

## **PROFICIENCY DESIGNATION FOR THE SHORE-BASED MANAGEMENT OF SHIPPING COMPANIES**

Dr. Ismail Deha ER, Dr. Osman Kamil SAG  
ITU Maritime Faculty  
81716 Tuzla-Istanbul, Turkey  
dehaer@care2.com oksag@itu.edu.tr

and

Dr. Neil OTWAY  
Australian Maritime College  
Launceston 7250, Tasmania, Australia  
N.Otway@corp.amc.edu.au

### **ABSTRACT**

The ISM Code has heralded a new era in shipping and shipping management. The Document of Compliance and the Safety Management Certificate of ISM are the only statutory trading certificates that take into account shore-based management strategies. The ISM Code is the first IMO instrument to combine both shore-based and shipboard standards in a coherent manner.

Although the STCW Convention clearly identifies proficiency standards and knowledge requirements for shipboard personnel, there are no such standards for shore-based staff. This is an issue as such staff can also affect the quality and the efficiency of the ship management process. STCW-95 addresses company responsibilities that were not defined in STCW-78. On the other hand, although Clause 4 of the ISM Code requires key shore-based person(s) to be nominated, it does not clearly indicate the qualifications of these staff while carrying out their ship management functions.

The assurance of safety and marine environmental protection can only be achieved by the efficient integration of shore-based and shipboard personnel qualifications for the different ship management functions. This paper provides definitions of proficiency and proposes interrelationships between shipboard and shore-based personnel which will reduce hazardous occurrences and other risk parameters.

This study proposes proficiency standards for staff involved in crewing, operation and the technical activities associated with the coordination of the fleet management process. In addition, the role of executive management and the interrelationship between the commercial and technical ship management processes are considered, whilst taking into account international legislation and regulations. Claims handling and supplying necessary resources to ships are covered under the operational management of fleet directors.

**KEY WORDS:** Proficiency designation, qualification requirements for shore-based staff, ship management

### **1. Introduction**

The international rules and regulations that are established by the International Maritime Organisation (IMO) for the technical management of ships are mainly focussed on two crucial outcomes - safety and pollution prevention. These rules and regulations concentrate on the specifications of ship's structure, the machinery and equipment that should be provided and operated on board the vessel and the proficiency of crew members to name just a few. The ISM code is the only set of IMO rules and regulations, focussed on the assurance of safety and pollution prevention, that addresses shore-based requirements (Traves, 1997). The ISM Code provides a management methodology for implementing the rules and regulations described under SOLAS, MARPOL, COLREG, LOADLINE and the STCW Convention.

The ISM Code defines what has to be done, but does not make any clear explanations on how it should be done (Er and Sogut 1999). This produces a great deal of uncertainty for both external and internal auditors. In an international environment, it is difficult to always produce a single specific rule as it may not be applied easily to every shipping company. Moreover, a prescriptive regime may be difficult to implement for ships with a multinational crew and differing cultural approaches to ship management. The methods proposed in this study aim to define and properly implement the minimum requirements of shore based proficiency that are required to produce an effective ship management process (Er 2001). Ideally, this paper will provide a blueprint for ensuring the safety and effective environmental management of ships whilst at the same time ensuring the continual improvement of quality in shipping.

## 2. Why Do We Need to Define Proficiency Standards for Shore-Based Staff?

The analysis of 113 deficiencies on 68 ships relating to the ISM Code in the year 2000 indicates that they are mainly caused by the insufficient coordination and understanding of the international requirements of technical ship management by shore-based staff and the ship's crew (Equasis 2001). The majority of defects are caused by operations carried out by shore-based personnel who are inadequately trained or poorly supervised. The rest of the defects are mainly caused by the inadequate implementation of action plans defined in shipboard operating procedures.

The dominant causes of deficiencies in year 2000 are illustrated in Table 1 with 1999 statistics included for comparison.

**Table.1** Dominant cause of ISM deficiencies in year 2000.

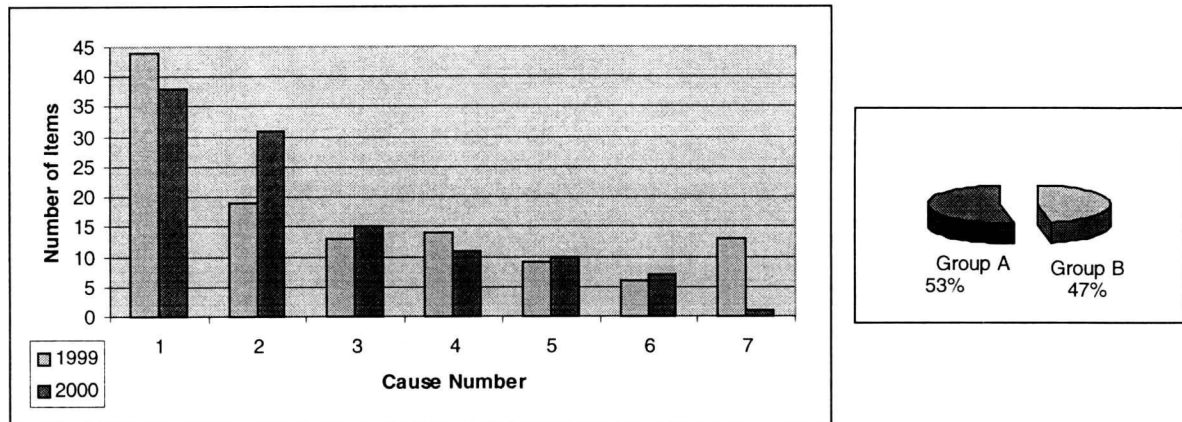
Cause No.	Leading Causes of ISM Deficiencies	No. of Items 2000	No. of Items 1999	% (Yr 2000)	No. of Detainable Deficiencies
1	Poor maintenance of ship and equipment	38	44	33.7	7
2	Insufficient familiarisation of crew and company staff with SMS	31	19	27.4	8
3	Failure to satisfactorily carry out emergency response drills	15	13	13.3	7
4	Improper documentation of SMS	11	14	9.7	3
5	Improper DOC or SMC	10	9	8.8	2
6	Other (relating to STCW regulations)	7	6	6.2	2
7	Inadequate language ability of crew members	1	13	0.9	1

In general, the total number of ISM deficiencies slightly decreased in year 2000 compared with the deficiencies that occurred in year 1999. In both years, the number of deficiencies caused by poor maintenance of ship and equipment (cause 1) was the greatest. Every Port State Control inspection addresses the maintenance aspects of ships from both the hardware and software viewpoint. Items related to the insufficient familiarization of crew and company staff (cause 2) and improper documentation of the Safety Management System (cause 4) have also increased from 1999 to 2000. Interestingly, the cause related to the inadequate language abilities of crewmembers (cause 7) showed a remarkable reduction between year 1999 and 2000.

Looking at specific causes, Cause 1 and 2 are consistently the most prevalent with the dramatic increase in unfamiliarity of crews with the Safety Management System (Cause 2) being a potential concern. However, this increase may reflect a greater focus on this matter by PSC surveyors and some care is required in interpreting the results, now and in the future.

The above seven dominant causes of defect can be classified into two groups (Redfern 1998); namely group "A", of conventional causes which have always been detected by PSC surveyors (causes 1, 3 and 6 above), even prior to the ISM Code came into force, and group "B" for post-ISM Code causes (causes 2, 4, 5 and 7).

The ratio of both groups and the comparison of deficiencies are illustrated in Fig.1. It can be seen that group A and B were almost equal in both years.



**Fig.1** Number of ISM Code deficiencies classified by dominant causes and grouped dominant causes

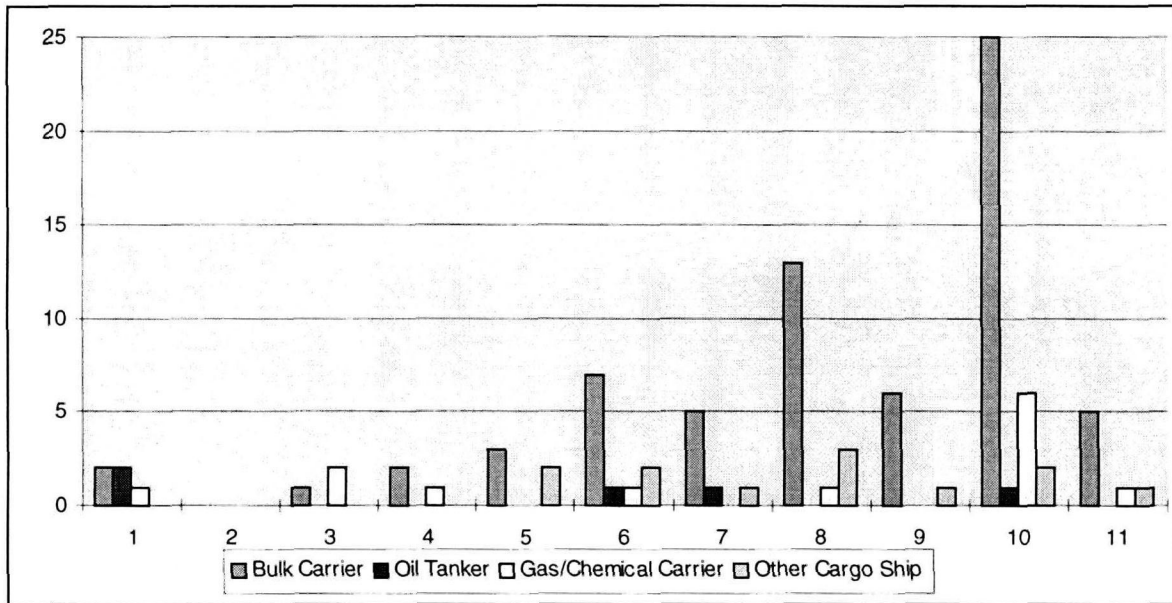
Now, taking the same deficiencies in Table 1 for year 2000 and relating them to each of the relevant ISM Code clauses, we obtain Table 2.

**Table 2.** ISM Deficiencies classified in each clause of the ISM Code

Clause No.	Clause	No. of Deficiencies	Percentage
1	General	5	4.4
2	Safety and Environmental Protection Policy	0	0.0
3	Company Responsibilities and Authority	3	2.7
4	Designated Person(s)	3	2.7
5	Master's Responsibility and Authority	5	4.4
6	Resources and Personnel	11	9.7
7	Development of Plans for Shipboard Operations	7	6.2
8	Emergency Preparedness	17	15.0
9	Reports and Analysis of Nonconformities, Accidents and Hazardous Occurrence	7	6.2
10	Maintenance of Ship and Equipment	34	30.1
11	Documentation	7	6.2
12	Company Verification, Review and Evaluation	4	3.5
13	Certification, Verification and Control	10	8.8
<b>TOTAL</b>		<b>113</b>	<b>100%</b>

We can see that Clauses 8 and 10 produced the most deficiencies in this year. These deficiencies have a close relationship with the Reports and Analysis of Non Conformities and Accidents and Hazardous Occurrence as stated in clause 9 of the ISM Code. In order to minimise the re-occurrence of the same non-compliances both in the company's office and on board the ships, the Designated Person Ashore (DPA) and the ship's master play a crucial role in the corrective and preventative actions (Hunter 1998).

The statistical distribution of deficiencies classified for each clause of the ISM Code depending on the type of ship is illustrated in Fig.2



**Fig.2:** ISM Deficiencies classified in each clause of the ISM Code and type of ships

It can be seen that the number of ISM Code deficiencies on bulk carriers account for 60% of the total deficiencies for all types of ships. Deficiencies relating to Clauses 10,8 and 6 of the ISM Code are the most prevalent across all ship types with bulk carriers again dominating. With respect to clause 10 of the ISM Code (relating to the maintenance of a ship and its equipment), many bulk carriers and gas/chemical tankers show the same deficiencies. The role of vetting as part of the approval process for charterers for oil tankers and gas/chemical carriers has undoubtedly had a significant effect on the reduced incidence of deficiencies on these vessels, especially compared to bulk carriers.

### 3. Identification of Proficiency and the Expected Duties and Responsibilities for Shore-Based Staff

To ensure a satisfactory level of safety and environmental management, a ship management company needs to have key people undertake the following activities (Er 2001):

- *Coordination and Execution* : The person carrying out these activities is the Fleet Manager or the General Manager of the Marine Division. These people are responsible for the technical and commercial management of ships as their first priority and provide all the necessary resources on behalf of the senior management.
- *Operational*: The person carrying out these activities is usually the Operations Manager. This person is responsible for the pre-fixture and post-fixture of ships including the voyage and cargo plans, port operations, ship supplies, implementation of charter party requirements, the claims handling process, emergency preparedness both for the office and shipboard staff, and the work assignment of operations superintendents.
- *Technical*: The person carrying out these activities is termed the Technical Manager. He/she is responsible for the maintenance of the ship and its equipment, supplying fuel and lubrication oil, any necessary ship docking and repair works, the traceability of a ship's statutory certificates, and the work assignment of technical superintendents.
- *Crewing*: This person, called the Crewing Manager, is responsible for recruiting crew members, implementing pre-joining ship training procedures and the arrangement of crew.

The associated job descriptions for the people described above all have the following objectives:

- To pro-actively control and maintain the company's Safety Management System;
- To control non-conformance's and take corrective actions with the intention of preventing re-occurrences of quality and safety system deficiencies;
- To ensure that any implemented corrective actions are effective; and
- To undertake management reviews that identify system weaknesses and eliminate these weaknesses.

The qualification levels and the expected functions of each key activity in terms of responsibilities and authority of each designated position in a Ship Management Company's system that has particular influence on the quality of service and the effectiveness of the Safety Management System are defined in Tables 3 and 4 below.

**Table 3.** Expected Proficiency and Identification of Training Needs for Coordination and Execution Activities.

<b>COORDINATION AND EXECUTION ACTIVITIES</b>	
<b>Required/Expected Proficiency</b>	<b>Identification of Training Needs</b>
1. Efficient and economical running of the marine operations and transportation requirements of cargo, formulating budgets for management, monitoring, and maintenance of Quality and Safety Management Systems.	<u>Course:</u> Ship Management <u>Output Skills:</u> Integrated implementation of the Commercial and Technical Management of Ships including budget planning, running cost analysis, ship finance.
2. Effective implementation of the Quality and Safety Policies and providing the infrastructure required to enable the Company to meet its desired objectives and stated aims of providing a quality service to its customers.	<u>Course:</u> Business Administration <u>Output Skills:</u> Process management, failure mode analysis, scope of assessment techniques, decision-making, team work approach.
3. In liaison with the other Departmental Managers producing and developing projects, budgets and determining the training requirements both for office staff and shipboard personnel. Providing necessary resources (including personnel) and support for the departmental activities to carry out their functions for implementing the Quality and Safety Management Systems effectively.	<u>Course:</u> Human Resources <u>Output Skills:</u> Compulsory rules and regulations overview, organization theory and planning, performance evaluation, resource management
4. Planning and implementing the internal audits of the Safety Management System, performance evaluation and review to ensure the effectiveness of Quality and Safety Management Systems	<u>Course:</u> Assessment & Improvement techniques <u>Output Skills:</u> Audit and inspection techniques, review and strategy planning.
5. Enough knowledge and experience to ensure the safe operation of ships and to provide a link between the company and those on board.	<u>Course:</u> Conventional Requirements <u>Output Skills:</u> Analysis of IMO rules and regulations, PSC requirements, P&I and insurance requirements.
6. Control of Quality and Safety Management Manuals and related procedures and documents.	<u>Course:</u> Documentation Management <u>Output Skills:</u> Principles of documentation, records and checklist formation
7. Reporting and analysis of the non-conformities and deficiencies and verification of corrective action to remedy defects in the Quality and Safety Management System.	<u>Course:</u> Non-Compliance Management <u>Output Skills:</u> Management system failure analysis, critical functions overview, close out process investigation
8. Planning and executing the emergency preparedness process both for office and shipboard personnel	<u>Course:</u> Contingency Planning <u>Output Skills:</u> Accident/ Casualty Cover Up, Relations with 3 <sup>rd</sup> parties, Minimising prospective defects

Similarly the Designated Person Ashore, defined in ISM Code clause 4, must have the same proficiency and knowledge for the defined activities illustrated in Table 3.

The proposed activities for the other shore-based key personnel (Er 2001) in Ship Management Companies and their proficiency level or background in terms of authorities, responsibilities and duties are illustrated in Table 4.

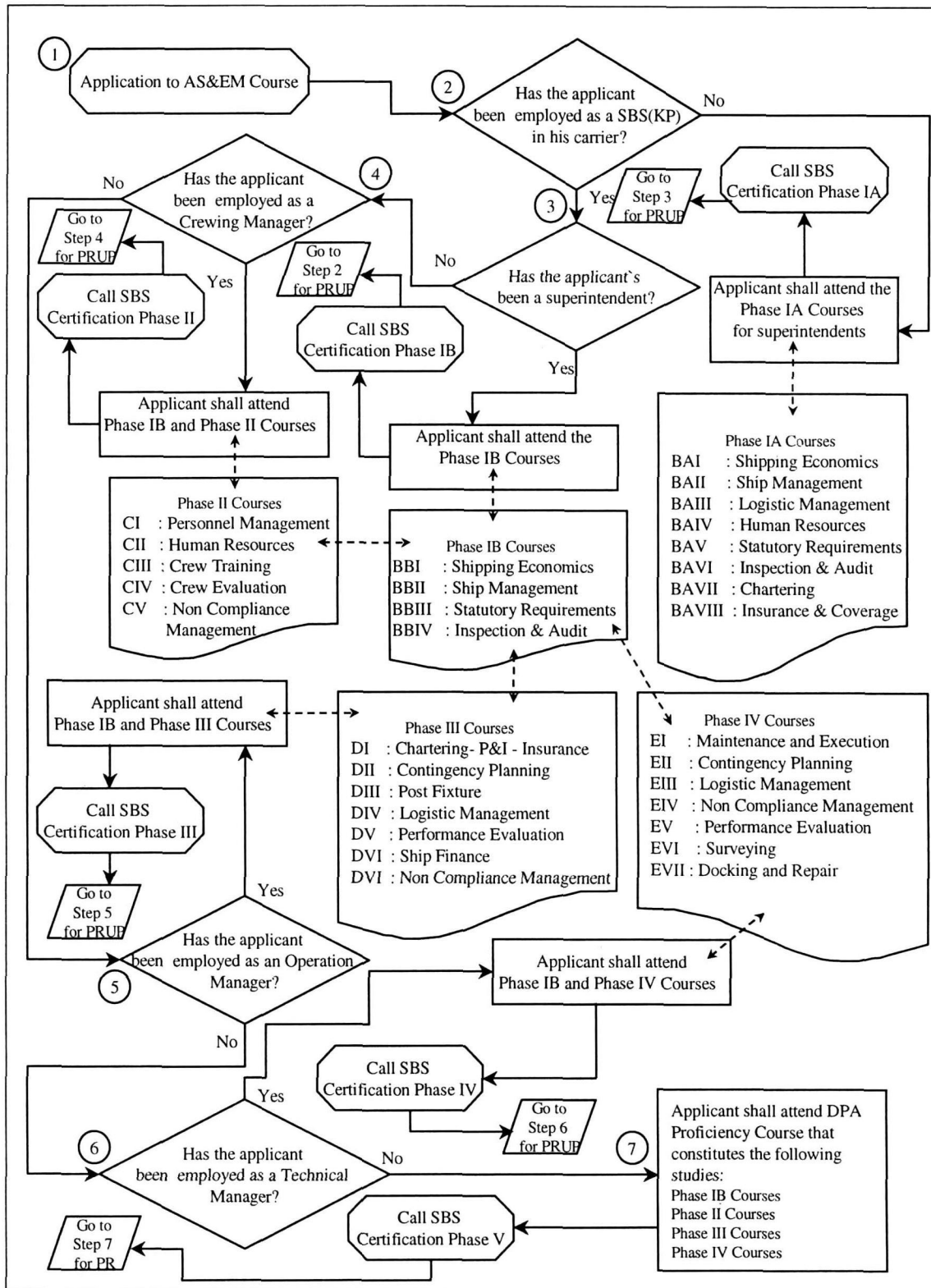
**Table 4.** Expected Proficiency for other key personnel of a Ship Management Company.

**KEY PERSONNEL OF A SHIP MANAGEMENT COMPANY WHO HAVE A DIRECT EFFECT ON THE SAFETY MANAGEMENT SYSTEM**

<b>OPERATION MANAGER</b>	<b>TECHNICAL MANAGER</b>	<b>CREWING MANAGER</b>
<p>Operational activities related to the Safety Management System are:</p> <p>1-) Training of shore based staff relating to the Safety Management System.</p> <p>2-) Planning and preparing training needs and training curriculum of shore based staff for the approval of the Designated Person Ashore.</p> <p>3-) Control of procedures and other documents as defined by the Document Control Rules and related procedures.</p> <p>4-) Operations and communication with ships defined by the Contingency Rules and related procedures.</p> <p>5-) Planning and implementing company emergency drills.</p> <p>6-) Responsibilities of the Operation Manager related to Safety Management System including:</p> <p>a-) Controlling all voyages and their connections.</p> <p>b-) Providing for the prevention and handling of marine casualties and giving information's to ships.</p> <p>c-) Examining the risks of handling dangerous and special cargoes, and reporting information to ships.</p> <p>d-) Maintaining health and safety conditions, and distributing necessary information to ships.</p> <p>e-) Maintaining necessary instructions for the prevention of marine and atmospheric pollution.</p> <p>f-) Providing information on a safe sea route and providing technical information's related to port facilities.</p> <p>g-) Operations pertaining to ship insurance, P&amp;I insurance, and other ship-related insurance.</p> <p>h-) Providing necessary information to vessels about the conventions, regulations and rules.</p> <p>i-) Providing necessary information to vessels about marine technology.</p> <p>j-) Researching matters pertaining to ship management.</p>	<p>Technical activities related to the Safety Management System are:</p> <p>1-) Operations and communication with ships defined by the Contingency Rules and related procedures.</p> <p>2-) Responsibilities of the Technical Manager related to the Quality and Safety Management System including:</p> <p>a-) Providing necessary information's to vessels about the regulations pertaining to ship equipment</p> <p>b-) Procurement of ships' stores, spares, supplies, and lubricating oils</p> <p>c-) Checking and supervision of measures for prevention of machinery accidents</p> <p>d-) Analysis of causes of machinery accidents and failures, examination of measures to prevent recurrence, and execution of post-accident/post-failure handling operations</p> <p>e-) Providing necessary technical information to vessels</p> <p>f-) Planning and execution of hull and engine maintenance management, and evaluation of maintenance contractors</p> <p>g-) Planning and implementation of shipbuilding and ship modifications</p> <p>h-) Planning, arrangement, and implementation of dry-docking</p> <p>i-) Collection and study of information on machinery and equipment for prevention of environmental pollution</p> <p>j-) Research into safe machinery operation and into facilities, fuels, lubricating oils, and water quality as they pertain to machinery</p>	<p>Crewing activities related to the Safety Management System are:</p> <p>1-) Operations defined by Contingency Rules and related procedures</p> <p>2-) Responsibilities of the Crewing Manager related to Quality and Safety Management System including:</p> <p>a-) Planning and preparing training needs and training curricula of shore based staff for the approval of the Management Representative/ Designated Person Ashore.</p> <p>b-) Operations related to evaluation, promotion, discipline and payment of crew members.</p> <p>c-) Providing necessary information's to vessels about the national and international regulations, especially STCW 95.</p> <p>d-) Operations related to health, safety, and management of medical treatment.</p> <p>e-) Operations related to employment of crew members, labour management, service, and welfare.</p> <p>f-) Operations related to communication with crew members' families.</p>

**4. Administration of Safety and Environmental Management and Refresher Courses for Shore-Based Staff**

The shore-based Staff Proficiency Designation during the ship management life cycle can be established by the initial certification of key management personnel taking into account the Administration of Safety and Environmental Management (AS&EM) needs that constitute all ship management activities both in the operation and management level. The details of the proposed Proficiency Designation process is illustrated in Fig. 3.



**Fig.3** Proposed Loop Cycle for Shore-based Staff Proficiency Designation

The first decision-making process in the loop decides whether the applicant has been employed as a shore-based staff in terms of key management personnel (SBS-KP) prior to applying the Proficiency Designation process. Defining the five different access levels of qualifications for each major activity, shore-based staff can be

certified for five different proficiencies. For each proficiency level, the minimum requirements can be considered as

- ❖ the Initial Certification,
- ❖ Proficiency Refreshment (PR) due to the effects of new regulations and technology change,
- ❖ Upgrading Proficiency Level (UP) for promotion starting from Marine Superintendent or Technical Superintendent to the Designated Person Ashore (DPA)

The duration of indicated Proficiency Designation courses for each qualification and the refresher course periods are illustrated in Table 5. To update existing knowledge, refresher courses should be held at least every three years.

**Table 5.** Proposed Course Schedules for Proficiency Designation

Qualifications and Certification	DPA	Operation Manager	Technical Manager	Crewing Manager	Superintendents	Course Duration
Initial Certification	79 hrs	24 hrs	20 hrs	15 hrs	30 hrs	
Refreshment Cert.	27 hrs	15 hrs	12 hrs	10 hrs	20 hrs	

## 5. Results and Discussions

The leading causes of deficiencies that frequently occur on board a ship are mainly sourced by insufficient coordination between the key office personnel and the master/chief engineer. This inadequate coordination mostly comes from three main aspects of the ship management process:

- ❖ the key office personnel cannot adequately describe what their expectations are for the efficient handling of shipboard operations;
- ❖ improperly certified crew members are employed in direct violation of the requirements of the Minimum Safe Manning Certificate; and
- ❖ the Masters and senior officers have not been delegated sufficient authority by the Company.

The second and third causes identified above could easily be avoided by redefining the training needs and properly notifying the ship’s officers what is required of them. The first cause is more difficult to overcome because generally the key office staff are mostly experienced in shipboard operations for different types of ships and they are employed after a competitive selection process. The actual paucity of their knowledge is caused by the implementation of new international regulations and rules. This leads to the Ship Management Companies needing to strengthen their technical and commercial ship management capability through short-term and long-term planing/execution activities. This enables them to reduce expenses and provide a competitive ship operating capability.

This study offers an approach for defining the key shore-based personnel proficiency requirements in order to minimise the deficiencies, hazardous occurrences and accidents. Although the STCW Convention clearly identifies proficiency standards and knowledge for shipboard personnel, it does not mean that all the critical factors, relating to the human element, are included in ship operations. The proficiency requirements for shore-based staff, including the Designated Person Ashore must be identified as well. This study proposes Proficiency Designations for the superintendents, crew managers, technical managers, operation managers and DPAs, by defining their tasks and their expected knowledge. Proficiency level training needs are considered for each qualification. The duration of the proposed training for each qualification and the associated refreshment courses are also indicated in an implicit manner to overcome the re-occurrences of any type of casualties, deficiencies, nonconformities and unforeseen expenses. In this way a better Safety and Environmental Management System is ensured.



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