

Alert! Index

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14.08.2015

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Overview

Human factors is the body of scientific knowledge about people and how they interact with their environment, especially when working. Design of ship takes into account human capacity, skills, limitations and needs. (**Alert!** Issue No 2 pg4 Exploring Human Factors)

Ergonomics is the study and design of working environments (e.g. work station, cockpit, Ship Bridge) and their components work practice and work procedure for the benefit of the workers productivity health comfort and safety. (**Alert!** Issue No pg. 1 An ergonomic nightmare)

80% accident are attributed by human error, modern technology's revolutionised the way in which a ship is operated, but lack of human attention to human system is the interface in terms of the design, layout and integration of system and training in their use root cause of many accidents (**Alert!** Issue No 1 pg. 1 Welcome). Some suggest all accidents at sea are a result of human error because, when seeking the root cause of an incident it is invariably the human input to the design, manufacture or operation of a system that has a contributing factor (**Alert!** Issue No15 pg. 1 let's be clear about automation). Factors of many accident: failure to maintain proper watch, poor maintenance, no dedicated look out, standing dangerous position during berthing operation, poor team work, complacency route course (**Alert!** Issue No16 pg. 3 Complacency at work). Human failing include poor management and supervision, planning, training, motivation and leadership and communication (**Alert!** Issue No23 pg. 3 An understanding of what makes human error less likely lies at the heart of loss prevention).

Human resource considerations

Personnel

Correct mix of people on board to operate and maintain the ship and its system.

Mental attitudes

Problems:

- Fatigue, boredom, commercial pressures, lack of support from company, cultural differences, lack of proper training, weather, temperature, humidity, noise, ship motion, communications in different languages, motion sickness, body clock instability, lack of basic ergonomics, no social areas, long isolation

Solutions:

- Awareness of importance of individuals, improve attitude and motivation, close personal relationship with staff and families, good quality management , good company culture(focused on: good living conditions, sufficient manning on board, prioritising safety, retention policy, investing in training, sharing knowledge), increase recreational facility, smaller voyage length, skilled crew do a better operating job and maintain a vessel and if breakdown occurred they would be better prepared for mitigation thus limiting cost and time to fix, safe crew safe ships, crew feedback , pilot flying/ pilot not flying

Alert! Issue Nos (1,2,3,4,5,9,11,13,16,19,22,25,26,23,31)

Paper work

Problems:

- Side tracks seafarer, make working hours longer, distraction

Solutions:

- Use of software program, employ staff to deal with paperwork

Alert! Issue Nos (2, 19)

Occupational stress

Problems:

- long working hours, changes in industry quicker turnovers, the home work interface (missing home), broken rest, paper work and environmental hardship

Solutions:

- Happy healthy lifestyle, good nutrition, sleep 8 hours, change shift pattern to 4 on 8 off 8 on 4 off, rest requires a feet up and mind disengaged characteristic, increase amount of shore leave

Alert! Issue Nos (2, 4, 9, 16, 32)

Health compromised

Problems:

- Smoking, drinking, lack of exercise, lack of relaxation and bad nutrition

Solutions:

- Have a gym on board, join Seafarers health information programmer (SHIPS), healthy food, longer rest periods

Alert! Issue Nos (2, 12)

Rouge behaviour

Problems:

- Boredom, complacency, drudgery, familiarity, ignorance, impulsiveness, risk-taking, reutilisation

Solutions:

- Safe secure and usable working environment, decent working and living conditions, fair terms of employment, healthy lifestyle, appropriate balance job and people, consistency in training, regular on-board training, clear concise operating instructions

Alert! Issue No (16)

Manning

Number of people required for the safe operation and security of the ship and for the protection of the marine environment in both normal and emergency situations.

Too few seafarers

Problems:

- social life on board decreased due to smaller crew, short turnaround ,bad image, too much paperwork, over regulations, to many inspections, reduced manning, fatigue, ship owners not caring, piracy, cost reduction is attempted by increasing work hours, reducing the use of skilled crew, recruitment developing countries

Solutions:

- build a team like a family, placing additional deck officers and or/ rating on board of vessels on short trading pattern or difficult routes or difficult handling processes, recruiting administrative assistants to manage the ship administrations, take care of seafarers investment not cost, seafarers need safe secure working conditions, fair term of employment, health protection, medical care, family support, need to become industry of choice, appoint health, safety and wellbeing , environment and quality person who promotes and overseas it implementation needs, people managers to look after crew, managers be on board: chat, eat, drink,

Alert! Issue No (2, 4, 10, 12, 16, 19, 22, 26, 31)

Under qualified seafarers

Problems:

- Recruiting and employing competent seafarers is essential for safe operation of the Ship as there is too few seafarers under qualified seafarers are given high up jobs

Solutions:

- Human resources selection and preparation of staff able to do required work, personnel and needs, seafarers with a good knowledge of a company and its ship who identify with both will display care and loyalty are less likely to produce claims, it is incumbent on the ship owner to ensure that they comply with legal obligations when it comes to the employment, training and certification of seafarers to make sure they attain the 'standard' required for reasonable ship power

Alert! Issue No (2, 11, 12, 31)

Training

Competency and familiarity with the ship and its system

Language/communication problems

Problems:

- procedural language may be used but because of inadequate training bad communication, discipline, poor teamwork and lack cultural awareness, seafarers may have excellent knowledge of English but without practical ability to speak it

Solutions:

- mixed crew communications very important, need to depend the education in English language, company to set English ranking test

Alert! Issue No (8, 9, 14, 21, 23)

Use of equipment

Problems:

- Need to be highly trained for modern equipment

Solutions:

- Increase the use of simulators to constantly challenge and test professional skills, have a training ship

Alert! Issue No (1, 3, 16, 20, 22)

Cost of training

Problems:

- Training a high cost to the ship owner

Solutions:

- investment in training not only increases productivity but also empowers and serves as a safeguard of seafarers rights

Alert! Issue No (5,6)

Standard of training

Problems:

- Training to be able to conduct their business in a safe efficient manner, certain nationalities less training

Solutions:

- Stakeholders need to work together to provide adequate training to ensure safe conduct of the ship and safe timely delivery of its cargo, to improve education additional experience, better

supervision and more rigours exams, many accidents on break down communication and team work need development of bridge resource management training focus personal attitudes rather than navigations, best training provided by those who have experience/expertise and good trainer, Mariners need it know: leadership, cultural awareness, human limitations including fatigue, effective communication, team work principles, decision making and problem solving processes, personal and professional development, coaching mentoring, appraisal system and techniques, train crew before leaving shipyard, command assessment program: psychological assessment, simulation based assessment, written/oral presentation, peer group exercise, completion shows strength and weaknesses and area to work on, maritime educator need to understand the ways of the sea, regular on board training needed

Alert! Issue No (1, 2, 4, 6, 8, 9, 11, 29, 37)

Alert! Articles used

Alert! Issue No 1 pg1 Improving the awareness of the human element in the Marine Industry, pg.2 One Naval Architect's view of the Human Factor pg.3 A Marine Engineering perspective

Alert! Issue No 2 pg.1 Paperwork...what paperwork, pg.3 cracking the code, pg.3 improving the Application of the Collision Regulation, pg6. Port State Control and the ISM Code pg.8 Report and Studies

Alert! Issue No 3 pg.1 an ergonomic nightmare, pg.6 The Human Element in Pilotage, Prevention through people: an overview

Alert! Issue No 4 pg1. Garbage in, garbage out, pg.3 Crew Endurance Management: Extending beyond Fatigue, pg6. Joined up maritime health, pg.7 Seafarer's wellbeing an holistic approach

Alert! Issue No 5 pg1. Investing in quality, pg3. Building the company culture, pg.6 corporate social responsibility in shipping

Alert! Issue No 6 pg.1 Competent people make the difference, pg.2 Invest in yourself, pg. 6 Training the trainer, pg.7 Leadership-a training need?

Alert! Issue No 9 pg.2 Forget the image...,pg.3 Communication skills are vital to safe ship operations, Stress at sea, pg.7 Good working practices have always given good results

Alert! Issue No 10 pg. 7 The effects of Regulation

Alert! Issue No 11 pg.2. Crew continuity and competence, Training Needs Analysis-What, How, Why, pg.3 Leadership and managerial skills, pg.6 Developing a Climate of Trust: the Human Face of Shipping,

Alert! Issue No 12 pg2. Negligent or incompetent? A need for due diligence, pg3. A welfare for seafarers, Towards safer ship operations and the economic viability of a company

Alert! Issue No 13 pg.5 Fatigue Causes, effects and mitigation

Alert! Issue No 14 pg.2 Culture and communication or the loneliness of modern ship's master, pg.3 Whose culture? The impact of language on safety and compliance at sea

Alert! Issue No 16 pg.1 Rogue behaviour is not the hallmark of professional mariner, pg.6 Routine should spring from the core, pg.7 Seafarers as an investment- not a cost

Alert! Issue No 18 pg.3 Regional Seafarers' Welfare Development Programs

Alert! Issue No 19 pg.1 Let's get positive, pg.2 Life At Sea surveys, pg.6 True North values, Attracting Generations Y and M to seafaring

Alert! Issue No 20 Occupational standards for shore-based ship management

Alert! Issue No 22 pg.2 Essential skills for addressing human element issues in a shipping company, pg 7 Looking at the role of the human element in the safety of marine operations

Alert! Issue No 23 pg3. An understanding of what makes human error less likely lies at the heart of loss prevention, pg.6 managing the impact of the human element on risk, pg.7 how much seafarer's worth?

Alert! Issue No 25 pg.2 What makes the ultimate Ship Manger?

Alert! Issue No 26 pg.2 Woven into Fabric, The ISM Code: just an overrated tool, pg.6 Safety culture and the human element, pg.7 Providing human element tools for seafarers and ship managers

- Alert!** Issue No 27 pg.2 The human elements are what they are, and they are what make us human
- Alert!** Issue No 30 pg.1 The people managers... looking after the company's most valued assets
- Alert!** Issue No 31 pg.6 Competence Management
- Alert!** Issue No 32 pg.7 Crew endurance Management
- Alert!** Issue No 33 pg.8 Trainee induction
- Alert!** Issue No 37 pg.2 Introduction

Human factors engineering considerations

- Ship designer go to sea before becoming a designer
(**Alert!** Issue No 1 pg. 2 One naval architects view of human factors,2 pg2 Some thoughts from the sharp end,3 pg. 3 The case for a Decent design,25 pg. 1 it's all about team work)
- The design of the ship will affect way ship handled: poor design, bad ergonomics, equipment failure, habitability, differing equipment design
(**Alert!** Issue No 1 pg. 3 Just waiting to happen...The work of UK P&I club, 3 pg. 1 opening)
- Human error brought on in engine room by: heat, noise, vibration, lighting, equipment layout, workload
(**Alert!** Issue No 1 pg. 3 A marine engineering perspective)
- Anthropology
 - Design for smallest: force and reach distance
 - Design for largest: clearances
 - Design for average: work station and adjustable items e.g. table and chairs
 - Design for range: amount of adjustability
(**Alert!** Issue No3 pg.5 Anthropometry-Designing to fit the user)
- Many stakeholders involved in the design of ships and their systems team work and communication at all levels from concept to build are essential to success any project
(**Alert!** Issue No7 pg. 1 Know thy users)
- Good design prioritises his expectations, sea, comfort and habitability for crew and passengers, meets environmental regulations concerns and complies with relevant regulations of class, international and national authorities
(**Alert!** Issue No7 pg. 2 A 'good design' is one that exceeds owner's expectation)
- Usability follows: understanding and specifying context of used, specifying the user and organisational requirements
- Before building new ship operational review of current vessel identify good and build on it
- Ship designer to listen to seafarers even better to have one around whilst building or a human factor engineer during build. Know the crew, organisation and specific strength and weaknesses
(**Alert!** Issue No1 pg2 One naval architect to another,3 pg. 3 A case for decent design,7 pg. 7 Identify the good and build upon it,24 pg. 1 The Ultimate aim)
- Design approach use human centered design (**Alert!** Issue No 24):
 - Identify need (owner/operator)
 - Define concept (owner/operator)
 - Define requirements(operator/end user)
 - Specify function
 - Design (ship yard/suppliers/ trainers)
 - Build (ship yard/suppliers/trainer)

- Design the problem out: design for user, design for spatial relationship, design for operational expectation, design for feedback requirements, decision sign for accessibility, design for consistency, design to eliminate ambiguity
(Alert! Issue No36 pg. 8 Design the problem out)
- Ship owner provide shipyard clear perspective specification of what he requires in terms of automation and alarms. Need to take into account operation and maintenance. Give user and usability requirements equal emphasis with technical requirements.
(Alert! Issue No15 pg. 1 Let's be clear about automation)
- Ship owner actively involved in shipyard to get the right product
(Alert! Issue No15)
- Potential hazards should be identified during design
(Alert! Issue No17pg 1 One hand for the ship.. and one for yourself)

Habitability

Comfortable clean (cleanable) and convivial accommodation, washing and toilet facilities, mess room, group meeting and exercise areas.

- Comfort and habitability is of increasing concern the quality of life to seafarer is one of the keys to successful operation
(Alert! Issue No7 pg. 2 A good design is one that exceeds the owner's expectations)
- Effects of noise and vibration on seafarer
(Alert! Issue No18 pg. 2 A momentous milestone for the international shipping industry)
- Decent quarters to live and rest in: crew bar, gym, IT equipment and game facilities
(Alert! Issue No18 pg. 3 Regional seafarers development program, 19 pg. 7 True North Value,35 pg. 3 Taking a human – centred approach)
- Different cultures need different designs.
(Alert! Issue No24 pg. 1 Ultimate aim, 35 pg. 3 Taking a human – cantered approach)
- Main goal to provide a design that will enhance human performance, mental alertness, quality of life and crew recruiting
(Alert! Issue No34 pg. 3 Crew habitability: what you need to know, 35 pg. 3 Taking a human centred approach)
- Decrease noise: insulation, noise absorbent flooring, large diameter propeller, shock absorbers engine and rubber suspension exhaust system
(Alert! Issue No34 pg.7 Less noise and vibration is good for the working environment)

Manoeuvrability

The most appropriate manoeuvring capabilities

- Good ship manoeuvrability
(Alert! Issue No7 pg. 2 A 'good design 'is one that exceeds the owner's expectations)
- Good field of view
(Alert! Issue No36 pg.7 Increasing the safety)

Maintainability

Operational maintenance task to be rapid, safe and effective to allow equipment and systems to achieve a specified level

- Maintenance responsibilities starts from the top managers of the company who should be committed to direct efforts, resources and investment in order to ensure that their ships are properly maintained and operated by qualified competent crew
(Alert! Issue No3 pg. 2 SHIPBOARD MAINTENANCE - a top management responsibility)
- Poor maintenance increase risk of casualty, pollution and damage to property.
(Alert! Issue No3 pg. 2 SHIPBOARD MAINTENANCE - a top management responsibility)
- When designing and building a vessel also need to consider the difficulties operator may have when dismantling areas for repair
- Automation reduces need for maintenance, problem automation goes wrong need qualified engineers and electronic officers on board

(Alert! Issue No15 pg. 3 A chief engineer's perspective)

Workability

Context of use

- Need a way of fitting in trained staff otherwise automation just for the sake of saving cost is accident waiting to happen
(Alert! Issue No15 pg. 1 let's be clear about automation)
- Demonstration of usability requirements for all significant aspect of operation and maintenance (Addressing the Human element –ship and equipment design)
- Stakeholders are not working together to ensure master and crew have right tools in place
(Alert! Issue No 2 pg.6 Port State Control and the ISM Code)
- Strong focus in design and optimal technical solutions and on ergonomic solutions during building phase is fundamental in prevention of future accidents
(Alert! Issue No3 pg.2 Human error – a fragile chain of contributing elements)
- Risk factors temperature, motion, vibration and intensity of lighting
(Alert! Issue No4 pg.3 Crew Endurance Management: Extending beyond Fatigue)
- User requirements are derived from human factors data considered context of a particular ship its manning, outfitting and operation
(Alert! Issue No7 pg. 5 A human-centered approach to ship and system design)
- Have an operating manual standard which is easy to understand operating instructions for all micro processes controlled equipment
(Alert! Issue No2 pg. 3 Cracking the code, 15pg. 1 let's be clear about automation)
- Simplicity of operation and ease of maintenance
(Alert! Issue No24 pg.7 Factoring in the human element in the design of ships)
- Human systems integration perspective major concern to maximise human performance and minimise human performance risk: human capability, human proficiency, human availability, human utilisation, human accommodation, human health and safety, human survivability
(Alert! Issue No24 pg.3 Adopting a Human System Integration approach to design)
- Navigation systems simple to understand
(Alert! Issue No24 pg.7 Factoring in the human element in the design of ships)

Controllability

Integrating people with equipment, systems and interfaces

- Requirement of relevant standards for electronic displays of chart, radar, bridge system, displays. Being harmonised: same colour, symbol, terms, abbreviation, unit and controls. Trying to reduce number of screens.

(**Alert!** Issue No 1 pg. 6 The International Maritime Organisation and the Human element)

- Integrated bridge/navigation systems

(**Alert!** Issue No21 pg.3 Information Management a shipmaster's perspective)

Survivability

Adequate firefighting, damage control, lifesaving and security facilities to ensure the safety and secure of crew, visitors and passengers

- How to manage without automation for emergency
(**Alert!** Issue No15 pg.2 a chief engineer's perspective)

Occupational Health and Safety

The effect of work, the working environment and living conditions on the health, safety and wellbeing of the person.

- Close involvement stake holders in making sure ship 'safe for purpose.
(**Alert!** Issue No 1 pg.1 Improving the awareness of the Human Element in the Maritime industry)
- Master and crew provided with proper tools
(**Alert!** Issue No 1 pg.1 Improving the awareness of the Human Element in the Maritime industry)

System Safety

The risks from people using (or misusing) the system

- Off the shelf system may not fit the purpose
(**Alert!** Issue No 2 pg. 3 Cracking the code)
- Computer are good but a constant stream of alarms can prove a great distraction and have potential to generate extremely hazardous situation
(**Alert!** Issue No 2 pg.3 Improving the Application of the Collision Regulations, 7 pg.3 The role of the International Organisation for Standardization in relation to Ships and Marine Technology)
- Automation verified by observing what is actually happening against what should be happening.
(**Alert!** Issue No15 pg.3 A Chief engineer's perspective)
- Selector switch that hides all no critical alarms as in blackout as to many alarms hinder engineer.
(**Alert!** Issue No15 pg.3 A Chief engineer's perspective)
- Cabin alarms to start soft
(**Alert!** Issue No15 pg.3 A Chief engineer's perspective)
- Alarms covering area of the ship directly looked after by deck department would not sound engine console should feed separate panel that will Alert selected navigation officers
(**Alert!** Issue No15 pg.3 A Chief engineer's perspective)

Human centred design

Focuses on making a design usable. Process of systematically applying human factors and ergonomics knowledge and techniques to minimize human error, enhance effectiveness and efficiency, improve human working conditions and counteract possible adverse effects of use on health, safety and performance of the mariner. **(Alert! Issue No7)**

- To prevent failure: well designed, operator focused work place control room instrumental display, planning, safety awareness **(Alert! Issue No 1,7)**
- Human element build
 - Identify need (owner/operator)
 - Define concept (owner/operator)
 - Define requirements (operator/end user)
 - Specify function (integrator)
 - Design (ship yard/suppliers)**(Alert! Issue No8)**
- Human centered design
 - Clear explicit understanding of users, tasks and environment
 - Involvement of user throughout design and development
 - Design for user
 - Multi-disciplinary skill and perspective**(Alert! Issue No35)**

Index

Human Resources	
Recruitment	<p>Alert! Issue No 4 pg. 1 Garbage in, Garbage out...</p> <p>Alert! Issue No 5 pg.3 Consolidating international Maritime Labour Standards</p> <p>Alert! Issue No 19 pg.3 Go to sea! A campaign to boost shipping industry recruitment</p> <p>Alert! Issue No 19 pg.4 Recruitment and retention – perceptions, experience and expectations</p> <p>Alert! Issue No 19 pg.6 Attracting Generations Y and M to seafaring</p> <p>Alert! Issue No 19 pg.6 Corporate Social Responsibility – a tool for recruitment and retention of seafarers</p> <p>Alert! Issue No 27 pg.3 The need for Human Factors Engineering skills</p> <p>Alert! Issue No 27 pg.4 Human element knowledge and skills framework – Technical</p> <p>Alert! Issue No 28 pg.1 Integrity, professionalism and transparency – the hallmarks of a good surveyor</p> <p>Alert! Issue No 28 pg.2 The need for human element competence among classification society surveyors</p> <p>Alert! Issue No 28 pg.3 Human element skills and knowledge required of P and I surveyors and inspectors</p> <p>Alert! Issue No 30 pg.1 Building a trusting relationship with candidates and clients</p> <p>Alert! Issue No 30 pg.1 The role of the Marine Training Manager</p> <p>Alert! Issue No 30 pg.3 All Aboard! A personal experience</p> <p>Alert! Issue No 30 pg.4 Maritime Human Resources – Knowledge, Skills and Attributes</p> <p>Alert! Issue No 30 pg.5 Global professional standards for HR</p> <p>Alert! Issue No 31 pg.2 Attracting and retaining talent</p> <p>Alert! Issue No 32 pg.4 Personnel – recruitment and retention, identification of required skills, crewing mixes, maintenance of competencies</p> <p>Alert! Issue No 32 pg.6 Competence Management</p> <p>Alert! Issue No 32 pg.7 Technical best practice</p>
Manning	<p>Alert! Issue No 10 pg.3 Safe Manning</p> <p>Alert! Issue No 19 Pg.2 What it takes to retain your seagoing personnel</p> <p>Alert! Issue No 19 pg.7 True North values</p> <p>Alert! Issue No 23 pg.7 How much are seafarers worth?</p> <p>Alert! Issue No 33 pg.3 A Rough Guide to interpreting the Principle of Safe Manning</p> <p>Alert! Issue No 33 pg.4 The complete guide to ship manning</p>
Training and competence	<p>Alert! Issue No 4 pg.2 Maritime Education and Training Providers take the initiative</p> <p>Alert! Issue No 4 pg.6 Communication- a step towards Emotional Intelligence</p> <p>Alert! Issue No 6 pg.1 Competent people make the difference</p> <p>Alert! Issue No 6 pg.2 Invest in yourself</p> <p>Alert! Issue No 6 pg.3 Training a multinational work force</p> <p>Alert! Issue No 6 pg.3 The value of the training ship in the training of seafarers</p> <p>Alert! Issue No 6 pg.6. Training the trainer</p>

	<p>Alert! Issue No 6 pg.7 Leadership-a training need?</p> <p>Alert! Issue No 8 pg.1 Testing times for the crew</p> <p>Alert! Issue No 9 pg.3 Communication skills are vital to safe ship operations</p> <p>Alert! Issue No 9 pg. 6 A roller – coaster ride</p> <p>Alert! Issue No 11 pg.2 Crew continuity and competence</p> <p>Alert! Issue No 11 pg.2 Training Needs Analysis – What, How, Why...</p> <p>Alert! Issue No 11 pg.3 Leadership and managerial skills for shipmasters</p> <p>Alert! Issue No 14 pg.1 Effective communication The key to successful operation</p> <p>Alert! Issue No 14 pg.4 The alphabet of effective communication</p> <p>Alert! Issue No 14 pg.6 Effective communication at sea</p> <p>Alert! Issue No 15 pg.3 Mitigating human error by improving communication</p> <p>Alert! Issue No 20 pg.1 Education, training and career development crucial for safe operation</p> <p>Alert! Issue No 20 pg.2 The cadet training experience</p> <p>Alert! Issue No 20 pg.2 Post-Graduate Certificates in Maritime Education and Training</p> <p>Alert! Issue No 20 pg.3 Are your seafarers competent?</p> <p>Alert! Issue No 20 pg.3 The value of on-board training</p> <p>Alert! Issue No 20 pg.4 Education and development – a route map</p> <p>Alert! Issue No 20 pg.5 Continuing Professional Development a notion of lifelong learning</p> <p>Alert! Issue No 20 pg.7 Investing in training</p> <p>Alert! Issue No 22 pg.3 Focus on seafarer education and training</p> <p>Alert! Issue No25 pg.2 What make the ultimate ship manager?</p> <p>Alert! Issue No 25 pg.3 Grappling with leadership skills</p> <p>Alert! Issue No25 pg.3 Leadership qualities of the master</p> <p>Alert! Issue No 25 pg.7 Nobody is perfect, but a Team can be</p> <p>Alert! Issue No 27 pg.6 A remarkable lack of practical skills something we all need to address</p> <p>Alert! Issue No 27 pg.7 Social skills: a vital complement to technical skills</p> <p>Alert! Issue No 28 pg. 4 Surveyors and Inspectors – Knowledge, skills and attributes</p> <p>Alert! Issue No 28 pg. 6 Human factors in surveyor training – meeting the challenge</p> <p>Alert! Issue No 29 pg.1 It takes a special sort of person to be a maritime educator and instructor</p> <p>Alert! Issue No 29 pg.2 Just being an experienced mariner does not make for a good educator and trainer</p> <p>Alert! Issue No 29 The importance of training the trainer</p> <p>Alert! Issue No 29 pg.3 On being a maritime lecturer</p> <p>Alert! Issue No 29 pg.3 A journey towards quality education and continual improvement</p> <p>Alert! Issue No 29 pg. 4 Maritime Educators and Trainers – Knowledge, skills and attributes</p> <p>Alert! Issue No 29 pg. 6 Competent maritime teaching staff</p> <p>Alert! Issue No 29 pg. 6 The qualities of a trainer</p>
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	<p>Alert! Issue No 29 pg.7 Quality teaching for maritime students: An ongoing challenge</p> <p>Alert! Issue No 30 pg.7 The good crewing Manager</p> <p>Alert! Issue No 31 pg.8 Mentoring</p> <p>Alert! Issue No 33 pg.4 An A to Z of maritime education and training</p> <p>Alert! Issue No 33 pg. 8 Trainee Induction</p> <p>Alert! Issue No 37 pg.6 Enclosed spaces – management and training</p>
Social and organizational	<p>Alert! Issue No 3 pg. 6 Prevention through People: An Overview</p> <p>Alert! Issue No 4 pg.3 Crew Endurance Management: Extending Beyond Fatigue</p> <p>Alert! Issue No 2 Pg.1 Paperwork... what paperwork?</p> <p>Alert! Issue No 2 Pg.1 Some thoughts from the sharp end...</p> <p>Alert! Issue No 2 pg.7 I’m Afloat</p> <p>Alert! Issue No 4pg.4 People: Mind ,Body and Spirit The 7 needs of the mariner</p> <p>Alert! Issue No 4 pg.6. Joined up maritime health</p> <p>Alert! Issue No 4 pg.7 Seafarers’ wellbeing an holistic approach</p> <p>Alert! Issue No 5 pg.1 Investing in quality- investing in people</p> <p>Alert! Issue No 5 pg.2 Quality, Safety and Security – trust and mistrust</p> <p>Alert! Issue No 5 pg.3 Building the company culture</p> <p>Alert! Issue No 5 pg.4 A total quality lifecycle</p> <p>Alert! Issue No 5 pg.6 Sustainability reporting in the marine sector</p> <p>Alert! Issue No 5 pg.5 Corporate social responsibility in shipping</p> <p>Alert! Issue No 6 pg.2 Managing fatigue</p> <p>Alert! Issue No 6 pg.4 The development and maintenance of the human component of ship systems</p> <p>Alert! Issue No 9 pg.2 Forget the image...</p> <p>Alert! Issue No 9 pg.3 Stress at sea</p> <p>Alert! Issue No 9 pg.4 Operations Keeping ahead of the game</p> <p>Alert! Issue No 9 pg.6 Building Bridges</p> <p>Alert! Issue No 9 pg.7 Good working practices have always given good results</p> <p>Alert! Issue No 11 pg.6 Developing a Climate of Trust: the Human Face of shipping</p> <p>Alert! Issue No 12 pg.1 Negligent or incompetent? A need for due diligence</p> <p>Alert! Issue No 12 A welfare service for seafarers</p> <p>Alert! Issue No 13 pg.1 Time to wake up to the consequences of Fatigue</p> <p>Alert! Issue No 13 pg.2 Seafarer fatigue: The Cardiff research programme</p> <p>Alert! Issue No 13 pg.2 Fatigue in the shipping industry</p> <p>Alert! Issue No 13 pg.3 Fatigue and an alternative watch system</p> <p>Alert! Issue No 13 pg.3 Towards a fatigue management plan...</p> <p>Alert! Issue No 13 pg.4 Fatigue Causes, effects and mitigation</p> <p>Alert! Issue No 13 pg.7 A holistic approach to improving crew performance</p> <p>Alert! Issue No 13 pg.7 Fatigue and tiredness or alertness and performance?</p> <p>Alert! Issue No 14pg.2 Culture and communication or loneliness of a modern ship’s master</p>

	<p>Alert! Issue No 14 pg.3 Whose culture? The impact of language and culture on safety and compliance at sea</p> <p>Alert! Issue No14 pg.7 A shipmaster’s view</p> <p>Alert! Issue No 16 pg.1 Rogue behaviour is not the hallmark of a professional mariner</p> <p>Alert! Issue No 16 pg.2 Explaining complacency and routinisation</p> <p>Alert! Issue No 16 pg.3 Complacency at work</p> <p>Alert! Issue No 16 pg.4 Exploring rogue behaviour</p> <p>Alert! Issue No 16 pg.6 Routine should spring from the core-not the checklist</p> <p>Alert! Issue No 16 pg. 6Decentralisation management as a safeguard against complacency</p> <p>Alert! Issue No 16 pg.7 Seafarers as an investment- not a cost</p> <p>Alert! Issue No 18 pg.1 Look after your people.. and they will look after you</p> <p>Alert! Issue No18 pg.3 Regional Seafarers’ Welfare Development Programmes</p> <p>Alert! Issue No 18 pg.6 Looking after the needs of the seafarer</p> <p>Alert! Issue No 18 pg.6 The essentials of a good working atmosphere</p> <p>Alert! Issue No 19 pg. 1. Let’s get positive</p> <p>Alert! Issue No 19 pg.2 Life at Sea surveys</p> <p>Alert! Issue No 20 pg.2 Occupational standards for shore-based ship management</p> <p>Alert! Issue No 21pg.1 Too much information</p> <p>Alert! Issue No 21 pg.2 Making information work</p> <p>Alert! Issue No 21 pg.2 Bridge team command and control Managing the navigational plan</p> <p>Alert! Issue No 21 pg.3 Information Management a shipmaster’s perspective</p> <p>Alert! Issue No 21 pg.3 Information Management a shipmaster’s perspective</p> <p>Alert! Issue No 21 pg.3 Environmental reporting comes of age</p> <p>Alert! Issue No 21 pg.4 Information management – bringing it all together</p> <p>Alert! Issue No 21 pg. 6 Will e-Navigation help the officer of the watch manage information?</p> <p>Alert! Issue No 21 pg.7 Shipboard IT and communication system keeping the crew happy</p> <p>Alert! Issue No 21 pg.7 E-Maritime – its contribution to the human element</p> <p>Alert! Issue No 23 pg.6 The shipbroker’s and charter’s’ perspectives</p> <p>Alert! Issue No 23 pg.7 Ship financiers need to treat seafarers with respect</p> <p>Alert! Issue No 25 pg.1 It’s all about teamwork</p> <p>Alert! Issue No 25 pg.2 Crew- the operator’s greatest challenge</p> <p>Alert! Issue No 25 pg.4 Operation</p> <p>Alert! Issue No 25 pg.6 Crew Resource Management – Learning from aviation</p> <p>Alert! Issue No 25 pg.6 What Makes a Good Human Element Investigator?</p>
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	<p>Alert! Issue No 26 pg.1 HSEQ- the essentials of an integrated Management System</p> <p>Alert! Issue No 26 pg.2 Woven into the fabric</p> <p>Alert! Issue No 26 pg.2 The ISM Code: just an overrated tool?</p> <p>Alert! Issue No 26 pg.3 Changing mind-sets</p> <p>Alert! Issue No 26 pg.3 Investing in the human element</p> <p>Alert! Issue No 26 pg.4 A human-centred approach to HSEQ</p> <p>Alert! Issue No 26 pg.6 The hallmarks of a good HSEQ manager</p> <p>Alert! Issue No 26 pg.7 Providing human element tools for seafarers and ship mangers</p> <p>Alert! Issue No 27 pg.3 Decision, decisions..</p> <p>Alert! Issue No 27 pg.7 The management of maintenance and repair</p> <p>Alert! Issue No 30 pg.1 The people managers.. looking after the company's most valued asset</p> <p>Alert! Issue No 31 pg.1 Fitting the correct peg into the correct hole</p> <p>Alert! Issue No 31 pg.3 The Shipping KPI Standard</p> <p>Alert! Issue No 33 pg.7 Crew Endurance Management</p> <p>Alert! Issue No 33 pg. 7 Operational integrity – recognising and developing people</p> <p>Alert! Issue No 38 pg.3 Developing Seafarers' Welfare Board in the 21st Century</p> <p>Alert! Issue No 39 Big Data: Harnessing it to improve risk management</p>
Human Factors engineering	
Habitability	<p>Alert! Issue No 3 Pg.1 An ergonomic nightmare!</p> <p>Alert! Issue No 3 Pg.4 An A to Z of Ergonomics</p> <p>Alert! Issue No 3 pg.7 Anthropometry- Designing to fir the user</p> <p>Alert! Issue No 11 pg.3 Comfort design of ship accommodation a harmonization of theoretical analyses and experiences</p> <p>Alert! Issue No 13 pg.6 Designing to Deal with Fatigue</p> <p>Alert! Issue No 13 pg.6 Use of light to improve Alertness in marine operations</p> <p>Alert! Issue No 34 pg.3 Crew Habitability: What you need to know</p> <p>Alert! Issue No 34 pg. 4 Habitability A rough guide to MLC 2006 Regulation 3.1 Accommodation and recreational facilities</p> <p>Alert! Issue No 34 pg.6 Improving Habitability on Board</p> <p>Alert! Issue No 34 pg.7 Less noise and vibration is good for the working environment</p> <p>Alert! Issue No 35 pg.7 On-board work and habitability environments</p>
Manoeuvrability	
Maintainability	<p>Alert! Issue No 3 pg.2 Shipboard maintenance – a top management responsibility</p> <p>Alert! Issue No 32 pg.8 The use of riding gangs aboard ship</p> <p>Alert! Issue No 35 pg.4 Ergonomics and maintainability A rough guide</p>
Workability	<p>Alert! Issue No 3 Pg.1 An ergonomic nightmare!</p> <p>Alert! Issue No 14 pg.2 The quality of shipboard documentation</p> <p>Alert! Issue No 14 pg.6 How to get signage right</p> <p>Alert! Issue No 36pg.4 Ergonomic criteria for control room equipment and layout a checklist</p>
Controllability	<p>Alert! Issue No 15 pg.1 Let's be clear about automation</p> <p>Alert! Issue No 15 pg.2 Making alarms more manageable</p> <p>Alert! Issue No15 pg.3 A chiefs engineer's perspective</p>

	<p>Alert! Issue No 15 pg.3 Automation, STCW and electronics officers</p> <p>Alert! Issue No 15 pg.5 Automation – Trust and Dependability</p> <p>Alert! Issue No 15 pg.6 Mitigating human error in the use of automated shipboard systems.</p> <p>Alert! Issue No 15 pg.7 Meeting the needs of the operator</p> <p>Alert! Issue No 24 pg. 7 A system should be designed to be easy to operate and maintain</p> <p>Alert! Issue No 36 pg.3 Control room design</p>
Survivability	<p>Alert! Issue No 37 pg.4 Resolution and Circulars and industry Guides</p> <p>Alert! Issue No 37 pg.8 Survivability and Emergency Preparedness – the 3Ps</p>
Occupational health and Safety	<p>Alert! Issue No 5 pg.2 The human element in safety management</p> <p>Alert! Issue No 8 pg.2 Safety in the Shipbuilding and Repair industry</p> <p>Alert! Issue No 8 pg.2 The need for robust ships</p> <p>Alert! Issue No 9 pg.2 Crew Claims – A Club’s perspective</p> <p>Alert! Issue No 10 pg.6 An administrator’s view</p> <p>Alert! Issue No 11 pg.6 Improving Safety by Applying Human Factors Methodologies</p> <p>Alert! Issue No 11 pg.3 Towards safer ship operations and the economic viability of a company</p> <p>Alert! Issue No 17 pg.1 One hand for the ship.. and one for yourself</p> <p>Alert! Issue No 17 pg.2 Matters of perception</p> <p>Alert! Issue No 17pg.3 Using good design practice to reduce slip, trip and fall accidents</p> <p>Alert! Issue No 17 pg.3 ‘Ships are inherently dangerous places’</p> <p>Alert! Issue No 17 pg.4 Mitigating slip, trip and fall hazards</p> <p>Alert! Issue No 17 pg.6 Slip, Trips and Falls- preventable mishaps</p> <p>Alert! Issue No 17 pg. 6. Designing out slips, trips and falls is not new, difficult or expensive</p> <p>Alert! Issue No 17 pg.7 Root causes and countermeasures</p> <p>Alert! Issue No 18 pg.3 It will never happen to me</p> <p>Alert! Issue No 18 pg.4 The good guide to seafarer health, safety and wellbeing</p> <p>Alert! Issue No 18 Working to improve health at sea</p> <p>Alert! Issue No 21 pg.6 Employing New Technologies in Marine Accident Investigation</p> <p>Alert! Issue No 22 pg.2 Unmasking hidden hazards-human and organizational factors</p> <p>Alert! Issue No 23 pg.1 Facing the challenge...</p> <p>Alert! Issue No 23 pg.2 Towards a safe, sustainable and dependable shipping industry</p> <p>Alert! Issue No 23 pg.3 An understanding of what makes human error less likely issues at the heart of loss prevention</p> <p>Alert! Issue No 26 pg.6 Safety culture and the human element</p> <p>Alert! Issue No 27 pg. 1. The engineer’s role in addressing the human element</p> <p>Alert! Issue No 28 pg.3 The US Coast Guard application of Safety Management Systems and Auditor skills</p> <p>Alert! Issue No 32 pg.6 MARTHA a new HORIZON</p> <p>Alert! Issue No 33 pg.3 The role of human behaviour in safety at sea</p>

	<p>Alert! Issue No 33 pg.6 Sail Safe- transforming the safety culture of the company</p> <p>Alert! Issue No 35 pg.7 Do current design standards cater for safety?</p> <p>Alert! Issue No 37 pg. 3 Crisis at Sea how to move on</p> <p>Alert! Issue No 38 pg.4 Exploring Occupational Health and Safety</p> <p>Alert! Issue No 38 pg.6 Wellness at Sea: Promoting on board health and well-being</p> <p>Alert! Issue No 38 pg.7 Getting the word out on mental illness</p> <p>Alert! Issue No 38 pg.8 The ILO Guidelines for Occupational Safety and health</p> <p>Alert! Issue No 38 A methodological approach to the management of risk and safety</p>
System safety	<p>Alert! Issue No 36 pg.7 Increasing the safety of demanding offshore operations through usability</p> <p>Alert! Issue No 38 pg.4 The human element and human-system aspects of risks in the context of total HSSEQ on board ship</p>
Security	<p>Alert! Issue No 37 pg.7 Makin maritime security work</p> <p>Alert! Issue No 38 Cyber: It's about operational Risk Management 38</p>
Human centred design	<p>Alert! Issue No 1 pg.2 One Naval Architect's view of the Human Factor</p> <p>Alert! Issue No 3 pg.2. Human error-a fragile chain of contributing elements</p> <p>Alert! Issue No 3 pg.3 The Case for a Decent Design</p> <p>Alert! Issue No 6 pg. 6 Gaining an understanding of the 'Perils of the Sea'</p> <p>Alert! Issue No 7 pg.1 Know thy users- for they are not you!</p> <p>Alert! Issue No 7 pg.2 A 'good design' is one that exceeds the owner's expectations</p> <p>Alert! Issue No 7 pg.2 Usability in the maritime industry</p> <p>Alert! Issue No 7 pg.3 Designing usable ships</p> <p>Alert! Issue No 7 pg.4 A human – centred approach to ship and system design</p> <p>Alert! Issue No 7 pg.6 Fit for purpose</p> <p>Alert! Issue No 7 pg. 6. Closing the loop – feedback from the user modulating the designs</p> <p>Alert! Issue No 7 pg.7 Identify the good and build upon it</p> <p>Alert! Issue No 8 pg.3 Building platform management systems based on User Centered Design</p> <p>Alert! Issue No 8 pg.4 Addressing the human element during build</p> <p>Alert! Issue No 8 pg.6 Standing by a new build- a Master's perspective</p> <p>Alert! Issue No 8 pg.7 Human Factors Engineering deficiencies in ship construction</p> <p>Alert! Issue No 11 pg. 7 Human centred design makes a difference</p> <p>Alert! Issue No 12 pg.1 It makes sense</p> <p>Alert! Issue No 24 pg.1 The ultimate aim...</p> <p>Alert! Issue No 24 pg.3 Adopting a Human Systems Integration approach to design</p> <p>Alert! Issue No 24 pg.6 Human Factors in Ship Design: A question of skills – and something more...?</p> <p>Alert! Issue No 35 pg.3 Taking a human-centred approach</p>

	<p>Alert! Issue No 35 pg.6 Taking into account human limitations in ship design</p>
Equipment	<p>Alert! Issue No 1 pg.6 Harmonising the presentation of navigation related information</p> <p>Alert! Issue No 1 pg.7 A-user centred design approach to the fitting of AIS</p> <p>Alert! Issue No 2 pg.6 Some Thoughts on cargoes, container ships and the human element</p> <p>Alert! Issue No 3 pg.6 The Human Element in Pilotage</p> <p>Alert! Issue No 24 pg.6 Developing the e-navigation concept-a human initiative</p>
Regulations	<p>Alert! Issue No2 pg.2 A Classification Society View of Human Element Issues</p> <p>Alert! Issue No 2pg.6 Port State Control and the ISM Code</p> <p>Alert! Issue No 5 pg.3 Consolidating international Maritime Labour Standards</p> <p>Alert! Issue No 5 pg.7 Regulations – Do our assumptions needs changing?</p> <p>Alert! Issue No 7 pg.3 The role of the International Organisation for Standardization in relation to Ships and Marine Technology</p> <p>Alert! Issue No 10 pg.1 For the guidance of wise men and the build obedience of fools</p> <p>Alert! Issue No 10 pg.3 Marine Safety Regulations Save Lives</p> <p>Alert! Issue No 10 pg.4 The human face of regulation Good intentions and human nature</p> <p>Alert! Issue No 10 pg.6 Intent versus implementation</p> <p>Alert! Issue No 10 pg.7 The effects of Regulation</p> <p>Alert! Issue No 12 pg.6 The Maritime Labour Convention 2006</p> <p>Alert! Issue No 12 pg. 7 The Human Element in the work of the IMO</p> <p>Alert! Issue No 14 pg.3 The IMO Standard Marine Communication Phrases – a communicative Survival Kit</p> <p>Alert! Issue No 18 pg.2 A momentous milestone for the international shipping industry</p> <p>Alert! Issue No22 pg.2 THE ILO’s Maritime Labour Convention, 2006 Placing the human element at the forefront</p> <p>Alert! Issue No 22 pg.3 IMO’s work on human element issues-some thoughts</p> <p>Alert! Issue No 22 pg.4 Human element knowledge and skills framework – Regulation, Administration and management</p> <p>Alert! Issue No 28 pg.7 Maritime Labour Convention Inspectors Addressing the Human Element</p> <p>Alert! Issue No 34 The Maritime Labour Convention 2006</p> <p>Alert! Issue No 38 Compliance with the ISM Code and the Maritime Labour Convention 2006</p>
Human Element	<p>Alert! Issue No 1 pg.1 Improving the awareness of The Human Element in the Maritime industry</p> <p>Alert! Issue No 1 pg.3 Just waiting to happen...The work of the UK P&I Club</p> <p>Alert! Issue No 1 pg.3 A Marine Engineering perspective</p> <p>Alert! Issue No 1 pg.4 Exploring the human element</p>

	<p>Alert! Issue No pg.6 The International Maritime Organisation.. and the Human element</p> <p>Alert! Issue No 2 pg.4 Exploring Human Factors</p> <p>Alert! Issue No 8 pg.4 Addressing the human element during build</p> <p>Alert! Issue No 11 Pg.1 The Human Element jigsaw</p> <p>Alert! Issue No 11 pg.4 Integrating the human element A rough guide</p> <p>Alert! Issue No 12 pg.2 Recognition of competence in addressing the human element</p> <p>Alert! Issue No 12 pg.4 A Human Element Voyage</p> <p>Alert! Issue No 22pg. 1 A need to address human issues effectively</p> <p>Alert! Issue No 22 pg.2 Essential skills for addressing human element issues in a shipping company</p> <p>Alert! Issue No 22 pg.6 A ship owner’s perspective on the human elements skills required in shipping</p> <p>Alert! Issue No 22pg.7 Addressing human element issues a ship owner’s association perspective</p> <p>Alert! Issue No 22 pg.7 Looking at the role of the human element in the safety marine operations</p> <p>Alert! Issue No 23 pg.3 A mutual insurer’s view of the human element</p> <p>Alert! Issue No 23 pg.4 Human element knowledge and skills framework – Finance, Insurance, Chartering and brokering</p> <p>Alert! Issue No 23 pg.6 Managing the impact of the human element on risk</p> <p>Alert! Issue No 24 pg.2 Human element shipyard training</p> <p>Alert! Issue No 24 pg.2 Consideration of the human element on ship design</p> <p>Alert! Issue No 24 pg.4 Human element knowledge and skills frame work – design, build, maintain</p> <p>Alert! Issue No 24 pg.7 Factoring in the human element in the design of ships</p> <p>Alert! Issue No 27 pg.2 The human elements are what they are, and they are what make us human</p> <p>Alert! Issue No 27 pg.6 What has the human element got to do with marine engineer?</p> <p>Alert! Issue No 28 pg.2 Winner and loser on oft mentioned perception</p> <p>Alert! Issue No 28 pg.4 Surveying and inspection of ships the human element requirements of the future</p> <p>Alert! Issue No 29 pg.7 Towards reducing the number of human – factors related accidents</p> <p>Alert! Issue No 30 pg.7 Human Element – Quo Vadis?</p> <p>Alert! Issue No 36 pg.8 A basic approach to the elimination of Human Factors Engineering problems</p>
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