European Maritime Safety Agency

Seafarers' Statistics in the EU

Statistical review (2019 data from the STCW-IS as provided by 31 December 2020)

EMSA.2021-JB4902
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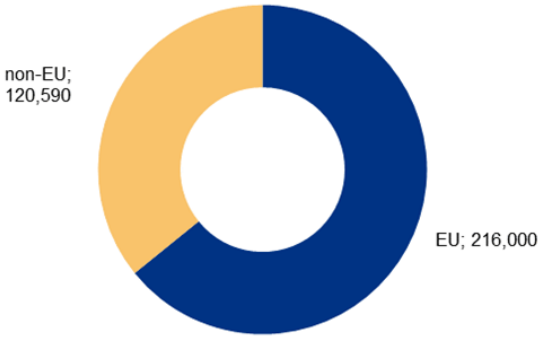
EMSA

Executive Summary

The amendments to Directive 2008/106/EC introduced by Directive 2012/35/EU established a mechanism for gathering information on certificates and endorsements issued to seafarers by the EU Member States. The objective is to use it as a primary source of data for statistical analysis and in support of the EU Member States, the Commission and the European Parliament in policy making.

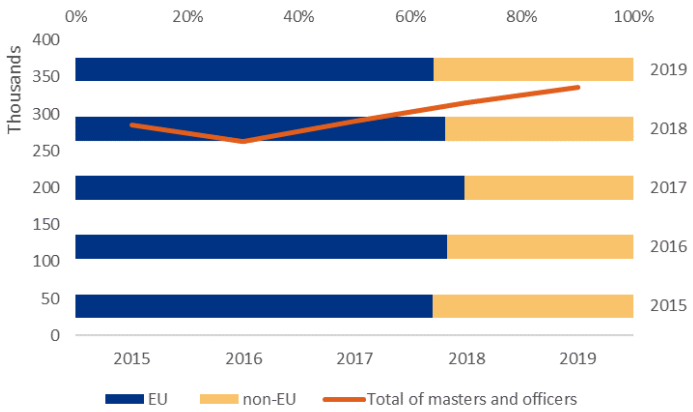
The statistical review presented in this report is based on data extracted from certificates and endorsements registered by EU Member States[1], Iceland and Norway until 31 December 2019. This data which was transferred and recorded in the STCW Information System (STCW-IS) until 31 December 2020, represents a snapshot of the European labour market in terms of the number of seafarers holding valid certificates and endorsements in 2019.

The data included in the STCW-IS shows that by end-2019, 216,000 masters and officers held valid certificates of competency (CoC) issued by EU Member States[2] while another 120,590 masters and officers held original CoCs issued by non-EU countries with endorsements issued by EU Member States attesting their recognition (EaR). Overall, the end of 2019 saw a third of a million masters and officers as potential manpower to serve on board EU Member State flagged vessels.



The five EU Member States that had more masters and officers holding CoCs issued by them in 2019 were the United Kingdom (30,217), Greece (21,850), Poland (20,829), Norway (18,793) and Croatia (14,962). In addition, the five EU Member States that had more masters and officers holding EaRs issued were Malta (72,601), Cyprus (29,973), Norway (16,074), Portugal (14,714) and the Netherlands (11,630). Finally, the five non-EU countries which had more masters and officers holding CoCs recognised by EU Member States were the Philippines (46,114), Ukraine (26,057), the Russian Federation (17,380), India (10,544) and Turkey (5,548).

From the overview for the period 2014-2019, it can be observed that since 2016 there has been an increase of more than 70,000 masters and officers available to serve on board EU Member States flagged vessels. Nevertheless, the overall figures remained broadly stable in terms of distribution by country issuing the original CoC. The figures remained stable also in terms of distribution of masters and officers by department, capacity, gender, nationality and age. This stability may continue to indicate that, in general terms, the European maritime labour market has been able to attract new entrants that have replaced those leaving the seafaring career.



[1] The United Kingdom is included in this report, as the data analysed refer to pre-BREXIT context. Austria does not issue certificates and endorsements to seafarers and therefore is excluded from this report.
[2] Hereinafter, and unless otherwise specified, reference to EU or EU Member State(s) is to be taken as including also Norway and Iceland.

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List of Abbreviations

CoC	Certificate of Competency
CoP	Certificate of Proficiency
EaR	Endorsement attesting the recognition of a foreign certificate of competency
EC	European Commission
EFTA	European Free Trade Association
EMSA	European Maritime Safety Agency
ETO	Electro-technical Officer
ETS	Exponential Triple Smoothing
EU	European Union
GT	Gross Tonnage
kW	kilowatts
ML	Management level
NCV	Near Coastal Voyages
OEW	Officer in charge of an engineering watch
OL	Operational level
OOW	Officer in charge of a navigational watch
STCW Convention	The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended
STCW-IS	STCW Information System, hosted and managed by EMSA

1. Introduction

1.1 Legal background

The EMSA Founding Regulation[3] establishes in its Article 2 that "The Agency shall facilitate cooperation between the Member States and the Commission in gathering and analysing data on seafarers, provided and used in accordance with Directive 2008/106/EC of the European Parliament and of the Council of 19 November 2008 on the minimum level of training of seafarers [4]".

Article 25a of Directive 2008/106/EC, as amended, establishes that "information shall be made available by Member States to the Commission on a yearly basis and in electronic format and shall include information registered until 31 December of the previous year". Norway and Iceland (Members of the European Free Trade Association States) are similarly bound by this obligation. This data is recorded in the STCW Information System (STCW-IS), developed and hosted in EMSA.

1.2 Data collection, analysis and beneficiaries

The statistical review presented in this report is based on data extracted from certificates and endorsements registered by EU Member States, Norway and Iceland until 31 December 2019, and received in the STCW-IS until 31 December 2020. This sixth review presents a snapshot of the number of seafarers holding valid certificates and endorsements in 2019. It should be noted that, because the data extracted from the national registers held by EU Member States did not include any information on whether the holders were active or not, it was not possible to determine how many of them were working on board vessels during 2019.

Section 2.5 provides an overview of data throughout the years with the objective of having a wide picture of the number of masters and officers available to serve on board EU Member State flagged vessels through trend analysis and forecasting the numbers for the next two years.

Due to the inclusion of data from Norway and Iceland and in order to simplify the text for the reader, where the wording EU or EU Member State(s) appears in respect of information from 2017 onwards, this is to be taken as including Norway and Iceland.

The main beneficiaries of this statistical review are the EU Member States, the Commission and the European Parliament for policy-making purposes. Ship owners and ship operators may continue to derive added value in terms of knowing the magnitude of manpower available in the EU to crew their vessels. The information provided in this review is also intended to be useful to maritime education and training institutions in the EU and could facilitate estimating market needs for their services. Researchers may also be interested in some of the statistical outputs, as well as seafarers and the organisations that represent them.

1.3 Accuracy

The information in this review must be qualified by the limitation in EMSA's ability to gauge the margin of error in the data extraction processes undertaken at EU Member States' level. Some inconsistencies were in fact identified during the validation phase at EMSA, demonstrating that in some cases seafarers' names and/or document numbers might have been registered as different strings by different EU Member States. Upon request, EMSA also proceeded to the replacement of previous years' data in cases where inconsistencies were detected by the EU Member States themselves. As with previous reviews, corrections were also made in the 2019 reported data on seafarers' gender when different genders were attributed to the same seafarer within the same country. In the case of seafarers reported as holding different genders between different countries, a query is under development to identify and correct these inconsistencies.

The original data received from the EU Member States included fields such as gender, nationality and the capacity together with its associated limitations. The information was made available in these fields as free text and consequently had to be encoded to ensure data harmonisation and comparability of data. In order to estimate the human error introduced through this process, an automatic sample was selected from the data made available by each EU Member State and was validated by a different operator at EMSA, thus maximising the widest possible

[3] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002R1406
[4] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0106

number of errors to be identified during the verification process. The dimension of the sample was established by the formula:

$$n = \frac{z^2 * 0.25 * N}{(N-1) * E^2 + 0.25 * z^2}$$

where,

n – is the dimension of the sample (number of documents to be randomly selected);

N – is the total number of documents belonging to the selected country;

z – is the level of confidence;

E – is the maximum amplitude of the error.

A level of confidence of 90% (z = 1.645) and an amplitude of error (E) of 1% were established for the evaluation of the errors introduced by human intervention during the coding process. This ensured a negligible level of error when coding the free text received into STCW-IS internal values, especially when considering that every identified error is consequently corrected not only within the sampled data but also in the whole data set.

1.4 Coherence and comparability

The information considered in this review comprised data from 27 EU Member States (Austria does not issue certificates and endorsements to seafarers), including the United Kingdom that in 2019 was still a member of the EU and two EFTA countries (Norway and Iceland).

It is to be noted that while measures have been taken to safeguard information subject to data protection rules (please see 1.6 below), said measures still maintained intact the possibility for data in its encrypted form to be analysed and compared.

In order to ensure comparability of the data received from various sources, all data was subject to a coding process, which ensured that all fields received as free text were linked to predefined internal values.

Taking into account the diversity of the capacities established by the national manning regulations, the information received on capacities in which the seafarers were entitled to serve, together with their associated limitations, was converted during the data coding at EMSA into generic capacities as defined by the STCW Convention. In order to keep the coherence, EMSA applied the criteria already used in previous statistical reviews when converting the data during the coding process.

It is to be noted that in the case of masters and officers, their total does not tally with the sum of the total number of masters and deck officers plus the total number of engineer officers. The reason for this is that some masters and officers may hold certificates for both the Deck and the Engine Departments. Furthermore, because a person may hold certificates/endorsements issued by different EU Member States, the sum of the number of masters and officers registered by individual EU Member States may not be equal to the total number of masters and officers at EU level.

1.5 Accessibility and clarity, dissemination format

User access to information featured in this report is restricted to the content of this written report. No direct access may be granted to the original data upon which the statistical compilation is based. EU Member States retain all property rights to the information in its raw data format and could amend their data at any time before its processing began. Detailed statistics may be compiled by EMSA upon request from the European Commission and the EU Member States, based on agreed terms of reference.

This report is published on the STCW-IS portal (https://portal.emsa.europa.eu/web/stcw) and on the EMSA website.

1.6 Confidentiality

All publicly available statistics fully comply with the obligations established in Article 4 of EMSA's Founding Regulation[5], as amended and Regulation (EU) 2018/1725[6] of the European Parliament and of the Council on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data. In order to ensure the safeguarding of personal information subject to data protection, EMSA developed and made available to the EU Member States, Norway and Iceland an anonymisation software module which converts all personal data – such as seafarer's name, seafarer's unique identifier and certificate/ endorsement number – extracted in its raw format from the national registries, into anonymous strings of characters by using a powerful encryption algorithm. The data anonymised at source is received and compiled by EMSA in its encrypted format.

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002R1406
[6] https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32018R1725

2. Statistical processing

The data subject to this review was extracted from the national registries on certificates and endorsements issued to seafarers and maintained by the EU Member States. Taking into account the diversity of technologies used to register such data, each EU Member State developed a data extractor module to retrieve the information established in Annex V to Directive 2008/106/EC in a structured format defined by the technical specifications made available by EMSA. As noted above, the data extracted was subject to a preliminary validation process to ensure consistency and to an encryption process by which all personal data was made anonymous at the EU Member State site.

Only documents with a valid status were considered (in principle, an EU Member State may provide information on all documents registered, including those suspended, cancelled, declared lost or destroyed).

For the last six years, EMSA has compiled the data received to allow the possibility of having a wide picture on the number of masters and officers available to serve on board EU Member States flagged vessels. These include those holding CoCs issued by EU Member States and those holding EaRs issued by EU Member States recognising non-EU CoCs. A broader view on the number of masters and officers holding EaRs recognising CoCs issued by other EU Member States and on the number of ratings holding CoPs was also possible.

Given the more accurate view that is possible with the build-up of data collected over more years, trend analysis and forecasting are also included in this review in section 2.5.

As a raw anticipation of what will be presented in the following sections, it can be stated that in recent years the absolute number of masters and officers holding CoCs and EaRs and of ratings holding CoPs – and thereby of those available to serve on board EU Member States flagged vessels – has been on the increase. From Figure 2-1 it can be observed that apart from an increase since 2016 of more than 70,000 masters and officers, overall figures remained broadly stable in terms of distribution by country issuing the original CoC. The figures also remained stable in terms of distribution by department, capacity, gender, nationality and age when reviewing the numbers of masters, officers and ratings per type of certificate held (2019 data in sections 2.1, 2.2 and 2.4) and also when reviewing the availability of masters and officers at EU level (2019 data in section 2.3 and a compiled overview in section 2.5). This stability may continue to indicate that, in general terms, the European maritime labour market has been able to attract new entrants who have replaced those leaving the seafaring career.

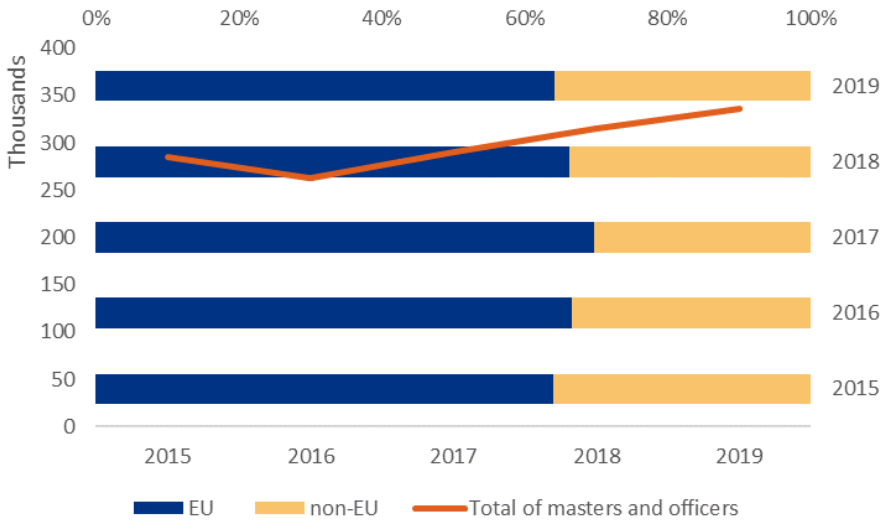

Figure 2-1 Masters and officers available at EU level over the years per country issuing the original CoC

The following contents of the report provide a more detailed analytical snapshot of the individual elements of this overview as of 2019, followed by a trend analysis and forecasting.

2.1 Masters and officers holding valid certificates of competency in 2019

2.1.1 Total

The total number of masters and officers holding valid certificates of competency (CoC) at EU level was 216,000. Of these, 3.55% held CoCs entitling them to serve in both the Deck and Engine Departments. In addition, just a very limited number of them (0.07%) held CoCs issued by more than one EU Member State.

2.1.2 Distribution by EU Member State

The data in Figure 2-2 shows the distribution of masters and officers as registered by EU Member State:

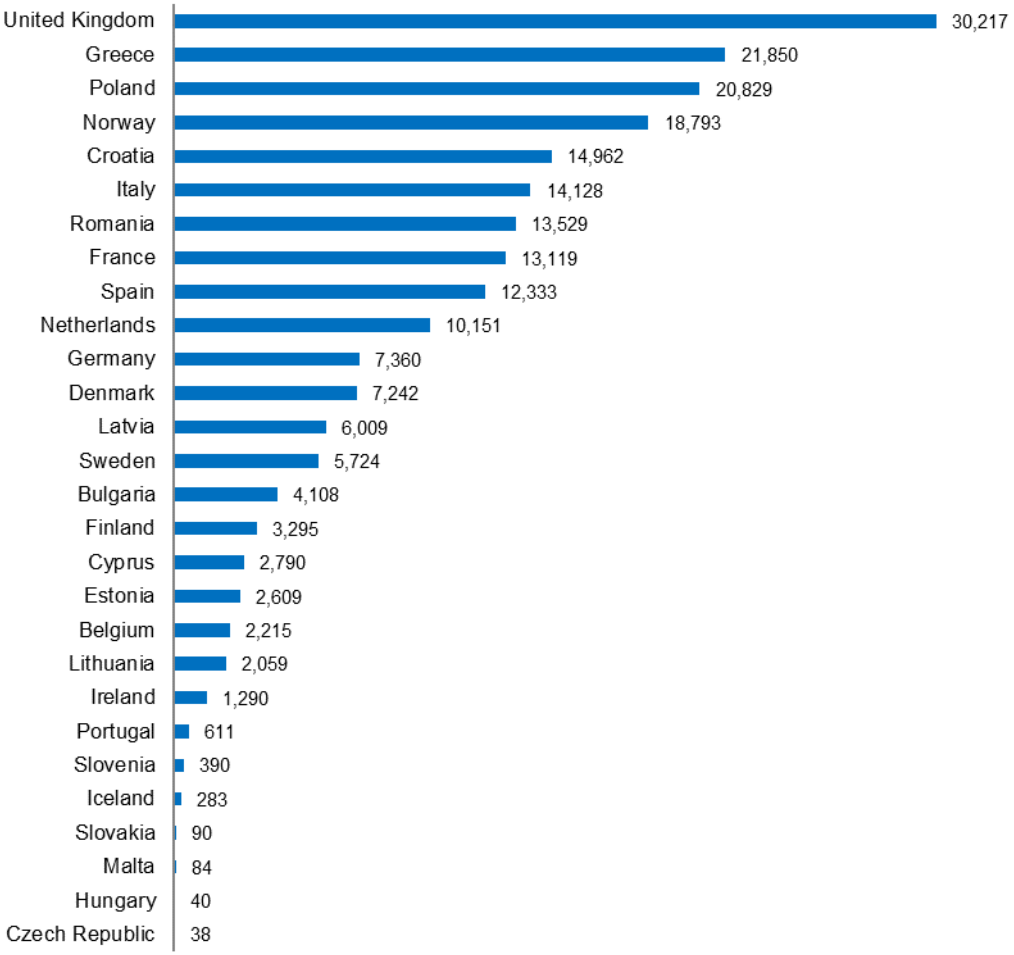

Figure 2-2 Masters and officers holding valid CoCs per EU Member State

2.1.3 Distribution by department

The number of masters and officers holding valid CoCs in each department is presented in Figure 2-3. It illustrates that the number of masters and officers entitled to serve in the Deck Department (Chapter II of the STCW Convention) was 44% higher than the number of officers entitled to serve in the Engine Department (Chapter III of the STCW Convention). The officers grouped under 'Alternative certification' (Chapter VII of the STCW Convention) were reported as holding a multipurpose capacity.

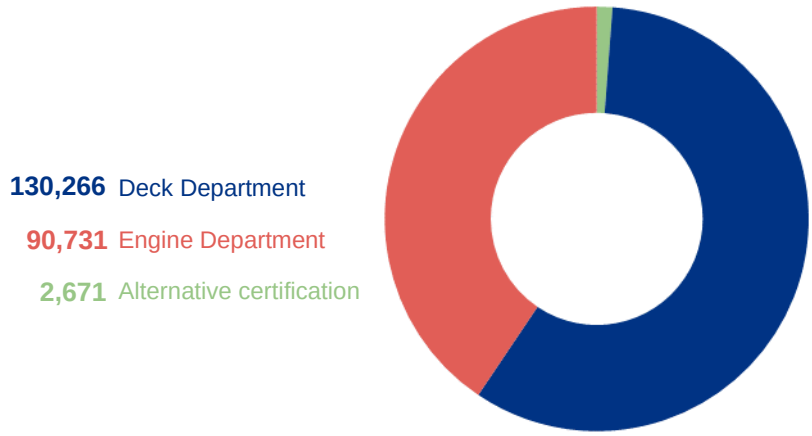

Figure 2-3 Distribution of masters and officers holding valid CoCs by department

The distribution by department within each EU Member State is presented in Figure 2-4.

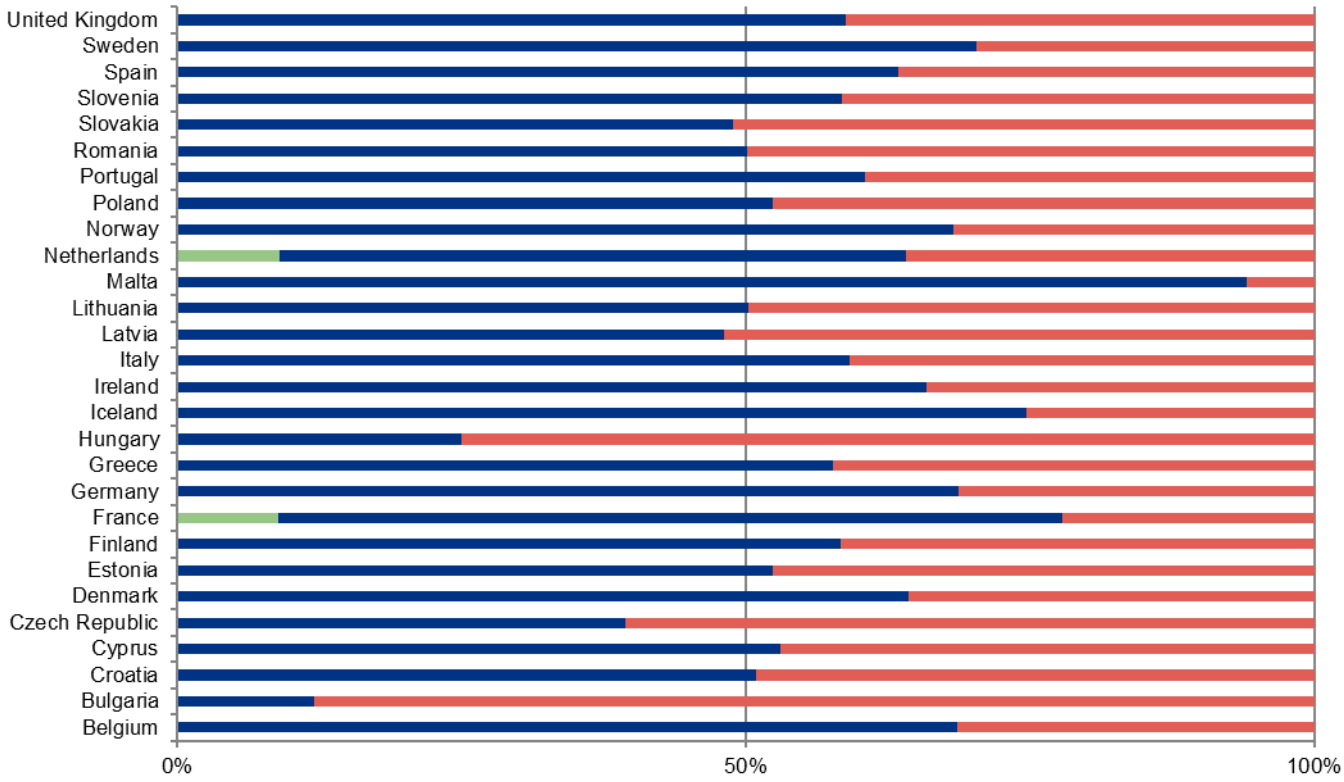

Figure 2-4 Distribution of masters and officers holding valid CoCs by department in each EU Member State

2.1.4 Distribution by capacity

Taking into account that EU Member States do not use the same terms to refer to capacities in their manning regulations, all capacities reported in the CoCs have been linked to the generic capacities established in Chapters II and III of the STCW Convention, in order to establish a common platform for data comparability. The review was conducted separately for the Deck and the Engine Departments. The total number of masters and officers was established by counting each person in his/her highest capacity.

2.1.4.1 Distribution by deck capacity

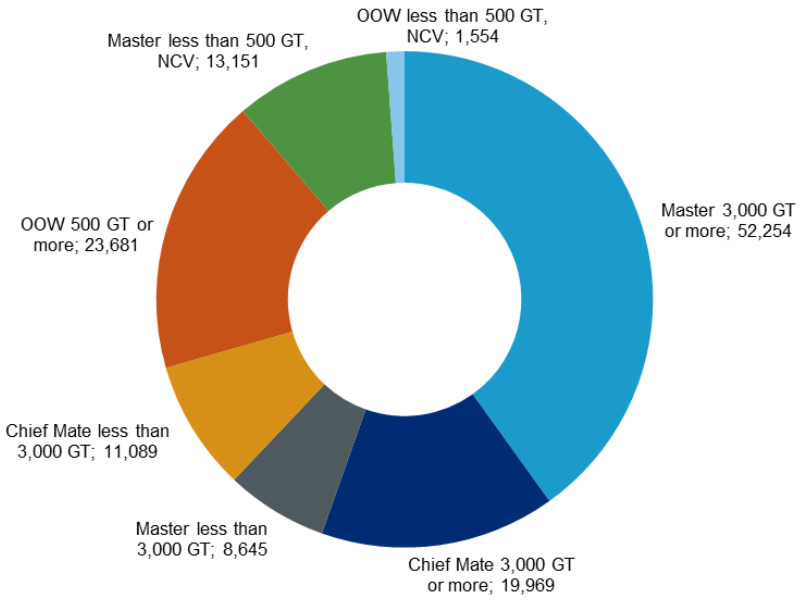

Figure 2-5 Distribution of masters and deck officers holding valid CoCs by deck capacity

The data in Figure 2-5 shows that 55.44% of the deck officers were entitled to serve at management level on ships of 3,000 GT or more, with 1.73% and 1.29% of their CoCs being limited in terms of gross tonnage and area of navigation, respectively.

2.1.4.2 Distribution by engine capacity

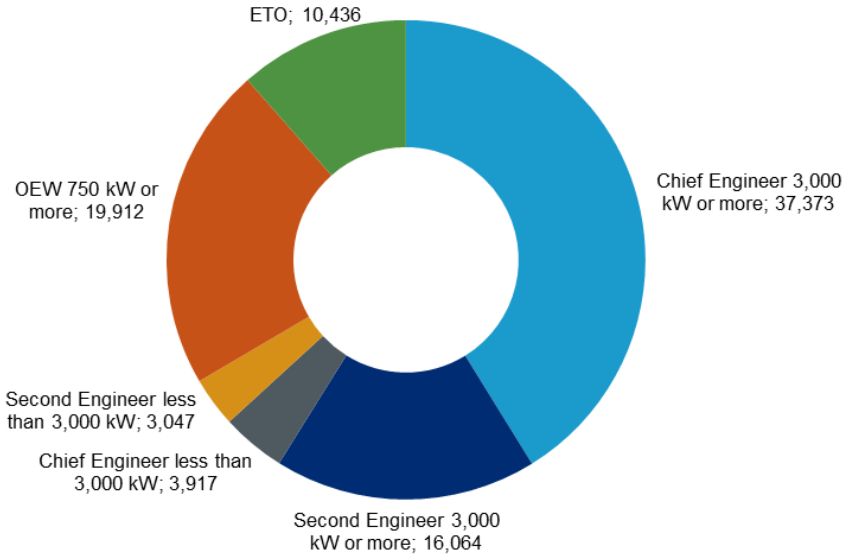

Figure 2-6 Distribution of engineer officers holding valid CoCs by engine capacity

The data in Figure 2-6 shows that 58.90% of the engineer officers were entitled to serve at management level on ships of 3,000 kW or more, with 4.72%, 44.34% and 5.14% of their CoCs being limited in terms of propulsion power, type of engine and area of navigation, respectively.

2.1.5 Gender distribution

Twenty-seven[7] out of the 28[8] EU Member States that provided data on masters and officers, made available information on gender. Consequently, the review on gender distribution covered 193,235 masters and officers representing 89.46% of the total number of officers holding valid CoCs in 2019 at EU level.

Considering the total number of masters and officers whose gender was known, it can be stated with a level of confidence of 99% that the percentage of female masters and officers was 2.28% ± 0.10% compared to 97.72% ± 0.10% of male masters and officers.

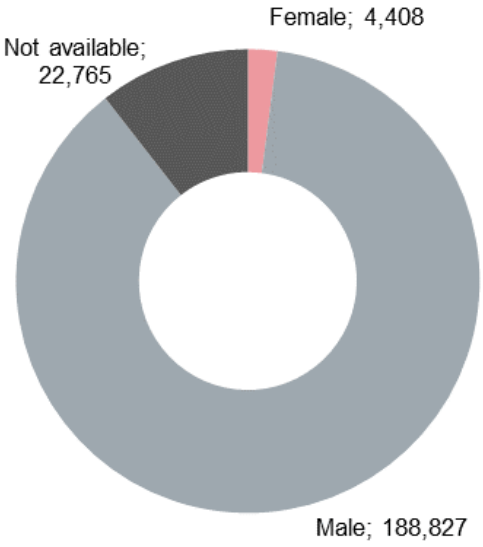

Figure 2-7 Gender distribution of masters and officers holding valid CoCs

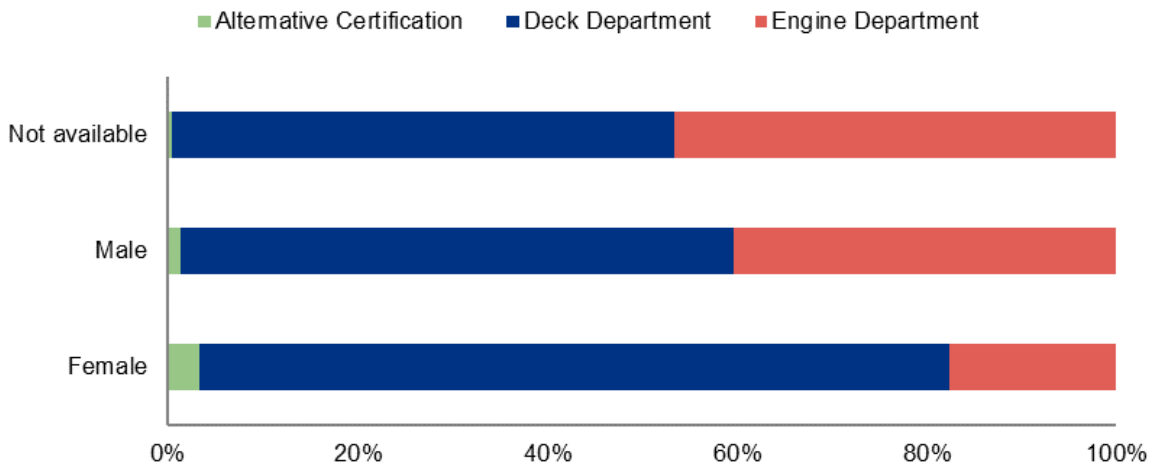

Figure 2-8 Distribution of masters and officers holding valid CoCs by department and by gender

The information presented in Figure 2-8 shows that male masters and officers follow a general distribution by department (60% entitled to serve in the Deck Department and 40% entitled to serve in the Engine Department) while most female masters and officers (85.78%) were entitled to serve in the Deck Department.

[7] Poland's data does not include information on gender.
[8] Luxembourg does not issue CoCs.

The distribution of the capacities of masters and deck officers holding valid CoCs by gender is presented in Figure 2-9.

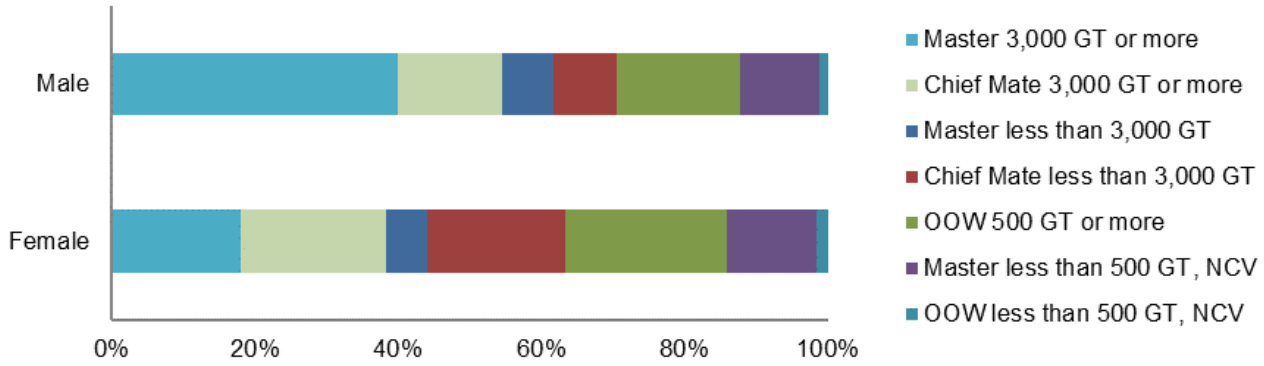

Figure 2-9 Distribution of the deck capacities of masters and deck officers holding valid CoCs by gender

As illustrated in Figure 2-9, the three main capacities in which female officers were entitled to serve were 'OOW 500 GT or more' (22.43%), 'Chief Mate 3,000 GT or more' (20.36%) and 'Chief Mate less than 3,000 GT' (19.44%), capacities representing 62.23% 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 3,000 GT or more' (40.05%), 'OOW 500 GT or more' (17.19%) and 'Chief Mate 3,000 GT or more' (14.55%), capacities representing 71.79% of the total number of male masters and officers entitled to serve in the Deck Department.

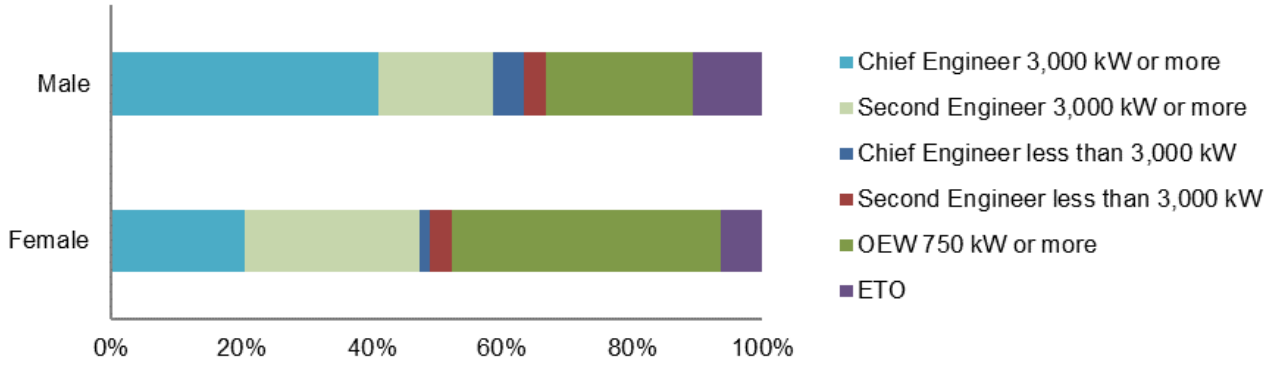

Figure 2-10 Distribution of the engine capacities of engineer officers holding valid CoCs by gender

As illustrated in Figure 2-10, the three main capacities in which female officers were entitled to serve in the Engine Department were 'OEW 750 kW or more' (41.38%), 'Second Engineer 3,000 kW or more' (26.87%) and 'Chief Engineer 3,000 kW or more' (20.57%). These capacities covered 88.82% 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 3,000 kW or more' (41.02%), 'OEW 750 kw or more' (22.43%) and 'Second Engineer 3,000 kW or more' (17.65%). These capacities represented 81.10% of the total number of male officers entitled to serve in the Engine Department.

2.1.6 Distribution by nationality

The review of the data received from 28[9] EU Member States issuing CoCs showed that information on nationality was available for 209,450 masters and officers, representing 96.97% of the total number of officers at EU level holding a CoC.

[9] Luxembourg does not issue CoCs.

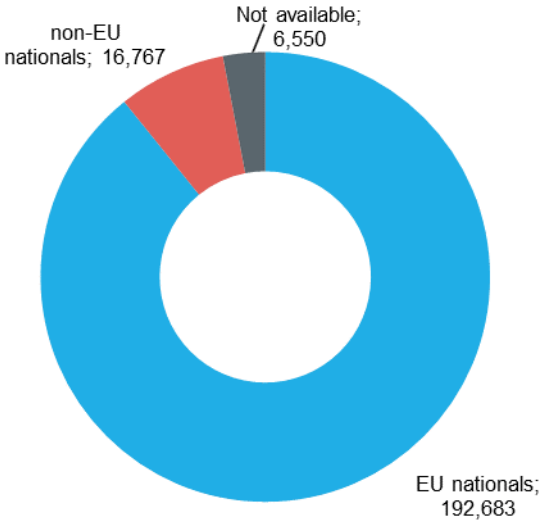

Figure 2-11 Nationality distribution of masters and officers holding valid CoCs

In addition to nationals of the EU Member States, 16,767 nationals of 115 non-EU countries held valid CoCs as masters or officers issued by EU Member States. When grouping these non-EU countries by region[10], it occurs that 16 were located in Europe, 34 were located in Asia, 33 were located in Africa, 26 were located in the Americas and 6 were located in the Oceania.

The distribution of the non-EU nationals holding valid CoCs issued by the EU Member States presented in Figure 2-12 shows that 82.93% of them were nationals of countries located in Asia.

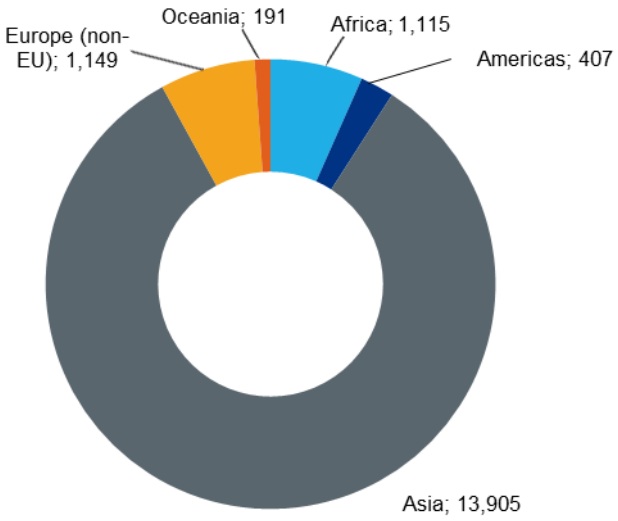

Figure 2-12 Nationality distribution of non-EU nationals holding valid CoCs issued by EU Member States by region of origin

2.1.7 Age distribution

The average age of masters and officers holding valid CoCs was 43.8 (years). Whereas the under 25 age group counted 6,803 masters and officers, all other age groups had a relatively uniform distribution, each counting between 21,300 and 31,400 masters and officers, which represented 10% to 15% of the total number.

[10] The grouping of countries per regions was based on the “Standard country or area codes for statistical use” established by the United Nations and the list of European countries established by the EU

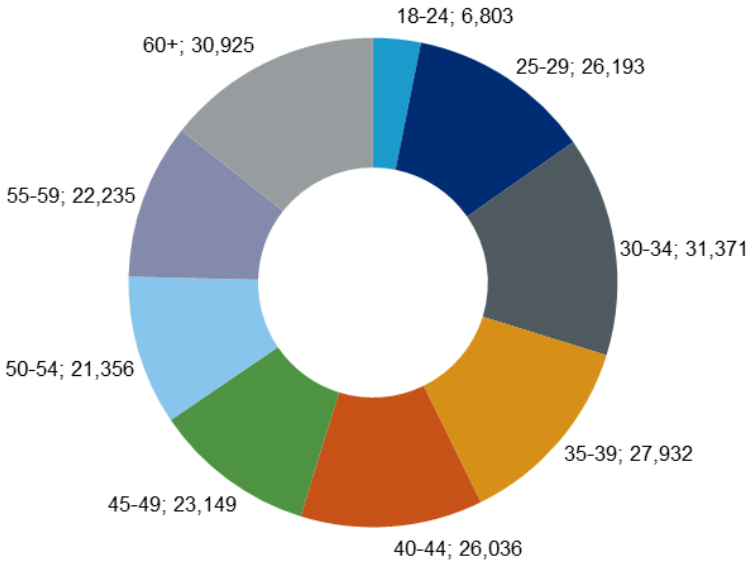

Figure 2-13 Age distribution of masters and officers holding valid CoCs

The age profile per department is presented in Figure 2-14.

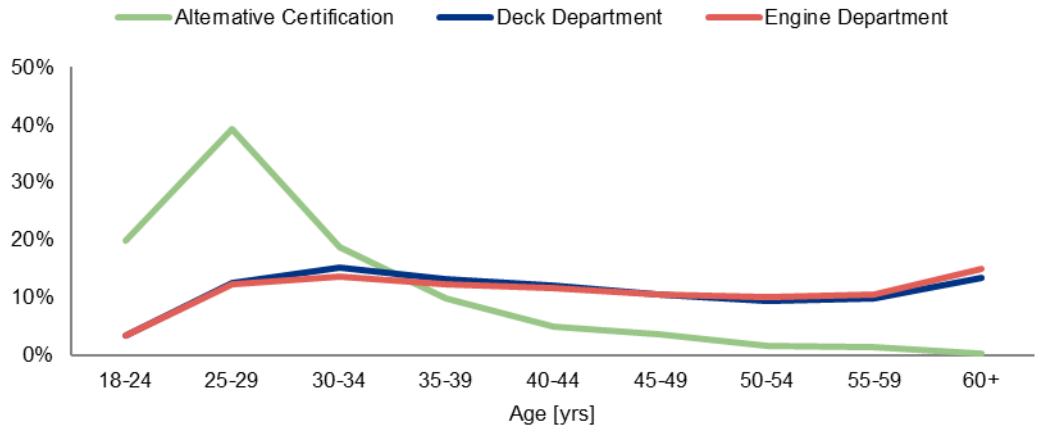

Figure 2-14 Age profile of masters and officers holding valid CoCs per department

Reviewing the data in Table 2-7 of Appendix A, the following conclusions could be stated:

- 77.84% of 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 the 18-24 years of age group;
- 56.51% of masters and deck officers and 53.62% of the engineer officers were younger than 45 years of age.

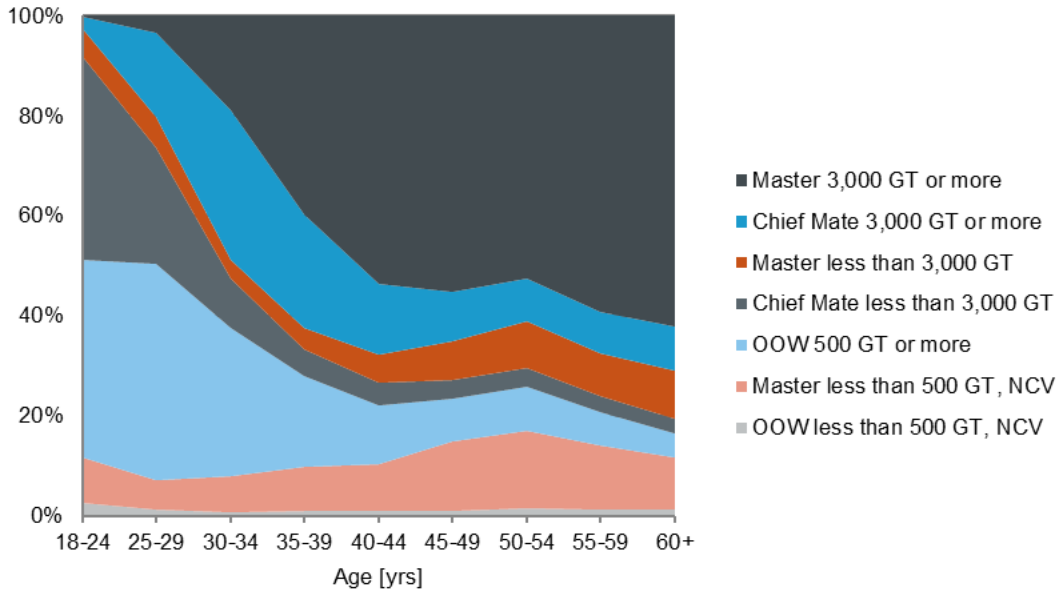

Figure 2-15 Distribution of masters and deck officers holding valid CoCs by age groups

Considering the highest capacity in which masters and deck officers were entitled to serve:

- 62.53% of those entitled to serve as 'Master 3,000 GT or more' were 45 years old or older;
- 63.45% of those entitled to serve as 'Chief Mate 3,000 GT or more' were younger than 40 years of age;
- 58.45% of those entitled to serve as 'Master less than 3,000 GT' were 45 years old or older;
- 50.65% of those entitled to serve as 'Chief Mate less than 3,000 GT' were younger than 30 years of age;
- 62.05% of those entitled to serve as 'OOW' 500 GT or more were younger than 35 years of age;
- 55.64% of those entitled to serve as 'Master less than 500 GT, NCV' were 45 years old or older; and
- 57.72% of those entitled to serve as 'OOW less than 500 GT, NCV' were older than 40 years of age.

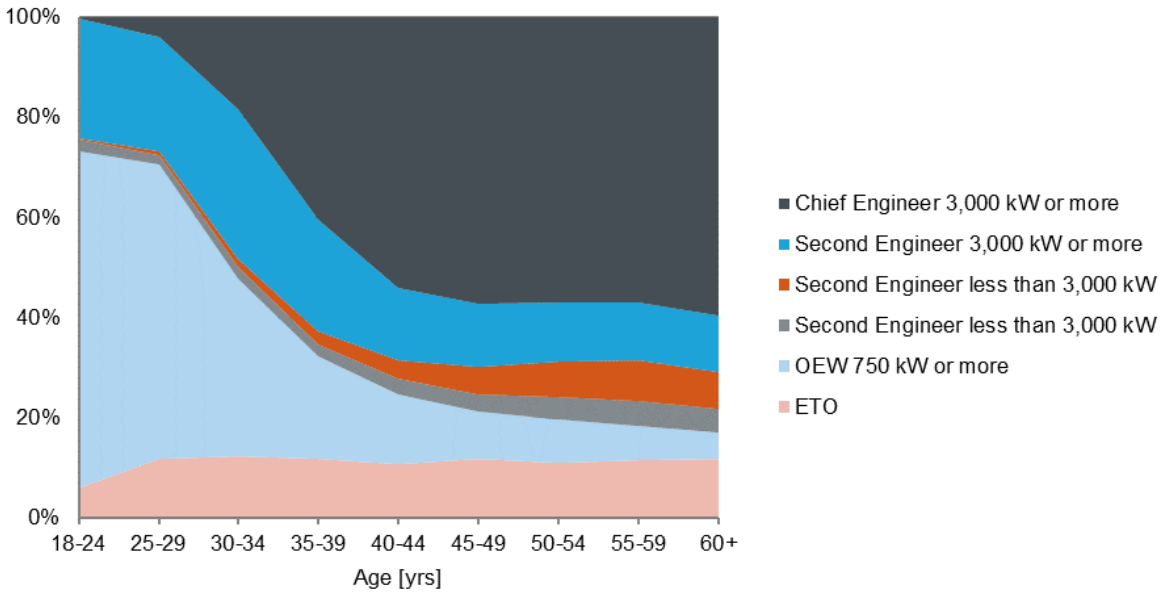

Figure 2-16 Distribution of engineer officers holding valid CoCs by age groups

Considering the highest capacity in which the engineer officers were entitled to serve:

- 65.13% of those entitled to serve as ‘Chief Engineer 3,000 kW or more’ were 45 years old or older;
- 59.49% of those entitled to serve as ‘Second Engineer 3,000 kW or more’ were younger than 40 years of age;
- 61.45% of those entitled to serve as ‘Chief Engineer less than 3,000 kW’ were 50 years old or older;
- 61.37% of those entitled to serve as ‘Second Engineer less than 3,000 kW’ were 45 years old or older;
- 65.62% of those entitled to serve as ‘OEW 750 kW or more’ were younger than 35 years of age; and
- 57.79% of those entitled to serve as ‘ETO’ were older than 40 years of age.

Figure 2-17 presents the age profile per gender, while Figure 2-18 and Figure 2-19 present the average age per capacity for each of the two gender groups. These figures indicate that:

- the average age for female masters and officers was 34.4 years, while that for male masters and officers was 43.6 years;
- 75.14% of 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 42.96%;
- the average age of female masters and deck officers (34.6 years) was higher than the average age of the female engineer officers (32.5 years).

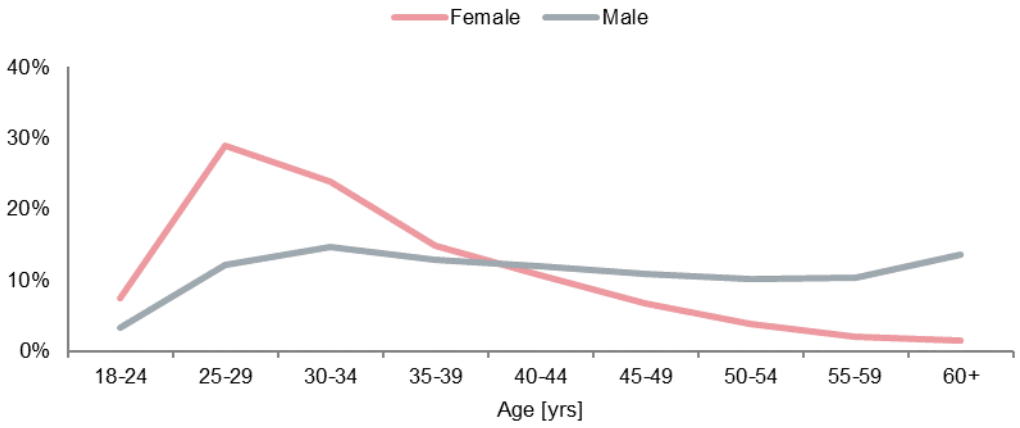

Figure 2-17 Age profile of masters and officers holding valid CoCs per gender

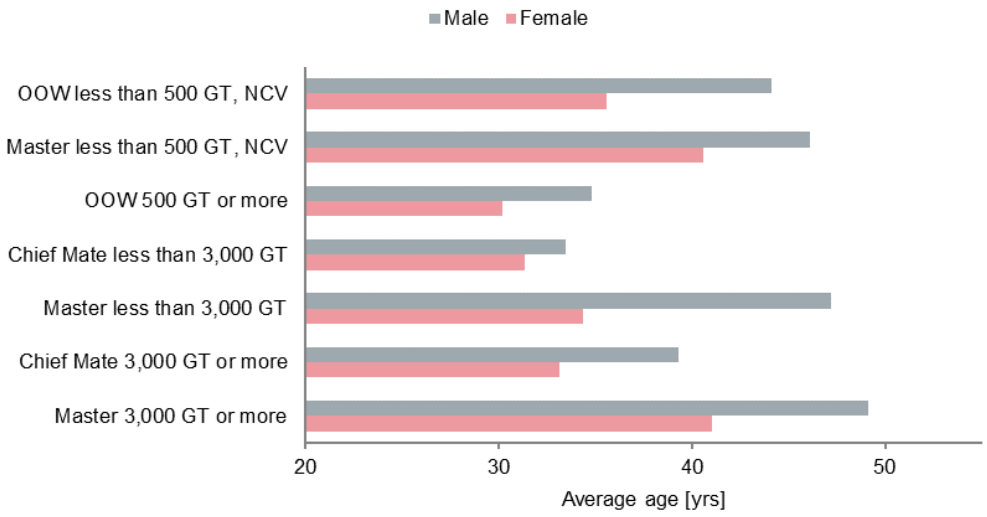

Figure 2-18 Average age of masters and deck officers holding valid CoCs per gender by deck capacity

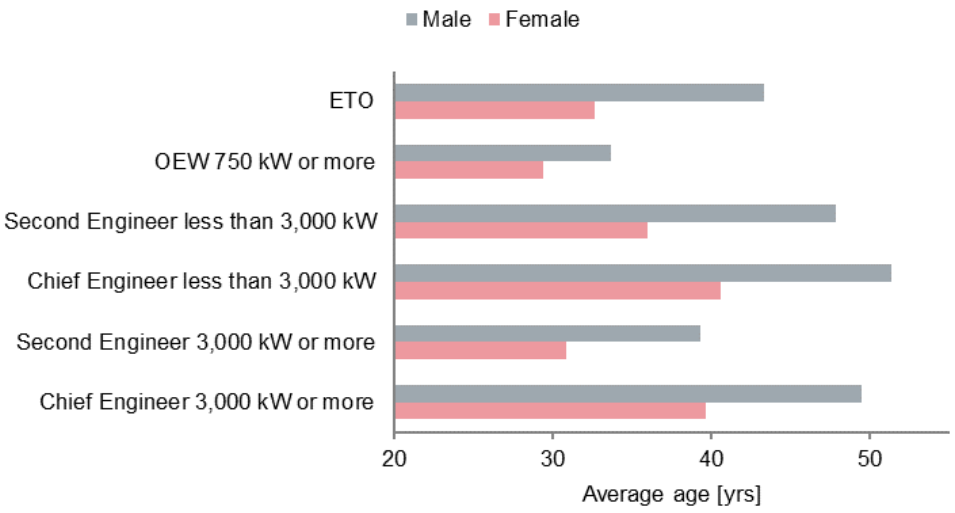

Figure 2-19 Average age of engineer officers holding valid CoCs per gender by engine capacity

2.2 Masters and officers who in 2019 held valid endorsements attesting recognition

2.2.1 Total

The total number of masters and officers holding valid EaRs at EU level was 173,794, with 0.08% of them entitled to serve in both the Deck and Engine Departments. In addition, 10.71% of them held more than one EaR issued by different EU Member States.

Reviewing the distribution by group of countries issuing the original CoC, 53,256 masters and officers held original CoCs issued by other EU Member States (24.66% of the total number of masters and officers holding valid CoCs as per section 2.2.1), 120,590 held original CoCs issued by non-EU countries and 0.04% held original CoCs issued by both EU Member States and non-EU countries.

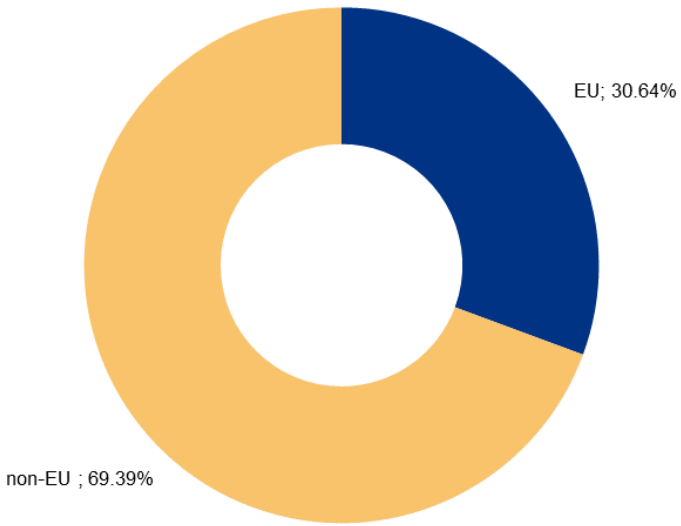

Figure 2-20 Distribution of masters and officers holding valid EaRs by countries issuing the original CoC

2.2.2 Distribution by EU Member State

The distribution of the number of masters and officers holding valid EaRs issued by EU Member State is presented in Figure 2-21.

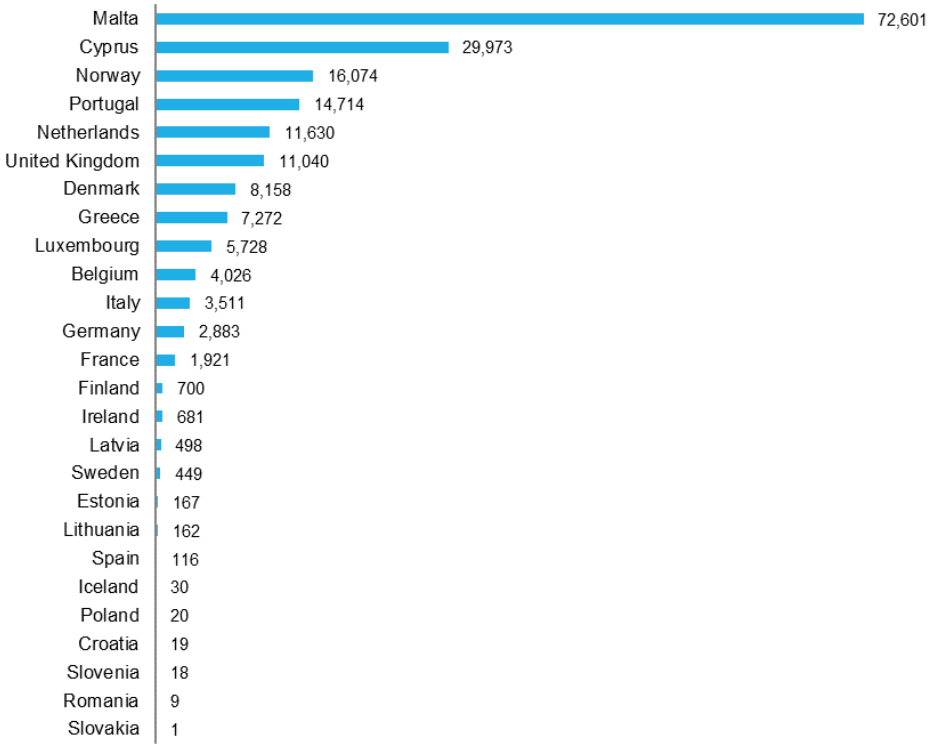

Figure 2-21 Masters and officers holding valid EaRs per EU Member State

The distribution of the masters and officers holding valid EaRs endorsing original CoCs issued by EU and non-EU countries is presented in Figure 2-22.

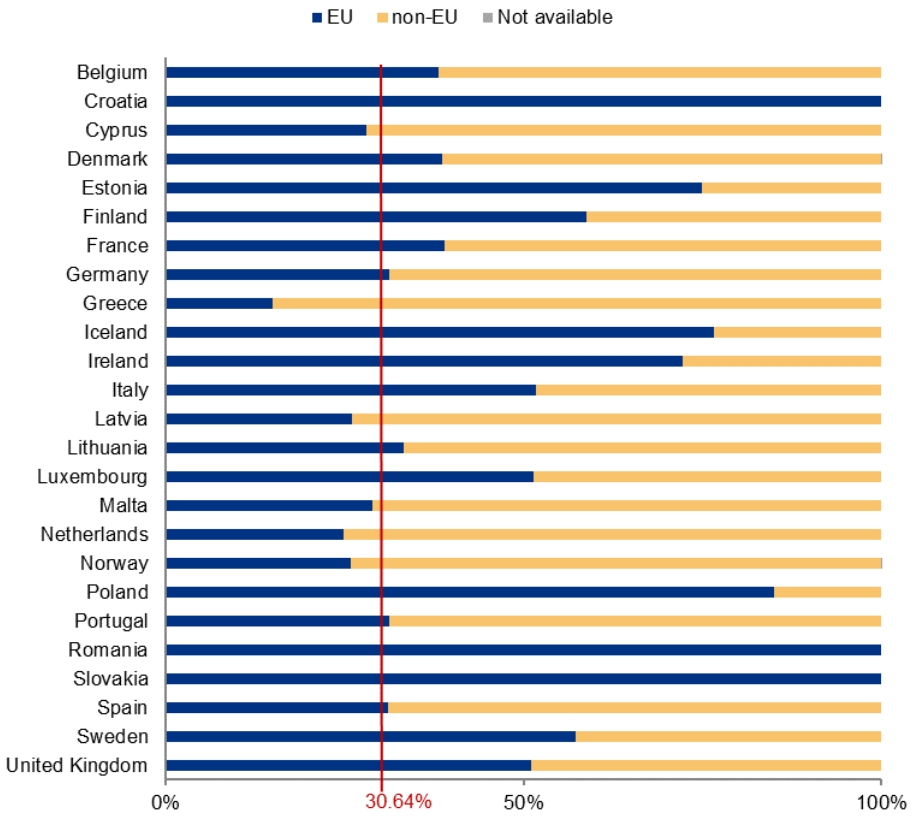

Figure 2-22 Distribution of masters and officers holding valid EaRs recognising original CoCs issued by EU and non-EU countries

2.2.3 Distribution by countries issuing the original CoCs

Based on reporting by the 26[11] EU Member States issuing EaRs, the name of the country that issued the original CoC was made available for 173,782 masters and officers, which represented 99.99% of the total number of masters and officers holding valid EaRs at EU level. Figure 2-23 shows the distribution of masters and officers holding valid EaRs by region[12] where the respective countries issuing the original CoC are located.

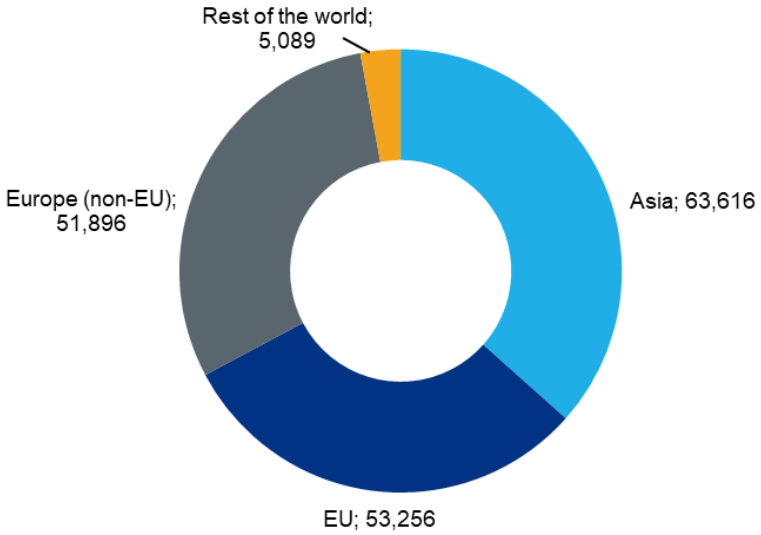

Figure 2-23 Distribution of masters and officers holding valid EaRs by region of the country issuing the original CoC

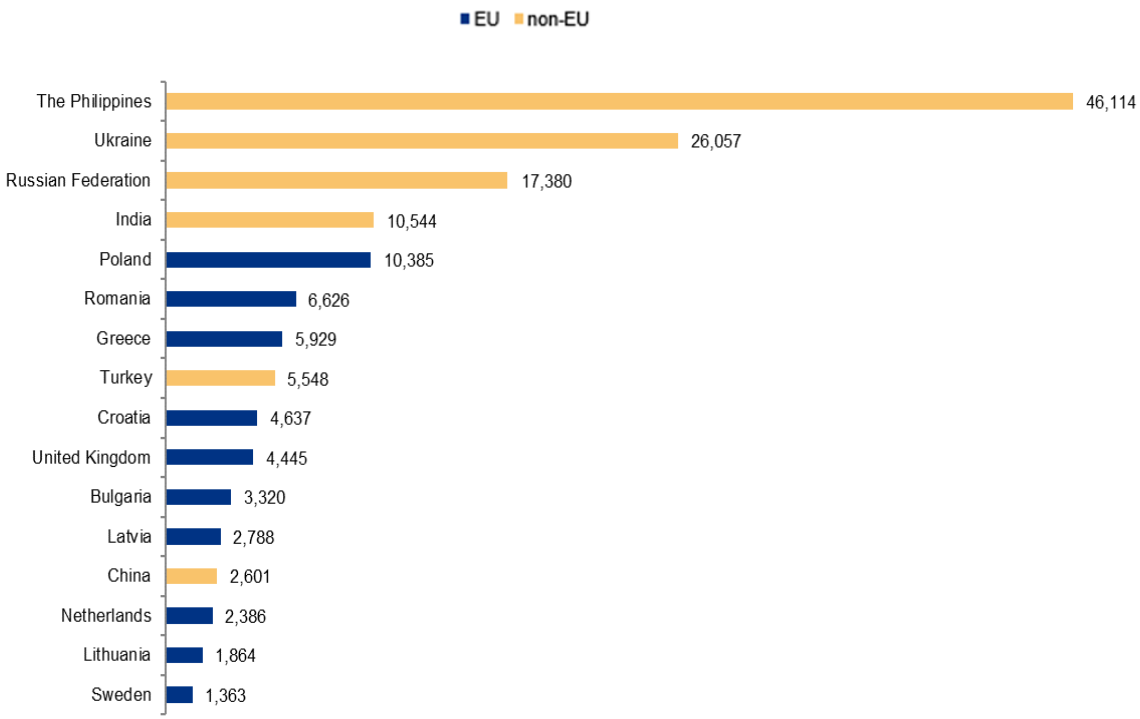

Figure 2-24 Countries issuing the original CoCs registering more than 0.75% of masters and officers holding valid EaRs

The masters and officers registered with valid EaRs in 2019 held original CoCs issued by 87 countries. Figure 2-24 identifies the 16 countries – ten EU Member States and six non-EU countries – which provided 87.45% of the total

[11] Bulgaria, Czech Republic and Hungary do not issue EaRs.
[12] The grouping of countries per regions was based on the "Standard country or area codes for statistical use" established by the United Nations and the list of European countries established by the EU

number of masters and officers holding valid EaRs at EU level. Table 2-15 and Table 2-16 of Appendix B present a more detailed list of countries issuing the original CoCs.

2.2.4 Distribution by department

The departments in which the holders of EaRs were entitled to serve are presented in Figure 2-25.

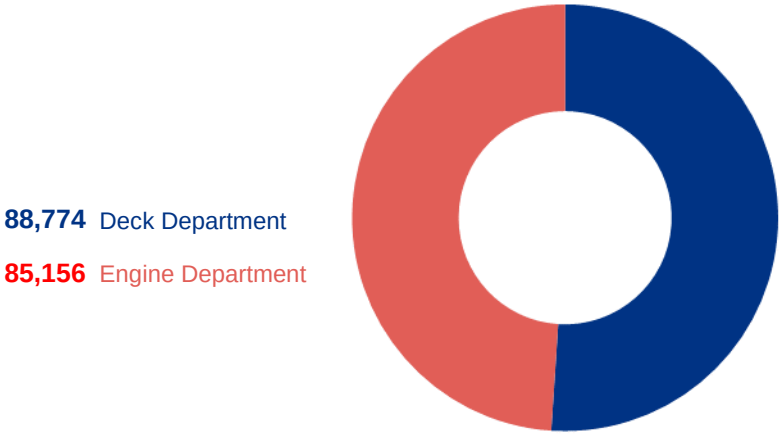

Figure 2-25 Distribution of masters and officers holding valid EaRs by department

The figure illustrates that the number of masters and officers entitled to serve in the Deck Department was only 4.25% higher than the number of officers entitled to serve in the Engine Department.

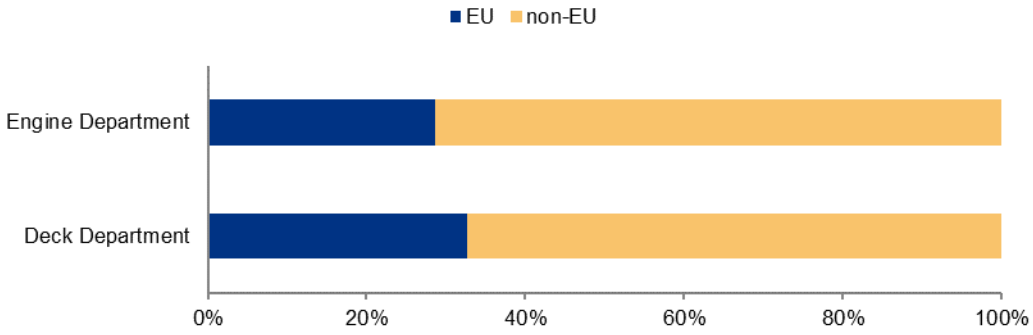

Figure 2-26 Distribution of masters and officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by department

The ratio between the masters and officers holding original CoCs issued by EU Member States and those holding original CoCs issued by non-EU countries follows a pattern for both the Deck (33% to 67%) and the Engine (29% to 71%) Departments, which is similar to the general distribution presented in Figure 2-20.

2.2.5 Distribution by capacity

Taking into account that EU Member States do not use the same terms to refer to capacities in their manning regulations, all capacities reported in the original CoCs have been linked to the generic capacities established in Chapters II and III of the STCW Convention, in order to establish a common platform for data comparability. The review was conducted separately for the Deck and the Engine Departments. The total number of masters and officers was established by counting each person in his/her highest capacity.

2.2.5.1 Distribution by deck capacity

The information in Figure 2-27 shows that, out of the total number of masters and deck officers holding valid EaRs in 2019, 97.85% were entitled to serve on ships of 3,000 GT or more. In addition, the data also indicated that 60.05% of

them were entitled to serve at management level on ships of 3,000 GT or more, with less than 0.5% of their EaRs being limited in terms of tonnage and/or navigation area.

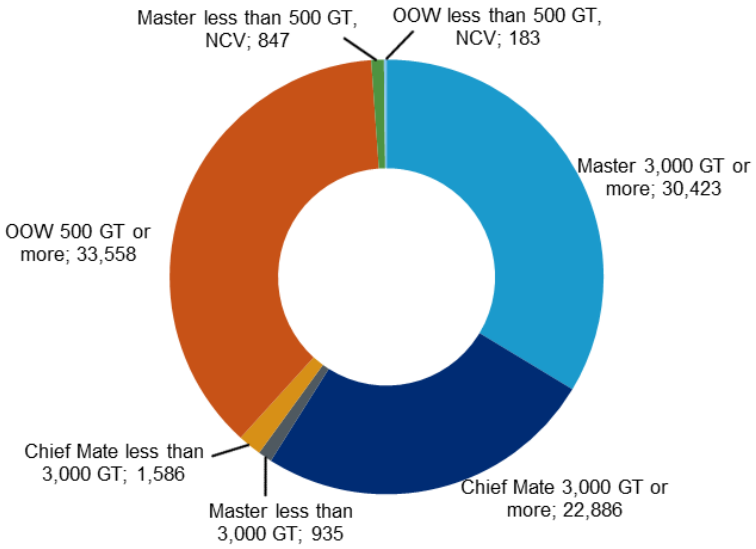

Figure 2-27 Distribution of masters and deck officers holding valid EaRs by deck capacity

The ratio between the masters and officers holding valid EaRs endorsing CoCs issued by EU Member States and those holding CoCs issued by non-EU countries was 33% to 67%. Nevertheless, the majority of masters and officers entitled to serve on board ships limited in tonnage or navigation area held CoCs issued mainly by EU Member States (see Figure 2-28).

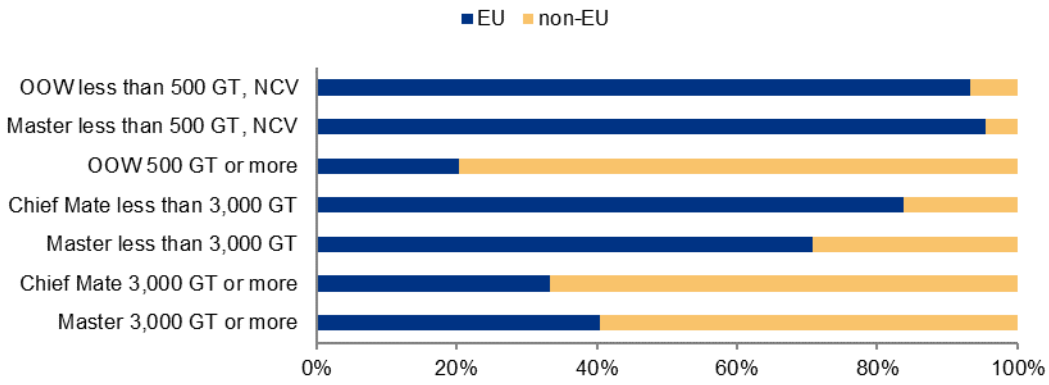

Figure 2-28 Distribution of masters and officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by deck capacity

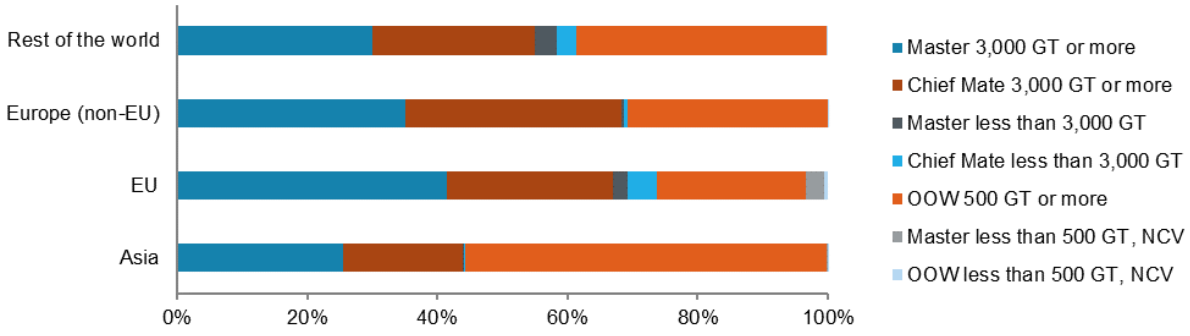

Figure 2-29 Distribution of the deck capacities of masters and deck officers holding valid EaRs by region of the country issuing the original CoC

The majority of masters and deck officers having their original CoC issued by Asian countries held EaRs entitling them to serve at operational level. Deck officers with original CoCs issued by countries in other parts of the world held, in their majority, EaRs entitling them to serve at management level.

2.2.5.2 Distribution by engine capacity

The information in Figure 2-30 shows that, out of the total number of engineer officers holding valid EaRs, 98.51% were entitled to serve on ships powered by main propulsion machinery of 3,000 kW propulsion power or more. In addition, the data also indicated that 56.37% of the engineer officers were entitled to serve at management level on ships powered by main propulsion machinery of 3,000 kW propulsion power or more, with less than 1% of their EaRs being limited in terms of propulsion power or area of navigation and 30.03% being limited in terms of type of propulsion machinery.

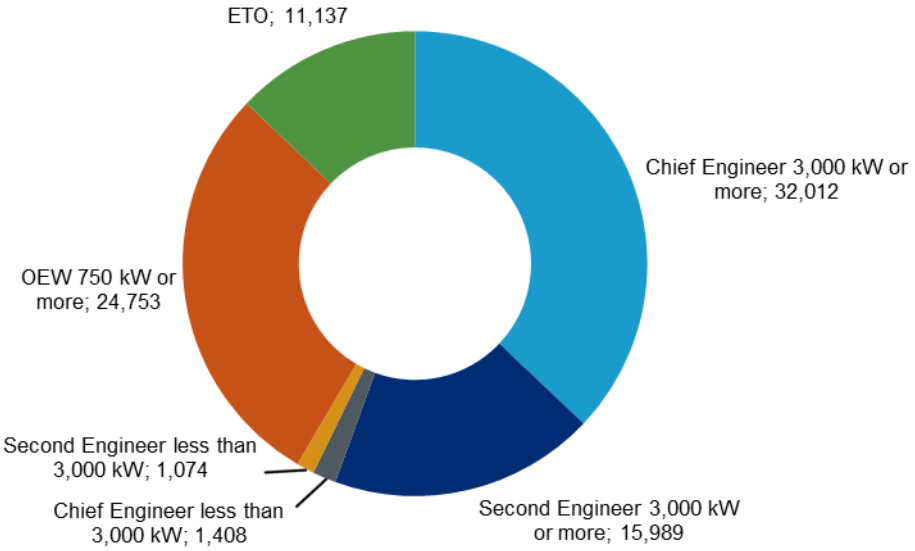

Figure 2-30 Distribution of engineer officers holding valid EaRs by engine capacity

The ratio between the engineer officers holding CoCs issued by EU Member States and those holding CoCs issued by non-EU countries was 29% to 71%. Nevertheless, this pattern was not clearly followed by those entitled to serve on board ships limited in propulsion power (see Figure 2-31).

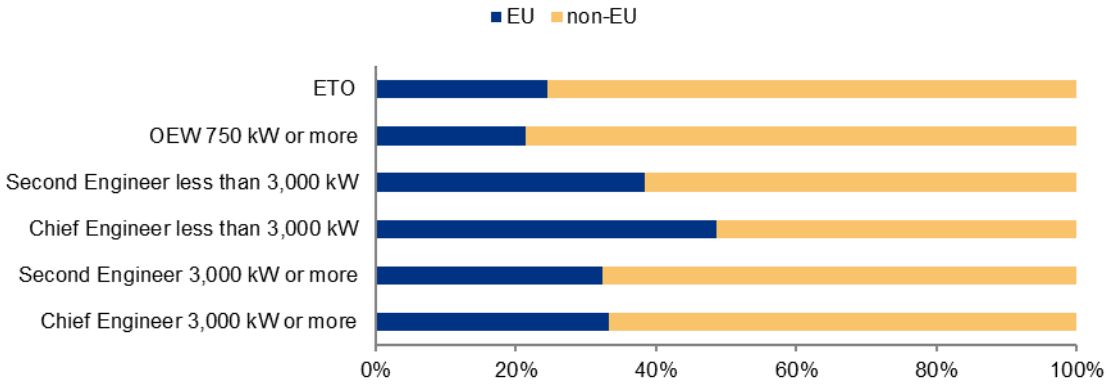

Figure 2-31 Distribution of engineer officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by engine capacity

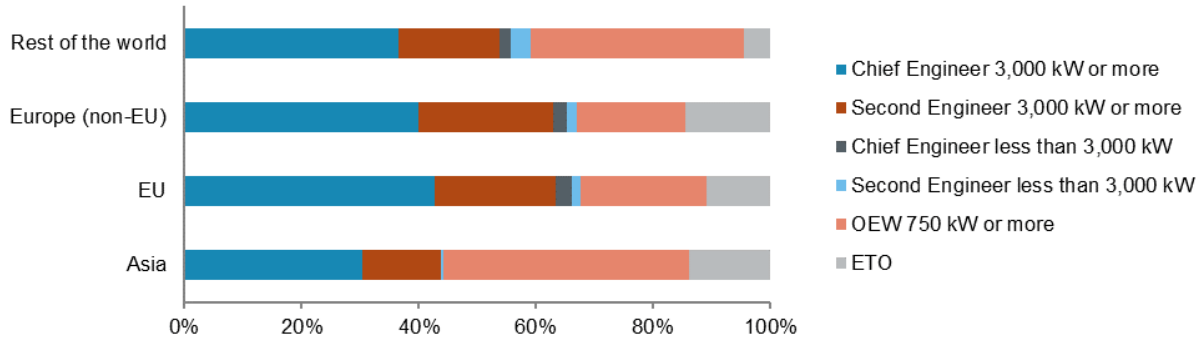

Figure 2-32 Distribution of the engine capacities of engineer officers holding valid EaRs by region of the country issuing the original CoC

The majority of the engineer officers having the original CoC issued by Asian countries held EaRs entitling them to serve at operational level. Engineer officers with CoCs issued by countries located in other parts of the world held, in their majority, EaRs entitling them to serve at management level.

2.2.6 Gender distribution

Twenty-five[13] out of the 26[14] EU Member States that provided data on masters and officers holding valid EaRs, made available information on gender. Consequently, the review on gender distribution was conducted for 172,272 masters and officers that represented 99.12% of the total number holding valid EaRs in 2019 at EU level.

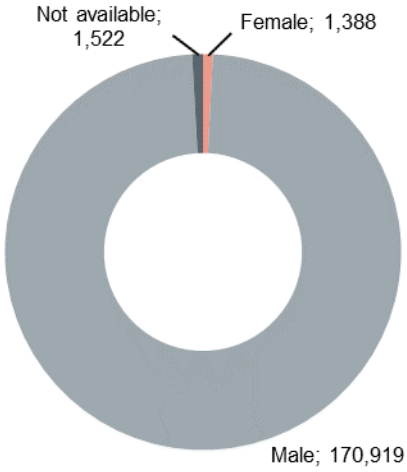

Figure 2-33 Gender distribution of masters and officers holding valid EaRs

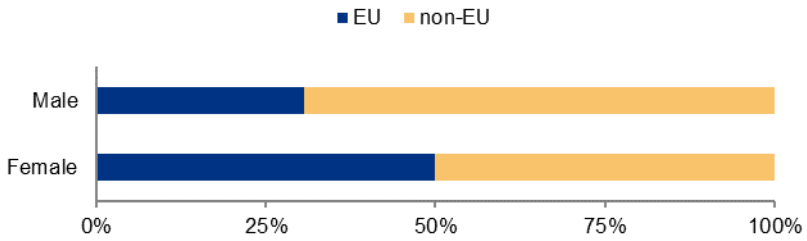

Figure 2-34 Distribution of masters and officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by gender

[13] Poland's data does not include information on gender.
[14] Bulgaria, Czech Republic and Hungary do not issue EaRs.

It was noted that 50.00% of the total number of female masters and officers holding valid EaRs held original CoCs issued by EU Member States, followed by 19.67% who had their original CoCs issued by countries located in Asia.

2.2.7 Distribution by nationality

The review of data made available by the 26[15] EU Member States issuing EaRs showed that masters and officers holding valid EaRs were nationals of 127 countries. The distribution of these countries per region[16] of origin does not show a significant deviation from the review on countries issuing the original CoCs.

2.2.8 Age distribution

The average age of masters and officers holding valid EaRs was 41.4 years. Reviewing the average age per country issuing the original CoCs, the average age of masters and officers holding CoCs issued by the EU Member States was 43.4 years, while of those holding original CoCs issued by non-EU countries was 40.4 years.

Considering the ratio between the masters and officers holding valid EaRs endorsing CoCs issued by the EU Member States and those holding valid EaRs endorsing CoCs issued by non-EU countries (31% to 69%), the distribution by age groups shows a deviation, especially for the masters and officers younger than 25 years of age and for those older than 59 as presented in Figure 2-36.

The data presented in Table 2-17 of Appendix B and in Figure 2-37 indicates that:

- the number of officers entitled to serve in the Engine Department was similar throughout the age groups (except for those of the boundaries) which was not the case with the masters and deck officers;
- 53.95% of the masters and officers holding valid EaRs for the Deck Department were younger than 40 years of age;
- the number of engineer officers was higher than the number of masters and deck officers for all age groups over 44 years of age.

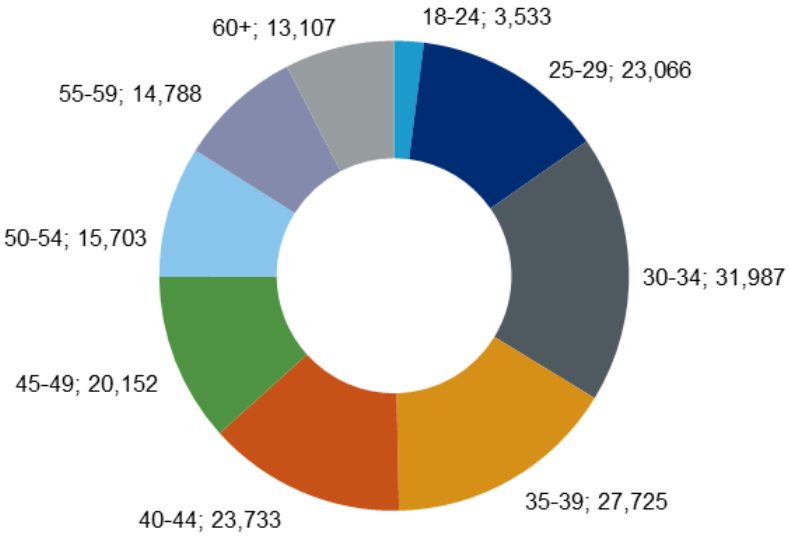

Figure 2-35 Age distribution of masters and officers holding valid EaRs

[15] Bulgaria, Czech Republic and Hungary do not issue EaRs.
[16] The grouping of countries per regions was based on the “Standard country or area codes for statistical use” established by the United Nations and the list of European countries established by the EU

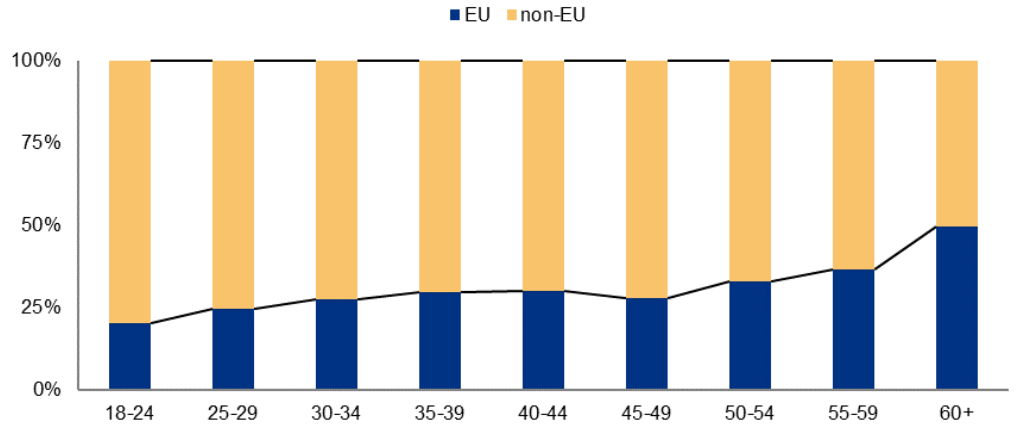

Figure 2-36 Distribution of masters and officers holding valid EaRs by EU and non-EU countries issuing the original CoC and by age group

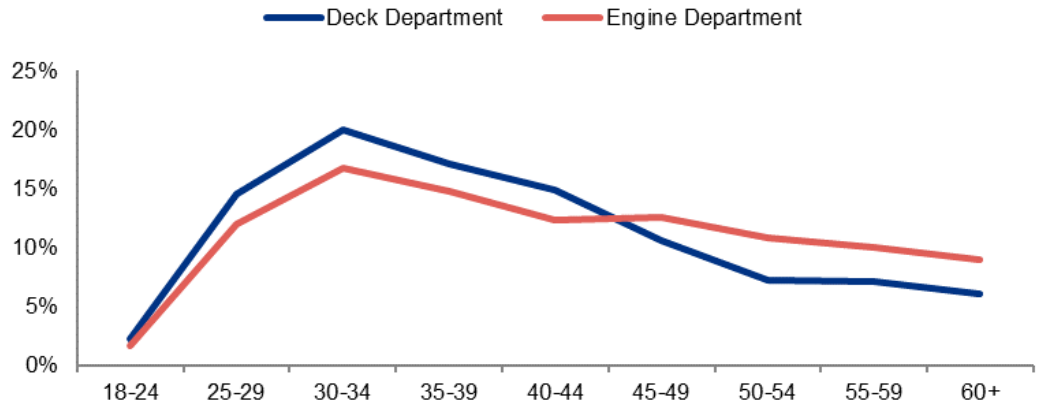

Figure 2-37 Age profile of masters and officers holding valid EaRs per department

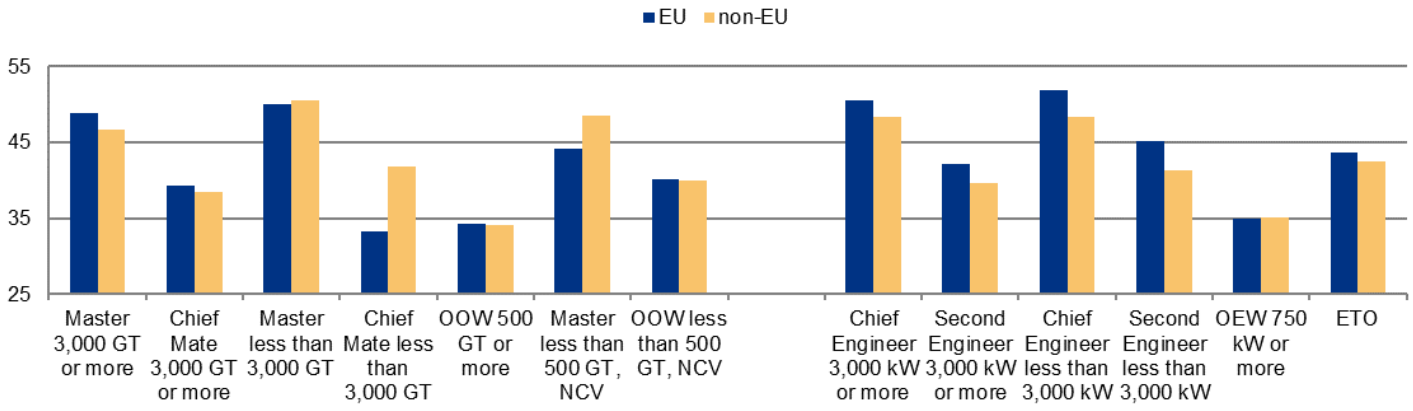

Figure 2-38 Average age of officers holding valid EaRs per EU and non-EU countries issuing the original CoC by capacity

The graphs in Figure 2-38 indicate that the average age of masters and officers was higher for those holding original CoCs issued by EU Member States, except for masters and chief mates holding EaRs endorsing capacities limited in gross tonnage.

2.3 Masters and officers available to serve on board EU Member State flagged vessels in 2019

Figure 2-39 aggregates the number of masters and officers holding valid CoCs and EaRs. This encompasses EaRs issued to holders of CoCs issued by both EU and non-EU countries analysed in sections 2.2 and 2.3.

Figure 2-39 Masters and officers holding valid CoCs or EaRs per EU Member State

2.3.1 Total

The total number of masters and officers available to serve on board EU Member State flagged vessels was 336,590, distributed as presented in Figure 2-40. It included the masters and officers holding valid CoCs issued by EU Member States and the masters and officers holding valid EaRs issued by EU Member States recognising CoCs issued by non-EU countries.

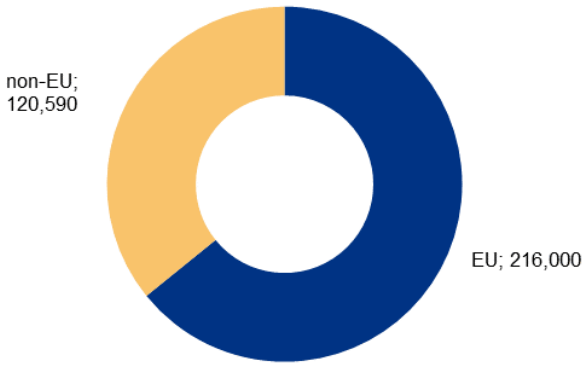

Figure 2-40 Distribution of masters and officers available to serve on board EU Member State flagged vessels by EU and non-EU countries issuing the original CoC

2.3.2 Distribution by department

Figure 2-41 presents the distribution by department of masters and officers available to serve on board EU Member State flagged vessels. It excludes officers holding original CoCs issued by EU Member States under Chapter VII 'Alternative Certification' of the STCW Convention because no officers from non-EU countries held EaRs for such certification.

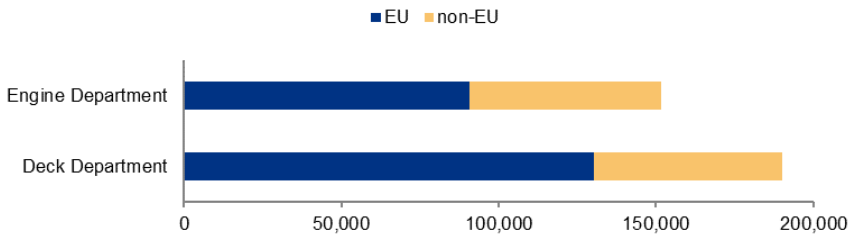

Figure 2-41 Distribution of masters and officers available to serve on board EU Member State flagged vessels by EU and non-EU countries issuing the original CoC and by department

The number of masters and officers available to serve in the Deck Department (190,116) was 25% higher than the number of officers available to serve in the Engine Department (151,501). This percentage changes depending on whether the CoCs were issued by EU Member States or non-EU countries. In the first case, the number of masters and officers available to serve in the Deck Department was 44% higher than the number of officers available to serve in the Engine Department. When CoCs were issued by non-EU countries the number of master and officers available to serve in the Engine Department was higher (1.5%) than the number of officers available to serve in the Deck Department.

In both Deck and Engine Departments, the number of officers holding valid CoCs issued by EU Member States and available to serve on board EU Member State flagged vessels was higher than those holding CoCs issued by non-EU countries (118% and 49% higher for Deck and Engine Departments, respectively).

2.3.3 Distribution by capacity

Taking into account that EU Member States do not use the same terms to refer to capacities in their manning regulations, all capacities reported in the CoCs have been linked to the generic capacities established in Chapters II and III of the STCW Convention, in order to establish a common platform for data comparability. The review was conducted separately for the Deck and the Engine Departments. The total number of masters and officers was established by counting each person in his/her highest capacity.

2.3.3.1 Distribution by deck capacity

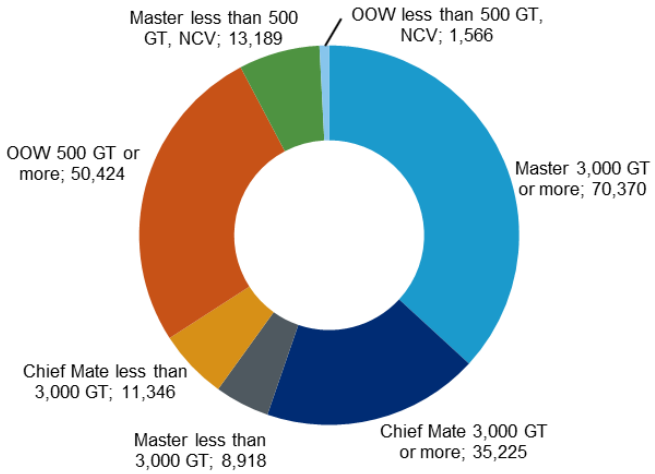

Figure 2-42 Distribution of masters and deck officers available to serve on board EU Member State flagged vessels by deck capacity

The information in Figure 2-42 shows that 55.54% (105,595) of the total number of available masters and deck officers were entitled to serve at management level on ships of 3,000 GT or more.

Although the ratio between masters and deck officers holding CoCs issued by EU Member States and those holding CoCs issued by non-EU countries was 69% to 31%, it changed significantly for masters and officers entitled to serve on board ships limited in gross tonnage or area of navigation where more than 96% were holders of CoCs issued by EU Member States. In the case of those officers entitled to serve as OOW the ratio was 47% to 53%. This is presented in Figure 2-43.

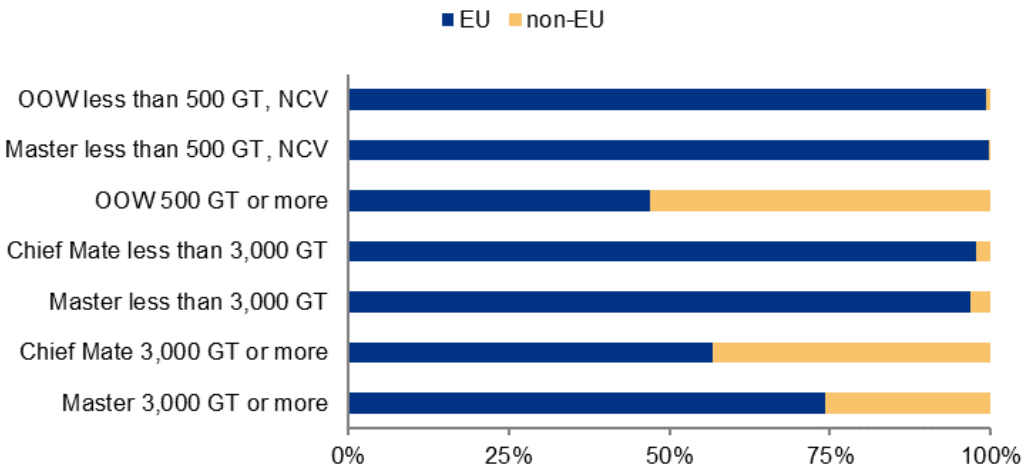

Figure 2-43 Distribution of masters and deck officers available to serve on board EU Member State flagged vessels by EU and non-EU countries issuing the original CoC and by deck capacity

2.3.3.2 Distribution by engine capacity

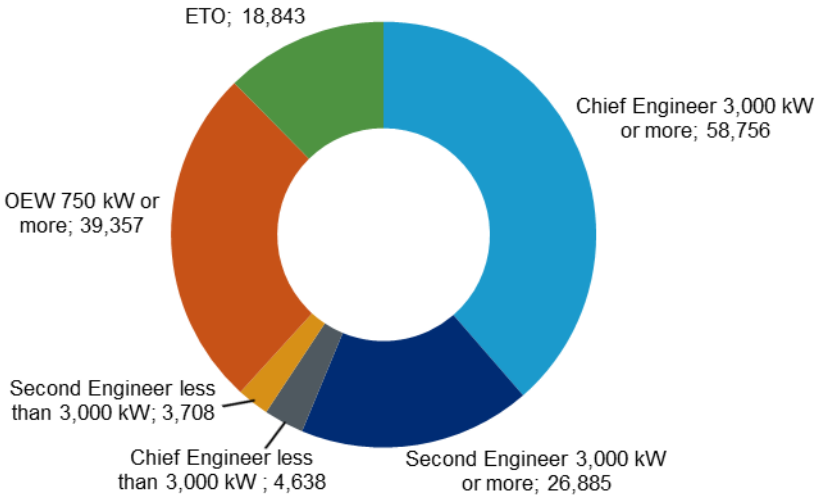

Figure 2-44 Distribution of engineer officers available to serve on board EU Member State flagged vessels by engine capacity

The information in Figure 2-44 shows that 56.53% (85,641) of the engineer officers were entitled to serve at management level on ships powered by main propulsion machinery of 3,000 kW propulsion power or more.

Although the ratio between engineer officers holding CoCs issued by EU Member States and those holding CoCs issued by non-EU countries was 60% to 40%, it changed significantly for officers entitled to serve on board ships limited in propulsion power where more than 82% were holders of CoCs issued by EU Member States. In the case of those officers entitled to serve as OEW the ratio was 51% to 49%. This is illustrated in Figure 2-45.

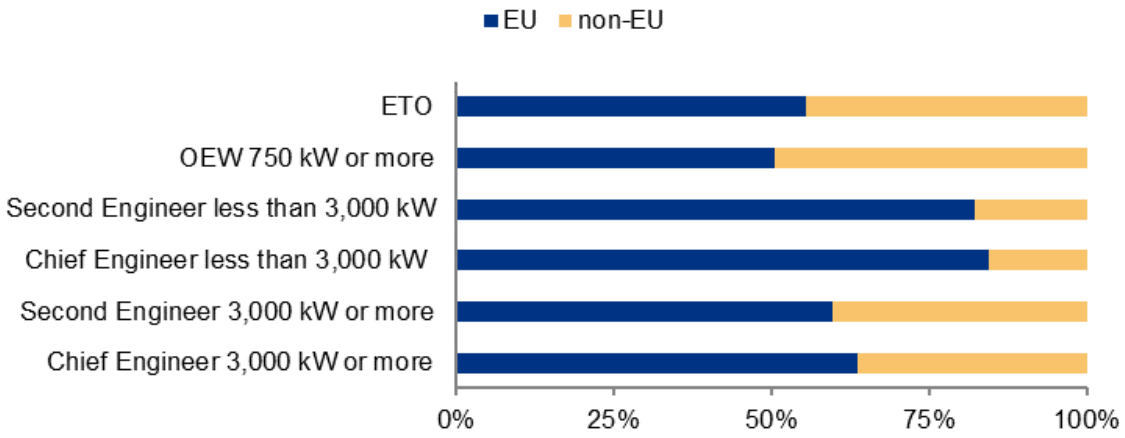

Figure 2-45 Distribution of engineer officers available to serve on board EU Member State flagged vessels by EU and non-EU countries issuing the original CoC and by engine capacity

2.3.4 Gender distribution

Twenty-eight[17] out of the 29 EU Member States that provided data on masters and officers holding valid CoCs and EaRs, made available information on gender. Consequently, the review on gender distribution was made for 312,611 masters and officers representing 92.88% of the total number of those available to serve on board EU Member State flagged vessels.

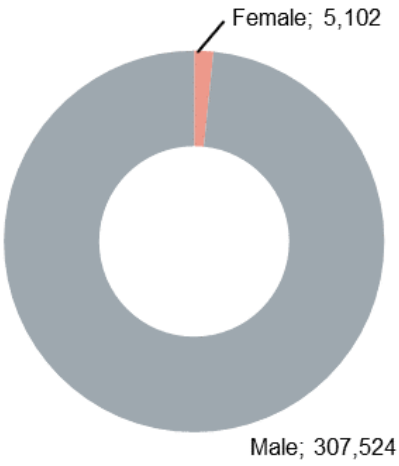

Figure 2-46 Gender distribution of masters and officers available to serve on board EU Member State flagged vessels

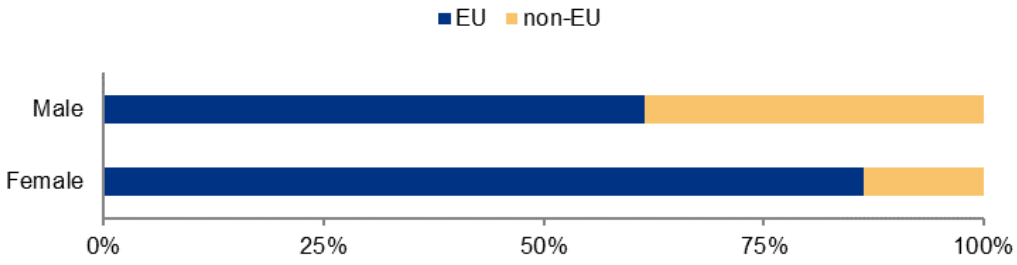

Figure 2-47 Distribution of masters and officers available to serve on board EU Member State flagged vessels by EU and non-EU countries issuing the original CoC and by gender

[17] Poland's data does not include information on gender.

Masters and officers whose gender was known were predominantly males. Female masters and officers represented 1.63% of the total number of officers available, with 86.40% of them holding CoCs issued by EU Member States.

Within the total number of masters and officers holding valid CoCs issued by EU Member States and available to serve on board EU Member State flagged vessels, female masters and officers represented 2.28% of their total, while for CoCs issued by non-EU countries they represented 0.58% of their total.

2.3.5 Distribution by nationality

The review of the data submitted by the EU Member States indicated that information on nationality was available for 322,136 masters and officers, representing 95.71% of the total number of officers available to serve on board EU Member State flagged vessels. It also showed that the masters and officers were nationals of 154 countries, with the distribution by region[18] as presented in Figure 2-48.

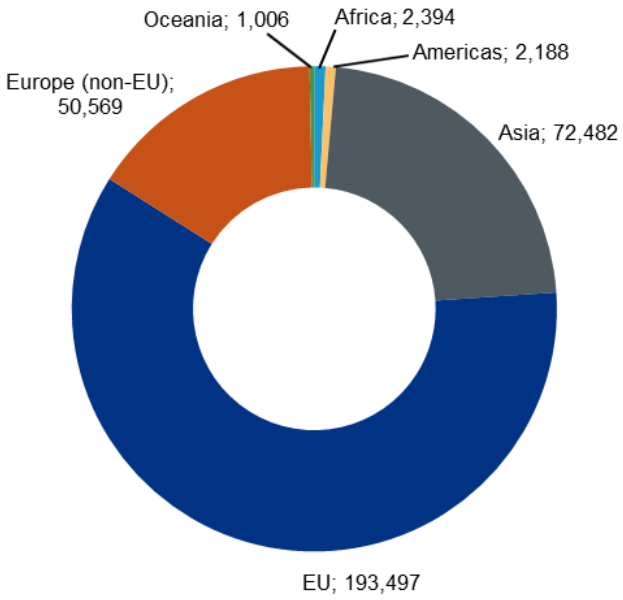

Figure 2-48 Nationality distribution of masters and officers available to serve on board EU Member State flagged vessels by geographical region according to nationality

[18] The grouping of countries per region was based on the “Standard country or area codes for statistical use” established by the United Nations and the list of European countries established by the EU

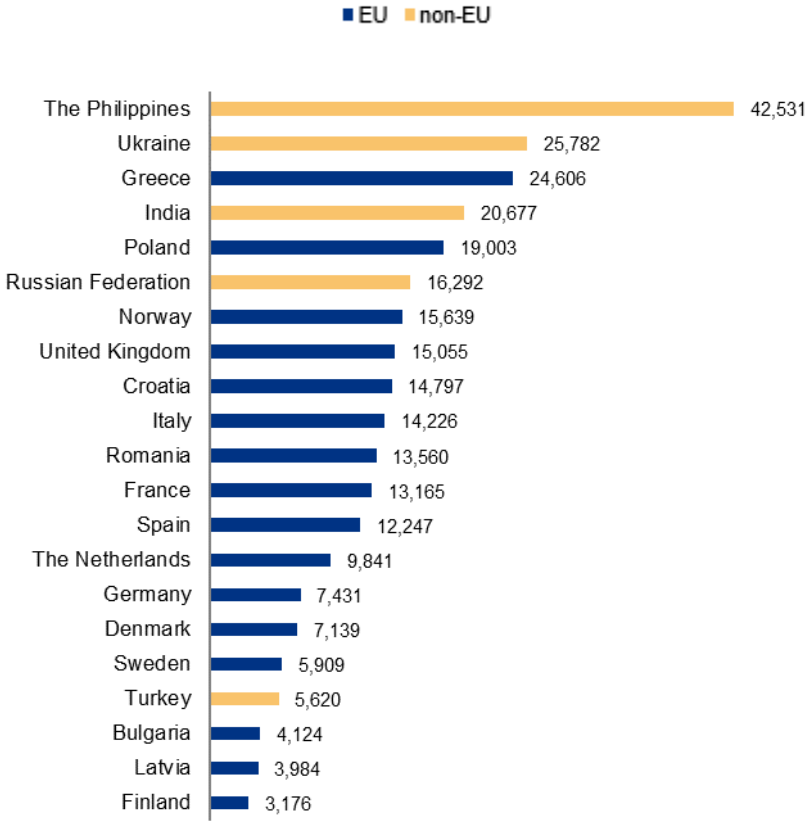

Figure 2-49 Countries whose nationals represented more than 0.75% of the total number of masters and officers available to serve on board EU Member State flagged vessels

The data in Figure 2-49 identifies the 21 countries whose nationals represented 87.59% of the total number of masters and officers available to serve on board EU Member State flagged vessels.

2.3.6 Age distribution

The average age of all masters and officers available to serve on board EU Member State flagged vessels was 42.6 years. The average age of masters and officers holding CoCs issued by EU Member States was 43.8 years, while for those holding original CoCs issued by non-EU countries, it was 40.4 years.

The age profile, per country issuing the original CoC, grouped under EU or non-EU in Figure 2-50, shows that those holding EU CoCs were more evenly distributed throughout the age groups than those holding non-EU CoCs.

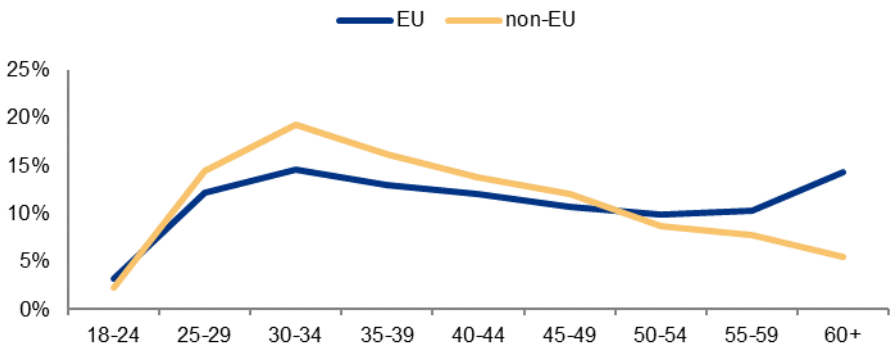

Figure 2-50 Age profile of masters and officers available to serve on board EU Member State flagged vessels per EU and non-EU countries issuing the original CoC

The highest average age was identified for masters entitled to serve on ships of 500 GT or more and for Chief Engineers entitled to serve on ships powered by main propulsion machinery of 750 kW propulsion power or more, as presented in Figure 2-51.

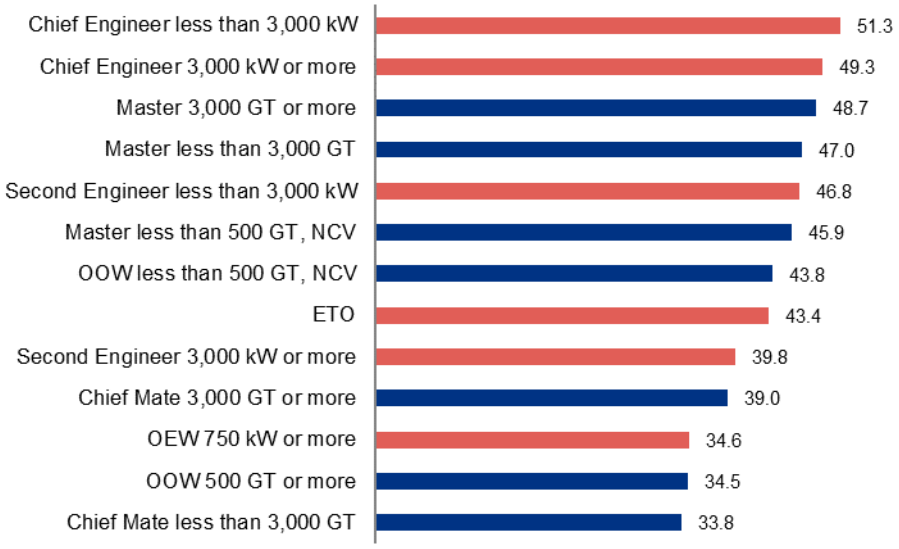

Figure 2-51 Average age of masters and officers available to serve on board EU Member State flagged vessels per deck and engine capacities

A variation ranging between 0.2 and 3 years in the average age was noticed for those holding CoCs as Master, Chief Mate, Chief Engineer, Second Engineer, OOW and OEW issued by EU Member States and non-EU countries. In all of those, with the exception of the OEWs, the highest average age was found in holders of CoCs issued by EU Member States.

2.4 Ratings holding valid certificates of proficiency in 2019

The data presented below is based on the information provided on certificates of proficiency (CoP) issued to ratings under regulations II/4, II/5, III/4, III/5, III/7 and VII/2 of the STCW Convention. The submission of this data is not mandatory under Directive 2008/106/EC but was voluntarily provided by 16[19] EU Member States.

2.4.1 Total

The total number of ratings holding valid CoPs in 2019 in the 16[16] EU Member States reporting such data was 72,816 with 6.24% of them entitled to serve in both the Deck and the Engine Departments.

2.4.2 Distribution by EU Member State

The distribution of the number of ratings holding valid CoPs by EU Member State is presented in Figure 2-52.

[19] The 16 EU Member States that voluntarily provided data on ratings are listed in figure 2-62.

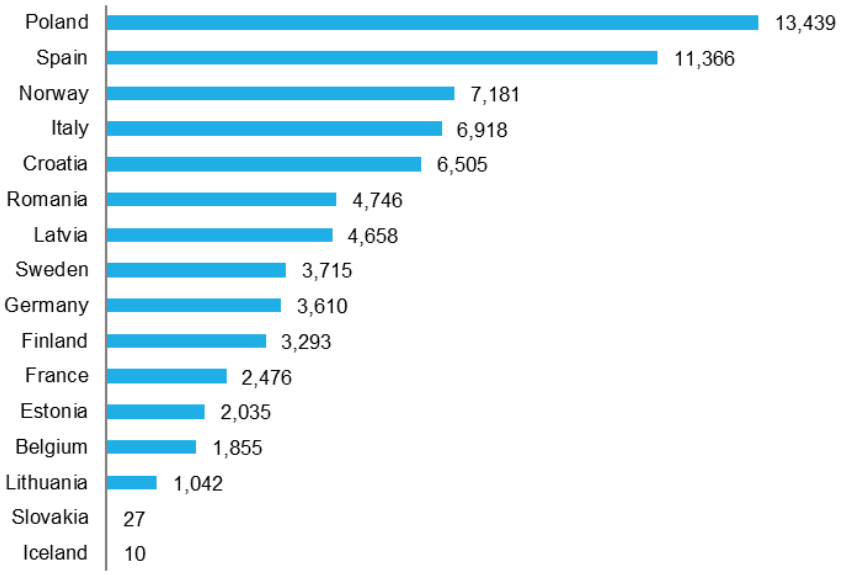

Figure 2-52 Ratings holding valid CoPs per EU Member State

2.4.3 Distribution by department

The distribution by department on which the ratings were entitled to serve is presented in Figure 2-53. It shows that the number of ratings entitled to serve in the Deck Department (Chapter II of the STCW Convention) was 82% higher than the number of ratings entitled to serve in the Engine Department (Chapter III of the STCW Convention). It also shows that 4.53% of them were qualified under Chapter VII, Alternative Certification, of the STCW Convention.

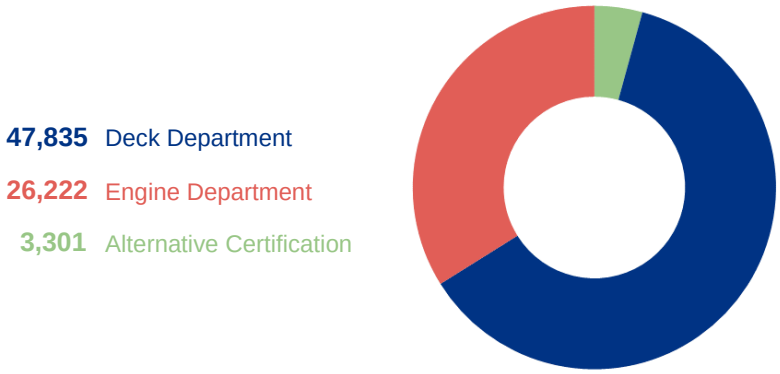

Figure 2-53 Distribution of ratings holding valid CoPs by department

2.4.4 Distribution by capacity

The distribution of ratings by capacity is illustrated in Table 2-22 of Appendix C. Taking into account that EU Member States do not use the same terms to refer to capacities in their manning regulations, all capacities reported in the CoPs have been linked to the generic capacities established in Chapters II and III of the STCW Convention, in order to establish a common platform for data comparability. The review was conducted separately for the Deck and the Engine Departments, even if compiled in Figure 2-54. The total number of deck and engineer ratings was established by counting each person per department.

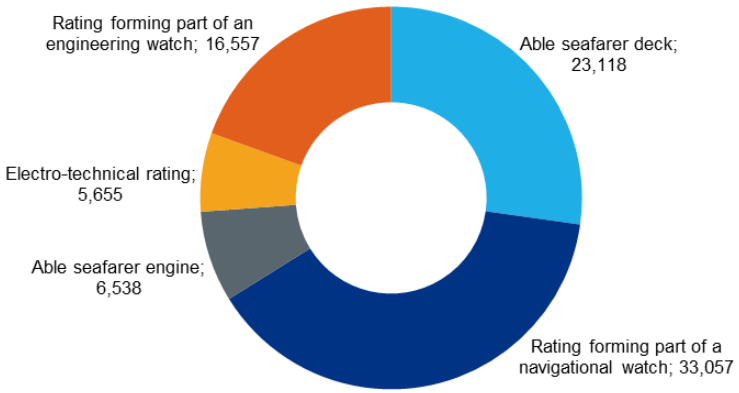

Figure 2-54 Distribution of ratings holding valid CoPs by capacity

The information shows that the majority of ratings either of deck or engine were entitled to serve as ratings forming part of a watch, being 69.11% for deck and 63.14% for engine.

2.4.5 Gender distribution

Fifteen[20] out of the 16[21] EU Member States that provided data on ratings made available information on gender. This covered 59,377 ratings representing 81.54% of the total number of the ratings reported as holding valid CoPs.

The information shows that the ratings holding valid CoPs were predominantly male. Considering the data provided as a sample of the total number of ratings at EU level, it can be stated with a level of confidence of 99% that the percentage of female ratings was 3.82% ± 0.23%.

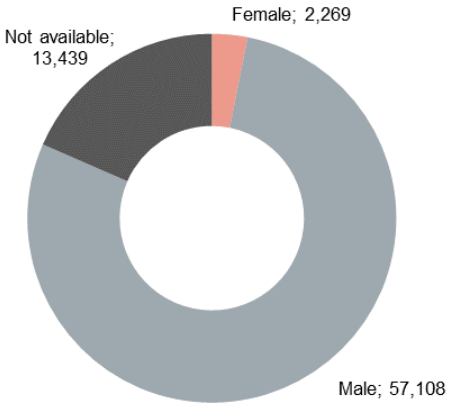

Figure 2-55 Gender distribution of ratings holding valid CoPs

2.4.6 Distribution by nationality

The review of the data made available by the 16 EU Member States showed that, except for 7.53% where nationality was not made available, ratings holding valid CoPs were nationals from 103 countries (29 EU Member States and 74 non-EU countries). The review also showed that 89.77% of the ratings were nationals of the same EU Member State providing the data (see section 2.5.2).

[20]Poland's data does not include information on gender.
[21] The 16 EU Member States that voluntarily provided data on ratings are listed in figure 2.62.

2.4.7 Age distribution

The average age of ratings holding valid CoPs was 41.0 years. Except for the 25-29 age group, all other groups registered similar distributions between 9.26% and 12.21%. The average age for female ratings was 33.2 years, while that for male ratings was 41.7 years. 75.76% of all female ratings were younger than 40 years of age while the percentage of male ratings in the same age group was 47.09%.

The distribution of gender groups by age intervals is presented in Figure 2-57.

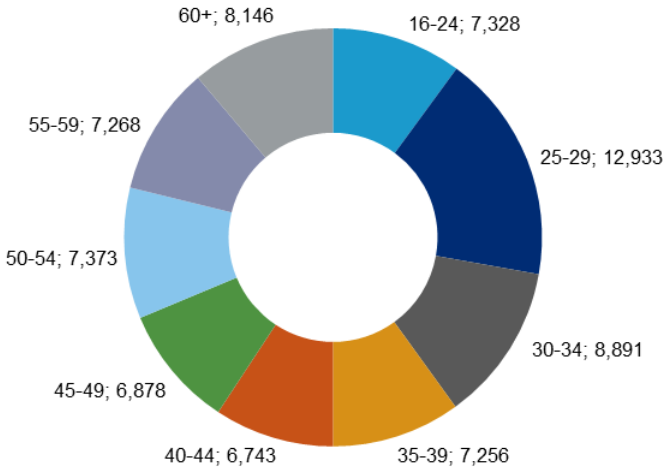

Figure 2-56 Age distribution of ratings holding valid CoPs

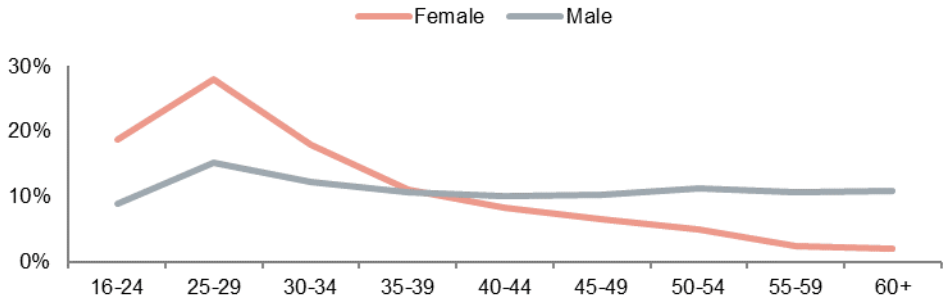

Figure 2-57 Age profile of ratings holding valid CoPs per gender

2.5 Masters and officers - summary overview 2014-2019

This section presents a compilation of the data received for the last six years, with the objective of providing a wide picture on the number of masters and officers available to serve on board EU Member State flagged vessels. As previously mentioned, a more accurate view of the situation would emerge with the build-up of data collected over more years. This will not only be conducive to a more precise trend analysis and forecasting but also contribute to stabilising the premises used to treat the data, which suffered slight changes during the past six years. For the analysis that follows, forecasts were made using linear regression and exponential triple smoothing (ETS) algorithm methods[22]. The values calculated can be found in Appendix D.

In the following sub-sections, the clustered horizontal bar graphs just include five years' data for a better clarity of the said graphs. All others will include all the years available.

[22] The linear regression method is suited for small and simple data sets that do not have enough historical data. The Exponential Triple Smoothing (ETS) algorithm is best suited for non-linear data models by smoothing out minor deviations in past data trends, detecting seasonality patterns and establishing confidence intervals (in this case, a level of confidence of 95% was used).

The inclusion of data received from Iceland and Norway as from 2017 was a positive development and an important contribution to a more robust consolidated data. Nevertheless, the comparative analysis presented in the graphs concerning the countries issuing the original CoCs and nationalities of the master and officers, does not include data received from Iceland and Norway until five years' data is collected from these two countries.

2.5.1 Countries issuing the original CoCs

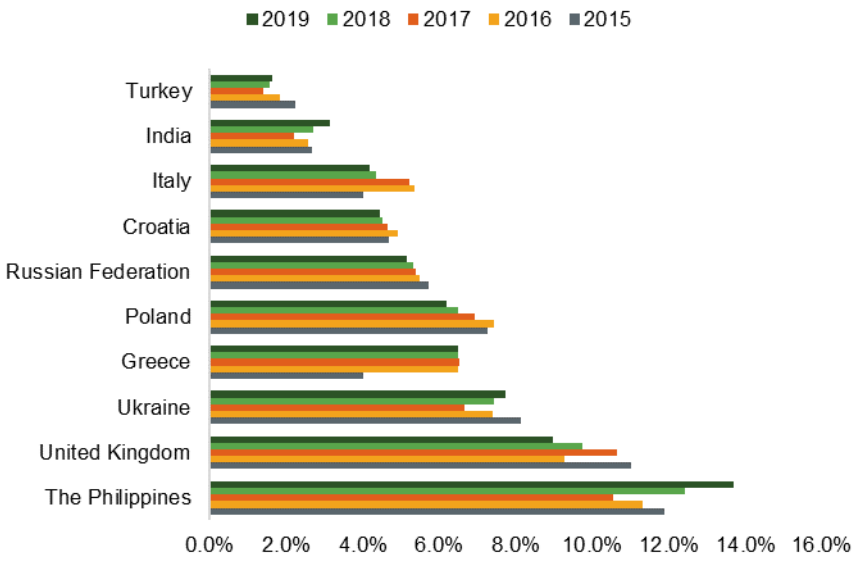

Figure 2-58 Top 5 EU and top 5 non-EU countries issuing the original CoCs

The five non-EU countries (India, the Russian Federation, the Philippines, Turkey and Ukraine) which had more masters and officers holding their CoCs recognised by EU Member States have retained the top spots throughout the last six years. The total percentage of these masters and officers among those available to serve on board EU Member State flagged vessels has varied, over the years, between 26.21% (in 2017) and 31.39% (in 2019).

For EU countries, the situation has been more fluid, with the top five spots – particularly the third, fourth and fifth – being occupied by different countries over recent years. Figure 2-58 features the five EU Member States that occupied the top ranking in 2019. These five EU Member States were the same as in 2018, but Poland and Greece changed spot. It is also to be noted that upon introduction of its data, Norway features in this list. Nevertheless, its data is not being included for the purpose of this review in order to ensure solidity and consistence of figures until data from more years is collected.

Figure 2-59 below presents the forecast for the next two years in relation to the masters and officers holding CoCs issued by the top 3 EU and the top 3 non-EU countries. In terms of linear forecast and similarly to what was estimated in the last two years, a slight decrease regarding the UK and Poland and an increase for Greece is suggested. The slight decrease concerning the UK and Poland had already been verified in 2018 and was also verified in 2019. Regarding the increase already suggested for Greece in the past two years, only in 2019 this could be verified. In addition, the percentage of masters and officers holding Greek CoCs among those available to serve on board EU Member State flagged vessels had fell within the range forecast of 7.78% ±1.57% as estimated through the ETS forecast in 2018.

As regards the non-EU countries, the percentage of masters and officers holding CoCs issued by the Russian Federation has remained broadly unchanged, although a slight decrease is expected. Contrary to 2017's forecast, where a slight decrease was suggested for the Philippines and Ukraine, the 2018 and the 2019 results of both countries did not follow that prognosis. Moreover, the estimates for the next two years suggest that the Philippines' numbers will slightly increase. As for Ukraine a slight decrease will continue to be observed (ETS forecast for 2020: PH=13.97% ±1.86%, UA=7.30% ±0.86%).

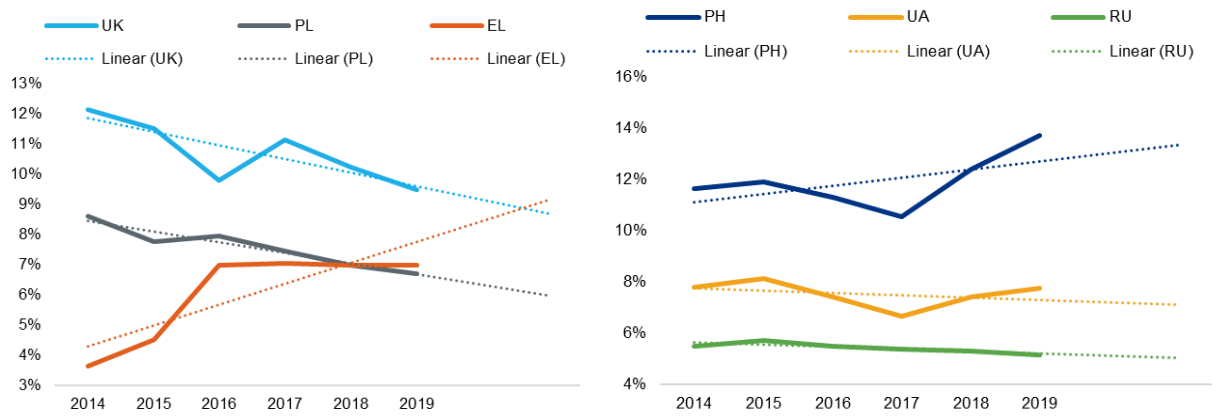

Figure 2-59 Forecast for the next two years of masters and officers holding CoCs issued by the top 3 EU and top 3 non-EU countries

2.5.2 Department - level of responsibility

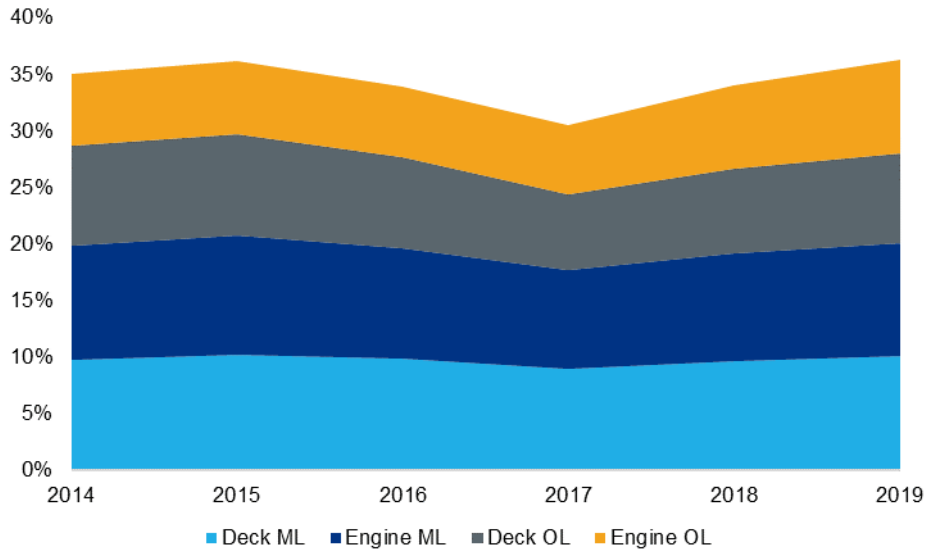

Figure 2-60 Officers at management and operational level holding CoCs issued by non-EU countries

The total percentage of masters and officers holding CoCs issued by non-EU countries recognised by EU Member States increased when compared with the values of the last two years. Nevertheless, when analysing these figures per department and level of responsibility, only the percentage of those entitled to serve in the engine department at operational level (OEW and ETO) reached the highest value during this six-year period. This could be verified both in 2018 and 2019, as illustrated in Figure 2-60.

Regarding the percentage of masters and officers available to serve on board EU Member State flagged vessels, **Error! Reference source not found.** below shows that, similarly to what was estimated in the last two years a slight increase is still expected for officers entitled to serve in the engine department at operational level.

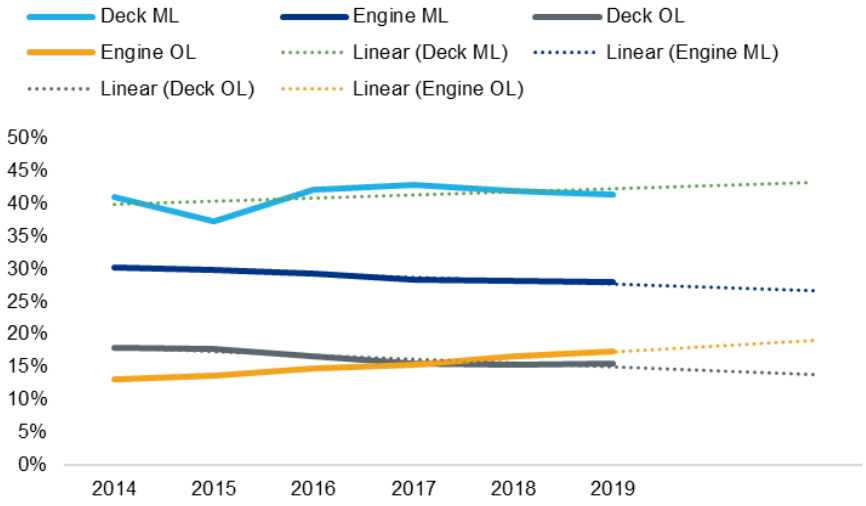

Figure 2-61 Forecast for the next two years of officers at management and operational level available to serve on board EU Member State flagged vessels

2.5.3 Female officers

As presented in Figure 2-62 below, the majority of female officers continues to be made up of those who hold CoCs issued by EU Member States entitling them to work in the deck department.

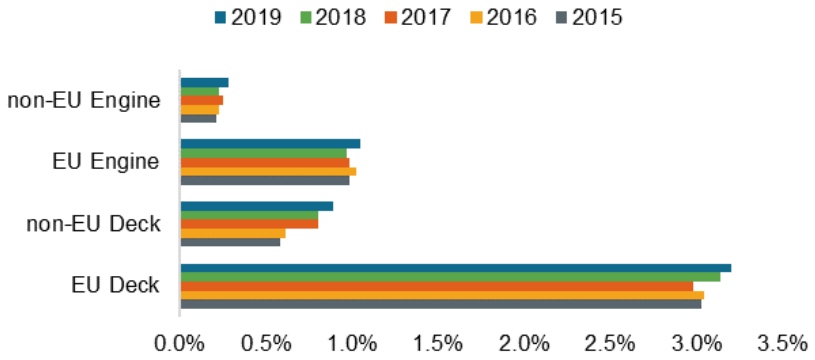

Figure 2-62 Female officers per department holding CoCs issued by EU and non-EU countries

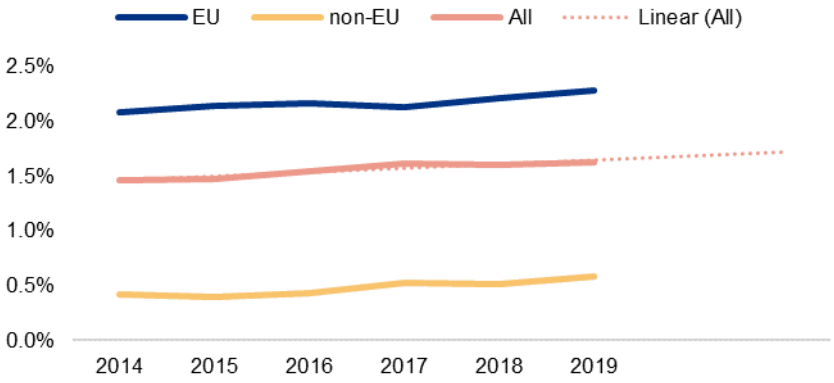

Figure 2-63 Forecast for the next two years of female officers available to serve on board EU Member State flagged vessels

As illustrated in Figure 2-63, the percentage of female officers globally (EU and non-EU) continues to be expected to increase in the coming years. However, it is unlikely that globally they will reach the 2% of the total number of

masters and officers already available to serve on board EU Member State flagged vessels; this percentage denotes the proportion of female participation currently achieved in the EU as indicated in the said Figure.

2.5.4 Nationality

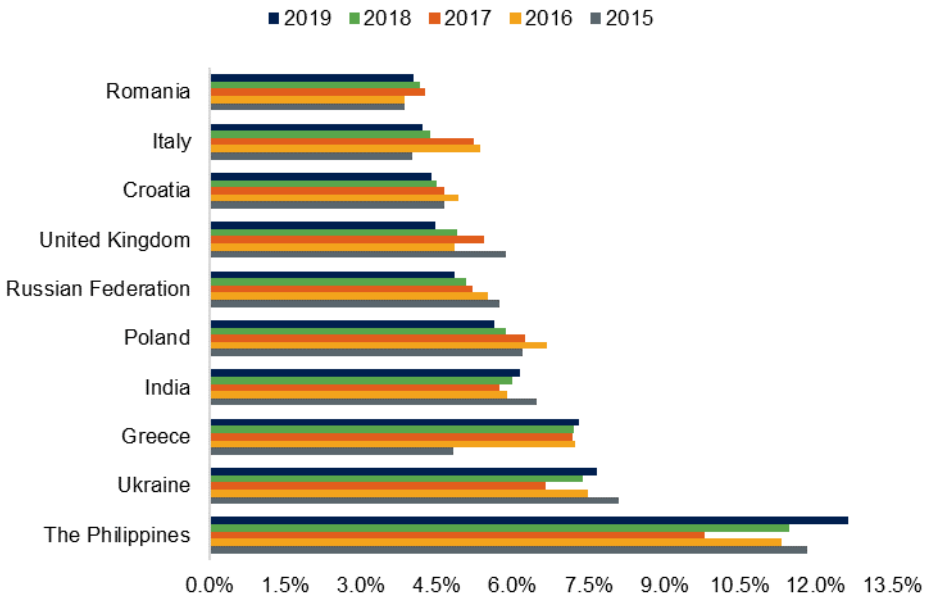

Figure 2-64 Top 10 nationalities of masters and officers available to serve on board EU member State flagged vessels

The 10 nationalities which had more masters and officers available to serve on board EU Member State flagged vessels have remained broadly the same for the past years. The exception in 2019 was the inclusion of Romania in this top ten replacing France that had always made part of the list. It should be noted that Norway would have featured in this list in 2018 and 2019 if its data had been included for the purpose of this review (see section 2.6.1).

Figure 2-65 below continues to indicate that nationals from EU Member States will potentially increase and that the Philippines will continue to be the country from where there will be more nationals among the masters and officers available to serve on board EU Member State flagged vessels. Indications that by 2018 and 2019, the number of Philippines nationals would slightly decrease did not materialise and the projections for the next two years do not indicate that either.

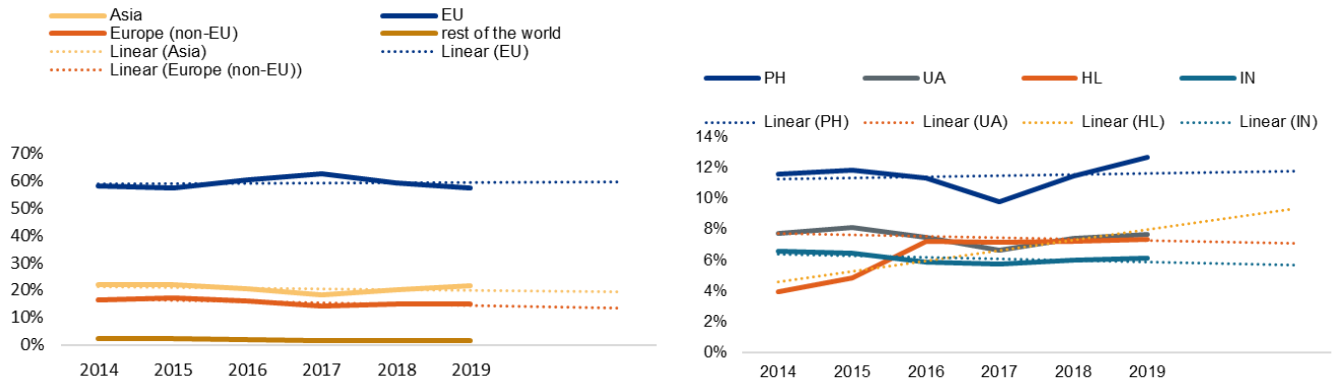

Figure 2-65 Forecast for the next two years of the nationalities of masters and officers available to serve on board EU Member State flagged vessels

2.5.5 Age

The average age of masters and officers available to serve on board EU Member State flagged vessels has remained stable throughout the years and prospects to continue, without any indication that it will increase in the next two years.

Figure 2-67 indicates that the average age of masters and officers holding CoCs at management level, either issued by EU or non-EU countries, will not increase as already foreseen in the last two years. This may suggest that younger officers of a lower rank are progressing in the seafaring career. However, for officers holding CoCs at operational level remains the indication that the average age will continue to slightly increase.

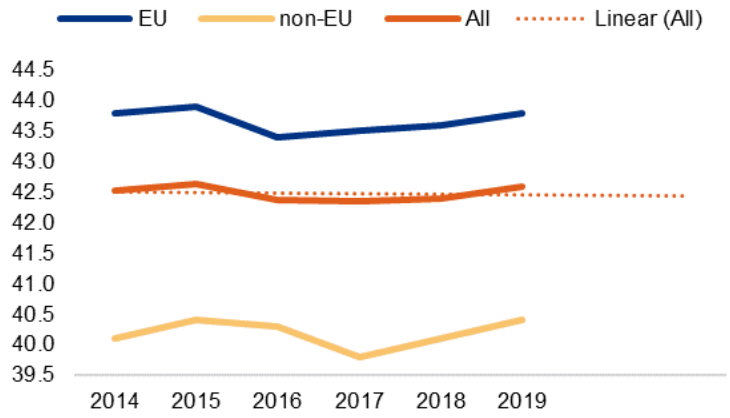

Figure 2-66 Forecast for the next two years concerning the average age of masters and officers available to serve on board EU Member State flagged vessels

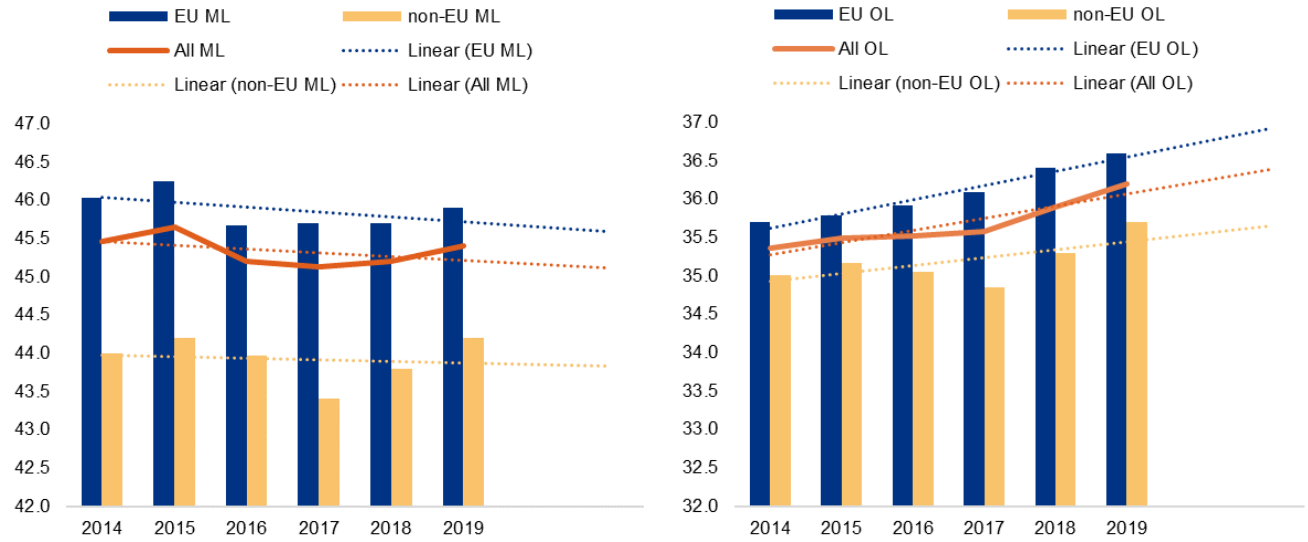

Figure 2-67 Forecast for the next two years concerning the average age of officers at management and operational level available to serve on board EU Member State flagged vessels

Appendix A Data on masters and officers holding valid CoCs in 2019

Table 2-1 Distribution of masters and officers by departments and EU Member States

Department	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IS	IT	LT	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
Alternative certification	0	0	0	0	0	0	0	0	0	1	1447	0	0	0	0	0	0	0	0	1223	0	0	0	0	0	0	0	0
Deck	1522	496	1482	15	5109	4736	1369	12606	8188	1933	11267	7622	10	852	215	8419	1034	2889	79	7442	12839	10907	370	6787	4115	230	44	17798
Engine	695	3613	1308	23	2324	2624	1243	9247	4729	1381	3612	7352	30	440	73	5824	1025	3121	5	4842	5957	9926	241	6747	1734	163	46	12441
Total[23]	**2215**	**4108**	**2790**	**38**	**7360**	**7242**	**2609**	21850	**12333**	**3295**	**13119**	**14962**	**40**	**1290**	**283**	**14128**	**2059**	**6009**	**84**	**10151**	**18793**	**20829**	**611**	**13529**	**5724**	**390**	**90**	**30217**

Table 2-2 Masters and deck officers registered by EU Member States

Capacity	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IS	IT	LT	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
Master 3,000 GT or more	619	310	1134	14	2987	2008	620	4567	1859	1124	1623	3116	2	325	56	3669	284	1126	26	3045	6787	4979	134	2287	1718	100	11	7738
Chief Mate 3,000 GT or more	171	89	297	1	681	104	335	2658	622	199	595	1151	0	207	3	1132	316	665	11	811	1533	2444	84	1718	693	22	2	3425
Master less than 3,000 GT	22	7	6	0	29	405	9	361	2165	7	285	547	4	6	101	690	0	84	0	507	3008	69	20	6	180	32	0	96
Chief Mate less than 3,000 GT	17	1	1	0	2	339	19	4264	2132	5	307	181	0	15	0	80	22	37	0	2178	246	176	7	22	786	3	0	250
OOW 500 GT or more	417	87	44	0	765	391	320	497	1410	577	604	1950	4	189	19	2571	401	894	41	38	315	3180	112	2740	0	73	31	6013
Master less than 500 GT, NCV	224	2	0	0	563	822	56	259	0	13	7751	499	0	109	35	262	5	75	0	651	950	0	7	14	657	0	0	210
OOW less than 500 GT, NCV	52	0	0	0	82	667	10	0	0	8	102	178	0	1	1	15	6	8	1	212	0	59	6	0	81	0	0	66
Total	**1522**	**496**	**1482**	**15**	**5109**	**4736**	**1369**	**12606**	**8188**	**1933**	**11267**	**7622**	**10**	**852**	**215**	**8419**	**1034**	**2889**	**79**	**7442**	**12839**	**10907**	**370**	**6787**	**4115**	**230**	**44**	**17798**

[23] The sum of the rows may not be equal to the total because some officers held CoCs for both Deck and Engine Departments

Table 2-3 Engineer officers registered by EU Member States

Capacity	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IS	IT	LT	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
Chief Engineer 3,000 kW or more	225	1460	868	12	1560	500	665	3585	1794	660	1471	2264	19	141	56	2664	285	1187	0	2030	3852	4196	101	2160	965	65	7	4592
Second Engineer 3,000 kW or more	53	661	289	0	340	88	271	1298	354	89	594	1184	0	107	2	622	248	710	0	2206	1050	1667	22	1323	354	35	1	2496
Chief Engineer less than 3,000 kW	113	38	0	0	11	213	14	248	1168	44	263	559	2	10	7	416	0	112	0	27	188	255	11	5	6	13	0	195
Second Engineer less than 3,000 kW	16	22	1	0	0	4	13	418	605	5	133	201	0	46	1	57	14	55	0	557	0	115	8	8	23	8	0	737
OEW 750 kW or more	288	618	147	0	334	412	172	3218	781	450	1117	1421	1	83	7	1824	302	722	5	22	0	1803	80	1639	386	20	34	4027
Electro-technical Officer	0	814	3	11	79	1407	108	480	27	133	34	1723	8	53	0	241	176	335	0	0	867	1890	19	1612	0	22	4	394
Total	**695**	**3613**	**1308**	**23**	**2324**	**2624**	**1243**	**9247**	**4729**	**1381**	**3612**	**7352**	**30**	**440**	**73**	**5824**	**1025**	**3121**	**5**	**4842**	**5957**	**9926**	**241**	**6747**	**1734**	**163**	**46**	**12441**

Table 2-4 Distribution of gender groups by EU Member States

Gender	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IS	IT	LT	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
Female	88	10	16	0	325	217	24	409	712	148	616	42	0	43	3	172	19	41	9	182	412	----	21	121	256	0	1	525
Male	2127	4098	2774	38	7035	7025	2585	21441	11621	3147	12503	14920	40	1247	280	13956	2040	5968	75	8014	18381	----	590	13408	5468	390	89	29692
Not available	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1955	0	20829	0	0	0	0	0	0

Table 2-5 Non-EU nationals holding CoCs issued by EU Member States

Region[24] of Origin	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IS	IT	LT	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK	Total
Africa	65	1	2	0	1	9	0	0	33	3	69	39	0	45	0	1	0	0	0	6	0	61	0	0	0	0	1	779	**1115**
Americas	129	0	0	0	2	3	1	0	29	1	6	6	0	4	0	0	0	1	0	20	6	0	1	0	0	0	0	198	**407**
Asia	10	0	2	0	0	7	0	0	1	1	1	13	0	49	0	0	0	0	0	36	1	10	0	0	0	0	0	13774	**13905**
Europe (non-EU)	7	8	1	0	27	113	399	0	11	3	5	33	0	0	1	0	37	376	0	2	4	74	0	27	0	2	0	19	**1149**
Oceania	0	0	0	0	1	2	0	0	0	0	1	0	0	16	0	0	0	2	0	4	0	1	0	0	0	0	0	164	**191**
Total	**211**	**9**	**5**	**0**	**31**	**134**	**400**	**0**	**74**	**8**	**82**	**91**	**0**	**114**	**1**	**1**	**37**	**379**	**0**	**68**	**11**	**146**	**1**	**27**	**0**	**2**	**1**	**14934**	**16767**

[24] The grouping of countries per regions was based on the "Standard country or area codes for statistical use" established by the United Nations and the list of European countries established by the EU

Table 2-6 Age distribution by EU Member States

Age	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IS	IT	LT	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
age<25	55	18	2	0	92	67	27	1544	246	88	545	273	0	73	4	706	130	128	20	873	426	152	14	130	53	5	2	1130
25≤age<30	403	279	154	0	741	695	215	3874	1185	337	1601	1571	1	205	14	2297	452	692	21	1528	2329	1872	70	1640	483	34	16	3494
30≤age<35	345	500	300	0	1304	808	326	3835	1367	432	1959	2037	1	217	34	2107	333	755	16	1255	2512	2414	76	2692	688	45	22	5010
35≤age<40	262	518	156	1	1001	655	338	3117	1453	435	1979	2171	0	168	25	1482	280	874	6	991	2133	2833	80	1877	634	44	20	4415
40≤age<45	199	634	70	2	711	684	223	2576	1968	440	1765	2313	0	153	20	1545	163	726	6	1013	1913	2539	74	1710	643	43	6	3915
45≤age<50	226	630	41	1	646	758	259	1622	1722	362	1892	1694	0	155	35	1422	136	669	2	1128	2232	2046	64	1511	649	36	2	3229
50≤age<55	236	564	136	4	670	920	296	1699	1658	343	1521	1521	4	97	36	1419	132	536	0	1161	2100	1669	47	1542	676	40	3	2344
55≤age<60	281	456	592	9	790	926	388	1943	1571	367	1172	1525	10	64	46	1445	187	678	2	1054	1953	2351	64	1243	580	43	10	2511
age≥60	208	509	1339	21	1405	1729	537	1640	1163	491	685	1857	24	158	69	1705	246	951	11	1148	3195	4953	122	1184	1318	100	9	4169
Total	**2215**	**4108**	**2790**	**38**	**7360**	**7242**	**2609**	**21850**	**12333**	**3295**	**13119**	**14962**	**40**	**1290**	**283**	**14128**	**2059**	**6009**	**84**	**10151**	**18793**	**20829**	**611**	**13529**	**5724**	**390**	**90**	**30217**

Table 2-7 Age distribution by departments

Department	age<25	25≤age<30	30≤age<35	35≤age<40	40≤age<45	45≤age<50	50≤age<55	55≤age<60	age≥60	Total
Alternative certification	529	1047	503	264	135	95	47	41	10	**2671**
Deck	4506	16291	19737	17239	15838	13851	12378	12976	17450	**130266**
Engine	3079	11238	12457	11249	10624	9678	9264	9490	13652	**90731**
Total[25]	**6803**	**26193**	**31371**	**27932**	**26036**	**23149**	**21356**	**22235**	**30925**	**216000**

[25] The sum of the rows may not be equal to the total because some officers held CoCs for both Deck and Engine Departments

Table 2-8 Age distribution for masters and deck officers

Capacity	age<25	25≤age<30	30≤age<35	35≤age<40	40≤age<45	45≤age<50	50≤age<55	55≤age<60	age≥60	Total
Master 3,000 GT or more	6	527	3739	6828	8482	7665	6510	7676	10821	**52254**
Chief Mate 3,000 GT or more	106	2752	5880	3933	2261	1362	1046	1077	1552	**19969**
Master less than 3,000 GT	250	1020	735	723	864	1048	1181	1124	1700	**8645**
Chief Mate less than 3,000 GT	1838	3779	1963	932	726	521	441	409	480	**11089**
OOW 500 GT or more	1778	7052	5864	3121	1852	1199	1098	865	852	**23681**
Master less than 500 GT, NCV	413	978	1396	1535	1512	1915	1914	1655	1833	**13151**
OOW less than 500 GT, NCV	115	191	172	179	148	150	202	178	219	**1554**
Total	**4506**	**16291**	**19737**	**17239**	**15838**	**13851**	**12378**	**12976**	**17450**	**130266**

Table 2-9 Age distribution for engineer officers

Capacity	age<25	25≤age<30	30≤age<35	35≤age<40	40≤age<45	45≤age<50	50≤age<55	55≤age<60	age≥60	Total
Chief Engineer 3,000 kW or more	7	446	2278	4548	5753	5537	5283	5397	8124	**37373**
Second Engineer 3,000 kW or more	737	2570	3743	2507	1512	1229	1096	1108	1562	**16064**
Chief Engineer less than 3,000 kW	6	71	193	306	410	524	654	757	996	**3917**
Second Engineer less than 3,000 kW	78	211	302	248	338	340	406	491	633	**3047**
OEW 750 kW or more	2063	6615	4389	2304	1466	916	791	640	728	**19912**
Electro-technical Officer	188	1325	1554	1338	1149	1136	1035	1100	1611	**10436**
Total	**3079**	**11238**	**12457**	**11249**	**10624**	**9678**	**9264**	**9490**	**13652**	**90731**

Table 2-10 Age distribution by gender group

Gender	age<25	25≤age<30	30≤age<35	35≤age<40	40≤age<45	45≤age<50	50≤age<55	55≤age<60	age≥60	Total
Female	327	1278	1050	657	476	296	169	92	63	**4408**
Male	6298	22881	27725	24214	22778	20536	19227	19518	25650	**188827**
Not available	178	2034	2596	3061	2782	2317	1960	2625	5212	**22765**
Total	**6803**	**26193**	**31371**	**27932**	**26036**	**23149**	**21356**	**22235**	**30925**	**216000**

Appendix B Data on masters and officers holding valid EaRs in 2019

Table 2-11 EU and non-EU countries issuing the original CoCs per EU Member States issuing the EaRs

Country issuing the original CoC	BE	CY	DE	DK	EE	EL	ES	FI	FR	HR	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
EU Member State	1538	8402	901	3155	125	1085	36	411	750	19	492	23	1817	54	2944	130	20991	2896	4162	17	4603	9	258	18	1	5637
non-EU country	2490	21574	1982	5007	42	6187	80	289	1172	0	189	7	1694	108	2785	368	51622	8736	11907	3	10116	0	192	0	0	5405
Not available	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	0	0	0	0	0	0	0
Total[26]	**4026**	**29973**	**2883**	**8158**	**167**	**7272**	**116**	**700**	**1921**	**19**	**681**	**30**	**3511**	**162**	**5728**	**498**	**72601**	**11630**	**16074**	**20**	**14714**	**9**	**449**	**18**	**1**	**11040**

Table 2-12 EU and non-EU countries issuing the original CoCs per departments

Country issuing the original CoC	Deck Department		Engine Department		Total[27]
	Number	Percentage	Number	Percentage	Number
EU Member State	28946	54.35%	24414	45.84%	**53256**
non-EU country	59850	49.63%	60770	50.39%	**120590**
Not available	3	25.00%	11	91.67%	**12**
Total[28]	**88774**	**51.08%**	**85156**	**49.00%**	**173794**

Table 2-13 Engineer officers holding EaRs registered by EU Member States

Capacity	BE	CY	DE	DK	EE	EL	ES	FI	FR	HR	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
Chief Engineer 3,000 kW or more	663	6220	475	1380	37	1002	38	135	294	5	147	3	763	28	1075	62	12731	2267	3122	3	3071	2	81	9	1	2109
Second Engineer 3,000 kW or more	374	2539	248	695	8	657	8	58	196	4	52	3	420	31	565	43	6989	1042	1325	2	1275	0	17	0	0	1230
Chief Engineer less than 3,000 kW	72	3	24	29	7	0	1	4	11	0	16	1	16	10	79	33	535	293	227	0	0	0	3	0	0	91
Second Engineer less than 3,000 kW	41	19	4	17	2	0	3	2	3	0	0	0	101	4	34	8	609	54	118	0	0	0	0	0	0	75
OEW 750 kW or more	583	3746	389	2072	11	1382	22	103	248	1	35	2	518	15	556	37	10245	1282	2188	0	1574	0	80	0	0	1412
Electro-technical Officer	278	2016	287	39	5	1209	0	3	234	0	12	0	352	12	353	5	4402	235	1090	0	1156	0	22	0	0	516
Total	**2008**	**14538**	**1426**	**4231**	**70**	**4249**	**72**	**305**	**985**	**10**	**262**	**9**	**2170**	**100**	**2660**	**188**	**35473**	**5171**	**8054**	**5**	**7073**	**2**	**203**	**9**	**1**	**5433**

[26] The sum of the rows may not be equal to the total because some officers held EaRs recognising original CoCs issued by EU Member States and non-EU countries
[27] The sum of the columns may not be equal to the total because some officers held EaRs for both Deck and Engine Departments
[28] The sum of the rows may not be equal to the total because some officers held EaRs recognising original CoCs issued by EU Member States and non-EU countries

Table 2-14 Master and deck officers holding EaRs registered by EU Member States

Capacity	BE	CY	DE	DK	EE	EL	ES	FI	FR	HR	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
Master 3,000 GT or more	687	6584	131	833	35	570	6	96	160	6	134	1	265	23	1371	113	13779	1545	1835	9	3191	7	123	3	0	1526
Chief Mate 3,000 GT or more	426	3257	364	891	16	806	4	30	281	0	120	12	326	19	729	85	8162	2772	3138	1	1774	0	28	0	0	1804
Master less than 3,000 GT	79	46	36	11	6	0	4	10	22	0	30	4	60	3	95	31	353	0	0	0	0	0	6	3	0	183
Chief Mate less than 3,000 GT	66	67	21	32	3	1	2	1	9	0	19	0	11	1	62	10	1047	0	99	1	0	0	1	2	0	162
OOW 500 GT or more	677	5489	905	2042	18	1657	24	222	462	3	117	5	434	17	757	69	13545	2101	2931	4	2686	0	102	0	0	1917
Master less than 500 GT, NCV	83	0	5	83	16	1	3	23	3	0	0	0	227	0	54	2	312	33	0	0	0	0	0	2	0	29
OOW less than 500 GT, NCV	5	1	3	40	3	0	1	13	1	0	0	0	25	0	10	0	16	15	46	0	0	0	0	0	0	4
Total	**2022**	**15442**	**1463**	**3930**	**97**	**3035**	**44**	**395**	**938**	**9**	**419**	**22**	**1347**	**62**	**3074**	**310**	**37159**	**6461**	**8024**	**15**	**7649**	**7**	**260**	**10**	**0**	**5624**

Table 2-15 EU Member States and EFTA countries issuing original CoCs endorsed by other EU Member States

Country issuing the original CoC	EU Member State issuing the EaR																										Total[29]
	BE	CY	DE	DK	EE	EL	ES	FI	FR	HR	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK	
Austria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Belgium	0	48	6	2	0	38	0	0	117	0	0	0	36	0	590	0	156	236	3	0	6	0	1	0	0	8	**1153**
Bulgaria	187	343	24	19	0	32	0	0	45	0	1	0	108	0	52	0	2005	73	108	0	324	0	0	0	0	387	**3320**
Croatia	450	541	52	109	0	25	2	0	65	0	3	1	0	0	762	24	1801	333	628	0	228	0	0	1	0	617	**4637**
Cyprus	0	0	0	0	0	464	0	0	0	0	0	0	0	0	1	0	622	1	0	0	8	0	0	0	0	1	**1015**
Czech Republic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	7	0	0	0	0	1	**25**
Denmark*	3	65	11	0	2	0	2	1	24	0	0	1	0	0	4	1	1	70	108	570	0	3	1	43	0	0	**884**
Estonia	7	205	20	18	0	1	0	308	3	0	7	0	9	15	9	64	141	187	82	0	141	0	2	0	0	108	**1155**
Finland	0	55	0	12	72	1	0	0	0	0	0	3	0	0	1	4	38	31	115	0	19	2	127	0	0	12	**459**
France	28	45	3	1	0	0	4	1	0	0	0	1	1	0	214	0	247	38	6	0	4	0	1	0	0	78	**653**
Germany	3	157	0	132	6	2	1	1	0	0	0	0	72	0	63	3	350	151	36	1	327	0	3	0	0	46	**1194**
Greece	5	1194	0	1	0	0	0	0	2	0	0	0	1	0	6	0	4827	15	3	0	44	0	1	0	0	14	**5929**
Hungary	0	3	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	11	0	0	0	0	2	**19**
Iceland	0	2	2	12	11	0	0	0	0	0	0	0	0	6	0	1	3	3	70	7	0	0	0	0	0	3	**120**

[29] The sum of the columns may not be equal to the total because some officers held EaRs issued by different EU Member States

Country issuing the original CoC	EU Member State issuing the EaR																									Total[29]
	BE	CY	DE	DK	EE	EL	ES	FI	FR	HR	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK	
Ireland	1	34	0	10	0	0	0	1	1	0	0	0	2	0	1	0	31	16	13	0	4	0	1	0	0	287	**372**
Italy	1	68	1	5	0	0	1	0	7	0	1	0	0	0	33	0	591	6	4	0	52	0	0	0	0	556	**1295**
Latvia	49	314	32	163	20	5	2	3	111	0	2	1	81	20	33	0	1026	300	444	0	223	0	20	0	0	387	**2788**
Lithuania	43	472	46	113	6	0	11	1	8	0	39	11	44	0	152	27	330	316	161	1	341	0	5	0	0	360	**1864**
Luxembourg	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Malta	0	1	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	**6**
Netherlands	501	533	97	57	0	0	1	22	25	8	2	1	0	9	483	2	701	0	45	7	16	1	2	10	0	83	**2386**
Norway	0	131	6	19	0	0	2	3	1	1	0	0	0	0	0	0	221	27	0	0	5	5	23	0	0	103	**534**
Poland	94	2674	530	862	0	17	1	8	91	1	334	4	0	1	229	2	2905	324	912	0	1597	0	19	6	1	1584	**10385**
Portugal	0	11	2	7	0	0	1	0	0	0	0	0	0	0	0	0	33	6	44	0	0	0	0	0	0	9	**113**
Romania	50	448	39	496	0	479	2	0	233	3	0	1	1158	0	195	0	2930	275	98	0	912	0	6	0	0	747	**6626**
Slovakia	0	5	6	5	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	18	0	1	0	0	0	**37**
Slovenia	1	54	2	1	0	0	6	0	1	6	0	0	5	0	5	1	43	10	3	0	29	0	0	0	0	6	**141**
Spain	8	287	2	21	3	3	0	0	4	0	0	0	5	0	20	0	395	40	30	0	131	0	2	1	0	162	**1031**
Sweden	0	51	11	405	6	0	1	50	1	0	1	0	0	0	0	0	78	29	713	0	6	0	0	0	0	55	**1363**
United Kingdom	108	671	10	684	1	16	1	10	34	0	102	0	300	0	100	0	1565	376	492	1	169	0	1	0	0	0	**4445**

*Includes Faroe Islands

Table 2-16 Non-EU countries, recognised at EU level or under the process of recognition, issuing original CoCs endorsed by EU Member States

Country issuing the original CoC	EU Member State issuing the EaR																									Total[30]
	BE	CY	DE	DK	EE	EL	ES	FI	FR	HR	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK	
Algeria	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Argentina	96	12	0	0	0	0	4	0	0	0	0	0	0	0	50	0	64	0	84	0	1	0	0	0	0	0	**290**
Australia	8	162	1	72	4	2	0	0	1	0	1	1	1	0	49	0	209	20	413	0	27	0	0	0	0	72	**940**
Azerbaijan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	516	0	0	0	2	0	0	0	0	0	**521**
Bangladesh	0	37	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	**41**

[30] The sum of the columns may not be equal to the total because some officers held EaRs issued by different EU Member States

Country issuing the original CoC	EU Member State issuing the EaR																										Total[30]
	BE	CY	DE	DK	EE	EL	ES	FI	FR	HR	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK	
Brazil	0	58	0	115	0	0	0	0	6	0	0	0	0	0	16	0	0	3	307	0	25	0	0	0	0	20	**541**
Canada	2	9	0	22	0	1	0	0	1	0	0	0	0	0	2	0	43	8	59	0	2	0	0	0	0	43	**186**
Cape Verde	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	**8**
Chile	0	12	0	0	0	0	4	0	0	0	0	0	0	0	4	0	0	1	5	0	0	0	0	0	0	0	**22**
China	0	215	23	138	0	0	0	0	0	0	0	0	0	0	0	0	835	95	457	0	89	0	0	0	0	959	**2601**
Cote D´Ivoire	0	0	0	0	0	0	0	0	64	0	0	0	0	0	56	0	0	0	0	0	0	0	0	0	0	0	**95**
Cuba	0	31	0	54	0	10	54	0	0	0	0	0	2	0	0	0	101	0	0	0	56	0	0	0	0	0	**278**
Egypt	3	211	3	0	0	0	1	0	4	0	0	0	0	0	104	0	538	0	1	0	78	0	0	0	0	0	**919**
Ethiopia	0	18	2	0	0	1	0	0	0	0	0	0	0	0	0	1	12	0	0	0	44	0	0	0	0	0	**73**
Fiji	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Georgia	5	136	0	3	0	96	0	0	1	0	0	0	6	0	0	0	593	0	0	0	37	0	0	0	0	0	**823**
Ghana	2	38	1	1	0	0	0	0	0	0	0	0	0	0	30	0	22	0	8	0	8	0	0	0	0	0	**103**
Hong Kong	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	5	**12**
India	373	883	0	1888	0	68	0	0	84	0	0	0	503	0	223	0	4098	105	1700	0	646	0	0	0	0	505	**10544**
Indonesia	5	270	0	2	0	9	0	0	17	0	0	0	0	0	46	0	301	383	35	0	119	0	0	0	0	0	**1114**
Iran, Islamic Republic of	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	3	**12**
Israel	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	4	0	0	0	0	0	**44**
Jamaica	92	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	1	0	0	0	0	7	**113**
Japan	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	**12**
Jordan	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156	0	0	0	1	0	0	0	0	0	**160**
Korea, Republic of	0	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	472	0	0	0	1	0	0	0	0	5	**490**
Lebanon	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	67	0	0	0	0	0	0	0	0	0	**68**
Madagascar	0	0	0	0	0	0	0	0	41	0	0	0	0	0	47	0	0	0	0	0	0	0	0	0	0	0	**60**
Malaysia	1	24	0	0	0	0	0	0	0	0	0	0	0	0	9	0	57	0	23	0	2	0	0	0	0	4	**118**
Mexico	2	30	1	0	0	0	2	0	0	0	0	0	0	0	5	0	0	0	0	0	2	0	0	0	0	0	**39**
Montenegro	0	274	1	2	0	1	0	0	0	0	0	0	0	0	27	0	701	4	52	0	147	0	0	0	0	148	**1173**

Country issuing the original CoC	EU Member State issuing the EaR																										Total[30]
	BE	CY	DE	DK	EE	EL	ES	FI	FR	HR	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK	
Morocco	0	59	0	0	0	0	0	0	23	0	0	0	0	0	8	0	0	0	0	0	2	0	0	0	0	0	**87**
Myanmar	0	83	9	4	0	0	0	0	6	0	0	0	0	0	1	0	512	0	32	0	108	0	0	0	0	46	**758**
New Zealand	5	49	1	30	1	0	0	0	0	0	0	0	0	0	9	0	103	71	104	0	9	0	0	0	0	111	**469**
Pakistan	0	69	0	0	0	3	0	0	0	0	0	0	0	0	0	0	37	0	0	0	11	0	0	0	0	8	**125**
Panama	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	**5**
Peru	0	76	0	0	0	0	8	0	0	0	0	1	0	0	0	0	202	0	4	0	227	0	0	0	0	0	**483**
Russian Federation	249	4205	358	262	29	186	0	19	80	0	177	4	25	95	351	284	6765	2922	1136	3	1876	0	1	0	0	775	**17380**
Senegal	0	0	0	0	0	0	0	0	9	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	**15**
Serbia	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	**10**
Singapore	7	54	0	117	0	0	0	0	2	0	0	0	0	0	14	0	187	9	85	0	39	0	0	0	0	30	**530**
South Africa	0	11	0	39	0	0	0	0	0	0	0	0	0	0	3	0	0	7	3	0	3	0	0	0	0	20	**84**
Sri Lanka	0	111	6	18	0	0	0	0	0	0	0	0	0	0	0	0	335	0	18	0	127	0	0	0	0	39	**582**
The Philippines	394	8404	1043	1758	0	4268	0	260	462	0	4	0	1157	0	701	0	17463	2289	6101	0	2328	0	191	0	0	1372	**46114**
Tunisia	0	0	0	0	0	0	0	0	21	0	0	0	0	0	14	0	9	0	0	0	0	0	0	0	0	0	**35**
Turkey	0	12	3	7	0	0	0	0	0	0	0	0	0	0	49	0	5390	4	0	0	223	0	0	0	0	0	**5548**
Ukraine	1234	5798	530	461	6	1536	0	9	329	0	7	1	0	13	956	83	11670	2752	837	0	3845	0	0	0	0	1140	**26057**
United States	3	18	1	17	0	0	0	0	0	0	0	0	0	0	0	0	66	1	25	0	0	0	0	0	0	65	**195**
Uruguay	0	6	0	0	0	0	7	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	**15**
Viet Nam	0	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	69	0	0	23	0	0	0	0	23	**298**

Table 2-17 Age distribution of holders of EaRs by departments

Department	age<25	25≤age<30	30≤age<35	35≤age<40	40≤age<45	45≤age<50	50≤age<55	55≤age<60	age≥60	Total
Deck	2042	12918	17787	15146	13246	9449	6434	6295	5457	**88774**
Engine	1494	10188	14225	12599	10497	10721	9277	8501	7654	**85156**
Total[31]	**3533**	**23066**	**31987**	**27725**	**23733**	**20152**	**15703**	**14788**	**13107**	**173794**

[31] The sum of the rows may not be equal to the total because some officers held EaRs for both Deck and Engine Departments

Table 2-18 Age distribution for engineer officers holding EaRs

Capacity	age<25	25≤age<30	30≤age<35	35≤age<40	40≤age<45	45≤age<50	50≤age<55	55≤age<60	age≥60	Total
Chief Engineer 3,000 kW or more	3	119	1779	4259	5106	5676	4909	4983	5178	**32012**
Second Engineer 3,000 kW or more	21	1142	4438	3513	1925	1686	1369	1081	814	**15989**
Chief Engineer less than 3,000 kW	0	22	94	149	180	198	229	252	284	**1408**
Second Engineer less than 3,000 kW	12	109	233	140	131	117	105	100	127	**1074**
OEW 750 kW or more	1272	7838	6189	2915	1830	1832	1324	1039	514	**24753**
Electro-technical Officer	188	1081	1799	1849	1468	1354	1451	1141	806	**11137**
Total	**1494**	**10188**	**14225**	**12599**	**10497**	**10721**	**9277**	**8501**	**7654**	**85156**

Table 2-19 Age distribution for masters and deck officers holding EaRs

Capacity	age<25	25≤age<30	30≤age<35	35≤age<40	40≤age<45	45≤age<50	50≤age<55	55≤age<60	age≥60	Total
Master 3,000 GT or more	5	140	2038	4755	6005	5202	3893	4340	4045	**30423**
Chief Mate 3,000 GT or more	53	1928	7002	5289	3573	2130	1287	943	681	**22886**
Master less than 3,000 GT	0	9	62	94	121	140	170	146	193	**935**
Chief Mate less than 3,000 GT	133	500	400	172	102	87	68	59	65	**1586**
OOW 500 GT or more	1850	10445	8563	5032	3520	1921	1005	788	434	**33558**
Master less than 500 GT, NCV	2	52	123	125	144	126	108	86	81	**847**
OOW less than 500 GT, NCV	6	23	42	30	25	16	17	13	11	**183**
Total	**2042**	**12918**	**17787**	**15146**	**13246**	**9449**	**6434**	**6295**	**5457**	**88774**

Table 2-20 Age distribution of officers holding EaRs by gender group

Gender	age<25	25≤age<30	30≤age<35	35≤age<40	40≤age<45	45≤age<50	50≤age<55	55≤age<60	age≥60	Total
Female	111	543	374	162	88	46	32	18	14	**1388**
Male	3418	22359	31365	27331	23431	19901	15543	14610	12961	**170919**
Total	**3529**	**22893**	**31729**	**27488**	**23517**	**19945**	**15571**	**14627**	**12973**	**172272**

Table 2-21 Age distribution by region of the country issuing the original CoC

Region[32] of the country issuing the original CoC	age<25	25≤age<30	30≤age<35	35≤age<40	40≤age<45	45≤age<50	50≤age<55	55≤age<60	age≥60	Total
Asia	1288	9888	11992	10514	9713	8178	4993	4194	2856	**63616**
EU	716	5638	8778	8268	7113	5646	5177	5400	6520	**53256**
Europe (non-EU)	1458	6735	10102	8216	6375	5908	5100	4741	3261	**51896**
Rest of the World	71	804	1131	741	543	428	442	455	474	**5089**
Total	**3533**	**23063**	**31987**	**27723**	**23731**	**20150**	**15702**	**14786**	**13107**	**173782**

[32] The grouping of countries per regions was based on the "Standard country or area codes for statistical use" established by the United Nations and the list of European countries established by the EU

Appendix C Data on ratings holding valid CoPs in 2019

Table 2-22 Ratings holding CoPs registered by EU Member States

Capacity	BE	DE	EE	ES	FI	FR	HR	IS	IT	LT	LV	NO	PL	RO	SE	SK
Able seafarer deck	0	32	849	1060	699	147	700	4	3363	265	2240	5354	4997	1240	2171	3
Rating forming part of a navigational watch	1307	1502	723	7844	655	1498	3626	1	2315	581	1216	0	9227	1581	971	11
Able seafarer engine	0	13	798	439	399	98	180	1	1159	18	875	828	506	727	498	1
Rating forming part of an engineering watch	381	378	0	4559	502	1023	1688	5	1065	229	685	0	4027	1747	258	11
Electro-technical rating	0	115	69	158	362	167	1459	0	597	20	49	1137	338	1011	172	1
Total[33]	**1855**	**3610**	**2035**	**11366**	**3293**	**2476**	**6505**	**10**	**6918**	**1042**	**4658**	**7181**	**13439**	**4746**	**3715**	**27**

[33] The sum of the rows may not be equal to the total because some ratings held CoPs for both Deck and Engine Departments

Appendix D Overview – Forecast for 2020 and 2021

Table 2-23 Forecast for the next two years of masters and officers holding CoCs issued by the top 5 EU and top 5 non-EU countries

Forecast -Year[34]	PH	UK	UA	PL	EL	RU	HR	IT	IN	TR
2020										
Linear Forecast	13.03%	8.63%	7.21%	5.83%	7.94%	5.13%	4.40%	4.68%	2.90%	1.39%
ETS Forecast	13.97%	8.90%	7.30%	5.80%	7.18%	5.08%	4.37%	4.47%	3.02%	1.41%
ETS Confidence bound (±)	1.86%	1.30%	0.86%	0.42%	1.74%	0.27%	0.21%	1.28%	0.55%	0.43%
2021										
Linear Forecast	13.34%	8.18%	7.12%	5.48%	8.63%	5.04%	4.32%	4.73%	2.97%	1.28%
ETS Forecast	14.34%	8.48%	7.21%	5.41%	7.80%	4.97%	4.29%	4.47%	3.10%	1.32%
ETS Confidence bound (±)	2.50%	1.31%	0.86%	0.43%	2.34%	0.31%	0.21%	1.32%	0.56%	0.44%

Table 2-24 Forecast for the next two years of officers at management and operational level available to serve on board EU Member State flagged vessels

Forecast -Year[35]	Deck ML	Engine ML	Deck OL	Engine OL
2020				
Linear Forecast	42.70%	27.19%	14.37%	18.16%
ETS Forecast	42.54%	27.17%	14.30%	18.49%
ETS Confidence bound (±)	3.70%	0.37%	0.83%	0.13%
2021				
Linear Forecast	43.16%	26.69%	13.79%	19.03%
ETS Forecast	42.77%	26.67%	13.72%	19.10%
ETS Confidence bound (±)	3.77%	0.37%	0.83%	0.19%

[34] The values presented are the % of master and officers holding CoCs issued by the specific country among the total number of masters and officers available to serve on board EU Member State flagged vessels for the year forecasted
[35] The values presented are the % of officers by department and level of responsibility among the total number of masters and officers available to serve on board EU Member State flagged vessels for the year forecasted

Table 2-25 Forecast for the next two years of female officers available to serve on board EU Member State flagged vessels

Forecast -Year[36]	EU	Non-EU	All
2020			
Linear Forecast	2.29%	0.60%	1.69%
ETS Forecast	2.28%	0.62%	1.68%
ETS Confidence bound (±)	0.06%	0.07%	0.05%
2021			
Linear Forecast	2.32%	0.64%	1.73%
ETS Forecast	2.31%	0.66%	1.72%
ETS Confidence bound (±)	0.06%	0.08%	0.05%

Table 2-26 Forecast for the next two years of the top 10 nationalities of masters and officers available to serve on board EM Member State flagged vessels

Forecast -Year[37]	PH	UA	EL	IN	PL	RU	UK	HR	IT	RO
2020										
Linear Forecast	11.70%	7.16%	8.67%	5.76%	5.49%	4.74%	4.20%	4.35%	4.71%	4.40%
ETS Forecast	12.05%	7.17%	7.98%	6.03%	5.58%	4.67%	4.34%	4.31%	4.50%	4.21%
ETS Confidence bound (±)	1.85%	0.80%	1.66%	0.53%	0.47%	0.32%	0.64%	0.22%	1.27%	0.48%
2021										
Linear Forecast	11.78%	7.06%	9.35%	5.66%	5.28%	4.57%	3.89%	4.27%	4.76%	4.54%
ETS Forecast	12.16%	7.07%	8.60%	5.94%	5.38%	4.48%	4.04%	4.22%	4.51%	4.32%
ETS Confidence bound (±)	1.86%	0.80%	2.23%	0.71%	0.47%	0.40%	0.65%	0.22%	1.31%	0.60%

[36] The values presented are the % of female officers among the total number of masters and officers holding CoCs issued by EU or non-EU countries or available to serve on board EU Member State flagged vessels for the year forecasted

[37] The values presented are the % of master and officers nationals of the specific country among the total number of masters and officers available to serve on board EU Member State flagged vessels for the year forecasted

Table 2-27 Forecast for the next two years of the nationalities by region of origin of masters and officers available to serve on board EM Member State flagged vessels

Forecast -Year[38]	Asia	EU	Europe (non-EU)	rest of the world
2020				
Linear Forecast	19.79%	59.66%	14.05%	1.48%
ETS Forecast	20.35%	58.61%	13.73%	1.47%
ETS Confidence bound (±)	2.67%	3.86%	1.56%	0.12%
2021				
Linear Forecast	19.54%	59.79%	13.62%	1.37%
ETS Forecast	20.15%	58.68%	13.26%	1.36%
ETS Confidence bound (±)	2.69%	3.86%	1.56%	0.12%

Table 2-28 Forecast for the next two years concerning the average age of masters and officers available to serve on board EU Member State flagged vessels

Forecast -Year[39]	EU	Non-EU	All
2020			
Linear Forecast	43.6	40.2	42.4
ETS Forecast	43.7	40.1	42.5
ETS Confidence bound (±)	0.4	0.5	0.2
2021			
Linear Forecast	43.6	40.2	42.4
ETS Forecast	43.6	40.1	42.5
ETS Confidence bound (±)	0.4	0.5	0.2

[38] The values presented are the % of master and officers nationals of countries included in the specific region of origin among the total number of masters and officers available to serve on board EU Member State flagged vessels for the year forecasted
[39] The values presented are the average age of masters and officers among the total number of masters and officers holding CoCs issued by EU or non-EU countries or available to serve on board EU Member State flagged vessels for the year forecasted

Table 2-29 Forecast for the next two years concerning the average age of officers at management and operational level available to serve on board EU Member State flagged countries

Forecast -Year[40]	EU ML	non-EU ML	All ML	EU OL	non-EU OL	All OL
2020						
Linear Forecast	45.6	43.9	45.2	36.7	35.5	36.2
ETS Forecast	45.6	43.9	45.2	36.8	35.6	36.4
ETS Confidence bound (±)	0.4	0.5	0.3	0.1	0.5	0.2
2021						
Linear Forecast	45.6	43.8	45.1	36.9	35.6	36.4
ETS Forecast	45.6	43.9	45.1	37.0	35.7	36.5
ETS Confidence bound (±)	0.4	0.5	0.3	0.2	0.5	0.3

[40] The values presented are the average age of officers by department and level of responsibility among the total number of masters and officers holding CoCs issued by EU or non-EU countries or available to serve on board EU Member State flagged vessels for the year forecasted

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