

THE EUROPEAN COMMISSION'S ROLE IN MARINE MATERIALS, EQUIPMENT AND COMPONENTS MUTUAL RECOGNITION CERTIFICATION

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ABSTRACT

The European Commission has, in the past, updated regulations regarding marine operations in order to enhance safety and protection of the environment. In that respect and with the scope to enhance safety onboard ships, Regulation No 391/2009 and in particular Article 10.1 on certification of ships, suggested that European Union Recognised Organisations (EU ROs) should harmonise their rules and procedures related to certification of materials, equipment and components based on equivalent standards issued by them. As a result the EU ROs Mutual Recognition (MR) scheme was initiated. This paper investigates the current implementation of the requirements of Article 10 through a developed questionnaire and case studies. The results have shown that the current level of implementation is regarded as acceptable and safety is adhered to the highest standard. Moreover, the current implementation needs further improvement and harmonisation of individual rules may be required. EU RO requirements can be further developed in the future as the overall process matures. Additional information and dissemination of the overall MR process is also required engaging additional stakeholders in the marine industry. However, the expansion of the scheme presents challenging issues to overcome including the global acceptance of the MR certification.

Keywords: Certification; EC Article 10.1; Marine Components Equipment Materials; Mutual Recognition

INTRODUCTION

The marine and maritime regulatory regime involves a number of national and international organisations and authorities such as the International Maritime Organisation (IMO), National Flag Authorities and others that may instigate relevant rules and regulations such as the European Union (EU). A National Flag Authority is the country that a particular vessel is registered with or licensed under and whose laws the vessel and its operator must abide by. All the involved regulators have the common goal of providing high standards of safety on all levels of naval activity safekeeping the environment among others, as presented by the International Association of Classification Societies (IACS 2011).

In addition to the above, Classification Societies are organisations that operate internationally (non-governmental) and are responsible for developing, establishing and maintaining technical standards for the construction and operation of marine and maritime structures including vessels. Classification Societies are well-established

organisations which operate globally and have, in some cases for hundreds of years, been developing expertise and acquiring experience in the sector. As part of their presence worldwide, they have established main offices in EU countries as well. Flag administrations can often authorise Classification Societies to carry out a number of surveys and inspections of ships among others, as required by the International Convention for the Safety of Life at Sea - SOLAS (IMO 2015a) and the International Convention for the Prevention of Pollution from Ships - MARPOL (IMO 2015b) to verify that the regulations are adhered to. The Classification Society acting on behalf of the Flag administration is known as Recognised Organisation (RO). Each RO is accountable to the Flag administration for the work that it carries out on the administration's behalf, such as surveys onboard ships, issuing certificates related to the seaworthiness of the vessel among others. All ROs acknowledged by EU Flag Administrations are collectively referred to as EU ROs.

REGULATORY FRAMEWORK

Apart from the condition of ship structures, EU ROs also certify the marine equipment used onboard ships. Suppliers of such equipment need to apply for certification to various EU ROs in order to ensure access of their products to EU and global markets. However, EU ROs have different sets of rules, resulting in the suppliers needing to apply for multiple certification. On the other hand, EU ROs tend to have very similar requirements for certification, in some cases based on identical tests carried out at the same laboratories.

Even though mutually recognised certificates have been used for years in other sectors, such as in aviation (US-EU 2011), in marine equipment this had not been fully implemented. Some work in this direction had been performed by the Marine Equipment Directive group – MarED (EU 2014). However, at that stage it was not obligatory for the EU ROs to neither harmonise their procedures nor accept certificates from other EU ROs within the EU.

Traditionally, EU Flag Administration policy-makers have taken the lead in shaping the policy followed within the maritime sector (Groenleer 2010). As the European Institutions extended their role and presence over and above national policy in shaping regulation especially concerning safety (Gulbrandsen 2011), the issue of certification was brought forward. This was addressed during the implementation of Article 10 of the Regulation of the European Commission (EC) No 391/2009 (EC 2009). The EC has the ability to influence policy making within the EU and support the integration process in every aspect (Camisão 2015); in this context the integration of maritime sector policy. Article 10 referred to a single certificate (e.g. an MR certificate) being issued which can provide the same level of safety as all the relevant certificates issued by various EU ROs. In this respect, Article 10 of the Regulation places an obligation on EU ROs to harmonise their rules and set up a system of mutual recognition of their classification certificates for marine equipment, materials and components.

EC introduced the specific Article of the Regulation to encourage the mutual certification process and reduce the burden on European manufacturers. However, as this Article refers to certification processes practiced globally through international organisations, even though it is proposed through the EC, in fact it has a global outreach. As such this Article goes beyond EU to international law and thus the application regime is not clearly specified. The balance in this case is challenging. Similar issues have occurred in other cases of maritime safety regulations enforced by EU but having a global impact (Ringbom 2008). Moreover, if such EU regulations either introduce standards that are more demanding than the internationally accepted standards or introduce new standards that did not previously exist, similar challenges arise (Marten 2015). Article 10 mandates the use of the most stringent certification rules to be used for the mutually accepted certificates. However, such challenges were addressed by allowing EU ROs to specify the implementation of the mutual certification process. By issuing a mutually recognised (MR) certificate and not replacing the currently existing ones, the EU ROs proposed a scheme that did not enforce change on internationally established processes. Thus, a new certification process was added to the global certification regime instead.

As a result, the actual implementation of the Article was not fully enforced as such. However, as the Article tasks the EU ROs to propose the best strategy in order to satisfy the requirements of the Article while maintaining the highest level of safety, another important issue was highlighted. While EU ROs have no regulatory authority as such, they are comprised of ROs that individually have developed requirements and certification processes over hundreds of years of experience which are globally accepted. In this respect, several consultation meetings with a variety of stakeholders e.g. manufacturers, EU ROs and others were arranged prior to the proposition of a strategy (Lazakis, et.al. 2015).

Additionally Article 10 mentions that the assessment of the implementation is obligatory and reports to the EC are submitted to that end. Assessing the impact of Article 10 has been an ongoing target through various studies in the maritime community (Danish Maritime Authority (DMA) 2013; EU ROs 2014; European Marine Equipment Council (EMEC) 2010) following up on similar approaches performed in the past e.g. the 'New Approach to technical harmonisation and standards between EU and USA' (EU 2004).

In order to address Article 10 of the Regulation, the EU ROs voluntarily set up a group among them in order to address Article 10. The group consists of eleven members and is structured in two main parts. These are the technical committee and the advisory board. They collectively worked on the technical and procedural requirements while also on the terms and conditions by which the EU ROs certificates of appropriate types of materials, equipment and components could be mutually recognised. In this respect,

the EU ROs developed an approach consisting of 6 levels for materials, equipment and components, based on commonly agreed safety considerations starting from the simplest to the most complex items (EU ROs 2012). Level 1 included all items with no classification requirements while Level 2 included items for which manufacturers' certificates are sufficient. Items requiring Type Approval certification were listed under Level 3 while those requiring Unit Certification under Level 4. Level 5 consists of a list of more complex items the certification of which is dependent upon sub-certification of individual parts. Finally, Level 6 includes full-build certification of a system.

As a starting point, several items included up to Level 3 were selected to be included in the MR scheme as the focus was placed on simple items that were more straightforward to certify compared to other more complex ones. In this respect, several individual items were eventually added in four Tiers of products since 2012, including a total of 44 Level 3 items as the MR scheme has gradually expanded over the years (EU ROs 2012; EU ROs 2013; EU ROs 2014). As also was mandated by Article 10, awareness was raised in the maritime industry by gathering feedback through workshops and relevant stakeholder meetings. As an example well attended workshops took place in Hamburg in 2013 and London in 2014 as published by the Ships and Maritime Equipment Association of Europe (SEA Europe 2014).

Considering all the above, it is important to identify and examine both the challenges and the expectations of the stakeholders involved in the MR process in order for the MR scheme to comply with article 10 and simultaneously address the industry needs. The main aim of this paper is to (1) provide an analysis of the progress achieved, (2) investigate the current state of the MR scheme following the provisions of Article 10.2 of the Regulation (EC 2009) and (3) identify the necessary steps for the acceptance and application of the scheme in practice. This paper will also aim to clarify whether the MR scheme is having an impact on safety, market access as well as cost of current MR certificates and moreover assess the need for further MR certification of marine products.

MATERIALS AND METHODS

In order to address the above aims, an initial thorough review was performed on similar studies as discussed in the Questionnaire and Discussion sections. Additionally, information was gathered from internet sources and interviews were performed. The above led to the development of a structured questionnaire including closed and open-ended questions. The aim of the questionnaire was to acknowledge and record the views, requirements, interests and expectations of as a wide spectrum of participants as possible in order to ensure the objectivity and independent spirit of the study undertaken.

The generation of a specific case study on assessing the implementation and cost implications of the MR scheme for a particular piece of equipment, material and/or

component belonging in Tier (TR) of marine items TR1, TR2 or TR3 group of marine products was performed as well (TR4 was not yet established at the time of performing the case study). This was necessary in order to validate the results of the questionnaire and to identify whether the application of the MR scheme is in line with the expectations and views of the marine stakeholders.

Questionnaire

The design of the questionnaire considered the methodology described in previous studies by Brace (2008) and Groves (2009). These considered the development of the structure of the questions that would cover the various aspects of this study and provide effective results that could be analysed in a meaningful way. Additionally the method for testing and evaluating surveys presented by Presser (2004) was used to assess the results which are presented in the following section. Also the analysis used in (McAuliffe 2014) was taken as guidance as well as other sources (Brittern 1995; Punch 1995; Sarantakos 2005; Scheurich 1997; Johnson 1999), in order to evaluate the quality of the questionnaire and associated results. A web-link and a hard copy were available. The electronic version was used as the main data collection strategy of this paper as it provided for wider distribution and response gathering in short time (Best 2001).

The structure of the questionnaire included initial sections with generic information required while then followed by more targeted questions. Questions were grouped in demographics, awareness, perception and critical review, relevance, involvement and suggestions for future developments. Both closed and open-ended questions were present to allow participants to express their views. This approach was utilised to provide better insight into the reasons behind the current perception of the MR scheme and to allow the respondents to present their views (Brittern 1995; Punch 1995; Sarantakos 2005; Scheurich 1997; Johnson 1999). A cover letter was also included as the first page of the questionnaire to inform users and introduce the research scope of the study.

The questionnaire was then distributed to all relevant stakeholders in order to gather feedback and evaluate the questionnaire design and validity (McAuliffe 2014). Eventually, a revised version was distributed to a total of 309 individuals and 59 responses were gathered over a period of two months. Marine stakeholders included EU ROs, manufacturers, suppliers, marine and maritime associations, shipyards, ship owners, flag state authorities, regulatory authorities, Insurers, Protection and Indemnity (P&I) clubs and charterers. P&I refers to maritime insurance providers covering open-ended risks associated to members of the marine and maritime industry.

Data analysis

Descriptive statistics and percentage distributions were used to analyse the results of the questionnaire for the closed questions as there were no initial hypotheses set out at the

beginning of this paper. Open ended questions were also similarly analysed based on frequency of similarity in responses and grouping. More elaborate analysis was deemed unnecessary as the data were categorical and non-continuous (Johnson 1999).

Case study

In order to further contribute to the investigation on the application of the MR scheme, a case study was performed. Contact with companies and manufacturers that had already applied and had been issued with an MR certificate was performed. It is worthwhile mentioning that not all companies' headquarters are located within EU (e.g. some companies are based in USA, Taiwan, South Korea, etc.) which presented difficulties in identifying the appropriate contacts within these organisations.

The case study was performed so that questionnaire results could be validated as well as to explore additional issues that might have not been clarified through the questionnaire. These could potentially include more practical issues present when companies/manufacturers actually applied and acquired the MR certificate.

RESULTS

Respondent characteristics

A total of 59 responses were received from a sample of 309 recipients. Overall, this is considered to be a satisfactory response rate (19.1 per cent) as previous studies have shown that most questionnaires have response rates similar to the rate or lower of the present study (between 10-20 percent) (Brace 2008; Groves 2009; Presser 2004; Oppenheim 2000). Additionally, similar numbers of responses have been recorded in previous attempts to evaluate the state of implementation of Article 10 (EMEC 2010; SEA Europe 2014). It is also worthwhile highlighting that the present study had a higher impact by including a number of different stakeholders while also achieving a higher number of responses overall, thus assuring the wider participation across the marine industry.

The questionnaire was completed by Flag State authorities (3 per cent), insurer associations (2 per cent), marine and maritime associations (9 per cent), marine equipment manufacturers (49 per cent), marine equipment suppliers (7 per cent), Recognised Organisations (17 per cent), regulatory authorities (3 per cent), shipyards and shipbuilders (2 per cent), ship owners (3 per cent) as well as stakeholders from the education and finance sectors of the industry (5 per cent, Other category).

Of the total number of responses, 47 per cent included large organisations while 41 per cent included Small and Medium-sized Enterprises (SMEs). An additional 12 per cent

included associations and other organisations. It is worthwhile mentioning that the responses included companies/institutions operating on more than one continent showing the global relevance as well as the inherent international features of the maritime industry. The respondents covered a wide area of activity on all continents and were also all active within Europe. From the respondents' characteristics it is evident that a wide range of stakeholders are active at an international level. As a result, the outcomes of the questionnaire can be regarded as providing a holistic overview of the current perception over the MR Certification process including all major stakeholders.

Level of awareness

Respondents acknowledged that the classification standards currently used by different EU ROs differ among them for products already available for MR Certification within Tiers 1–3 as shown by 42 per cent (Figure 1). A significant number (24 per cent) were not aware of the existence of any differences. A portion of respondents (14 per cent) did not identify any differences in classification standards among EU ROs. This further stresses the need for harmonisation between EU ROs which is one of the issues the MR certification process strives to resolve and is in line with results of other studies as well (SEA Europe 2014; Milieu Ltd 2015).

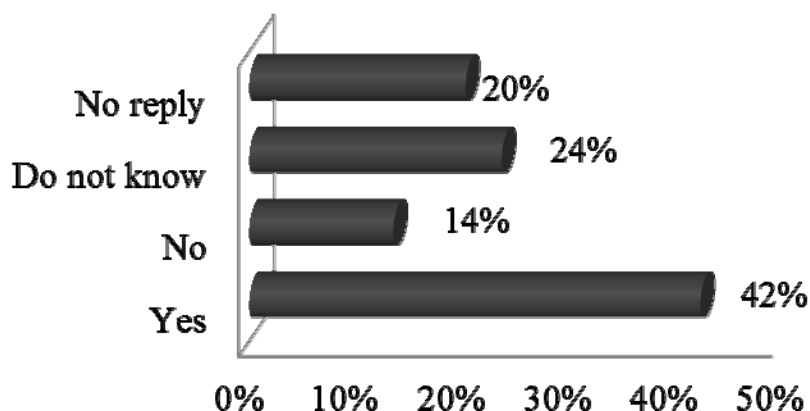


Figure 1: Classification Standards' variation between European Union Recognised Organisations

The respondents' general awareness level towards the regulatory regime related to MR Article 10.1 of the Regulation was high. Good and Excellent responses accounted for 68 per cent of the responses, while only 21 per cent reported a Fair or Poor awareness level. Related to the participants' awareness on the harmonisation process of

classification rules by the EU ROs since the implementation of Article 10.1 of the Regulation , 46 per cent of them indicated that they were aware of it while another 25 per cent was not aware of them (Figure 2).

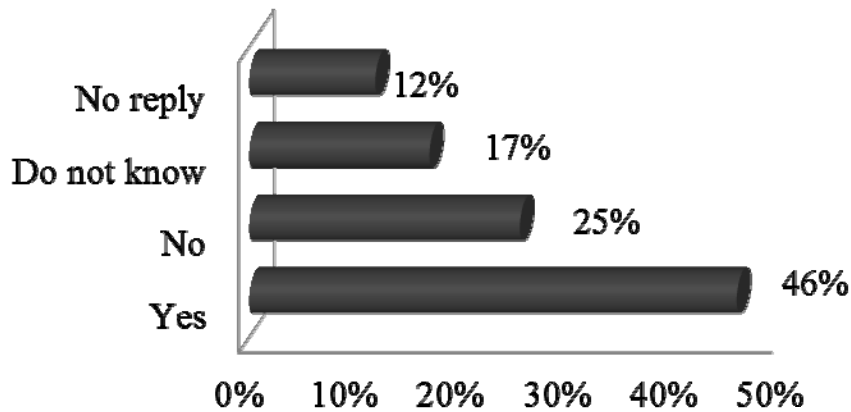


Figure 2: Awareness on harmonisation of European Union Recognised Organisations classification rules

The quality of the to-date developed EU ROs MR rules was regarded as average to very good by the majority of respondents (73 per cent) while 16 per cent considered the current rules not to be adequate. Given these responses it can be concluded that the MR classification rules' quality is generally acceptable. All the respondents that were aware of changes towards the harmonisation of the EU ROs' rules (46 per cent) also responded to the question regarding which changes they were aware of. Their comments included a general recognition of the changes affecting their individual products or area of work within the industry. Additionally, they were aware of the process followed by the EU ROs and Tiers 1-3 as well as the standards followed for the design of the EU ROs MR rules. The latter reveals that the majority of the respondents are not only aware of the scheme but are also aware of the particular effect the MR process has on the marine industry they are involved in.

Opinions were divided (32 per cent responded yes, and 32 per cent no) when stakeholders were asked to provide their view on the alignment of standards for the accreditation of material, equipment or component certification between each EU RO. This can be attributed to an extent to the experience of each stakeholder and the interaction they have with different EU ROs as well as to the type of product/market they are involved in. These responses also illustrate the complexity of the current

regime as the standards are different among products and thus difficult to make an overall judgement.

The MR Scheme

Related to the already issued certificates being accepted by all EU ROs, with 14 MR certificates having been issued so far by all EU ROs for products up to Level 3 (Lazakis 2015), 54 per cent replied that they were not aware of it. However, another 34 per cent of replies denoted that they were aware of the entire process (Figure 3). This indicates that regardless of the level of awareness of the scheme there is still confusion over the acceptance of the issued certificates.

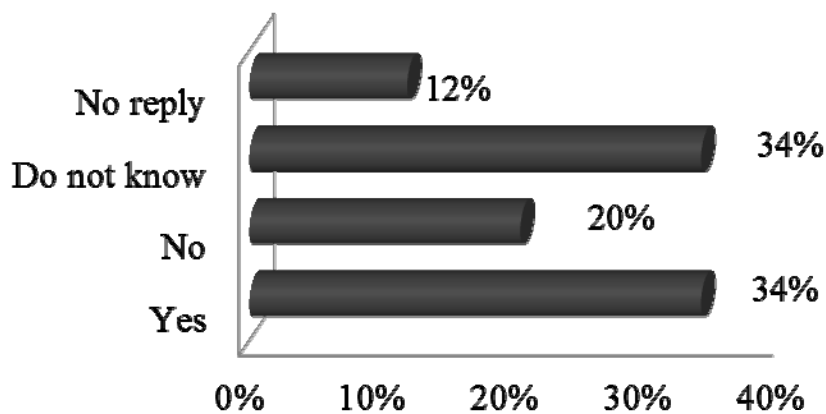


Figure 3: Are you aware whether already issued certificates for materials, equipment and components are being accepted by other European Union Recognised Organisations?

The answers to the next question further validated this result as 39 per cent of the participants reported that they did not have any knowledge of whether the new MR certificates issued by a single EU RO is directly recognised by the other EU RO group members. A further 10 per cent also reports non-acknowledgement of MR certificates by other EU ROs. The latter confirms the early stages that the MR process is currently in, while it also suggests that there is still some ambiguity among companies applying for the MR certificate.

Questioned about their knowledge of the three Tiers of products currently available for MR certification, marginally under half of the population sample replied positively (49

per cent) while 17 per cent was unaware of Tier 1-3 products. Additionally, 19 per cent of the respondents indicated that there exist some products in Tier 1-3 that are not yet included in their company's portfolio, while a further 24 per cent replied that all/some of the listed Tier 1-3 products are part of their company's portfolio (Figure 4). As this question was more relevant to manufacturers (49 per cent of overall respondents) it is evident that only a very small percentage was not aware of the products in the Tier lists, which further underlines their interest as well as the effect this scheme is going to have on their businesses.

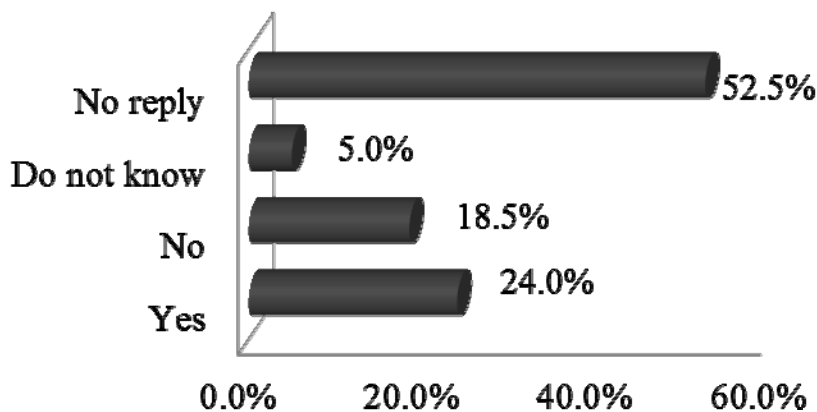


Figure 4: Are all/some of the listed materials, equipment and components in Tiers 1, 2 and 3 part of your company's portfolio?

When asked if they have applied for at least one MR certificate for their products, 12 per cent replied positively. This statement is further strengthened by Figure 5 which illustrates that a number of respondents (25 per cent) are positive towards applying for MR certificates in the future. The reasons for not having applied yet for MR certification or not intending to apply, as summarised from the responses to the questionnaire, are related to a number of reasons. The latter refers to companies not being expected to apply for a certificate for a specific product prior to the introduction of the MR scheme, as well as to cost issues, witnessed testing, uncertainty related to the acceptance of the certificate both globally and among EU ROs and thus the practical value of such a certificate. Another reason was identified as the initial resistance to change when benefits of the new MR scheme are not obvious compared to the previous certification regime.

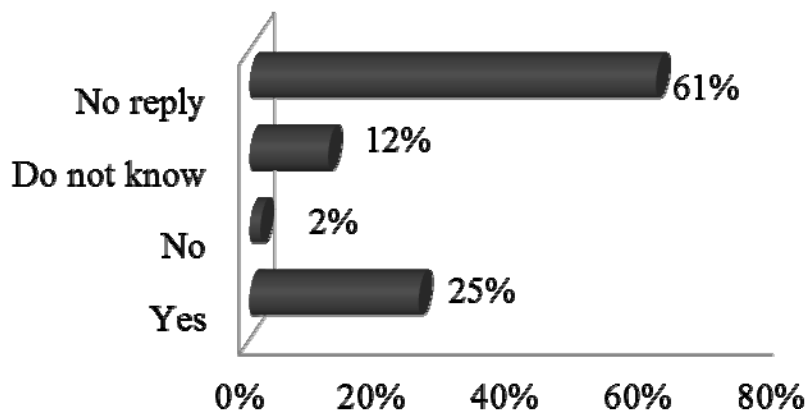


Figure 5: Do you intend to apply for a European Union Recognised Organisations Mutual Recognition certification for at least one of your products?

Evaluating the overall application process, stakeholders underlined through their responses an issue with the additional requirements for new certificates. Furthermore, technical requirements were reported as needing refinement while intensity of testing was reported as being overwhelming compared to current practices. Similar responses have also been recorded in previous studies (SEA Europe 2014; Milieu Ltd 2015). It was also highlighted by some stakeholders that due to lack of experience the EU ROs struggle internally to handle new applications. Other than that, the process was found to be straightforward and well documented for interested parties.

Having observed the above, the benefits of the MR scheme can be multifaceted and interesting to explore. For some of the participants the benefit of reduced cost and bureaucracy was evident along with the reduced time to market, even though the lack of worldwide recognition is still overshadowing the benefits. To others, any benefit is yet unclear as products available are still few and insufficient time has passed in order to compare the results of this process to current practices. Also in terms of safety some expect the MR rules to be beneficial while others see neither a positive nor a negative effect.

Moreover, further interesting features were revealed through the questionnaire as well. Firstly, manufacturers were concerned that additional certificates would be needed for products previously not requiring any certification. Secondly the cost of witnessed tests for some products was reported to be higher than non-witnessed tests available for products in Tiers 1-3. Furthermore, the global acceptance of the MR certificate is a

major consideration which prohibits companies from applying for this certificate. This has been an ongoing issue since the initial implementation of the MR scheme (SEA Europe 2014; Milieu Ltd 2015).

The time for Article 10 to be implemented in practice, and the limited availability of products were also mentioned as inhibiting issues. Finally legal implications and liability associated to the new certificates were still questioned due to the limited applications available. The latter can be associated with the suggestion of withholding the expansion of the MR certification process to Level 4 safety critical items as indicated in the responses to the questionnaire. However, regardless of the concerns voiced in the previous responses, when rating the status of the content of Tiers 1-3 in terms of number of items included in the scheme and their application, 37 per cent rated them as Good and Very Good to Excellent while 17 per cent considered them to be Poor with an additional 19 per cent rating them as Fair.

From the responses to the questionnaire it was suggested that it would be desirable for additional items to be included in the MR certification list of Tiers such as steel parts, alloys and materials used in ship construction, components used in propeller systems, soft starters, pilot devices (push buttons), solid-state relays/contactors for non-motor-loads, pipes, fire safety products and pumps among others. Generally, items that have marginal differences in rules between EU ROs were also suggested. The application of common environmental standards was also recommended though this does not strictly fall within the scope of the current implementation of Article 10. Finally the need for experience in practice with the currently available products was stressed before any further expansion of the list of products is possible.

Regarding the improvement of the selection process of materials, equipment and components for the MR certification scheme, a number of changes were suggested as well. These mostly relate to the simplification of the scheme, the publication of the common rules for all EU ROs and the expansion of the scheme to cover more products. Also greater involvement of industry was suggested through the responses and further work towards the direction of wider recognition. To that extent the use of global standards and globally recognised certification methods could facilitate the desired acceptance as indicated by the respondents.

Attention was further drawn to issues related to the question on which are the main barriers towards the broader acceptance and application of the MR scheme. One of the suggestions mentioned was related to increasing the transition period for new items to be included in the scheme and constrict the Tiers to the current level (Level 3) until further experience can be accumulated in practice. Again the cost issues due to stringent rules and witnessed testing were reported. Finally, the level of awareness particularly between shipowners and shipbuilders, the issues with global acceptance, safety

considerations by some stakeholders and, most importantly, contractual considerations between EU ROs and shipowners, were reported as obstacles of further MR implementation.

In addition to the above, respondents suggested that the barriers mentioned could be overcome by making MR compulsory or by further disseminating the relevant information among shipbuilders and shipowners. Moreover the involvement of local surveyors was reported as an important step forward. In addition, the publication of information on Type Approval booklets, publication of cost for MR Certificates by all involved EU ROs, and expanding the range of products while ensuring safety is adhered was an important suggestion as shown through the responses received. Moreover, an interesting suggestion as identified by an open-ended question was to allow for an international independent/regulatory body to oversee and perform the implementation of the MR scheme.

Involvement

On the subject of transparency and identification of the industry involvement in the implementation process of the requirements set out in Article 10 of the Regulation, the consultation steps that have been taken by the EU ROs towards industry groups and trade associations were rated as satisfactory (36 per cent) while 17 per cent of the respondents reported they were not fully satisfied with them. It is clear that the process has already moved towards the involvement of the majority of stakeholders and there is a general appreciation of the result, though some stakeholders would have wanted greater involvement as also denoted by 34 per cent of the responses. This further stresses the need for involvement by various stakeholders so that the industry is able to feedback any concerns in advance of the publication of new technical requirements or additional products which has also transpired through other studies (Milieu Ltd 2015).

The same need for better communication between the various stakeholders with regards to the developments around the MR certificates is stressed even further by the responses presented in Figure 6. A small majority (52 per cent) expected to be better informed while only 20 per cent is informed to a satisfactory extent.

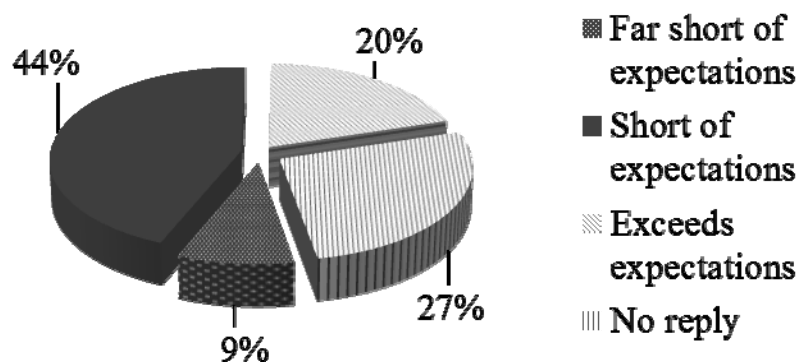


Figure 6: How would you rate, up to now, the overall level of awareness on Mutual Recognition certification?

It is also important to note that the majority of respondents (61 per cent) was not fully satisfied with the knowledge of and involvement in various initiatives by the EU ROs in informing and educating the stakeholders over the progress achieved on the introduction of the MR scheme. As in earlier questions on awareness from which participants reported a higher level of satisfaction, it could be concluded that respondents were mostly referring to involvement in this question.

Regulators and incentives

Responses to the question on incentives considered to be essential for a widely accepted MR certification process are summarised in this section. Among others, the increased involvement of EU authorities and EU ROs and better advertisement of the scheme were suggested. The initiation of a general point of contact for information on the MR scheme was another option presented. Finally, the clear identification of responsibility and liability was reported as an incentive for the implementation of the MR scheme to enjoy wider acceptance. On the other hand, reducing the overall cost and paperwork for new MR certificates and the overall certification process was suggested as an incentive for the companies to embrace the scheme.

When enquiring if the EU ROs MR scheme should be further promoted the responses were mostly positive (37 per cent) while another 33 per cent is still uncertain or negative about it showing the overall ambiguity on the MR process (Figure 7).

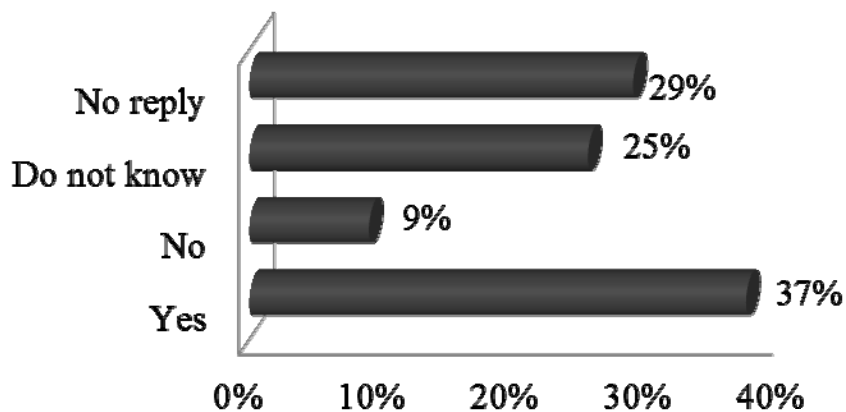


Figure 7: Should the European Union Recognised Organisations Mutual Recognition certification scheme be further promoted?

Further promotion should be facilitated - according to responses received - by supporting global MR certification acceptance, share information with all marine stakeholders, promote the MR scheme by IACS members and by providing information on promoting the scheme via local surveyors in EU ROs branch offices across the world. Further involvement has been requested in the past thus leading to the initiation of several attempts by EU ROs (Lazakis 2015). However some stakeholders mentioned that, that was the first time they had been asked to provide their views on this subject thus highlighting the need for broader dissemination as depicted in previous replies as well. This can be partially attributed to the global and multiscale nature of the industry as well as the “baby steps” of the application of the scheme so far.

Moreover, as shown in Figure 8, a significant proportion of the respondents (32 per cent) suggested that an EU Regulation is not regarded as the scheme that is most relevant to these issues. Reasons reported by the respondents included the need for an easier approach to harmonisation of rules without the need for such a detailed process as well as cost and safety implications. Further, the MR scheme not being a global initiative and the additional bureaucracy in the event of non-acceptance of the scheme in the global market were also mentioned. Moreover, some respondents identified that the EU ROs are not the appropriate organisations to facilitate Article 10 of this Regulation while another body such as the IMO was suggested instead.

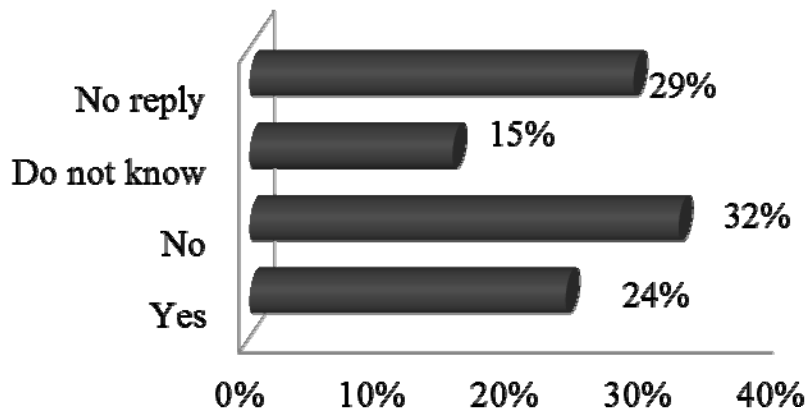


Figure 8: Do you consider a European Union Regulation to be appropriate for these issues?

However, an interesting feature of this question was that 24 per cent of the participants mentioned that an EU Regulation is considered appropriate for MR issues. Reasons for supporting the EU Regulation as depicted by the provided answers include the good existing framework of cooperation among EU ROs towards common rules and guidelines on marine products, the protection of the EU market while also moving the marine market back to EU. Other comments recommended that the International Electrotechnical Commission (IEC) committees and harmonised standards should be consulted prior to finalising the technical requirement specification as well as that EU ROs should not have been involved in statutory work.

Case study

In order to review the experience gained by manufacturers that have already applied for and been issued with MR certificates, a number of direct contacts were performed via emails and direct telephone calls. A semi-structured interview style was followed and the discussion was divided into the following sections: application, concerns and future developments. The most important points drawn from those conversations are summarised next.

MR in practice

When a new product (e.g. valve) was developed, the company directly applied for the new MR certificate. Before choosing which EU RO to apply through, the company contacted a total of three EU ROs. One of them was most helpful in providing information as personal contact was established as well. Moreover, the price regarding

the same MR certificate was different among EU ROs which assisted in the selection of the EU RO to be employed.

According to the contacted companies, the time from the initial application to acquisition of the MR certificate was the same as that of any other certificate for the same product within the general framework of the previous Type Approval certificate as well.

The companies that participated in this case study reported that the cost of certification for mass produced items such as air pipes was similar between EU ROs and close to the cost of acquisition of Type Approval certificates. On the other hand, where individual certificates for specialised products would be required (e.g. water-tight doors), the Type Approval certificate cost was much higher and differed substantially among EU ROs. To this extent, the difference in cost of current practices could lead to similarly differently priced MR certificates in the future. Additionally, it was mentioned that no maintenance fee was applicable for the duration of the MR certificate which is similar to that of the previous Type Approval certificate (5 years).

It is also important to highlight that EU ROs issued two certificates (MR and Type Approval) for the same product in a particular case. The new MR certificate was issued together with an EU RO Type Approval certificate for the same product. The Type Approval certificate was issued for use with ships registered with the particular EU RO. The new MR Certificate on the other hand was issued to be used for ships overseen by other EU ROs (IACS members). Moreover, it was mentioned that a single price was presented for both certificates (i.e. new MR plus the EU RO Type Approval certificate). In this particular case, the price was similar to the existing Type Approval certificate price.

Challenges

With regards to the companies' concerns over the validity of the MR certificate worldwide, it was mentioned that the new certificate should be similarly valid compared to the existing EU ROs Type Approval certificates that are already accepted worldwide. However this conflicts with the general perception and practical acceptance of the scheme in some countries as recorded in the questionnaire responses and other studies (SEA Europe 2014; Milieu Ltd 2015). It was also reported that the validity of MR certificates was only relevant for use on-board ships and not on offshore applications.

The future

From the manufacturers' experience, the future application of MR certificates is certainly regarded positively. Additional comments from the manufacturers' side included the specification of a single rule set to be used by all 11 EU ROs as then the

MR Certificate would be much more easily accepted in countries and non EU Flag States. This is in line with recommendations and expectations from the manufacturers side (SEA Europe 2014). This would be particularly beneficial in the event of a shipowner/company selecting to collaborate with a different EU RO as the same certificates could be used as well. Further recommendations included the expansion of the scheme to higher than Level 3 items such as main engines and propellers.

In conclusion, according to manufacturers it is straightforward to apply for the new MR certificates; and a reduction in administrative load and time-to-market for new products could be achieved. However, time is needed for industry experience to feed back into the MR certification process before stakeholders are fully convinced to apply the new MR certificates at a larger scale.

DISCUSSION

High safety standards and harmonisation

In the current implementation of Article 10 of the Regulation the most important aspects have been the preservation of highest standards related to safety and the harmonisation of the rules of all the EU ROs towards a mutually accepted certificate.

Regarding Article 10.1 of the Regulation, there is consensus in terms of the major aspect that the MR process addresses; in other words, safety issues are of paramount importance and are considered accordingly by all key stakeholders. A potential area of concern could include the use of MR certificates issued from different EU ROs for various sub-systems onboard ships. However, since the strictest rules apply for the preparation and implementation of the Technical Requirements for all new MR certificates, all EU ROs will need to follow the same rules for issuing them. Moreover, any new MR certificates that are issued will have exactly the same standing worldwide.

On the other hand, the review of the current state of implementation provided evidence of the harmonisation process being underway. However, it must be noted that thus far the extent of the harmonisation is still in its infancy. Although a separate MR certificate has been provided for a certain number of items, it has not yet replaced the individual EU ROs' certificates for the same products as initially expected by the marine industry. The above discussion highlights the need for additional time to test the new MR certificate in practice, which may eventually become common practice replacing the individually issued certificates and thus simplifying a complicated regulatory regime.

Cost reduction or not?

Overall, as the MR scheme is still in its infancy, currently available information is limited. However it was found that the cost for the new MR certificate may vary according to the item that will be issued for. To this extent, for simple mass produced

items (e.g. valves, electrical components, etc.), the cost for the new certificate can be similar to or up to twice the price of the one for the same product for which Type Approval certification was previously required. On the other hand, maintenance fees seem to be similar to those for other Type Approval certificates where applicable. The fact that witness testing is needed and more rigorous standards are to be met, have potentially led to the increase in cost in certain cases. However, the case study also revealed that for that particular product the time to issue the new MR certificate was the same as for the older Type Approval certificates.

Moreover, it was shown that the duration of the new MR Certificate is 5 years which is the same as the previous Type Approval certificates. As was revealed through the questionnaire results, additional benefits can be generated when applying for the replacement of a number of old certificates with a single new MR certificate for a variety of products under the same category (e.g. one single certificate for a range of display screens), which will also lead to the overall reduction of cost in addition to minimising the administrative burden for the industry.

Awareness exists but further involvement is necessary

The present study has highlighted that the marine industry is involved in the MR certification process to a certain extent. On one side, big Original Engine/Equipment Manufacturer (OEMs) are more involved in the MR process due to their own interest and prior knowledge of similar certification processes in the past through other international collaborations e.g. international standardisation activities for electrical or mechanical products and equipment. However, smaller OEMs are not as well informed and involved in the MR process due to their inherent market characteristics e.g. smaller size companies, constraints in terms of administrative and financial resources. It is this part of the marine manufacturers that would appreciate higher level of involvement and availability of information regarding the MR certification scheme. Accordingly, it is this particular sector of stakeholders that would most benefit from Article 10 of the Regulation as multiple certificates are less often affordable by these manufacturers.

The above statement highlights an additional feature revealed through this study including the limited information available to a wide range of stakeholders. This can be attributed to the limited time that the MR certificate has been eventually applied and showcased in the marine market (all current MR certificates have been issued over the last 16 months). As was expected, all EU ROs have developed internal processes for the MR certification in order to increase awareness within their organisation. The latter has been applied at both within the EU and worldwide level (i.e. EU ROs headquarters and site offices worldwide), very much related to the global operations of each organisation. At the time of the preparation of this paper (March 2015), a total of 14 MR certificates were already published most of which within the last year. The fact that companies with MR Certificates are based all over the world further highlights the global nature of the industry and the outreach of Article 10 as well as the importance for global acceptance of the issued MR certificates.

The need for additional involvement by a larger group of stakeholders is stressed, as is the fact that there is some confusion over the procedure through which the EU ROs accept and issue the MR certificates as well as the scope of the scheme. The above can be addressed through the publication of additional information on the technical requirements of the products to a larger proportion of stakeholders with different industry interests, also providing for time to process and allow for feedback and recommendations. Further involvement of international regulators would be beneficial for the scheme in terms of status, feedback as well as acceptance.

Steps to facilitate future acceptance

The EU regulatory framework related to the MR scheme, although it provides support to an industry scheme introduced by EU ROs, has provoked some concerns in terms of its wider implementation worldwide, particularly related to non-EU Flag states. This issue could be resolved if a pilot voluntary multilateral scheme is put in place among the Flag state, EU ROs and end-users that could lead to a wider and global acceptance of the new MR certificate. However, as Article 10 of the Regulation has a global impact and would potentially introduce changes at international level several challenges have to be overcome to facilitate future global acceptance.

Finally, the expansion of the scheme to higher than Level 3 items is eagerly awaited by some of the marine stakeholders. Level 4 safety critical items could be considered for inclusion in the MR scheme as well while a 6 month pilot study is scoped for implementation to ensure that safety is maintained at the highest level. Dissemination of the recorded information and involvement of the majority of stakeholders in the process will become beneficial at that stage too.

Validation

The findings of this study were validated through a full day workshop that took place in Glasgow in September 2015. It is worthwhile mentioning that positive feedback was received as denoted in EU ROs news bulletin (EU ROs 2015). The results were presented to representatives of all the stakeholders including EU ROs, SEA Europe representing the European manufacturers, the shipowner association (International Chamber of Shipping - ICS), European Maritime Safety Agency (EMSA) and the EC amongst others. Based on the discussion of the results presented in this paper, future actions were suggested which included among others to continue gathering experience within the proposed Level 3 tiers before expanding to higher levels while also increasing cooperation with stakeholders.

FUTURE WORK

Even though a significant amount of data was gathered through the initial thorough review, questionnaires and the case studies, this paper is not exhaustive. Further investigation of the reasons for some of the main areas of concern will need to be performed as there is still not sufficient practical experience with the full implementation of the MR scheme at this stage.

Moreover, additional studies will need to be carried out as more MR certificates will be issued. Most importantly the inclusion of safety critical items higher than Level 3 will be an important development. The global acceptance of the scheme is of paramount importance and further discussion among all stakeholders through workshops and feedback mechanisms will be instrumental to that.

CONCLUSIONS

Through the questionnaires and additional case studies, this paper has critically examined and presented the views and opinions of a range of stakeholders within the marine industry with regards to the development and application of the MR scheme so far. In this respect, a number of key conclusions can be derived from the above. First of all, the developed MR scheme is compliant with Article 10 of the EU Regulation. At the same time, through the application of the risk based approach for the selection of items included in the latest Tiers and the adherence to the strictest rules, safety is fully promoted.

The application process for MR Certificates was considered as straightforward and where experience exists the industry is satisfied by the general cost and administrative burden reduction as well as with the duration of the certificates and their quality. However, when witnessed testing is necessary, it is considered overwhelming (especially for SMEs), as it affects the cost of acquiring an MR certificate compared to previous certification. Also, the industry is supportive of the MR scheme and looks forward to its expansion but further surveyor training and promotion of the scheme would be an asset to the current state of the implementation through involvement of a variety of stakeholders in the process.

At this stage international acceptance is the most important obstacle to overcome, as impact to liability and contractual agreements is yet to be identified. It is still early stages of the implementing Article 10 and such issues have not had to be dealt with as of yet. However, since the harmonisation process is not directly linked to the guidelines of each individual EU RO, it is still considered to be short of providing the market need for common application among all EU ROs. At the same time, there is a clear direction towards further expanding the mutual recognition certification scheme including the close collaboration among all interested stakeholders.

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REFERENCES

- Best, S.J., Krueger, B., Hubbard, C., Smith, A. (2001). 'An assessment of the generalizability of Internet surveys', *SocSciComput Rev* 19, 131–145.
- Brace, I. (2008). *Questionnaire Design: How to Plan, Structure and Write Survey Material for Effective Market Research (Market Research in Practice)*. Kogan Page Great Britain.
- Britten, N. (1995). 'Qualitative research: qualitative interviews in medical research', *Br Med J*, 311, pp. 251.
- Camisão, I. (2015). 'Irrelevant player? The Commission's role during the Eurozone crisis', *Journal of Contemporary European Research*. 11 (3), pp. 268 - 286.
- Danish Maritime Authority (2013). Danish RO Agreement 2013: DMA.
- European Commission (2009). 'Regulation (EC) no 391/2009 of the European Parliament and of the Council of 23 April 2009 on common rules and standards for ship inspection and survey organisations', *Official Journal of the European Union L 131/11*. Available online at: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009R0391>: EC.
- European Marine Equipment Council (2010). *Final report on the implementation of Article 10 of regulation EC391*: EMEC.
- European Union (2004). 'Council decision of 21 April 2004 on the conclusion of an Agreement between the European Community and the United States of America on the Mutual Recognition of Certificates of Conformity for Marine Equipment', *Official Journal of the European Union*. L 150(47), 30/04/2004. Available online at: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=OJ%3AL%3A2004%3A150%3ATOC>: EU.
- European Union (2014). 'Marine Equipment Directive (MarED), Council Directive 96/98/EC on Marine Equipment', <http://www.mared.org>, Accessed: 23/12/2014: EU.

- European Union Recognised Organisations (2012). ‘Mutual Recognition within ship classification’, *Report to the EU*. Available online at: http://www.euomr.org/SiteAssets/Document%20Archive/EU_report_1212_L02.pdf: EU ROs.
- European Union Recognised Organisations (2013). ‘Mutual Recognition in ship classification - Supplement No 1 to First Report to the European Commission and the Member States’, *Report to the EU*. Available online at: <http://www.euomr.org/SiteAssets/Document%20Archive/EU%20Report%20Supplement%20No%201%20TR2%20requirements%2001%20July%202013.pdf>: EU ROs.
- European Union Recognised Organisations (2014). ‘Mutual Recognition in ship classification - Supplement No 2 to First Report to the European Commission and the Member States’, *Report to the EU*. Available online at: <http://www.euomr.org/SiteAssets/Document%20Archive/Supplement%20No%202%20Tier%203%20requirements%20July%202014.pdf>: EU ROs.
- European Union Recognised Organisations (2015). ‘EU RO Mutual Recognition Group – Newsletter, Issue No. 5 – January 2016’, Available online at: <http://www.euomr.org/SiteAssets/stakeholder-relations/EU%20RO%20MR%20Newsletter%20-%20Issue%205.pdf>: EU ROs.
- Gulbrandse, C. (2011). ‘The EU and the implementation of international law: the case of “sea-level bureaucrats”’, *Journal of European Public Policy*, 18(7), pp.1034-1051.
- Groenleer, M., Kaeding, M., Versluis, E. (2010). ‘Regulatory governance through agencies of the European Union? The role of the European agencies for maritime and aviation safety in the implementation of European transport legislation’, *Journal of European Public Policy*, 17(8), pp. 1212-1230
- Groves, R. M., Fowler Jr., F. J., Couper, M. P., Lepkowski, J. M., Singer, E., Tourangeau, R. (2009) ‘*Survey Methodology*’, Wiley New Jersey.
- International Association of Classification Societies (2011). ‘Classification societies - their key role’, *IACS report*. Available online at: http://www.iacs.org.uk/document/public/explained/CLASS_KEY_ROLE.pdf: IACS.
- International Maritime Organisation (2015a). ‘International Convention for the Safety of Life at Sea (SOLAS), 1974. Concluded at London on 1 November 1974. Treaties and international agreements registered on 30 June 1980 No. 18961’. Available online at: <https://treaties.un.org/doc/Publication/UNTS/Volume%201184/volume-1184-I-18961-English.pdf>: IMO.
- International Maritime Organisation (2015b). ‘International Convention for the Prevention of Pollution from Ships (MARPOL) Adoption: 1973 (Convention), 1978 (1978 Protocol), 1997 (Protocol - Annex VI); Entry into force: 2 October 1983 (Annexes I and II)’. Available online at: [http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx): IMO

- Johnson, D. (1999). 'The insignificance of statistical significance testing', *J Wildl Manage*, 63(3), pp. 763–772.
- Lazakis, I., Turan, O., Michala, A.L. (2015). 'Final Report on the level reached in the process of harmonising the rules and procedures and on Mutual Recognition (MR) of certificates for materials, equipment and components, pursuant to Article 10.2 of Regulation (EC) 391/2009', *Report to the EU*. Available online at: <http://ec.europa.eu/transport/modes/maritime/studies/doc/2015-05-29-report-mutual-recognition.pdf>
- Marten, B. (2015). *Jurisdiction over Ships. Post-UNCLOS Developments in the Law of Sea. Chapter 5 – Port State Jurisdiction, International Conventions, and Extraterritorially: An Expansive Interpretation*. Koninklijke BRILL NV, Leiden.
- McAuliffe, S., Potts, J., Canessa, R., Baily, B. (2014). 'Establishing attitudes and perceptions of recreational boat users based in the River Hamble Estuary, UK, towards Marine Conservation Zone', *Marine Policy*, 45, pp. 98-107.
- Milieu Ltd (2015). 'Ex-post impact assessment on the implementation and effects of the Third Maritime Safety Package', *Report to the EU*, PE 536.331. Available online at: http://www.europarl.europa.eu/meetdocs/2014_2019/documents/tran/dv/eia_thirdmaritimesafetypackage_/eia_thirdmaritimesafetypackage_en.pdf
- Oppenheim, A. (2000). *Questionnaire Design, Interviewing and Attitude Measurement*. Bloomsbury Academic United Kingdom.
- Presser, S. Rothgeb, J.M., Couper, M. P., Lessler, J. T., Martin, E., Martin, J., Singer, E. (2004). *Methods for Testing and Evaluating Survey Questionnaires*. Wiley-Interscience New Jersey.
- Punch, K. (2005). *Introduction to social research: quantitative and qualitative approaches (2nd ed)*. Sage London.
- Ringbom, H. (2008). *The EU Maritime Safety Policy and International Law*. Publications on Ocean Development, Brill
- Sarantakos, S. (2005). *Social research (3rd ed)*. Palgrave MacMillan New York.
- Scheurich, J. J. (1997). *Research method in the postmodern*. Falmer London.
- Ships and Maritime Equipment Association of Europe (2014). 'Mutual Recognition Study', *Report*. Available online at: http://www.vsm.de/sites/default/files/dokumente/9c721b3441531645a4bd41052c8e781b/sea_europe_mr_study_december_2014.pdf: SEA Europe.
- United States – European Union (2011). 'Information Note: Agreement between the United States of America and the European Union on cooperation in the regulation of civil Aviation Safety', <https://www.easa.europa.eu/system/files/dfu/Information%20note%20-%20Agreement%20EU-US.pdf>: US-EU.