Safety Culture & Operational Safety

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COURSE OUTLINE

Occupational Health & Safety (OHS) Terms

SAFETY: Freedom from (unacceptable) risk of harm to persons.

HEALTH: A state of wellbeing with the absence of illness or disease .

SAFE SYSTEM OF WORK: A method of working that eliminates or reduces the risk of injury.

COSHH :Control of Substances Hazardous to Health

DERMATITIS: Inflammation of the skin. When the condition is due to contact with a substance at work it is called 'occupational' or 'industrial' dermatitis

ERGONOMICS : The study of the relationship between workers ,their occupation, equipment and environment .

HAZARD : A potential source of harm.

ALARP: As Low As Reasonably Practicable-ALARP

Basic OHS Terms

OCCUPATIONAL HEALTH -Health issues associated with work

ACCIDENT - an unplanned, unwanted event that leads to injury, damage or loss.

NEAR MISS - an unplanned, unwanted event that had the potential to lead to injury, damage or loss (but did not actually, do so).

RISK- the chance or likelihood that someone could be harmed or experience negative health effects due to exposure to a hazard. Risk = Likelihood × Severity

It combines how likely an incident is to happen with how serious the consequences would be if it did.

WHY OHS

To promote physical, mental and social wellbeing of employees

Protect employees and others affected from risks

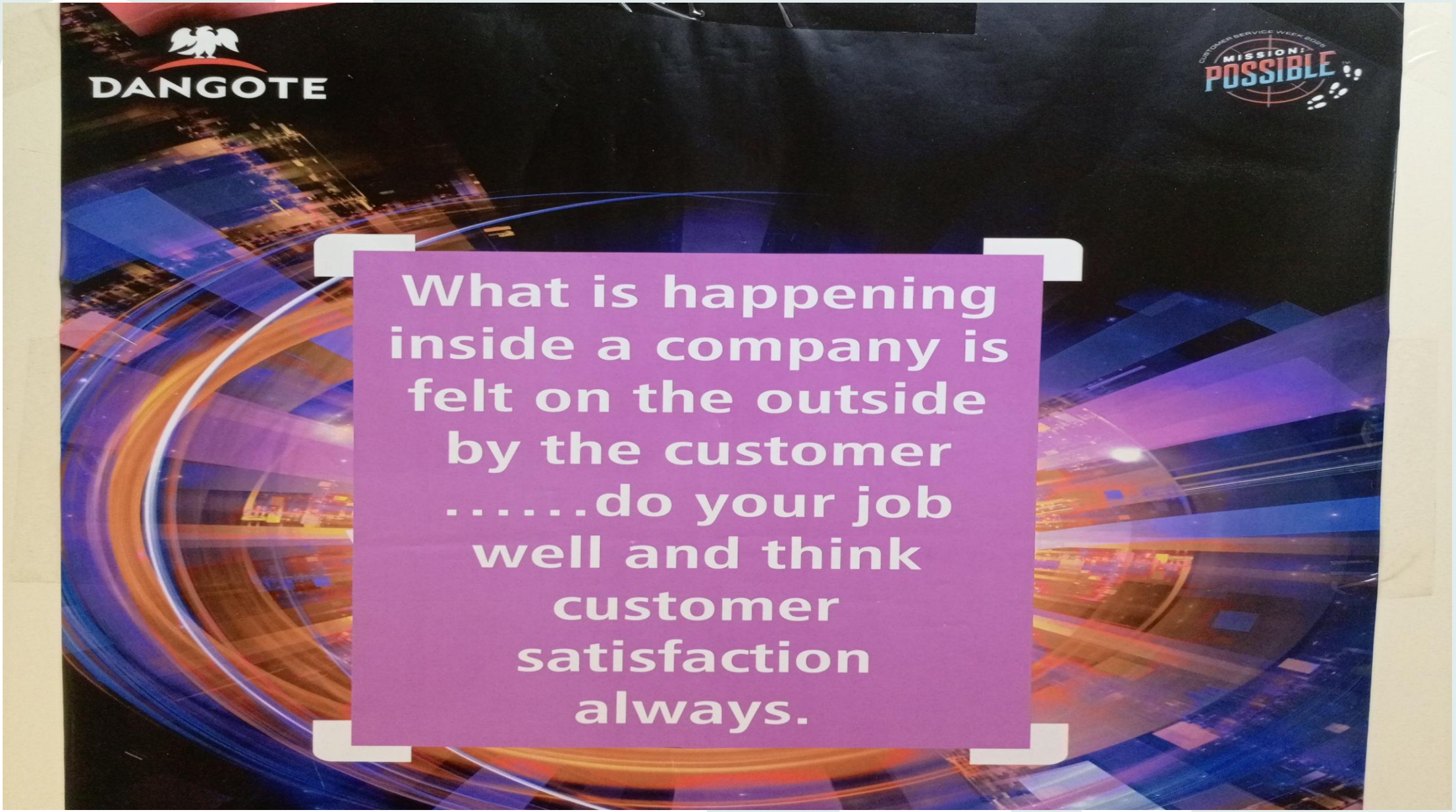
Provide adequate welfare facilities

Develop a management system and policies

Create a positive OHS culture in the workplace .

REASONS FOR HSE

- **Moral**: Ethical and responsible behavior
- **Financial/Economic**: The cost of injuries and ill health
- **Legal/social**: Criminal and Civil liability

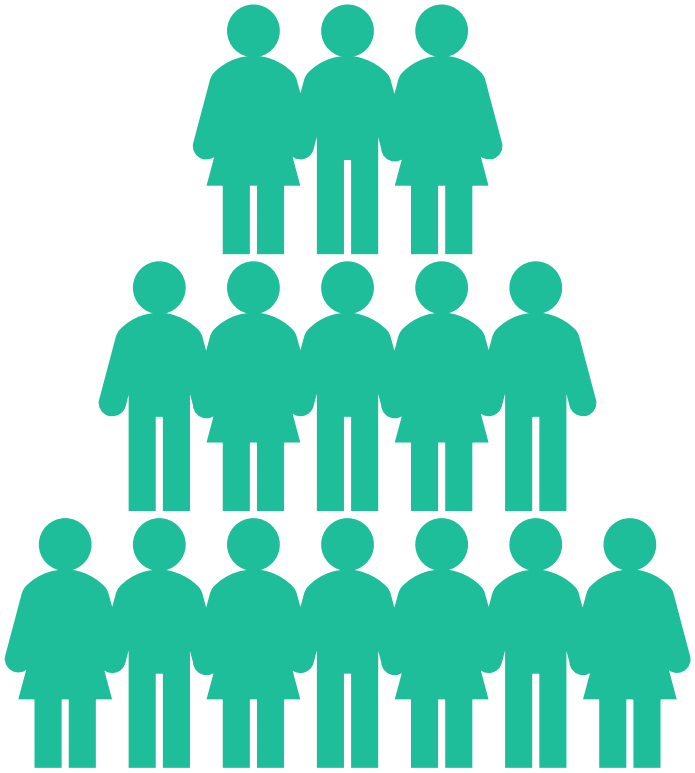

DANGOTE
CUSTOMER SERVICE WEEK 2023
MISSION: POSSIBLE
What is happening inside a company is felt on the outside by the customer .....do your job well and think customer satisfaction always.

Safety Culture

Safety culture refers to the collective beliefs, values, attitudes, and behaviors that shape how safety is approached and practiced in a workplace.

A strong safety culture in a cement production /logistics company hinges on leadership commitment, employee engagement, and rigorous safety protocols.

It is about embedding safety into every aspect of operations from quarrying to packaging and distribution (logistics)



Key Pillars of a Safety Culture (Cement plant)

Leadership Commitment

• Senior management must visibly prioritize safety.

• Regular safety audits and reviews led by executives reinforce accountability.

Comprehensive Training

• Workers should receive ongoing education on machinery operation, hazard recognition, and emergency procedures.

• Training should be tailored to roles e.g., kiln operators vs. maintenance ,logistics staff etc.

Hazard Identification and Risk Assessment

• Conduct regular risk assessments across all production stages.

• Use tools like Job Safety Analysis (JSA.

Personal Protective Equipment (PPE) Compliance

• Enforce mandatory use of PPE such as helmets, goggles, respirators, and safety boots.

• Regular inspections ensure PPE is in good condition and properly used.

Key Pillars of Safety Culture contd..

Incident Reporting and Investigation

- Encourage transparent reporting of near-misses and accidents.
- Investigate incidents thoroughly to identify root causes and prevent recurrence.

Behavior-Based Safety (BBS) Programs

- Promote safe behaviors through observation and feedback.
- Recognize and reward safety-conscious actions to reinforce positive habits.

Emergency Preparedness

- Develop emergency response plans for fire, chemical spills, and equipment failure.
- Ensure all employees know evacuation routes and first-aid procedures.

Contractor Safety Management

- Hold contractors to the same safety standards as employees.
- Conduct safety inductions and monitor contractor compliance.

Promoting a good safety culture

Safety Committees

Establishing safety committees comprising employees from various departments can foster a collaborative approach to safety. These committees can identify safety concerns, develop solutions, and promote best practices.

Safety Incentives

Recognizing and rewarding employees for adhering to safety protocols and suggesting improvements can motivate everyone to prioritize safety.

Open Communication

Encouraging open communication about safety issues helps address concerns promptly and ensures that employees feel comfortable reporting hazards without fear of reprisal.

Cost of Accidents

Examples of direct costs:

- Fines in the criminal courts.
- Compensation to the victim which may result in an increase in insurance premiums.
- First-aid treatment.
- Worker sick pay.
- Repairs to, or replacement of, damaged assets.
- Lost or damaged product.
- Lost production time while dealing with the injury.
- Overtime to make up for lost time.
- Costs associated with the rehabilitation of the injured worker and their return to work.

Examples of indirect costs:

- Loss of staff from productive duties due to Incident investigation.
- Loss of staff morale impacts on productivity.
- Cost of remedial action following an investigation.
- Cost of recruiting and training temporary or replacement labour.
- Loss of goodwill of customers following delays in production and fulfilling orders.
- Damage to public image and business reputation.
- Industrial action (e.g. strikes).

Health and Safety Responsibilities

The Employer's Basic Responsibilities

To provide and maintain workplaces, machinery, equipment and work processes.

To ensure that **Chemical**, **Physical** and **Biologica**l substances and agents are without risk to health when protective measures have been taken.

Provide adequate protective clothing and equipment to prevent risks of accidents or adverse health effects.

Employee’s Basic Responsibilities

Take reasonable care of their own safety and others affected by their acts or omissions at work.

Comply with instruction, for their own safety and health and that of others and with safety procedures.

Use safety devices and protective equipment correctly and not to render them inoperative.

Report to supervisor any situation which could present a hazard and which they cannot themselves correct.

Report any accident or injury arising in the course of or connection with work.

Consequence of non-compliance

Criminal law

Punishment.

Action by the State.

Often uses statute law.

No time limit.

Regardless of loss/no loss.

Burden of proof = “beyond all reasonable doubt”.

Civil law

Compensation.

Action by the individual.

Often uses common law.

Time limit.

Must be a loss.

Burden of proof = “balance of probability”.

Syndicate Group Exercise

In your groups, discuss the **criminal** and **civil law** implications of the following scenarios; considering the hazards involved, as well as referring to the legal frameworks where applicable

- A technician escapes injury by diving under a bench when a vessel blows up as a result of a design defect.

- A 12-year-old boy breaks his arm falling into a pit whilst playing on an unfenced building site.

- A machine operator is blinded in one eye by a colleague trying to help him remove a jammed machine part using a hammer. There is a safe way to remove the jammed part which does not involve the use of a hammer and the area they are in is a mandatory eye protection zone.

- A scaffolder is electrocuted when the pole he is carrying touches a live overhead cable. The scaffolder works for a company contracted to a roofing company, in turn contracted to a factory owner.

HAZARD IDENTIFICATION & RISK ASSESSMENT IN CEMENT PLANTS AND DEPOT

Hazards in cement plants/depot

HAZARD /SOURCES	HEALTH RISKS	CONTROLS
Dust Exposure-Cement dust, silica dust, coal dust	Respiratory diseases like silicosis, pneumoconiosis, and chronic bronchitis	Dust suppression systems, proper ventilation, and use of respirators
Noise Pollution-Crushers, grinders, kilns, and heavy machinery	Hearing loss, stress, and reduced concentration	Soundproofing, regular noise monitoring, and use of ear protection
High Temperatures and Burns-Kilns, clinker coolers, and hot surfaces	Thermal burns, heat stress, dehydration	Heat-resistant PPE, hydration protocols, and temperature monitoring
Mechanical Hazards-Moving parts of machinery, conveyors, and rotating equipment	Crush injuries, amputations, entanglement	Machine guarding, lockout/tagout procedures, and safety training

Hazards in cement plants/depots contd..

HAZARD /SOURCES	HEALTH RISKS	CONTROLS
Chemical Exposure: Fuels, lubricants, and additives like chromium compounds	Skin irritation, chemical burns, and long-term toxicity	Safe handling procedures, chemical storage protocols, and PPE
Ergonomic Hazards: Manual handling of heavy bags, awkward postures	Musculoskeletal disorders, fatigue	Mechanical aids, ergonomic training, job rotation
Confined Spaces- tanks, pits, silos etc	Oxygen deficiency, toxic gas accumulation, entrapment	Gas testing, entry permits, rescue plans
Electrical Hazards: Faulty wiring, exposed circuits, wet conditions	Electrocution, fires	Regular inspections, grounding, and electrical safety training

Spot the Hazards

Spot the Hazards

Job Safety Analysis (JSA)

Job Safety Analysis is a systematic process designed to identify potential hazards and recommend the safest methods for carrying out a specific task or job operation.

Conducting a JSA also raises safety and health awareness among workers and supervisors, promoting a safety culture and encouraging communication about safe work procedures.

Developing a written work procedure based on the JSA can serve as a teaching aid for initial job training and a briefing guide for infrequent jobs

Steps to conduct a JSA

1. **Selecting the job or task to be analyzed**
2. **Breaking Down the Job into individual steps-** Observe the task, Consult with workers, Document the steps, Ensure a manageable number of steps, Capture variations and non-routine tasks, Review and refine.
3. **Identifying potential hazards-**Hazards can be categorized into various types, including physical, chemical, biological, ergonomic, and psychological.
4. **Recommending Safety Measures**
5. **Documenting The JSA-** Assign responsibility, obtain approval and signatures, store and organize the documentation
6. **Reviewing And Updating The JSA-**Periodic reviews and updates ensure that the JSA remains relevant and accurate in the face of changes in the work environment, the introduction of new equipment, or the identification of new hazards

CEMENT DEPOT SAFETY PROTOCOLS

Depot Safety protocols

Safety protocols in a cement depot focus on preventing injuries from handling heavy materials, controlling dust exposure, and ensuring safe vehicle and equipment operations. These protocols are essential for protecting workers and maintaining operational efficiency.

Material Handling Safety

- Manual Handling: Train workers on proper lifting techniques to avoid musculoskeletal injuries.
- Mechanical Aids: Use forklifts, conveyors, and hoists to move heavy cement bags.
- Stacking Guidelines: Stack cement bags securely and limit height to prevent collapse.

PPE Compliance

- Mandatory Gear: Helmets, gloves, safety boots, high-visibility vests, and eye protection.
- Inspection: Regular checks to ensure PPE is in good condition and properly worn.

Depot Safety Protocols

Traffic and Vehicle Safety

- Designated Routes: Mark clear paths for forklifts and delivery trucks.
- Speed Limits: Enforce low-speed zones within the depot.
- Spotters and Mirrors: Use spotters during reversing and install convex mirrors at blind spots.

. **Dust Control Measures**

- Ventilation Systems: Install exhaust fans and dust collectors to reduce airborne particles.
- Wet Handling: Use misting systems to suppress dust during bagging and transfer.
- Respiratory Protection: Provide N95 masks or respirators for workers in high-dust zones.

Safety Protocols

Equipment Safety

- Maintenance Schedule: Routine checks and servicing of bagging machines, conveyors, and forklifts.
- Lockout/Tagout (LOTO): Procedures to isolate equipment during maintenance.
- Operator Training: Only certified personnel should operate machinery.

Fire and Emergency Preparedness

- Fire Extinguishers: Strategically placed and regularly inspected.
- Evacuation Plans: Clearly marked exits and regular fire drills.
- First Aid Kits: Accessible and stocked with essentials.

Safety Protocols

Chemical Handling

- Storage Protocols: Store additives and chemicals in labeled, ventilated areas.
- Spill Response: Train staff on containment and cleanup procedures.

Incident Reporting and Investigation

- Reporting System: Encourage prompt reporting of near-misses and accidents.
- Root Cause Analysis: Investigate incidents to prevent recurrence.
- Corrective Actions: Implement changes and communicate lessons learned.

Training and Communication

- Induction Programs: Safety orientation for new employees and contractors.
- Toolbox Talks: Regular briefings on specific hazards and safety updates.
- Signage: Use clear, multilingual signs for hazards, PPE zones, and emergency exits.

SAFE EQUIPMENT & MANUAL HANDLING

TEAM ASSESSMENT

Mr. DAVE, Mr. STANLEY, and Mr. TOLA , work in the same establishment, where they use a U-blending machine in shifts.

Mr. DAVE worked with the machine from 7am-11.30am, and left without putting the machine in order. Mr. STANLEY resumed for work by 12 noon; discovering that the machine was not in order, climbed in, to fix a few things. Mr. TOLA arrived the scene, and switched on the U-blender, which crushed Mr. STANLEY.

As the departmental **SUPERVISOR**,

analyze the situation

Case Study: Cement Plant Fatality from LOTO Failure

Incident Overview: At a large cement manufacturing facility, a maintenance technician was assigned to inspect and service a conveyor system used to transport raw materials to the kiln. The system had experienced frequent jams, and the technician entered the chute area to clear debris.

What Went Wrong:

- The conveyor system was still energized.
- No Lockout/Tagout (LOTO) procedures were applied to isolate the power source.
- A control room operator, unaware of the technician's presence, restarted the system.
- The technician was pulled into the moving conveyor and crushed between the belt and the chute wall.

Case Study Contd...

Key Failures:

- No physical locks or tags were placed on the control panel or motor disconnect.
- No communication protocol existed between maintenance and operations.
- The plant lacked a formal LOTO training program, and procedures were not enforced.

Consequences:

- The technician died from traumatic injuries.
- The company was cited by OSHA for multiple violations, including failure to implement energy control procedures.
- A $70,000 fine was levied, and the plant underwent a full safety audit and retraining program.

Case Study Lessons Learned

- LOTO procedures must be mandatory for all maintenance tasks involving hazardous energy.
- Training and enforcement are critical—LOTO is not just paperwork but a life-saving discipline.
- Clear signage, lockout devices, and communication protocols must be in place before any servicing begins.

This case is often referenced in safety training to emphasize how a single lapse in energy isolation can lead to irreversible consequences

Energy isolation

Energy isolation in a cement depot requires strict Lockout/Tagout (LOTO) procedures to control hazardous energy sources such as electrical, mechanical, hydraulic, and pneumatic systems during maintenance or servicing. These protocols are essential to prevent accidental startup and protect workers from injury.

Key Energy Isolation Requirements

❑ **Hazardous Energy Identification**

• Types of energy: Electrical (motors, conveyors), mechanical (rotating shafts), hydraulic (pressurized systems), pneumatic (compressed air), thermal (hot surfaces), and gravity (elevated loads).

• Assessment: Conduct a thorough risk assessment to identify all energy sources associated with equipment.

Lockout/Tagout (LOTO)

- **Lockout/Tagout (LOTO) Procedures**

• Lockout devices: Use padlocks, valve lockouts, circuit breaker lockouts, and plug lockouts to physically isolate energy sources.

• Tagout labels: Attach warning tags stating “Do Not Operate” with the name of the person performing the lockout.

• Verification: Always test equipment to confirm zero energy before starting work.

ENERGY ISOLATION

.**Isolation Methods**

- **Electrica**l: Disconnect power at the main switch or breaker; use lockable disconnects.
- **Mechanical**: Immobilize moving parts using blocks or restraints.
- **Hydraulic/Pneumatic:** Bleed off pressure and lock valves in the closed position.
- **Thermal:** Allow equipment to cool and isolate heat sources.
- **Gravity**: Secure elevated components with blocks or chains

Permit-to-Work System

- Require formal authorization before any isolation or maintenance begins.
- Include details of isolation points, responsible personnel, and duration.

Training and Competency

- Train all employees and contractors on LOTO procedures and their roles.
- Conduct refresher courses and practical drills regularly.

Documentation and Auditing

- Maintain a register of all isolation points and procedures.
- Perform regular audits to ensure compliance and update protocols as needed.

Best Practices for Energy Isolation

- Use color-coded locks to differentiate departments or roles.
- Implement group lockout boxes for multi-person tasks.
- Ensure supervisory oversight during critical isolations.
- Display LOTO signage near equipment and control panels.

MANUAL HANDLING

MANUAL HANDLING

1

Assess Before You Lift

2

Evaluate the load: Check weight (typically 50 kg for cement bags), shape, and stability.

3

Plan the route: Ensure the path is clear of obstacles, spills, or uneven surfaces.

4

Seek help: Use team lifting or mechanical aids for heavy or awkward loads.

Proper Lifting Techniques

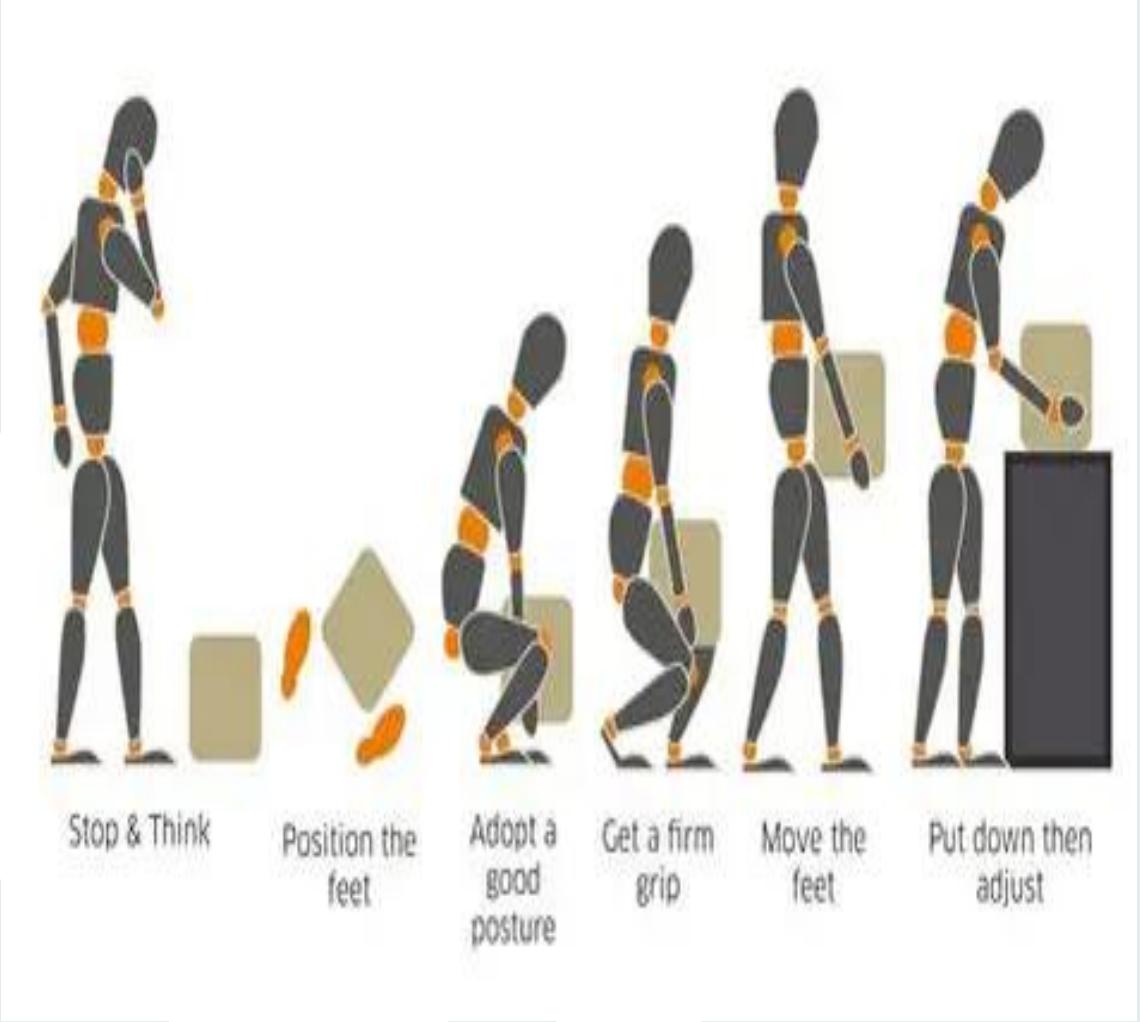
Feet shoulder-width apart for balance.

Bend knees, not your back—keep your spine straight.

Hold the load close to your body at waist height.

Avoid twisting—turn with your feet, not your torso.

Lift smoothly—no jerking or sudden movements.



Manual Handling Considerations

.**Limit Load Weight and Frequency**

Recommended limit: No more than 25 kg for a single person (adjust based on local regulations and worker capability).

Use mechanical aids: Trolleys, hoists, or conveyors for repetitive or long-distance handling.

Rotate tasks to reduce fatigue and repetitive strain.

Common Hazards to Avoid

Overreaching or lifting above shoulder height

Carrying loads that block vision

Handling wet or damaged cement bags

Ignoring signs of fatigue or strain

Ergonomic Workstation Design

Adjustable platforms to reduce bending or overreaching.

Anti-slip mats and proper lighting in handling zones.

Storage height: Keep frequently handled items between knee and shoulder height.

PPE and Clothing

Gloves for grip and hand protection.

Steel-toe boots to protect feet from dropped loads.

Back support belts (if recommended by safety assessments).

WORKPLACE SAFETY - WALKTHROUGH

Purpose of a Safety Walkthrough

Walkthrough serves to..

- Spot hazards early before they cause incidents
- Reinforce safety protocols and compliance
- Engage employees in safety conversations
- Document observations for corrective action

Areas to Inspect

• Fire Safety: Accessible extinguishers, clear exits, functional alarms

Housekeeping: Clean floors, clear walkways, proper waste disposal

• Electrical Safety: No exposed wires, grounded outlets, tagged equipment

• Machinery & Equipment: Guards in place, emergency stops, maintenance logs

• Chemical Safety: Proper labeling, secure storage, spill kits

• PPE Compliance: Correct gear worn and available

• Ergonomics: Safe lifting practices, workstation setup

• Emergency Preparedness: Evacuation maps, first aid kits, trained personnel

Walkthrough Procedure

1. **Prepare a Checklist-** Use a digital or printed template tailored to your facility
2. **Schedule Regular Walks-** Daily for high-risk areas, weekly or monthly for general zones
3. **Engage Employees-** Ask questions, observe behavior, encourage feedback
4. **Document Findings-** Note hazards, take photos, assign corrective actions
5. **Follow Up-** Track resolution of issues and update safety plans

For Effective Walkthroughs

- Be consistent but unpredictable in timing
- Focus on both physical conditions and behaviors
- Use walkthroughs as coaching opportunities, not just audits
- Share results with teams to build transparency and trust

ANY QUESTIONS ?

THANK YOU

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