



*Psychophysical*: pertaining to the mind and its relation to physical manifestations.

*Static Lift*: The physical act of a person attempting to move a fixed or immovable object with muscle contraction, but no motion of the object to which force is applied. A static lift is also known as an isometric lift.

## DISCUSSION

### Materials Handling Factors

There are numerous factors that impact the safety and efficiency of materials handling tasks. For this reason, pre-planning of materials handling tasks should be undertaken before lifting, carrying, or moving any load. Key factors include the actual materials handling task, the size and weight of the load, how the load will be lifted (e.g., manually or with assisted lifting devices), how the load will be moved or transported, the working area, personnel capabilities, and safety considerations. Each factor, either alone, or in combination with other factors, can significantly impact materials handling tasks.

*Task-Related Factors*. Task-related factors, for both manual materials handling and assisted lifting, that should be considered as a part of pre-planning include:

- Vessel and offshore installation layout in terms of porches, hatches, removable plates, crane placement, pathway size, and location for moving loads
- Vessel or installation motions or movement, as well as motions or movement associated with support or supply vessels
- The material's location with regard to access, pathways, hatches, doors, porches, and any obstructions (overhead or on the deck) in the path of movement
- Distance the load needs to be moved, from the origin of the lift to its final destination (e.g. the distance between the point where the object is lifted and the point where the object is placed)
- Type of lifting method (e.g., manually or with assisted lifting devices).

Task-related factors related solely to manual materials handling that should also be considered during pre-planning include:

- Need for support equipment (e.g., carts, trolleys, overhead rail or conveyor systems)
- How personnel will handle the load (e.g., lifting, lowering, carrying, pushing, pulling, and static lifting/loading)
- The duration and frequency of the handling task (e.g., how long and how often will personnel be performing the handling task?)
- The required body postures for lifting and placing (e.g., reaching, bending, and twisting of the torso and flexion of joints such as the wrist, elbow, neck, and knees)
- The distance of the load from the torso of the worker (e.g. the distance between the load and the worker's body)
- Load height at lift origin and termination, as well as carry distance (e.g. the height the object is at when it is initially lifted, and the height at which the object is placed upon completion of carrying the load)
- Effects of gloves and/or other personal protective equipment (e.g. boots, hat)
- Rest/recovery time between lifts.

*Load-Related Factors*. Load-related factors, for both manual materials handling and assisted lifting that should be considered as a part of pre-planning include:

- Weight, size, and dimensions of the load
- "Bulkiness" of the load and the potential difficulty in securing (e.g., strapping) or manually grasping the load
- Stability or instability of the load (e.g., likelihood of the load to shift, including within a container, during movement)
- Center of mass of the load.