

Appendix 1

STCW-IS web reporting and statistical module

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List of Abbreviations

COC	Certificate of Competency
COP	Certificate of Proficiency
EAR	Endorsement attesting the issue of a Certificate of Competency
EFTA	European Free Trade Association
EMSA	European Maritime Safety Agency
ER	Entity-Relationship
ETL	Extract, Transform, Load
EU	European Union
GT	Gross Tonnage
KW	Kilowatts
STCW Convention	The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended
STCW-IS	STCW Information System

1. Objective

The objective of this project is to create a Report Module to cover the reporting requirements presented below for the STCW-IS. As such, the final product is composed of two different sub-modules:

- A public sub-module: includes reports that shall be available for public access;
- A private sub-module: includes reports that shall be available only to authenticated accounts.

The Reporting Module will be accessible to users with the necessary privileges to view IdM-V2 data.

The IdM-V2 report module shall be developed using the JASPER BI suite and shall be deployed at EMSA's JASPER BI Horizontal Framework according to the mandatory requirements defined in Appendix 3 "JASPER Technical Overview".

The implementation project shall follow the Project Delivery requirements defined in Appendix 4 "Project Delivery".

Within their bids, bidders shall describe in as much detail as possible:

- The technical solution and approach to be used;
- Any foreseen deviation from the technical requirements or project delivery requirements.

2. Source of information

All information subject to this Reporting Module is stored in a database composed of two schemas:

- An operational schema storing all STCW-IS operational data. See Appendix 6 for the ER diagram
- A statistical schema storing all STCW-IS statistical data. See Appendix 7 for the ER diagram.

A high-level overview of the main data subject to reporting is provided below.

Records in the database within the statistical schema represent documents held by a seafarer that are of the type:

- Certificate of Competency (CoC), compiled in table STATISTICS.COC; and/or
- Endorsement attesting the recognition of a certificate of competency issued by another Member State or Third Country (EaR), compiled in table STATISTICS.EAR; and/or
- Certificate of Proficiency (CoP), compiled in table STATISTICS.COP.

Each document is issued by a Member State belonging to a Country Group (EU or EFTA).

In addition, each document has one or more associated capacities in which the seafarer is entitled to serve on board a ship. When a seafarer is entitled to serve in more than one capacity, the database registers one record per capacity, generating multiple records for the same seafarer. Each capacity has associated limitations in terms of 'area of operation of the ship', 'gross tonnage of the ship', 'propulsion power of the ship' and 'type of propulsion machinery of the ship'.

Documents issued to seafarers can be valid up to 5 years (time difference between 'Date of Expiry' and 'Date of Issue/Last Revalidation Date'), mainly in the case of CoCs and EaRs, as CoPs can be issued without a 'Date of Expiry'. Therefore, per each 5-year period of analysis, a seafarer can hold more than one valid document issued by a country, documents that might have different dates of issue/expiry, different capacities and/or different corresponding limitations. In addition, seafarers can hold one or more documents issued by more than one country entitling them to serve in one or more capacities.

The records within the system contain not only the data transferred by the Member States but also other fields automatically assigned after data is compiled by EMSA:

Country - the Member State/Party to the STCW Convention issuing the certificate/endorsement. By Member State one should read any one of the EU Member States and the EFTA countries Norway and Iceland;

Valid YEAR - the year defined by the EMSA user when compiling the data annually, that aggregates all documents valid within its duration. For a document to be considered valid it must have its date of expiry \geq than the year defined by the EMSA user when compiling the data for a certain Valid YEAR;

Internal Seafarer ID - generated as a system seafarer's unique ID, is based on "Seafarer's Name", "Seafarer's Date of Birth" and "Seafarer's Nationality". This is the field that identifies the seafarer as a unique individual;

Rank - by assigning highest or lowest, the system automatically ranks the seafarer in his/her highest capacity bearing in mind the hierarchy of the capacities within the Deck and Engine capacities;

Although the current reporting tool was designed to build statistics both on documents and on seafarers, the 'Statistics on Seafarers' annual report focuses only on counting **the number of unique seafarers** holding valid documents in a specific valid year, ranked in their highest capacity.

The annual statistical review is based on queries to the STATISTICS tables and on filters picked by the EMSA user and run on each type of document (CoC, EaR or CoP) for a specific Valid YEAR or for an interval of years.

EMSA extracts the data for its reports using the Jasper Reports user interface with which it builds several crosstabs, further detailed in Section 4.2. On average, 600.000 records are processed when producing each annual report.

The fields available to be used in the statistical reporting and upon which the filters are applied are the following:

CAPACITY_I_DESC	The capacity in which the seafarer is entitled to serve in accordance with the STCW Convention. Ex: Master on ships of 3000 GT or more
CAPACITY_I	The Regulation of the STCW Convention associated to the capacity. Ex: Regulation II/2; para 1.2 MA
COUNTRY_DESC	The Country sending the data. Ex: BULGARIA
COUNTRY_GROUP_DESC	The Group to which the Country sending the data belongs to. The field can have the following values: EU, EFTA, OTHER
COUNTRY_ID	The acronym of the Country sending the data. Ex: BG
COUNTRY_ISSUING	The Country issuing the original CoC, that was endorsed by one of the EU or EFTA Member States. Ex: SINGAPORE
DATE_OF_ISSUE	The date of issue of the certificate/endorsement. The field is in a dd/mm/yyyy format
DATE_OF_EXPIRY	The date of expiry of the certificate/endorsement. The field is in a dd/mm/yyyy format
INTERNAL_SEAFARER_ID	A combination of the "Seafarer's Name", "Seafarer's Date of Birth" and "Seafarer's Nationality". The field is used to count the seafarer as a single person
AGE_INTERVALS or LEVELS ¹	Intervals of age used to build statistics on seafarer's age. The field can have the following values: <20 (less than 20) ; [20- 25); [25-30); [30-35); [35-40); [40-45); [45-50); [50-55); [55-60); and >60 (more than sixty)
LIMITATION_AREA	Limitation to the capacity in the certificate regarding the area of navigation in which the seafarer is entitled to serve. The field can have the following values: unlimited, limited or not clearly defined
LIMITATION_ENGINE	Limitation to the capacity in the certificate regarding the type of propulsion machinery of the ship in which the seafarer is entitled to serve. The field can have the following values: unlimited, limited or not clearly defined
LIMITATION_GT	Limitation to the capacity in the certificate regarding the gross tonnage of the ship in which the seafarer is entitled to serve. The field can have the following values: unlimited, limited or not clearly defined

¹ This field does not exist in the tables and was customized in the current reporting tool. The field shall be replicated by the contractor.

LIMITATION_KW	Limitation to the capacity in the certificate regarding the propulsion power of the ship in which the seafarer is entitled to serve. The field can have the following values: unlimited, limited or not clearly defined
SEAFARER_DATE_OF_BIRTH	The date of birth of the seafarer. The field is in a dd/mm/yyyy format
SEAFARER_GENDER	The gender of the seafarer. The field can have the following values: Female, Male, Not available
COC_YEAR, EAR_YEAR, COP_YEAR	The Year for which the valid document was compiled, as defined by the EMSA user
CAPACITY_I_TYPE_DESC	The department in which the seafarer is entitled to serve. The field can have the following values: Alternative certification, Deck, Engine
SEAFARER_NATIONALITY	The nationality of the seafarer. Ex: INDONESIA
DOCUMENT_LEVEL	Order in which capacities are ranked. The field can have the following values: 1 to 7 in the Deck Department, with 1 being used to define the highest of the capacities and 7 the lowest; and 1 to 6 in the Engine Department, with 1 being used to define the highest of the capacities and 6 the lowest
DOCUMENT_RANK	The rank associated with the capacity. The field can have the following values: highest, lowest

Although efforts are continuously being made by EMSA to improve the accuracy of the data, due consideration should be given to the existence of some inconsistencies within the data transferred by the Member States. In cases where different genders and/or different nationalities are identified for the same seafarer, he/she shall be counted only once in the gender and/or nationality mostly referred to in the documents he/she holds. The exception concerns cases where gender and/or nationality are not allocated in most of the seafarer's documents (gender and/or nationality == not available), in which case, the said seafarer shall be allocated the gender and/or nationality recognised by the one document that identifies him/her. For quality enhancement purposes the contractor will be requested to produce ad-hoc reports listing the existing cases of discrepancies of nationality and gender for the same seafarer so that data can be amended accordingly within the compilation phase.

3. Mandatory Requirements

The following points are mandatory requirements for the implementation of the reporting modules defined in the next chapters:

- Design and implementation shall follow the technical specification provided in the “JASPER Technical Overview” appendix.
Within their bids, bidders shall state and describe if and how they comply with the above mandatory requirements. If any deviation is foreseen, it must be explicitly stated and the reasons and impacts clearly presented, and possible solutions described in detail;
- ETL processes shall be designed and implemented using Talend (Jasper ETL). This ETL process is responsible for handling the information and making it available in an adequate structure and format to produce outputs identified in the requirements.
Within their bids, bidders shall describe in as much detail as possible how the ETL process will be implemented and deployed at EMSA's JASPER Horizontal Framework;
- Design, Implementation and deliverables shall cover (but are not limited to) Database design, Datasource definitions, Domains definitions, Ad-Hoc Views, Reports and Dashboards.
Within their bids, bidders shall list in as much detail and as completely as possible all the foreseen deliverables to be provided within the scope of this project.
- Results (reports, dashboards, ...) shall be integrated/embedded into the EMSA Portal
Within their bids, bidders shall describe in as much detail and as completely as possible how they will address this integration and what technical means (e.g. REST services, HTML integration, Javascript API) they plan to use.

4. Reporting Requirements

4.1 Public sub-module

The main objective of this project is to create an interactive Seafarers' Statistical Review Report based on the data stored in the STCW-IS.

Final users shall be able to generate bar charts, maps, doughnut charts, chart line for trends and pivot charts. The values shall be displayed in numbers or percentages, as appropriate.

The above mentioned figures shall be produced based on different filters such as, but not limited to, Valid YEAR or interval of years; type of document held by the seafarers; country or group of countries from which the data is to be analysed.

The following tables provide the data combinations used to produce the figures within the annual report and make reference to EMSA's statistical review report published in 2018. The information contained in the tables defines the minimum output expected to be generated by the web-based module.

As mentioned, all the figures within the EMSA annual report derive from crosstabs extracted from the system through the Jasper Reporting Tool, crosstabs that are further detailed in Section 4.2. For each figure one or more crosstabs can be created such as in the case of analysing the nationality of the seafarers (as this field can be analysed at country, country group (EU/non-EU) or regional (Africa, Americas, Asia, ...) level.

The contractor shall propose different layouts for the figures contained in the report to increase attractiveness and interactivity with users.

Finally, it shall enable trends – i.e. aggregate data from one or more variables for an interval of at least two Valid YEARS defined by the users – to be derived from the available data.

4.1.1 Masters and officers holding valid certificates of competency: data extracted from table STATISTICS.COC

Title	Figure in the 2018 report	Filters applied ²	Remarks
Masters and officers holding valid CoCs per EU Member State	2-1	VALID_YEAR; COUNTRY_ID	Number of seafarers by countries sending the data for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each Country.
Distribution of masters and officers holding valid CoCs by department	2-2	VALID_YEAR; COUNTRY_ID; DEPARTMENT	Number of seafarers by department for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each Department.
Distribution of masters	2-3	VALID_YEAR;	Number of seafarers by countries sending the data and

² In any of the filters applied it shall exist the possibility to choose one or more values within that filter, i.e. for example to choose the whole countries or a single one when using filtering by COUNTRY_ID

Title	Figure in the 2018 report	Filters applied ²	Remarks
and officers holding valid CoCs by departments in each EU Member State		COUNTRY_ID; DEPARTMENT	by departments for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each department.
Distribution of masters and officers holding valid CoCs by deck capacity	2-4	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE (filtered by DECK); LIMITATION_AREA; LIMITATION_GT	Number of seafarers by deck capacities for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity <u>in the deck department</u> .
Distribution of masters and officers holding valid CoCs by engine capacity	2-5	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE (filtered by ENGINE); LIMITATION_AREA; LIMITATION_kw; LIMITATION_ENGINE	Number of seafarers by engine capacities for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity <u>in the engine department</u> .
Gender distribution of masters and officers holding valid CoCs	2-6	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER	Number of seafarers by gender for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender.
Distribution of masters and officers holding valid CoCs by department and by gender	2-7	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER; DEPARTMENT	Number of seafarers by gender and by departments for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once his/her most frequently known gender for each department.
Distribution of the deck capacities of masters and deck officers holding valid	2-8	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER;	Number of seafarers by gender and by deck capacities for the last Valid YEAR available (when additional filters are not applied).

Title	Figure in the 2018 report	Filters applied ²	Remarks
CoCs by gender		CAPACITY_CERTIFICATE (filtered by DECK)	Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender for each capacity. In addition, the seafarer shall be counted only once in his/her highest capacity in the deck department.
Distribution of the engine capacities of engineer officers holding valid CoCs by gender	2-9	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER; CAPACITY_CERTIFICATE (filtered by ENGINE)	Number of seafarers by gender and by engine capacities for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender for each capacity. In addition, the seafarer shall be counted only once in his/her highest capacity in the engine department.
Nationality distribution of masters and officers holding valid CoCs	2-10	VALID_YEAR; COUNTRY_ID; SEAFARER_NATIONALITY ³	Number of seafarers by nationality group for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known nationality.
Nationality distribution of non-EU nationals holding valid CoCs issued by EU Member States by region of origin	2-11	VALID_YEAR; COUNTRY_ID; SEAFARER_NATIONALITY ⁴	Number of seafarers by all non-EU regions for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known nationality.
Age distribution of masters and officers holding valid CoCs	2-12	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS	Number of seafarers by age intervals ⁵ for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may

³ In this report, SEAFARER_NATIONALITY is grouped into two categories: EU nationals and non-EU nationals. Seafarers from Norway and Iceland are to be included within the EU nationals' group.

⁴ In this report, SEAFARER_NATIONALITY is grouped into six regions: EU; Europe (non-EU); Oceania; Africa; Americas and Asia to where all countries existing in that Valid YEAR are assigned. Seafarers from Norway and Iceland are to be included within the EU group.

⁵ The Age intervals might be changed from one year to the other.

Title	Figure in the 2018 report	Filters applied ²	Remarks
			hold, he/she shall be counted only once.
Age profile of masters and officers holding valid CoCs per department	2-13	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS; DEPARTMENT;	Number of seafarers by age intervals and by departments for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each department.
Distribution of masters and deck officers holding valid CoCs by age groups	2-14	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS; CAPACITY_CERTIFICATE (filtered by DECK)	Number of seafarers by age intervals and by deck capacities for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the deck department.
Distribution of engineer officers holding valid CoCs by age groups	2-15	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS; CAPACITY_CERTIFICATE (filtered by ENGINE)	Number of seafarers by age intervals and by engine capacities for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the engine department.
Age profile of masters and officers holding valid CoCs per gender	2-16	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS; SEAFARER_GENDER	Number of seafarers by gender and by age intervals for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender.
Average age of masters and deck officers holding valid CoCs per gender by	2-17	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER; CAPACITY_CERTIFICATE (filtered by DECK)	Average age ⁶ of seafarers by all gender and by all deck capacities for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may

⁶ Age of the seafarer = VALID_YEAR - YEAR (SEAFARER_DATE_OF_BIRTH) ; Average Age = SUM ('number of seafarers holding CoCs for a specific capacity with 18 years old' * 18 + 'number of seafarers holding CoCs for a specific capacity with 19 years old' * 19 + 'number of' * ...) / total number of seafarers holding CoCs for the capacity in question

Title	Figure in the 2018 report	Filters applied ²	Remarks
deck capacity			hold, he/she shall be counted only once in his/her most frequently known gender for each capacity. In addition, he/she shall be counted only once in his/her highest capacity in the deck department.
Average age of engineer officers holding valid CoCs per gender by engine capacity	2-18	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER; CAPACITY_CERTIFICATE (filtered by ENGINE)	Average age of seafarers by gender and by engine capacities for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender for each capacity. In addition, he/she shall be counted only once in his/her highest capacity in the engine department.

Any figure not listed in this table but included in tables 4.1.2 and 4.1.3 shall also be available for the CoCs, as applicable.

In addition, a main filter shall be included in the CoCs, in order to make it possible to generate the figures by each of the group of countries (COUNTRY_GROUP_DESC).

4.1.2 Masters and officers holding valid endorsements attesting the recognition of their original certificates of competency: data extracted from table STATISTICS.EAR

Title	Figure in the 2018 report	Filters applied ⁷	Remarks
Distribution of masters and officers holding valid EaRs by country issuing the original CoC	2-19	VALID_YEAR; COUNTRY_ID; COUNTRY_ISSUING	Number of seafarers by groups of issuing country for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in two – EU and non-EU. Within EU, those from Norway and Iceland are included. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each issuing country group.
Masters and officers holding valid EaRs per EU	2-20	VALID_YEAR; COUNTRY_ID	Number of seafarers by country sending the data for the last Valid YEAR available (when

⁷ In any of the filters applied there shall exist the possibility to pick one or more values within that filter, i.e. for example to pick the whole countries or a single one when using filtering by COUNTRY_ID

Title	Figure in the 2018 report	Filters applied ⁷	Remarks
Member State			additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each Country.
Distribution of masters and officers holding valid EaRs recognising original CoC issued by EU and non-EU countries	2-21	VALID_YEAR; COUNTRY_ID; COUNTRY_ISSUING	Number of seafarers by country sending the date and by groups of issuing country for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in two – EU and non-EU. Within EU, those from Norway and Iceland are included. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each issuing country group and each country sending the data.
Distribution of masters and officers holding valid EaRs by region of the country issuing the original CoC	2-22	VALID_YEAR; COUNTRY_ID; COUNTRY_ISSUING	Number of seafarers by regions to who the country issuing belongs for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in six regions – EU; Europe (non-EU); Oceania; Africa; Americas and Asia. Within EU, those from Norway and Iceland are included. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each issuing country group.
Countries issuing the original CoCs registering more than 0.75% of masters and officers holding valid EaRs	2-23	VALID_YEAR; COUNTRY_ID; COUNTRY_ISSUING	Number of seafarers by issuing countries registering more than 0.75% ⁸ of the total of masters and officers holding valid EaRs for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each issuing country.
Distribution of masters	2-24	VALID_YEAR;	Number of seafarers by departments for the last Valid

⁸ The percentage is obtained by dividing the 'total number of masters and officers holding a valid EaR from a specific CoC issuing country' by the 'total number of masters and officers holding valid EaRs', excluding the number of seafarers holding an EaR from an unknown issuing country. The value of the percentage to be considered in the analysis can vary from one year to the other according to a decision taken by the EMSA user.

Title	Figure in the 2018 report	Filters applied ⁷	Remarks
and officers holding valid EaRs by department		COUNTRY_ID; DEPARTMENT	YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each department.
Distribution of masters and officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by department	2-25	VALID_YEAR; COUNTRY_ID; DEPARTMENT; COUNTRY_ISSUING	Number of seafarers by departments and by groups of issuing country for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in two – EU and non-EU. Within EU, those from Norway and Iceland are included. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each department and for each issuing country group.
Distribution of masters and deck officers holding valid EaRs by deck capacity	2-26	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; (filtered by DECK) LIMITATION_AREA; LIMITATION_GT	Number of seafarers by deck capacities for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the <u>deck</u> department.
Distribution of masters and deck officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by deck capacity	2-27	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; (filtered by DECK) COUNTRY_ISSUING	Number of seafarers by deck capacities and by groups of issuing country for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in two – EU and non-EU. Within EU, those from Norway and Iceland are included. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the deck department and for each issuing country group.
Distribution of the masters and deck officers	2-28	VALID_YEAR; COUNTRY_ID;	Number of seafarers by deck capacities and by country issuing regions for the last Valid YEAR available (when

Title	Figure in the 2018 report	Filters applied ⁷	Remarks
holding valid EaRs by EU and non-EU countries issuing the original CoC and by deck capacity		CAPACITY_CERTIFICATE; (filtered by DECK) COUNTRY_ISSUING	additional filters are not applied). COUNTRY_ISSUING is grouped in six regions – EU; Europe (non-EU); Oceania; Africa; Americas and Asia. Within EU, those from Norway and Iceland are included. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the deck department and for each region of country issuing.
Distribution of engineer officers holding valid EaRs by engine capacity	2-29	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; (filtered by ENGINE) LIMITATION_AREA; LIMITATION_KW; LIMITATION_ENGINE	Number of seafarers by engine capacities for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the <u>engine</u> department.
Distribution of engineer officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by engine capacity	2-30	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; (filtered by ENGINE) COUNTRY_ISSUING	Number of seafarers by engine capacities and by groups of issuing country for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in two – EU and non-EU. Within EU, those from Norway and Iceland are included. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the engine department and for each issuing country group.
Distribution of the engineer officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by	2-31	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; (filtered by ENGINE) COUNTRY_ISSUING	Number of seafarers by engine capacities and by country issuing regions for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in six regions – EU; Europe (non-EU); Oceania; Africa; Americas and Asia. Within EU, those from Norway and Iceland are included.

Title	Figure in the 2018 report	Filters applied ⁷	Remarks
engine capacity			Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the engine department and for each region of country issuing.
Gender distribution of masters and officers holding valid EaRs	2-32	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER	Number of seafarers by gender for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender.
Distribution of masters and officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by gender	2-33	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER; COUNTRY_ISSUING	Number of seafarers by gender and by groups of issuing countries for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in two – EU and non-EU. Within EU, those from Norway and Iceland are included. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender for each issuing country group.
Age distribution of masters and officers holding valid EaRs	2-34	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS	Number of seafarers by age intervals ⁹ for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once.
Distribution of masters and officers holding valid EaRs by Eu and non-EU countries issuing the original CoC and by age group	2-35	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS; COUNTRY_ISSUING	Number of seafarers by age intervals and by groups of issuing countries for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in two – EU and non-EU. Within EU, those from Norway and Iceland are included.

⁹ The Age intervals might be changed from one year to the other.

Title	Figure in the 2018 report	Filters applied ⁷	Remarks
			Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each issuing country group.
Age profile of masters and officers holding valid EaRs per department	2-36	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS; DEPARTMENT;	Number of seafarers by age intervals and by departments for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each department.
Average age of masters and deck officers holding valid EaRs per EU and non-EU countries issuing the original CoC by deck capacity	2-37 (the figure includes two graphs that are split in this table)	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; (filtered by DECK) COUNTRY_ISSUING	Average age ¹⁰ of seafarers by issuing country groups and by deck capacities for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in two – EU and non-EU. Within EU, those from Norway and Iceland are included. In addition, he/she shall be counted only once in his/her highest capacity in the deck department and for each issuing country group.
Average age of engineer officers holding valid EaRs per EU and non-EU countries issuing the original CoC by engine capacity	2-37 (the figure includes two graphs that are split in this table)	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER; CAPACITY_CERTIFICATE; (filtered by ENGINE) COUNTRY_ISSUING	Average age of seafarers by issuing country groups and by engine capacities for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING is grouped in two – EU and non-EU. Within EU, those from Norway and Iceland are included. In addition, he/she shall be counted only once in his/her highest capacity in the engine department and for each issuing country group.

Any figure not listed in this table but included in tables 4.1.1 and 4.1.3 shall also be available for the EaRs, as applicable.

¹⁰ Age of the seafarer = VALID_YEAR - YEAR (SEAFARER_DATE_OF_BIRTH); Average Age = SUM ('number of seafarers holding EaRs for a specific capacity with 18 years old' * 18 + 'number of seafarers holding EaRs for a specific capacity with 19 years old' * 19 + 'number of ...' * ...) / total number of seafarers holding EaRs for the capacity in question

In addition, a main filter shall be included in the EaRs, in order to make it possible to generate the figures by each of the groups of COUNTRY_ISSUING: EU; Non-EU; All (EU + non-EU).

4.1.3 Masters and officers available to serve on board EU Member State flagged vessels: data extracted from table STATISTICS.COC and STATISTICS.EAR

Title	Figure in the 2018 report	Filters applied ¹¹	Remarks
Masters and officers holding valid CoCs and EaRs per EU Member State	2-38	VALID_YEAR; COUNTRY_ID	Aggregate number of seafarers holding valid CoCs and EaRs (issued by both EU and non-EU countries) by countries sending the data for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each Country per type of certificate held.
Distribution of masters and officers available to serve on board EU flagged vessels by EU and non-EU countries issuing the original CoC	2-39	VALID_YEAR; COUNTRY_ID; COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each issuing country group.
Distribution of masters and officers available to serve on board EU flagged vessels by EU and non-EU countries issuing the original CoC and by department	2-40	VALID_YEAR; COUNTRY_ID; DEPARTMENT; COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by departments and by groups of issuing country for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be

¹¹ In any of the filters applied there shall exist the possibility to pick one or more values within that filter, i.e. for example to pick the whole countries or a single one when using filtering by COUNTRY_ID

Title	Figure in the 2018 report	Filters applied ¹¹	Remarks
			counted only once for each department and for each issuing country group.
Distribution of masters and deck officers available to serve on board EU flagged vessels by deck capacity	2-41	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE (filtered by DECK); LIMITATION_AREA; LIMITATION_GT; COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by deck capacities for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity <u>in the deck department</u> .
Distribution of masters and deck officers available to serve on board EU flagged vessels by EU and non-EU countries issuing the original CoC and by deck capacity	2-42	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; (filtered by DECK) COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by deck capacities and by groups of issuing country for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the deck department and for each issuing country group.
Distribution of masters and engine officers available to serve on board EU flagged vessels by EU and non-EU countries issuing the original CoC and by engine capacity	2-43	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; (filtered by ENGINE) LIMITATION_AREA; LIMITATION_KW; LIMITATION_ENGINE; COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by engine capacities for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her

Title	Figure in the 2018 report	Filters applied ¹¹	Remarks
			highest capacity in the <u>engine department</u> .
Distribution of engineer officers available to serve on board EU flagged vessels by EU and non-EU countries issuing the original CoC and by engine capacity	2-44	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; (filtered by ENGINE) COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by engine capacities and by groups of issuing country for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the engine department and for each issuing country group.
Gender distribution of masters and officers available to serve on EU flagged vessels	2-45	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER; COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by gender for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender.
Distribution of masters and officers available to serve on EU flagged vessels by EU and non-EU countries issuing the original CoC and by gender	2-46	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER; COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by gender and by groups of issuing country for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her

Title	Figure in the 2018 report	Filters applied ¹¹	Remarks
			most frequently known gender for each issuing country group.
Nationality distribution of masters and officers available to serve on EU flagged vessels by geographical region according to nationality	2-47	VALID_YEAR; COUNTRY_ID; SEAFARER_NATIONALITY ¹² ; COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by EU and non-EU regions for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known nationality.
Countries whose nationals represent more than 0.75% of the total number of masters and officers available to serve on EU flagged vessels	2-48	VALID_YEAR; COUNTRY_ID; COUNTRY_ISSUING	Aggregate number of seafarers registering more than 0.75% ¹³ of the total of masters and officers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each issuing country. Seafarers holding CoCs and/or EaRs issued by non-available issuing countries are excluded from the counting.
Age profile of masters and officers available to serve on EU flagged vessels per EU and non-	2-49	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS; COUNTRY_ISSUING	Aggregate number of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by age intervals for the last Valid YEAR available

¹² In this report, SEAFARER_NATIONALITY is grouped into six regions: EU; Europe (non-EU); Oceania; Africa; Americas and Asia to where all countries existing in that Valid YEAR are assigned. Seafarers from Norway and Iceland are to be included within the EU group.

¹³ The percentage is obtained by dividing the 'total number of masters and officers available to serve on the EU fleet from a specific Nationality' by the 'total number of masters and officers available to serve on the EU fleet', excluding the number of seafarers for whom the nationality is unknown. The value of the percentage to be considered in the analysis can vary from one year to the other according to a decision taken by the EMSA user.

Title	Figure in the 2018 report	Filters applied ¹¹	Remarks
EU countries issuing the original CoC			(when additional filters are not applied) for each issuing country group. COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once.
Average age of masters and officers available to serve on EU flagged vessels per deck and engine capacities	2-50	VALID_YEAR; COUNTRY_ID; CAPACITY_CERTIFICATE; COUNTRY_ISSUING	Average age ¹⁴ of seafarers holding valid CoCs issued by EU Member States and holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries by deck and engine capacities for the last Valid YEAR available (when additional filters are not applied). COUNTRY_ISSUING includes only non-EU issuing countries. Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her highest capacity in the deck and the engine departments.

Any figure not listed in this table but included in tables 4.1.1 and 4.1.2 shall also be available for the combined CoCs & EaRs as applicable.

In addition, two main filters shall be included in the combined CoCs & EaRs in order to make it possible to generate the figures by each of the group of countries (COUNTRY_GROUP_DESC) and each of the groups of COUNTRY_ISSUING: EU; Non-EU; All (EU + non-EU).

4.1.4 Ratings holding valid certificates of proficiency: data extracted from table STATISTICS.COP

Title	Figure in the 2018 report	Filters applied ¹⁵	Remarks
Distribution of ratings holding valid CoPs per EU Member State	2-51	VALID_YEAR; COUNTRY_ID	Number of seafarers by countries sending the data for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may

¹⁴ Age of the seafarer = VALID_YEAR - YEAR (SEAFARER_DATE_OF_BIRTH); Average Age = SUM ('number of seafarers holding CoCs/EaRs for a specific capacity with 18 years old' * 18 + 'number of seafarers holding CoCs/EaRs for a specific capacity with 19 years old' * 19 + 'number of ...' * ...) / total number of seafarers holding CoCs for the capacity in question

¹⁵ In any of the filters applied there shall exist the possibility to pick one or more values within that filter, i.e. for example to pick the whole countries or a single one when using filtering by COUNTRY_ID

Title	Figure in the 2018 report	Filters applied ¹⁵	Remarks
			hold, he/she shall be counted only once for each Country.
Distribution of ratings holding valid CoPs by department	2-52	VALID_YEAR; COUNTRY_ID; DEPARTMENT	Number of seafarers by department for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once for each Department.
Gender distribution of ratings holding valid CoPs	2-53	VALID_YEAR; COUNTRY_ID; SEAFARER_GENDER	Number of seafarers by gender for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender.
Age distribution of ratings holding valid CoPs	2-54	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS	Number of seafarers by age intervals for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once.
Age profile of ratings holding valid CoPs per gender	2-55	VALID_YEAR; COUNTRY_ID; AGE_INTERVALS; SEAFARER_GENDER	Number of seafarers by gender and by age intervals for the last Valid YEAR available (when additional filters are not applied). Independently of the number of valid documents a seafarer may hold, he/she shall be counted only once in his/her most frequently known gender.

Any figure not listed in this table but included in tables 4.1.1, 4.1.2 and 4.1.3 shall also be available for the CoPs, as applicable.

In addition, a main filter shall be included in the CoPs in order to make it possible to generate the figures by each of the group of countries (COUNTRY_GROUP_DESC).

Within their bids, bidders shall describe in as much detail as possible:

- How the reports will be implemented and how they will work;
- Proposed wireframes or mockups for possible solutions to present the reports selection criteria and generated report;
- Any other dashboard or report that is considered to add value to the sub-module.

4.2 Private sub-module

Apart from the figures indicated in section 4.1 other values and calculations are included in the EMSA statistical reports that enrich the analysis. This information is retrieved from tables built from the numbers extracted from the system through crosstabs combining different variables, on which simple calculations by rows and columns are done in order to obtain totals and percentages.

An example of one of these tables can be found below, divided between Figure 1, where the calculations behind the numbers are visible, and Figure 2 where the real numbers are shown. The table is an extract of table 2-1 that can be found in Appendix A to the EMSA 2018 report:

	A	B	C	D	AA	AB	AC
1	COUNTRY /		Country A	Country B	Country Y	Country Z	Totals
2	DEPARTMENT						
3	Alternative certification	Seafarers	numbers of masters and officers in the alternative certification for each country and total for all countries retrieved from the data base				
4		% Dept	=C3/AC3	=D3/AC3	=AA3/AC3	=AB3/AC3	
5		% Country	=C3/C15	=D3/D15	=AA3/AA15	=AB3/AB15	
6		% Totals	=C3/AC15	=D3/AC15	=AA3/AC15	=AB3/AC15	=AC3/AC15
7	Deck Department	No. Officers	numbers of masters and officers in the deck department for each country and total for all countries retrieved from the data base				
8		% Dept	=C7/AC7	=D7/AC7	=AA7/AC7	=AB7/AC7	
9		% Country	=C7/C15	=D7/D15	=AA7/AA15	=AB7/AB15	
10		% Totals	=C7/AC15	=D7/AC15	=AA7/AC15	=AB7/AC15	=AC7/AC15
11	Engine Department	Seafarers	numbers of masters and officers in the engine department for each country and total for all countries retrieved from the data base				
12		% Dept	=C11/AC11	=D11/AC11	=AA11/AC11	=AB11/AC11	
13		% Country	=C11/C15	=D11/D15	=AA11/AA15	=AB11/AB15	
14		% Totals	=C11/AC15	=D11/AC15	=AA11/AC15	=AB11/AC15	=AC11/AC15
15	Totals	Seafarers	Total number of masters and officers for each country and total for all countries retrieved from the data base				
16		% Totals	=C15/AC15	=D15/AC15	=AA15/AC15	=AB15/AC15	=AC15/AC15
17	CoC for both departments		=C5+C9+C13-1	=D5+D9+D13-1	=AA5+AA9+AA13-1	=AB5+AB9+AB13-1	=AC6+AC10+AC14-1

Figure 1 - (calculations behind the) Distribution of masters & officers holding valid CoCs per EU MS by Department

	A	B	C	D	AA	AB	AC
1	COUNTRY /		Belgium (BE)	Bulgaria (BG)	Slovenia (SI)	Slovakia (SK)	Totals
2	DEPARTMENT						
3	Alternative certification	Seafarers	0	0	0	0	2,975
4		% Dept	0.00%	0.00%	0.00%	0.00%	
5		% Country	0.00%	0.00%	0.00%	0.00%	
6		% Totals	0.00%	0.00%	0.00%	0.00%	1.70%
7	Deck Department	No. Officers	1,517	1,627	187	33	107,146
8		% Dept	1.42%	1.52%	0.17%	0.03%	
9		% Country	69.14%	53.38%	58.81%	51.56%	
10		% Totals	0.87%	0.93%	0.11%	0.02%	61.30%
11	Engine Department	Seafarers	678	1,423	131	31	73,453
12		% Dept	0.92%	1.94%	0.18%	0.04%	
13		% Country	30.90%	46.69%	41.19%	48.44%	
14		% Totals	0.39%	0.81%	0.07%	0.02%	42.03%
15	Totals	Seafarers	2,194	3,048	318	64	174,780
16		% Totals	1.26%	1.74%	0.18%	0.04%	100.00%
17	CoC for both departments		0.05%	0.07%	0.00%	0.00%	5.03%

Figure 2 – Distribution of masters & officers holding valid CoCs per EU MS by Department

It is to be noted that in the tables, the number of columns depends of the data made available by the Member States, which can vary from one valid year to the other, depending on the number of certificates valid in that country within that period. Should a Member State have no valid certificates in a specific valid year, the column for that Member State is not generated by the current reporting tool. The same behaviour can be observed when

analysing country of nationality or country issuing the original CoC, as the number of countries can vary from one valid year to the other.

The information derived from the calculations mentioned above and found in the annual report, is referenced in the following sections, whenever possible. Within these the contractor can find the combinations of data that are retrieved through the crosstabs extracted from the system using the current reporting tool and that the contractor shall, as a minimum, develop. Some might eventually also be made available to the public users. The tables shall be produced based on different filters such as, but not limited to, Valid YEAR or interval of years; type of document held by the seafarers; country or group of countries from which the data is to be analysed. Some of these combinations may imply creating more than one crosstab for the analysis to be completed, especially when analysing the data at country, country group (EU/non-EU) or regional (Africa, Americas, Asia, ...) level.

The filters mentioned in the figures sections above are likewise used while building the crosstabs from where the numbers in the tables derive. Therefore no reference to them is again being made in order to avoid repeating the information.

For an example of a simplified crosstab extracted from the system please refer to Appendices A to C annexed to the 2018 report.

4.2.1 Masters and officers holding valid certificates of competency: data extracted from table STATISTICS.COC

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
Country / Department	Sections 2.1.1 and 2.1.3 Table 2-1	Number/Percentage (partial = per country and totals = per all countries): by country and by department; Percentage of seafarers in both departments	Total number of masters and officers holding CoCs at EU level = 174,780 ; 5.03% held CoCs entitling them to serve in both the Deck and Engine Departments.
Country/ Deck capacities	Section 2.1.4.1 Table 2-2	Number/Percentage (partial and totals) by country and by deck capacities with applicable limitations	55.25% of the total number of masters and chief mates were entitled to serve on ships of 3,000 GT or more, with 2.45% and 1.81% of their CoCs being limited in terms of gross tonnage and area of navigation, respectively.
Country/ Engine capacities	Section 2.1.4.2 Table 2-3	Number/Percentage (partial and totals) by country and by engine capacities with applicable limitations	58.91% of the engineer officers were entitled to serve at management level on ships of 3,000 kW or more, with 4.83% , 27.64% and 3.98% of their CoCs being limited in terms of propulsion power, type of engine and area of navigation, respectively.
Country/ Gender	Section 2.1.5 Table 2-4	Number/Percentage (partial and totals) by country and by gender; percentage of officers of which gender is known; interval of confidence for a maximum error of 99%	The review on gender distribution was made for 145,647 masters and officers representing 83.33% of the total number of officers holding valid CoCs. Male masters and officers represented 81.52% of the total

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
			number of officers holding valid CoCs. With a level of confidence of 99% the percentage of female masters and officers was 2.17% ± 0.14% compared to 97.83% ± 0.14% of male masters and officers.
Country/ Age	Section 2.1.7 Table 2-6	Number/Percentage (partial and totals) by country and by age interval; Average age by country and total age average	The average age of masters and officers holding valid CoCs was 43.4 (years). Age group under 25 counted 6,306 masters and officers. All other age groups counted from between 18,000 and 25,000 masters and officers.
Country/ Nationality	Section 2.1.6 Table 2-5	Number/Percentage (partial and totals) by country and by geographical region of the country of nationality (or EU and non-EU or country name);	Information on nationality was available for 170,960 masters and officers, representing 97.81% of the total number of officers at EU level. 13,146 nationals of 102 non-EU countries held valid CoCs as masters or officers issued by EU Member States. 81.62% of the non-EU nationals holding valid CoCs issued by the EU Member States were nationals of countries located in Asia.
Gender/ Department	Section 2.1.5	Number/Percentage (partial and totals) by gender and by department; Percentage of seafarers in both departments	In the case of male masters and officers, 60% of them were entitled to serve in the Deck Department and 40% of them were entitled to serve in the Engine Department. 86.60% of female masters and officers were entitled to serve in the Deck Department.
Age/ Department	Section 2.1.7 Table 2-6	Number/Percentage (partial and totals) by age interval/average age and by department; Percentage of seafarers in both departments	75.76% of the officers holding certificates issued under Chapter VII, 'Alternative certification' of the STCW Convention were younger than 35 years of age ; The masters and officers certified under Chapter II (Deck Department) and Chapter III (Engine Department) of the STCW Convention were evenly distributed throughout the age groups other than 18-24 years of age; 57.40% of masters and deck officers and 52.81% of the engineer officers were younger than 45 years of age .

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
Nationality/ Department		Number/Percentage (partial and totals) by geographical region of the country of nationality (or EU and non-EU or country name) and by department; Percentage of seafarers in both departments	
Gender/ Deck capacities	Section 2.1.5	Number/Percentage (partial and totals) by gender and by deck capacities; Percentage of seafarers with more than one capacity	The three main capacities in which female officers were entitled to serve were 'OOW' (29.30%), 'Chief Mate' (18.39%) and 'Chief Mate 3,000 GT' (17.84%), capacities representing 65.52% of the total number of female masters and officers entitled to serve in the Deck Department. The three main capacities in which male masters and officers were entitled to serve were 'Master' (39.61%), 'OOW' (19.85%) and 'Chief Mate' (14.82%), capacities representing 74.29% of the total number of male masters and officers entitled to serve in the Deck Department.
Gender/ Engine capacities	Section 2.1.5	Number/Percentage (partial and totals) by gender and by engine capacities; Percentage of seafarers with more than one capacity	The three main capacities in which female officers were entitled to serve in the Engine Department were 'OEW' (52.07%), 'Chief Engineer' (21.82%) and 'Second Engineer' (18.02%). These capacities represented 91.90% of the total number of female officers entitled to serve in the Engine Department. The three main capacities in which male officers were entitled to serve in the Engine Department were 'Chief Engineer' (41.05%), 'OEW' (24.02%) and 'Second Engineer' (17.13%). These capacities represented 82.21% of the total number of male officers entitled to serve in the Engine Department.
Age/ Deck capacities	Section 2.1.7 Table 2-8	Number/Percentage (partial and totals) by age interval/average age and by deck capacities;	62.07% of those entitled to serve as 'Master' were 45 years old or older ; 64.28% of those entitled to serve as 'Chief Mate' were between 25 and 40 years old ;

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
		Percentage of seafarers with more than one capacity; Average age by gender and by deck capacities	51.01% of those entitled to serve as 'Master 3,000 GT' were between 40 and 55 years old ; [...]
Age/ Engine capacities	Section 2.1.7 Table 2-9	Number/Percentage (partial and totals) by age interval/average age and by engine capacities; Percentage of seafarers with more than one capacity; Average age by gender and by engine capacities	50.72% of those entitled to serve as 'Chief Engineer' were 50 years old or older ; 56.04% of those entitled to serve as 'Second Engineer' were younger than 40 years of age ; 54.81% of those entitled to serve as 'Chief Engineer 3,000 kW' were 50 years old or older ; [...]
Nationality/ Deck capacities		Number/Percentage (partial and totals) by geographical region of the country of nationality (and/or EU and non-EU) and by deck capacities; Percentage of seafarers with more than one capacity	
Nationality/ Engine capacities		Number/Percentage (partial and totals) by geographical region of the country of nationality (and/or EU and non-EU) and by engine capacities; Percentage of seafarers with more than one capacity	
Age/ Gender	Section 2.1.7 Table 2-10	Number/Percentage (partial and totals) by age interval/average age and by department	The average age for female masters and officers was 33.5 years, while that for male masters and officers was 43.4 years; 77.63% of the female masters and officers were younger than 40 years of age , while the percentage of the male masters and officers in the same age group was only 42.95% ; The average age of female masters and deck officers (33.7 years) was higher than the average age of the female engineer officers (32 years)
Nationality/ Gender		Number/Percentage (partial and totals) by geographical region of the country of nationality (or EU and non-EU or country name) and by gender	
Nationality/ Age		Number/Percentage (partial and totals)	

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
		by geographical region of the country of nationality (or EU and non-EU or country name) and by age interval/average age	

4.2.2 Masters and officers holding valid endorsements attesting the recognition of their original certificates of competency: data extracted from table STATISTICS.EAR

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
Country / Department	Sections 2.2.1 and 2.2.4	Number/Percentage (partial = per country and totals = per all countries): by country and by department; Percentage of seafarers in both departments	See 4.2.1, as applicable. All crosstabs generated in this section shall be generated per group of countries issuing the original CoC: EU and non-EU. Other crosstabs shall also be generated for EU plus non-EU issuing countries
Country/ Deck capacities	Section 2.2.5.1 Table 2-14	Number/Percentage (partial and totals) by country and by deck capacities with applicable limitations	
Country/ Engine capacities	Section 2.2.5.2 Table 2-13	Number/Percentage (partial and totals) by country and by engine capacities with applicable limitations	
Country/ Gender	Section 2.2.6	Number/Percentage (partial and totals) by country and by gender; percentage of officers of which gender is known; interval of confidence for a maximum error of 99%	
Country/ Age	Section 2.2.8	Number/Percentage (partial and totals) by country and by age interval; Average age by country and total age average	
Country/ Nationality	Section 2.2.7	Number/Percentage (partial and totals) by country and by geographical region of the country of nationality (or EU and non-EU or country name)	
Gender/ Department		Number/Percentage (partial and totals) by gender and by department;	

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
		Percentage of seafarers in both departments	
Age/ Department	Section 2.2.8 Table 2-17	Number/Percentage (partial and totals) by age interval/average age and by department; Percentage of seafarers in both departments	
Nationality/ Department		Number/Percentage (partial and totals) by geographical region of the country of nationality (or EU and non-EU or country name) and by department; Percentage of seafarers in both departments	
Gender/ Deck capacities		Number/Percentage (partial and totals) by gender and by deck capacities; Percentage of seafarers with more than one capacity	
Gender/ Engine capacities		Number/Percentage (partial and totals) by gender and by engine capacities; Percentage of seafarers with more than one capacity	
Age/ Deck capacities	Section 2.2.8 Table 2-19	Number/Percentage (partial and totals) by age interval/average age and by deck capacities; Percentage of seafarers with more than one capacity; Average age by gender and by deck capacities	
Age/ Engine capacities	Section 2.2.8 Table 2-18	Number/Percentage (partial and totals) by age interval/average age and by engine capacities; Percentage of seafarers with more than one capacity; Average age by gender and by engine capacities	
Nationality/ Deck capacities		Number/Percentage (partial and totals) by geographical region of the country of nationality (or EU and non-EU or country name) and by deck capacities; Percentage of seafarers with more than one capacity	

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
Nationality/ Engine capacities		Number/Percentage (partial and totals) by geographical region of the country of nationality (or EU and non-EU or country name) and by engine capacities; Percentage of seafarers with more than one capacity	
Age/ Gender	Table 2-20	Number/Percentage (partial and totals) by age interval/average age and by department	
Nationality/ Gender		Number/Percentage (partial and totals) by geographical region of the country of nationality (and/or EU and non-EU) and by gender	
Nationality/ Age		Number/Percentage (partial and totals) by geographical region of the country of nationality (or EU and non-EU or country name) and by age interval/average age	
Country/ Country issuing original CoC	Section 2.2.3 Tables 2-11, 2-15 and 2-16	Number/Percentage (partial and totals) by country and by country issuing the original CoC/geographical region of the country issuing the original CoC (EU or non-EU)	
Country issuing original CoC/ Department	Section 2.2.1 and 2.2.4 Table 2-12	Number/Percentage (partial and totals) by country issuing the original CoC/geographical region of the country issuing the original CoC (EU or non-EU) and by department; Percentage of seafarers in both departments	
Country issuing original CoC/ Deck capacities	Section 2.2.5.1	Number/Percentage (partial and totals) by country issuing the original CoC/geographical region of the country issuing the original CoC (EU or non-EU) and by deck capacities	
Country issuing original CoC/	Section 2.2.5.2	Number/Percentage (partial and totals) by country issuing the original CoC/geographical	

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
Engine capacities		region of the country issuing the original CoC (EU or non-EU) and by engine capacities	
Country issuing original CoC/ Gender	Section 2.2.6	Number/Percentage (partial and totals) by country issuing the original CoC/geographical region of the country issuing the original CoC (EU or non-EU) and by gender; percentage of officers of which gender is known; interval of confidence for a maximum error of 99%	
Country issuing original CoC/ Age	Section 2.2.8 Table 2-21	Number/Percentage (partial and totals) by country issuing the original CoC/geographical region of the country issuing the original CoC (EU or non-EU) and by age interval/average age	

4.2.3 Masters and officers available to serve on board EU Member State flagged vessels: data extracted from table STATISTICS.COC and STATISTICS.EAR

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
Country/ Type of document		Number/Percentage (partial = per country and totals = per all countries): by country and and by type of document (CoC and EaR)	See 4.2.1, as applicable.
Country issuing original CoC/ Department	Sections 2.3.1 and 2.3.2	Number/Percentage (partial and totals) by EU and non-EU country issuing the original CoC and by department; Percentage of seafarers in both departments	
Country issuing original CoC/ Deck capacities	Section 2.3.3.1	Number/Percentage (partial and totals) by EU and non-EU country issuing the original CoC and by deck capacities	
Country issuing original CoC/ Engine capacities	Section 2.3.3.2	Number/Percentage (partial and totals) by EU and non-EU country issuing the original CoC and by engine capacities	
Country issuing	Section 2.3.4	Number/Percentage (partial and totals)	

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
original CoC/ Gender		by EU and non-EU country issuing the original CoC and by gender; percentage of officers of which gender is known; interval of confidence for a maximum error of 99%	
Country issuing original CoC/ Age	Section 2.3.6	Number/Percentage (partial and totals) by EU and non-EU country issuing the original CoC and by age interval/average age; Average age by type (EU and non-EU) of country issuing the original CoC and by department/deck capacities/engine capacities/gender	
Country issuing original CoC/ Nationality	Section 2.3.5	Number/Percentage (partial and totals) by EU and non-EU country issuing the original CoC and by nationality (or by geographical region of the country of nationality); percentage of officers of which nationality is known	

4.2.4 Ratings holding valid certificates of proficiency: data extracted from table STATISTICS.COP

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
Country/ Department	Sections 2.4, 2.4.1 and 2.4.3	Number/Percentage (partial = per country and totals = per all countries): by country and by department; Percentage of seafarers in both departments	See 4.2.1, as applicable.
Country/ Deck capacities	Section 2.4.4 Table 2-22	Number/Percentage (partial and totals) by country and by deck capacities	
Country/ Engine capacities	Section 2.4.4 Table 2-22	Number/Percentage (partial and totals) by country and by engine capacities	
Country/ Gender	Section 2.4.5	Number/Percentage (partial and totals) by country and by gender; percentage of officers of which gender is known;	

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
		interval of confidence for a maximum error of 99%	
Country/Age	Section 2.4.7	Number/Percentage (partial and totals) by country and by age interval; Average age by country and total age average	
Country/ Nationality	Section 2.4.6	Number/Percentage (partial and totals) by and by geographical region of the country of nationality (or EU and non-EU or country name)	
Gender/ Department		Number/Percentage (partial and totals) by gender and by department; Percentage of seafarers in both departments	
Age/ Department		Number/Percentage (partial and totals) by age interval/average age and by department; Percentage of seafarers in both departments	
Nationality/ Department		Number/Percentage (partial and totals) by geographical region (or EU and non-EU or country name) of the country of nationality and by department; Percentage of seafarers in both departments	
Gender/ Deck capacities		Number/Percentage (partial and totals) by gender and by deck capacities; Percentage of seafarers with more than one capacity	
Gender/ Engine capacities		Number/Percentage (partial and totals) by gender and by engine capacities; Percentage of seafarers with more than one capacity	
Age/ Deck capacities		Number/Percentage (partial and totals) by age interval/average age and by deck capacities; Percentage of seafarers with more than one capacity;	

Title	Section/Table in the 2018 report	Values to be retrieved	Information in the report
		Average age by gender and by deck capacities	
Age/ Engine capacities		Number/Percentage (partial and totals) by age interval/average age and by engine capacities; Percentage of seafarers with more than one capacity; Average age by gender and by engine capacities	
Nationality/ Deck capacities		Number/Percentage (partial and totals) by geographical region (or EU and non-EU or country name) of the country of nationality and by deck capacities; Percentage of seafarers with more than one capacity	
Nationality/ Engine capacities		Number/Percentage (partial and totals) by geographical region (or EU and non-EU or country name) of the country of nationality and by engine capacities; Percentage of seafarers with more than one capacity	
Age/ Gender	Section 2.4.7	Number/Percentage (partial and totals) by age interval/average age and by department	
Nationality/ Gender		Number/Percentage (partial and totals) by geographical region (or EU and non-EU or country name) of the country of nationality and by gender	
Nationality/ Age		Number/Percentage (partial and totals) by geographical region (or EU and non-EU or country name) of the country of nationality and by age interval/average age	

Within their bids, bidders shall describe in as much detail as possible:

- How the reports will be implemented and how they will work;
- Proposed wireframes or mockups for possible solutions to present the reports selection criteria and generated report;
- Any other dashboard or report that is considered to add value to the sub-module.

4.3 Miscellaneous requirements

Finally, the contractor shall create additional ad hoc reports and comply with the following requirements, some of which are already mentioned in previous Sections:

- Ad hoc reports shall be built per valid year on:
 - Average age of seafarers by country, by department, by deck and engine capacities and by gender;
 - Age of seafarers;
 - Full list of the seafarer's country of nationality; and
 - Full list of countries issuing the seafarer's original CoC.
- Reports shall be created per valid year combining specific fields of data to allow for correlations to be made such as, but not limited to:
 - Age of seafarer AND highest capacity in which he/she is entitled to serve;
 - Gender of seafarer AND highest capacity in which he/she is entitled to serve.
- The contractor shall allow for specific calculations to be made using numbers obtained in turn from previous calculations, such as the levels of confidence presented by the variables containing unknown values at their origin (such as in gender);
- Filters such as VALID_YEAR, COUNTRY_ID shall be available in all crosstabs;
- VALID_YEAR can vary and therefore crosstabs on different valid years shall be created;
- For the purpose of the calculations, Norway's and Iceland's data is to be processed together with the EU Member States' data. However, it will be an advantage if they can also be analysed as a third group (EFTA group) making possible for the analysis to be focused on these two countries should the user decide to do so;
- Crosstabs shall be able to be built with or without the "Not available" value within some of the variables such as Gender and Nationality;
- Filters on the different fields and aggregation of different possibilities within the fields shall be available/possible for EMSA/public users;
- Reports shall be dynamic depending on the chosen Valid YEAR (compilation of five years' data);
- It shall be possible to have the results made available per each individual MS/EFTA country data, from a group of MSs/EFTA countries or from the total data;
- Attention should be given to the fact that the new web-based reporting module shall be available for public and private usage and that some of the reports produced in the private part might eventually also be made available to the public;
- Reports shall all be exportable to Excel and pdf.
- Sections 2.1.8, 2.2.9, 2.3.7 and 2.4.8 of the 2018 statistical report compare results from different valid years. The contractor shall build comparative tables that allow for these comparisons to be made and shall also be used for the purpose of building trends;
- The web-module shall be compatible with tablets.

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