



Designing Means of Access and Related Access Aids

Means of Access: Any item used to safely and efficiently assist movement of personnel, materials or supplies. These can include doors, stairs, vertical ladders, ramps, walkways, passage-ways, hatches, manholes, lightening holes, handrails, railings, work platforms and landings.

Percentile: Given the range of variability of human bodily dimensions, anthropometric data are typically expressed as percentile statistics, such as 5th or 95th percentile. A percentile statistic defines the anthropometric point at which a percentage of a population falls above or below that value. For example, the seated eye height of a 95th percentile North American male is 853 mm (33.5 in), so by definition, 5% of North American males will have a seated eye height of greater than this figure, and 95% will have a lesser seated eye height.

Vessel: Any ship, boat, or offshore installation where people work, live and are subjected to the marine environment.

DISCUSSION

Bodily Injuries

Vessel motions can have a negative influence on a person's mobility. They can introduce instability and increase the energy expended to counter those motions. Using access aids can be awkward in a best case scenario, but with motion access aids present significant safety concerns. When motion-induced instabilities are introduced and the danger of personnel injury is increased, the use of some accesses can be rendered unsafe.

The body can be injured simply from the posture required to complete a single access task; for example, a strained muscle or tendon. The body can also suffer injuries such as muscular and skeletal disorders from repeated exposure to awkward postures required to gain access and to complete tasks. Inefficient access designs can also cause extensive damage to equipment, piping insulation, frayed wires, etc., either due to a fall or from using the damaged equipment as a foot hold. As a result, design guidance and standards for accesses are provided in the recent design standards (ABS, 2007; ASTM, 2007).

A final concern to consider is that crew members often do not use means of access safely, often carrying too much, carrying objects that are too heavy, taking several steps at a time, or not using safety devices such as harnesses.

Inclined Stairs

Stairs are noted as necessary access aids that are associated with more accidents on a vessel than any other access aid.

Traditional maritime design practices allowed for stairs of up to 60° inclination. However, as the angle of inclination of stairs increase, the stair tread gets narrower and the riser height increases. This in turn decreases the amount of tread available to step on, especially during descent, thereby increasing the likelihood of a crew member's foot slipping from, or missing, a step.



In 1990, a major oil and gas exploration and production (E&P) company initiated a program to assist in the design of their first deepwater drilling and production platform. One initiative selected by the company was to reduce accidents and