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Manual Material Handling Procedure

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1.0 PURPOSE

Handling of equipment and material is an essential part Operation and Maintenance. Manual techniques used to exert force on equipment, supply, and material movement can lead to both immediate acute injuries, and long-term chronic musculoskeletal disorders. Therefore, it is a necessary practice for Entities, and/or their contractors, to implement a procedure to identify, assess, and control these hazards, and train personnel to mitigate situations involving heavy handling and/or repetitious movements.

2.0 SCOPE

The scope of this procedure is to provide means to the user to create a custom procedure outlining and detailing the requirements and responsibilities to identify, assess, and control hazards associated with the manual handling of equipment, supplies, and materials. This procedure applies throughout the Kingdom of Saudi Arabia to Operations and Maintenance functions and activities on government owned facilities and projects where handling of such elements is required.

3.0 DEFINITIONS

Definitions	Description
Manual Handling	Tasks that require the use of force exerted by a person to lift, push, pull, carry or otherwise move, hold or restrain a person, animal or object
Hazardous Manual Handling	Manual handling which reflects the following characteristics: • Repetitive or sustained application of force • Repetitive or sustained awkward posture • Repetitive or sustained movement • Application of high force • Exposure to sustained vibration • Manual handling of live persons or animals • Manual handling of unstable or unbalanced loads or loads which are difficult to grasp • Manual Handling of containers of hazardous substances (e.g., gases, caustic chemicals)
Musculoskeletal Disorder (MSD)	An injury or condition that arises in whole or part from undertaking hazardous manual handling tasks in the workplace, whether occurring acutely (suddenly) or chronically (over a long period of time). Such conditions may include: • Muscle sprains and strains • Injuries to muscles, ligaments, intervertebral discs and other structures in the back • Injuries to soft tissues such as nerves, ligaments and tendons in the wrists, arms, shoulders, neck or legs abdominal hernias • Chronic pain
HSE	Health, Safety, and Environment
JHA	Job Hazard Analysis

4.0 REFERENCES

- EOM-KSS-PR-000001 A&FM General Safe Work Requirements Procedure.
- EOM-KSS-PR-000002 Housekeeping Requirement Procedure.
- OSHA 29 CFR 1910.176 Subpart N Materials Handling and Storage
- OSHA 29 CFR 1926.25 Subpart C General Safety and Health Provisions.

5.0 RESPONSIBILITIES

5.1 Facility Manager

- Overall responsibility for this procedure, supporting this process and verifying personnel actively participate.

5.2 Supervisor

- Provides the resources to implement the requirements of this procedure.
- Communicates with personnel concerning management's expectations concerning safe work practices.
- Ensure the implementation of this procedure

5.3 HSE Representative

- Auditing this procedure.
- Confirming that this procedure meets the government requirements and regulations in the location.
- Provides support and advice for leadership on HSE matters

5.4 Facility Personnel

- Knowing and understanding the Environmental Safety and Health requirements of this Procedure that apply to the work they perform.
- Requesting additional information and further clarification before starting work if personnel receive assignments they do not understand.
- Complying and abiding by this Material Handling Procedure for any work they perform

6.0 PROGRAM

6.1 Implementation – General

Supervisors must work to eliminate, as far as is reasonably practicable, the need for employees to manually handle any heavy load. Mechanical aids will be designed into work methods with adequate access and design to eliminate the need for employees to over exert or over stretch. Supervisors will be trained in ergonomics and proper manual material handling techniques for hazards analysis, controls and mitigation, as well as conducting risk assessments. Where manual handling is unavoidable, the supervisor will conduct a risk assessment and follow up with a group discussion session with employees before work starts. Attachment 1 provides step-by-step instructions for conducting such assessments.

Storage areas must be designed to reduce risk to personnel from moving heavy loads and over-reaching (Figure 1 and 2). Injuries will be promptly reported to the supervisor and investigated. Action(s) will be instituted to prevent similar injuries in the future.

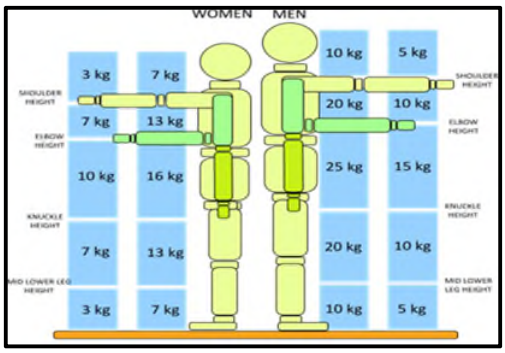

Figure 1: General Guidelines to Move Heavy Loads

Figure 2: General Manual Handling Guidelines

7.0 MANUAL HANDLING BASICS

When manual handling is anticipated, the following guidelines are provided to minimize the potential for back injuries.

7.1 Identification, Assessment and Control of Manual Handling

Hazardous manual handling risks shall be identified and assessed:

- During Safety in Design reviews.
- As part of the JHA development process.
- When an incident investigation, audit, inspection, observation, etc., identifies a hazardous manual handling risk which has not been identified or assessed through other existing processes such as JHA using the Manual Handling Risk Assessment form.

Identification of manual handling risks should include:

- Assessment of manual handling tasks during the design phase.
- Assessment of plant modification.
- Workplace layout.
- Working position and posture.
- Actions and movements necessary for tasks including their frequency and duration.
- Location and position of loads to be lifted, carried, pushed, pulled or restrained.
- Weight and dimensions of loads.
- Age, fitness level and physical characteristics of personnel undertaking manual handling tasks.
- Working environment and conditions (e.g., heat, noise, cold, vibration, air quality, weather conditions).

7.1.1 Posture and Layout

- What is the weight of the object?
- Is stooping involved where the hands pass below mid-thigh height?
- Is reaching above shoulder height involved?
- Is forward reaching (more than 30 cm away from the body) involved?
- Is significant sideways twisting of the body involved?
- Is unbalanced or uneven lifting or carrying involved?
- Is an awkward grip involved?

7.1.2 Task and Object

- Is handling performed for more than one hour at a time?
- Is handling performed more than once every five minutes?
- Are there any forces applied to move the object, apart from lifting e.g. pushing, pulling, restraining, holding?
- Is there a long vertical distance of travel (more than 25 cm)?
- Is the weight of the object?
- Does the object have sharp edges or contain hot/cold materials?
- Does it have unstable/unbalanced contents?
- Are live persons or animals being moved?
- Are slippery materials/objects handled?
- Is the object bulky or awkward (i.e., more than 75 cm in two directions)?
- Is the object an unusual shape (e.g. does it have handles)?
- Does the object have a proper grip?

7.1.3 Workplace Conditions

- Is the task performed in a confined space?
- Is the workplace hot, cold, or poorly lit?
- Are the floor surfaces slippery or uneven?

7.2 Assess the Load

To assist employees, it is essential to assess the load prior to attempting any manual handling task. The following questions should be considered:

- Are slings attached to make it easier for loading?
- Are handhold points strategically placed to assist the best body position for the load, preventing excessive bending, stretching.
- Is the load weight evenly distributed?
- Is the load free of debris, dust, oil, etc...?
- Is the work surface sound and free of obstructions (e.g., trip, fall hazards)?
- Are storage areas and vehicle access routes identified and clearly marked?
- Is access and manual handling to different levels restricted (can mechanical lifting be utilized instead).
- Does work area have sufficient lighting?

Once these basic questions have been considered, take appropriate steps to minimize the weight of the load by:

- Minimize the packaging of the load – make it smaller.
- Specify lower package weights to suppliers.
- Sort loads by category.
- Make it easier to grasp – assess handle, grip, indents on cartons, etc., to make lifting the load easier.

7.3 Importance of Posture

Poor posture during manual handling introduces the additional risk of loss of control and sudden, spontaneous increase in physical stresses on the body, let alone the back see **Attachment 2 - Manual Handling Guideline Techniques** (Figure 3).

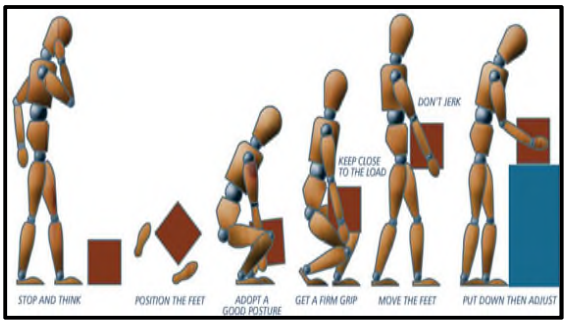

Figure 3: Lifting Technique

Stress on the back increases with:

- Twisting
- Stooping
- Reaching upwards
- Excessive lifting and over-reaching
- Pushing and pulling
- Sudden movement or jerking of load
- Prolonged or frequent physical effort
- Insufficient rest periods/breaks
- Work rate governed by process system
- Handling while seated

Note: A combination of the above seriously increases the risk of back injury. Assessment of the load is always critical and using the correct posture is essential.

7.4 Hazard Mitigation

7.4.1 Elimination of the Hazard

- Redesign workstations and work areas to eliminate reaching, bending, or other awkward postures.
- Provide adjustable tables and chairs that can be used by workers with a range of sizes and shapes, and that allow neutral postures.
- Provide carts for transporting material and mechanical hoists to eliminate lifting.
- Use tools that fit the hand, have no sharp edges, and eliminate awkward hand and wrist positions.
- Change where materials are stored to minimize reaching.
- Design containers with handles or cutouts for easy gripping.

7.4.2 Administrative Controls

- Establish a Comprehensive Ergonomics Program
  - An organizational structure to get the work done, such as an ergonomics team or committee
  - Ongoing evaluation of the ergonomics program
- Management commitment
- Worker involvement
- Training and education of workers and supervisors
- Job evaluation to identify risk factors
- Hazard prevention and reduction or elimination of risk factors
- Early detection and treatment of ergonomic injuries, and medical management of injury cases
- A system for workers and supervisors to report ergonomic problems, symptoms, and injuries without reprisal

7.4.3 PPE Controls

PPE that can help address ergonomic problems includes:

- Knee pads for kneeling tasks.
- Shoulder pads to cushion loads carried on the shoulder.
- Gloves to protect against cold, vibration, or rough surfaces.

Note: A CAUTION ABOUT BACK BELTS are sometimes provided as PPE. Back belts have been studied extensively, and experts have concluded that they are not effective in preventing back injuries. Some believe that, in fact, they may cause injury by encouraging workers to lift heavier objects or by making muscles weaker. Most importantly, they do not make workers stronger or more able to perform a lift that is awkward or too heavy. The National Institute for Occupational Safety and Health (NIOSH) recommends that employers not rely on back belts to protect workers. Instead, it recommends that employers implement a comprehensive ergonomics program that includes workplace assessment, hazard reduction, and worker training.

8.0 TRAINING REQUIREMENTS

Initial training to be presented to each employee will include an overview on back injury prevention, stretching, and correct lifting methods. Employees will be trained in lifting techniques. An example of a training course can be seen in Attachment 2. These requirements also apply to non-manual employees. The training conducted shall be recorded and documented.

Back injury prevention will be continually emphasized to supplement initial training (e.g., Safety meetings, toolbox meetings, coaching or other methods, etc.). Topics that can be linked to manual material handling and back injury prevention include, but are not limited to, the following:

- Potential hazards (job or task specific).
- Unfamiliar handling operations.
- Proper use of handling aids (tools, equipment).
- Proper use of personal protective equipment.
- The working environment and personnel safety.
- Housekeeping.
- Factors affecting individual capabilities.
- Good handling techniques.

9.0 ATTACHMENTS

1. Attachment 1 - Risk Assessment for Back Injury Protection
2. Attachment 2 - Manual Handling Guideline Techniques

Attachment 1 - Risk Assessment for Back Injury Prevention

Factors to be considered when making an assessment of Manual Handling Operations

1.0 The Tasks

Do they involve:

Holding or manipulating the loads at a distance from the body? Unsatisfactory bodily movements or postures, especially:

- Twisting the trunk?
- Stooping?
- Reaching upward or overstretching?

Excessive movement of loads, especially:

- Excessive lifting or lowering of loads?
- Excessive carrying distances?
- Excessive pushing or pulling of loads?
- Risk of sudden movement of loads?
- Frequent or prolonged physical effort?
- Insufficient rest or recovery periods?
- A rate of work imposed by the process?

2.0 The Loads

Are they:

- Heavy?
- Bulky or unwieldy?
- Difficult to grasp?
- Unstable, or with contents likely to shift?
- Sharp, hot, or otherwise potentially damaging?

3.0 The Working Environment

Are there:

- Space constraints preventing good posture?
- Uneven, slippery or unstable floors/surfaces?
- Variations in level of floors or work surfaces?
- Extremes of temperature or humidity?
- Conditions causing ventilation problems or gusts of wind?
- Poor lighting conditions?

Attachment 2 - Manual Handling Guideline Techniques

Step 1 – ASSESS THE LOAD
Plan the lift, where is it going to be placed, handling aids available, Assistance available, Obstruction removed, access egress routes assessed for obstructions.

STEP 2 – FEET POSITION
Feet apart – balance, stable base for lifting, leading leg forward (ensure proper clothing is also worn).

STEP 3 – ADOPT GOOD POSTURE
Bend the knees ensuring hands are close to waist when lifting. Do not kneel or over flex the knees. Keep the back straight (tuck in chin – this helps align body) lean forward a little to allow a better grip, keep shoulders level and facing the same direction as the hips.

STEP 4 – GET A FIRM GRIP
Try to keep the arms within the boundary formed by the legs. The optimum position and nature of the grip depends on the circumstances and individual preferences, but it must be secure. A hook grip is less fatiguing than keeping the fingers straight. If it is necessary to vary the grip as the lift progresses, do so as smoothly as possible, preventing jerking or sharp movements.

STEP 5 - DON'T JERK
Carry out the lifting movement smoothly, keeping control of the load.

STEP 6 - MOVE THE FEET
Don't twist the trunk when turning to the side.

STEP 7 – KEEP CLOSE TO THE LOAD
Keep the load as close to the trunk for as long as possible. Keep the heaviest side of the load next to the trunk. If a close approach to the load is not possible, try sliding it towards you before attempting to lift it.

STEP 8 – PUT DOWN – THEN ADJUST
If precise positioning if load is necessary, put it down first, then where possible slide the load into position.