

Safety in Material Handling

Material handling is the job done by every worker in an industry from unloading raw materials , dispatching the finished product and Materials handled between operations in every department or plant of the company.

Mechanized material handling equipment has come into the industry to eliminate the human handling or to assist the person to handle move, varied and heavy objects. Mechanical handling of materials reduces manufacturing cost and increases the productivity. At the same time mechanical handling has , a new set of hazards and injuries.

The accidents in material handling are almost due to human failure or unsafe acts rather than mechanical failures or unsafe conditions. The ratio between unsafe acts and unsafe conditions in material handling accidents is 4 to 1.

The following statistics , highlights the magnitude of material handling problems to be solved in eliminating the unsafe acts and conditions .

1. For every ton of finished product 50 to 120 ton of equivalent material has to be handled.
2. 2/3 of manufacturing cycle is material handling.
3. 40% accidents are due to unsafe material handling.
4. 80% accidents in material handling are due to human failure or unsafe acts.

Materials are handled in three methods:

- i. Manual handling
- ii. with the help of hand tool
- iii. Mechanized material handling

The accidents and injuries that are common in unsafe material handling work are :

- a. Dropping or slipping of objects on the foot.
- b. Body organs Pressed in between objects and lifting tackles.
- c. Cuts due to sharp edges.
- d. Burns due to hot or corrosive substance.
- e. Sprains while lifting materials by wrong method.
- f. Scalp injuries while working in confined spaces

Manual Handling :

Manual handling means using physical strength to move materials. This method increases the possibilities of injuries and adds to the cost of product.

To reduce the number of material handling injuries and increase the efficiency, material handling to be minimized by combining and eliminating operations or mechanization.

Even after all elimination and mechanization there will be still objects to be lifted manually for which the following factors are to be taken into consideration for safe acts in materials handling.

Factors to be considered before attempting to lift a load

1. Material to be handled, terrain or the surface.
2. The distance to be moved.
3. The direction of the load to be taken.
4. Volume and weight, shape and size.
5. Frequency.
6. Mode of handling.

TEACH: - Training in safe material handling practice.

WATCH: - Remind constantly for safety.

CATCH: - Correcting unsafe acts.

Training and constant supervision will reduce the unsafe acts :

1. Inspect materials for sleeves, jagged edges burns, rough or slippery surfaces.
2. Get a firm grip on the object.
3. Keep fingers away from material resting points, especially when setting down on the rollers.
4. When handling timber, pipe or other long objects keep hands away from the ends to prevent them from being pinched.
5. Wipe of greasy, wet, slippery or dirty objects before trying to handle them.
6. Most strains and back injuries occur while lifting and setting down objects by hands.

PROPER METHOD OF MANUAL HANDLING :

- a. Consider the size, weight and shape of the object to be carried. Do not lift more than the object that can be handled comfortably. If necessary get help from others.
- b. Set feet solidly. One foot can be slightly ahead of the other for increased effectiveness. Feet should be enough apart to give good balance and stability(approximately the width of the shoulder).
- c. Get close to the load as possible. Bend legs about 90 degrees at the knees. Crouch do not squat. It takes about twice as much effort to get up from squat.

- d. Keep the back as straight as possible. Bend at the hips, not the middle of the back.
- e. Grip the object firmly. Maintain the grip while lifting or carrying. Before changing or adjusting the grip set the object down again.
- f. Straighten the legs to lift the object, and at the same time bring the back to a vertical position. Look upward when beginning to lift.
- g. Never carry a load you cannot see over or around. Make sure the path of travel is clear. Carry the object close to the body.
- h. Never turn at the waist, to change the direction or to put an object down. Turn the whole body and crouch down to lower the object. To keep hands from being pinched against down first, so that the fingers can be removed from under the sides.

Team Lifting and Carrying

- a. When two or more men must carry a single object, they should adjust the load so that it rides in level and so that each person carries an equal part of the load. Trial lifts can be made before proceeding.
- b. When two men carry long sections of pipe or any lengthy material, they should not carry on the same shoulder and walk in unison. Shoulder pads will prevent cutting of shoulders and help to reduce fatigue.
- c. When a gang of men carries a heavy object like a rail, the foreman or the leader should direct the work and special tools such as tongs should be used.
- d. Normally the gang leader has different signals, like blowing whistle or hand clapping for different operations of which the men are familiar.
- e. New employees and men who move slowly need special attention.

Handling materials of Specific Shapes

Sheetmetal:

Sharp edges of sheet metal is to considered and leather hand gloves and safety boot to be used

BarrelandDrum:

Barrel lifting handle or manila rope to roll up or down on a ramp to be used.

Glasspanes:

Hand gloves and long leather sleeves, apron, leg guard and safety boot to be worn.

Longobjects:

Long pieces of pipes, bars, timber should be carried over the shoulders with the front end raised to prevent striking other employees. Shoulder pads to protect abrasion on the shoulder to be used.

Scrapmetals:

The irregularly shaped jagged, mingled objects and strips or pieces may fly when piece is removed from a pile. Workmen should wear goggles, leather gloves, safety boot, leg guard and apron.

Gas cylinders:

Compressed gas cylinders should be handled carefully. Do not drag the cylinders on floors.

Boxes, cartons & sacks:

The best way to handle boxes and cartons is to grasp the alternate top and bottom corners.

While handling materials manually the safety equipments should be appropriate to the type of material. Where toxic or irritating solids are handled, workmen should take daily showers to remove the materials from the persons.

MECHANISED MATERIAL HANDLING EQUIPMENTS AND ACCESSORIES

a. Cranes:

EOT or MOBILE cranes they should not be over loaded. EOT crane is to be used to lift and move materials and not to be used as side pulling. Cranes should not be stopped with jerky motion, where the swinging material will fall due to displacement of slings.

Crane movements, while material is being moved or repair work is being done should be governed by a standard code of signals transmitted to the crane operator .

Clear signals only to be taken, when the signal is not clear , crane should not be operated .

The operator should move the hoisting apparatus only on signals from the proper person, but to stop signal should be obeyed regardless of who gives it, otherwise it would result an accident. The operator should be governed absolutely by the signal.

Crane rigger should be distinguishable from others, for easy spotting by the crane operators.

Employees who work near cranes or assist in hooking on or arranging loads should be instructed to keep out from and under load.

SAFE ACTS IN OPERATING A CRANE

1. No one but an authorized operator be allowed to use any crane.
2. When on duty, authorized operator should remain in the crane cabin ready for prompt service.
3. Operator should never go on top of the crane or permit anyone else to do so without opening the main power disconnect switch and locking it 'OFF' with a padlock.

4. Before moving the trolley or crane bridge, operator should be sure that the hook is high enough to clear obstacles.
5. Operator should never permit the crane to bump into another crane or the buffers.
6. Operator should Examine the crane at the start of every shift for loose or defective gears, keys, runway railings, warning bell, signs, switches, down shop leads and cables and report defects. Make sure that the crane is kept clear and well lubricated.
7. While hoisting equipment is in operation, the operator should not be permitted to perform any other work and he should not leave his position at the controls until the load has been safely landed or returned to ground.
8. Operator should not carry the load over men on the floor, sound the bell when necessary.
9. Operator should not allow men to ride on a load or on crane hooks.
10. If the power goes off, move the controller to 'OFF' position until power is available again.
11. Fire extinguisher should be kept filled and in working condition.

SAFETY RULES FOR CRANE OPERATORS

1. Never pick up a load which is beyond the rated load capacity of the crane.
2. Never move the load or the crane unless you understand the signal.
3. Do not allow the load to swing.
4. When hoisting or lowering the load have clear space between load and adjacent machineries or objects.
5. Do not smoke while operating a crane.
6. Never leave a load suspended.

SAFETY RULES FOR SLINGERS

1. Check the slings before taking it for use at the beginning of each shift.
2. A sling that has a stretched leg should not be used.
3. Choose the proper sling (SWL, wire or chain) according to the weight of the object to be lifted.
4. Use proper attachments so that, when lifted the object will not fall or tilt.
5. Satisfy yourself before giving orders to crane operator that all slings are securely holding.
6. Distribute the load equally on the legs of the sling.

7. The slings are not kinked, twisted or knotted.
8. Cylinders should be carried in a special cradle.
9. The hook should be centered on the load before hoisting signal given.
10. Slings should be lying on the center of the crane hook.
11. Hands should be kept out of pinch points , while hooking or unhooking .
12. Before slinging a load , find out if the unloading position is clear.
13. Sharp edged objects usually lifted with chain slings. When suitable chain slings are not available , wire rope sling with proper packing to protect the wire rope to be used.
14. Loose articles, should not be left on the load while moving the load.
16. When using shackle the pin should be fully screwed.
17. Machined objects should be lifted with manila rope slings. When using wire rope slings give wooden packing between the load and the sling.
18. Never carry load over men.
19. Always guide the load in moving. Go before long objects. When the load has to be raised and moved due to obstruction tie a line to the load and guide it.
20. Do not attempt to lift the load when the load is away from vertical reach of the crane hook.