



Designing Means of Access and Related Access Aids

male, especially those from the Northern European and North American regions. At the lower limit, it is judged more likely for taller crew members to rotate over the rail, as the center of mass (for a 95% Northern European and North American male) is about three inches higher than the height of the rail.

When the center of mass of a human body acts above a guardrail, a person falling against that guard rail will have a greater tendency to rotate over the top of the railing. Further, when the center of mass of a human body acts below the top of a rail that person would have a tendency to rotate under the railing. This action (rotating under the top rail), along with the provision of intermediate rail(s), helps prevent a fall either over or under the top safety rail.

The provision of lower guardrail heights puts taller offshore workers or mariners at a safety dis-advantage. When considering the taller potential worker population, a guardrail height of 42 inches (1070 mm) can help protect approximately 99% of all potential workers (men and women) from falls over the rail.

Based on the state of knowledge, and a large collection of anecdotal data, a number of significant changes in vertical ladder designs have occurred over the past decade. These now appear in related and recent design standards and guidance documents (ABS, 2003; ASTM, 2007). Changes include:

- Elimination of vertical flat bar stringers
- Changes in rung design
- Limitation in the height of a single ladder run
- Use of positive fall protection (i.e., not just climber cages) for ladders over a certain height
- Special protection for ladders located within six feet of the edge of a ship or offshore installation

Walkways and Passageways



A major concern related to the simple task of walking down a passageway is the presence of bulkhead mounted equipment. Items mounted on a bulkhead, such as an electrical junction box or a fire hose box and fittings, present safety hazards. Further, it is advisable that passageways be kept free of any bulkhead-mounted objects if a passageway has any of the following characteristics (Zohar, 1978):

- Passageway is used under emergency conditions (e.g., foot traffic may be moving at accelerated speeds, passageway is used to transport injured crew members or emergency equipment)
- Passageway width is narrow
- Marginal lighting is present (such as emergency lighting lanterns, bridge companionways).

Where minimum widths are offered in walkway and passageway design standards they define the minimum clear walking surface. This is different than the dimensions of the walkways or passageway bulkheads with a walking area impeded by items mounted on walkway or passageway bulkheads. There should be suitable upper clearance for items mounted on a walkway or passageway bulkhead to prevent a person from accidentally walking into these items (Zohar, 1978).