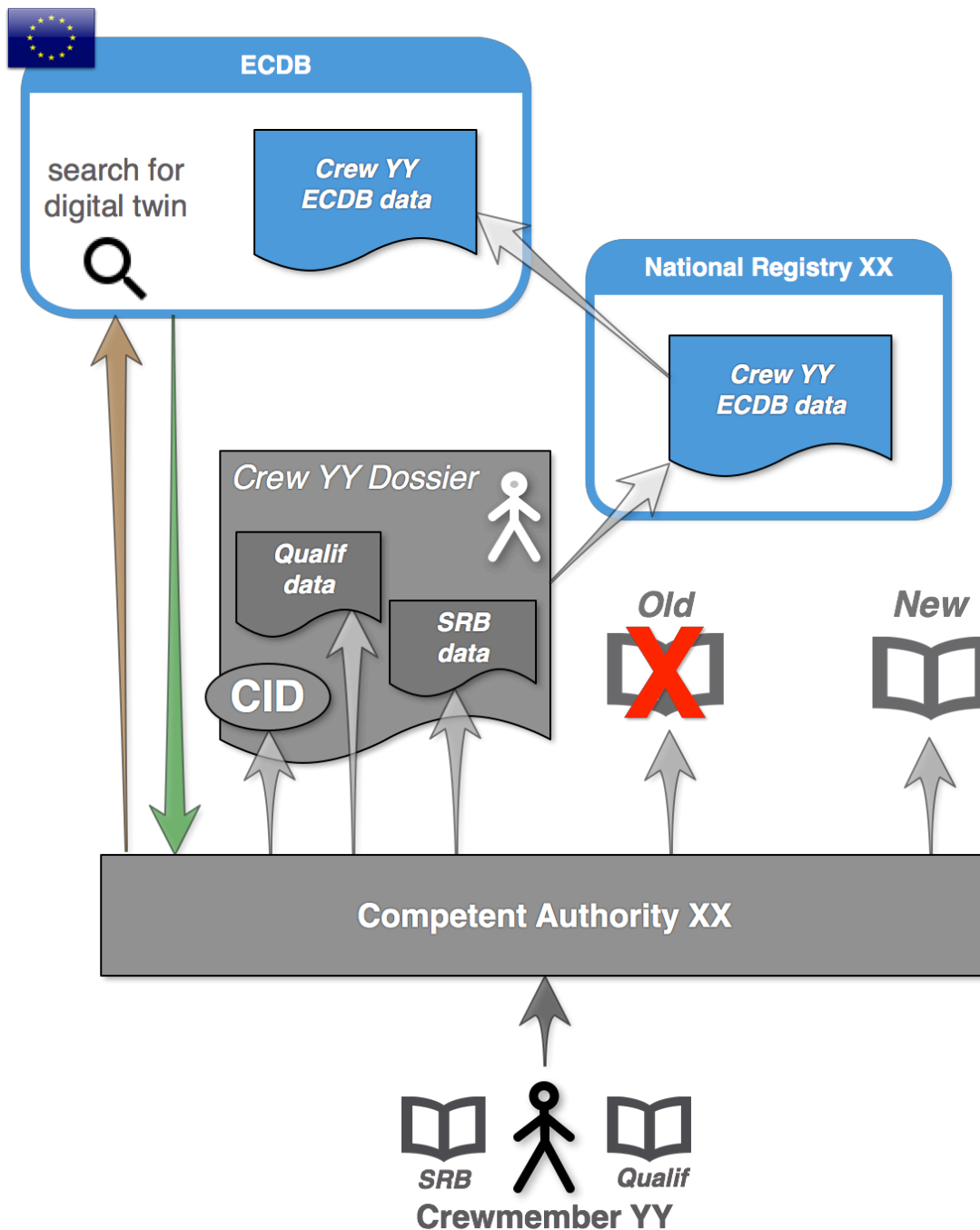


Figure 19: Information flow into and from the ECDB in IUC2: competent authority XX checks (orange arrow) if applicant crewmember YY is already in ECDB; After mandatory clearance from ECDB (green arrow), it proceeds to assign a *unique crew number* (CID) and establishes his/hers dossier in their own digital archives and forwards the ECDB relevant data to its *national registry* and the ECDB; it deactivates the old paper documents (union certificate and SRB) and issues the new/updated ones

The importance of the ID check and the 'digital twin' search during IUC2 is fundamental since the whole system is based on a strict one-to-one correspondence between each crewmember and his/her CID. This one-to-one correspondence is ensured in IUC2 by:

- The proper ID checks by the *issuing competent authority* and
- A mandatory digital twin search in ECDB.

In fact, it is only after the acknowledgement of a negative search for digital twin (green arrow on Figure 13 above) that the issuing competent authority can proceed with the attribution of a CID and the consequent introduction of a new crewmember in the system.

The digital twin search (DTS) initiates by sending a request to ERDB including all crewmember's data required in the *Crew.Identity* class, as per Table 3. In the *Crew.Identity.CID* field, a special ASCII string is sent, comprised by the prefix 'DTS' followed by the identifier of the issuing authority (as per the variable *Crew.Qualification.Authority(i)* in Table 5). ECDB automatically performs a query, the exact modalities which will be defined at the ECDB design phase.

If the query is negative, the green light is given from ECDB to the issuing competent authority by returning the crewmember's *Crew.Identity* data with a 'GREEN' instead of the 'DTS' prefix in the *Crew.Identity.CID* field.

If the query is positive, ECDB returns the crewmember's *Crew.Identity* data with a 'RED' instead of the 'DTS' prefix in the *Crew.Identity.CID* field, appending the CID(s) of the identified digital twin(s). The issuing *competent authority* can thus proceed to more elaborate controls, eventually contacting directly the issuing authority of the identified digital twin(s). The modalities and procedures for these controls, the eventual corrective actions and the formalities required to turn the RED light into GREEN will be defined during the ECDB design phase.

9.3 IUC3: Certificate update/renewal

This use-case includes all necessary steps/procedures that a competent authority must take to register in ECDB the update, upgrade or renewal of a *Union Certificate of Qualifications* for a crewmember already registered in ECDB and, consequently, has a unique crew identification number (CID). The steps followed during this UC are described in the following paragraphs while the information flow between the *competent authority*, the *national registry* and the *ECDB* is depicted schematically in Figure 20 below. In case of a request to a *competent authority* other than his/her own (request under step 2 below) then Figure 21 applies.

1. The *crewmember* physically submits a request to his/her national *competent authority* for the update or renewal of his/her union qualification certificate, furnishing all the necessary documents (or other proof) for his/her identity and requested qualification update, including the SRB and vessel LBK copies, as applicable.
2. In alternative to step 1 above, a *crewmember*, if he/she has a valid reason⁵⁶, can submit the request for his/her qualification certificate update or renewal to any other recognised⁵⁷ *competent authority*. The crewmember's *national competent authority* is automatically notified, through ECDB, by the *recipient authority* on the request using the *Crew.Authority.(Request, CReqDate and CReqNote)* variables, Table 6.
3. The *competent authority*, verifies the data furnished by the *crewmember* and checks their consistency with those at its archives and the *European Crew Database (ECDB)*. In case of step 2 above, the crewmember's *national competent authority*, having been notified on the request, can express an opinion by contacting directly the *recipient competent authority*.

⁵⁶ If, for example, he/she has to submit paper documents or interact physically with the authority or he/she have passed exams at a certain country.

⁵⁷ That is part of the ERDMS list of competent authorities as per section 6.8, paragraph 2.

4. On positive verification of the *request*, the *competent authority* initiates the procedure for the *Qualification* issuance, renewal or update, according its own rules and procedures. The competent authority:
 - a. Opens the electronic crewmember's dossier and checks his/her data *Identity* and *Fitness* data (Table 3 and Table 4), if necessary updating any of the fields.
 - b. Issues the updated crewmember's union certificate of qualifications as requested.
 - c. Updates the crewmember's qualification history as per the Table 5 and, when applicable, the active SRB incremental active paper SRB number, issuing authority and issuing date to the data-fields *LastSRBNo*, *LastSRBAuth* and *LastSRBDate* (Table 6).
5. The *competent authority* deactivates⁵⁸ the old union certificate(s) of qualification and, where applicable, the SRB; it provides the crew with his/her new/updated paper Union Qualification Certificates (and SRB).
6. The *competent authority* uploads the new qualification data (i.e. the values of the data-fields in Table 3, Table 4 and Table 5) as well as the active SRB incremental active paper SRB number, issuing authority and issuing date to the data-fields *LastSRBNo*, *LastSRBAuth* and *LastSRBDate* (see Table 6) of the European Crew Qualification Database (ECDB), maintained by the EC.
7. In case under step 2 above, the archives of the crewmember's *national authority* are updated through the ECDB; the fields *Crew.Authority*, (*Request*, *CReqDate* and *CReqNote*) are reset to NULL by the crewmember's *national authority*.

⁵⁸ Stamps, perforates or use other method to clearly and unambiguously mark the non-validity of the old documents because crew might be reluctant to handle/destroy them as they represent a piece of their personal history.

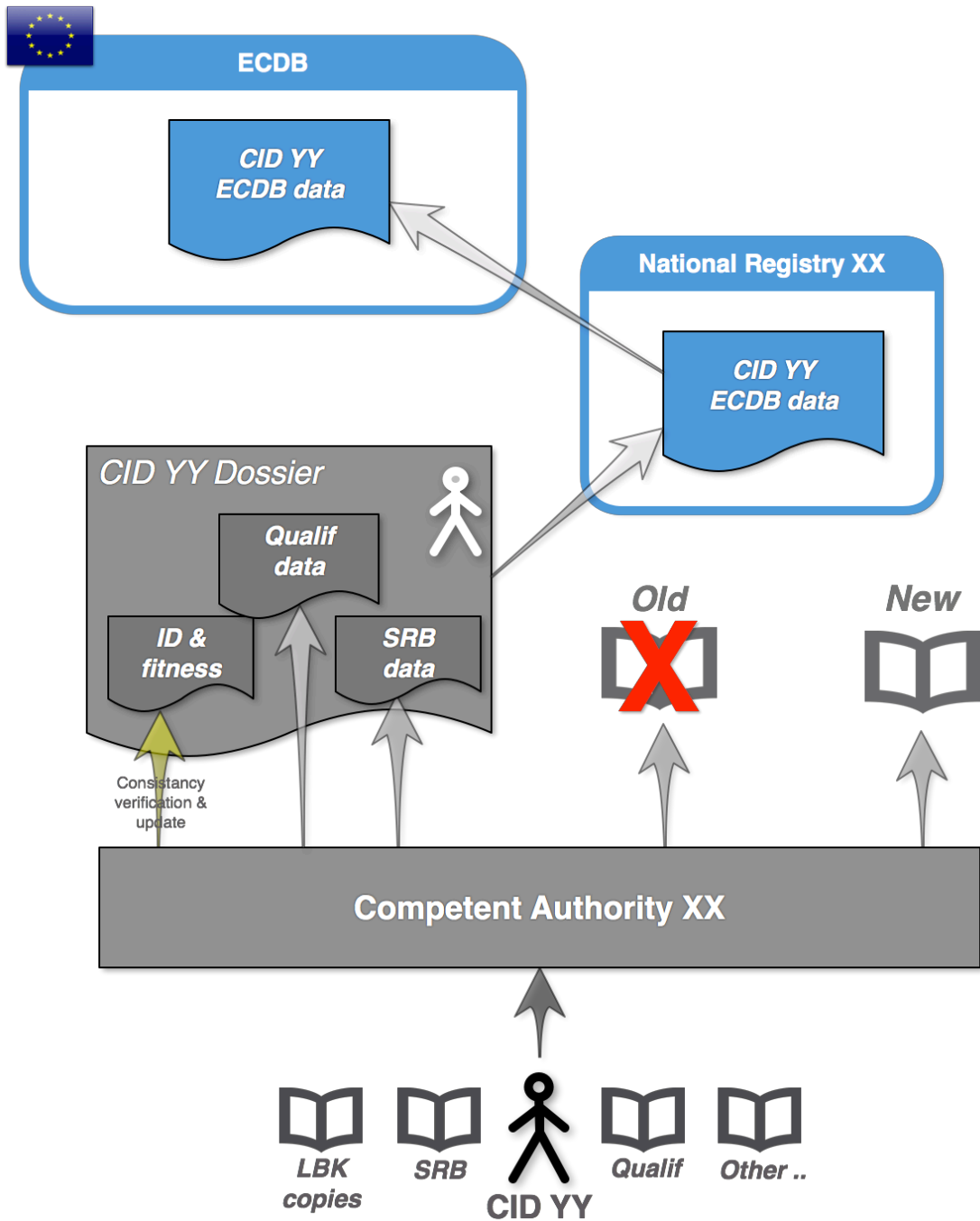


Figure 20: Information flow into and from the ECDB in IUC3: competent authority XX checks the data consistency of applicant with CID YY, updating any data if/as necessary; it then controls the crew application and, if OK, proceeds with the update of the qualification and SRB data at the crewmember’s dossier; it forwards the ECDB relevant data to its *national registry* and the ECDB; it deactivates the old paper documents (union certificate and SRB) and issues the new/updated ones

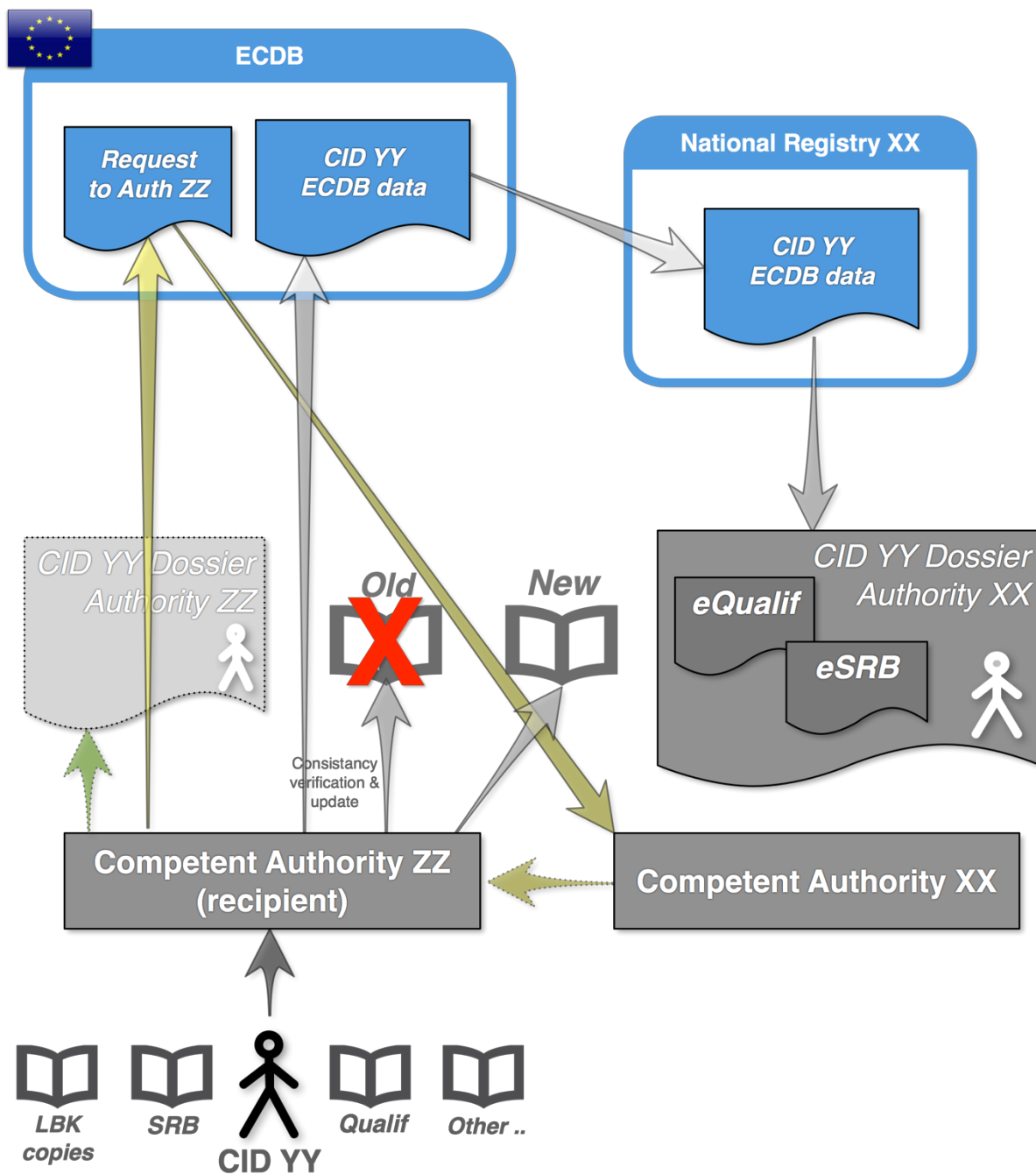


Figure 21: Information flow into and from the ECDB in IUC3: a *crewmember* with CID YY, registered in *competent authority XX*, requests the update/renewal of his certificates to *competent authority ZZ* (recipient). The later informs *competent authority XX* through ECDB, eventually receiving comments/opinion (dotted yellow arrows). *Recipient authority ZZ* checks the consistency of crew YY request and, if OK, proceeds with the update of the crew YY data in ECDB, optionally opening a crew YY dossier in its own archives; it deactivates the old paper documents (union certificate and SRB) and issues the new/updated ones; the updated ECDB data relevant to crew YY are forwarded to its *national registry* and the *national competent authority's XX* archives;

9.4 IUC4: Certificate suspension or withdrawal

This use-case includes all necessary steps/procedures that a competent authority must take to register in ECDB the suspension or withdrawal of the *Qualification certificate* (paper) of a crewmember registered⁵⁹ in ECDB. By *qualification suspension* or *withdrawal*, we understand the temporary (suspension) or permanent (withdrawal) prohibition to exercise his profession/function usually because of a serious offence/wrongdoing. The initiator of a suspension/withdrawal procedure is, usually, an enforcing authority (police, water police etc.). This use-case is very similar to UC4 (section 8.4) since the ECDB, already in the initial phase, foresees the electronic registering of all data that are written on the paper Union certificate, including the special abilities certificates. The main differences consist in:

- i. A manual procedure should be followed in order to handle (temporarily deactivate or invalidate) the concerned paper certificates and SRB.
- ii. There is no eIWC (electronic crew card) to push/synchronize the updated qualification data.

IUC4 includes the following steps:

1. The enforcing body/authority submits an enforcing request to the national *competent authority* for the suspension or withdrawal of the access to the profession of crewmember and consequent prohibition to exercise his/her functions. This is done through the ECDB, by filling as appropriate the *Crew.Authority.(ERequest, EReqDate, EgReqNote and EReqBody)* fields in Table 6. The *Crew.Authority.EReqNote* field is used for inserting a free text on any additional information regarding the infraction, the enforcing officer's contact details etc.
2. The enforcing body/authority changes the ECDB status of the concerned crewmember by introducing in the field *Crew.Status.Suspended* the appropriate suspension end date⁶⁰.
3. The request of the enforcing authority is passed automatically to the crewmember's *competent authority*.
4. The enforcing authority applies the standard procedures regarding the paper certificates and/or SRB of the concerned crewmember: it detains them and/or sends them to the issuing competent authority for further processing.
5. The *competent authority* initiates the procedure for checking the *enforcing request* as applicable and according its own rules and procedures, eventually contacting directly the requesting enforcing authority and/or the concerned crewmember.
 - a. Upon acceptance of the *enforcing request*, the competent authority proceeds to the update of the electronic crewmember's dossier. Otherwise the procedure jumps to step d.
 - b. It updates, through its national registry, the relevant ECDB fields, i.e. the *Crew.Qualification.(SuspStart, SuspEnd, WithdrawDate and WithdrawNote)* fields in Table 5.
 - c. It updates the crewmember status in ECDB by filling-in the fields *Crew.Status.(Suspended or Withdrawn)* in Table 10 as appropriate. In case of suspension, the suspension end date is introduced in the *Crew.Status.Suspended* field. This field is automatically switched to 'NO' after the suspension end date.

⁵⁹ Hence having a unique European crew number (CID)

⁶⁰ Maximum allowable suspension days, after which the variable *Crew.Status.Suspended* is automatically reset to NO if, in the meantime, it has not been re-set to another date by the concerned *competent authority*.

- d. Having accepted the enforcing authority's request, the competent authority proceeds to resetting to NULL the relevant ECDB variables: *Crew.Authority.(ERequest, EReqDate, EReqNote and EReqBody)*.
6. The paper certificates and SRB are handed over to the concerned crewmember upon the end of the suspension period or, in case of a withdrawal, are dully invalidated.

The information flow to and from the ECDB during IUC4 is outlined schematically in Figure 22 below.

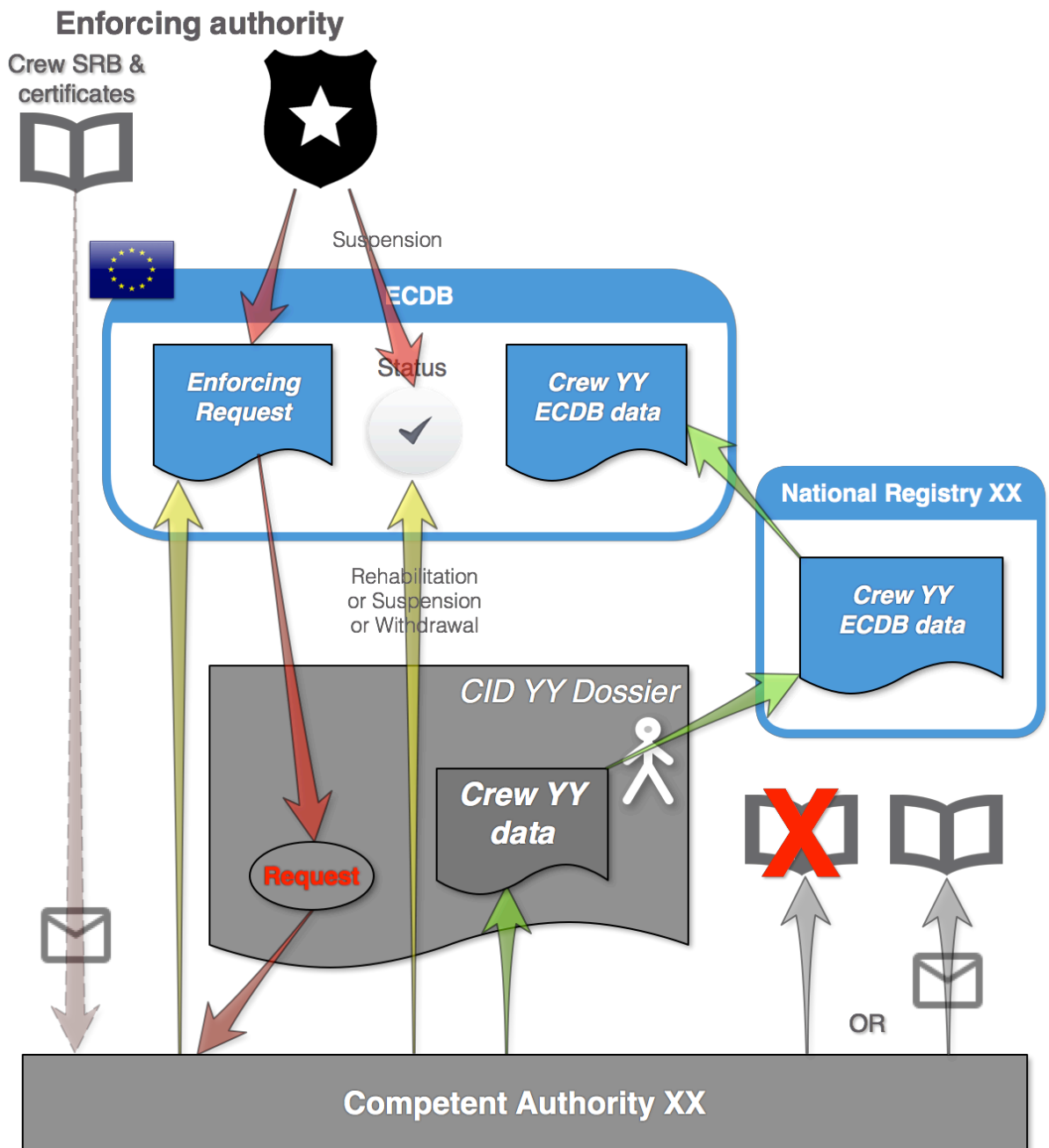


Figure 22: Information flow into and from the ECDB in IUC4: an enforcing authority makes, through ECDB, a suspension or withdrawal request and changes the crewmember YY status by introducing a suspension *end date* (red arrows); optionally, it sends the paper documents to the competent authority XX (dotted pink arrow); the later controls the enforcement request and, if OK, proceeds with the update of the crewmember’s dossier and forwards the ECDB relevant data to its *national registry* and the ECDB (green arrows); it sets the relevant *status* fields in ECDB as appropriate and resets the enforcing request fields (yellow arrows); the paper documents are invalidated or returned to the owner after the suspension end date (grey arrows)

9.5 IUC5: Queries by authorities

Competent authorities, in addition to the interactions defined in sections 9.1 to 9.4 above, can access the full ECDB for control / verification purposes. This is a READ-

ONLY access of all the data concerning all crewmembers, irrespective of their status or the competent authority at which they are registered.

Enforcing authorities, can only access ECDB in the frame of their inspection/enforcing duties. In addition to the interactions described in 9.4 above, when on board of a vessel to be inspected, they should be granted a READ-ONLY access to:

- All ECDB data concerning the current crewmembers of a vessel under inspection or those who have been part of the vessel's crew during its current voyage.
- They are also granted READ-ONLY access to the EHDB data of the vessel under inspection.

Given that in the initial phase here considered there are is no eIWT system, consequently no eIVU to automatically grant the required access rights, there should be a special, web-based mechanism granting the required access rights on request. Such a mechanism could be quite complicated.

In case there is no connectivity, enforcing authorities can request a READ-ONLY access to the databases through their competent authority.

Enforcing authorities that need to perform a query for purpose other than an inspection must access ECDB through their respective national authorities.

In alternative, it could be envisaged that the enforcing authorities could have full READ-ONLY access to ECDB, especially in view the limited data stored in ECDB in this initial phase.

9.6 IUC6: Queries for statistics

Competent authorities can, anyhow, access all data in ECDB in READ-ONLY mode.

International organizations and other bodies (i.e. recognised professional organisations, IWT social partners, authorised private bodies etc.) can access only anonymised⁶¹ information in READ-ONLY mode.

ECDB should provide the possibility, through a web-based interface, to build complex queries on the number of ECDB entries that respect certain conditions. Typical such queries are:

- Number of crewmembers registered in ECDB
- Number of crewmembers with a particular active qualification or special ability
- Number of Union certificates or special abilities emitted per competent authority over a certain period of time
- Number of SRBs validated per validating authority over a certain period of time
-

9.7 IUC7: Queries by crewmembers

Crewmembers can have a READ-ONLY access exclusively to their *own data* i.e. all data classes (as per Table 1) indexed at their CID.

⁶¹ Anonymized data in respect to both the crewmembers' and the vessels' identities.

Annexes

Annex 1

Relevant provisions of the Directive 2017/2397/EU, [2].

Article 24 - Protection of personal data

1. Member States shall carry out all processing of personal data provided for in this Directive in accordance with Union law on the protection of personal data, in particular Regulation (EU) 2016/679.
2. The Commission shall carry out all processing of personal data provided for in this Directive in accordance with Regulation (EC) No 45/2001.
3. Member States shall ensure that personal data are processed only for the purposes of:
 - (a) implementing, enforcing and evaluating this Directive;
 - (b) exchanging information between the authorities that have access to the database referred to in Article 25 and the Commission;
 - (c) producing statistics.

Anonymised information derived from such data may be used to support policies that promote inland waterway transport.

4. Member States shall ensure that the persons referred to in Articles 4 and 5 whose personal data, and in particular health data, are processed in the registers referred to in Article 25(1), and in the database referred to in Article 25(2), are informed *ex ante*. Member States shall grant such persons access to their personal data, and shall provide such persons with a copy of that data on request at any time.

Article 25 - Registers

1. To contribute to efficient administration with respect to issuing, renewing, suspending and withdrawing certificates of qualification, Member States shall keep registers of the Union certificates of qualification, service record books and logbooks issued under their authority in accordance with this Directive and, where relevant, of documents recognised pursuant to Article 10(2) which have been issued, renewed, suspended or withdrawn, which have been reported lost, stolen or destroyed, or which have expired.

For Union certificates of qualification, registers shall include the data appearing on the Union certificates of qualification and the issuing authority.

For service record books, registers shall include the name of the holder and his identification number, the service record book identification number, the date of issuance and the issuing authority.

For logbooks, registers shall include the name of the craft, the European Number of Identification or European Vessel Identification Number (ENI number), the logbook identification number, the date of issuance and the issuing authority.

The Commission is empowered to adopt delegated acts in accordance with Article 31 in order to supplement the information in the registers for service record books and logbooks with other information required by the models of service record books and logbooks adopted pursuant to Article 22(4), with the objective of further facilitating the exchange of information between Member States.

2. For the purpose of implementing, enforcing and evaluating this Directive, for maintaining safety, for ease of navigation, as well as for statistical purposes, and in order to facilitate the

exchange of information between the authorities that implement this Directive, Member States shall reliably record without delay data related to the certificates of qualification, service record books and logbooks referred to in paragraph 1 in a database kept by the Commission.

The Commission is empowered to adopt delegated acts in accordance with Article 31 to provide the standards laying down the characteristics of such a database and the conditions for its use, specifying in particular:

- (a) the instructions for encoding data into the database;
 - (b) the access rights of the users, differentiated where appropriate according to the type of users, the type of access and the purpose for which the data is used;
 - (c) the maximum duration that data is retained in accordance with paragraph 3 of this Article, differentiated where appropriate according to the type of document;
 - (d) the instructions regarding the operation of the database and its interaction with the registers referred to in paragraph 1 of this Article.
3. Any personal data included in the registers referred to in paragraph 1 or in the database referred to in paragraph 2 shall be stored for no longer than is necessary for the purposes for which the data were collected or for which they are further processed pursuant to this Directive. Once such data are no longer needed for those purposes, they shall be destroyed.
 4. The Commission may provide access to the database to an authority of a third country or to an international organisation in so far as this is necessary for the purposes referred to in paragraph 2 of this Article, provided that:
 - (a) the requirements of Article 9 of Regulation (EC) No 45/2001 are fulfilled; and
 - (b) the third country or the international organisation does not limit access by Member States or by the Commission to its corresponding database.

The Commission shall ensure that the third country or international organisation does not transfer the data to another third country or international organisation without the Commission's express written authorisation and under the conditions specified by the Commission.

Article 29 - Prevention of fraud and other unlawful practices

Annex 1 Member States shall take appropriate measures to prevent fraud and other unlawful practices involving Union certificates of qualification, service record books, logbooks, medical certificates and registers provided for in this Directive.

Annex 2 Member States shall exchange relevant information with the competent authorities of other Member States concerning the certification of persons involved in the operation of craft, including information on the suspension and withdrawal of certificates. In doing so, they shall comply fully with the principles of personal data protection laid down in Regulation (EU) 2016/679.

Article 36 - Phasing-in

1. The Commission shall adopt delegated acts referred to in Article 17(1) and (4), Article 21(2), Article 23(6) and Article 25(1) and (2) by 17 January 2020.
At the latest 24 months after the adoption of the delegated acts referred to in Article 25(2), the Commission shall set up the database provided for in that Article.
2. The Commission shall adopt implementing acts referred to in Article 11(3), Article 18(3) and Article 22(4) by 17 January 2020.

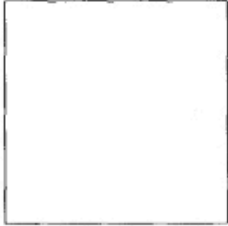
Annex 2

EU boatmaster's qualification certificate model

MODÈLE DE CERTIFICAT DE CONDUITE DE BATEAU DE NAVIGATION INTÉRIEURE

(85 mm × 54 mm — Fond bleu clair)

Les caractéristiques physiques de la carte doivent être conformes aux normes ISO 78.10.

CERTIFICAT DE CONDUITE DE BATEAU DE NAVIGATION INTÉRIEURE: A/B		FRANCE
1. xxx		
2. xxx		
3. 01/01/1996 — F-Paris		
4. 02/01/1996		
	6.	
7. #####		
8. AB		
9. R, tonnes, kW, xx		
10. 01/01/2061		
11.	5. xxx	

CERTIFICAT DE CONDUITE DE BATEAU DE NAVIGATION INTÉRIEURE POUR LE TRANSPORT DE MARCHANDISES ET DE PERSONNES	
1. Nom du titulaire	9. — R (Radar)
2. Prénom(s)	— Catégorie et capacité de bateau exclusive (tonnes, kW, passagers)
3. Date et lieu de naissance	10. Date d'expiration
4. Date de délivrance du certificat	11. Mention(s)
5. Numéro de délivrance	Restriction(s)
6. Photographie du titulaire	
7. Signature du titulaire	
8. A Toutes les voies d'eau sauf le Rhin	
B Toutes les voies d'eau sauf maritime et Rhin	
Modèle de l'Union européenne	

Annex 3

SRB model used on the Rhine as per the CCNR 2015 RPN, [1].

Commission Centrale pour la Navigation du Rhin
Règlement relatif au personnel de la navigation sur le Rhin (RPN)

Livret de service/Schifferdienstbuch/ Dienstboekje délivré par/ausgestellt durch/afgegeven door:

Titulaire/Inhaber (im ganzen Buch wird sowohl die weibliche und die männliche Form gemeint)/**Houder** (in het gehele dienstboekje wordt zowel de vrouwelijke als de mannelijke vorm bedoeld)

Nom/Name/Naam: _____

Prénom(s)/Vorname(n)/Voornaam(en): _____

Né le/Geboren am/Geboren op: _____

Né à/Geboren in: _____

Nationalité/Staatsangehörigkeit/Nationaliteit: _____

Photographie du titulaire
Photographie des Inhabers
Foto van de houder

Le titulaire du présent livret de service a justifié son identité au moyen
/ Der Inhaber dieses Dienstbuches hat sich ausgewiesen / De houder van dit dienstboekje heeft zich gelegitimeerd met:

- d'un passeport / durch einen Reisepass / een paspoort
- d'une carte nationale d'identité / durch eine Identitätskarte, einen Personalausweis / een identiteitskaart/een legitimatiebewijs
- du document cité ci-dessous, avec sa traduction officielle / durch das nachfolgend genannte Dokument mit amtlicher Übersetzung / het hierna aangehaalde document met officiële vertaling:

Désignation du document
Bezeichnung des Dokumentes: _____

Aanduiding van het document

N° du document

Nummer des Dokumentes: _____

Nummer van het document

Document délivré par

Dokument ausgestellt durch : _____

Document afgegeven door:

**Lieu, date, cachet et signature de l'autorité de délivrance du livret de service/
Ort, Datum, Stempel und Unterschrift der ausstellenden Behörde/ Plaats, datum,
stempel en handtekening van de autoriteit die het afgeeft**

A-00735

Commission Centrale pour la Navigation du Rhin
Règlement relatif au personnel de la navigation sur le Rhin (RPN)

**Livrets de service antérieurs et adresse du titulaire/Vorangehende
Schifferdienstbücher und Anschrift des Inhabers/Reeds eerder
afgegeven dienstboekjes en adressen van de houder:**

Le premier Livret de service portant le/Das
erste Schifferdienstbuch mit der/Het eerste
dienstboekje met het

N°/Nummer/nummer: _____
a été délivré par/wurde ausgestellt
durch/werd afgegeven door:

Adresse du titulaire du présent livret de
service (Inscrire ici les changements
d'adresse)/Anschrift des Inhabers dieses
Dienstbuches (Adressänderungen sind hier
einzutragen)/Adres van de houder van dit
dienstboekje (Adreswijzigingen moeten hier
worden ingevuld)

le (date)
am(Datum)/op (datum) : _____

Le précédent Livret de service portant le/Das
unmittelbar voran-gehende
Schifferdienstbuch mit der/Het hieraan
vooraafgaande dienstboekje met het

N°/Nummer/nummer: _____
a été délivré par/wurde ausgestellt
durch/werd afgegeven door:

Observations de l'autorité (par exemple
indications relatives à un livret de
remplacement)/Vermerk der Behörde
(z.B. Hinweise auf ein
Ersatzdienstbuch)/Ambts-halve
aantekeningen (Bijv. Verwijzing naar een
vervangend dienstboekje)

le (date)
am(Datum)/op (datum) : _____

A-00735

Commission Centrale pour la Navigation du Rhin
Règlement relatif au personnel de la navigation sur le Rhin (RPN)

Qualification du titulaire conformément à l'article 3.02 du Règlement relatif au personnel de la navigation sur le Rhin/Befähigung des Inhabers nach § 3.02 der Verordnung über das Schiffspersonal auf dem Rhein/Bekwaamheid van de houder als bedoeld in artikel 3.02 van het Reglement betreffende het scheepvaartpersoneel op de Rijn

Qualification/als: _____
à compter du (date)
ab dem (Datum): _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en onder-tekening door de autoriteit:

Qualification/als: _____
à compter du (date) :
ab dem (Datum): _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en onder-tekening door de autoriteit:

Qualification/als: _____
à compter du (date)
ab dem (Datum): _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en onder-tekening door de autoriteit:

Qualification/als: _____
à compter du (date)
ab dem (Datum): _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en onder-tekening door de autoriteit:

Qualification/als: _____
à compter du (date)
ab dem (Datum): _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en onder-tekening door de autoriteit:

Qualification/als: _____
à compter du (date)
ab dem (Datum): _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en onder-tekening door de autoriteit:

A-00735

Commission Centrale pour la Navigation du Rhin
Règlement relatif au personnel de la navigation sur le Rhin (RPN)

Qualification du titulaire conformément aux dispositions en vigueur hors du Rhin/Befähigung des Inhabers nach Bestimmungen außerhalb des Rheins/Bekwaamheid van de houder als bedoeld in de voorschriften van kracht buiten de Rijn

Qualification/als: _____
Conformément aux dispositions du/Nach den Bestimmungen von/Over-eenkomstig de voorschriften van:

Qualification/als: _____
Conformément aux dispositions du/Nach den Bestimmungen von/Overeenkomstig de voorschriften van:

à compter du (date)
ab dem (Datum) : _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en onder-tekening door de autoriteit:

à compter du (date)
ab dem (Datum) : _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en onder-tekening door de autoriteit:

Qualification/als: _____
Conformément aux dispositions du/Nach den Bestimmungen von/Over-eenkomstig de voorschriften van:

Qualification/als: _____
Conformément aux dispositions du/Nach den Bestimmungen von/Overeenkomstig de voorschriften van:

à compter du (date)
ab dem (Datum) : _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en ondertekening door de autoriteit:

à compter du (date)
ab dem (Datum) : _____
vanaf (datum)
Cachet, date et signature de l'autorité/Stempel, Datum und Unterschrift der Behörde/Stempel, datum en ondertekening door de autoriteit: **A-00735**

Commission Centrale pour la Navigation du Rhin
Règlement relatif au personnel de la navigation sur le Rhin (RPN)

Attestation de l'aptitude physique et psychique conformément aux dispositions du Règlement relatif au personnel de la navigation sur le Rhin//Nachweis der Tauglichkeit nach den Bestimmungen der Verordnung über das Schiffspersonal auf dem Rhein/Bewijs van lichamelijke en geestelijke geschiktheid als bedoeld in het reglement betreffende het scheepvaartpersoneel op de Rijn

Le titulaire du présent livret de service est qualifié sur la base du certificat médical visé à l'annexe B2 du Règlement relatif au personnel de la navigation sur le Rhin/Inhaber dieses Schifferdienstbuches ist aufgrund des ärztlichen Zeugnisses nach Anlage B2 der Verordnung über das Schiffspersonal auf dem Rhein/De houder van dit dienstboekje is op grond van de medische verklaring als bedoeld in de bijlage B2 van het reglement betreffende het scheepvaartpersoneel op de Rijn.

délivré par _____
ausgestellt durch: _____
afgegeven door _____
délivré le _____
ausgestellt am: _____
afgegeven op _____

- apte/tauglich/geschikt
 aptitude restreinte/eingeschränkt tauglich/beperkt geschikt

assortie de la/des condition(s) suivantes/mit der/den folgenden Auflage(n)/

onder de volgende voorwaarde(n): _____

Durée de validité/Befristung/Voor de termijn van: _____

Lieu, date, cachet et signature de l'autorité de délivrance
Ort, Datum, Stempel und Unterschrift der ausstellenden Behörde
Plaats, datum, stempel en handtekening van de autoriteit die het afgeeft

A-00735

Commission Centrale pour la Navigation du Rhin
Règlement relatif au personnel de la navigation sur le Rhin (RPN)

Temps de service à bord, nom du bateau/Dienstzeit an Bord,
Schiffsname/Diensttijd aan boord, scheepsnaam: UNTERWALDEN

Numéro européen unique d'identification des bateaux ou numéro officiel du bateau / einheitliche europäische Schiffsnummer oder amtliche Schiffsnummer / uniek Europees scheepsidentificatienummer of officieel scheepsnummer: 7000281

Type de bateau/Schiffsart/Scheepstype: TMS

Pavillon/Flagge/Vlag: CH

Longueur du bateau en/Schiffslänge in/Scheepslengte in m^{*)}, nombre de passagers/Anzahl Fahrgäste/aantal passagiers^{*)} 105 m

Propriétaire (nom, adresse)/Eigner (Name, Anschrift)/Naam en adres van de eigenaar: _____

TSAG, Hauptstrasse 55, CH-4127 Riehen, Basel-Stadt

Prise de fonction du titulaire en tant que/Dienstantritt des Inhabers als/Houder in dienst getreden als: Steuermann

Prise de fonction le (date)/Dienstantritt am (Datum)/Aanvang diensttijd (datum): 22.10.1995

Jusqu'au (Date)/Dienstende am (Datum)/Einde diensttijd (datum): 22.11.1996

Conducteur (nom, adresse)/Schiffsführer (Name/Anschrift)/Schipper (Naam en adres): _____

K. Huber, Rheinstrasse 55, D-76497 Wintersdorf

Lieu, date et signature du conducteur/Ort, Datum und Unterschrift des Schiffsführers/Plaats, datum en handtekening van de schipper: Rotterdam, 20.11.1996

K. Huber

Temps de service à bord, nom du bateau/Dienstzeit an Bord,
Schiffsname/Diensttijd aan boord, scheepsnaam: _____

Numéro européen unique d'identification des bateaux ou numéro officiel du bateau / einheitliche europäische Schiffsnummer oder amtliche Schiffsnummer / uniek Europees scheepsidentificatienummer of officieel scheepsnummer: _____

Type de bateau/Schiffsart/Scheepstype: _____

Pavillon/Flagge/Vlag: _____

Longueur du bateau en/Schiffslänge in/Scheepslengte in m^{*)}, nombre de passagers/Anzahl Fahrgäste/aantal passagiers^{*)} _____

Propriétaire (nom, adresse)/Eigner (Name, Anschrift)/Naam en adres van de eigenaar: _____

Prise de fonction du titulaire en tant que/Dienstantritt des Inhabers als/Houder in dienst getreden als: _____

Prise de fonction le (date)/Dienstantritt am (Datum)/Aanvang diensttijd (datum): _____

Jusqu'au (Date)/Dienstende am (Datum)/Einde diensttijd (datum): _____

Conducteur (nom, adresse)/Schiffsführer (Name/Anschrift)/Schipper (Naam en adres): _____

Lieu, date et signature du conducteur/Ort, Datum und Unterschrift des Schiffsführers/Plaats, datum en handtekening van de schipper: _____

A-00735

^{*)} rayer la mention inutile/nichtzuttreffendes streichen/doorhalen wat niet van toepassing is

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Nom du bateau ou numéro européen unique d'identification ou n° officiel du bateau Schiffsname oder amtliche Schiffsnummer oder einheitliche Schiffsnummer	Voyage de (p.k.) Reise von (km)	via	à (p.k.) nach (km)	Début du voyage (Date) Reisebeginn (Datum)	Journées d'inter-ruption Unterbrechungstage	Fin du voyage (Date) Reisende (Datum)	Total des jours de navigation Gesamtanzahl Fahrtage	Signature du conducteur Unterschrift des Schiffsführers
A	Reis van (kmr) scheepsnummer of unieke scheepsidentificatienummer	via	naar (kmr)	Begin van de reis (datum)	Dagen van onderbreking	Einde van de reis (datum)	Totaal aantal vaardagen	Handtekening van de schipper
1		B		C	D	E	F	G
2								
3								

document complet ou non
volständig ausgefüllt ja nein
voldig ingevuld ja nein
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A	B	C	D	E	F	G
1						
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10						

document complet oui non doutes levés par la présentation (d'extraits) du Livre de bord
 vollständig ausgefüllt ja nein Zweifel ausgeräumt durch (auszugsweise) Vorlage des Bordbuches
 volledig ingevuld ja neen twiifel weggenomen door het overleggen van een (uittrek) van het vaartijdenboek
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Abstract

The EU directive on the recognition of professional qualifications in inland navigation foresees harmonized procedures and models for Union certificates of qualifications, service record books (SRB) and logbooks (LBK) and facilitates the electronic exchange of information through the setting up of a database. In doing so, it paves the way for the introduction of electronic tools, for which the European Parliament and the Council have asked the Commission to submit an assessment.

In this context, JRC assisted DG MOVE for the characterization of options for an architecture covering, as a minimum, electronic SRB and LBK, concluded with a final report on July 2106.

Following-up these activities, a new administrative arrangement between JRC and DG MOVE became operational at the beginning of January 2017. Its main scope is to provide technical and scientific support on two main objectives:

1. Technical requirements, characteristics and conditions of use of the database provided for in the Directive on the recognition of professional qualifications in inland navigation (ECDB - *European Crew Database*).
2. Options for an electronic system based on *Inland Workers Cards* and *Inland Vessel Units*, serving as *service record books* and *logbooks* but also recording the resting and working time as per Council Directive 2014/112/EU including considerations on the *Digital Inland Navigation Area* (DINA).

The work of the JRC during 2017 and 2018 focuses on the European Crew Database (ECDB). The goal is a future-proof ECDB that fully meets the requirements of Directive 2017/2397/EU and, at the same time, accommodates the anticipated eIWT operational requirements.

The current document is the mid-term report of the eIWT 2107 AA between DG MOVE and JRC. It outlines the ECDB objectives, structure and dataset and describes the main operational use-cases assuming a fully implemented eIWT system and during the initial non-electronic phase.

In view of a Commission delegated regulation on the ERCDB implementation, the current document serves as a basis for discussion with the members of the Commission expert group on social issues in inland navigation and other IWT stakeholders, focusing in particular on the immediate requirements that are object of the delegated regulation, that is the initial phase, transitory to a fully digital one, where ECDB and the MS registries are operational but all documents (qualification certificates, SRBs and LBKs) are still on paper.

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