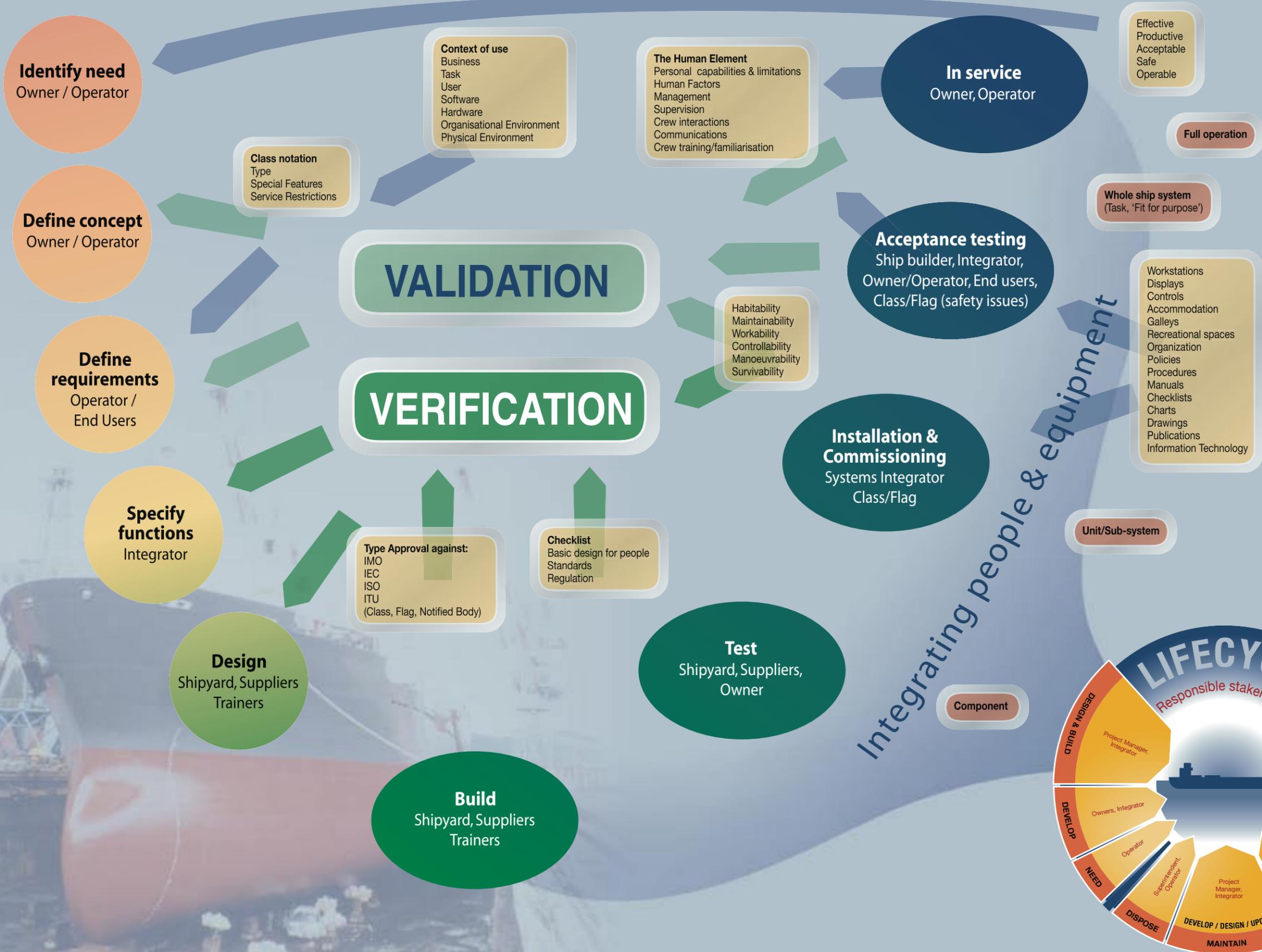


Addressing the human element during build



The operability requirements in the specification will only have an effect if the detailed design, selection of components, Factory Acceptance Tests (FAT), installation, commissioning, and sea trials take account of the needs, limitations and capabilities of the crew. Evaluation of the developing systems is required, taking into account how the equipment will be used, the crew's competence and motivation, their training, the procedures that they will be following and the type of supervision.

Type approval does not fully address ergonomic issues. Design is more about reduction of costs, and system integration is (at best) about making sure that everything is working on the day the ship is delivered. Therefore, additional monitoring is required if the Human Element is to be successfully addressed during build. That is to say:

- Has the manufacturer followed the standards for the intrinsic ergonomic properties of working and living spaces and equipment? This includes health and safety issues from Class, Flag and ILO.
- Has the designer taken account of necessary attributes, context of use (user, task, physical and social environment) and maintainability of the layout and ship's sub-systems? In addition to good operational design this includes the requirements of Class, Flag and ILO, for operational safety.
- Can typical crew perform the intended working procedures with the provided equipment? Is the ship operable in terms of the effectiveness, productivity, acceptability and safety of the crew's work?

The crew form an essential part of the operational ship system. Integration includes ensuring that they are recruited, trained and worked according to the assumptions behind the specification. ISM requires assessment of the risk to operability from any change.

Why evaluate operability? Because it affects the bottom line. Poor effectiveness means human error. Lack of productivity means inefficient use of limited manpower. Safety problems mean compensation or increased premiums. Low acceptability decreases motivation.