

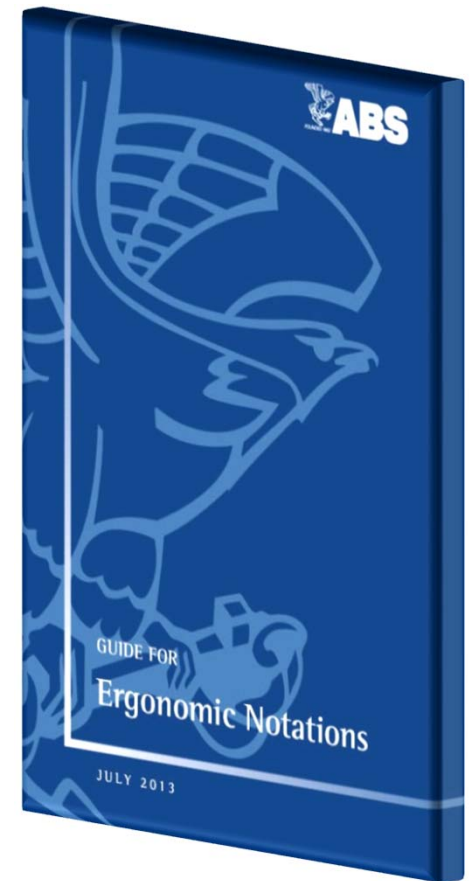


ABS

ABS Guide for Ergonomic Notations

ABS Guide for Ergonomic Notations

- Addresses structural aspects of four vessel areas
- Can be applied to ships or offshore structures
- Ergonomic notations for:
 - Topside interface design (**ERGO TOP**)
 - Enclosed space and hull interface design (**ERGO ES**)
 - Maintenance access and design (**ERGO MAINT**)
 - Valve locations, access and operation (**ERGO VALVE**)



ABS Guide for Ergonomic Notations

- Requirements limited to human and vessel structure compatibility
 - Anthropometry
 - Biomechanics
 - Reach and working envelopes
- Cognitive factors not addressed (e.g., information display)
- Environmental factors not addressed (e.g., noise, vibration)



Why the ABS ERGO Notations?

- Owner and Operator
 - Interested in improving crew safety
 - Increase crew performance / productivity
 - Decrease costs
- ABS Activities
 - Revisions of existing ABS HAB Guides
 - ABS research into mariner personal safety
 - Revision of Ergonomics Guidance Notes
- IMO and Industry Initiatives
 - Goal Based Standards (GBS) initiatives
 - ILO Maritime Labour Convention



Ergonomic Related Crew Injuries*

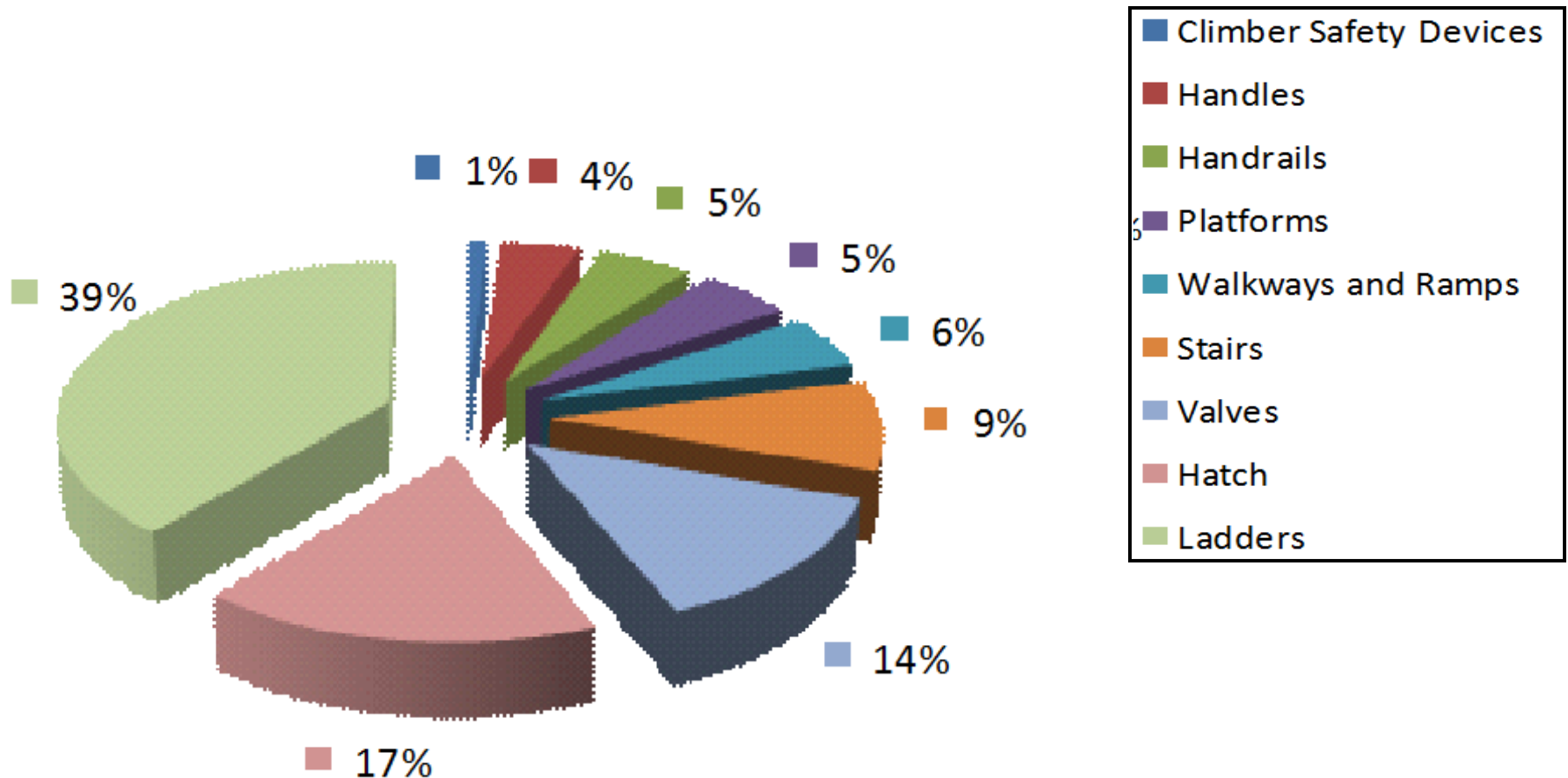
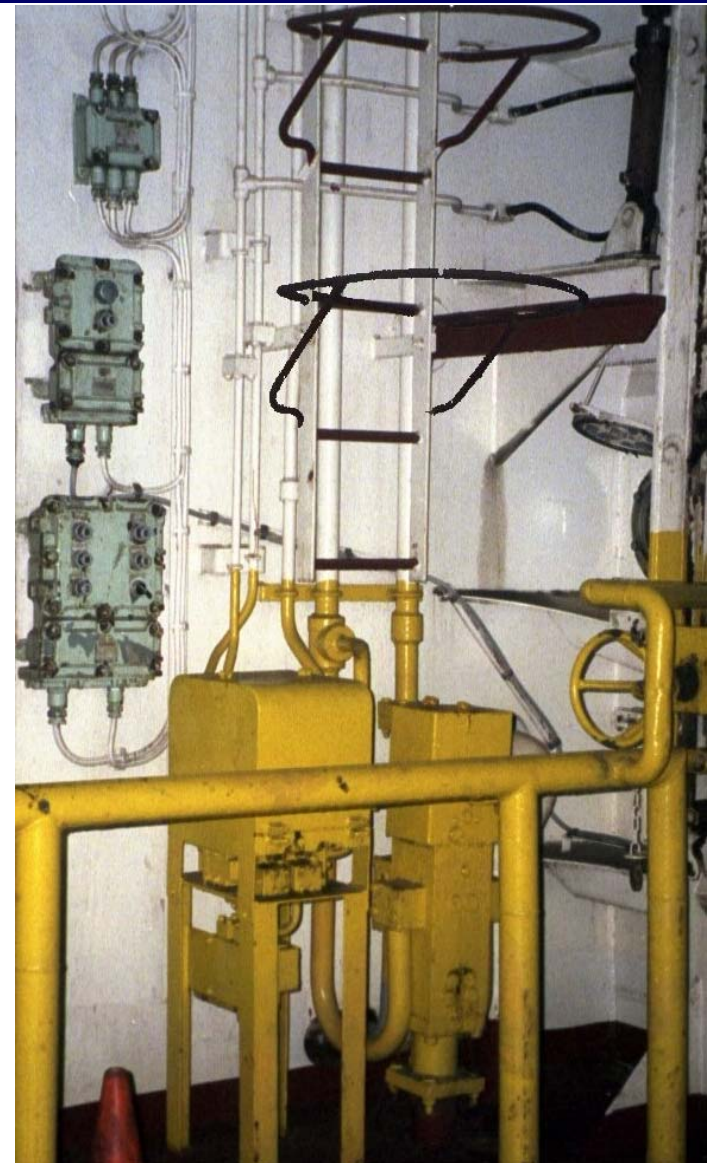


Chart data represents ~24% of all crew injuries

Crew Interaction with Vessel Structure

- Stairs, walkways and ramps
- Vertical and inclined ladders
- Guard rails and climber safety devices
- Fall protection from secondary fall points
- Work platforms
- Handles
- Hatches
- Doors and scuttles
- Manual valve operation, access, location and orientation
- Maintenance access

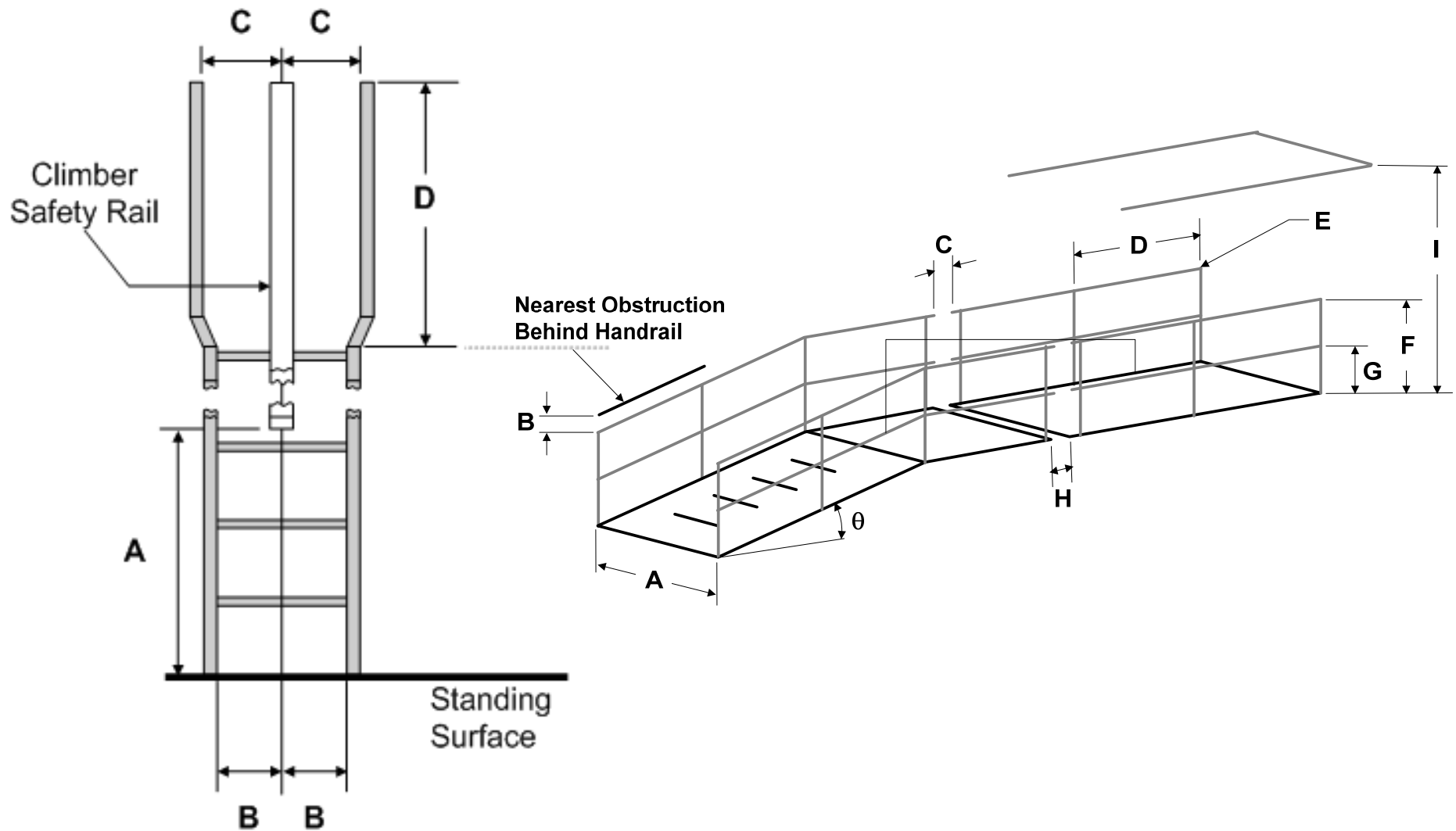


ERGO TOP (Topsides)

- Generally addresses vessel areas from the main deck (weather deck) upward
- Involves structures and accesses
 - Ladders and landings
 - Climber safety devices
 - Platforms
 - Stairs
 - Walkways



ERGO TOP (example)

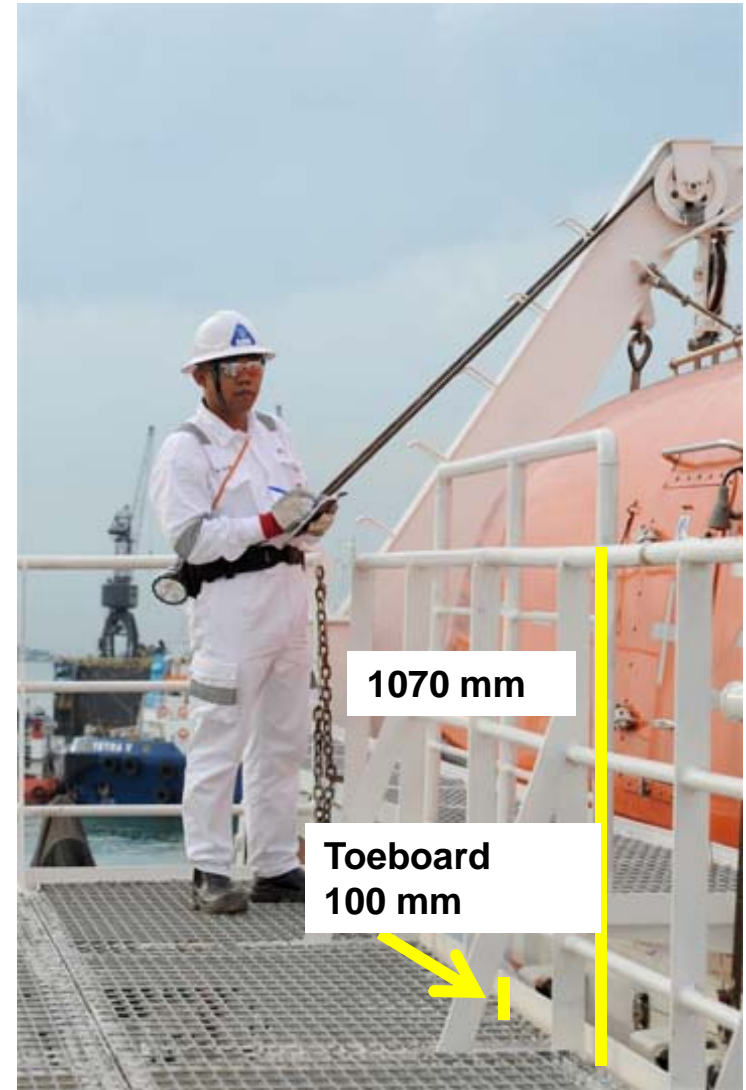
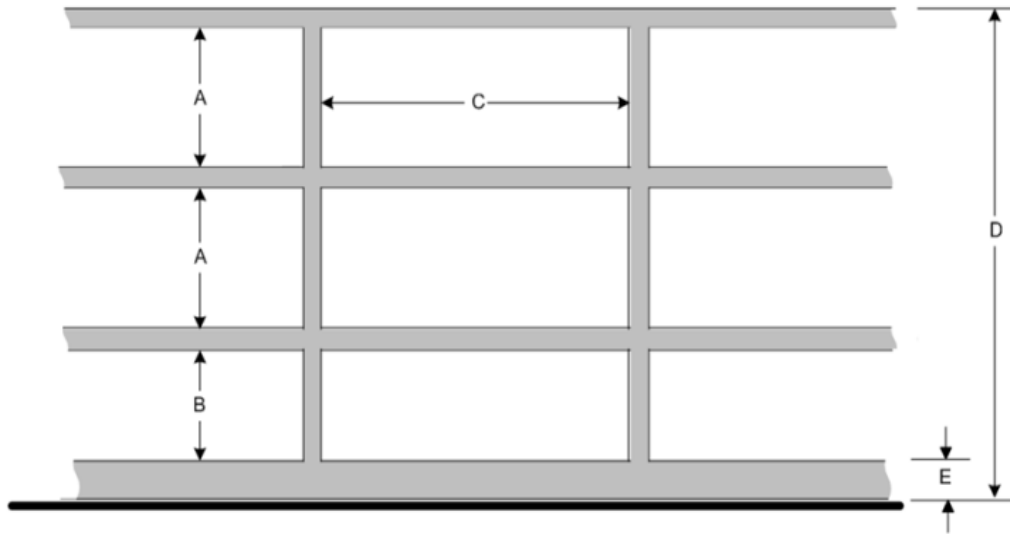


Guardrail Design

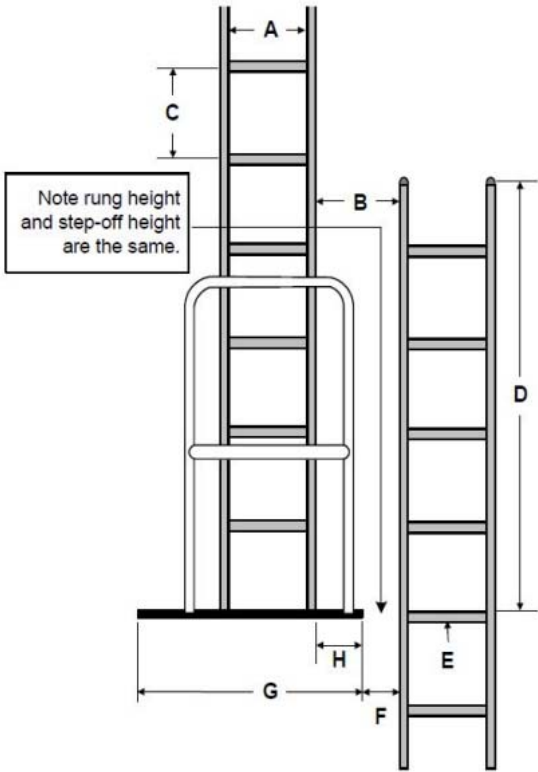
FIGURE 12
Deck Edge and Elevated Walkway Rail Dimensions

	<i>Dimension</i>	<i>Requirements</i>
A	Upper rail courses vertical separation	≤ 380 mm (15 in.)
B	Lower rail course vertical separation	≤ 230 mm (9 in.)
C	Vertical stanchion separation	≤ 1525 mm (60 in.)
D	Rail height from deck to top of rail*	≥ 1070 mm (42 in.)
E	Toeboard height	100 mm (4.0 in.)

*Note: Assumes handrail diameter of 50 mm (2 in.).



Staggered Vertical Ladder



4.4 Vertical Ladder Design and Dimensions

The following figures present requirements for vertical ladders design and dimensioning:

- Figure 2, "Staggered Vertical Ladder"
- Figure 3, "Vertical Ladders (General Criteria)"
- Figure 4, "Vertical Ladders to Landings (Side Mount)"
- Figure 5, "Vertical Ladders to Landings (Ladder through Platform)"

FIGURE 3
Vertical

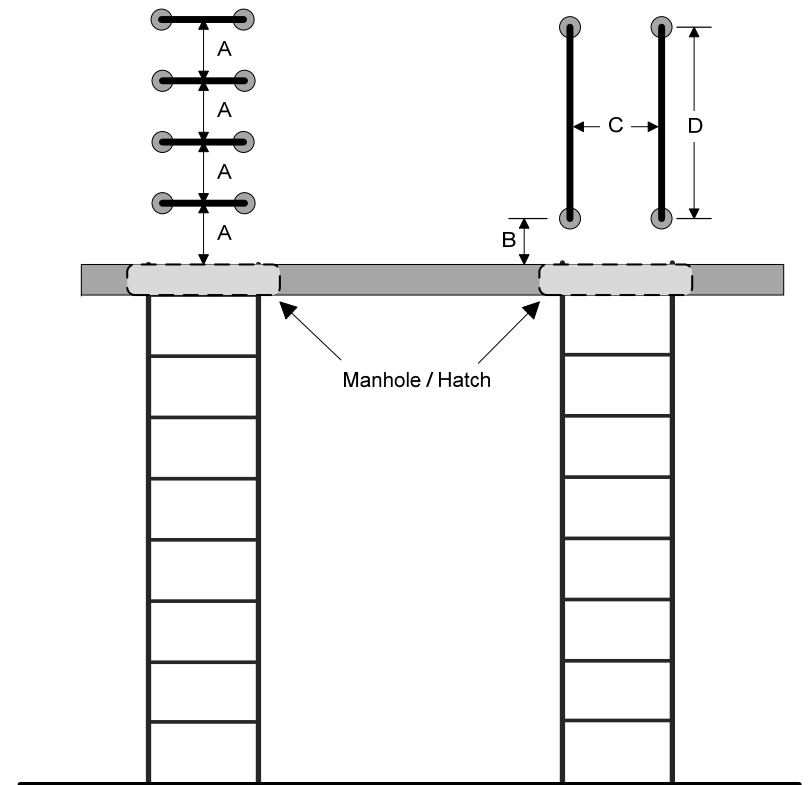
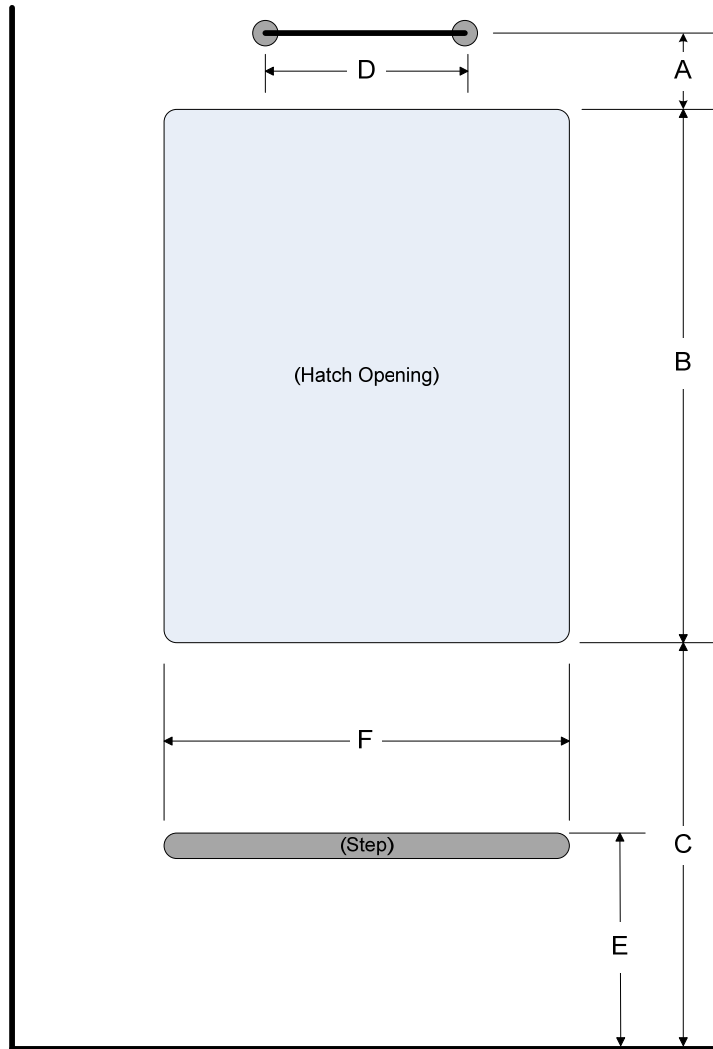


ERGO ES (Enclosed Space)

- Areas within the hull, below the main deck
- Similar coverage as topsides, tailored for cargo and machinery access including:
 - Ladders and walkways
 - Hatches and passages
 - Lifting devices
 - Doors and scuttles

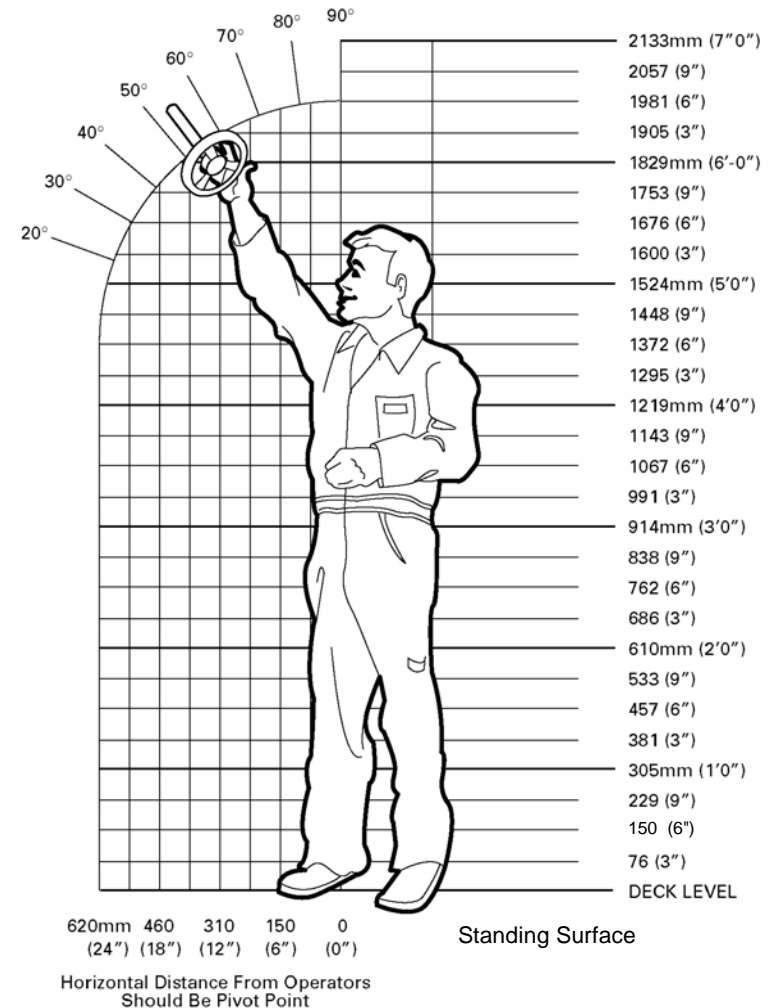


ERGO ES (example)



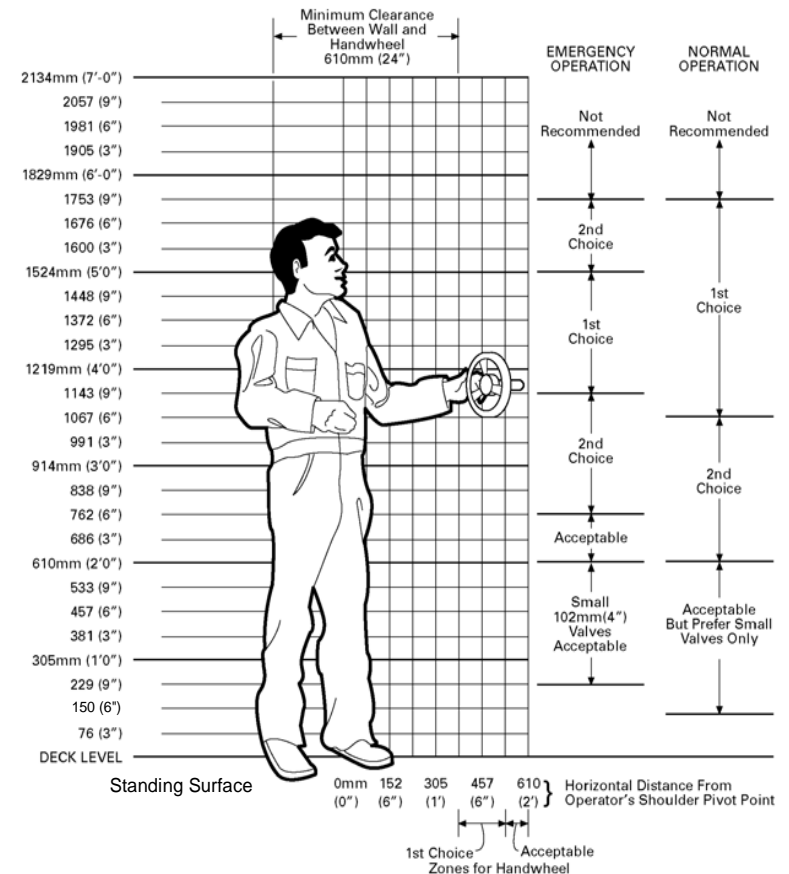
ERGO VALVE

- Addresses design and accessibility of valves
- Manual and motor operated (for maintenance)
- Topics include:
 - Valve criticality and location, access, reach envelopes
 - Mounting heights and orientations
 - Mode(s) of operation, biomechanics of operation
 - Force requirements, support devices (extenders, bars)



ERGO VALVE (Valve Criticality Analysis)

- Category 1 – valves critical for safety or operations or are also used frequently for routine maintenance
 - Example
 - Emergency shutdown valves
- Category 2 – valves not critical for operations but required for routine maintenance
 - Example
 - Condensate drain valves
- Category 3 – valves not critical for operations and are infrequently used
 - Example
 - Valves used in drydock only



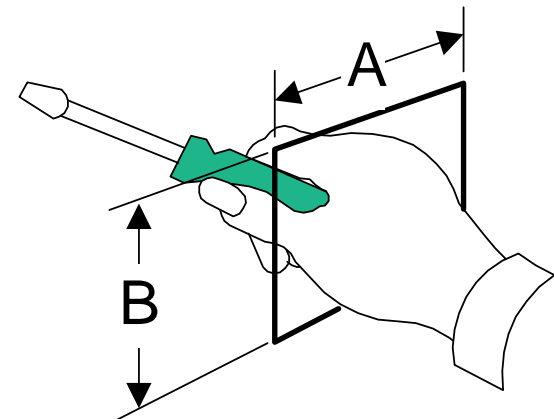
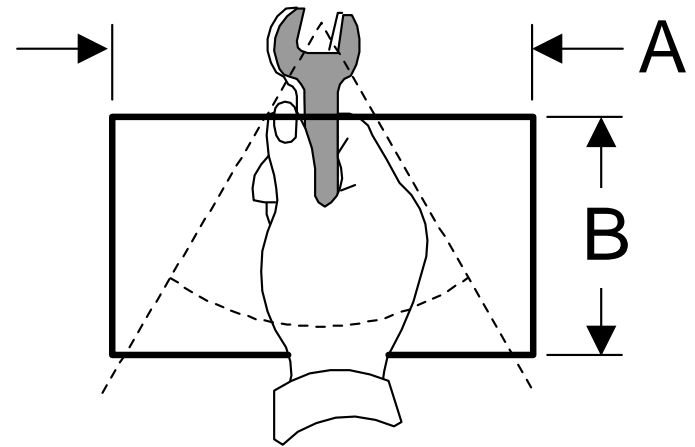
Criticality Analysis: Valves

- Analysis to determine Category 1 and 2 valves
- Analysis participants:
 - Vessel designers
 - Construction yard
 - Owner's representatives
 - ABS Engineering and Survey
- Category 1 and 2 valves follow the ERGO VALVE criteria in the Guide



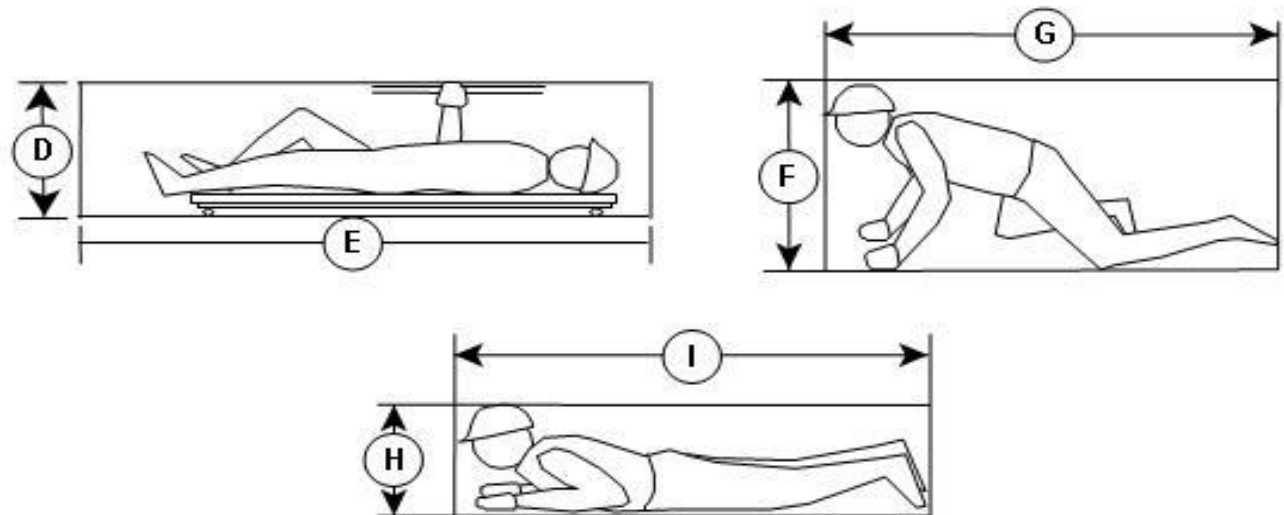
ERGO MAINT (Maintenance)

- Addresses maintenance accesses and workspace, generally on or below the main deck
- Topics include:
 - Access openings, maintenance platforms
 - Reach and access envelopes
 - Space for tools and parts storage
 - Provisions for storage
 - Lifting and moving devices
 - Safety devices



ERGO MAINT (Maintenance)

- Category 1 Maintenance or Operational Access
 - Maintenance/operational actions that are system and safety critical
- Category 2 Maintenance or Operational Access
 - Maintenance or operational actions that are performed frequently
- Category 3 Maintenance or Operational Access
 - Maintenance or operational actions which are considered to be non-critical



Criticality Analysis: Maintenance

- Analysis to determine Category 1 and 2 maintenance activities
- Analysis participants:
 - Vessel designers
 - Construction yard
 - Owner's representatives
 - ABS Engineering and Survey
- Category 1 and 2 maintenance activities follow the ERGO MAINT criteria in the Guide





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