Ergonomic criteria for control room equipment and layout A checklist

Alert!

User interaction

In accordance with ergonomic standards ❑
Response speed sufficient for interaction without disrupting task ❑
Comfortable for long watches ❑
Operator interface permits monitoring, control/supervision of machinery/equipment ❑
Visual/audible/mechanical feedback acknowledges operator input ❑
Functions requested by operator confirmed by displays on completion ❑

Visual clarity

Information clear ❑
Display formats free from irrelevant information ❑
Logical grouping & structure of information ❑
Display formats not densely packed/cluttered ❑
No distraction from user's primary tasks ❑

Consistency

Information consistently presented within & between sub-systems ❑
No confusion/errors through inconsistencies ❑
Graphical symbols and colour coding in accordance with recognised International Standard ❑
Symbols used in mimic diagrams consistent across all displays ❑
Screen layout & arrangement of information consistent ❑
Flashing of information reserved for unacknowledged alerts or transient states ❑

Compatibility with users' expectations

Information/labelling in accordance with recognised standards/conventions ❑
Information in form that users are accustomed to ❑
Control functions work as users expect ❑
Equipment mode obvious to user ❑

Alarms

Provision of alarms consistent with Human Hazard Assessment ❑
No unnecessary alarms ❑
Alarm philosophy based on good practice ❑
Accepting/cancelling alarms do not cause distraction/excessive workload ❑
Alarms prioritised/grouped to reflect urgency ❑
Captions/alarm list messages easily understood ❑
Different audibles easy to distinguish ❑
Sufficient alerting when user busy with other item of equipment ❑

Error prevention and correction

Failure indications clear & unambiguous ❑
Sufficient information to identify cause of failure ❑
Assistance in recovering from user error ❑
'Undo' function provided ❑
Single user errors identified and avoidable ❑
Operator confirmation provided for control action that could affect safety of ship ❑

Flexibility and control

Equipment meets needs of different users ❑
User 'in control' of sequence of commands/actions ❑
Able to switch between tasks with some incomplete ❑
Obvious to team who is in control of particular function(s) ❑
Transfer of control compatible with good watchkeeping procedures ❑

Situation awareness

Functional overview display provided ❑
Equipment & arrangements assist operator in maintaining awareness of overall situation ❑
Operator not absorbed in what equipment is doing ❑
'Head-down mode' avoided ❑

Automation and status indication

Operating mode of machinery & equipment clearly indicated ❑
Defects/failures & their implications obvious to user ❑
Able to override automation or intervene part way through process ❑
No monotonous monitoring tasks ❑
Procedures & assigned tasks address failure modes ❑

Support for operator tasks

User interaction in accordance with task requirements ❑
Needs of all watch conditions & situations considered ❑
Specific needs of particular users considered ❑
Workstation design supports teamworking & assignment of tasks ❑
Operator able to crosscheck control actions ❑

Supporting tasks

Adequate storage of manuals, log books, work surfaces, etc ❑
Able to perform background tasks at workstation ❑
Background or supporting tasks do not cause distraction or additional workload ❑

Panel layout

Panel layout logical ❑
Items grouped & sequenced in manner that supports correct use & helps to prevent errors ❑
Controls & displays positioned according to frequency, urgency and criticality ❑

Controls & displays grouped according to sequence of use ❑
Keyboards divided logically into functional areas ❑

Controls, displays & labelling

Controls, displays & labelling clear & easy to access ❑
Purpose of each control clearly indicated ❑
Controls and indicators easily distinguishable ❑
Displays & indicators present operator with clear, timely & relevant information ❑
Operating mode of machinery & equipment clearly indicated ❑
Failure indications clear & unambiguous ❑
Sufficient information to identify cause of failure ❑
Display visibility satisfactory in conditions of daylight, darkness or no natural light ❑

Documentation design

Appropriate formats of documentation provided ❑
Documentation consistent with equipment ❑
Documentation provided in correct language ❑
Documentation easy to use ❑
Documentation does not cause distraction from safe and effective watchkeeping ❑
Needs of all watch conditions and situations considered ❑
Specific needs of particular users considered ❑

Environment

Control room environment meets criteria for heating, ventilation, air conditioning, airflow, humidity, heat sources; noise; vibration; ship movement ❑
Lighting sufficient to avoid glare/reflections from working & display surfaces, flicker-free ❑
Non-reflective or matt finish on surfaces ❑

Field of view

External view meets Regulatory requirements ❑
Satisfactory horizontal field of view from each workstation ❑
Satisfactory vertical field of view over bow from conning & manoeuvring positions ❑
Window inclination, dimensions, framing & heights of upper & lower edges satisfactory ❑
Satisfactory view between different workstations/operators ❑

Room layout

Layout supports operation in all watch conditions & emergency situations ❑
Location of equipment appropriate to operator task does not cause distraction to other users ❑
Sufficient space & access for intended number of operators in expected operating conditions ❑
Local control stations positioned to minimise risk of harm to operator ❑
Instruments face operator's intended working position ❑

Access

Access to & within control room meet ergonomic criteria ❑
Controls easily accessible to operator at workstation ❑
Layout of control room meets ergonomic criteria ❑
Ease of maintenance addressed ❑
Ease of cleaning addressed ❑

Occupational safety

Measures for occupational safety, including grab rails, non-slip surfaces, warning signs, protective clothing, protuberances, safety equipment marking, escape & survivability, security, cleaning ❑
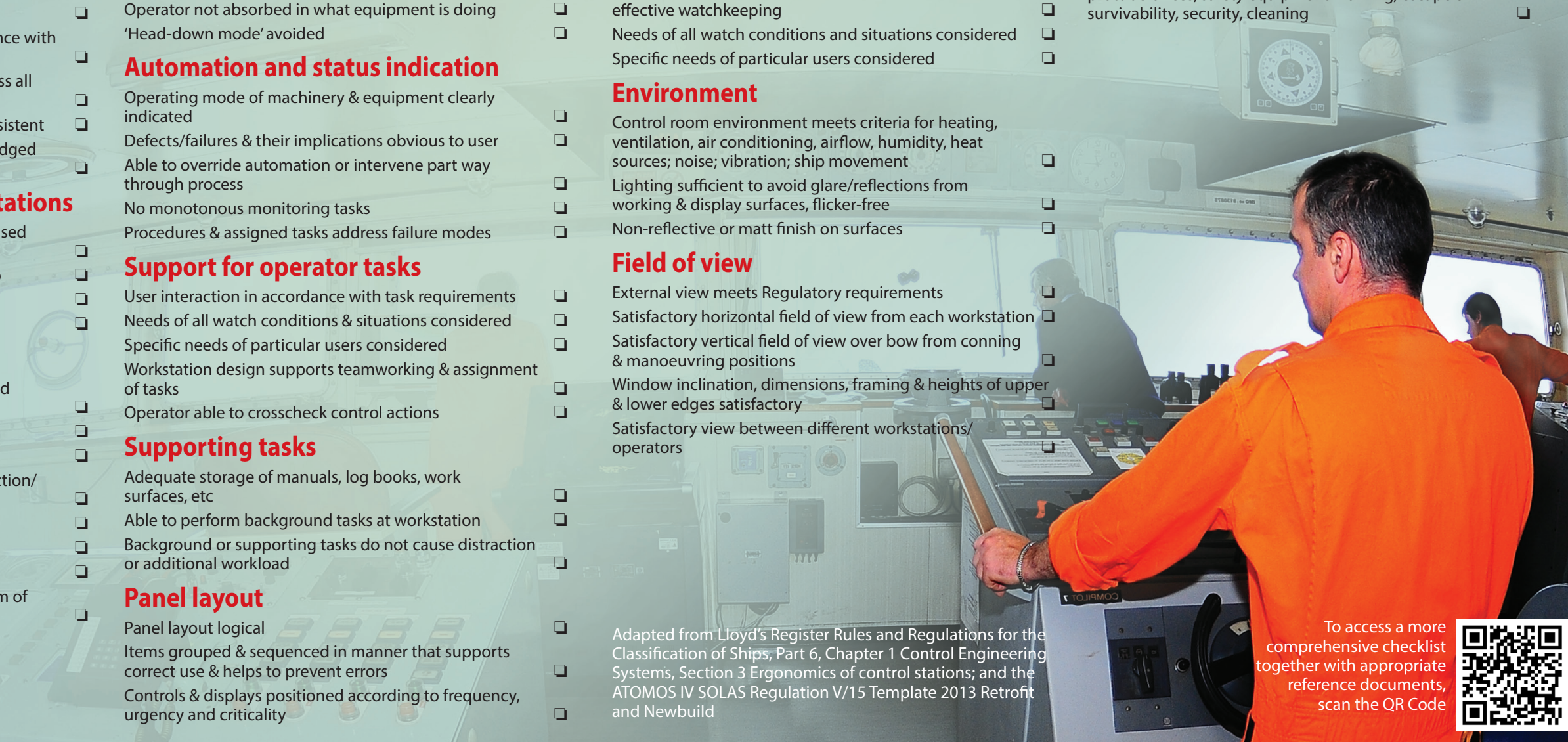
To access a more comprehensive checklist together with appropriate reference documents, scan the QR Code