

SUB-COMMITTEE ON HUMAN ELEMENT,  
TRAINING AND WATCHKEEPING  
4th session  
Agenda item 7

HTW 4/INF.2  
18 November 2016  
ENGLISH ONLY

## ROLE OF THE HUMAN ELEMENT

### Human Element Competencies Template

Submitted by the Nautical Institute (NI)

#### SUMMARY

*Executive summary:* This document provides information that aims to inform and define the required competencies for addressing human element issues by maritime stakeholder groups, in order to ensure that the human element is properly considered across the maritime industry and ultimately to provide the basis for a curriculum for human element awareness training

*Strategic direction:* 5, 7

*High-level action:* 5.4; 7.4

*Output:* 5.4.1; 7.4.1

*Action to be taken:* Paragraph 3

*Related documents:* None

#### Introduction

1 Alert is a Nautical Institute project, sponsored by Lloyd's Registry Foundation that aims to improve awareness of the human element in the maritime industry. Since the project began in 2003, 40 issues of the award winning *Alert!* international human element bulletin have been produced, with 2.5 million copies distributed worldwide. Although no further issues of the bulletin will be published, the project continues to serve the maritime industry as a valuable resource for all to use.

2 The *Alert!* project has developed a series of human element competence templates for those who are responsible for the following which is not an exhaustive list:

- Procuring, financing, specifying, designing and overseeing the build of a ship and its systems;
- Operational, technical and people management;
- Maritime education and training;
- HSSEQ management; and
- The development of maritime conventions, regulations and technical standards.

These competency templates are set out in the annex to this document.

**Action requested of the Sub-Committee**

- 3 The Sub-Committee is invited to note the information provided.

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**HUMAN ELEMENT COMPETENCIES TEMPLATES**

**1. Regulation, Administration & Management**

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>REGULATORS</b></p> <p><b>Knowledge of the human element in the development of international regulations.</b></p>	<p><b>Have a full understanding of</b> the IMO Human Element Vision, Principles and Goals for the Organization (Resolution A.947(23))</p> <p><b>Understand the need to apply:</b></p> <ul style="list-style-type: none"> <li>- the Checklist for Considering Human Element issues by IMO Bodies (MSC-MEPC.7/Circ.1)</li> <li>- the Guidelines for the application of the Human Element Analysing Process (HEAP) to the IMO-rule making process (MSC-MEPC.2/Circ.13)</li> <li>- the Revised Guidelines for Formal Safety Assessment (FSA) in the IMO-rule making process. (MSC-MEPC.2/Circ.12/Rev.1)</li> </ul>	<p>Interview Observation</p> <p>Interview Observation</p> <p>Interview Observation</p> <p>Interview Observation</p>	<p>Consider the human element when developing any IMO or ILO Resolution, Instrument or Circular</p> <p>Consider the input from seafarers or their proxies, during the development or amendment process related to any Resolution, Instrument or Circular</p> <p>Provide guidance on the human element aspects of the application and/or implementation of any proposed solution being provided for Administrations, ship owners/managers, seafarers and surveyors</p> <p>Establish, and require the enforcement of, principles and rules which ensure a uniform minimum international standard for the safety of life at sea, the safety of navigation, the protection of the marine environment and the safety, security and wellbeing of ships' crews</p> <p>Set the necessary levels of knowledge, skills, abilities and experience for personnel employed in the maritime sector to properly perform job tasks</p> <p>Provide practical guidelines for the investigation of human factors in marine casualties and incidents</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>ADMINISTRATORS (FLAG STATES)</b></p> <p><b>Knowledge of the human element in the national interpretation of international regulations</b></p>	<p><b>Fully understand:</b></p> <ul style="list-style-type: none"> <li>- the importance of the requirements of pertinent IMO, ILO, WHO and regional instruments relevant to maritime safety and protection of the marine environment</li> <li>- the importance of properly addressing the human element for the safety of life at sea, the safety of navigation, the protection of the marine environment and the safety, security and wellbeing of ships' crews</li> <li>- the need to promote safety of life at sea by establishing and requiring the enforcement of, principles and rules which ensure that a uniform national standard is maintained, at least in line with the required minimum international standards</li> <li>- regional instruments relevant to maritime safety and protection of the marine environment</li> <li>- measures to prevent/suppress terrorism against ships and port facilities to improve security aboard and ashore, so as to reduce the risk to passengers, crews and port personnel and to the vessels and their cargoes, in accordance with the requirements of the ISPS Code</li> </ul>	<p>Interview Observation</p> <p>Interview Observation</p> <p>Interview Observation</p> <p>Interview Observation</p> <p>Interview Observation</p>	<p>IMO Resolution A.1070(28) - IMO Instruments Implementation (III) Code</p> <p>ILO Guidelines for flag State inspections under the Maritime Labour Convention, 2006</p> <p>International Health Regulations (2005) - Toolkit for implementation in national legislation</p> <p>SOLAS 1974, as amended</p> <p>IMO/ILO Code of practice on security in ports</p> <p>Convention on the International Regulations for Preventing Collisions at Sea (COLREGs), 1972, as amended</p> <p>International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended</p> <p>Maritime Labour Convention, 2006</p> <p>The International Health Regulations (2005)</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p><b>Recognize the need to:</b></p> <ul style="list-style-type: none"> <li>- investigate human factors in marine casualties and incidents, and act on the findings</li> <li>- properly consider the human element when developing/amending national maritime instruments related to safety, security and protection of the marine environment</li> </ul>	<p>Interview Observation</p> <p>Interview Observation</p>	<p>IMO MSC.255(84): The Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code)</p> <p>IMO MSC-MEPC.7/Circ.1 - Checklist for Considering Human Element issues by IMO Bodies</p> <p>The Human Element Best Practice for Ship Operators (The Lloyd's Register Group)</p>
<p><b>SHIPOWNER/SHIPMANAGER</b></p> <p><b>Knowledge of international and national regulation and good practice relating to the human element in the development and application of the company's corporate policies</b></p>	<p><b>Fully understand:</b></p> <ul style="list-style-type: none"> <li>- the importance of properly addressing the human element for the safety of life at sea, the safety of navigation, the protection of the marine environment and the safety, security and wellbeing of ships' crews</li> </ul>	<p>Interview Observation</p>	<p>The Human Element Best Practice for Ship Operators (The Lloyd's Register Group)</p> <p>Establish and communicate a policy for the human-centred approach to ship design/operations</p> <p>Have a policy for using human element data</p> <p>Maintain increased awareness of usability</p> <p>Facilitate personal and technical interactions on human element issues</p> <p>Seek and exploit expert guidance and advice on human element issues</p> <p>Perform research to develop human element data as it is required</p> <p>Develop or provide relevant staff with human element skills</p> <p>Develop a plan to achieve and maintain the optimum level of usability throughout ship operation</p>

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	<p><b>Fully understand:</b></p> <ul style="list-style-type: none"> <li>- the importance of safety at sea, prevention of human injury or loss of life and avoidance of damage to the environment, in particular to the marine environment/property in, accordance with the requirements of the ISM Code</li> <li>- the importance of properly addressing the human element for the safety of life at sea, the safety of navigation, the protection of the marine environment and the safety, security and wellbeing of ships' crews</li> </ul>	<p>Interview Observation</p> <p>Interview Observation</p>	<p>Identify the specialist skills required and plan how to provide them</p> <p>Manage a lifecycle plan to address HE issues</p> <p>Commitment from the top</p> <p>Demonstrate a full understanding of the content of the ISM Code</p> <p>SOLAS 1974, as amended</p> <p>IMO/ILO Code of practice on security in ports</p> <p>ISPS Code</p> <p>Convention on the International Regulations for Preventing Collisions at Sea (COLREGs), 1972, as amended</p> <p>International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention), 1978, as amended</p> <p>Maritime Labour Convention, 2006</p> <p>The International Health Regulations (2005)</p> <p>Appropriate Flag State legislation</p> <p>Appropriate Best Practice Guides</p>

2. Design, Build, Maintain

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>NAVAL ARCHITECTS, DESIGNERS &amp; PROJECT MANAGERS</b></p> <p><b>Knowledge of industry rules, regulations and guidelines impacting the human element in design</b></p>	<p><b>Demonstrate an understanding of:</b></p> <ul style="list-style-type: none"> <li>– what it means to live and work at sea</li> <li>– the human element design requirements of international resolutions, conventions and instruments, classification rules, international standards and flag State regulations</li> </ul>	<p>Familiarisation trip to sea, written report, interview</p> <p>Test (computer or written), interview</p>	<p>Undertake project whilst at sea</p> <p>Access the relevant information and apply it in design</p>
<p><b>NAVAL ARCHITECTS &amp; DESIGNERS</b></p> <p><b>Human Element best practices</b></p>	<p><b>Understand the importance of</b> the human element to assure good design and construction as well as operational aspects</p> <p><b>Demonstrate an understanding of</b> a human-centred approach to ergonomic design</p> <p><b>Understand</b> the relationship between design, build and operation from a human element perspective</p> <p><b>Understand that:</b></p> <p>design must take full account of the nature of the task and its implications for the human</p> <ul style="list-style-type: none"> <li>- any plan for human-centred design should form part of the overall project plan</li> <li>- process modelling and assessment is an element in the assurance of timely and effective system delivery</li> <li>- the design process is iterative</li> <li>- the design team should include multi-disciplinary skills and perspectives</li> </ul>	<p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Observation</p>	<p>Ergonomic criteria are established for the design</p> <p>Ergonomics are considered early and continuously within the design process</p> <p>The environment in which a system, product, service or facility is intended to be used is identified and described</p> <p>Sufficient attention is given to the application of ergonomics principles in order to prevent any negative effects</p> <p>Conceptual and detailed designs take account of ergonomics criteria</p> <p>Evaluation of the ergonomic design of any system, product or service is based on established ergonomic criteria</p> <p>Develop a practical model of the user's work from the requirements, context of use, allocation of function and design constraints for the system</p> <p>Produce a description of how the system will be used</p>

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<p><b>NAVAL ARCHITECTS &amp; DESIGNERS</b></p> <p><b>Human Element best practices (continued)</b></p>	<p>- project planning should allocate time and resources for human-centred activities</p>		<p>Produce designs for the user-related elements of the system that take account of the user requirements, context of use and human element data</p> <p>The operational safety and business effectiveness of the ship/system are dependent on a number of elements all working together in an integrated way</p> <p>The users (or potential users) are involved in the process of design</p> <p>Users are involved throughout the lifecycle such that the design is driven and refined by user-centred evaluation</p> <p>The design addresses the whole user experience</p> <p>Design solutions include ergonomics and user requirements</p>



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<p><b>PROJECT MANAGERS</b></p> <p><b>Human element best practices</b></p>	<p><b>Understand that</b> human-centred design should be planned and integrated into all phases of the product life cycle</p>	<p>Observation</p>	<p>The relative importance of ergonomics in the project is considered</p> <p>The environment in which a system, product, service or facility is intended to be used, is considered, taking full account of the nature of the task and its implications for the seafarer</p> <p>Designed for the target population and the whole user-experience</p> <p>User-centred evaluation and established ergonomic criteria drive and refine the design</p> <p>Context of use specified such that design is based upon an explicit understanding of users, tasks and environments – through case studies/exercises</p> <p>User needs identified and user requirements specified</p> <p>Milestones for human-centred activities integrated into the overall design and development process</p> <p>Required range of skills and viewpoints identified</p> <p>Workers or users (or potential workers or users) involved in the process</p> <p>Most suitable formats for exchanging human element data identified and used</p> <p>Human resources and human-centred design included in corporate procedures, standards and guides</p> <p>Research undertaken into required ship and system usability for future operating concept</p>

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<b>PROJECT MANAGERS</b>  Human element best practices (continued)			Usability defined as a competitive asset Usability objectives set for ship operation User-centred infrastructure developed

<p><b>SHIPOWNER/OPERATOR</b></p> <p><b>Human element best practices</b></p>	<p><b>Understand the need to:</b></p> <ul style="list-style-type: none"> <li>- take the human element into account during the design and building of a new ship</li> <li>- include and integrate human-centred design into the overall project plan and all phases of the product life cycle</li> <li>- relate human element issues to business benefits</li> <li>- plan and integrate human-centred design into all phases of the product life cycle</li> <li>- present the needs and represent the interests of the crew and support staff to naval architects, designers, equipment manufacturers etc.</li> </ul>	<p>Observation</p>	<p>Occupational health and safety risks to the crew are predicted</p> <p>The developing ship and/or systems is regularly reviewed</p> <p>Input from the crew (or representative seafarers) on the usability of the developing ship and its systems is collected</p> <p>Risks to the community and environment arising from human error in ship operations assessed</p> <p>Human-centred solutions for each design option are produced</p> <p>Key aspects of the ship and its systems before are tried out before they are built</p> <p>Design options for each aspect of the ship and its systems related to operation and its effect on stakeholders are generated</p> <p>Ship/system designed for customisation</p>
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<p><b>SHIPOWNER/OPERATOR</b></p> <p><b>Human element best practices (continued)</b></p>			<p>Type approval and regulatory requirements are met</p> <p>The preferences and needs of the crew are captured</p> <p>Specific complaints and any history of maintenance problems, for example from a sister ship, or previous use of the same item of equipment, are considered</p> <p>Input is collected from crew carrying out real tasks in a realistic environment</p> <p>Feedback from an existing sister ship is obtained where applicable</p> <p>Prototype surveys and human reliability analyses carried out</p>

3. Maritime education and training (MET)

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<p><b>Human element best practices</b></p>	<p><b>Understand</b> the relevance of the human element in design, build and operation of marine assets</p> <p><b>Have a basic understanding of:</b></p> <ul style="list-style-type: none"> <li>- applied social sciences</li> <li>- national cultural differences</li> <li>- ergonomics and psychology/cognitive science</li> <li>- the effect of context of use and the environment on human performance</li> </ul> <p><b>Demonstrate the ability to:</b></p> <ul style="list-style-type: none"> <li>- apply a student-centred approach to the design of education and training</li> <li>- create the prerequisites for students to acquire own skills</li> <li>- transfer skills and deliver knowledge to a diverse student audience</li> </ul>	<p>Written task: skill review, portfolio, project task, interview</p> <p>Written task, project work, role play, simulation</p> <p>Exemplars of work-based evidence, portfolio</p> <p>Practical demonstrations in classroom</p> <p>Practical demonstrations in classroom Exemplars and portfolio of work</p>	<p>Display understanding of key strategic features of HE and their significance &amp; of the human-centred approach to systems</p> <p>Recognise the impact of performance shaping factors in the context of safety and operations</p> <p>Approved in-service experience</p> <p><i>The Human Element Best Practice for Ship Operators</i> (The Lloyd's Register Group)</p> <p>Peer observation and review</p> <p>Student feedback</p> <p>Peer observation and review</p> <p>Communicate complex ideas in a clear and concise manner</p>

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<p><b>Human element best practices</b></p>	<p><b>Fully understand</b> the principles of:</p> <ul style="list-style-type: none"> <li>- teaching practice</li> <li>- assessment and examination schemes, e.g. formative and summative methods</li> </ul> <p><b>Demonstrate the ability to</b> design education and training programmes including:</p> <ul style="list-style-type: none"> <li>- presentation skills</li> <li>- classroom management skills</li> <li>- communication theory</li> <li>- feedback and de-briefing</li> </ul> <p><b>Fully understand</b> the principles of:</p> <ul style="list-style-type: none"> <li>- curriculum development</li> <li>- flexible and blended teaching and learning strategies</li> <li>- identifying and writing learning objectives and outcomes</li> <li>- lesson and resource planning procedures</li> <li>- the use of examination methods that constitute a learning opportunity</li> </ul>	<p>Exemplars and portfolio of work</p> <p>Work-based evidence</p> <p>Work-based evidence</p> <p>Interviews, portfolio of evidence, student feedback, peer review</p>	<p>Presentation of information in a manner that can be understood and applied by the learners</p>

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<p><b>Human element best practices</b></p>	<p><b>Demonstrate the ability to</b> evaluate and apply IT effectively in teaching, including:</p> <ul style="list-style-type: none"> <li>- the selection of instructional methods and material planning assessments</li> <li>- knowledge of common teaching and general software packages, e.g. PowerPoint</li> <li>- awareness of web-based services, multi-media products and services and social media</li> </ul> <p><b>Demonstrate the ability to</b> empathise with student needs, including:</p> <ul style="list-style-type: none"> <li>- psychology of learning</li> <li>- factors which influence effective student learning</li> <li>- the needs of different national, cultural, ethnic groups and students with disabilities</li> </ul> <p><b>Demonstrate</b> academic leadership, with regard to the principles of leadership, coaching, mentoring, appraisals, motivation &amp; engagement</p> <p><b>Fully understand:</b></p> <ul style="list-style-type: none"> <li>- what it means to live and work at sea</li> <li>- the international maritime context (political, economic, environmental, geographical, socio-technical)</li> </ul>	<p>Portfolio</p> <p>Interview, observation</p> <p>Interview</p> <p>Familiarisation trip to sea; written report</p> <p>Interview, assessment</p>	<p>Identify problematic areas e.g. isolation, communication challenges, team working</p>

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<p><b>Compliance with conventions, resolutions, rules and regulations</b></p>	<p><b>Be fully conversant with:</b></p> <ul style="list-style-type: none"> <li>- relevant IMO, ILO, WHO Conventions &amp; Resolutions, (e.g. SOLAS, MARPOL, STCW and MLC)</li> <li>- Flag State regulations of own nation, or of country where teaching</li> <li>- the Role and overview of Classification societies rules</li> <li>- Best Practice Guides and other industry standards appropriate to the subject being taught</li> </ul>	<p>Interview, assessment</p> <p>Interview, assessment</p> <p>Interview, assessment</p> <p>Interview, assessment</p>	



4. Finance, Insurance, Chartering & Brokering

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Financier/Banker</b></p> <p><b>Human element best practices</b></p>	<p><b>Fully understand the need:</b></p> <ul style="list-style-type: none"> <li>- for safe, sustainable and dependable shipping</li> <li>- to balance the return risks with those of financial risk, market risk, asset risk and operator risk</li> <li>- to specify the correct level of operational knowledge and processes to protect the income generation of the ship through the covenants in the loan or lease documentation</li> <li>- to appreciate the level of risk from inadequate integration between people, process and plant</li> <li>- to appreciate the need to price risk highly, as an incentive for operators to pay more attention to addressing human-system issues</li> </ul>	<p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p>	<p>Assess the human element issues associated with the sector being offered for investment.</p> <p>Assess the human element implications of the owner/charterer/sub-charterer agreements and long term plans (COA, TC/P, VC/P, etc.)</p> <p>Gauge risks arising from not addressing the human element in ship operations</p>

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<p><b>Finance director (person responsible for financial planning and control in a shipping company)</b></p> <p><b>Human element best practices</b></p>	<p><b>Be fully aware of</b> the marketplace and define and maintain a position relative to the market place</p> <p><b>Fully understand the need:</b></p> <ul style="list-style-type: none"> <li>- for safe, sustainable and dependable shipping</li> <li>- to balance the return risks with those of financial risk, market risk, asset risk and operator risk</li> <li>- to embrace the principle of the three legs of sustainability, business, environment and social conditions being in harmony</li> <li>- to continuously improve the social conditions of seafarers and of the social conditions of those affected by maritime activities</li> <li>- for triple bottom line accounting and through-life cost-benefit analysis</li> </ul> <p><b>Fully understand:</b></p> <ul style="list-style-type: none"> <li>- the human element implications of any business opportunity</li> <li>- the business implications of any human element issue</li> </ul>	<p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p>	<p>Encourage socially responsible investment through the consideration of the human element in the balance between economic, social and environmental considerations.</p> <p>Consider people's needs and abilities in order to enhance utilisation, quality and efficiency; providing cost effective solutions and reducing the likelihood that systems, products or services will not be used correctly.</p> <p>Take responsibility for the impact of the organization's activities upon its employees, as well as its customers, the community and the environment</p> <p>Ensure the right balance between the cost of, versus the investment in, people</p> <p>Include the human element in the business case for future operating concepts</p> <p>Include the 'soft' costs of introduction, operation and disposal, and human contributions to system effectiveness, including human error and human resilience in recovering from system failures</p> <p>Include usability and human element activities as part of the business strategy</p>

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<p><b>Finance director (person responsible for financial planning and control in a shipping company)</b></p> <p><b>Human element best practices (continued)</b></p>			<p>Ensure that business management sets demands on usability for ship operations</p> <p>Ensure that business management is interested in how the usability of their ship operations compares to that of competitors</p> <p>Ensure that senior management directly control the funds to maintain/improve user-centred design skills, resources, technology, awareness and culture</p> <p>Establish through-life cost accounting in order to assess the costs and benefits of a user-centred approach regarding the operation of future systems in their expected context</p> <p>Provide human element data and advice to purchasing processes in general</p> <p>Provide and review human element aspects of investment appraisals, cost effectiveness analyses, business cases and high-level metrics or other financial performance indicators</p> <p>Use through-life and other suitable total cost models as part of financial analysis</p>

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<p><b>The underwriter (Hull or P&amp;I)</b></p> <p><b>Human element best practices</b></p>	<p><b>Fully understand:</b></p> <ul style="list-style-type: none"> <li>- the importance of the human element in the mitigation of risk</li> <li>- the need for safe, sustainable and dependable shipping</li> <li>- that human failure is a leading cause of total and partial losses of vessels and of the valuable cargoes they carry</li> <li>- that the human element in shipping operations and its impact on risk is critical</li> <li>- the need for underwriters and surveyors to be knowledgeable about how the transportation supply chain works</li> <li>- the need for underwriters and surveyors to have a practical understanding of the standard operating procedures applied by the vessels/owners they insure/survey to fully appreciate and evaluate constantly evolving risks</li> <li>- the need to assess crew and office management to ensure that shipowners are entrusting their vessels to quality seafarers</li> <li>- the importance of the crew matrix in assessing risk</li> </ul>	<p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p>	<p>Understand the client's approach to business in particular how they address human-system issues</p> <p>Work with clients in managing and embracing all risks</p> <p>Ensure that underwriters, loss control professionals and surveyors who assume and manage the risks associated with international trade are properly trained and have the appropriate experience to carry out their duties</p> <p>Identify human-system risks and seek to avoid them</p> <p>Encourage risk reduction through ergonomic design</p> <p>Highlight human element issues when assessing and prioritising risk, when raising awareness of the threats that can lead to insurance claims, and when determining what controls should be in place to reduce such claims.</p> <p>Establish whether the ship is manned by owner's crew or a third party manager's crew; is the ship manned down to the safe manning certificate or at a more sensible level; cultural mix and age profiles</p> <p>Be prepared to filter out unsuitable ships</p>

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<p><b>P&amp;I Claims Directors/Claims executives Human element best practices</b></p>	<p><b>Fully understand the need:</b></p> <ul style="list-style-type: none"> <li>- for safe, sustainable and dependable shipping</li> <li>- to accurately assess the human element aspects of claims for full assessment and processing into loss prevention guidance</li> <li>- to raise the awareness of the human element issues relating to accidents</li> <li>- to provide contemporaneous advice on current claims trends</li> </ul> <ul style="list-style-type: none"> <li>- to develop loss prevention programmes for individual shipowners, for members and for the shipping industry as a whole</li> </ul>	<p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Interview, evidence</p> <p>Interview, evidence</p>	<p>Consider and promote continuous improvement in human element skills and knowledge within their own and appointed survey companies</p> <p>Develop appropriate human element guidance material and tools for members and appointed survey companies</p> <p>Check for adequate procedures and if there is any evidence they are being followed and logged.</p> <p>Encourage risk reduction through ergonomic design</p> <p>Prioritise the high risk areas from claims through analysis, and determine what the threats are that cause these claims</p> <p>Focus on the high-risk threats which cause P&amp;I claims and the controls that have failed to contain some of the threats; and on the effectiveness of controls to mitigate the consequences</p> <p>Whenever there has been an accident, identify what did what, why and with what consequences</p> <p>Claims executives should be aware of the positive side of the human element so they can help the owner mitigate either at the sharp end and/or when in court trying to prove the owner was trying his best</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Brokers (Cargo, Hull, P&amp;I)</b></p> <p><b>Human element best practices</b></p>	<p><b>Fully understand the need:</b></p> <ul style="list-style-type: none"> <li>- for safe, sustainable and dependable shipping</li> <li>- select quality and vetted ships, across the market</li> <li>- to address people's needs and abilities to enhance utilisation, quality and efficiency; providing cost effective solutions and reducing the likelihood that systems, products or services will be rejected by their users</li> </ul>	<p>Test (computer or written), interview</p> <p>Interview, evidence</p> <p>Interview, evidence</p>	<p>Ensure that the ship and its crew are 'fit for purpose'</p> <p>Ensure that the ship is properly equipped and 'fit for the crew'</p>
<p><b>Charterers</b></p>	<p><b>Fully understand the need:</b></p> <ul style="list-style-type: none"> <li>- for safe, sustainable and dependable shipping</li> <li>- to address people's needs and abilities to enhance utilisation, quality and efficiency; providing cost effective solutions and reducing the likelihood that systems, products or services will be rejected by their users</li> <li>- to filter out unsuitable shipping</li> </ul>	<p>Test (computer or written), interview</p> <p>Interview, evidence</p> <p>Interview, evidence</p>	<p>Encourage socially responsible investment through the consideration of the human element in the balance between economic, social and environmental considerations</p> <p>Consider human element effects on tasks, jobs, products, tools, equipment, systems, organizations, services, facilities and environments which are better for human health and well-being</p> <p>Ensure that the client takes responsibility for the impact of the organization's activities upon its employees, its customers, the community and the environment</p> <p>Ensure that best practices are applied and that the selected vessel is 'fit for purpose', properly equipped and 'fit for the crew'</p>

5. Health, Safety, Security, Environmental, Quality (HSSEQ)

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Human element best practices</b></p>	<p><b>Understand:</b></p> <ul style="list-style-type: none"> <li>- what it means to live and work at sea</li> <li>- cultural and religious differences of multinational crews</li> <li>- the need to promote a company culture</li> </ul> <p><b>Have a professional knowledge of:</b></p> <ul style="list-style-type: none"> <li>- current HSSEQ practices</li> <li>- welfare issues</li> </ul> <p><b>Understand</b> underlying human factors in the accident investigation process</p> <p><b>Understand</b> how human factors influence HSSEQ during training, drills, meetings, inspections, audits, surveys, projects and claims</p>	<p>Familiarisation trip to sea; written report</p> <p>Test (computer or written), interview</p> <p>Interview, observation</p> <p>Observation</p> <p>Interview</p> <p>Interview, observation</p> <p>Interview, role play, work-based evidence</p>	<p>Identify problematic areas e.g. isolation, communication challenges, team working</p> <p>Describe culture and religious challenges associated with staff within area of responsibility</p> <p>Enact the values of the organization (e.g. walk the talk)</p> <p>Demonstrate knowledge of current HSSEQ practices – e.g. good practice guides, ISO9001 etc.</p> <p>Describe welfare challenges associated with staff in area of responsibility</p> <p>Demonstrate empathy towards staff and their families</p> <p>Recommended reading: <i>MAIIF Investigators Manual</i> (<a href="http://www.maiif.org/index.php/investigators-manual">http://www.maiif.org/index.php/investigators-manual</a>)</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Knowledge of conventions, resolutions, rules and regulations</b></p>	<p><b>Ensure compliance with:</b></p> <ul style="list-style-type: none"> <li>- relevant maritime conventions and codes, e.g. SOLAS, STCW, MLC, ISM Code other conventions and resolutions</li> <li>- current and emerging legislation in relation to the human element issued by, e.g. ILO, IMO, WHO, Flag State</li> <li>- international and national employment laws</li> <li>- the principles of safe manning</li> </ul> <p><b>Understand:</b></p> <ul style="list-style-type: none"> <li>- international industry standards, e.g.: ISO9001, OHSAS 18001, ISPS</li> <li>- national industry standards, e.g.: Flag State requirements</li> <li>- Best Practice guidelines (in specific sectors) appropriate to the HSSEQ function</li> </ul>	<p>Interview, assessment</p> <p>Interview, assessment</p> <p>Interview, assessment</p> <p>Interview, assessment</p> <p>Interview</p> <p>Interview</p> <p>Interview</p>	<p>Demonstrate knowledge of maritime conventions relevant to the human element</p> <p>Demonstrate knowledge of current and emerging legislation as relevant to the human element</p> <p>Demonstrate knowledge of international and national employment laws as relevant to the human element</p> <p>Demonstrate knowledge of the principles of safe manning considerations as relevant to the human element. Recommended reading: <i>A Rough Guide to interpreting the Principles of Safe Manning (Alert! he01125)</i></p> <p>Locate relevant information and demonstrate knowledge on specific human element issues</p> <p>Locate relevant information and demonstrate knowledge on specific human element issues</p> <p>Locate relevant information and demonstrate knowledge on sector specific human element best practice guidelines</p>
<p><b>Knowledge about the tasks to be performed</b></p>	<p><b>Understand:</b></p> <ul style="list-style-type: none"> <li>- the need to actively consider human-related risks in the Risk Assessment process</li> </ul>	<p>Records, interview</p>	<p>Locate appropriate HSSEQ risk assessment records</p> <p>Demonstrate an understanding of the human-related risks associated with HSSEQ</p>



Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Knowledge about the tasks to be performed</b></p>	<p><b>Understand:</b></p> <ul style="list-style-type: none"> <li>- the need to ensure that changes to procedures working practices, equipment and systems are based on an explicit understanding of users, their abilities, their expected work and the working environment</li> <li>- how human factors can affect systems performance and reliability, and be able to mitigate the effects</li> </ul> <p><b>Demonstrate ability to:</b></p> <ul style="list-style-type: none"> <li>- identify and monitor the competencies of the staff in area of responsibility</li> <li>- identify HSSEQ training needs in area of responsibility</li> <li>- define, deliver and implement HSSEQ solutions with the human element in mind for: training, drills, meetings, inspections, audits, surveys, projects, claims</li> <li>- define, manage, and communicate HSSEQ change</li> <li>- define, implement and manage the continuous performance of staff, e.g.: appraisals , promotions, succession planning</li> </ul>	<p>Interview</p> <p>Work-based evidence</p> <p>Interview, records</p> <p>Records</p> <p>Interview, role play, work-based evidence</p>	<p>Locate and demonstrate examples of organizational changes incorporating consideration of the human element</p> <p>Locate appropriate documentation and demonstrate strategic planning for continuous performance of staff</p> <p>Locate appropriate documentation and demonstrate knowledge of performance monitoring processes</p> <p>Provide appropriate performance monitoring documentation for staff under area of responsibility</p>
<p><b>Knowledge of human behaviour</b></p>	<p><b>Understand</b> human performance influencing factors, e.g. workload, stress, fatigue, emotion, family issues, grievances, etc.</p> <p><b>Ability to</b> recognise and manage human element issues in staff – e.g. stress, fatigue, emotion, family issues, grievances, work life balance etc.</p>	<p>Interview</p> <p>Records, interview</p>	<p>Demonstrate knowledge of performance influencing factors and how these can impact on staff under area of responsibility. Recommended reading: <i>Exploring Human Factors (Alert! Issue No.2 Centrespread)</i></p> <p>Locate appropriate documentation</p> <p>Demonstrate corrective action</p>



6. HR Director, HR Manager, Personnel Officer

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Knowledge of conventions, resolutions, rules and regulations</b></p>	<p><b>Be fully conversant with and fully understand the need to implement:</b></p> <ul style="list-style-type: none"> <li>- pertinent IMO, ILO, WHO and other international instruments relevant to the human element and particularly the HR function</li> <li>- international codes, guidelines and standards in the context of SOLAS 1974, as amended, STCW Convention 1978, as amended, MARPOL and the ILO Maritime Labour Convention 2006 (MLC 2006)</li> <li>- other international or regional instruments relevant to maritime safety and protection of the marine environment</li> <li>- Company regulations relevant to the HR management of seafarers</li> <li>-</li> <li>- international and national employment laws</li> <li>- the IMO Principles of Minimum Safe Manning</li> </ul>	<p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Practical example</p>	<p>Demonstrate knowledge of maritime conventions and resolutions relevant to the human element</p> <p>Demonstrate knowledge of pertinent international codes, guidelines and standards</p> <p>Demonstrate knowledge of current and emerging legislation relevant to the human element</p> <p>Demonstrate knowledge of Company regulations relevant to the HR management of shore staff and ships' crews</p> <p>Demonstrate knowledge of international and national employment laws</p> <p>Demonstrate knowledge of the IMO Principles of Minimum Safe Manning</p>
<p><b>Human element best practices</b></p>	<p><b>Be fully conversant with</b> human element best practice guidelines</p>	<p>Interview</p>	<p><i>The Human Element Best Practice for Ship Operators</i> (The Lloyd's Register Group)</p> <p>Locate relevant information and demonstrate knowledge on sector specific human element best practice guidelines</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p><b>Fully understand:</b></p> <ul style="list-style-type: none"> <li>- what it means to live and work at sea</li> <li>- international maritime context (political, economic, environmental, geographical, socio-technical)</li> <li>- cultural and religious differences with respect to multi-national crewing</li> <li>- the need to promote a company culture</li> </ul> <p><b>Demonstrate a professional knowledge of:</b></p> <ul style="list-style-type: none"> <li>- current HR practices, such as recruitment, selection, promotion, appraisal and competency management systems as they apply to the seafarer community</li> <li>- welfare issues, as they apply to the seafarer community</li> </ul>	<p>Familiarisation trip to sea, written report, interview</p> <p>Test (computer or written), interview</p> <p>Test (computer or written), interview</p> <p>Observation</p> <p>Observation Certification</p> <p>Interview Observation</p>	<p>Identify problematic areas e.g. isolation, communication challenges, team working</p> <p>Describe political, economic, environmental, geographical and socio-technical challenges associated with ships' areas of operation</p> <p>Describe cultural and religious challenges associated with seafarers within area of responsibility</p> <p>Observed to enact the values of the organization (e.g. <i>walk the talk</i>)</p> <p>Hold a relevant HR qualification</p> <p>Describe the welfare challenges associated with seafarers in area of responsibility</p> <p>Demonstrate empathy towards seafarers and their families</p>
<p><b>Human Resources knowledge</b></p>	<p><b>Demonstrate ability to:</b></p> <ul style="list-style-type: none"> <li>- define, implement and monitor a human resources strategy</li> <li>- define and implement a competency standards matrix</li> <li>- define crewing solutions and delivery plans</li> </ul>	<p>Record Interview</p> <p>Record Interview</p> <p>Record Interview</p>	<p>Locate and describe appropriate documentation</p> <p>Locate and describe appropriate documentation (for both technical and non-technical competencies)</p> <p>Locate and describe appropriate documentation</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<ul style="list-style-type: none"> <li>- define, manage, and communicate organizational change, evaluate operational solutions and obtain feedback</li> <li>- understand the human element considerations associated with crew rotations, and consider these in planning</li> <li>- develop relationships with seafarers and their families</li> <li>- manage crew change logistics taking into consideration all aspects, e.g. immigration, customs, time to reach destination, fatigue etc.</li> <li>- define, implement and manage the continuous performance of seafarers with respect to selection, recruitment, appraisals, promotions, succession planning &amp; exit interviews</li> </ul> <p><b>Demonstrate the ability to recognise and manage</b> human element issues in seafarers, e.g. stress, fatigue, emotion, family issues, grievances, work life balance</p>	<p>Record Observation</p> <p>Interview</p> <p>Interview Records</p> <p>Interview</p> <p>Interview Records</p> <p>Interview Records</p>	<p>Locate appropriate documentation and describe the method for implementing and communicating organizational change</p> <p>Communicate effectively with staff in line with organizational change plans</p> <p>Locate and demonstrate the crew rotation system &amp; describe the necessary considerations associated with planning crew rotations</p> <p>Demonstrate knowledge of seafarers and their families under area of responsibility</p> <p>Describe the necessary considerations associated with crew change logistics</p> <p>Locate appropriate documentation and demonstrate strategic planning for continuous performance of seafarers</p> <p>Locate appropriate documentation and demonstrate knowledge of performance monitoring processes</p> <p>Provide appropriate performance monitoring documentation for seafarers under area of responsibility</p> <p>Demonstrate knowledge of performance influencing factors and how these can impact on seafarers under area of responsibility</p> <p>Locate appropriate documentation</p> <p>Demonstrate corrective action</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p><b>Understand the need for</b> communication and the ability to communicate effectively</p> <p><b>Demonstrate the ability to</b> mentor, motivate and inspire staff</p>	<p>Interview</p> <p>360° feedback Observation</p>	<p>Demonstrate understanding and provide examples of effective communication</p> <p>Select appropriate methods of communication</p> <p>Closed loop communication</p> <p>Mitigate linguistic challenges in multi-cultural environment</p> <p>Active listening</p> <p>Demonstrate appropriate behaviour in the workplace</p>

7. Operations

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>SHIP OPERATORS (OWNERS, MANAGERS), MASTER &amp; SENIOR OFFICERS</b></p> <p><b>Knowledge of conventions, resolutions, rules and regulations</b></p>	<p><b>Be fully conversant with and fully understand the need to implement:</b></p> <ul style="list-style-type: none"> <li>- pertinent IMO, ILO, WHO and other international instruments relevant to maritime safety and protection of the marine environment</li> <li>- international codes, guidelines and standards in the context of SOLAS 1974, as amended, STCW Convention 1978, as amended, the International Regulations for Preventing Collisions at Sea, 1972, as amended, IHR 2005, and MARPOL and the ILO Maritime Labour Convention 2006 (MLC 2006)</li> <li>- other regional instruments relevant to maritime safety and protection of the marine environment</li> <li>- Company regulations relevant to the safe conduct of the ship, the safe and timely delivery of its cargo and the health, safety and wellbeing of the crew</li> <li>- measures to prevent/suppress terrorism against ships and to improve security aboard and ashore, in accordance with the ISPS Code</li> </ul>	<p>Test (computer or written), interview</p>	

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>SHIP OPERATORS</b></p> <p><b>Human element best practices</b></p>	<p><b>Fully understand the need to:</b></p> <ul style="list-style-type: none"> <li>- promote and manage human element activities to reflect the needs of safe and effective operation, and provide the necessary resources</li> <li>- facilitate information feedback, exchange and other communication about human element issues, in required formats</li> <li>- establish a focus on human element issues (including usability, health and safety) in those aspects of shipping operations that deal with the business strategy (current and future), markets, options for future operations and planning their concept</li> <li>- effectively involve and consult crew and support staff on each significant aspect of the ship and its systems in order to improve its usability, health and safety, or performance</li> <li>- include human element issues in decision making, trade-off and risk management studies, in order to mitigate the risk to safe and effective ship and company operation</li> <li>- take account of the human element in the acquisition, supply and operation of systems and the management of services</li> <li>- ensure that human element issues arising from the operation, support and maintenance of the ship and its systems are given sufficient attention</li> </ul>	<p>Test (computer or written), interview</p>	<p>Recommended reading: The Human Element Best Practice for Ship Operators - The Lloyd's Register Group</p> <p>Demonstrate that task descriptions of actual work on board correspond to company procedures and checklists</p> <p>Make sure that any data collected is relevant and analysis of it is planned, as is the feedback loop</p> <p>Pull together a team with relevant representatives, 'gel' the group and demonstrate the intended process</p> <p>Demonstrate a process that can take account of new build or retrofit changes</p> <p>Involve the right crew and ask the right questions, based on task or mission analysis</p> <p>Involve an HF expert as appropriate Ensure a blame-free culture</p> <p>Demonstrate that data collected is properly addressed</p>



<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
	- ensure that the human element is given sufficient attention throughout the introduction and validation of an operation		ATOMOS templates FSA+HE analysis

<p><b>Human element best practices</b></p>	<p><b>Fully understand the need to:</b></p> <ul style="list-style-type: none"> <li>- ensure that modifications to the ship and its equipment take account of human element issues identified in service, and that the human element is managed during major work originating from the company office</li>   <li>- achieve safe and effective operation in the most timely and cost-effective manner by provision of the correct number of competent crew and support staff</li>   <li>- operate an HR strategy based on the company business objectives that includes a mechanism for recording and implementing lessons learnt</li>   <li>- identify the changes to existing staffing and personnel resources and skill demands imposed by planned operations and predict staff availability over planned future developments</li>   <li>- deliver individual and collective training solutions reconciled to the requirements of safe and effective ship operations</li> </ul>		<p>Demonstrate a process that can take account of new build or retrofit changes – involving the right crew and asking the right questions – based on task or mission analysis</p> <p>SOLAS regulation V/15 - Principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures; MSC/Circ.834 - Guidelines for Engine-Room Layout, Design and Arrangement; MLC 2006; MSC/Circ.982 - Guidelines on ergonomic criteria for bridge equipment and layout; MSC.64(67) - Performance standards for IBS; MSC.86(70) Performance standards for INS</p> <p>Demonstrate knowledge of work/job design and teamwork, and group psychology</p> <p>Understand the implications of IMO Resolution A.1047(27) - Principles of Minimum Safe Manning</p> <p>Show willingness to participate and how work is performed</p> <p>Use of Best Practice Indicators (BPIs) to demonstrate HE best practices (The Human Element Best Practice for Ship Operators - The Lloyd's Register Group)</p> <p>Identify user needs as opposed to user wants</p>
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Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<b>Human element best practices</b>	<p><b>Fully understand the need to:</b></p> <ul style="list-style-type: none"> <li>- provide data on ship operations in order to improve staffing provision and deployment, ship and system design, and operational deployment</li> <li>- check usability of a system, by selecting and applying appropriate practices that use human element data</li> <li>- establish, clarify and communicate the characteristics of the users, their tasks and the technical, organizational and physical environment in a system will operate</li> <li>- establish, clarify and communicate the requirements of the users of a system</li> <li>- ensure that the design options for any product system of work take account of the human element</li> </ul>		<p>Demonstrate comparison between task analysis and actual operations – critically review discrepancies and suggest revisions</p>
<b>Knowledge about safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment</b>	<p><b>Fully understand the need to recognise:</b></p> <ul style="list-style-type: none"> <li>- the importance of safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment, in particular to the marine environment and to property, in accordance with the requirements of the ISM Code</li> <li>- the Master's responsibility with regard to: implementing the safety and environmental-protection policy of the Company; motivating the crew in the observation of that policy; issuing appropriate orders and instructions in a clear and simple manner; verifying that specified requirements are</li> </ul>	<p>ISM audits</p> <p>ISM audits</p>	<p>Properly Implementing the ISM Code, taking into account the human element</p> <p>Properly Implementing the ISM Code, taking into account the human element</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p>observed; and reviewing the safety management system and reporting its deficiencies to the shore-based management</p> <ul style="list-style-type: none"> <li>- that the master has the overriding authority and the responsibility to make decisions with respect to safety and pollution prevention and to request the Company's assistance as may be necessary</li> </ul>	ISM audits	Properly Implementing the ISM Code, taking into account the human element
<p><b>MASTER</b></p> <p><b>Knowledge about safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment</b></p>	<p><b>Fully understand the need to recognise:</b></p> <ul style="list-style-type: none"> <li>- the importance of properly addressing the human element for safety of life at sea, prevention of human injury or loss of life, and avoidance of damage to the marine environment and to property, in accordance with the requirements of the ISM Code</li> <li>- his/her responsibilities with regard to implementing the SMS; motivating the crew in the observation of that policy; issuing appropriate orders and instructions in a clear and simple manner; verifying that specified requirements are observed; and reviewing the safety management system and reporting its deficiencies to shore-based management</li> <li>- that he/she has the overriding authority and the responsibility to make decisions with respect to safety and pollution prevention and to request the Company's assistance as may be necessary</li> <li>- new crew members are made familiar with their duties</li> </ul>	<p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p>	<p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>MASTER</b></p> <p><b>Knowledge about safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment</b></p>	<p><b>Fully understand the need to ensure that:</b></p> <ul style="list-style-type: none"> <li>- the ship is manned with qualified, certificated and medically fit seafarers in accordance with national and international requirements</li> <li>- new crew members are made familiar with their duties</li> </ul> <p><b>Fully understand the need to ensure that:</b></p> <ul style="list-style-type: none"> <li>- instructions, which are essential to be provided prior to sailing are identified, documented and given</li> <li>- appropriate training is provided for all crew members</li> <li>- relevant information is provided in (a) language(s) understood by crew members</li> <li>- crew members are able to communicate effectively</li> <li>- plans and instructions for key shipboard operations are available; tasks involved are defined and assigned to qualified crew members</li> <li>- procedures are in place to identify, describe and respond to potential emergency shipboard situations</li> <li>- programmes are established for drills and exercises to prepare for emergency actions</li> <li>- the ship can respond at any time to hazards, accidents and emergency situations</li> </ul>	<p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p>	<p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p><b>Fully understand the need to ensure that:</b></p> <ul style="list-style-type: none"> <li>- non-conformities, accidents and hazardous situations are investigated and reported to the Company; timely corrective action is taken</li> <li>- all documents and data relevant to the SMS are properly controlled</li> <li>- valid documents are available on board; changes to documents are reviewed and approved by authorized personnel; obsolete documents are promptly removed</li> <li>- the Safety Management Manual is kept in a form that the Company considers most effective, and that all documentation relevant to the ship is carried on board</li> </ul>	<p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p>	<p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p>
<p><b>MASTER</b></p> <p><b>Human element best practices</b></p>	<p><b>Fully understand the need to ensure that:</b></p> <ul style="list-style-type: none"> <li>- ships' crews are effectively involved and consulted on each significant aspect of the ship and its systems so as to improve its usability, health and safety, or performance</li> <li>- communication between the crew and other stakeholders is effective</li> <li>- the crew are aware of human element issues, are involved in the feedback process and are notified of changes made to design, operation, training or manning as a result of their input</li> <li>- the crew competencies required to operate and support the ship and its systems are identified and continuously reviewed over time</li> </ul>	<p>Audit</p> <p>Audit</p> <p>Audit</p> <p>Audit</p>	<p>Use of Best Practice Indicators (BPIs) to demonstrate HE best practices (The Human Element Best Practice for Ship Operators - The Lloyd's Register Group)</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p><b>Fully understand the need to ensure that:</b></p> <ul style="list-style-type: none"> <li>- ship maintenance and maintainability requirements for support are met by the ship and its systems</li> <li>- the overall performance of the ships and their systems is consistent with required capability</li> <li>- he/she works together with operations staff to achieve the objectives of the organization</li> <li>- the principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures (as appropriate) are complied with</li> </ul>	<p>Audit</p> <p>Audit</p> <p>Audit</p> <p>Audit</p>	<p>SOLAS regulation V/15 - Principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures; MSC/Circ.834 - Guidelines for Engine-Room Layout, Design and Arrangement; MLC 2006; MSC/Circ.982 - Guidelines on ergonomic criteria for bridge equipment and layout; MSC.64(67) - Performance standards for IBS; MSC.86(70) Performance standards for INS</p>
<p><b>SENIOR OFFICERS</b></p> <p><b>Knowledge about safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment</b></p>	<p><b>Fully understand the need to ensure that:</b></p> <ul style="list-style-type: none"> <li>- all crew members are fully conversant with the Company's SMS and it is properly implemented</li> <li>- all crew members are aware of the identify and role of the DPA</li> <li>- new crew members are familiar with their duties</li> <li>- all crew members have an adequate understanding of relevant rules, regulations, codes and guidelines</li> </ul>	<p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p>	<p>Implementing the ISM Code Ensure awareness of the need for, and method of, implementing a sound reporting culture and blame-free culture</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code Check employee satisfaction</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<p><b>Fully understand the need to ensure that:</b></p> <ul style="list-style-type: none"> <li>- non-conformities, accidents and hazardous situations are reported in accordance with the SMS</li> <li>- the ship is maintained in conformity with the provisions of relevant rules and regulations and Company instructions</li> <li>- the results of audits and reviews are brought to the attention of crew members; timely corrective action is taken on deficiencies</li> <li>- crew members are involved and consulted on each significant aspect of the ship and its systems to improve usability, health and safety or performance; crew feedback is widespread and effective</li> <li>- crew members are aware of human element issues, and of the changes made as a result of their input</li> </ul>	<p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p> <p>ISM audits</p>	<p>Implementing the ISM Code If possible involve crew in process</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p> <p>Implementing the ISM Code</p>
<p><b>BRIDGE TEAM</b></p> <p><b>Knowledge about safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment</b></p>	<p><b>Be fully conversant with and understand the need to comply with:</b></p> <ul style="list-style-type: none"> <li>- the provisions of the International Regulations for Preventing Collisions at Sea, 1972, as amended</li> <li>- the appropriate provisions of MARPOL</li> <li>- the principles of Bridge Resource Management, including the involvement of the pilot when appropriate</li> <li>- procedures for responding to system failures and emergency situations</li> </ul>	<p>Regular testing, simulation</p> <p>Test (computer or written), interview</p> <p>On-board continuation training, navigational audits</p> <p>On-board continuation training, navigational audits</p>	<p>Convention on the International Regulations for Preventing Collisions at Sea, 1972, as amended</p> <p>International Convention for the Prevention of Pollution from Ships and subsequent protocols</p> <p>ISF Bridge Procedures Guide</p> <p>ISF Bridge Procedures Guide</p>



Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	<ul style="list-style-type: none"> <li>- the principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures (as appropriate)</li> </ul>	Test (computer or written), interview	Knowledge of SOLAS regulation V/15 - Principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures
<p><b>ENGINEERING TEAM</b></p> <p><b>Knowledge about safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment</b></p>	<p><b>Be fully conversant with and understand the need to comply with:</b></p> <ul style="list-style-type: none"> <li>- the appropriate provisions of MARPOL</li> <li>- the principles of Ship Resource Management</li> <li>- procedures for responding to system failures and emergency situations</li> </ul>	<p>Test (computer or written), interview</p> <p>On-board continuation training, engineering audits</p> <p>On-board continuation training, engineering audits</p>	<p>Knowledge of The International Convention for the Prevention of Pollution from Ships and subsequent protocols</p>

8. Surveyors & Inspectors

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>ALL SURVEYORS AND INSPECTORS</b></p> <p><b>Awareness of the human element</b></p>	<p><b>Have a knowledge of:</b></p> <ul style="list-style-type: none"> <li>- what is meant by the human element</li> <li>- the benefits of addressing the human element in shipping</li> <li>- the impact of changes in the marine industry on people</li> <li>- the regulatory expectations with respect to the human element</li> <li>- the human aspects in ship design</li> </ul>	<p>Test (computer or written), interview CBT, with evaluation</p>	<p>Demonstrate an understanding of:</p> <ul style="list-style-type: none"> <li>- context of use analysis in design evaluation</li> <li>- the nature of work systems and socio- technical systems</li> <li>- the people aspects of systems design</li> <li>- human error prevention</li> <li>- the current fragmented state of regulation, and the implications for the human element</li> <li>- the impact of changes to the sector e.g. new technology, the changing seafarer population</li> <li>- the use of product, performance and process characteristics in specifying and assessing human-systems</li> <li>- the need for a human-centred design approach</li> </ul>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>PLAN APPROVAL SURVEYORS</b></p> <p><b>Meeting ergonomic requirements in the design of the ship and its systems</b></p>	<p><b>Be fully aware of the need:</b></p> <ul style="list-style-type: none"> <li>- to consider users in design</li> <li>- for design documentation to contain human element information</li> </ul> <p><b>Have a knowledge of:</b></p> <ul style="list-style-type: none"> <li>- human element hazards and risks related to the structural arrangements, physical layout, systems and control, equipment and environment aspects</li> <li>- human factors methods and techniques and when to ask for expert advice</li> <li>- the methods and techniques for assessing design documentation related to the human element in design</li> <li>- regulations, standards and guidance for the human element</li> <li>- the information required to perform an assessment of ergonomics in design</li> <li>- the hazards and risks associated with lack of ergonomic thinking in the design process</li> <li>- human element criteria and procedures for assessment of rule requirements</li> </ul>	<p>Test (computer or written), interview Practical examples CBT, with evaluation</p>	<p>Demonstrate an understanding of:</p> <ul style="list-style-type: none"> <li>- operational concept</li> <li>- task design</li> <li>- HRA/EHFA</li> <li>- standards for the human element</li> <li>- sources of specialist advice</li> <li>- specific Rule requirements</li> <li>- implied Rule requirements</li> <li>- regulatory requirements that affect Survey</li> <li>- tools and methods</li> </ul> <p>Explain the use of relevant plans and documentation</p> <p>Demonstrate an understanding of:</p> <ul style="list-style-type: none"> <li>- the project evidence approach</li> <li>- the evaluation approach</li> <li>- when to contact an ergonomics specialist for assistance</li> </ul>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>FIELD SURVEYORS (Class, Flag, Vetting, PSC) Applying ergonomic design principles</b></p>	<p><b>Have a knowledge of:</b></p> <ul style="list-style-type: none"> <li>- ergonomics in the design of ships and ship systems</li> <li>- relevant design and plan approval documentation and guidance</li> <li>- usability evaluation methods</li> </ul>	<p>Test (computer or written), interview Practical examples CBT, with evaluation</p>	<p>Demonstrate an understanding of:</p> <ul style="list-style-type: none"> <li>- good and bad practices in design with respect to ergonomics and usability</li> <li>- the hazards and risks associated with lack of ergonomics in the design and installation of: access and egress' layout, noise and vibration management, heating and ventilation, lighting</li> <li>- physical hazards (rotating machinery, falls from height, etc.)</li> <li>- basic usability evaluation, including: identifying users and their tasks, informal usability evaluation, reporting the results of a simple usability evaluation</li> </ul>
<p><b>AUDITORS (ISM, ISPS, MLC etc.) Identifying human element issues</b></p>	<p><b>Have a knowledge of:</b></p> <ul style="list-style-type: none"> <li>- Human-system and human element issues with respect to the effect of work, the working environment and living conditions on the health, safety and wellbeing of the person</li> <li>- the rights of every seafarer to fair terms of employment, decent working and living conditions on board ship, and to health protection, medical care, welfare measures and other forms of social protection</li> <li>- work-systems procedures, organizational behaviours and dynamics, task analysis, fatigue, etc.</li> <li>- Manning levels (both minimum safe and optimal)</li> </ul>	<p>Test (computer or written), interview Practical examples CBT, with evaluation</p>	<p>Identify human element issues with respect to: manning, personnel, training, social and organizational, system safety and OHS</p> <p>Demonstrate the ability to:</p> <ul style="list-style-type: none"> <li>- maintain knowledge in the human element, be aware of the diversity and value of knowledge about the human element and be able to apply this knowledge in discussions with clients, in the preparation of study reports and to a client's capability improvement</li> <li>- detect conflicts between safety and security</li> <li>- determine the effects of external interventions on general wellbeing</li> </ul>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>FORENSIC/LOSS SURVEYORS (cargo, damage, accident investigation)</b></p> <p><b>Identifying human factor/human error issues</b></p>	<p><b>Have a knowledge of:</b></p> <ul style="list-style-type: none"> <li>- how mismatches between system requirements and human capacity could cause or contribute to an occurrence</li> <li>- safety hazard (engineering, administration and personal protection) mitigation strategies that result in conditions that are likely to exceed human operational capacity, or reinforce behavioural risk adaptation</li> <li>- sources of data relating specifically to human factors</li> <li>- data gathering models</li> <li>- human performance influencing factors</li> <li>- the concepts of usability and context of use</li> <li>- human error classification</li> <li>- cognitive interviewing techniques</li> <li>- the physiological bases of alertness and fatigue and of how fatigue affects performance</li> <li>- cultural differences and the sub-cultures that may be on board a ship, particularly those with multi-national crewing</li> </ul>	<p>Test (computer or written), interview Practical examples CBT, with evaluation</p>	<p>Demonstrate an understanding of the difference between human error and human factors and the effects of context of use on the usability of equipment and systems</p> <p>Demonstrate how to determine the type and quality of data to be collected and reviewed with respect to:</p> <ul style="list-style-type: none"> <li>- Primary sources relating to human factors including: hardware evidence, paper documentation, voyage data recorders, marine communications, traffic services and recordings, Interviews, direct observation of marine personnel activities and simulations, and factual information</li> <li>- Secondary sources including: marine occurrence databases, reference literature and human factors/ergonomics professionals, psychologists, medical practitioners and sociologists etc.</li> </ul> <p>Describe the possible error mechanisms (human error types or modes)</p> <p>Demonstrate an understanding of:</p> <ul style="list-style-type: none"> <li>- the basic concepts of sleep and fatigue</li> <li>- common fatigue-related performance effects</li> <li>- terms such as fatigue, sleep debt, circadian rhythm etc.</li> </ul>

9. Technical

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Technical Directors, Superintendents &amp; Chief Engineers</b></p> <p><b>Knowledge of conventions, resolutions, rules and regulations</b></p>	<p><b>Be fully conversant with and fully understand the need to implement:</b></p> <ul style="list-style-type: none"> <li>- pertinent IMO, ILO, WHO and other international instruments relevant to maritime safety and protection of the marine environment</li> <li>- international codes, guidelines and standards in the context of SOLAS 1974, as amended, STCW 1978, as amended, and MARPOL</li> <li>- the provisions of the ILO Maritime Labour convention 2006 (MLC, 2006)</li> <li>- other international and regional instruments relevant to maritime safety and protection of the marine environment</li> <li>- IMO Guidelines for Engine-Room Layout, Design and Arrangement (MSC/Circ.834), as appropriate</li> <li>- Company regulations relevant to the safe conduct of the ship, the safe and timely delivery of its cargo and the health, safety and wellbeing of the crew</li> </ul>	<p>Test (computer or written), interview</p>	

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Superintendents</b></p> <p><b>Human element best practices</b></p>	<p><b>Fully understand the need to:</b></p> <ul style="list-style-type: none"> <li>- take account of the human element in the acquisition, supply and operation of systems and the management of services</li> <li>- include human element issues in decision making, trade-off and risk management studies, in order to mitigate the risk to safe and effective ship and company operation</li> <li>- Ensure that human element issues arising from the technical operation, support and maintenance of the ship and its systems are given sufficient attention</li> <li>- Give sufficient attention to the human element throughout the introduction and validation of a new system</li> </ul>	<p>Test (computer or written), interview</p>	<p>Recommended reading: The Human Element Best Practice for Ship Operators - The Lloyd's Register Group</p> <p>Demonstrate knowledge about decision making processes and cognitive ergonomics</p> <p>Have a strategy of how to evaluate blueprints and design with regards to the work environment and ergonomics</p> <p>Facilitate information feedback, exchange and other communication about human element issues, including the provision of human element data in standard formats</p> <p>Make sure that any data collected is relevant and analysis of it is planned, as is the feedback loop</p> <p>Pull together a team with relevant representatives, 'gel' the group and demonstrate the intended process (cf. UCD)</p> <p>Demonstrate a process that can take account of new build or retrofit changes– involving the right crew and asking the right questions – based on task or mission analysis</p> <p>Be aware of the need to involve an HF expert in meetings where this is discussed</p> <p>Show knowledge of work/job design and teamwork, and group psychology</p> <p>Show comparison between task analysis and actual operations – critically review discrepancies and suggest revisions</p> <p>Show willingness to participate and how work is performed, collect user needs as opposed to user wants</p>

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Chief Engineer</b></p> <p><b>Human element best practices</b></p>	<p><b>Recognise:</b></p> <ul style="list-style-type: none"> <li>- the importance of properly addressing the human element in the provision of a safe, efficient, effective and acceptable working environment</li> <li>- the importance of safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment, in particular to the marine environment and to property, in accordance with the requirements of the ISM Code</li> <li>- the overall performance of the ships and their systems is consistent with required capability</li> <li>- ship maintenance and maintainability requirements for support are met by the ship and its systems in conformity with the provisions of relevant rules and regulations and Company instructions</li> <li>- crew are effectively involved and consulted on each significant aspect of the ship and its systems so as to improve its usability, health and safety, or performance and are notified of changes made to design, operation, training or manning as a result of their input</li> <li>- the technical officers, ratings and officer trainees are aware of human element issues and are engaged in the feedback process</li> </ul>	<p>Interview, observation</p> <p>Safety audit</p> <p>Engineering audit</p> <p>ISM audit Engineering audit</p> <p>Engineering audit</p> <p>Engineering audit</p>	<p>Demonstrate responsibilities with regard to the scope and use of the safety and work management systems</p> <p>Motivate the crew in the observation of the policy</p> <p>Plan work, issuing appropriate orders and instructions in a clear and simple manner</p> <p>Ensure that specified requirements are observed Implementing the ISM Code</p> <p>Show that task descriptions of actual work on board correspond to procedures and checklists (from company)</p>



Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p><b>Chief Engineer/Technical Officers</b></p> <p><b>Knowledge about safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment</b></p>	<p><b>Be fully conversant with and fully understand the need to implement</b> the ISM Code as it pertains to the Technical Department</p> <p><b>Be fully conversant with and fully understand the need to implement:</b></p> <ul style="list-style-type: none"> <li>- the provisions of MARPOL</li> <li>- other regional instruments relevant to maritime safety and protection of the marine environment</li> <li>- Company regulations relevant to the safe conduct of the ship, the safe and timely delivery of its cargo and the health, safety and wellbeing of the crew</li> <li>- the principles of Engine Room Resource Management, safe working and ergonomics</li> <li>- procedures for responding to system failures and emergency situations</li> <li>- the importance of properly addressing the human element in the provision of a safe, efficient, effective and acceptable working environment</li> </ul>	<p>ISM audits</p> <p>Interview, observation</p> <p>Interview, observation</p> <p>Interview, observation</p> <p>Interview, observation</p> <p>Interview, observation</p> <p>Safety audit</p>	<p>Implementing the ISM Code</p> <p>Awareness of the need for a blame free culture and methods for a sound reporting culture</p> <p>On-board continuation training</p>