

Human factors considerations

Achieved through Human Factors Engineering (HFE)

Human resources considerations

Recruitment

- Crew nationality
- Language onboard
- Selection criteria
- Physical characteristics for the tasks to be done
- Terms & conditions of service
- Appropriate competencies
- Appropriate experience
- Disciplinary & complaints process
- Leave & travel arrangements
- Medical screening

Manning

- Minimum safe manning compliance
- Tasks, duties & responsibilities
- Numbers, grades & roles
- Watchkeeping patterns
- Hours of work & rest
- Fatigue management
- Retention measures
- Continuity at handover
- Succession planning
- Promotion paths

Education & Training

- Required knowledge, skills & abilities
- STCW competencies
- System-specific training
- In-house/onboard training facilities
- Management/leadership training
- Technical training
- Safety & security training
- Induction
- Onboard familiarisation
- Safety drills
- Onboard continuation training
- Distance learning
- CPD

Social & organisational considerations

Organisational Configuration

- International conventions & regulations
- Industry best practice
- Company structure
- Roles & responsibilities
- Company standing orders
- Organisational culture
- Staffing
- Communication & connectivity
- Job design
- Career development

Social environment

- Intended role
- Security as practiced
- Safety as practiced
- Trust
- Ethos, core values, pride, allegiance
- Individual habits & personality
- Leadership styles
- Health & wellbeing awareness – mental & physical
- Risk awareness
- Communication/working language
- Team dynamics

Ways of working

- Environmental/capability stressors
- Impact of fatigue/stress
- Degree of automation
- Policies, processes & procedures
- Guidelines & practices
- Working hours
- Methods of communication
- Information sharing
- Recording, reporting & feedback procedures
- Easy to understand operating instructions & procedures

Habitability

- Religious & cultural differences
- Need for privacy
- Bathroom facilities
- Messing arrangements
- Facilities for personal recreation & study
- Communications connectivity
- Need for natural light
- Storage space for personal effects
- Furnishing, interior design & decoration
- Cleanability
- Surface coverings

Manoeuvrability

- Potential weather conditions
- Communications
- Minimum/maximum/manoeuvring speed
- Propulsion/manoeuvring systems configuration
- Critical system redundancy
- Available harbour services
- Through-life costs
- Protection of the environment
- Fuel economy

Workability

- The users
- Tasks
- Fitness for task
- Equipment
- Accessibility
- Communications
- Signage
- Protective equipment
- Size, shape & gender
- Strength & stamina
- Posture

Maintainability

- Shipboard maintenance policy
- Through-life support
- Onboard expertise
- Accessibility
- Provision & location of tools
- Location of heavy spare parts
- Bench space
- Removal routes
- Noise protected communications
- Policy for onboard spares
- Storage of spare parts and supplies
- Handling of heavy parts
- Disposal of parts & equipment

Controllability

- Control room, workstation, display screen layout
- Computer dialogue design
- Controls & switches
- System integration
- Communications
- Alarm philosophy & management
- Direct & peripheral vision
- Daytime/night-time vision
- Dazzle
- Reflection
- Glare

Security

- Company/ship physical, documentary & cyber security policies
- Human threat landscape (error, misuse and abuse)
- Relationship between security and safety
- Updating of security knowledge
- Seafarer role in protective measures
- Training for confidence and knowledge
- Awareness of, and response to, threat
- Team cohesion
- Management of security risks

Survivability

- Availability of manpower
- Emergency response systems & procedures
- Ship layout & equipment fit
- Firefighting & damage control systems & equipment
- Lifesaving appliances
- Personal Survival & medical kits
- Search & rescue communications
- Escape & evacuation routes
- Crisis management plans

Occupational Health and Safety

- Company/ship occupational health & safety policies
- Health & wellbeing
- Personal health
- Health awareness – mental & physical
- Short/long term hazards to health
- Safe working practices
- Tripping/falling/bumping/crushing hazards
- Provision, maintenance, access & use of PPE
- Accident recording, reporting, investigation & feedback

System safety

- Hazards to/from crew
- Human element in analysis of risks
- Human element in treatment of risks
- Ability to respond
- Ability to monitor
- Ability to learn
- Ability to anticipate
- Business imperative
- Potential for human & organisational error
- Potential for environmental damage & pollution
- Training & familiarization

Human element **considerations** will raise human element **issues** which if not addressed can become system **hazards**.

In ship design and operation this list of Human Element considerations should be examined for issues.

Where these are identified the potential hazards to effectiveness, efficiency, safety and user satisfaction should be assessed and addressed as appropriate.

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