

# The New Role of Maritime Institutions from the Viewpoints on the Maritime Education, Training and Research Activities

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## ABSTRACT

Considering the present and expected demand for human resources by the maritime community, its quantity and quality depend on the number of the ships and the technology applied to them.

Scientific and economic developments in this community bring the intensive use of modern technology for many of ships operation. Generally it effects to reduce the quantity of manpower, while it increases the requirement of qualifications of human resources to utilize such advanced technology. Considering above, the maritime education, training and research activities should be revised and updated according to the demand of the community.

Because of a difference between the transition of the demand for the human resources and development of the maritime education, training and research activities, there are two most common questions as “What to teach” and “How to teach”.

The first question has been asked for many years. The contents of maritime education and training are always related to the existing maritime knowledge and technology and should be updated with consideration of changes of the demand namely “Globalisation of maritime community”. It brings globalisation of the maritime education, training and research activities.

The second question is still keeping us busy to look for the best way. Presently traditional methods are used together with new system, while the use of sophisticated simulation, communication and information systems etc. and it is changing our understanding on teaching.

This paper introduces the new role of Maritime Institutions from the viewpoints of the maritime education, training and research activities. The role of guide for seafarers and maritime companies is always essential and the concepts such as “Refreshment Training”, “On the Job Training”, “Lifelong” or “Continuous Training” bring new understanding to the training period, trainee’s age and position. As a result, the maritime institutions should be ready for their new role, which is, in brief, guiding the maritime society, recommending and providing new learning environments, organising research and developments, performing the education, training and assessment, improving existing methods and developing new methods of the education, training and assessment.

## 1. Introduction

Human element in the maritime industry is always one of the most significant components to achieve better productivity in maritime services, while maintaining safe and secure shipping operations and protecting the marine environment. This approach is the fundamental philosophy of new global maritime culture, which is based on safety, security and environmental protection. Research and development (R&D) on the maritime human resources are very critical and important part of all maritime related R&D activities, at maintaining and expanding the knowledge base in the maritime industry as a whole. It covers therefore a wide spectrum, starting from training to the impact of the human element in maritime industry. To understand the effect of the human element, we have to consider all and each part of the process of manpower supply for the maritime industry. This process contains mainly three sequences as follows.

The first sequence is the planning of maritime human resources. It is depending on the present and future employment opportunities and maritime carrier path. It is one of the major parts of Maritime Resource Management. The second sequence is the training of maritime human resources. It is depending on the technology used onboard, national and international rules, regulations, codes and standards. The last sequence is the recruitment of maritime human resources. It is depending on the national and international market for maritime human resources and standards for manning.

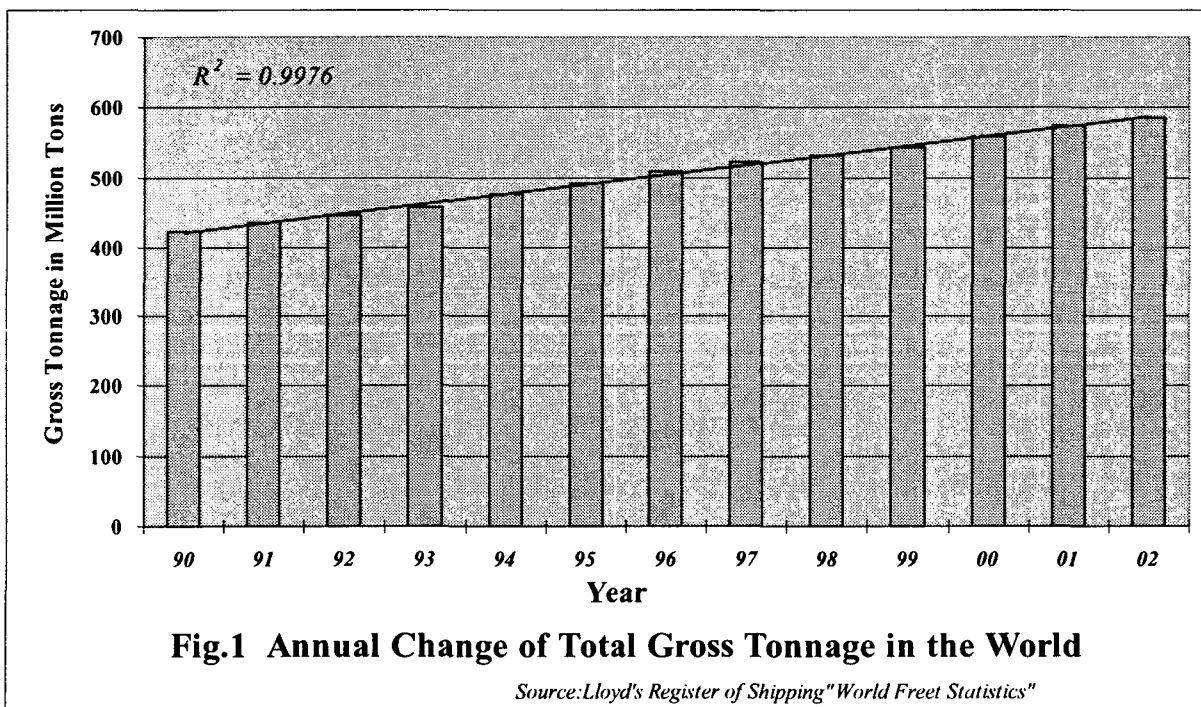
All these three sequences are depending on the needs of the maritime industry. Authors would like to focus on the second sequence and introduce the new role of the maritime institutions from the viewpoints on the functions of maritime education, training and research activities. As the result of these activities, maritime institutions, they usually transfer its intellectual outcome to the maritime industry and/or Maritime Administration, are assigned on the new role as an additional consultancy function beside others. In this paper, "Maritime Institution" means an institution with all these functions; therefore authors also call it with a new abbreviated name "METRC Institution" (Maritime Education Training Research and Consultancy Institution).

## 2. Background

### 2.1 Facts of World Merchant Fleet

"Lloyd's Register – Fairplay, World Fleet Statistics 2003" as at 31<sup>st</sup> of December 2002 gives a statistical summary of the current world fleet of propelled sea-going merchant ships of not less than 100 GT as at the end of 2002, and of those ships completed during 2002. The world fleet of sea-going merchant ships now stands at 89,010 ships of 585.6 million gross tons (487.5 million compensated gross tons) and an average age of 22 years. Top 10 merchant fleets of the world by registration are Panama, Liberia, Bahamas, Greece, Malta, Cyprus, Singapore, Norway (NIS), China and Hong Kong.

Figure 1 indicates a constant increase of world fleet since 1990.



### 2.2 Supply and Demand for Seafarers

According to the very well known Economic Rule of the "Free Market", there are determining relationships between quality and quantity of the supply, quantity and quality of the demand, cost and price for any goods and service in the market. This relationship exists also in the market of maritime manpower. In brief, the present and expected demand for human resources by the maritime community, its quantity and quality depend on the

number of the ships and the technology applied to them. Considering the constant increase of the demand of world fleet and rapid development of maritime technologies, demand of highly educated seafarers is also predicted to increase accordingly.

The Baltic and International Maritime Council (BIMCO) and the International Shipping Federation (ISF) completed the report *BIMCO/ISF 2000 Manpower Update: The World Demand for and Supply of Seafarers* in April 2000. It is probably the most comprehensive study of the global supply and demand for merchant seafarers that have so far been undertaken, building on data amassed by earlier studies conducted in 1990 and 1995. This report shows that the worldwide supply of officers working aboard in 2000 is estimated 404,000 against 420,000 of demand. It means there is almost 4% against total demand and it is expected to be 14% (maximum) in 2005 and be 24% (maximum) in 2010 as per Figure 2 below.

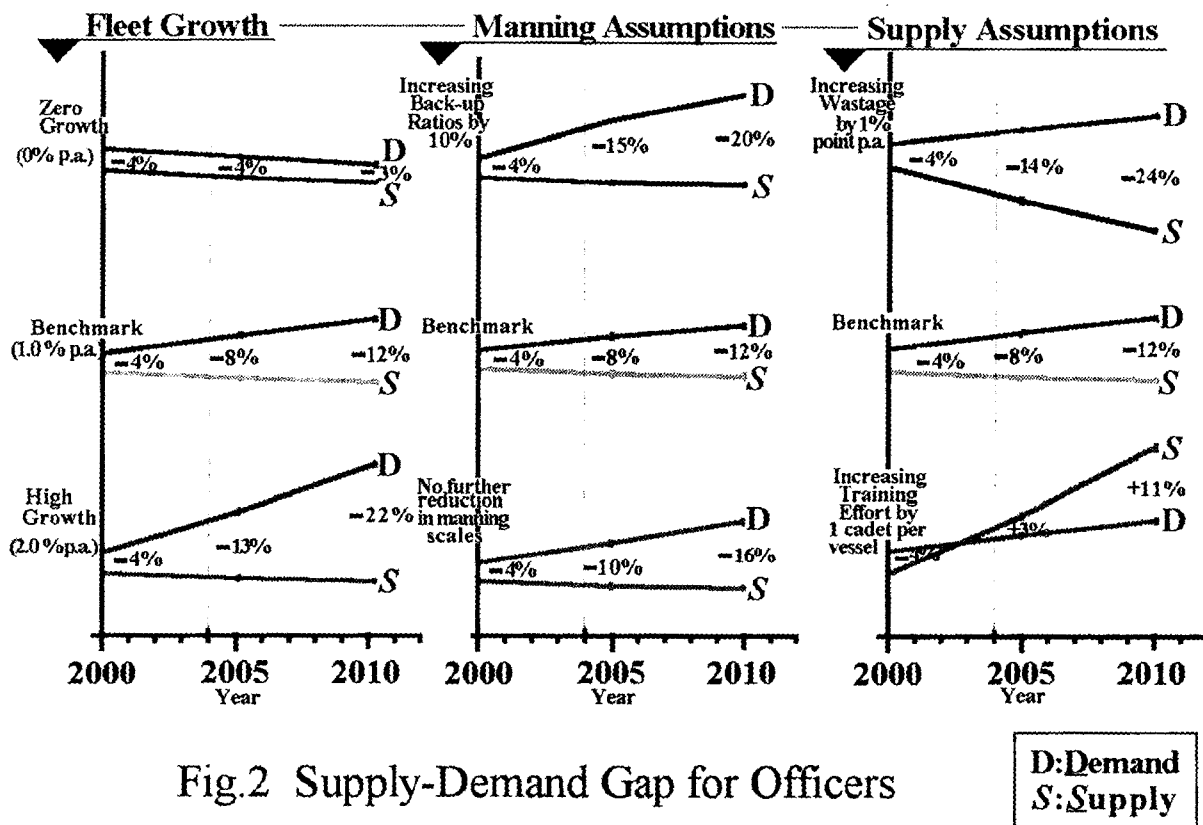


Fig.2 Supply-Demand Gap for Officers

Source: BIMCO/ISF estimates based on computer model

Taking above fact in account, ISF Manning and Training Committee Report says that the international maritime industry is approaching a critical point regarding supply of seafarers. Failure to take the right action now could have radical implications for the character of the industry in the years ahead, not least because the quality and make-up of the shore based workforce is closely linked to an adequate global supply of high calibre seafarers.

To supply sufficient number of suitably qualified seafarers to the maritime industry requires proper co-planning by the maritime industry, Maritime Administrations and maritime institutions. They also should carry out implementation of this plan. The extent and the quantity of the contribution depend on the capacity and the capability of the industry, Administrations and maritime institutions. However the benefit as economic and tangible results will be shared also by entire maritime community.

According to ILO R139 Employment of Seafarers (Technical Developments) Recommendation, 1970 (Recommendation concerning Employment Problems Arising from Technical Developments on Board Ship) each member country should ensure National Maritime Manpower Planning within the framework of its national employment policy; it should be taken into account of;

- (a) the size of the maritime labour force, the nature and extent of employment, the distribution of the labour force by such characteristics as age and occupational group and probable future trends in these fields;
- (b) studies of trends in the evolution of new techniques in the maritime industry both at home and abroad, in relation, among other things, to structural changes in the industry in the form of;
  - (i) changed methods of operation of ships, technically and organisationally; and
  - (ii) modifications in manning scales and job contents on different types of ships;
- (c) forecasts, in the light of the foregoing studies, of the probable requirements, at different dates in the future, for various categories and grades of seafarers.

To ensure also recruitment and placement of seafarers into the maritime industry should be taken into account of existing manpower plans and of the forecasts contained therein.

### **2.3 Regional Difference of Supply of Seafarers**

The global characteristics of the maritime transportation bring the international working environment to the industry. Beside the effect of the international character of the maritime transport, differences of the economical conditions, life standards, average salary level, different purchasing power of the same amount of the money in the different countries, difficulties of the seafaring profession, alternative employments and social funds such as unemployment payments reduce the preference of the young generations for being seafarers in developed countries, while same reasons increase number of seafarers from developing countries, working onboard foreign owned vessels.

The modern maritime transport industry uses human resources widely from developing countries, onboard ships flying mostly convenient flags, while ship-owners are mostly from developed countries. The new manning trend divides the countries into two groups, namely “Seafarer Demanding Countries” and “Seafarer Supplying Countries”. As a result of this, there are arising considerable changes in needs for the maritime institutions as a part of suppliers of seafarers in these two groups. In brief, for the maritime institutions of “Seafarer Demanding Countries”, the needs of education and training are decreasing in their capacity due to a decrease of student (including existing seafarers who need refreshment and/or continuous training), on the other hand, for the maritime institutions of “Seafarer Supplying Countries”, the needs of education and training are increasing in their capacity and quality to satisfy the rapidly increasing demand of qualified seafarers.

## **3. Questions and Discussions**

### **3.1 What is the need for Maritime Institutions Today?**

Scientific and economic developments in maritime community bring the intensive use of modern technology for many of the ships’ operations. Generally it effects to reduce the quantity of manpower, while it increases the requirement of qualifications of human resources to utilize such advanced technology. It can be said that the shipping companies, as costumer for the service of seafarers, desire two things in the human element as reducing manning cost and enhancement of safety. The first one can be realized by reducing the quantity of human resources in use and/or finding cheaper resources. The second one can be realized by improving the quality of education and training. However, in either case, better quality is being required for individual seafarer in the concept of “Cost Performance”. In addition to above, considering the facts of the scientific and technological improvement, the maritime education, training and research activities should be revised and updated according to the demand by the industry.

### **3.2 What are the Present Tasks of the Maritime Institutions?**

The present tasks of the maritime institutions are mainly providing the maritime education and training to the seafarers (including maritime trainees and cadets) of own countries according the national and international standards. The International Maritime Organization (IMO) provides minimum mandatory global standards for the maritime education and training such as STCW’78 (as amended) and usually the demands by the maritime industry are considered, usually indirectly, by these standards.

In addition to above, many of maritime institutions such as maritime universities/academies or maritime faculties of universities have a task of “Research and Development” based on standpoints as the highest learning

institutions and many of the results of their activities have been contributing for improving in the fields of education and training.

### **3.3 “What to Teach” and “How to Teach”**

Because of the difference between the transition of the demand for the human resources and development of the maritime education, training and research activities, there are two most common questions as “What to teach” and “How to teach”.

The first question has been asked for many years. The contents of maritime education and training required are always related to the existing maritime knowledge and technology. Therefore they should be updated with consideration of changes of the demand namely “Globalisation of maritime community”. It brings globalisation of the maritime education, training and research activities.

The second question is still keeping us busy to look for the best way. Presently traditional methods are used together with new ones. New teaching/learning environment brings the use of sophisticated simulation, communication and information systems based on the new methods and environments whose systems are changing our understanding on teaching.

### **3.4 What Can Be New Role of Maritime Institutions?**

IMO provides minimum mandatory global standards for the maritime education and training. Flag States' Administrations may define additional requirements for their national seafarers and the maritime institutions. These rules and standards are accepted by Governments and the global shipping industry (which carries over 90% of the world's trade) because they provide a single and universal framework governing maritime operations. However, they are only the minimum standards to the last. Considering the circumstances surrounding the maritime institutions such as demand of seafarers by shipping companies, balance of supply and demand for seafarers in the future, regional difference of supply of seafarers, etc., we should remind that it may take opportunities of progressive activities away from the maritime institutions occasionally to adhere to the minimum standards. Authors consider that the maritime institutions should be more adaptable, flexible, creative, innovative and self-progressive.

Considering the demand by the national and global maritime industry, maritime institutions have to contribute to form the optimum supply of maritime human resources by proper planning, preparing and employing the new and existing seafarers. This contribution brings the new commitment as the new role of the maritime institutions from the viewpoints of the maritime education, training and research activities. Authors would like to place this new role as the guide for seafarers, maritime community and maritime administrations.

Authors consider that this role of the guide for seafarers and maritime community is always essential. The new concepts such as “Refreshment Training”, “On the Job Training”, “Lifelong Study and Training” bring new comprehension to the training period, trainee's age and position. Modern technologies in teaching, e-teaching/learning and effectiveness of simulator training are providing completely new implementations for improvement of the seafarers' competence.

## **4. Considerations**

### **4.1 Introduction of the Concept of METRC**

To realize the new role of the maritime institutions, authors consider that they should be endowed with a consultancy function in addition to the education, the training and the research (R & D) functions. Hence we would like to define the maritime institution with all of these functions as “METRC Institution” (Maritime Education Training Research and Consultancy Institution).

METRC institutions, as an output of education, training, research and consultancy, perform also the other activities such as publishing bulletins, which are obtained and innovated as the tangible results of all their activities. Some kinds of publications are major guiding tools by METRC Institutions, for the maritime community. Therefore the Guiding Role to the maritime community should be one of the functions of METRC Institutions.

Performing many activities, such as maritime education, training, research and consultancy, maritime institutions give highly specialised and professional services to the seafarers, maritime companies, National Maritime

Administrations and the entire maritime community. All functions are not necessarily to be given by each institution, but the relationship among all these functions reflects this new concept. All these functions are connected and related to each other. Outcomes of some functions are necessary incomes for others. Hence authors would like to define a maritime institution or a group of institutions performing all these functions.

A general image model of METRC institution is shown in Figure 3 below.

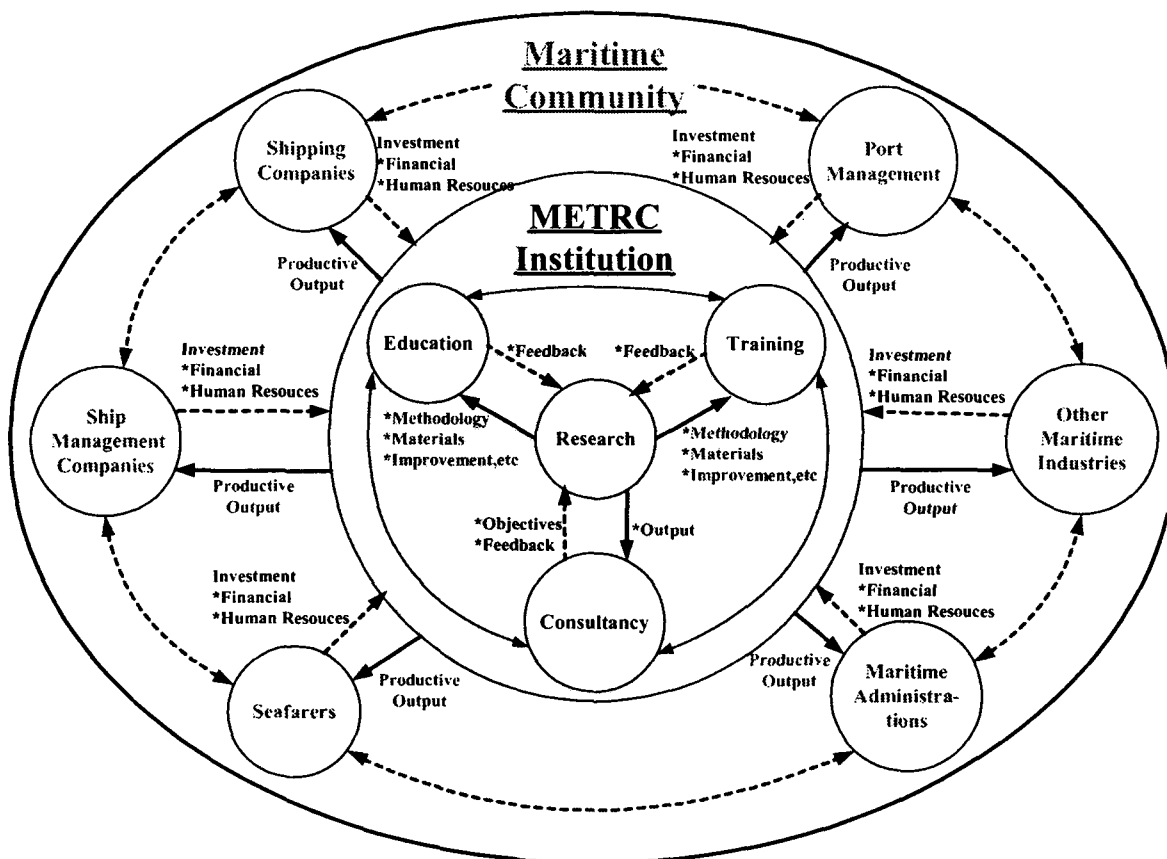


Fig. 3 Image Model of METRC Institutions

## 4.2 Functions of METRC Institutions

### 4.2.1 Education

METRC institutions are the major parts of maritime human resource supply process. METRC institutions are to be sensitive to the demand by the maritime industry to supply qualified seafarers. This can be achieved by providing suitable curriculum and learning environment. Education should be one of the functions of METRC institutions, which can be done in or out of the institution campus.

### 4.2.2 Training

METRC institutions may be also centres for training. METRC institutions are to be sensitive to the demand by the maritime industry to provide required training and refreshment training for seafarers. This can be achieved by providing suitable training programmes and training environment. Training activities are not limited only with METRC institutions; onboard drill and exercises, professional and safety training by the maritime companies are considerable part of the general maritime training activities. But this also gives new objectives to the METRC institutions to contribute and assist to the maritime industry. Therefore, maritime training, in whatsoever form should be one of the functions of METRC institutions.

### 4.2.3 Research

Research and development activities are essential for scientific and academic improvement. They are also supporting activities for education and training. To ensure necessary improvement for content and method of education and training, METRC institutions must consider technologic improvements in maritime industry, as well as marine and maritime related scientific outcomes, which have been done by anyone and also by their own Institution. Therefore research and development activities by METRC institutions will provide for them also

scientific and intellectual outcome to use to improve the quality and content of other activities in that institutions. Research and development activities should be the ones of the functions of METRC institutions.

#### **4.2.4 Consultancy**

METRC institutions can provide very useful interface between “Seafarers”, “Maritime Industry”, “Maritime Administration” and “Scientific and Academic Community”, also between “National and International Maritime and Academic Community”. This interface might enable all parties to produce or to contribute to produce, to share and utilise maritime knowledge. Knowledge can be increase by sharing it with others. In most of maritime country, many METRC institutions traditionally contribute to carry out many social and professional responsibilities for maritime industry and Maritime Administration. For example consultancy for preparing national maritime legislations, building up maritime management systems, carrying out new projects etc. are used to be essential consultancy area for METRC institutions. Consultancy for the maritime community should be one of the functions of METRC institutions.

### **5. Conclusion**

As a result, the maritime institutions should be ready for their new role, which is, in brief, guiding the maritime society, recommending and providing new learning environments, organising research and developments, performing the education, training and assessment, improving existing methods and developing new methods of the education, training and assessment. They have to update their new policy considering all these functions.

As the conclusion of all the discussions above, METRC institutions, which the maritime industry requires for today and tomorrow, should be different, in some ways, from the ones in the past, keeping in mind that new working conditions onboard, as per social, cultural, economic and technologic working environment, require new competences for today’s seafarers. To give education and training to new and existing seafarers should be according to needs of this new working environment, which is also very dynamic variable. METRC institutions should have flexibility to adapt and update themselves to these facts. The policy of METRC institution, therefore, should contain the necessary commitment to maritime community.

The policy of METRC institution must include all its functions with related objectives, methods and applications. To achieve the objectives depends to obtain and sustain all necessary human, material and financial resources also for METRC institutions. Human resources for METRC institutions are mainly academic staffs with required academic background, as well as maritime background. The sufficient academic and maritime background as a best combination of competences, require considerable maritime and academic experience. Taking this requirement into consideration, the policy of METRC institution must be provided also flexibility for employment of academic staff in the both maritime and academic environment. Authors consider that this can be achieved with very close relationship with other maritime sector/industry.

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**Nomenclature**

BIMCO - The Baltic and International Maritime Council

CIN - The China Institute of Navigation

ILO - International Labour Organisation

IMO - International Maritime Organization

ISF - International Shipping Federation

ITU - Istanbul Technical University

JICA - Japan International Cooperation Agency

JIN - Japan Institute of Navigations

KINPR - Korean Institute of Navigation and Port Research

OHRLLS - The Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and the Small Island Developing States

SIRC - Seafarers International Research Centre (SIRC) at Cardiff University

STCW - Standards of Training, Certification, and Watchkeeping

UN - United Nations

UNCTAD - United Nations Conference on Trade and Development