



The Swedish Club
ACADEMY

Information to Maritime Administrations and Training Providers

Maritime Resource Management

*A brief guide on the STCW Manila amendments in respect of
Resource Management and Leadership & Teamwork training*

September 2011

Developing people for safer shipping

The Swedish Club was founded in 1872 as a marine non-profit making mutual insurer. Today, the Club offers the international shipping community a wide range of insurance and loss prevention services. The Swedish Club has been committed to resource management training since the early 1990s when the Club together with seven other organisations developed the first ever resource management training course for the shipping industry. This course is now labelled Maritime Resource Management (MRM). The Club's increased focus on human factor issues and the growing demand for such training, led to a decision to in 2010 form The Swedish Club Academy AB assuming the responsibility for the further development of the MRM training programme and related activities.

MRM training is today available in over 30 countries worldwide and training providers include maritime universities and training centres, ship owners and ship managers, manning agencies, pilot associations and seafarer associations. It is estimated that some 50,000 seafarers have participated in MRM training since the launch of the training in June 1993.

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Foreword

Major revisions to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (the STCW Convention), and its associated Code were adopted at a Diplomatic Conference in Manila, the Philippines, on 21-25 June 2010.

The amendments, to be known as “The Manila amendments to the STCW Convention and Code” are set to enter into force on 1 January 2012 with full compliance by 1 January 2017.

The amendments aim at bringing the Convention and Code up to date with recent developments and to enable them to address issues that are anticipated to emerge in the foreseeable future. Amongst the amendments adopted, there are a number of important changes to the Convention and Code. These changes include training in:

- ***Resource Management and Leadership & Teamwork***

It is these specific training issues – sometimes referred to as *human factors training*, *soft skills training* or *non-technical training* – that we will address in this document. Even if just now introduced as a mandatory requirement in the STCW, this kind of training is not new in the industry. For nearly 20 years, this training has been carried out on a voluntary basis with great success by a large number of maritime schools and shipping companies around the world. Administrations and training providers not yet involved in human factors training may appreciate that there is no need to reinvent the wheel but instead take a close look at the training that is already being carried out in the industry.

The Maritime Resource Management (MRM) course was developed by a consortium consisting of aviation representatives, maritime administrations, shipping companies and marine insurers with the purpose of combating ‘human errors’ in accidents at sea. Today, the further development of the course takes place in cooperation between all MRM training providers with The Swedish Club Academy at the coordinating party.

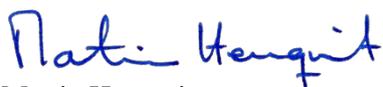
Readers of this document may note that we are passionate about MRM. Based on the feedback and the results of training that we have experienced, we believe that we serve the purposes of this document best if we are very open and clear about what we believe in and what we would like to achieve.

We invite Administrations, training providers and other concerned parties to read and take note of the contents of this document. We hope that the document shall assist in the understanding and the implementation of human factors training in the maritime industry. We furthermore hope that Administrations shall see the benefits of providing support to the training providers who on a voluntary basis, well ahead of mandatory requirements, already have adopted these training concepts.

The main part of the document is kept fairly short. Additional information is found in the appendixes, at www.swedishclub.com/academy or by contacting the undersigned.

We hope that you shall enjoy and benefit from the reading!

Gothenburg, September 2011



Martin Hernqvist
The Swedish Club Academy AB

The Swedish Club Academy AB
Gullbergs Strandgata 6, P.O. Box 171, 401 22 Gothenburg, Sweden
Tel: +46 31 638400, E-mail: academy@swedishclub.com
www.swedishclub.com/academy

Purposes of this document

Although the revised STCW focuses on training areas identified as being of significant importance for the enhancement of safety at sea, there may be confusion on how to interpret and translate the revised STCW requirements into national regulations. Issues discussed are:

- What is the difference between *Resource Management* training and *Leadership & Teamwork* training?
- How should this training be organised and structured so that intended results are achieved?
- How can we assess the results of non-technical training?
- How do we integrate non-technical training with technical training?

In this document we will put forward our ideas and opinions concerning these questions. We will use the *SHELL model* to explain what is meant by *human factors*. The SHELL model will also show how *leadership and teamwork* is an integrated part of the wider *resource management* concept and thus not two separate training issues.

We will compare the STCW requirements with the Maritime Resource Management course modules to show how the new STCW requirements not only are met, but also exceeded, by the contents of the MRM course.

We therefore hope that Administrations, as a “method for demonstrating competence” for the non-technical STCW requirements, shall consider the Maritime Resource Management course to be an “approved course” and that MRM training and certification carried out in the past shall be approved and acknowledged.

STCW Manila amendments

Appendix B of this document contains all tables of the revised STCW where references are made to *resource management, leadership, teamwork and managerial skills*. Important conclusions that can be drawn from these tables are:

- There is no major difference between the STCW requirements related to *Bridge Resource Management* and *Engine-Room Resource Management*.
- There is no major difference between the requirements for *deck* and *engine* department.
- There is no major difference between the requirements at *operational* level and *management* level.
- The method for demonstrating competence may for all these table sections be done by assessment of evidence obtained from one or more of the following:
 - .1 approved training
 - .2 approved in-service experience
 - .3 practical demonstration

A table containing the below requirements in column 2 (Knowledge, understanding and proficiency) would cover all requirements related to *resource management, leadership, teamwork and managerial skills* for *deck* and *engine* and *operational* and *management* level. The MRM course modules are listed in the column to the right.

Column 2	Maritime Resource Management course modules
Knowledge, understanding and proficiency	(Described in more detail in Appendix A)
Knowledge of shipboard personnel management and training A knowledge of related international maritime conventions and recommendations, and national legislation Ability to apply task and workload management, including: <ul style="list-style-type: none"> .1 planning and co-ordination .2 personnel assignment .3 time and resource constraints .4 prioritization Knowledge and ability to apply effective resource management: <ul style="list-style-type: none"> .1 allocation, assignment, and prioritization of resources .2 effective communication on board and ashore .3 decisions reflect consideration of team experiences .4 assertiveness and leadership, including motivation .5 obtaining and maintaining situation awareness Knowledge and ability to apply decision-making techniques: <ul style="list-style-type: none"> .1 situation and risk assessment .2 identify and generate options .3 selecting course of action .4 evaluation of outcome effectiveness Development, implementation, and oversight of standard operating procedures	<ul style="list-style-type: none"> • Situation Awareness • Attitudes and Management Skills • Cultural Awareness • Communication and Briefings • Challenge and Response • Short Term Strategy • Authority and Assertiveness • Management Styles • Workload • State of the Ship • Human Involvement in Error • Judgment and Decision Making • Leadership in Emergencies • Crisis and Crowd Management • Automation Awareness

Comment: Combining the STCW requirements related to *resource management, leadership, teamwork* and *managerial skills* as done in the table above results in a syllabus most suitable for a stand-alone course. While strongly supporting the introduction of non-technical skills in the STCW as such, there are still things that could be improved. We believe, for example, that it is a drawback to have the non-technical contents split up in different tables keeping departments and ranks apart. Because of the subject’s generic nature and contents we could instead make departments and ranks come together in training sessions. The different labels *Bridge Resource Management* and *Engine-Room Resource Management* to the same contents add to the confusion. During our meetings with seafarers, we often hear about the feeling of “us and them” – between ranks, between departments and between ship and shore. To improve safety and open up for efficient communication and teamwork, such barriers must be brought down. In conclusion, we are not in favour of non-technical training where target groups are kept apart. We recommend the same course contents for all target groups, and mixed groups as far as possible, with the purpose of establishing a shared view on how things should be done.

Definitions and explanations

With the introduction of new training concepts and training terms, such as *human factors, resource management* and *leadership & teamwork* we need to define and explain what is meant by those terms. Keeping advanced theory and knowledge simple will be of utmost importance to achieve the training objectives and avoid making trainees, and possibly also trainers, afraid of the new subjects. With simple definitions in place, we will easier see the similarities and differences between the subjects and organise training so that it fits into the big picture. Let’s start with *human factors*.

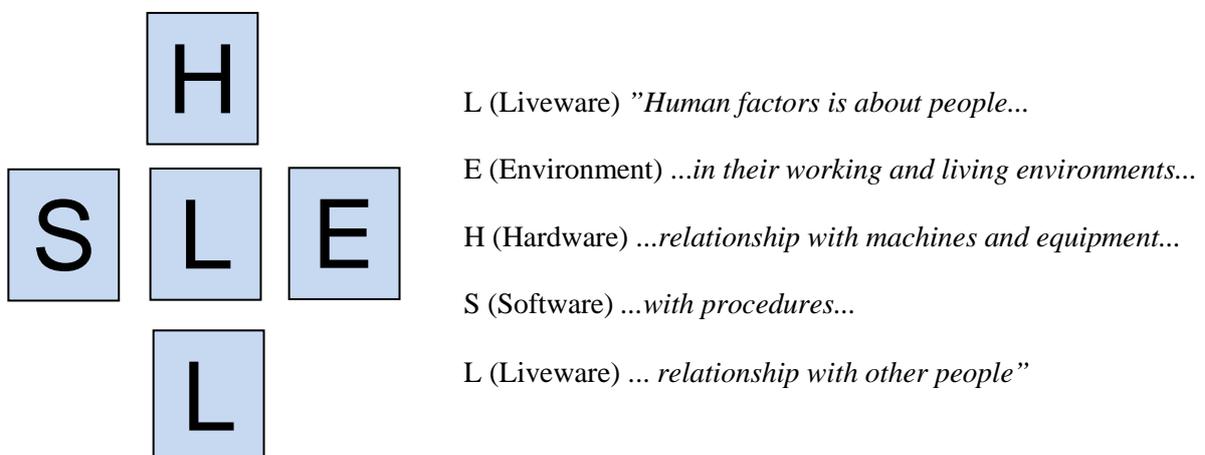
Human factors

Frank H. Hawkins has defined human factors as:

“Human Factors is about people. It is about people in their working and living environments. It is about their relationship with machines and equipment, with procedures and with the environment about them. And it is also about their relationship with other people.”

This definition could be illustrated using the “SHELL model”:

The SHELL model:



The SHELL model

The SHELL model is a conceptual model of human factors that clarifies the relationships between the human component and other resources in the maritime system/environment.

The model is named after the initial letters of its components - software, hardware, environment and liveware. Each component of the model represents a building block of human factors studies.

The human element, or worker of interest, is at the centre of the SHELL model. The human element is the most critical and flexible component in the system, interacting directly with the other system components - software, hardware, environment and liveware.

The SHELL model adopts a system perspective that suggests that the human is rarely, if ever, the sole cause of an accident. There is a variety of factors that interact with the human operator that affects his/her performance. As a result, the SHELL model considers both *active failures* and *latent failures*. Active risks and failures normally occur at the operational end, such as the crew onboard the vessel. Latent risks and failures are hidden in the organization's structure, not known or observed by the organization.

Components of the SHELL model

Software

- Software includes rules, instructions, regulations, policies, norms, laws, orders, safety procedures, standard operating procedures, customs, practices, conventions, habits, symbology, supervisor commands and computer programmes.
- Software can be included in a collection of documents such as the contents of charts, maps, publications, emergency operating manuals and procedural checklists.

Hardware

- Physical elements of the maritime system such as the ship (including controls, surfaces, displays, functional systems, machinery), operator equipment, tools, materials, buildings, vehicles, computers, etc.

Environment

- The context in which the ship and the maritime system resources (software, hardware, liveware) operate, made up of physical, organisational, economic, regulatory, political and social variables that may impact on the worker/operator.
- Internal environment relates to immediate work area and includes physical factors such as temperature, humidity, noise, vibration and light levels.
- External environment includes the physical environment outside the immediate work area such as weather (visibility, sea state, wind, current), congested waters and physical facilities and infrastructure such as ports and fairways.

Liveware

- Human element or people in the maritime system. For example, ship's officers and crew, pilots, VTS operators, shore-side management and staff.
- The liveware component considers human performance, capabilities and limitations.

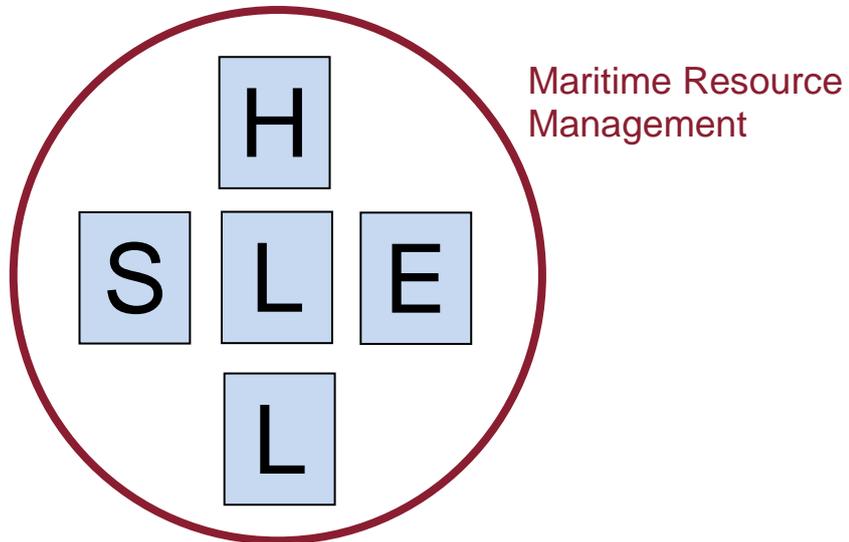
According to the SHELL model, a mismatch at the interface of the blocks/components can be a source of human error or system vulnerability that can lead to system failure in the form of an incident or accident. Maritime disasters tend to be characterised by mismatches at interfaces between system components, rather than catastrophic failures of individual components.

Maritime Resource Management

If *human factors* is the theory, *Maritime Resource Management* is the practical application of what we have learnt about human factors.

MRM aims at covering all components of the SHELL model. This could be illustrated the following way:

The SHELL model:



More details about Maritime Resource Management are found in Appendix A.

Leadership & Teamwork

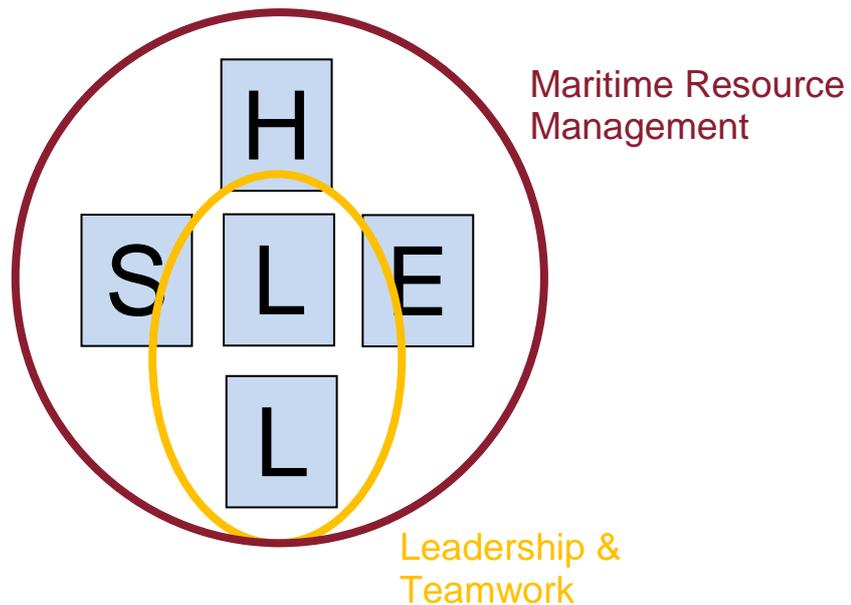
Leadership and teamwork issues are found in the Liveware-Liveware (L-L) interface of the SHELL model:

Liveware-Liveware interface:

- Interaction between the central human operator and any other person in the system.
- Involves interrelationships among individuals within and between groups. This includes masters and bridge officers, engineers, other crew members, pilots, VTS operators, passengers, shore-side managers etc.
- Human-human/group interactions can positively or negatively influence behaviour and performance. Therefore, the L-L interface is largely concerned with:
 - interpersonal relations
 - leadership
 - crew cooperation, coordination and communication
 - teamwork
 - cultural interactions
 - personality and attitude interactions
- Examples of mismatches at the L-L interface include:
 - Communication errors due to misleading, ambiguous, inappropriate or poorly constructed communication between individuals.
 - Reduced performance and error from an imbalanced authority relationship between ranks. For instance, an autocratic master and an overly submissive officer may cause the officer to fail to speak up when something is wrong, or alternatively the master may fail to listen.

Using the same illustration as before, Leadership & Teamwork is found in the L-L interface of the SHELL model.

The SHELL model:



Comment: As seen in the above illustration, leadership and teamwork is part of resource management. It is possible to construct courses focusing only on leadership and teamwork issues but if we would like to address the whole chain of events and the variety of contributing factors in accidents, there would be many important human factor issues and interactions missing. For example the Liveware-Environment interface. Seafarers are part of many different environments, not least different ‘cultures’. To what extent efficient teamwork and communication between people may be established depend on national, professional and organizational culture. In the Liveware-Software interface factors such as non-adherence to operating procedures, or poorly designed safety management systems, may be addressed. Over-reliance in automated systems is part of the Liveware-Hardware interface. In conclusion, since accidents often are caused by a combination of factors involving liveware, software, hardware and environment it would be difficult to effectively tackle these accidents if training would be limited to just the liveware components.

Integration and assessment - technical and non-technical skills

During everyday operation onboard a ship, *technical* and *non-technical* skills are integrated into each other and both skills needed to perform tasks as safely and efficiently as possible. But there are important differences. The technical skills are related to a specific department, job, function and rank while the non-technical skills are generic, i.e. applicable to all. While most technical training has to be carried out with groups kept apart – divided into, for example, deck and engine – the non-technical training may be carried out with no separation of people at all.

The assessment of technical and non-technical training also differs. Technical training can most often be assessed by means of a test. Assessment of non-technical training requires different methods. People can learn about resource management, leadership and teamwork theory. Trainees may even demonstrate the specific behavioural objectives of the training in a simulator in connection with the course. However, this says very little about what trainees actually think about the training and how willing they will be to apply the skills onboard. The challenge is to make safe and sound resource management principles become part of a permanent behaviour onboard after training. The trainees must therefore understand the importance of the training and want to try. To succeed, trainees also

need encouragement and support for the desired behaviour from the companies they work for. If the willingness to apply the theories would be related to the *attitudes of people*, the company support would be related to the *culture of the company*. The attitudes of people and the culture of the company are two central issues for the training to be effective and show intended results. An example of an important issue from a safety perspective is how you look upon *assertiveness*. People's attitudes to assertiveness are deeply rooted in national and professional culture. Only a very strong and clear organisational culture, where people know what is expected from them, can override the difficulties rooted in national and professional culture.

Comment: We would recommend training providers to organise their training programmes in such a way that the non-technical training according to the new STCW requirements is carried out as a separate training course (such as the MRM course) without mixing it with technical issues. The major benefit would be that all disciplines and ranks would be able to come together in the same training class, receiving the same course contents, terminology and training objectives. As previously mentioned, assessment of trainees in connection with the course is difficult and will not provide long-term evidence that the training has been effective. Trainers should stress that the initial training is just an introduction for the 'real training' that starts onboard. For approval and certification during initial resource management training, two requirements would need to be met – the trainees should have actively participated in an approved course.

MRM training providers

In addition to the traditional flag State approved training providers, new types of training providers may look for approval for their non-technical training programmes when this is being introduced in the STCW Convention and Code. This is a development that is much welcomed and should be supported as far as possible. There are several reasons for that.

When resource management training was first introduced in the maritime industry some 20 years ago the first ones adopting the concept were pro-active ship owners and ship managers. Considering the debate at the time – frequently mentioning “human error” as the cause of 80% of accidents at sea – these organisations identified a need for new type of training and found resource management training as an important countermeasure. By establishing in-house training centres, where own staff were trained as MRM workshop leaders, training commenced. An important success factor was the *internal motivation* to commence resource management training rather than an *external pressure* to do so. Results of training was what mattered and the same applies to these training providers today. Shipping companies operate close to their own and the seafarers' reality and thanks to the in-house training there are good opportunities for using own incident reports and similar during the training sessions. Shipping companies may also refresh course contents during officer conferences and use the MRM terminology and tools in communication with ships, for incident analyses and keeping their Safety Management Systems updated and in line with the training objectives.

There may actually be bigger challenges for the established maritime academies and training centres to produce good and long-lasting results since they are further away from the organisational cultures the trainees eventually will be part of.

Considering the above, safety at sea would clearly benefit from Administrations taking a positive view on the shipping companies who have committed themselves for resource management training by providing the support needed so that these companies may continue and further develop their training and safety initiatives.

Such support from Administrations was also recommended by the IMO in connection with the Manila Conference in June 2010. (See Appendix C.)

Appendix A – The Maritime Resource Management course in brief

Definition

The use and co-ordination of all the skills, knowledge, experience and resources available to the team to achieve the established goals of safety and efficiency of a voyage or any other safety critical task.

Target groups

Ships' officers, engineers, pilots and shore-based personnel.

Objectives of MRM training

To motivate the team – if necessary – to change its behaviour to good resource management practices during everyday operations. This includes understanding of the importance of good management and teamwork and the willingness to change behaviour.

MRM training concepts

The MRM course is...

- changing attitudes – not skills
- focusing on crews as intact teams, not a collection of competent individuals
- addressing crew member attitudes and behaviour
- providing two sets of objectives:
 - training objectives
 - specific behavioural objectives
- providing computer based training for transfer of facts
- utilising case studies and human interaction to change attitudes

History, development of MRM

- On March 27th 1977, a collision took place on the runway of the Los Rodeos Airport on the island of Tenerife between two Boeing 747 airliners. The accident resulted in the highest number of fatalities in aviation history – 583 people lost their lives.
- Contributing causes of the accident were:
 - Fog
 - Stress
 - Communication misunderstandings
 - Incorrect decision that was not challenged
- Additional research of airline accidents showed that approximately 60% of the accidents in airline flight operations were caused by cockpit management errors.
- Examples of such management errors are:
 - Preoccupation with minor technical problems,
 - Failure to delegate tasks and assign responsibilities,
 - Failure to set priorities,
 - Inadequate monitoring,
 - Failure to detect or challenge deviations from Standard Operating Procedures.
- Analysis revealed that errors were caused by improper attitudes rather than lack of skills.
- Aviation's safety response to prevent the recurrence of cockpit management errors was to develop a new type of training program. This training programme was called *Cockpit Resource Management* or *CRM*. The meaning of CRM was later changed to *Crew Resource Management*.
- The maritime industry shows similar statistics, and similar counteractions were recommended.
- In the beginning of the 1990s, eight entities gathered with the objective of converting the airline industry's Cockpit Resource Management course to a course aimed at the shipping industry. These entities were:
 - Dutch Maritime Pilots' Corporation

- Finnish Maritime Administration
 - Norwegian Shipowners' Association
 - SAS Flight Academy
 - Silja Line
 - Swedish Maritime Administration
 - Swedish Shipowners' Association
 - The Swedish Club
- The group decided to call the course *Bridge Resource Management*, or *BRM*, simply because it would be the most accurate translation of *Cockpit Resource Management*. "The 'cockpit' onboard a ship ought to be the bridge."
 - The first BRM course was launched in June 1993.
 - After some time, the group felt unhappy with the name of the course since the name reflected an old approach and thinking and in 2003 the name of the course was changed from *Bridge Resource Management* to *Maritime Resource Management*. The main purpose was to increase attraction amongst other important target groups besides masters, bridge officers and pilots. Such target groups included engineers and shore-based personnel.
 - In September 2011, 89 training providers in 33 countries are authorised to deliver the Maritime Resource Management course.

Training method

Workshops

The learning process in the MRM course takes place in workshops, one workshop per course module.

In the workshops, conducted by a specially trained workshop leader, the trainees work together with 8-12 other trainees, sometimes in smaller groups.

Case studies and situation analysis are performed, during which comparison between others' and own attitudes and opinions are made.

The MRM course is rather increasing the tendency, or willingness, to apply the skills than teaching the skills. This is a matter of changing attitudes.

Computer Based Training (CBT)

As a preparation for each workshop, the trainee must learn some basic facts about human behaviour and interaction. This is done by means of computer based training, or 'CBT'. The CBT program also contains scripted drama examples of good and bad management situations.

The CBT may be carried out individually or in group.

Application

As an option, a bridge/engine 'mock-up' or simulator can be used during the course. This is for reinforcement and practical MRM training and the exercises can either be integrated in the course or carried out as a concluding exercise with feedback. These exercises should be considered an option for training providers who wish to use such facilities - 'mock-up' or simulator exercises should not be considered a mandatory part of the course.

Case studies

An important part of the course is case studies of real accidents and incidents with analysis using 'MRM terminology'.

Facilitation techniques

There are two main techniques that are available to trainers, namely instruction and facilitation. Instruction can be described as being primarily a telling activity, where knowledge and skills are developed in trainees through either direct communication or demonstration. Facilitation on the other

hand, can be described as a technique that helps trainees to discover for themselves what is appropriate and effective, in the context of their own experience and circumstances.

Both techniques are useful and have their place. In order to transfer knowledge, instruction is the most efficient technique to employ. However, trying to encourage appropriate attitudes using instruction as the technique, normally has limited success. People, particularly adults, do not like being told how to behave and what to think.

In MRM training, facilitation is the technique primarily used.

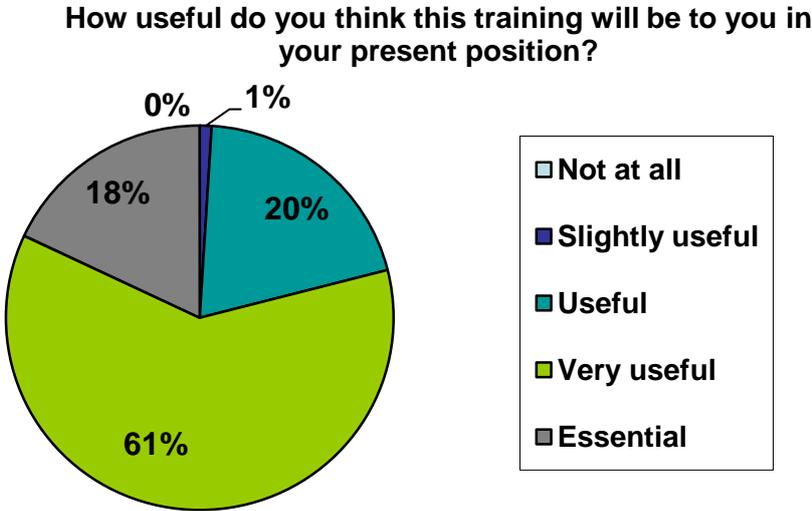
Refresher training

Refresher training is a critical success factor for long-lived results from resource management training. There are several ways this could be done. It could be done through shorter courses summarising the core MRM modules, focusing on recently added modules and analysing new case studies. It could also be done during officer and crew conferences and in the daily communication with the ships.

Course evaluations

All MRM training providers are provided with a standard form for course evaluations. Feedback received from the course evaluations is used by the individual training provider to assess how the trainees perceive the quality of training at that specific training site. The analysis of course evaluations from several training providers is primarily used for the identification of strengths and weaknesses in general of the training material.

The graph below is based on the 200 first trainees attending the MRM course at The Swedish Club Training Centre in Greece. The trainees represented primarily master and bridge officers from various shipping companies in international trade. The positive trainee feedback was a very important factor in the early stages of the introduction of resource management training in the shipping industry.



Course feedback from other training providers - representing other nationalities and ships – shows similar results.

Results of training

With a number of different tools, such as trainees’ evaluation of the effectiveness, attitude change measurements, behaviour change operations, subjective incident reports and insurance claims statistics the efficiency of resource management training has been proved, both in aviation and in shipping.

Quality assurance

There are a number of measures taken to ensure the quality of MRM training.

First, all MRM training providers must sign a licence agreement specifying the rights and undertakings of the training provider. Upon signing of the agreement, the training provider is issued a *Certificate of Authorisation*. This certificate is renewed yearly provided the requirements of the agreement are met.

The MRM trainers, who should be carefully selected by the training provider, are required to go through MRM Workshop Leader training. Upon successful completion of the training, the candidates are issued the *MRM Workshop Leader Certificate*. To stay updated about the development in the human factors area and the further development of the MRM course, all workshop leaders are invited to special MRM Workshop Leader meetings held about twice a year. In addition, about 5-6 times a year, all MRM training providers and workshop leaders are sent an MRM News email providing latest MRM news.

All MRM workshop leaders are equipped with the *MRM Workshop Leader Guide*. This, together with a uniform course material, shall guarantee that an MRM training certificate has the same value wherever in the world the training has taken place.

Training providers

MRM training providers include maritime universities and training centres, ship owners and ship managers, manning agencies, pilot associations, seafarer associations and insurers. During workshop leader meetings and in development projects, this mix of training providers ensures that a variety of interests are being considered without deviating from the training providers' shared goal of further increasing safety, efficiency and job satisfaction. All certified MRM training providers are listed at the website www.swedishclub.com/academy.

MRM course modules

Situation Awareness

In this module the concept of Situation Awareness is addressed and defined. The trainees will be able to recognize the importance of Situation Awareness to decision-making, state the three levels of Situation Awareness and list factors affecting Situation Awareness.

Attitudes and Management Skills

The human nature and its weaknesses are discussed. The trainees learn to be aware of "hazardous thoughts", that can induce accidents, and the opposite, "safe thoughts". The concept of Common Terminology is introduced.

Cultural Awareness

Cultural differences and how to deal with them. The following characteristics are used to describe cultural differences: Group-Individual, Power Distance, Uncertainty Avoidance, Feminine-Masculine, and Short-Long Term.

Communication and Briefings

This module deals with common errors in communication, the importance of "closed loop communication" and how you achieve a good communication climate. Briefings and debriefings are mandatory in aviation and should be applied also on ships. Practical guidelines are given on how to perform briefings and debriefings.

Challenge and Response

The importance of a Challenge and Response environment is emphasised, defined as a "supportive environment", in which everybody feels free to question assumptions and actions, and in which positive responses are the norm.

Short Term Strategy

Short Term Strategy is a practical method for dealing with any type of task, but especially useful in abnormal or emergency situations when use of all available resources is necessary.

Authority and Assertiveness

In this module, behaviour in terms of authority and assertiveness is discussed. Reasons for and the dangers of extreme combinations of authority and assertiveness are analysed.

Management Styles

Different leadership styles are discussed and how to deal with them. The performance/human relation management grid is used.

Workload

The dangers of too low and too high workload are discussed and systematic ways to avoid them. Methods like task analysis, delegation and rotation of tasks are addressed.

State of the Ship

The state of the ship is generated by the combination of the team members' personal states of mind. The underlying reasons for different states of mind are discussed, as well as the importance to detect and take action on state extremes and differences between the crew members.

Human Involvement in Error

Here, underlying causes of accidents in terms of externally and internally induced errors are discussed, and the importance of responding to and learning from errors.

Judgment and Decision Making

Factors affecting judgment and decision making and the process of decision making are addressed. The importance of detecting and avoiding hidden pressure is emphasised.

Leadership in Emergencies

Transferring an emergency situation from the unanticipated, fast reaction type towards the anticipated, slow reaction type is discussed, and the necessity to apply different leadership styles in different emergency situations.

Crisis and Crowd Management

Together with the above modules, this module meets the STCW requirement for theoretical training in C&C management. It covers mental and physical reactions in a crisis situation, how to deal with them, how to deal with a crowd and finally a method for personal crisis debriefing.

Automation Awareness

This module addresses the consequences of increased automation on ships' bridges. It discusses different levels of automation, characteristics, advantages and dangers with automation and some guidelines for learning to work in automated environments.

Working with pilots and VTS *(Expected launch in September 2011)*

The Swedish Club deals with on average two major incidents a week involving pilots and even if the pilot certainly in most cases adds safety and prevent (an unknown number of) incidents from happening, the pilot – and what happens to the bridge team when the pilot boards the ship - may be part of the problem when things go wrong. Very often the things that go wrong are related to lack of MRM. With this additional module, we aim at making this part of a ship operation as safe as possible. “Working with pilots and VTS” is not part of the core course material. This is an optional module illustrating for masters and bridge teams how MRM should be applied in these specific situations.

Appendix B – STCW Manila amendments

This appendix contains all tables where references are made to the terms *resource management*, *leadership*, *teamwork* and *managerial skills*.

Table A-II/1 - Specification of minimum standard of competence for officers in charge of a navigational watch on ships of 500 gross tonnage or more

Function: Navigation at the operational level

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
Maintain a safe navigational watch (continued)	<p>Bridge resource management</p> <p>Knowledge of bridge resource management principles, including:</p> <ul style="list-style-type: none"> .1 allocation, assignment, and prioritization of resources .2 effective communication .3 assertiveness and leadership .4 obtaining and maintaining situational awareness 	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved training .2 approved in-service experience .3 approved simulator training 	<p>Resources are allocated and assigned as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Questionable decisions and/or actions result in appropriate challenge and response</p> <p>Effective leadership behaviours are identified</p> <p>Team member(s) share accurate understanding of current and predicted vessel state, navigation path, and external environment</p>

Function: Controlling the operation of the ship and care for persons on board at the operational level

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
<p>Application of leadership and teamworking skills</p>	<p>Working knowledge of shipboard personnel management and training</p> <p>A knowledge of related international maritime conventions and recommendations, and national legislation</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> .1 planning and co-ordination .2 personnel assignment .3 time and resource constraints .4 prioritization <p>Knowledge and ability to apply effective resource management:</p> <ul style="list-style-type: none"> .1 allocation, assignment, and prioritization of resources .2 effective communication onboard and ashore .3 decisions reflect consideration of team experiences .4 assertiveness and leadership, including motivation .5 obtaining and maintaining situational awareness <p>Knowledge and ability to apply decision-making techniques:</p> <ul style="list-style-type: none"> .1 Situation and risk assessment .2 Identify and consider generated options .3 Selecting course of action .4 Evaluation of outcome effectiveness 	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved training .2 approved in-service experience .3 practical demonstration 	<p>The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned</p> <p>Training objectives and activities are based on assessment of current competence and capabilities and operational requirements.</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel and operational status and external environment</p> <p>Decisions are most effective for the situation</p>

Table A-II/2- Specification of minimum standard of competence for masters and chief mates on ships of 500 gross tonnage or more

Function: Controlling the operation of the ship and care for persons on board at the management level

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
<p>Use of leadership and managerial skill</p>	<p>Knowledge of shipboard personnel management and training</p> <p>A knowledge of related international maritime conventions and recommendations, and national legislation</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> .1 planning and co-ordination .2 personnel assignment .3 time and resource constraints .4 prioritization <p>Knowledge and ability to apply effective resource management:</p> <ul style="list-style-type: none"> .1 allocation, assignment, and prioritization of resources .2 effective communication on board and ashore .3 decisions reflect consideration of team experiences .4 assertiveness and leadership, including motivation .5 obtaining and maintaining situation awareness <p>Knowledge and ability to apply decision-making techniques:</p> <ul style="list-style-type: none"> .1 situation and risk assessment .2 identify and generate options .3 selecting course of action .4 evaluation of outcome effectiveness <p>Development, implementation, and oversight of standard operating procedures</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved training .2 approved in-service experience .3 approved simulator training 	<p>The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned</p> <p>Training objectives and activities are based on assessment of current competence and capabilities and operational requirements</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel and operational status and external environment</p> <p>Decisions are most effective for the situation</p> <p>Operations are demonstrated to be effective and in accordance with applicable rules</p>

Table A-III/1 - Specification of minimum standard of competence for officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room

Function: Marine engineering at the operational level

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
Maintain a safe engineering watch (continued)	<p>Engine-room resource management</p> <p>Knowledge of engine-room resource management principles, including:</p> <ul style="list-style-type: none"> .1 allocation, assignment, and prioritization of resources .2 effective communication .3 assertiveness and leadership .4 obtaining and maintaining situational awareness .5 Consideration of team experience 	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved training .2 approved in-service experience .3 approved simulator training 	<p>Resources are allocated and assigned as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Questionable decisions and/or actions result in appropriate challenge and response</p> <p>Effective leadership behaviours are identified</p> <p>Team member(s) share accurate understanding of current and predicted engine-room and associated systems state, and of external environment</p>

Function: Controlling the operation of the ship and care for persons on board at the operational level

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
Application of leadership and teamworking skills	<p>Working knowledge of shipboard personnel management and training</p> <p>A knowledge of related international maritime conventions and recommendations, and national legislation</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> .1 planning and co-ordination .2 personnel assignment .3 time and resource constraints .4 prioritization <p>Knowledge and ability to apply effective resource management:</p> <ul style="list-style-type: none"> .1 allocation, assignment, and prioritization of resources .2 effective communication on board and ashore .3 decisions reflect consideration of team experiences .4 assertiveness and leadership, including motivation .5 obtaining and maintaining situational awareness <p>Knowledge and ability to apply decision-making techniques:</p> <ul style="list-style-type: none"> .1 Situation and risk assessment .2 Identify and consider generated options .3 Selecting course of action .4 Evaluation of outcome effectiveness 	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved training .2 approved in-service experience .3 practical demonstration 	<p>The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned</p> <p>Training objectives and activities are based on assessment of current competence and capabilities and operational requirements.</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel and operational status and external environment</p> <p>Decisions are most effective for the situation</p>

Table A-III/2 - Specification of minimum standard of competence for chief engineer officers and second engineer officers on ships powered by main propulsion machinery of 3,000 kW propulsion power or more

Function: Controlling the operation of the ship and care for persons on board at the management level

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
<p>Use leadership and managerial skills</p>	<p>Knowledge of shipboard personnel management and training</p> <p>A knowledge of international maritime conventions and recommendations, and related national legislation</p> <p>Ability to apply task and workload management, including:</p> <ul style="list-style-type: none"> .1 planning and coordination .2 personnel assignment .3 time and resource constraints .4 prioritization <p>Knowledge and ability to apply effective resource management:</p> <ul style="list-style-type: none"> .1 allocation, assignment, and prioritization of resources .2 effective communication on board and ashore .3 decisions reflect consideration of team experience .4 assertiveness and leadership, including motivation. .5 obtaining and maintaining situation awareness <p>Knowledge and ability to apply decision-making techniques:</p> <ul style="list-style-type: none"> .1 situation and risk assessment .2 identify and generate options .3 select course of action .4 evaluation of outcome effectiveness <p>Development, implementation, and oversight of standard operating procedures</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> .1 approved training .2 approved in-service experience .3 approved simulator training 	<p>The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned</p> <p>Training objectives and activities are based on assessment of current competence and capabilities and operational requirements</p> <p>Operations are demonstrated to be in accordance with applicable rules</p> <p>Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Effective leadership behaviours are demonstrated</p> <p>Necessary team member(s) share accurate understanding of current and predicted vessel and operational status and external environment</p> <p>Decisions are most effective for the situation</p> <p>Operations are demonstrated to be effective and in accordance with applicable rules</p>

Appendix C – IMO recommendation on support to shipping companies

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Resolution 7

Promotion of technical knowledge, skills and professionalism of seafarers

THE 2010 MANILA CONFERENCE,

HAVING ADOPTED the Manila amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 and to the Seafarers' Training, Certification and Watchkeeping Code, as amended (STCW Convention and Code),

NOTING with concern the reported and anticipated shortage of qualified officers to effectively man and operate ships engaged in international trade,

APPRECIATING that the overall effectiveness of selection, training and certification processes can only be evaluated through the skills, abilities and competence exhibited by seafarers during the course of their service on board ship,

RECOMMENDS that Administrations make arrangements to ensure that shipping companies:

- .1 establish criteria and processes for the selection of seafarers exhibiting the highest practicable standards of technical knowledge, skills and professionalism;
- .2 monitor the standards exhibited by ships' personnel in the performance of their duties;
- .3 encourage all officers serving on their ships to participate actively in the training of junior personnel;
- .4 monitor carefully and review frequently the progress made by junior personnel in the acquisition of knowledge and skills during their service on board ship;
- .5 provide refresher and updating training at suitable intervals, as may be required; and
- .6 take all appropriate measures to instil pride in the maritime profession and encourage the creation of a safety culture and environmental conscience among all those who serve on their ships.

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