

Naval Architects & Designers

- Recognise that the operational safety and business effectiveness of ships are dependent on a number of elements all working together in an integrated way
- Fully understand the importance of the human element to assure good design and construction as well as operational aspects
- Ensure that the introduction of technology and reductions in manning take account of responsibility and human competence, capabilities and limitations (e.g. fatigue and stress) or available procedures and resources
- Fully understand that an ergonomics approach to design must be human-centred
- Fully understand that design must take full account of the nature of the task and its implications for the human
- Be aware that the environment in which a system, product, service or facility is intended to be used has to be identified and described
- Be mindful that ergonomics must be considered early and continuously within the design process
- Be mindful that sufficient attention should be given to the application of ergonomics principles in order to prevent any negative effects
- Be mindful that ergonomics criteria must be established for the design
- Be mindful that conceptual and detailed designs shall take account of ergonomics criteria
- Be mindful that the users (or potential

users) must be involved in the process of design

- Distribute functions between the human, machine and organisational elements of the system best able to fulfil each function
- Develop a practical model of the user's work from the requirements, context of use, allocation of function and design constraints for the system
- Produce a description of how the system will be used
- Produce designs for the user-related elements of the system that take account of the user requirements, context of use and human element data
- Be aware that evaluation of the ergonomic design of any system, product or service must be based on established ergonomic criteria
- Revise design and safety features using feedback from evaluations

Note: The type of user involvement will differ for different roles. For equipment and systems design the understanding and usability of complex and novel functions will be a major issue and this will require fairly direct user input. For naval architects the issues will probably be related to ergonomics, health and safety, interior design and other aspects that have been standardised and there may even be regulation. However, wherever there is uncertainty users will have to be involved in some way

Project Managers

- Understand that human-centred design should be planned and integrated into all phases of the product life cycle
- Understand that any plan for human-centred design should form part of the overall project plan
- Be mindful of the need to adopt process modelling and assessment as an element in the assurance of timely and effective system delivery
- Be mindful that the design process is iterative
- Be aware that the design team should include multi-disciplinary skills and perspectives
- Be mindful that project planning should allocate time and resources for the human-centred activities
- Ensure that users are involved throughout the lifecycle such that the design is driven and refined by user-centred evaluation
- Fully understand and specify the context of use such that design is based upon an explicit understanding of users, tasks and environments
- Fully understand the need to identify user needs and specify the user requirements
- Ensure that the design addresses the whole user experience
- Ensure that design solutions include ergonomics and user requirements
- Be mindful of the need to consider the relative importance of ergonomics in the project
- Be mindful of the need to identify and describe the environment in which a system, product, service or facility is intended to be used, taking full account of the nature of the task and its implications for the seafarer
- Be mindful of the need to design for the target population and the whole user experience
- Be mindful of the need to drive and refine the design by user-centred evaluation and use of established ergonomic criteria
- Include multi-disciplinary skills and perspectives in the design team

Note: The senior management of manufacturers and shipyard have a responsibility to analyse and understand the value of quality in use of their products and to champion HCD

Shipowner/Operator

- Include and integrate human-centred design into the overall project plan and all phases of the product life cycle
- Integrate milestones for human-centred activities into the overall design and development process
- Allocate time for iteration and the incorporation of user feedback, and for evaluating whether the design solution satisfies the user requirements
- Identify the range of skills and viewpoints required
- Involve workers or users (or potential workers or users) in the process
- Identify and use the most suitable formats for exchanging human element data
- Include human resources and human-centred design in corporate procedures, standards and guides
- Define and maintain human element processes, methods, tools, techniques and test facilities
- Perform research into required ship and system usability for future operating concept
- Define usability as a competitive asset
- Set usability objectives for ship operation
- Develop user-centred infrastructure
- Perform early analysis of the future operating concept
- Identify expected context of use for possible future operating concepts
- Relate human element issues to business benefits
- Identify human element issues and aspects of ship operation and design that require crew input
- Take account of crew input and inform crews of changes made
- Select and use the most effective method to obtain crew input
- Plan user involvement
- Assess the risks of not involving crewmembers in each evaluation
- Take account of human element issues in acquisition
- Include human element review and sign-off in all reviews and decisions
- Take effective actions to address human element risks
- Assess the extent to which human element considerations are likely to be met by proposed operations
- Review the design and operation of the ship for adherence to regulations and industry guidelines
- Analyse feedback on the operation of the ship and inform the company of emerging issues
- Maintain contact with all involved staff throughout the introduction of the ship or new operation
- Test that the ship and its systems will meet the needs of the crew, the operation and the environment
- Build the required competencies into training and awareness programmes
- Identify, specify and deliver the training and support for the operation of the ship

Note: Responsibility for usability rests with the owner/operator. However, naval architects, designers and project managers need to address many of these topics so that they have the capability to respond to owner/operator requests