Human Element Industry Group

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WELCOME – Who we are

Non-Governmental Organisations at IMO holding a special interest in people, including:

- International Chamber of Shipping
- Oil Companies International Marine Forum
- International Marine Pilots Association
- International Federation of Ship Masters’ Associations
- Institute of Marine Engineering Science and Technology
- InterManager
- International Christian Missions Association
- International Transport Workers Federation
- The Nautical Institute

Human Element Industry Group
• Lead discussions considering how people in the workplace can enhance safety and effectiveness.

• Step 1 – A review of the Human Element Checklist
What's Behind Human Error?

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Mr. Martin L Shaw
Chair IMarEST Human Element Working Group

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Member IMarEST Human Element Working Group
Human Error or Human Element?
Context
Organisational Factors
Technical Factors
Conclusion
Human Error or Human Element?

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1. Human Error
   a. Skill Based Errors
      i. Slips of Action
      ii. Lapses of Memory
   b. Mistakes
      i. Rule Based Mistakes
      ii. Knowledge Based Mistakes

2. Violations
   a. Routine
   b. Situational
   c. Exceptional

**Human error** is an *unintentional* action or decision. **Violations** are *intentional* failures – *deliberately* doing the wrong thing

*(Source James Reason and UK HSE)*

Do we now treat all human errors as malevolent violations?
‘Rather than being the main instigators of an accident, operators tend to be the inheritors of system defects created by poor design, incorrect installation and bad management decisions. Their part is usually that of adding the final garnish to a lethal brew whose ingredients have been long in the cooking’

*Human Error* by James Reason (1990)
So who is prone to human error?

a) the human element is a complex multi-dimensional issue that affects maritime safety and marine environmental protection. It involves the entire spectrum of human activities performed by ..... 

shore based management, regulatory bodies, recognized organizations, shipyards, legislators, 

..........and other relevant parties, all of whom need to cooperate to address human element issues effectively

IMO Resolution A 947 (23) Human Element Vision Principles and Goals for the Organisation 

other relevant parties.... equipment designers, system designers, programmers, port operators, terminal operators, charterers, vetting organisations, industry bodies etc etc.........ME
(b) the Organization, when developing regulations, should **honour the seafarer by seeking and respecting the opinions of those that do the work at sea**;

(c) effective remedial action following maritime casualties requires a sound understanding of human element involvement in accident causation. This is gained by a **thorough investigation and systematic analysis of casualties for contributory factors and the causal chain of events**;

(d) in the process of developing regulations, it should be recognized that adequate **safeguards must be in place to ensure that a "single person error" will not cause an accident** through the application of these regulations;

(e) **rules and regulations** addressing the seafarers directly should be **simple, clear and comprehensive**;

(f) **crew performance is a function of individual capabilities, management policies, cultural factors, experience, training, job skills, work environment and countless other factors**;

(g) dissemination of information through **effective communication** is essential to sound management and operational decisions; and

(h) consideration of **human element matters should aim at decreasing the possibility of human error** as far as possible.
It's all ‘Joined Up’ - The human element

- Technology
  - Equipment and System Design
  - Information
- Physical Environment
  - Vessel Layout
  - Engine Room Layout
  - Environment
- Practice
  - Engineering Practice
  - Operations
  - Maintenance
- Group
  - Onboard Leadership and Management
  - Onboard living
- Organisational Environment
  - Policy and Strategy
  - Motivation
  - Culture
  - Leadership
  - Procedures
  - Compliance
  - Systems
- Society and Culture
  - Formal Culture
  - Informal Culture

After Thomas Koester and Michelle Grech... Human Factors in the Maritime Domain
### Seafarer hazard or hero?

**Hazard**
- Ships are correctly designed, reliable and with minimal flaws
- Management systems reflect the operating environment perfectly
- The only problem is people not following the procedures or making other egregious errors
- Focusing on those errors will prevent incidents
- Work as imagined .. Safety 1
  *(references Safety I and Safety II Erik Hollnagel)*

**Hero**
- Ships contain errors and compromises in specification, design, construction, system integration, build, testing and classification.
- Management systems contain errors and compromises in procedures, resource allocation, maintenance planning.
- The only way ships operate is because of those onboard who ‘join the dots’
- Focus on what goes right
- Work as actually done .. Safety 2

‘After studying human unsafe acts within hazardous enterprises for more than three decades, I have to confess that I find the heroic recoveries of much greater interest and in the long run, I believe potentially more to the pursuit of improved safety in dangerous operations’

*The Human Contribution, Unsafe acts, accidents and heroic recoveries James Reason 2008.*
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Casualty trends

Source: Pomeroy using IHS data
Steps to Improvement

Traditional

Major Characteristics
• Development of Hardware
• Competence

Supporting Themes
• Regulations
• Industrial Safety

Rapid technological change, oil shocks, low freight rates, casualisation, race to bottom on costs, weak compliance.

Procedural Paradigm

Major Characteristics
• Procedures
• Management Systems

Supporting Themes
• Development of Hardware
• Competence
• Industrial Safety
• Risk Assessments
• Quality Systems
• Performance Management
• Vetting and Port State
Did the procedural paradigm work?

Source Intertanko
Organisational Factors

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Increasing Jeopardy

Law of Diminishing Returns

Best Practice
Codification of industry best practice and enforcement by vetting shows largest reduction

Continuous Improvement
Continuous improvement phase with large benefit from small resources

Diminishing Returns
Limited common causes and more abstract solutions

Increasing Workload
Increasing workload leads to ‘ETTO’

Poor decisions
Wrong culture. Wrong motivation leads to poor decisions

Complexity
Increasing organisational and technical complexity

Risk Reduction=Reduced Incidents

Time
Conflicting Goals

Your priority is safety, emissions, greenhouse gas, ballast water, piracy, security, making money, doing things quicker, doing the paperwork.

Duplicate /Conflicting Requirements

You need to follow the owners, charterers, flag states, port states, terminals rules and the qa system, chartering, accounts, purchasing department, procedures.

Communications

Budgets
Planned Maintenance
Spare Gear and Stores
Risk Assessments
Incident Reports
Near Misses
Port and Cargo Info

Systems

ISO9001
ISO14001
ISM
ISPS
SIRE/CDI
TMSA

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The human-ship interface
Design the total system

Human-Centred Quality
The measure of success

Human resources
Fitting the person to the job

Human factors
Fitting the job to the person

Achieved through Human-Centred Design

Competent people

Usable systems
Conclusions

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Where are we now?

Time

Rapid technological change, low freight rates, casualisation, race to bottom on costs, weak compliance.

Seafarer Human Error

Goal conflicts, complexity, workload, unruly technology

Human Element

Major Characteristics
- Development of Hardware
- Competence
Supporting Themes
- Regulations
- Industrial Safety

Major Characteristics
- Procedures
- Management Systems
Supporting Themes
- Development of Hardware
- Competence
- Industrial Safety
- Risk Assessments
- Quality Systems
- Performance Management
- Vetting and Port State

Traditional

Trajectory without paradigm shift

Procedural Paradigm
Conclusions

- Human Error applies to us all across the industry
- Human Error cannot be considered in isolation we need to consider the Human Element
- People are the organisations final safety barrier. Their contribution and success is your success
- As the industry and ships become more complex then organisational and technical factors contributing to human success becomes more important.
- Addressing these factors will reduce the potential for human error and increase the effectiveness of training and procedures.
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Any Questions?

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