NIOSH Lifting Criteria Considerations (Recommendations)

Horizontal Location Reduction
Reduce Horizontal Distance (H) by:
- Specifying a smaller package size to the supplier
- Packaging the object into smaller size
- Storing objects on a turntable to avoid reaching
- Rearranging the workplace
- Providing access to the object from all sides to avoid reaching
- Pulling the load towards you before lifting (use hooks, grabbers, rollers, etc.)
- Educating and training the worker to keep the object as close to the body as possible
- Tilting the load towards the worker before lifting
- Supporting part of the load (on the workbench, table, platform, etc.) before lifting and setting down
- Wearing an apron when handling dirty objects
- Making sure the object is not too hot or too cold

Frequency Multiplier
Reduce frequency (F) by:
- Eliminating some of the manual lifting and lowering
- Increasing duration of lifting for the same amount of material to be handled (example: from 1 hour to 2 hours)
- Using automatic material handling devices (hoists, cranes, lift trucks, forklifts, manipulators, jacks, gravity dumps and chutes, belt and other roller conveyors, etc.)
- Replacing lifting and/or lowering by pushing or sliding (rollers, ball castors, air tables, etc.)
- Lifting/lowering two or more objects each time if an only if the objects are extremely light and very compact
- Assigning more workers to the same job

Increase allowable frequency (F) by:
- Job rotation (lifting followed by light work followed by lifting followed by light work, etc.)
- Reducing the duration of lifting followed by frequent and longer rest breaks (Frequency Multiplier is the highest duration of 1 hour or less and the lowest for lifting duration of greater than 2 hours up to 8 hours)
- Redesigning the workplace to make the initial height for lifting or lowering 30 inches (75 cm.) or greater. A height of 30 inches (75 cm.) is preferred.

NOTE: Maximum allowable frequency for V greater than or equal to 30 inches (75 cm.) is greater than the allowable frequency for V less than 30 inches (75 cm.)

Coupling Multiplier
Improve coupling by:
- Keeping object length (L) within 16 inches (40 cm.) and height (H) within 12 inches (30 cm.)
- Packaging so that contents are stable and center of mass will not shift during lifting
- Having symmetric center of mass for the object
- Changing shape and/or surface texture of the object to make it easier to grip
- Avoiding sharp edges

Our safety evaluations, reports and recommendations are made solely to assist your organization in reducing hazards and the potential of hazards and accidents. These recommendations were developed from conditions observed and information provided at the time of our visit. They do not attempt to identify every possible loss potential, hazard or risk, nor do they guarantee that workplace accidents will be prevented. These safety evaluations, reports and recommendations are not a substitute for ongoing, well-researched internal safety and risk management programs. This report does not warrant that the property inspected and its operations are compliant with any law, rule or regulation.

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• Making sure the object is not too hot or too cold
• Providing properly designed handles or handhold cutoffs
• Packaging the object in a box (instead of a bag) so that it does not sag

Asymmetric Angle Reduction
• Changing the workplace layout to provide the object to be lifted always in front of the worker
• Using conveyors, rollers, turntables, slides, chutes, etc. to change material flow direction
• Providing sufficient work space for the worker to turn his/her feet
• Educating and training the workers to turn their feet rather than twist
• Eliminating time pressures either due to production standards or the production line so that the worker has time to turn his/her feet rather than twist
• Increasing horizontal distance between origin and destination of lift to force worker to turn and take a step rather than twist

NOTE: This will increase energy expenditure, especially for high frequency lifting tasks

Vertical Location Recommendations
Increase Vertical Height (V) by:
• Using adjustable work surface (electric, hydraulic, etc.)
• Raising the work surface or using lift tables
• Storing the objects on a knuckle high platform, work bench, table, etc.
• Don’t lower the object that must be lifted later
• Using a cart with an adjustable platform
• Providing handles or handhold cutouts on the objects

Reduce Vertical Height by:
• Lowering the work surface
• Storing objects at a lower height, preferably at knuckle height
• Providing adjustable platform for the worker to stand on
• Using properly designed and stable step stools. (There is a risk that the worker may stumble and fall down.)
• Using adjustable work surface (electric, hydraulic, etc.)

Vertical Travel Distance Reduction
Reduce travel distance (D) by:
• Redesigning the workplace to keep origin and destination at about the same height
• Using adjustable work surface (electric, hydraulic)
• Using a cart with an adjustable platform
• Storing the object at the same height
• Providing an adjustable platform for the worker to stand on
• Using properly designed and stable step stool. (Note: There is a risk that the worker may stumble and fall down.)
• Raising or lowering the height at the origin of lift as needed and/or lowering or raising the height at the destination as needed
Manual Lifting and Lowering
You may be able to eliminate manual lifting/lowering by:

- Using forklifts
- Using lift trucks
- Using cranes
- Using hoists (electric, hydraulic, magnetic, vacuum)
- Using balances, manipulators
- Using gravity dumps and chutes
- Using drum and barrel dumpers
- Using vacuum systems
- Using belt and roller conveyors
- Replacing lifting by pushing or pulling
- Replacing lifting by sliding (rollers, ball castor tables, air tables)
- Increasing weight so that the object cannot be lifted manually

Object Weight Reduction
Reduce Object Weight (W) by:

- Specifying smaller quantity to the supplier
- Packaging in smaller quantities
- Using light weight containers
- Using mechanical assistance (simple levers)
- Replacing lifting by pushing, pulling, sliding, tilting or turning the object
- Team lifting—use two or more workers to lift the object