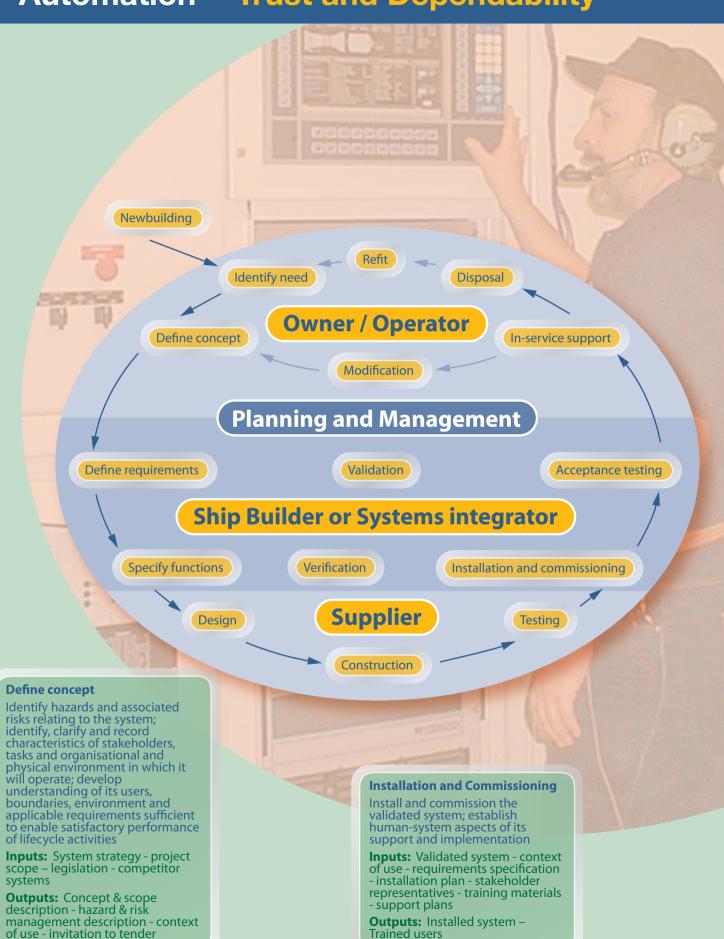
Automation - Trust and Dependability





Planning and Management

Specify how the required technical, quality, safety and human-centred activities integrate and fit into the whole system lifecycle

Inputs: Concept and scope description - terms and conditions of contract - requirements specification - context of use

Outputs: Project Plans - installation plan - validation plan

Validation

Validate that the system meets its requirements specification; ensure that it meets the requirements of the users, the tasks and the environment

Inputs: Validation plan requirements specification project plan - context of use – standards & legislation - user feedback

Outputs: Validated system - validation report - validation log

Define requirements

Define complete, correct and unambiguous set of functional and non-functional requirements for the system; establish requirements of the organisation and other stakeholders acquiring or utilising it, taking full account of needs, competencies and working environment of each relevant stakeholder

Inputs: Concept & scope description - hazard & risk management description - project scope - user representatives - industry/national/international standards

Outputs: Requirements specification - revised context of use

Identify need

Refine the need for a system

Inputs: Company strategy
- crew, market &
technology forecasts replacement request experience gained from
existing systems legislative requirements

Outputs: Business requirement - context(s) of use - system strategy concept and scope description

Design

Draw on established state-of-the-art practice, experience and knowledge of the supplier and other stakeholders and on the results of the context of use analysis, to design the system to meet specified requirements; design the operation, maintenance, training, support and other procedures that ensure that it performs as required in use; develop integration testing approach and products

Inputs: Requirements specification - context of use - rules & regulations - standards & codes of practice – legislation evaluation report

Outputs: Design documentation - integration & test specification - training needs of crew - support plans

In-service support

Operate and maintain the system to keep the required dependability

Inputs: Installed system - operation & maintenance procedures - system manuals - support plans

Outputs: Operation & maintenance log - monitoring log

In order for the marine industry to gain full benefit from computer-based systems, such as ship automation, it is necessary for crews to place appropriate trust in the system and that the system is sufficiently dependable for the task. The International Standards Organization (ISO) has developed a total system, human-centred, risk-based, through-life approach to the specification, design, introduction and use of operationally effective and commercially efficient software intensive marine systems. This is presented in ISO 17894:2005 General principles for the development and use of programmable electronic systems in marine applications, which defines twenty principles and associated criteria for dependable marine systems. This new standard:

- Promotes a systems-oriented view of software intensive systems development;
- Gives user and usability requirements equal emphasis with technical requirements;
- Takes account of operation and maintenance;
- Supports the assessment of innovative designs;

And

• Provides a set of dependability requirements that owners can request for all systems.

Here we present the guidance in ISO 17894 on the lifecycle stages and processes for the definition, development and operation of a dependable and usable computer-based system - from a human element perspective.